

Clemson University



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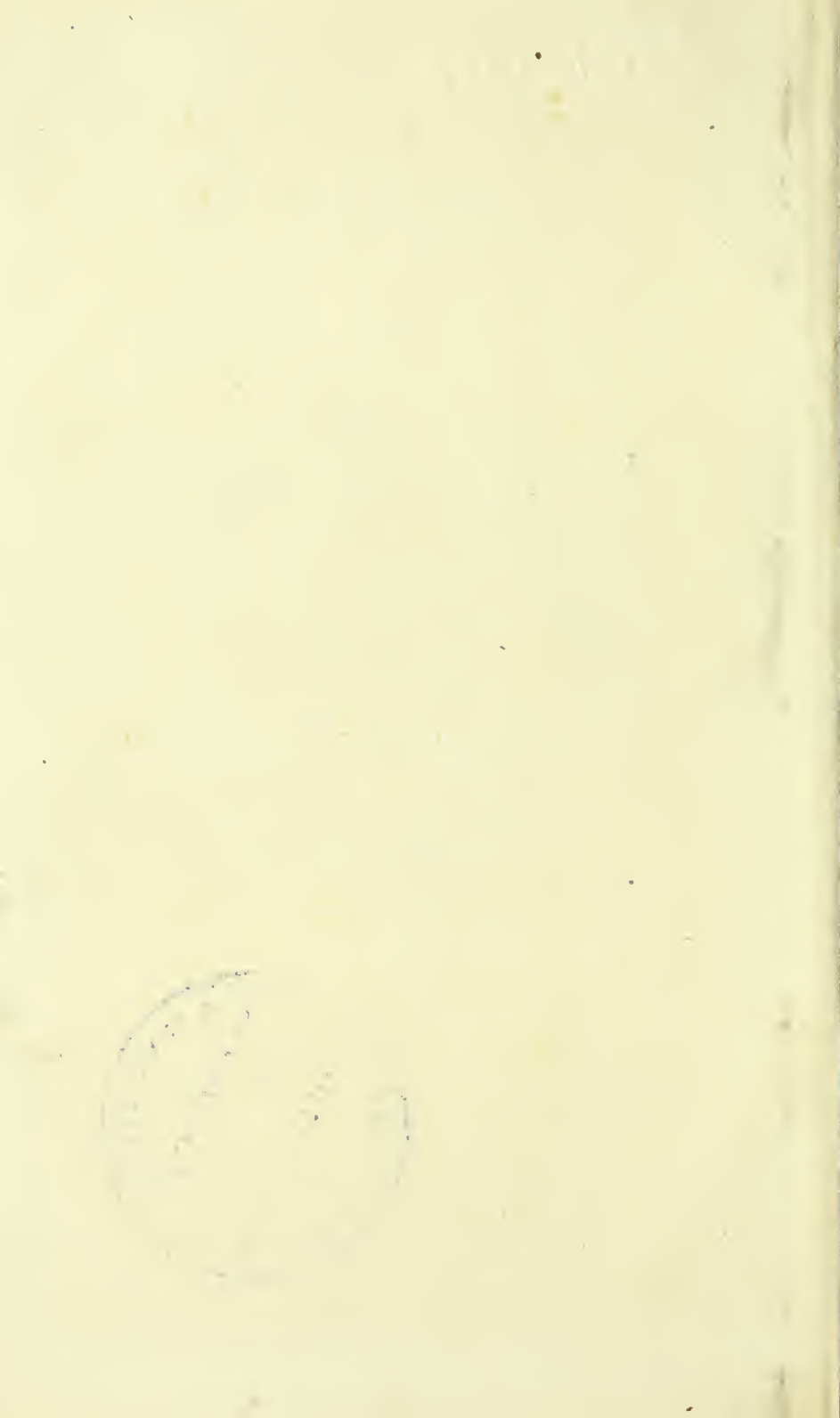
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REPORT

OF THE

COMMISSIONER OF GENERAL LAND OFFICE,

FOR

THE YEAR 1867.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1867.





## EXTRACT FROM THE REPORT OF THE SECRETARY OF THE INTERIOR.

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None of these branches occupies a higher place in the public regard than that which relates to the national domain. Much of this noble patrimony was acquired by cession from the States which won our independence. Successive additions to it have been made by treaties, the first of which was concluded with France in 1803, and the last with Russia, ceding to us her American possessions, which cover an area of 369,529,600 acres.

Our legislation has been adapted to the peculiar status of the territory acquired from foreign powers and to the adjudication of individual rights claimed under them. Experience has suggested salutary changes in the mode of disposing of the public lands. Credit on sales has been long since abolished. The right of pre-emption, originally conferred only by special enactment, has become a permanent part of our system. At a later period the homestead policy was engrafted upon it. In no respect has the wisdom of Congress been more strikingly displayed than in the adoption of a general and uniform method of public surveys. Until they are extended over the soil, the proprietorship thereof remains in the government. This policy offers a marked contrast to that of the nations which established colonies within our limits, and secures to the purchaser an indisputable right to a well-defined tract. Notwithstanding our settlements have progressed with a rapidity unequalled in the history of nations, few serious controversies have arisen in regard to titles emanating from the United States. Our present system is so simple and efficient, so well adapted to the wants of our population and the interests of the service, that it is not susceptible of much improvement. Such modifications as were needed to perfect it were alluded to in my last annual report. No necessity exists for making at this time more special reference to them.

During the last fiscal year 7,041,114.50 acres were disposed of, as follows:

	Acres.
Sold for cash.....	756,619.61
Located with military warrants.....	476,760.00
Taken for homesteads.....	1,788,043.49
Approved to States as swamp.....	1,066,450.15
Grants to railroads, wagon roads and canals.....	533,168.52
Located with college scrip.....	2,420,072.73
	<hr style="width: 100%; border: 1px solid black;"/>
	7,041,114.50
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This quantity exceeds that disposed of during the previous year by 2,411,800.

The cash receipts of the office from sales and fees of various kinds amounted to \$1,347,863 52; a sum greater than that received the previous year by more than half a million dollars.

During the last fiscal year and the quarter of the present year ending 30th September last, 550 Indian patents were issued, embracing 89,824 acres.

Under the several acts of Congress relating thereto, 275 patents for private land claims in California have been issued, embracing 4,363,300 acres.

Contracts have been entered into for surveying and marking the northern boundary of California, that portion of the eastern boundary of Oregon which lies due south of the confluence of Owyhee with Snake river, to the northern line of Nevada, and the northern boundary of New Mexico. It is recommended that appropriations be made for the survey of the northern and eastern boundaries of Colorado Territory and the northern and eastern boundaries of Nevada.

The report of the Commissioner evinces great labor and research. He discusses with his accustomed ability many questions in connection with the landed interests of the United States.



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REPORT  
OF  
THE COMMISSIONER OF THE GENERAL LAND OFFICE.

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DEPARTMENT OF THE INTERIOR, GENERAL LAND OFFICE,

*October 15, 1867.*

SIR: In accordance with the resolution of the Senate, dated February 28, 1855, I have the honor to present the following as an abstract of the annual report of this office for the year 1867:

1. The area of the public lands, exclusive of the Russian purchase, is 1,465,468,800 acres. The extent of that purchase is estimated at 577,390 square miles, or 369,529,600 acres, making a total of 1,834,998,400 acres.

2. The aggregate of public lands which have been surveyed is 485,311,778 acres, leaving a residue of 1,349,686,622 acres yet unsurveyed.

3. The quantity of public land disposed of during the last fiscal year is 7,041,114.50 acres, of which there were sold for cash 756,619.61 acres; located with military bounty land warrants 476,760 acres; taken for homesteads under the acts of 1862, 1864, and 1866, 1,788,043.49 acres; approved to several States as swamp "in place" 1,030,020.22 acres; for indemnity swamp selections 36,429.93 acres; titles vested in certain States under railroad, wagon-road, and ship-canal grants for 533,168.52 acres, and located with agricultural and mechanic college scrip, together with selections made by States within their respective limits, 2,420,072.73 acres.

4. The amount received on cash sales, pre-emptions, military scrip received as money, homestead payments, and commissions, fees for locating agricultural college scrip on military warrants, and railroad selections, commissions on pre-emptions, and donations and proceeds from furnishing transcripts under act of July 2, 1864, is \$1,347,862 52.

5. The excess disposed of over the previous year is 2,411,800 acres.

6. Explanation of the public surveying system is given, indicating the structure of base lines, principal meridians, township and sectional lines, showing the establishment, since the adoption of the system in 1785, of 20 principal bases and 23 principal meridians, extending into all the States and Territories carved out of the public domain, except the Russian purchase, aggregating in length 1,476,673 lineal miles, the locality of each base and meridian being designated.

7. The public surveys have been extended wholly over Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Missouri, Arkansas, Mississippi, Alabama, and nearly so in Louisiana and Florida.

8. Outline sketches are given of the rise and progress of each of the public land States and Territories, with their areas, and the advancement of surveys therein; commencing with Ohio, where the system had its initiation, to the Territory of Montana, where that system was inaugurated in 1867.

9. Landed property; the rise and progress shown of the pre-emption system, with results; number stated of farms under actual cultivation; also of urban settlements.

10. Homestead policy considered with homestead rulings; results shown.



11. Relation of foreigners to real estate in the United States. Laws respecting naturalization.

12. Legislation making provision for schools, seminaries of learning, and colleges; extent of such concessions.

13. Extent of grants shown for military services since the foundation of the government.

14. Operations of the General Land Office, in connection with Indian rights; sketch of Pueblos.

15. Foreign titles; effect of laws of 1860-'66 explained in regard to the adjudication of a certain class of claims, including not only those under governments which, *de jure*, preceded the United States, but also those from governments *de facto*.

16. Legislation shown respecting the discontinuance of surveying districts.

17. Laws respecting discontinuance of land offices; the new offices established; proclamation of sales.

18. Military reservations; legislation recommended so as to confer authority for the sale of such as may be abandoned.

19. Account of surveyors general, deputies, receivers of public money and disbursing officers, reported as settled to the end of fiscal year.

20. Transcripts of archives reported as furnished to supply lost records in the southern and other States.

21. Laws respecting the suppression of timber depredations and measures taken in that respect.

22. Proceedings had respecting certain special improvement interests, viz: the Fox and Wisconsin, Des Moines, Portage lake, Sturgeon's bay, and Lac la Belle.

23. Swamp and overflowed land concessions; results submitted; further legislation recommended.

24. Riparian interests considered; rights of the United States to the islands in the Mississippi, which, although not navigable according to the theory of the English law, yet are so in fact, and in virtue of acts of Congress.

25. Geological survey of Nebraska; results reported under legislation in that respect.

26. General views as to the extension of such explorations.

27. Proceedings had for the establishment of the boundary lines between Colorado and New Mexico, California and Oregon.

28. A revival of the laws recommended in regard to the right of way, which was conceded in past legislation, for railroads and turnpikes.

29. Pacific slope; its extent; also its importance shown in an agricultural, mineral, and commercial point of view.

30. Roads and railways considered; legislation in respect to the same, and progress made.

31. Relation of the United States to the trade of the East.

32. In the papers accompanying this report will be found an account of the gold and silver producing countries, the amount taken from the mines since the discovery of America, with a summary of the mineral wealth of the United States.

33. The report is accompanied by the returns of the surveyors general of the number of acres surveyed, total unsurveyed on 30th June, 1867, area of the public domain remaining unsurveyed, cash sales, homestead, extent of swamp concessions, internal improvement selections, agricultural college.

34. General tabular statement exhibiting the disposal of the public lands, under 22 different heads, from the commencement of the land system to 30th June, 1867.

35. Historical and statistical table of the United States and States of North America.

36. The report is accompanied by maps of the public land States and Territories, a connected map of the United States, as it existed prior to the Russian

purchase; also a map of the world on Mercator's projection, showing our territory, including the Russian purchase, and the relations of the country to important points of trade in the eastern and western hemispheres.

Respectfully submitted:

JOS. S. WILSON,  
*Commissioner.*

Hon. O. H. BROWNING,  
*Secretary of the Interior.*

DEPARTMENT OF THE INTERIOR, GENERAL LAND OFFICE,  
October 15, 1867.

	Acres.
Sir: The public lands, including the Russian purchase in northwestern America acquired by treaty of May 28, 1867, are now equal in area to.....	1,834,998,400
From the beginning of the land system to the end of the last fiscal year the aggregate of surveyed lands is.....	485,311,778
Leaving unsurveyed.....	1,349,686,622
During the fiscal year ending June 30, 1867, the total cash sales embraced.....	756,619.61
The aggregate of military bounty-land warrant locations.....	476,760.00
The total quantity taken by homestead for actual settlement, under acts of 1862, 1864, and 1866.....	1,788,043.49
In the same period there were approved swamps "in place" to several States as grantees under acts of 1849 and 1850.....	1,030,020.22
And selected as swamp indemnity.....	36,429.93
Making a total of swamp lands or their equivalents, confirmed to States, of.....	1,066,450.15
In same fiscal year titles under railroad, wagon-road, and ship-canal grants have been vested in certain States, for the quantity of.....	533,168.52
The agricultural and mechanic college land-scrip locations under act of 1862, and supplementals of 1864 and 1866, with selections by certain States within their respective limits under said acts, making an aggregate of.....	2,420,072.73
Making a total of public lands disposed of during the year ending June 30, 1867, of.....	7,041,114.50

The moneys received in the same period for ordinary cash sales, pre-emptions, in military scrip received as money, for the ten-dollar homestead payments, for homestead commissions, for fees in the locating of agricultural college scrip, for same on military warrants and on railroad selections, for commissions on pre-emptions, donations, and for proceeds from furnishing transcripts under act of July 2, 1864, make a cash aggregate of \$1,347,862 52 received during the fiscal year ending 30th June, 1867.

By these results it appears that in virtue of the cession by treaty concluded on 30th March, 1867, between the United States and the Emperor of Russia, an enlargement of the national territory has been effected equal to five hundred and seventy-seven thousand three hundred and ninety square miles, or three hundred and sixty-nine million five hundred and twenty-nine thousand six hundred acres, possessing extensive belts capable of yielding food for the support of man, mineral resources, important fisheries, and extending our possessions toward the continent of Asia and by the chain of the Aleutian islands equal in length to one thousand and sixty-five statute miles, bringing us, comparatively speaking, to the vicinity of the Japanese islands.

These results further show the disposal in round numbers of two million four hundred and eleven thousand eight hundred acres in excess of the quantity for which evidences of title were granted during the year ending 30th June, 1866, caused by the cash sales being nearly doubled, by additional bounty land locations, by a very large increase in selections under railroad grants, also by nearly a quadruplication of the quantity in the previous year in locations and selections under the agricultural college grants, the cash receipts for the last year having exceeded those of a like previous period by a sum considerably in excess of half a million of dollars.

Among the most important principles in the transfer of landed property are certainty and brevity of description in the conveyed premises.

The public land or rectangular system is pre-eminently valuable, and in that respect stands unrivalled.

It was adopted on 20th May, 1785, and has been modified and enlarged by subsequent laws until it has reached its present proportions and completeness of scientific structure.

Under that system base lines are first established, corresponding with latitude. These are then intersected at right angles by principal meridians in coincidence with longitude. From such bases townships of six miles square are run out and established with regular series of numbers counting north and south from these bases, while the ranges are counted by like series of numbers as running east and west of the meridians.

The six-mile square townships are divided into sections of one mile square or 640 acres, again into half sections of 320, quarters of 160, half quarters of 80, and quarter quarters of 40 acres.

Since the adoption of the system, covering a period of eighty-two years, twenty principal bases and twenty-three principal meridians have been permanently established, and it has been initiated, the Russian purchase excepted, in all the land States and Territories of the Union, in several of which it has completed the work of surveying. In its progress, the whole of the surveys everywhere, from the Atlantic to the Pacific, are referable for the identification of any division or subdivision, great or small, to the initial points or intersections of the surveyed base lines with the principal meridians.

The *first* principal meridian divides the States of Ohio and Indiana; the *second* is a controlling line in the surveys of Indiana, and in part in Illinois, the *third* also governing to a certain extent in the latter State; the *fourth* traverses the western part of Illinois, extending through Wisconsin and Minnesota to our northern international boundary; the *fifth*, passing through Arkansas, Missouri, and Iowa, with a common base line running due west from the St. Francis river in Arkansas, governs the surveys in these States, also in part of Minnesota west of the Mississippi, and in Dakota west of the Missouri; then there is the *sixth* principal meridian, the initial point of intersection being coincident with the fortieth parallel and  $92^{\circ} 13'$  west longitude from Greenwich. Upon this line depend the surveys in Kansas, Nebraska, Colorado, and that part of Dakota west of the Missouri.



In addition to these six principal meridians and bases, there has been established the *Michigan* meridian, with a base line running on a parallel of seven miles north of Detroit, and guiding all the surveys in that State.

In the south, the *Tallahassee* meridian, in Florida, has been surveyed north and south from the point of intersection with the base line at the city of Tallahassee, which regulates Florida surveys.

In Alabama is found the meridian of *St. Stephens*, starting from Mobile and intersecting the principal base on the 31st parallel, upon which rest to a certain extent the surveys in that State, and also in Mississippi east of Pearl river.

Besides, there is the *Huntsville* meridian, with the northern boundary of Alabama for its base, upon which are adjusted the surveys in the northern part of that State.

The *Choctaw* meridian, in Mississippi, starting from the base, twenty-nine miles south of Jackson, runs due north, passing within two miles west of that city, and terminating on the south boundary of the Chickasaw cession, controlling the surveys east and west of that meridian, and north of the base.

The *Washington* meridian, in Mississippi, begins on the base corresponding with the 31st degree of latitude, running north, passing seven miles east of Washington, in that State, and governing the surveys in the southwestern part of Mississippi.

The *Louisiana* principal meridian intersects the principal base coincident with the 31st parallel, controlling the surveys west of the Mississippi.

The *St. Helena* meridian is a continuation of the Washington meridian, in the southwestern part of the State of Mississippi, the surveys in Louisiana east of the Mississippi river, from the base on the 31st parallel, running due south therefrom one mile east of Baton Rouge, and intersecting the river several miles south of that town.

The *New Mexico* meridian, with the principal base has its intersection on a hill two hundred feet in height ten miles below the mouth of the Puerco river, on the Rio Grande, and upon those lines are adjusted the surveys in New Mexico, and in that part of Colorado in the valley of the Rio Grande del Norte.

In California, there is the *San Bernardino* meridian, intersected by a principal base on the high peak of a mountain of that name in longitude  $116^{\circ} 53'$  west of Greenwich, that meridian controlling the surveys in the southern part of the State. The *Mount Diablo* meridian, intersecting its base on latitude six miles north of San Francisco, at a distance of thirty-eight miles east of the ocean, the intersection being on the loftiest peak of Mount Diablo, which is three thousand six hundred feet in height, coincides with the  $123^{\circ} 53'$  west longitude from Greenwich, and governs the surveys in middle and northern California, and in the State of Nevada; besides, there is in the State the *Humboldt* meridian, intersecting its base in north latitude  $40^{\circ} 24'$  on the peak of Mount Pierce, five thousand feet above the level of the ocean, the surveys west of the Coast Range, in the northwestern part of the State, having been adjusted on that meridian.

On the Pacific slope there is also the *Willamette* meridian, which controls the surveys in Oregon and Washington.

In Utah the *Great Salt Lake* meridian commences at the corner of Temple Block, in Great Salt Lake City, where it is intersected by its base, the intersection being commemorated by a monument, and the structure of surveys in that Territory resting on that meridian and base.

The *Boise* meridian, for surveys in Idaho, intersects the principal base on the summit of an isolated rocky butte on the plain between the Snake and Boise rivers, in latitude  $43^{\circ} 26'$ , distant 19 miles from Boise City, and bearing south  $29\frac{1}{2}^{\circ}$  west.

The *Gila* and *Salt River* meridian, for the surveying system in Arizona, intersects the principal base line on the conical hill 150 feet in height on the south

side of Gila river, opposite the mouth of Salado river, its geographical position being in latitude  $33^{\circ} 22' 57''$ , longitude  $112^{\circ} 15' 46''$  west.

The *Beaver Head Rock* meridian, determined upon by this office for surveying operations in Montana, is a remarkable landmark in the Great Horseshoe Basin of the Rocky mountains, it having been designated as the initial point of the intersection of the principal base with the meridian. Its geographical position is in the forks of Wisdom and Jefferson rivers, tributaries of the Missouri, near the intersection point of  $112^{\circ}$  longitude west from Greenwich with the  $45^{\circ} 20'$  north latitude.

The foregoing surveying meridians and bases, with their auxiliary standard parallels and guide meridians, township and section lines, embracing the area of 485,311,778 acres of land surveyed from the beginning of the system to the 30th June, 1867, called forth perambulations of surveyors in the field amounting to 1,476,673 lineal miles.

The framework of the surveying system thus described as meridians and intersecting bases constitutes a scientific structure which has been established over the greater portion of this continent. Upon that structure rests the whole work of dividing and subdividing the national territory, and of marking out the same into tracts of different sizes for farms and urban settlements. The service has been steadily advancing from the foundation of the government, and in its progress has completed the extension of the lines of survey over the whole surface of Ohio, Indiana, Illinois, Michigan, the Upper and Lower Peninsula, Wisconsin, Iowa, Missouri, Arkansas, Mississippi, Alabama, and nearly so in Louisiana and Florida.

Sketches in outline of the rise and progress of those States where the public surveys have been completed, and of the other public land States and Territories, with the advances therein of the surveys, are presented in the following :

OHIO forms part of the northwestern territory, which before and during the revolutionary war was claimed in part by several of the Atlantic States in virtue of the charters granted by the King of England to the companies colonizing those States. Indiana, Illinois, Michigan, Wisconsin, and the eastern part of Minnesota, embrace the remaining portion of that territory. The greatest length of Ohio from north to south is two hundred miles, from east to west one hundred and ninety-five, covering an area of 39,964 square miles, or 25,576,960 acres.

It was formed into a territorial government by the ordinance of 1787, subsequently confirmed by the first Congress under the Constitution, and admitted into the Union as one of the States in 1802, with its present boundaries.

The Virginia military reservation, between the Scioto and Little Miami rivers, extending from their head-waters to the Ohio, covers an area of 6,570 square miles, or 4,204,800 acres, being nearly one-sixth the surface of the whole State. The Connecticut western reserve, in the northeast corner of the State, embraces 3,800,000 acres.

In 1796 Congress appropriated certain lands lying east of the Scioto and west of the seventh range of townships, and north of Zanesville, containing about 2,560,000 acres, to satisfy claims of officers and soldiers of the revolutionary war. They are known as the "United States military lands."

In 1787 a company was formed in Massachusetts, called the "Ohio Company," which, in the following year, entered into contract with the United States for the purchase of a tract of land on the Ohio, mostly on the west side of the Muskingum, and, as ultimately patented, embracing something less than 1,000,000 acres. Within this tract, on the site of the present town of Marietta, in 1788 the first permanent white settlement within the limits of the State appears to have been made, and the oldest town in Ohio had its beginning.

In October, 1788, John Cleves Symmes entered into contract with the Board of Treasury for the purchase of one million acres of land on the Ohio between the Great and Little Miamis, and including the site of the city of Cincinnati. As ultimately patented the tract contained only 311,682 acres, of which 248,540 were the property of the patentees, the residue consisting of various reservations and grants for public purposes.

In the fall of 1788 Fort Washington was erected on what is now the site of Cincinnati, and in the month of January, 1789, the town was laid off, which improved slowly until after the defeat of the Indians by General Wayne in 1794. Since that time the progress of Cincinnati and the surrounding country, in population, wealth, and internal improvements, has been rapid and uninterrupted. It was the seat of the territorial government until 1800.

The proprietary interest of the United States in the soil of Ohio has been disposed of, with inconsiderable exceptions, by sale and otherwise.

The surface of the interior and of the northern and western parts is level, and moderately rolling, consisting of forest and prairie. The eastern and southeastern are somewhat hilly, becoming rather rough and broken on the banks of the Ohio. Back from the river the hills are less precipitous, and generally cultivated to their summits. A ridge of high lands is found crossing the northern half of the State from east to west, forming the water-shed between the streams flowing into Lake Erie and those emptying into the Ohio.

Extensive timber tracts, in early times denominated the "barrens," were found between the Scioto and Great Miami rivers, many of which, by the prevention of fires, are again covered with a forest growth, and in this part of the State timber is becoming more abundant than it was half a century ago.

In this and some other western regions the highlands or water-sheds are frequently rather marshy, while the driest lands are found in the valleys of the streams. Most of the marshy lands found at an early day have been drained and brought under cultivation.

Although nearly all the land in the State may be described as of good quality, none comparatively unfit for cultivation, yet the valleys of the rivers, and particularly of the two Miamis, the Scioto, the Maumee, and their tributaries, contain the most fertile and valuable lands. Indeed, it would be difficult to find anywhere lands, equalling these in extent, surpassing them in the elements of fertility or in agricultural capacity.

The Scioto and Miami valleys contain each an area of about 3,300,000 acres, and together comprise more than one-fourth of the area of the whole State. The valleys of the Muskingum, though less in extent, have much excellent land, while the Maumee bottoms in the northwest, when once properly drained, will be equal to any in productiveness, being for the most part deep, black mould, with just sufficient sand intermixed to constitute soils of the very highest fertility. Of such a character is the tract called the "Black Swamp," in the northwest, portions of which have of late years become sufficiently dry for cultivation, and it is claimed are the best corn and grass lands. The shores of Lake Erie are of superior adaptation to the cultivation of fruit, on account of their exemption from destructive frosts. The peach, so liable to fail in most of the northern States, finds here a congenial climate, while the culture of the grape is perhaps more successful than in any other part of the State, and some of the islands of the lake, a short distance from the shore, have become celebrated for the excellence of their wine.

The Ohio river, bounding the State on the southeast and south for a distance of four hundred and fifty miles, is navigable throughout its whole length. Its principal tributaries within the State are the Scioto, the Great and Little Miami, and the Muskingum. The Great Miami and Muskingum are navigable for short distances for light boats. Lake Erie extends along two-thirds of the northern boundary of the State, with a shore line of two hundred miles. It has an



extreme length of two hundred and seventy-five miles, and a breadth of fifty; covering an area of 11,000 square miles. The Maumee and Sandusky bays form fine harbors in the lake within the State of Ohio. The Maumee, Sandusky, Huron, and Cuyahoga rivers empty into the lake, and drain the northern portion of the State.

The western half of the State is limestone formation.

The climate of northern Ohio is of course colder in winter than the southern and interior, yet even here severe weather is not usual. In the southern and central parts the ground is seldom covered with snow more than a few days, the thermometer not usually sinking as low as zero. The summers in all parts of the State are warm and well adapted to the growth and maturity of Indian corn, the autumn season being remarkable for its beauty. The rain-fall in Ohio is generally sufficient for the most successful husbandry, droughts, although sometimes occurring, being not more frequent than in the adjoining States.

The banks of the Ohio above and below Cincinnati are covered with extensive vineyards, from which large quantities of wine are annually manufactured.

The great bituminous coal field of Pennsylvania and Virginia projects into the eastern and southeastern parts of the State, its western boundary extending from the northeastern corner of Trumbull county through the counties of Portage, Wayne, Knox, Licking, and Fairfield, to the mouth of the Scioto. Salt springs are numerous within the same limits. Iron ore in abundance is found between the Licking and Muskingum rivers, near Zanesville, and on the Ohio near the southwest corner of Adams county, and particularly in the counties of Lawrence, Gallia, Jackson, Meigs, Vinton, Athens, Hocking, Perry, and Licking.

About 14,000,000 acres of the lands in the State are improved, either as pasture, grass, cultivated in grain, or planted in orchards, gardens, or lawns, leaving eleven and one-half millions unimproved either in the condition of forests or commons.

The soil of Ohio is generally of the highest fertility, free from rock or stone, and easily cultivated; all or nearly all of the land is arable and in favorable climate. The State must therefore in future take high rank in an agricultural point of view. In this respect it already occupies a prominent position. Wheat, Indian corn, barley, oats, buckwheat, rye, hay, grass-seeds, Irish and sweet potatoes, peas, beans, flax, hemp, hops, tobacco, melons, pumpkins, apples, peaches, pears, plums, cherries, currants, berries, and grapes, with nearly every variety of garden vegetables, are extensively cultivated; maple and sorghum sirup and sugar, honey, and wine, are manufactured in considerable quantities; and horses, cattle, sheep, and hogs, are raised in large numbers.

In 1865 Ohio stood third among the States of the Union in the production of wheat and corn, and fourth in the yield of oats; Illinois and Wisconsin leading in the number of bushels of wheat, Illinois and Indiana in the quantity of corn, and New York, Pennsylvania, and Illinois in oats; while Ohio surpassed all other States in the number and value of horses, sheep, and the amount of wool crop.

The production of grain in the State in 1865, including wheat, corn, rye, oats, barley, and buckwheat, amounted in the aggregate to 134,264,000 bushels, valued at \$80,000,000. In 1860 the orchard products were estimated at \$1,929,309, and market products at \$907,513. The value of slaughtered animals was \$14,725,945.

In 1860, 8,695,000 bushels of Irish potatoes were raised; 25,092,581 pounds of tobacco, 568,517 gallons of wine, 3,345,508 pounds of maple sugar, 370,512 gallons of maple sirup, 779,076 gallons of sorghum molasses, and 1,459,601 pounds of honey were manufactured.

The estimated value of horses in the State in 1865 was \$38,710,308, cows \$31,432,410, other cattle \$22,598,264, sheep \$30,103,572, hogs \$17,695,377; valuation of real estate for taxation, including town and city property, \$663,647,542, and of chattel property, \$442,561,379.

The forest trees of the State are white oak, black oak, jack oak, and several other varieties of the oak; the black, blue, gray, and swamp ash; several kinds of poplar, sycamore, pawpaw, dogwood, buckeye, elm, cherry and horn-bean, besides beach, iron-wood, basswood, walnut, and a few evergreen trees. Ohio, though not possessing great variety of mineral products, has inexhaustible supplies of coal and iron. The coal-fields in the eastern and southeastern portions cover an area of 12,000 square miles, extending through twenty counties, and embrace nearly one-third of the area of the whole State, it being estimated that the county of Tuscarawas alone is underlaid with an amount equal to eighty thousand millions of bushels. Iron ore of very superior quality for the finer castings is found in several counties in the southern bend of the Ohio, covering an area of 1,200 square miles, and has already laid the foundation of a very extensive iron interest in the southern part of the State. In the northern part the furnaces are supplied with ore from the Lake Superior mines.

Large quantities of salt are manufactured for market.

Many oil wells have been sunk in the southeastern portion and large quantities of oil have been exported.

In 1860, according to the estimates of the commissioner of statistics for the State, 50,000,000 bushels of coal were mined, and 2,000,000 bushels of salt manufactured. Ohio ranked next to Pennsylvania in the production of coal and pig iron, the latter State standing first in these industries. For the manufacture of salt Ohio stood third. The State has doubled its products and manufactures every ten years since 1840.

No State in the Union has a more extensive system of railroads, according to the area covered and the amount of population. There is scarcely a county, and no important town, without railroad transit. Two canals connect the Ohio river with Lake Erie—one commencing at Cincinnati and terminating at Toledo; the other starting at the mouth of the Scioto, ends at Cleveland; a third connects Cincinnati with Cambridge City, in Indiana; and a fourth, Lancaster, on the Scioto, with the Hocking valley; making an aggregate of nine hundred and twenty-one miles.

In 1860 there were in the State 3,100 miles of turnpike and plank roads and 67,000 miles of common roads.

The surplus produce of Ohio is exported by railroad, by the Ohio and the Mississippi rivers and the great lakes, it having amounted to over \$60,000,000.

Although an inland State, it has great facilities for commerce, having a shore line on Lake Erie, with harbors capable of accommodating the heaviest and most extensive shipping, and, by way of the lakes and the St. Lawrence, direct communication with the ocean. The various railroads and canals passing through the State afford direct intercourse with the commercial cities on the Atlantic and on the Mississippi, as well as with the States and Territories beyond.

The whole number of manufacturing establishments in the State in 1860 was 11,123, employing an aggregate capital of \$58,000,000, and consuming raw material valued at \$70,000,000, producing annually goods valued at \$125,000,000.

There are ten cities in the State having each a larger population than 10,000. In 1800 Cincinnati had 752 inhabitants; at present the number is 200,000.

In 1800 the population of the State, excluding Indians, was 45,365.

In 1860 it was 2,339,511, and now it is estimated at 2,500,000, ranking third in the Union in point of population, and seventh in the density of its inhabitants.

The number of persons to the square mile in Ohio at the present time is about 62; in Massachusetts in 1860 it was 158.

If the population of Ohio were of equal density with that of Massachusetts it would amount to 6,314,312.

In the year ending July 1, 1866, there were erected in the State 11,000 new



buildings, being a larger number than had been built in any single year since 1856.

The assessed value of property in 1866, real and personal, was \$1,106,208,921, an increase over 1865 of more than \$36,000,000. Of that increase more than \$33,500,000 was in chattel property. The amount of taxable property has largely increased since 1860; and although the State sent to the field during the late civil war an aggregate of more than a third of a million of men, adding to the public debt and increasing the taxes, yet the State nevertheless has continued not only to pay the interest but even to reduce the principal, the finances being accordingly in a most flourishing condition.

INDIANA, adjoining Ohio on the west, is in greatest length from north to south about 275 miles, and from east to west about 135, embracing an area of 33,809 square miles, or 21,637,760 acres.

It was organized as a part of the northwest territory by the ordinance of 1787. The subsequent division of that territory left Indiana with its present limits, and in 1816 it was admitted into the Union.

Like the whole northwest territory, it was originally claimed by the French, but was ceded to England by treaty of 1763 between Great Britain, France and Spain, and in 1783, by the treaty of peace, became a part of the United States.

In 1702 a party of French Canadians descended the Wabash and established a settlement at Vincennes, on the east bank of that river, and were subsequently confirmed in their possessions.

The public lands in Indiana have nearly all been disposed of by the general government, the quantity remaining being only about two thousand acres.

The State has numerous streams, furnishing excellent water power for mills and other manufacturing establishments. The Wabash river, forming part of the western boundary, and its principal tributary, the White river, have their sources in and near the western borders of Ohio, and with their numerous tributaries flow through nearly every county in the State.

Indiana has no mountains, but hills, rising in height from one to three hundred feet, skirt the Ohio and other rivers in the southern part, but much the greater portion of the surface is level or gently rolling. The river bottoms are deep alluvion, and the soils of all portions of the State, excepting the tops of the highest hills, are exceedingly fertile.

The valley of the Ohio river, including that of the Whitewater in the south-east, contains 5,500 square miles, and is a limestone region, consisting partly of broken hills. About two-thirds of this region is good farming land, the greater part of the residue valuable for grazing. White River valley, extending from the Wabash in the southwest to the Ohio line in the northeast, embraces an area of about 9,000 square miles, or 5,760,000 acres, the surface of which is almost uniformly level. This magnificent valley covers more than one-fourth part of the whole State; the soil is deep vegetable mould, destitute of rock or stone, and of the richest quality. Large prairies occupy the western part of the valley, while the remaining portion was covered with heavy forest, much of which has been removed and the land converted into cultivated farms. The numerous streams flowing through every part of this valley furnish an abundant supply of water for the purposes of farming or raising stock, or as power for mills or manufacturing establishments.

The Wabash valley is still more extensive, covering 12,000 square miles, or 7,680,000 acres. It extends from the Ohio river northward along the western border of the State for 150 miles; thence inclining northeast, it reaches the boundary of Ohio north of the White River valley. It has large prairies in the west, heavy forests in the east, and abundant water power in the centre. With the exception of some of the highest bluffs in the lower part of these valleys, every acre of their surface is susceptible of cultivation. The Wabash valley

within this State alone is 600 square miles larger than the kingdom of Belgium, and contains a less quantity of inferior land.

The valley of the Maumee contains 2,000 square miles in the northeast part of the State, of the same general character as the eastern portion of the Wabash and White River valleys. The bottom lands of the Kankakee, in the northwest, are low and flat, forming in some places extensive swamps. These, however, are susceptible of drainage, and when the demand for land becomes sufficient to justify the expense, will be reclaimed and their fertile soils converted to productive uses.

Immediately bordering Lake Michigan extensive sand-hills occur, behind which is a region covered with pine.

One of the finest agricultural sections is found in the northern tier of counties, in the valleys of the St. Joseph and the Elkhart.

Unimproved lands of excellent quality may be purchased from private holders in the less settled portions of the State at very reasonable prices; but in Indiana, as in all the States east of the Mississippi, the price of real estate is annually increasing.

The valley of the Ohio was originally heavily timbered, but most of it has been felled to supply fuel to the boats on the river, and for shipment as lumber. In the central, eastern, and northern parts many heavily-timbered forests of walnut, poplar, beech, buckeye, oak, maple, ash, elm, sycamore, dogwood, hickory, and basswood still exist. Considerable quantities of walnut lumber are transported by rail to New York. The great demand for fuel along the railroads traversing every part of the State is working a rapid decrease of the forest. Prudence would seem to require that some of the best forest lands, when denuded of their larger trees, should be surrendered to the younger growths, and suffered to renew the forest. Were such lands protected from fires and other destructive causes, the young timber would become large enough for all useful purposes in a single generation.

The climate is similar to that of Ohio. The prevailing winds of winter produce severe spells of cold, seldom, however, of long duration. The summers are warm but salubrious.

Indiana holds a high rank as an agricultural State. In 1850, when the population was less than a million, the estimated value of real and personal property was \$202,650,264, which in 1860 had increased to \$528,835,371, or nearly 161 per cent. in 10 years.

In 1850 the cash value of farms in the State was appraised at \$136,385,173, and in 1860 at \$344,902,776, an increase of more than 200 per cent.

In 1865 and 1866 the value of real and personal property, according to the appraisement of the board of equalization, amounted as follows:

Value of lands and improvements, including town lots, in 1865, \$373,391,061; in 1866, \$389,793,346, being an increase of \$16,402,285; value of real and personal property in 1865, \$570,458,400, which in 1866 had increased to \$584,607,829.

In 1860 Indiana ranked as the third State in the relative amount of wheat produced, and fourth as to corn. In 1865 the State surpassed all others except Illinois in the production of corn, and ranked fifth in the production of wheat. The produce of the fields, in grains, potatoes, tobacco and hay, amounted to \$80,748,014.

The value of live stock in 1860 was \$50,116,964; in 1866 \$88,657,071. Owing to the fertility of soil and the geniality of climate, this State must ever hold a prominent position as an agricultural region. Wheat, rye, Indian corn, oats, barley, buckwheat, Irish and sweet potatoes, sorghum, grass, flax, hemp, hops, and tobacco succeed well and are extensively cultivated. The fruits and vegetables common to the latitude of the State find here as favorable conditions to their growth as in any of the States east of the Rocky mountains.

In 1860 the products of the orchards amounted to \$1,258,942 in value, and

the market products to \$546,053. Large quantities of maple and sorghum sugar and molasses, beeswax and honey, are annually manufactured. Some wine is made along the Ohio river, where considerable attention is bestowed upon the culture of the grape. In 1866 there were in the State 2,783,367 sheep, worth \$9,393,864.

The great coal-field of Illinois extends into Indiana, covering in the western part an estimated area equal to 7,700 square miles, or more than one-fifth part of the whole surface. On White river the seams are upwards of six feet thick. In other localities seams of eight feet in thickness are found. Some of the coal measures, it is estimated, are capable of yielding 50,000,000 bushels to the square mile. At Cannelton, on the Ohio, a bed of cannel coal is found from three to five feet in thickness, at an elevation of 70 feet above the river. It is represented as an excellent coal for steamboat purposes, and large quantities of it are mined to supply the boats on the Ohio. The coal fields of Indiana will possess greater value when the supply of wood for fuel becomes less abundant and more expensive.

Besides coal, iron, limestone, marble, freestone, gypsum, and grindstones, slate of several varieties, clays useful in the arts, and some copper are found in the State.

In 1860 \$300,000 were invested in forges and furnaces for working iron. About \$105,000 worth of bar and other rolled iron was produced. Upwards of \$400,000 worth of steam engines and machinery was made, and about \$200,000 worth of iron castings. From the abundant water power, the cheapness of fuel, and the existence of excellent iron ore, there is no doubt this branch of industry is destined to a great expansion. Salt springs are found on the east border of the coal formation.

The whole number of manufactuaing establishments in the State in 1860 was 5,120, employing 21,300 hands, and consuming raw material, inclusive of fuel, valued at \$27,360,000, with a capital invested of \$18,875,000, and producing an annual product of \$43,250,000.

In the construction of an extensive railroad system, Indiana is among the foremost of the great States of the West. In the commencement of this enterprise, the State lent credit with such liberality as subsequently resulted in financial embarrassment, from which, happily, the skilful management of great resources is in recent years rapidly extricating Indiana, indicating at no distant day a liquidation of all obligations.

Lines of railroad cross the State from the Ohio river to the great lakes, and from the Ohio to the Illinois boundary, tapping the river at different points within the State, crossing the east and west boundaries, and connecting every important place with the large cities of the eastern, middle, and western States.

The geographical position of Indiana, like that of Ohio and Illinois, is such that the whole land commerce between the manufacturing States of the East and the country west of the Mississippi must pass over its territory. The amount of traffic over the lines of its railroads is already immense, and is annually witnessing an extraordinary increase.

In 1800 Indiana had a population of 4,875; in 1850, 988,393; in 1860 it was 1,350,428, and 1,700,000 in 1866. With a continuance of present prosperity the census of 1870 will find a population of 2,000,000 within the State limits.

Indiana has eight cities having each a population of 10,000 and over, viz: Indianapolis, the capital, of 35,000; New Albany, on the Ohio river, of 19,000; Evansville, on the Ohio, of 17,000; Fort Wayne, in the northeast part of the State, of 13,000; Lafayette, Terre Haute, Madison, and Richmond, with populations of 10,000 and upwards.

The population of the towns has increased in a still greater ratio than the rural districts, believed to equal 50 per cent. since 1860 at all important railroad centres or shipping points on the Ohio.



The school fund of Indiana in 1866 was estimated at \$7,611,337, and the revenue for school purposes derived from this and other sources amounted to \$1,330,863.

The whole number of children in the State in 1866 attending primary schools was 390,714; high schools, 12,098; number of teachers employed, 9,473; number of pupils attending private schools, 49,332; number of volumes in town libraries, 265,338. Colleges and academies are numerous throughout the State and in flourishing condition.

ILLINOIS has Wisconsin on the north; on the east Indiana and Lake Michigan; on the south the Ohio river, and on the west the Mississippi, its greatest length from north to south being 388 miles, and extreme width from east to west 212, with an area of 55,410 square miles, or 35,462,400 acres. It is five times as large as Belgium, and more than half the size of Prussia prior to 1866. The first settlers were French Canadians, who founded as early as 1682, in the western part, Kaskaskia, Cahokia, and other towns.

In 1818 it was admitted as a State in the Union with its present boundaries. With the exception, perhaps, of a few isolated parcels, the proprietary interest of the United States in the soil of Illinois has been disposed of for cash, homesteads, military services, railroads, swamps, internal improvements, schools, universities, salines, public buildings, and other purposes. The surface is level, or gently undulating prairie, of an elevation averaging 550 feet above the level of the Gulf of Mexico. A very small proportion in the northwest is hilly, with occasional bluffs on the Mississippi, the Illinois, and some of the other rivers, but by far the greater proportion is rolling plain. The Illinois river, the largest in the State, formed 50 miles southwest of Lake Michigan by the junction of the Kankakee and the Des Plaines, flows southwest, emptying into the Mississippi 20 miles above the mouth of the Missouri. Its length by its sinuosities is 500 miles, it being navigable half the distance. It has numerous tributaries, draining one of the finest and best improved portions of the State, while other important streams emptying into the Mississippi are Rock river in the northwest, the Kaskaskia in the central, and Big Muddy in the southern part, joining the Mississippi 30 miles south of the Kaskaskia.

Of the rivers falling into the Ohio the most important within the limits of Illinois are the Wabash, forming the boundary between Illinois and Indiana for more than 100 miles, with its tributaries on the Illinois side—the Vermillion, the Embarrass, and Little Wabash. The Saline falls into the Ohio at short distance below the Wabash, and the Cash near the junction of the Ohio with the Mississippi.

The Wabash is navigable for light draught boats for 300 miles; Rock river, during high water, more than 200 miles. As the Ohio and Mississippi wash the southern and western shores of this State, the Wabash a part of the eastern boundary, the natural advantages of Illinois in navigable streams are, perhaps, unsurpassed by any State in the Union, and its position on Lake Michigan, securing it an outlet by way of the lakes and the St. Lawrence river to the Atlantic, still further increases its facilities for trade, while its geographical situation, between the commercial cities of the Atlantic States on one side, and the enterprising millions beyond the Mississippi on the other, constitutes it a thoroughfare for the immense traffic between the East and West, making its network of railroads and canals the scenes of ceaseless industry, pointing to a future of increasing prosperity, wealth and power. No State has a greater proportion of level or moderately undulating land, and none a smaller of hilly or broken, there being scarcely an acre not tillable. The soil is deep and fertile, without rock or stone to impede the labors of the husbandman.

Portions of the American bottom on the Mississippi have been cultivated for more than a hundred years, without showing any signs of exhaustion. A

spontaneous growth of timber, varieties indigenous to the climate and soil, usually takes place by simply turning over the prairie sod or preventing fires, but many prefer planting the faster-growing trees, such as cottonwood and locust, in order to realize in the shortest period the advantages of timber.

The southern part is more abundantly supplied with trees than the northern and central, but belts of timber are found in all sections, sometimes skirting the banks of the streams or growing in clumps or groves upon the uplands, with wide intervals of prairie. The most common are the black and white walnut, the different varieties of the oak, the ash, hackberry, hickory, linden or basswood, sycamore, locust, sugar-maple, buckeye, pecan, cottonwood, persimmon, and in the southern, white and yellow poplar, beech, yellow pine, and cedar. Of fruit trees, the apple, peach, pear, cherry, plum, and quince are common, and succeed well. Grapes, currants, strawberries, raspberries, gooseberries, and blackberries are largely cultivated and yield extensive crops.

As Illinois extends through more than five degrees of latitude, a considerable difference exists between its northern and southern extremities in respect to climate. In the northern part the winters are sometimes severe, but less so than on the Atlantic in the same parallel. The summers are warm, yet agreeably modified by continual breezes.

The State, every portion of which is healthy, occupies a leading agricultural position, there being few regions of like area possessing in an equal degree elements of the highest agricultural capacity, with so many circumstances favorable to their development.

In 1850 Illinois had 76,208 farms, valued at \$96,133,290; in 1860, 144,338, valued at \$408,944,033. The quantity of land in farms increased about 77 per cent. during the decade, the improved land 165 per cent., the cash value of farms about 325, and the value of farming implements and machinery nearly 200 per cent.

The value of live stock in 1850 was \$24,209,258; in 1860, \$72,501,225; and in 1865, according to the State returns, it had advanced to \$123,770,554, showing an increase during the 10 years following 1850 of 200 per cent., or 20 per cent. per annum, and 70 per cent. for the five years following 1860, or 14 per cent. per annum.

New York, Pennsylvania, and Ohio are the only States making larger quantities of butter; and, in the value of slaughtered animals, Illinois is exceeded only by New York.

In 1860 Illinois produced 23,837,023 bushels of wheat, and 115,174,777 bushels of Indian corn, being 14 bushels of wheat and 67 bushels of Indian corn to every man, woman and child.

The State surpassed all others in wheat and corn products, there having been cultivated upon its soil nearly one-seventh of the entire wheat and corn crop of the United States. In 1865, 177,095,852 bushels of Indian corn were produced, and 25,266,745 bushels of wheat. The entire grain crop in 1865, including Indian corn, wheat, rye, oats, barley, and buckwheat, amounted to 232,620,173 bushels. The crop of potatoes was 5,864,408 bushels, tobacco, 18,867,722 pounds, and hay, 2,600,000 tons, the whole amounting in value to \$116,274,322. Besides this there were produced in 1865, 5,000,000 pounds of cotton, a branch of industry just beginning to receive attention, yet already pronounced one of the most profitable crops in the southern part of the State; also large quantities of grass seeds, maple and sorghum sugar and molasses, flax, flax seed, hemp, hops, silk cocoons, beeswax, honey, wine, butter and cheese, peas and beans. The wool clip in 1865 was over 6,000,000 pounds; orchard products of the value of \$2,000,000, and market, \$500,000.

The year 1865 was unfavorable for wheat in Ohio, Indiana, and Illinois, the yield in each being less than in either 1862, 1863, or 1864. Illinois then produced 32,213,500 bushels.



In every year since 1860 the State has maintained a position as the leading wheat and corn growing region, while the product of other staples is annually increasing.

The cultivation of the castor bean has been prosecuted successfully in the southern part, and experiments have been made to test the adaptability of the soil and climate to grape culture and the wine product; the result having been so successful that enterprising cultivators are planting large vineyards and preparing to prosecute this interest upon an extensive scale.

Although one of the richest agricultural States, a large part is mineral, the coal fields being estimated at 44,000 square miles, and the lead mines as among the most valuable in the world.

The Illinois coal-field stretches from the Mississippi, near Rock Island, eastward toward Fox river, thence southeast through Indiana, and southward into Kentucky, occupying the greater part of Illinois, the southwestern portion of Indiana, and the northwestern part of Kentucky, measuring 375 miles in length from northwest to southeast, and 200 in width from St. Louis eastward—estimated to contain 1,277,500,000,000 tons of coal, sufficient to furnish an annual supply of 13,000,000 tons for nearly a hundred thousand years, being more than six times as large as all the coal fields of Great Britain, and embracing one-third of all the coal measures of North America.

The present annual product of the State is 1,500,000 tons, the amount increasing every year, and, as the coal is of good quality and easily mined, it is destined to become one of the most prominent interests of the State.

The great lead district of the Mississippi river occupies a portion of northwestern Illinois, southwestern Wisconsin, and northeastern Iowa, covering an area of about 1,000,000 acres, one-sixth of which lies in Illinois, in Jo Daviess county, which has furnished the entire lead product of the country for twenty years. A few mines in Wisconsin and Illinois have supplied and smelted 15,000,000 pounds a year.

Iron ore has been mined in Hardin county, on the Ohio, several furnaces being in operation. Valuable beds of the ore are reported between the Kaskaskia and the Mississippi; also in Union county and in the northern part of the State. Copper has been found in several counties; also marble, crystallized gypsum, quartz crystal, and silex for glass manufacture; salt also existing in the southern counties, while small quantities of gold and silver have been obtained in the lead district in the northwest corner of the State. Petroleum is found in the northeast part, zinc ore in the lead district in Jo Daviess, sulphur and chalybeate springs in Jefferson and other localities.

Although the leading interest of Illinois continues to be agriculture, its manufactures have been steadily advancing.

In 1850 it had 3,162 establishments, with a capital invested of \$6,217,765, producing an annual product of \$16,534,272.

In 1860 it had 4,268 establishments, with a capital invested of \$27,548,563, producing an annual product of \$57,580,887, being an increase in value during the decade of 248 per cent.

While Illinois was fifteenth among the States in general industry in 1850, its advance was so rapid during the decade that, in 1860, it stood seventh; and while its population increased during the ten years at the rate of 101 per cent., the increase in manufactures was still greater, equalling, as before stated, 248 per cent. A similar increase during the ten years following 1860 will make the value of this branch of industry \$200,000,000 in 1870, and advance it in rank to be fifth.

According to the State census, the value of manufactured products for 1865 was \$63,356,013. The value of real estate and personal property for 1850 is reported in the United States census at \$156,265,006, and for 1860, at \$871,860,282, being an increase in the ten years of \$715,595,276, or 458 per

cent. In 1866 the governor estimated the real wealth of the State at not less than \$1,200,000,000.

The population in 1850 was 851,470, in 1860, 1,711,981, and in 1865, 2,151,007. A density of population equal to that of Massachusetts would give Illinois a population of 8,754,780; a density equal to that of the French empire would increase it to 9,641,340.

The average ratio of the population in Belgium is 424 to the square mile, which, upon a surface as extensive as that of Illinois, would exhibit a population of 23,493,840, or about 300,000 more than the population of the whole United States in 1850. One-ninth part of the surface of Belgium is waste, and a fifth still covered with primeval forest. Two-thirds of the kingdom are cultivated with such industry and scientific skill as to entitle the occupants of the soil to be called the model farmers of Europe, and to constitute Belgium an extensive garden. Next to agriculture, mining forms the most important interest in that kingdom and coal and iron are the most valuable mineral products, coal forming the most important of Belgian exports. But the Belgian coal-field covers an area of only 500 square miles, or about one twenty-second part of the whole surface of the kingdom.

The Illinois coal-field covers an area of 44,000 square miles, or three-fourths of the whole surface, and if its soil were cultivated with the laborious care bestowed upon the Belgian fields, scarcely an acre could be designated as waste land.

The railroad system is on a scale commensurate with its advantageous position in respect to agriculture and internal commerce.

3,160 miles are completed and now in operation, 812 miles more are in course of construction, making in the aggregate 3,979 miles, or one mile of railroad to 14 square miles of territory.

France has an area of 212,000 square miles, and in 1865 had 8,140 miles of railroad, or about one mile of road to every 26 square miles of territory, being about half as many miles of railroad upon a given space as in Illinois. At the same period France had a population of 37,382,000, and the ratio of population to railroad mileage was one mile to 4,600 inhabitants; whereas in Illinois, if the present population be assumed at 2,250,000, the ratio will be one mile of completed railroad to 710 inhabitants, about six times as many in proportion to population as in France.

The United Kingdom of Great Britain and Ireland, with an area of 122,550 square miles, in 1865 had 13,289 miles of railroad completed, or one mile of railroad to every nine square miles, being a greater railroad mileage than Illinois in comparison to the extent.

But the United Kingdom in 1865 had a population of 30,000,000, and consequently one mile of railroad to every 2,250 inhabitants, about twice as many railroads as France compared to the population, but only about one-third as many as Illinois by a similar comparison. In the whole United States there is about one mile of railroad to every 81 square miles of surface and to every 1,000 inhabitants.

Eight lines cross the eastern boundary of the State, and the Mississippi river is approached within the State by 13, connecting with the east and west through routes across the States of Missouri and Iowa, and northern routes through Wisconsin and Minnesota, westward to the Pacific and eastward to the great trade marts of the Atlantic coast.

In addition to the facilities thus afforded to commerce, a canal has been constructed from Lake Michigan, at Chicago, to La Salle on the Illinois river, 100 miles in length, affording communication by water between the lake and the Mississippi. The canal is now being enlarged by deepening its channel to accommodate large class vessels, so that the waters of Lake Michigan will flow

through to the Illinois river, the bed of which is improved so as to establish uninterrupted steam navigation at all seasons from the Mississippi, by way of the lakes and the St. Lawrence, to the Atlantic.

The leading city in the State is Chicago, on the west shore and near the southern extremity of Lake Michigan. In 1837 its population was 4,170; in 1850, 29,963; in 1860, 110,973; its population being now over 200,000.

Twenty-four lines of railroad, connecting various points in the State, centre here, and 200 trains of cars daily arrive and depart.

Chicago is now the most extensive grain and lumber market in the world. In 1838 the first shipment of wheat consisted of 78 bushels; in 1862 there were exported in flour and grain of all kinds from the port 56,484,110 bushels. During the year there were shipped 1,828,164 barrels of flour. In 1863, 1,537,816 barrels of flour, or flour and grain of all kinds equal to about 55,000,000 bushels.

The receipts of lumber in 1865 were 606,642,300 feet; shingles 304,216,000; lath 60,340,000; sent by lake and railroad transportation to all points in Illinois, to Indiana, Ohio, New York, and westward to Iowa, Missouri, Dakota, Nebraska, Kansas, and the lower Mississippi.

The trade in staves, railroad ties, telegraph poles, fence posts, and other similar materials is very extensive, and the amount of capital invested in the lumber traffic immense.

This city holds an equally leading position in the pork and beef trade of the west, and next to New York is the greatest cattle market in the United States.

The trade is also very extensive in salt, lead, hides, tallow, the products of the dairy, orchards, in distilled spirits, and other articles. The lake tonnage of the port in 1864 was 2,172,866 tons in arrivals, and 2,166,904 in clearances, and during the season 8,939 vessels and propellers arrived, and 8,824 cleared, the tonnage engaged wholly in the Chicago trade amounting to 198,005.

The cost of buildings erected in the city in 1865 was \$7,510,000, and the number in 1866 was 9,000.

Three street railroads pass through the city, carrying annually 7,000,000 passengers.

The wholesale dry goods business forms a large interest, the sales having reached \$35,000,000 a year, and the trade in boots, shoes, and clothing, \$25,000,000.

Many other thriving cities exist in other portions of the State. Springfield, the capital, near the geographical centre, in the rich and beautiful valley of the Sangamon, is one of the handsomest cities in the west, and rapidly increasing in population, wealth, and refinement. Galena, Quincy, and Alton on the Mississippi, Cairo at the mouth of the Ohio, and Peoria on the Illinois, are enterprising and growing cities.

The educational interests of the State are in a most flourishing condition, 9,753 school-houses having been reported on 30th September, 1866, with 614,659 pupils and over seventeen thousand two hundred teachers; the revenue for the year ending 30th September, 1866, in support of the school interest amounting to \$4,445,130.

In 1860 there were in the State 18 colleges, 2,900 students, and an income of \$97,412; 211 academies with 13,205 pupils, and an income of \$233,262.

There were at the same time 854 libraries, 246 of which were public; 243 for schools, 339 for Sunday schools, 7 college and 19 church libraries, with a total of 244,394 volumes.

The finances of the State are in a very encouraging condition, and the debt contracted in the construction of its extensive railroad lines is being speedily reduced by annual payment of the interest and gradual liquidation of the principal.



MICHIGAN rests upon and is intersected by the great lakes of North America. It is divided by the lake of its own name into two peninsulas. The northern, included between Lakes Michigan and Superior, is three hundred and sixteen miles long and from thirty-six to one hundred and twenty broad. The southern, included between Lake Michigan on the one side and Lakes Huron, St. Clair, and Erie on the other, is four hundred and sixteen miles long, and from fifty to three hundred wide. The State possesses an aggregate lake shore line of fourteen hundred miles, the area being fifty-six thousand four hundred and fifty-one square miles, or thirty-six million one hundred and twenty-eight thousand six hundred and forty acres.

The scenery of the northern peninsula is bold and picturesque, that of the southern less remarkable for salient features. The eastern portion of the former is undulating, gradually rising from the lake shore into elevated table land; westward it breaks into hills, enlarging into the Porcupine mountains, which form the dividing ridge between the tributary waters of Lakes Superior and Michigan. The highest peaks of this ridge attain an altitude of eighteen hundred or two thousand feet. The shores of Lake Superior abound in striking and romantic views, the "pictured rocks" being objects of special interest. They are composed of party-colored sandstones worn by the attrition of the waves into fancied resemblances of ruined temples and castles. They are sixty miles from the Sault Ste. Marie. The southern peninsula is level and more homelike in character. It is diversified in the southern portion by natural parks, called oak openings, or stretches of level country, with a scattered growth of trees intersected with prairies and heavy timber. Its rivers are neither numerous nor generally very large, yet a number of small lakes enliven the scenery.

The population in 1810 was 4,672; in 1830, 31,639; in 1850, 397,654; in 1860 it amounted to 751,956, and the census of 1870 will doubtless exhibit a population of over a million, an aggregate which, indeed, according to reliable estimates, has been already nearly reached.

The soil in the middle and south of the lower peninsula is very rich, generally free from stones, of a deep, dark, rich sandy loam, often mingled with gravel and clay. The northern part is well timbered, arable, and fertile.

The agricultural character of the northern peninsula has not been determined. Portions of it are densely timbered, furnishing immense quantities of lumber for domestic use and for exportation, the trees being the white pine, spruce, hemlock, birch, and oak. In the lower peninsula are heavily timbered tracts of black and white walnut, sugar maple, oak, hickory, ash, basswood, locust, and poplar.

The climate of Michigan is less severe than that of other portions of the country between the same parallels of latitude, being softened by the immense fresh water surface on the borders of the State.

The colder and less genial climate of the northern peninsula, though admitting good crops of winter grain, is not favorable to maize. The lower portion of the State, however, produces large aggregates of all kinds of cereals.

The agricultural yield of the State is immense in wheat, rye, maize, oats, barley, buckwheat, potatoes, beans, and hay, also the products of the orchard, (apples, peaches, pears, and plums,) and of the dairy. The yield of maple sugar, sorghum molasses, and honey, is abundant and increasing.

Tobacco is cultivated to some extent, and large quantities are imported for manufacture.

Wool raising is an important branch of husbandry. The clip of 1866 was estimated at 9,750,000 pounds, an increase of 2,500,000 pounds over the clip of 1864, notwithstanding an immense exportation of sheep to Iowa.

The lumber trade of Michigan is of great value and extent; the extensive pineries, after satisfying the home demand, supply a large surplus for exportation. The quantity cut in 1866 was largely in excess of the product of the previous year—at least 30 per cent.; the total amounted to 1,125,000,000 feet.

The upper peninsula, rich in minerals, prominent among which is copper, is mostly of primitive geological character; the lower exclusively secondary. The copper deposits among the primary rocks of the northern peninsula are the richest in the world, the copper belt being one hundred and twenty miles long and from two to six miles wide. A block of several tons of almost pure copper, taken from the mouth of Ontonagon river, has been built into the wall of the Washington monument at the national capital. A mass weighing one hundred and fifty tons was uncovered in 1854 in the North American mine.

Isle Royale abounds in this mineral; one house in that district, during five and a half months of 1854, shipped over two millions of pounds, and in the nine years previous there were produced four thousand eight hundred and twenty-four tons. The yield of copper in the State has risen to an annual average of eight thousand tons, with promise of steady increase. The opening of the St. Mary's canal and the clearing of the entrance into Portage lake have given fresh impetus to this branch of mining industry, which is becoming one of the most cherished interests of the State. Silver has been found in connection with the copper in the proportion of from twenty-five to fifty per cent. of the precious metal. Iron of superior quality has been discovered in a bed of slate from six to twenty-five miles wide, and one hundred and fifty long, extending into Wisconsin. In the production of this mineral in 1863, Michigan was second only to Pennsylvania, having produced two hundred and seventy-three thousand tons of ore. Bituminous coal is mined on an enlarging scale to meet the demand of manufactures. Salt also exists in quantities repaying the investment of capital.

The high prices lately prevailing have caused a rapid development of the salt fields around Saginaw, a basin some forty or fifty miles square, in which by boring some eight hundred feet an inexhaustible supply of brine is obtained, yielding eighty or ninety per cent. of salt.

The manufacturing interests in the year 1860 were represented by three thousand four hundred and forty-eight establishments, with a capital of \$23,808,226. The cost of labor and the raw material amounted to \$24,370,658, the total value of the products having been \$32,658,356, giving a surplus over cost of labor and materials of \$8,287,698, or nearly 35 per cent. on the capital invested. These establishments were mostly engaged in the working of the heavy products of the mines and the forest into forms for the more elaborate processes in the older States. Yet the increase of labor and capital is such that the intelligent industries of the people are finding occupation in the higher branches of manufactures.

The lakes around the State abound in fish, consisting of white fish, pickerel, siskiwit, trout, bass, herring, and maskinonge. The yield of 1865 was 35,200 barrels, averaging sixteen dollars each, amounting to \$563,200, the legislature having forbidden seine-fishing in order to prevent injury to this branch of industry.

Upwards of eight hundred miles of railroad have been completed at a cost of about thirty-five millions of dollars, and six hundred more are in course of construction or projected, the completion of which will add largely to the prosperity of all the industrial interests of the State.

Lansing, the capital, on Grand river, one hundred and ten miles northwest from Detroit, was, when selected as the seat of government in 1847, an unbroken wilderness. It is now a city of nearly five thousand inhabitants, containing churches, banks, newspaper establishments, and institutions of learning, male and female.

Detroit, settled by the French in 1670, situated on the strait connecting Lakes Erie and St. Clair, is a splendid city, with a population in 1865 of sixty thousand, now rapidly increasing. It is well built, gas lit, and provided with ample street railways, possesses a very efficient system of public schools, accommodated

in neat and commodious edifices, while its churches embrace several specimens of elaborate and tasteful architecture.

Its position is admirable for commerce, of which it has a considerable share, having lines of trade with Liverpool. Monroe, Saginaw, Port Huron, Ste. Marie, and New Buffalo, are also important places.

The finances of the State are in healthy condition, the debt small and in rapid liquidation. Educational endowments are liberal and well administered.

The resources of the State when fully developed will doubtless be sufficient to support comfortably a population of ten millions.

The United States have over five millions of acres in this State yet to be disposed of.

WISCONSIN extends from Lake Michigan to the Mississippi, and from Illinois to Lake Superior, being coterminous with Michigan. Its greatest length from north to south is three hundred and two miles, and varying in breadth from one hundred and forty-six to two hundred and fifty-eight, its area being 53,924 square miles, or 34,511,360 acres.

The whole State is rolling prairie, elevated from six hundred to twelve hundred feet above sea level, with no mountains or lofty hills. The descent to Lake Superior being very abrupt, the streams emptying therein are too full of rapids for navigation, but present admirable facilities for manufactories. Several large rivers and lakes of considerable size agreeably diversify the scenery, affording important internal navigation. The Wisconsin, emptying into the Mississippi, and the Fox into Lake Michigan, approach so near that they are joined by a short canal.

The population of Wisconsin in 1860 was 775,881, but has now (1867) risen to a million, the mass of foreign-born population being Teutonic and Scandinavian.

The soil in the southern part is remarkably productive, and even in the mineral regions of the northwest it is well adapted to grazing. In the country lying upon Lake Superior, the overlying deposits of drift and boulders, and the presence of swamps and marsh, limit the agricultural character of the soil. There are vast forests of pine upon the rivers in the northwestern part of the State, with a large intermixture of spruce, hemlock, oaks in great variety, hickory, elm, ash, and poplar—the large forests of the last mentioned being found only in the southern part of the State. The climate is cold, yet agreeable, and free from oppressive extremes, the average temperature on the shore of Lake Michigan being  $6\frac{1}{2}^{\circ}$  Fahrenheit higher than on the Mississippi.

Wisconsin is less liable than other new places to the diseases incident to new settlements, and compares favorably, as to salubrity, with other States, owing to the openness of the country.

The Wisconsin river is frozen only four months in the year.

The agricultural statistics of the State indicate extraordinary wealth in production and quality in wheat, rye, maize, oats, barley, hay, clover, grasses, hops, flax, and potatoes. Tobacco is cultivated quite successfully, while the yield of the dairies in butter and cheese, and of the vintage, is abundant, as also of maple sugar, molasses, sorghum, honey, and wax; the products of the orchard and market gardening returning large rewards to the agriculturist. The aggregate results in 1860 reached in value upwards of thirty-six and a third million of dollars, being an enormous increase in percentage over previous decennial returns.

The manufacturing establishments in 1860 numbered 3,064, with a capital invested of \$15,831,581.

The value of the raw material absorbed and cost of production equalled \$21,406,042, the total product having reached \$27,849,467, leaving a profit of \$6,403,425, or upwards of 40 per cent. upon the capital invested.

The necessities of a new country still limit the range of these establishments to



the production of articles for common use, or in preparing the original products for the more elaborate processes of art elsewhere; yet the tendency to introduce higher branches of manufacturing industry becomes more evident as the resources of the State are developed.

The facilities for propelling machinery found in the various water-courses of Wisconsin invite large investments of labor and capital in the extension of manufacturing enterprise.

The mineral resources of the State are varied and valuable. The lead region of Illinois and Iowa extends over an area of 2,140 square miles in Wisconsin, which compares with the other portions in the abundance and richness of the ores. In 1863 there were 848,625 pounds of lead received at Milwaukee. The completion of the southern Wisconsin railroad will raise the aggregate to 2,500,000 pounds. It is mingled with copper and zinc ores.

The iron region of Lake Superior presents within the limits of this State abundant deposits of great richness. Magnetic iron, plumbago, and the non-metallic earths abound. Copper deposits have also been developed, but as yet have only been worked to a limited extent. Beautiful marbles, susceptible of elaborate working, exist.

The mineral productions are rapidly opening a very inviting field for capital and industry, promising an immense addition to the resources of this energetic young State.

Its railroad interests are assuming magnificent proportions.

In 1866 there were completed and in full operation 1,731 miles, representing a capital of \$14,099,400.

A canal is proposed to connect the waters of the Mississippi with the lakes, through the medium of Rock river and Lakes Horicon and Winnebago, which is to have the full capacity of the New York and Erie canal, with another route by way of Fox and Wisconsin rivers, these canal routes having been surveyed by competent engineers and pronounced entirely practicable.

Madison, the capital of the State, is handsomely located on an isthmus between Lakes Mendota and Monona, its situation being the most picturesque and beautiful of any of our western capitals. The city is well built, contains the State buildings, the State university, newspaper establishments, banks, churches, iron founderies, a woollen factory, and steam mills.

Its population in 1865 was 10,000. The charming scenery around, salubrious atmosphere, business advantages, and educational interests will cause it to be a large and flourishing city.

Milwaukee, at the mouth of the Milwaukee river, and seventy-five miles by lake coast above Chicago, is a fine, thriving city, and a prominent railroad centre in the northwest. Milwaukee's commercial and manufacturing importance are annually increasing with extraordinary rapidity. It is especially celebrated for the manufacture of a superior article called Milwaukee brick, which is largely exported to different parts of the Union.

It is the greatest *primary* wheat market in the world. In 1862 the receipts of wheat, and of flour reduced to wheat, were nearly 18,000,000 of bushels.

The other cereals were shipped in less quantities, but showing astonishing aggregates. The elevators and warehouses of Milwaukee have a capacity to store about 5,000,000 bushels of grain. The tonnage owned at this port in 1863 was 31,780. Lines of steamers cross the lake and communicate with the Detroit and Milwaukee railroad.

The extensive water power of Milwaukee river affords splendid facilities for manufacturing, and is in process of rapid development.

There are in the city churches of superior architecture, and public schools embracing a large number of departments, the Milwaukee Female College and several academies affording facilities for the higher elements of education.

The city contains banks, daily and weekly newspapers, orphan asylums, and hospitals; its population in 1867 having reached 75,000, with steady rate of increase.

Among the prominent towns of the State are Beloit, on Rock river, Columbus, Dodgeville, Fond du Lac, Green Bay, Portage, Prairie du Chien, Janesville, and La Crosse.

The finances of Wisconsin are in fine condition, the government economically administered, the burden of State taxation exceedingly light.

The educational interests, amply endowed and prosecuted with energy and intelligence, must result in important benefits to the rising generation.

There are yet to be disposed of in this State about 10,000,000 acres of the public lands.

IOWA occupies an admirable territorial position between the two great rivers Mississippi and Missouri. Its length from east to west is 300 miles; its breadth 208, with a surface of 55,045 square miles, equal to 35,228,800 acres.

The State is one of rare beauty, undulating, nowhere rising into mountains. The general features may be described as rolling prairies, crossed by timber-skirted rivers, the banks of which frequently consist of calcareous bluffs from 40 to 130 feet high. The scenery of the southern part is more gently picturesque. Grassy plains and groves of deep verdure are interspersed with beautiful streams.

In the north the elevations are bolder and more abrupt. High hills, covered with oaks, and rapid rivers, tumbling over rocky ledges, are numerous.

About three-fourths of the country consists of treeless prairies, but the woodland is so well distributed that much less inconvenience has been felt from scarcity of timber than in other States having large prairie surface. The natural meadows, while furnishing abundance of excellent pasturage, are ornamented with a profusion of beautiful and fragrant flowers. An extensive river system adds to the interest of the landscape, affording desirable means of intercommunication.

The first white settlement of Iowa was in 1833.

The population in 1840 was 43,112; in 1850, 192,214; in 1860 it had increased to 674,913; and at this time it is estimated as containing over 1,000,000.

The soil is generally very fertile, no State having smaller proportion of inferior land.

The valleys of Cedar, Iowa, and Des Moines rivers are the choice agricultural regions of the State, being remarkably rich in organic elements of soil, with a desirable intermixture of saline matter and earthy silicates.

To the north of this region the land, though less valuable, is still available for some kinds of husbandry. The greatest scarcity of timber is found north of the 42d parallel.

On the banks of the streams further south are broad belts of woodland. Upon these alluvions is an extensive growth of ash, elm, sugar, white maple, poplar, oak, and walnut. The oak is predominant, and here attains magnificent proportions.

The forests of Iowa, however, are not the basis of an extensive lumber trade; yet timber is cultivated with encouraging success upon the broad and rich prairies. The climate is healthy, being free from injurious variations of temperature.

In 1860 it appears there was a very rapid development of the agricultural character of the State compared with 1850; the increase of improved land, of the value of farms and implements, being from four-fold to seven-fold. The increment of live stock, both in numbers and value, was nearly in the same proportion. The cereals, animal products, tobacco, potatoes, hay, sugar, and molasses advanced in still larger ratio.

In the products of orchards and market gardens the increase was extraordinary, averaging fifteen-fold. The remarkable intelligence and success of the agricultural system pursued in the State is an earnest of still further expansion in all the elements of wealth, power, and prosperity. Partial statistics show an advance during years subsequent to 1860 fully commensurate with the previous rate of progress. Wool-raising has become a very prominent and profitable branch of industry.

The mineral resources of Iowa are abundant and rich, the lead region of Illinois and Wisconsin extending into this State, the ore being found in large quantities, but lying deeper than on the east side of the Mississippi. Dubuque is the centre of the Iowa lead region. From this point and Buena Vista, in 1853, were shipped 3,256,970 pounds of this mineral. Zinc and copper are found in the same localities in close association with it. Coal is abundant and accessible.

Manufacturing industry has already attracted a large amount of capital and skilled labor. In 1860 there were one thousand nine hundred and thirty-nine establishments, with a capital of \$7,247,130; the outlay was the sum of \$8,612,259 for raw material, and \$1,922,457 for labor; total, \$10,534,716; producing articles to the value of \$13,971,325; leaving the profits of \$3,436,609, or over forty-seven per cent. on the capital invested.

The advantages for the extension of manufacturing enterprise in Iowa are found in the abundance of coal and water power.

The necessities of an advancing civilization will enlarge the scope of manufactures already inaugurated, and introduce those of more delicate and elaborate process, the products of which are now supplied only in the older States and in Europe.

The railroad system of Iowa, in common with all the northwestern States, has rapidly expanded during the last ten years. In 1860 the State had six hundred and seventy-nine miles of road in full operation, representing a capital of \$19,494,633.

On the 1st of January, 1862, the number of miles completed and in progress of construction was two thousand and eighty-seven; of these eight hundred and ninety-two had been finished at a cost of \$21,382,557. Since that time these lines have been steadily prosecuted and others projected. The completion of this system will make Council Bluffs, on the Missouri river, opposite Omaha, the eastern terminus of the Pacific railroad—the point of intersection of four extensive lines connecting with the railways of all the northwestern States. The nature of the country renders the construction of such lines easy and economical; advantages which are fully appreciated and energetically acted upon.

The facilities of Iowa for domestic trade are very great. These have been extensively realized. A very large export and import trade has grown up, which, through the advantages afforded by the rivers and railroads of the State, is enlarging at an accelerating ratio.

Des Moines, the capital, on the Des Moines river, is a thriving city of seven thousand inhabitants, well supplied with literary institutions and churches. Mines of coal have been opened around the city, which, with the abundance of accessible timber, will afford facilities for manufactures.

Iowa City, the former capital, is situated on Iowa river, eighty miles from its mouth. It is embowered in beautiful groves, and surrounded by very fertile prairies. The State University and other institutions of learning located here afford excellent educational advantages. Its population is six thousand. Its manufacturing facilities, though undeveloped, are promising.

Davenport, on the Mississippi, is one of the largest cities in the State, having a population of seventeen thousand. The railroad connections are extensive, and the manufactures, though yet in their infancy, are important and growing.



Its religious and literary institutions are of high order. The scenery around Davenport is unsurpassed, even in that beautiful country.

Dubuque, settled by a French trader in 1788, is the largest city in Iowa and the depot of the lead regions, a place of very active trade, having a population of nearly twenty thousand. It is well built, and furnished with all the institutions of an advanced civilization. Its railroad and river commerce have a large capital and numerous employés.

The financial condition of Iowa is satisfactory, the debt small, the revenue fully meeting expenditures.

There are yet to be disposed of in this State over three millions of acres of public land.

MISSOURI, one of the largest States in the Union, has centrality of position in the first tier of States on the west bank of the Mississippi. Its greatest length is 318 miles, and width 280, with surface equal to 65,350 square miles, or 41,824,000 acres.

The State is divided by the Missouri river into two regions, widely differing in physical conformation. The northern is nowhere mountainous, but has a large extent of undulating territory, with alternating plains. South of the Missouri, and as far west as the Osage, the surface is rolling, gradually rising into high ranges, forming the outer spurs of the Ozark mountains. To the westward is an indefinite expanse of prairie, the southeastern region being marshy. The rivers of the State are on a scale of grandeur, adding magnificence to the scenery and affording unequalled facilities for navigation. The population in 1810 was 20,845, in 1830 140,455, in 1850 682,044, and in 1860 1,182,012, being now estimated at 1,500,000. Though originally settled by the French, that element embraces less than one-third of one per cent. of the present inhabitants. The population now pouring into the State is highly intelligent and energetic, bringing with it capital and business enterprise—qualities so essential to the proper organization of young communities.

The soil of Missouri is remarkable for its variety and excellence. The most productive portions are the alluvions of the river-courses, which, though often mixed with sand, are rich in the elements of fertilization. Even in the mountain regions there are rich valleys, and those tracts reported as inarable are covered with valuable growths of white pine. The marshes of the southeast when properly drained will constitute the best farming lands of the State. The river bottoms are covered with luxuriant growths of oak, elm, ash, hickory, cottonwood, linden, and white and black walnut. Thinner soils abound in white and pin oak, and occasionally are covered with heavy forests of yellow pine, crab apples, pawpaws, hazel, and wild grapes of a spontaneous luxuriance.

The climate is noted for extremes of temperature. In the winter the rivers are often frozen so as to admit the crossing of heavily-loaded vehicles, while in summer it is extremely warm, its enervating effects being prevented by a very dry, pure atmosphere, generally favorable to health and longevity.

The splendid agricultural capacities of this State are attracting increased attention. In 1860 returns exhibited an advance of from fifty to five hundred per cent. over the aggregate of 1850, in the production of live stock, cereal crops, tobacco, rice, hay, peas, beans, potatoes, fruits, wines, butter, cheese, molasses of all kinds, honey and wax, wool, slaughtered animals, and of the orchard and garden products. The great staple is Indian corn, to the production of which the rich prairies and hot summers of Missouri are particularly adapted. More hemp is produced in this State than in any other except Kentucky. The increase of cultivated land in ten years was threefold. During the subsequent years of domestic strife the agricultural interests of the State were in a languishing condition, but the return of peace is rapidly restoring the elements of prosperity to all industrial interests.

Missouri is richly endowed with mineral wealth. The iron region around Iron mountain and Pilot Knob is unsurpassed in the world for the abundance and purity of deposits.

On the Maramec river and in some other localities are found small quantities of lead.

Copper is found extensively deposited, being most abundant near La Motte mines. It is also found with nickel, manganese, iron, cobalt, and lead, in combinations yielding from 30 to 40 per cent. All these metals, except nickel, exists in considerable quantities; also silver, in combination with lead ore and tin. Limestone, marble and other eligible building materials are abundant, especially north of the Missouri. The geological formations of the State are principally those between the upper coal measures and the lower silurian rocks. The drift is spread over a large surface; in the north, vast beds of bituminous coal, including cannel coal, exist on both sides of the Missouri river. When these mineral resources shall receive their proper development, they will immensely enlarge the scope of industrial enterprise.

The manufacturing establishments, in 1860, numbered 3,157, with a capital of \$20,034,220, employing a large laboring force. The expense of production, including raw material and labor, was \$30,519,657, the value of the products being \$41,781,651, giving a profit of \$11,261,994, or 55 per cent. on the capital. The articles produced were generally suited to home demands and restricted to the simpler processes. Facilities for the higher branches of the useful, and for the fine arts, however, are known to exist, and will soon be developed, their aggregates showing a very marked advance over the previous decennial results.

The position of Missouri, at the central point of the Mississippi river system, is admirable for the control of the commerce of the vast interior basin of the continent. Notwithstanding the very powerful competition of its neighbors, the State has secured a large proportion of this trade. To superior water communication there has been added an expansive system of railroad improvement. In 1860 its extent was 817 miles in operation. Late hostilities were destructive to such interests and property, but the injuries are being rapidly repaired by the renewing forces of peaceful industry. The position of Missouri in regard to continental railway lines is eminently favorable, one of the direct routes from New York to San Francisco passing through the State, which is destined to accommodate a constantly accumulating and extensive trade.

Jefferson City, the capital of the State, on the right bank of the Missouri, 128 miles from St. Louis, occupies an elevated site, with a commanding view of the river and of the opposite cedar-crowned cliffs. It contains the capitol building, other State edifices, and is well supplied with churches, schools and newspapers. Its present population is about 4,000.

St. Louis, situated on the right bank of the Mississippi, 174 miles above its confluence with the Ohio, occupies two plateaus, the first of which rises somewhat abruptly from the river, but the latter, gently ascending, expands into a large and beautiful plain several miles back from the city, which embraces a space seven miles in length by three in breadth. The streets near the river, following its meanderings, are irregular, the new portion being built upon a rectangular plan, presenting a cheerful and inviting appearance. In its public buildings, halls, churches, and schools a large sum has lately been expended under judicious and tasteful management. Benevolent institutions, upon both individual and State foundations, attest the intelligent philanthropy of its people, and the literary and professional ones are of high order. The periodical press, embracing some 25 publications, exercises a commanding influence upon public opinion, and religious and educational zeal is manifested by a complement of churches and schools fully equal to the average of American cities.

St. Louis is a great commercial and industrial emporium, commanding a large portion of the trade of the Mississippi river system. Its railroad connections have expanded its influence, increasing its commercial transactions. The accumulations of capital, the splendid industrial enterprise, the social refinement and intellectual advantages render it one of the most attractive cities on the continent, its present population being considerably in excess of 200,000.

The State finances are comparatively easy, the administration economical, and the revenue amply adequate to the requirements of the State. There are yet to be disposed of in this State 1,800,000 acres of public land.

ARKANSAS presents features of soil, climate, and productions which naturally associate it with the southern States. Its length from north to south is 242 miles, its breadth varying from 170 to 229, with an area of 52,198 square miles, or 33,406,720 acres. The physical aspects present remarkable variety. The eastern portion, with a breadth from 30 to 100 miles from the Mississippi, is a low marshy plain, abounding in lagoons, and subject, with exceptions, to the annual overflow of the Mississippi and its tributaries. Towards the centre of the State the land rises into hills, enlarging into the Ozark mountains. This chain enters the State in the northwest, dividing it into two unequal portions, one of which, in physical character, assimilates to the northern, and the other to the southern States. A singular phenomenon in Hot Springs county, 60 miles southwest of Little Rock, has excited the marked attention of men of science as well as of the public. Overlooking Hot Springs creek is a ridge, 250 feet high, composed of beautiful novaculite, of chalcedonic whiteness, of the age of millstone grit, transformed from simple ordinary sandstone by being permeated with heated alkaline silicious water. From this ridge issues a number of springs, varying in temperature from cold spring-water to a heat of 160° Fahrenheit. These extremes of temperature are so near each other that a person can place one hand in cold and the other in hot water at the same time.

The temperature of Hot Springs creek has been elevated by the infusion of these waters to such an extent that even in the coldest weather it furnishes a comfortable bath. Many chronic diseases have been cured by these springs, the virtues of which seem to result from varied temperature and chemical infusions. They are the resort of invalids from all parts of the country.

The population of Arkansas, in 1820, was 14,273; in 1840, 97,574; in 1850, 209,877; and in 1860, 435,450, the present population being about 500,000. This State was settled by the French in 1685, but civilization made very little progress prior to the territorial organization in 1819.

The soil of Arkansas presents a variety of characteristics. The black mould of the river bottom, though surpassingly rich in fertilizing elements, especially organic, is to some extent unavailable for lack of drainage. Where cultivation is effective the soil yields from 50 to 80 bushels of maize to the acre. There are lands of especial excellence found along White's and St. Francis rivers, but back of these are sterile ridges, the country north of the Ozark mountains being well adapted to grazing.

The climate of the northern and western parts of Arkansas is allied to that of the northwestern States, while the eastern and southern resembles Louisiana. The lowlands are not generally healthy, but the uplands are equal in salubrity to the most favored regions of the western States. The deposits of rain are very copious.

The agricultural statistics of 1860 showed a rapid enlargement of cultivated land and a sixfold improvement in the value of farms and farm implements over the preceding decade. The live stock averaged from 50 to 300 per cent. increase upon the returns of 1850. The cereal crops showed still greater



improvement. Butter, cheese, wool, slaughtered animals, honey, tobacco, cotton, peas, beans, potatoes, hay, and garden and orchard products manifested an equally gratifying development, both in quantity and value.

The minerals of Arkansas are chiefly iron, coal, lead, zinc, manganese, gypsum, and salt. The coal embraces deposits of the anthracite, cannel, and bituminous varieties.

Gold is said to have been found in White county. Near Hot Springs is a quarry of novaculite, or oil-stone, superior to any other on the globe, inexhaustible in quantity and of great variety of fineness. There is manganese enough in the State to supply the world's demand. In zinc Arkansas ranks next to New Jersey. It has more gypsum than all the other States, and is equally well supplied with marble and salt. The lead ore is largely associated with silver. Lead mines were worked extensively during the civil war to answer military necessities.

Arkansas has not engaged in manufactures to any considerable extent, they having been restricted to the production of the simpler indispensable articles. In 1860 the State had 518 establishments, with a capital of \$1,316,610. The annual product was \$2,880,578. The cost of labor was \$554,240, and of raw material \$1,280,503, leaving a profit of \$1,055,835, or eighty per cent. on the capital. Over three-fourths of this production consisted of lumber, flour, meal, and leather. Manufacturing enterprise was greatly stimulated during the civil war, but no statistics have been reported to show the amount of such improvement.

The extensive and widely diffused internal navigation of the State has supplied so well the limited wants of a hitherto sparse population, that railroads have not been completed to any considerable extent. The eastern section of the Memphis and Little Rock railroad, thirty-eight miles, has been finished, and several hundred miles additional have been projected, which will soon be placed under construction. The State has a large trade with New Orleans. An internal navigation of over one thousand miles brings every part of the country in communication with the great streams of commerce. The settlement of the back counties will add very materially to the volume of this domestic trade.

Little Rock, the capital, on the right bank of the Arkansas, three hundred miles from its mouth, is built upon a rocky promontory fifty feet above the river level, commanding an extensive prospect in all directions.

It contains a population of about four thousand, a number of fine public buildings, and church accommodations equal to the requirements of the population.

Superior building clay, slate and granite are abundant in the surrounding country. These have attracted capital and enterprise from the North, which will form the basis of a considerable export trade. Lines of steamers connect with prominent ports on the western and southern rivers.

Arkansas Post, Van Buren, and Fort Smith, are thriving trading towns.

Prior to the opening of the late civil war the financial condition of the State was very safe, the revenue being largely in advance of the expenditures.

The present financial condition is not found reported in any late statistics.

There are yet to be disposed of in this State about eleven million seven hundred thousand acres of public land.

MISSISSIPPI, in shape approaching an oblong parallelogram, is one of the southern States on the left bank of the Mississippi river, from which it took its name. Its length from north to south is three hundred and thirty-four miles, with an average breadth of one hundred and fifty, the area being 47,156 square miles, or 30,179,840 acres.

From the elevated plateaus of the eastern and central portions the land descends gradually towards the west and southwest, whither all its water-courses run. The Mississippi bed is marked by two ranges of bluff, irregular in outline, sometimes closely approaching the river, overhanging it in cliffs two hundred

feet high and then receding, leaving the intervening space a low flat plain overflowed by annual freshets and resulting in swamps, one of these extending from below the Yazoo river to Memphis, Tennessee, sometimes one hundred miles in width, occupying an area of seven thousand square miles.

This whole region is often covered with water, the northeastern part of the State being beautiful prairie. The southeastern portion is low but undulating, abounding in pine. The southern coast is a sandy level country, covered with heavy growth of pine interspersed with cypress swamps, prairies, and hills of slight elevation. Near Natchez are groups of ancient mounds of very remarkable construction. There are several medicinal springs in the State, among which is Cooper's well, in Hinds county, twelve miles from Jackson. The waters of this well are strongly impregnated with sulphur, also iron, and considered beneficial in cutaneous and intestinal diseases. Lauderdale springs, in the county of that name, are charged with white sulphur and chalybeate.

The population of Mississippi in 1800 was 8,850; in 1820, 75,448; in 1840, 375,651; in 1850, 605,948; in 1860, 791,305; and notwithstanding the ravages of war, may now be estimated at 900,000. The first settlements were made by the French. They were almost exterminated by Indians, but received a re-enforcement of French colonists driven out of Nova Scotia upon the English conquest of that peninsula. The admirable agricultural character of the country soon began to attract immigration from the British colonies on the Atlantic coast.

The average fertility of the State is of a high standard. The northern and central valleys, though subject in places to severe sand washing, are very productive. Excessive cotton culture has injured the soil of this region, which is now devoted in general to lighter and less exhausting staples.

The prairie region of the northeast has a rich black adhesive mould, impregnated with lime and very prolific in cotton and maize.

In the southeast fruits flourish in sandy soil, which, with the exception of a few valleys, is not sufficiently strong to support the heavier crops.

Cattle also abound to such an extent that it is called the "cow country."

The southern pine forests afford considerable trade in tar, pitch, and turpentine, but the land does not possess any especial agricultural capacity. The "bottoms" of the Mississippi, with their measureless depths of black mould, constitute par excellence the most productive lands of the State.

The establishment of permanent and sufficient embankments to protect them from the annual destructive overflow of the Mississippi is all that is requisite to make these lands a great planting region.

Their inexhaustible richness will bid defiance even to the appetite of the cotton plant, which has devalued the fertilizing principles of the soil of the central valleys.

The climate of Mississippi partakes very strongly of some of the characteristics of the torrid zone. Its winters, however, like those of Louisiana, have an average temperature a few degrees below the same seasons on the Atlantic coast, in the same parallels. The protection of the southwestern "bottoms" from overflow will soon dissipate the error that the climate of that region is naturally unhealthy, and attract a large population.

The agricultural capacity of Mississippi is incalculable. In the amount of land reduced to cultivation the returns of 1860 show an increase in the number of acres of sixty per cent. in ten years, and in the value of farms and agricultural implements of over two hundred per cent. The live stock have on the whole enlarged their numbers, and more than doubled in value. The animal products of butter, cheese, wool, slaughtered animals, and honey, have increased their volume in some cases fifty per cent. The cereal crops, with tobacco, cotton, peas, beans, potatoes, and hay, have had a still greater increment.

The products of orchards and market gardens have tripled and quadrupled.

The reorganization of labor will require time after the struggles of the late

civil war. With an entire revolution in the theory of the industrial system of the State, it is beyond doubt that the agricultural interests of Mississippi will yet be one of the great productive powers of American civilization.

No mineral deposits of any great extent have been developed in the State; some gold was found in Marion county, but coal and marble have as yet been discovered only in small quantities.

The presence of iron is attested by the existence of a few iron foundries in the State.

The manufacturing enterprise of Mississippi has been limited, the statistics of 1860 showing nine hundred and seventy-six establishments, involving a capital of \$4,384,492, producing articles valued at \$6,500,687; and deducting from this an expense of \$4,764,956 for raw material and labor, there remains a profit of \$1,735,731, or nearly forty per cent. on the capital.

The free development of the American industrial system will soon establish manufactories near the centres of original production, thus saving unnecessary transportation of the raw material. This diffusion will open to all the States of the Union a thriving future of industrial enterprise. The avoidance of all unnecessary processes of manufacture, transportation, and mercantile exchange, seems to be the tendency of modern civilization.

The commerce of Mississippi is mostly carried on through the ports of New Orleans and Mobile. The facilities of internal navigation are scarcely less extensive and valuable than those of Louisiana. The same causes have retarded the development of railroad enterprise as in that State. In 1860 there were but eight hundred and seventy-two miles of railway completed and in operation. The great railroad spirit of the age, however, is now advancing in this State, giving reason to expect in the future great expansion.

Jackson, the capital of the State, on the right bank of Pearl river, is a prominent cotton depot; it is situated in the midst of a fine large plain; its population is about four thousand. Natchez, on the Mississippi, two hundred and eighty miles above New Orleans, is situated on a bluff two hundred feet above the river, and is the centre of a large cotton trade. Vicksburg, one hundred and twenty miles above Natchez, is also a great cotton mart. Columbus, Aberdeen, Holly Springs, Canton, and Grenada, are important towns. There are yet to be disposed of in this State about four million nine hundred thousand acres of public land.

ALABAMA, one of the Gulf States, derives its name from the aboriginal language, signifying "here we rest." Its extreme length from north to south is 336, and the breadth ranges from 148 to 200 miles. Its area is 50,722 square miles, or 32,462,080 acres.

The Alleghany mountains terminate in the northeastern part of Alabama, subsiding into low hills. From the north the surface gradually declines towards the coast, which is depressed and level, with hilly country in the centre. The limited sea-coast is broken by Mobile bay, a beautiful sheet of water, 30 miles long and from 3 to 18 broad, with depth of 15 feet on the entrance bar at low tide. The southward deflection of the general level causes the rivers to run in the same direction. These are numerous and of very considerable length and volume.

The population in 1820 was 122,901; in 1840, 590,756; in 1850, 771,623; in 1860, 964,201. Even after the desolations of war the present population cannot be less than 1,250,000.

The first white men that set foot upon the soil of this State were the adventurers under De Soto in their famous march to the Mississippi. They found the aborigines a formidable obstacle, evincing a more intelligent manhood and higher social organization than their compatriots further north.

The first settlement was made by the French under Bienville, who built a fort



on Mobile bay in 1702. Nine years afterwards the present site of Mobile was occupied.

The peace of 1763 transferred to the British crown all the territory north of the Gulf and east of the Mississippi. Its agricultural value soon attracted an Anglo-American immigration, in the mass of which the original French element was absorbed. Alabama in point of population now ranks as fourth among the southern States.

The soil varies with the geographical locality and elevation. The mountain region of the north is well suited to grazing and stock-raising, and is interspersed with valleys of excellent soil. The undulating surface of the central portion is well watered, and, especially in the river bottoms, highly charged with fertilizing elements.

The valley of the Alabama is one of the richest on the continent. The removal of the canebrakes of Marengo and Greene counties has disclosed soil of surpassing quality. Towards the coast the vegetation becomes decidedly tropical. Cotton is the great staple, but sugar-cane is cultivated on the neck between Mississippi and Florida, and indigo has been produced in considerable quantities. Oaks in great variety, poplars, hickories, chestnuts, and mulberries, cover the northern and central parts, while in the south the pine, cypress, and loblolly are the prevailing species.

The climate varies with the latitude, approaching within seven degrees of the tropics. The southern coast is strongly assimilated to the torrid zone in its temperature. The nights, however, are alleviated even in the hottest weather, by the Gulf breezes. During the coldest seasons the rivers, even in the north, are seldom frozen, and the general winter temperature of the State is very mild. The low lands near the rivers are malarious, but the State generally is remarkable for salubrity.

The agricultural statistics of 1860 disclose an advance in ten years of fifty per cent. in the amount of land brought under cultivation, and of nearly two hundred per cent. in the value of farms and farm implements.

Live stock presents some enlargement of aggregate numbers, and more than doubles in value. Animal products, such as butter, cheese, wool, honey, and slaughtered animals, have increased fifty per cent. Cereals, tobacco, cotton, potatoes, and hay show like increment. Market garden products nearly double in value, while orchard products increase nearly fifteen fold. Like the neighboring Gulf States, an injudicious cultivation of cotton, tobacco, and other heavy staples has somewhat exhausted the fertility of portions of the land. Tillage and rotation of crops will remedy the mischief and restore the elements of productiveness. The agricultural development of Alabama awaits the final adjustment of the system of labor, the State possessing elements promising a bright future.

The mineral resources of Alabama are sufficiently known to indicate their abundance and variety. The central region is underlaid by vast beds of iron ore, alternating with thick coal measures of great extent. The juxtaposition of these minerals favors mining operations and the processes of preparing iron for market. Lead, manganese, ochres, and marbles are found in different localities, and even gold is reported. Sulphur and chalybeate springs are of frequent occurrence.

The returns of 1860 show 1,459 manufacturing establishments, with a capital of \$9,098,181, producing articles valued at \$10,588,571, at an outlay for labor and raw material of \$7,622,903; the margin of profits was \$2,965,668, or nearly 30 per cent. on the capital invested. A new era in manufacturing enterprise may be expected in the reorganization of labor now in progress in this and other States, in which this great industrial interest will find its true position and influence in the social system.

The natural advantages possessed by Alabama are very important. The



magnificent bay of Mobile and a river navigation of 1,500 miles form an outlet not only to her own productions, but also to those of the neighboring States. A very considerable foreign and domestic commerce has its seat at Mobile, which will increase with the development of the State. The natural advantages are being supplemented by an extensive system of railroads yet in its infancy. In 1860 Alabama had 743 miles completed and in full operation, with several hundred more in process of construction or projected. These will connect Mobile with the prominent railroad centres of the country and permeate the whole State with their beneficial influence.

Montgomery, the capital, with a population of 10,000, on the left bank of the Alabama, 340 miles above Mobile, is admirably located for a domestic commercial depot. Its railroad communications are extensive and increasing, while the Alabama, which never freezes and is seldom affected by drought, is one of the best steamboat rivers in the country. The city is well built, with numerous literary institutions, and periodicals circulating extensively through the State. Its commercial transactions are on an important scale.

Mobile, on the river bearing the same name, three miles above its mouth, is, next to New Orleans, the greatest cotton market in the Union. Its position in a large sandy plain is just sufficiently elevated for the purpose of drainage. The streets are wide and luxuriantly shaded by tropical trees. The city is well supplied with pure water from springs several miles distant. It is not compactly built, except the business portion. The religious, literary, and commercial institutions are numerous. Its position being well defended both by art and nature, it presents superior commercial facilities. It is connected by lines of steamers and railroads with all the prominent points on the coast and in the interior, and carries on an extensive commerce with foreign nations.

Tuscaloosa, Blakely, Marion, Huntsville, Jacksonville, Selma, and West Point, are among the principal towns.

There are yet to be disposed of in this State about 6,900,000 acres of public land.

LOUISIANA is the most southerly of the first tier of trans-Mississippi States. Its extreme length is 292 miles, and average breadth 250, embracing an area of 41,346 square miles, or 26,461,440 acres. The surface of the State, not more than 200 feet above the level of the Gulf, is in many places so low that extensive districts, especially in the south, are submerged during the stages of high water in the rivers. West of the Mississippi basin the land rises in hills towards the northwestern part of the State, broken, however, by the marshes along the several arms of the Red river. The delta of the Mississippi, included by the rivers Atchafalaya and Iberville, and amounting to one-fourth of the area of the State, is nowhere more than ten feet above the sea, and is subject through its entire extent to annual inundation. Large forests of pitch pine occupy the northern and western highlands, interspersed with oaks, elms, cypress, and honey locust. In the parish of Concordia are numerous mounds, built by a former race of intelligence and capacity superior to the Indians. They contain human bones, pottery, and arrow-heads. These elevations being beyond the reach of the annual overflow, are much prized for gardens and orchards.

The population in 1810 was 76,556; in 1830, 215,739; in 1850, 517,762; in 1860, 708,002. This State having been originally colonized by French and Spanish settlers, that element is large in the present population.

The soil of the rivers is of the most productive character. In some cases the rich black surface mould is one thousand feet deep. These "bottoms" produce the sugar cane and rice, which, with cotton, are the great staples of Louisiana. Two-thirds of the alluvial land is covered with heavy forests and an exuberant undergrowth of cane. These lands are easily drained and constitute the most valuable districts in the State. The prairie lands are not always very fertile,

being sometimes thin and inferior for agricultural purposes. Walnut, oak, sassafras, ash, mulberry, hickory, and magnolia trees are abundant in the northern parts, on the more fertile land; buckeye, locust, cottonwood, and willow flourish in the bottoms. Cypress swamps are frequent in the overflowed districts. Peaches, quinces, plums, and figs succeed very well, but not so with pears and apples.

The winters of Louisiana, though more severe than those of the Atlantic States between the same parallels, are still very mild. The evaporation of the stagnant water left by the annual overflow of the rivers produces a malaria in the low districts during the long hot summers, which, each autumn, manifests itself in fever cases more or less numerous. The uplands are healthier and embrace many desirable localities.

The agricultural enterprise of Louisiana, as illustrated in the details of the census of 1860, is very satisfactory. In the ten previous years the acreage of land under cultivation had doubled, while the farms and farm implements had nearly tripled in value. Live stock had increased from thirty to fifty per cent.; annual products of butter, cheese, wool, honey, wax, and slaughtered animals had in valuation nearly doubled. The same increase was observable in rice, tobacco, sugar, molasses, peas, beans, potatoes, and hay. The expansion of the cotton crop was four-fold; of the value of orchard products five-fold; of market garden products nearly three-fold. The agriculture of this State is unique in its general features and practical methods. Its capacities have hitherto been only indicated and by no means developed.

The geological features of the State show the emersion of the tertiary strata over about two-fifths of its surface in the northwestern part; underlying this formation is a saline bed; the residue of the State being alluvial and diluvial. In the tertiary series are found coal, salt, iron, ochre, gypsum, and marl. The iron is especially frequent in the tertiary strata and of good quality. The coal is not equal to that of some other parts of the western coal field, but the marl is rich and the gypsum of the very best quality.

The western range of the Mississippi alluvion is marked by precipitous hills of freestone, from eighty to two hundred feet high. In the neighborhood of Harrisonburg, quartz, crystals, agates, jasper, sardonyx, carnelians, onyx, selenites, chalcedony, and other precious stones have been found in unusual size and abundance.

In 1860, the capital employed in manufactures was \$7,151,172, invested in 1,744 establishments. The annual product was valued at \$15,587,473, of which, after deducting \$10,692,987 for cost of raw materials and labor, there remains a profit of \$4,894,486, or nearly sixty-eight per cent. on the capital invested.

These manufacturing processes were generally such as had immediate relation to those of original production in agriculture.

In Louisiana attention has not hitherto been generally directed to manufacture, though there is no reason why that class of industry should not be profitably conducted.

The commerce of the State, both domestic and foreign, has been very extensive, and the admirable system of internal navigation, in which Louisiana excels highly favored neighbors, will yet place the State in the front rank of the world's commercial communities. To the direct navigation of the Mississippi, extending northward to the falls of St. Anthony, some two thousand miles, its greatest tributary, the Missouri, adds three thousand miles, stretching up to the Rocky mountains, the Ohio and its tributaries twenty-five hundred more, reaching the heart of the Alleghanies and tapping the rim of the northern lake basin. To these aggregates adding the numerous large affluents further south, with their branches, we obtain a sum total approaching in round numbers seventeen thousand miles pouring the products of fourteen States into the magazines of New Orleans for foreign exportation.

This State not realizing any special need of artificial routes in the face of such

a system of internal communication, has not engaged extensively in railroad building. Yet in 1860 there were nearly 400 miles of road in operation, and soon the State will be in perfect communication with the great northern lakes by a continuous line of railroad. Baton Rouge, the capital, is built upon a high bluff on the left bank of the Mississippi, 130 miles above New Orleans. It is reputed one of the healthiest towns on the Mississippi. It contains the public buildings, churches, schools, and banks, and is the centre of a very rich agricultural district.

New Orleans, the commercial emporium of the southwest, is situated on the Mississippi, 105 miles from its mouth, on the isthmus between that river and Lake Pontchartrain. The site being below the level of the river, in times of high water is protected by an embankment or levee. The deposition of alluvial matter by the river is continually changing the channel, requiring wharves to be erected upon piles driven out in the river. The city plat shows a convenient arrangement of well-paved streets. Most of the buildings are of brick, with suburban villas, the residences of men of wealth and business prominence. The public buildings are on a magnificent scale. The churches exhibit evidences of great wealth and cultivated architectural taste in the congregations. The hotels are proverbial for their magnitude and splendor. The benevolent institutions are among the most extensive and admirably conducted in the Union. Literary institutions of high grade are largely patronized. The commerce of New Orleans is most extensive, it being the greatest cotton market of the world. It has been the depot of the agricultural products of the Mississippi valley, though the extension of northern railroads has tapped the streams of western commerce, and deflected a large proportion of the trade to Atlantic ports. New Orleans, feeling this drain, is making efforts to recover supremacy. Even with the loss occasioned by the opening of these rival lines of trade, this city must ever be one of the great commercial marts of the Union. The finances of Louisiana up to the commencement of the civil strife were in a very prosperous condition. There are yet to be disposed of in this State over six million five hundred and eighty thousand acres of public land.

FLORIDA is the most southern State in the Union, reaching nearly to the tropic of Cancer. It is three hundred and eighty-five miles long, and the width in the lower part fifty, expanding in the upper portion to two hundred and fifty, the area being 59,268 square miles, equal to 37,931,520 acres.

The southern section of the State is an extensive marsh, called the "Everglades," with occasional tracts of firm ground, which seem like islands in a lake. It is supposed that its watery saturation may be removed by drainage. North of this the surface is generally level, interspersed with undulating tracts, the west of the neck joining Georgia being more broken and hilly. The lands of Florida have been distinguished as high hummock, low hummock, swamp, savanna, and pine land. High hummock is timbered with live and other oaks, magnolia and laurel, and is the best land for general purposes. Low hummock with the same kinds of timber is liable to overflow; when properly drained, however, it is the best land for sugar cane. Savannas are the river alluvions, usually very rich, but requiring drainage in all ordinary years. The southern coast has a range of small rocky islands called "keys," ending in a cluster of rocks and sand-banks, called the Tortugas, deriving their names from the number of turtles found in the surrounding waters. The whole peninsula is of diluvial origin.

The population in 1830 was 34,730; in 1840, 54,447; in 1850, 87,445; in 1860, 140,424; and at present it may be estimated at 160,000. The country was first occupied by Spanish adventurers. Subsequent French settlers were expelled by the Spaniards, whose first permanent settlement at Saint Augustine dated from 1565, the Spanish element now bearing but a small proportion to the population.



The soil is generally sandy, except in the hummocks, which are mixed with clay; a favorable climate bringing out its full capacities, renders it quite productive. The best lands of the State are unavailable for want of drainage. A large area is very well suited to grazing and stock-raising. The vegetation is mostly of a tropical character, producing cotton, sugar cane, rice, and tobacco in great abundance, with crops belonging to higher latitudes. The progress of agricultural enterprise in ten years, as detailed in the statistics of 1860, shows that the acreage enclosed in farms increased one hundred per cent., and their value one hundred and fifty per cent. Live stock in numbers advanced fifty per cent., and doubled in value. Animal products, cereal crops, tobacco, cotton, molasses, peas, beans, and potatoes show an increment of fifty per cent., market garden products more than double, while orchard products increased nearly twenty-fold.

The climate of Florida is one of elevated general temperature, very closely approaching that of the torrid zone. The local climates of the coasts, however, are very much softened by sea breezes; the interior being without this alleviation, is more affected by the intense heat of summer. The winter on the Gulf coast exhibits greater depression of temperature than the Atlantic coast. Florida is the resort of invalids, especially those affected with pulmonary symptoms. Statistics of health show that there are points in this State the salubrity of which is greater than any other part of the Union. No minerals of any amount have yet been discovered.

The manufactures of Florida in 1860 showed an aggregate embracing one hundred and eighty-five establishments; capital invested, \$1,874,125; cost of raw material and annual cost of labor being \$1,494,346; value of annual product \$2,447,469, presenting a profit of \$953,125, or nearly one hundred per cent. on the capital invested. The same general observations made in reference to the industrial interests of the other States apply with equal force to Florida. A well-adjusted system of labor will be followed by a revival of agriculture, commerce, and manufactures. Its trade has been of a very limited character, having had but a small basis of manufacturing enterprise and agricultural industry upon which to rest. The railroad movement, from its inauguration in this State, gave as the result in 1860 four hundred and one miles completed and in full operation, representing an aggregate capital of \$8,628,000.

The financial interests of Florida prior to the late domestic struggle were in a flourishing condition, the administration economical, and the receipts in advance of expenditures.

Tallahassee, the capital, which is built upon an elevated site of a rectangular plan, contains the State buildings, with several churches, newspapers, and schools. It is situated in the midst of a well-watered productive country, in the most thickly settled part of the State.

Saint Augustine has a deep, safe harbor, the outlet of the productions of a considerable portion of the country, its fine climate rendering it a great resort for invalids. Appalachicola and Pensacola enjoy extensive trade, and Key West, Jacksonville, and Fernandina are prominent towns. There are yet to be disposed of in this State about seventeen million five hundred thousand acres of public land.

MINNESOTA, lying near the centre of the continent, occupies the summit of the interior plateau formed by the converging basins of the Mississippi, Lake Superior, and Lake Winnipeg, embracing the head-waters of three great river systems of North America. Its series of undulating plains, seldom broken by abrupt elevations and never rising into mountains, present an agreeable variety of prairie, alternating with belts of heavy timber and studded with beautiful lakes, the crystal waters and euphonious Indian names of which have become proverbial, and whose intercommunication, together with the large and numerous rivers, forms a system of internal navigation permeating all parts of the State.



The population in 1850 was 6,077; in 1860 it had increased to 172,023. With the exception of Pembina, no white settlements existed within the limits of the State prior to 1845.

A distinguished statesman from Minnesota estimates the present population of the State at four hundred thousand, and predicts it will reach the aggregate of seven hundred thousand in the returns of the next decennial census. A large European immigration, embracing the hardy Teutonic and Scandinavian elements, is swelling the tide of population from the older States, promising to realize the prediction.

Its soil varies in character. Its peculiar excellence is shown in its adaptation to the culture of wheat, the great and unfailing staple of Minnesota and the northwestern region of the country. The valleys of the great rivers, especially the Mississippi and Minnesota, are very productive. Above the falls of St. Anthony, with the exception of river alluvions and some prairie land, the country is covered with drift and marshes, restricting the area of effective cultivation.

The agricultural character of Red River valley is excellent. Notwithstanding its high latitude the State produces maize of superior quality in large quantities. Wild rice, strawberries, currants, plums, and cranberries abound in the prairies. The returns of the census of 1860 show very large aggregates, compared with the extent under cultivation, of wheat, rye, oats, potatoes, and barley, with large quantities of maize, buckwheat, tobacco, rice and hay. The products of maple sugar, maple and sorghum molasses, honey, orchard and dairy products, live stock and slaughtered animals, are remarkable, considering the brief period since the first settlement of the country.

The climate of Minnesota from its high latitude is necessarily severe in the northern parts of the State, yet it is accompanied by an equability which easily assimilates the human system to its low temperature, preventing those sudden changes which are insalubrious in lower latitudes. The climatic relations are very favorable to health and longevity, presenting many alleviations to the extreme cold of winter.

Portions of Minnesota are covered with heavy growths of pine, which the development of natural water communication and railroad improvements will soon bring into market. The ridges of the drift localities abound in small pine, spruce, hemlock, birch, aspen, and maple; cyprus, cedar, and tamarack exist in the swamps, the river alluvions furnishing an excellent growth of oaks, hard and soft maple, birch, linden, elm, and walnut.

The mineral resources of the State are yet undeveloped. Copper has been found, but in most cases as a detritus carried away from its deposits imbedded in moving masses of boulders and drift. Yet around Lake Superior it is likely a considerable amount of this mineral will be produced.

Coal has not yet been discovered in quantities comparable to its development in the neighboring States. Lead gives promise of great abundance. In the northeastern part large formations of gold and silver-bearing quartz, accompanied by still further developments of iron ore, were reported by the State geologist upon actual survey in 1855. Notwithstanding the large area of the State its geological character seems to be confined to the azoic and protozoic groups, concealed by a thin superincumbent stratum of drift extending over a large part of the country.

In 1860 there were in Minnesota five hundred and sixty-two manufacturing establishments, with a capital of \$2,388,310, consuming raw material valued at \$1,904,070; that sum, with the cost of labor, being equal to \$2,616,284. The value of the manufactured products was \$3,373,182, resulting in a profit of \$756,898, or over 31 per cent. on the capital. The greater portion of production was lumber, of which in the first of the four districts of the State, including the St. Croix and its tributaries, there were sent to market seventy-three million feet. In the whole State there were in 1860 one hundred and fifty-eight saw-

mills, producing lumber valued at \$1,234,203. The yield of the timber trade in 1866 amounted to 157,273,944 feet, valued at \$2,359,124. The abundant water power of Minnesota will, it is believed, induce the investment of a large amount of capital in manufactures, which, by the decisive advantages of natural and artificial channels of transportation, will yet become an important element of prosperity in the State.

The railroad communications are in process of rapid extension. During 1865 two hundred and ten miles were completed, one hundred and thirty-two additional miles having been graded.

During 1866 it was estimated that four hundred and seventy miles would be put in process of construction. The completion of these lines of road will place all the prominent points of the State in rapid communication with Chicago, the great railroad centre of the west, and the commercial entrepôt of the nation.

St. Paul, the State capital, is located on the east bank of the Mississippi, at the head of navigation, nine miles below the Falls of St. Anthony, being situated on a bluff seventy or eighty feet above the level of the river, and surrounded by picturesque hills abounding in excellent springs of water. It was first settled in 1840 and has grown to be a large commercial city, holding very active business relations with the northwest. It contains the State-house and other buildings erected for the accommodation of various benevolent and literary institutions. Its churches, schools, and printing establishments are on a scale commensurate with its rapid progress as a city, indicating a worthy aspiration for intellectual and moral improvement; its banks and other commercial institutions representing an extensive and growing trade.

Red Wing, St. Anthony, Fort Snelling, Stillwater, Mankato, Saint Cloud, and Minneapolis are important places, rapidly increasing in population, business and wealth.

The educational and moral interests of the State are judiciously managed; the landed endowments of learning, as devised by the wise benevolence of the government, are developing a high tone of intelligence.

Authoritative statistics indicate that earnest attention is given to religious enterprises, showing adequate church accommodations.

The financial condition of the State is sound, the expenditures falling within the receipts, and its debt nearly liquidated.

There are yet to be disposed of in the State about thirty-six million seven hundred and fifty thousand acres of public land.

During the last fiscal year the extensions of the public lines in Minnesota were retarded by rains through the surveying season. Since last report, however, the field work in eastern and western Minnesota was prosecuted to the extent of the means provided, the returns including thirty-nine whole and fractional townships, embracing nine hundred and fifty-five thousand eight hundred and forty-three acres. These, with the one thousand one hundred and eighteen townships previously reported, cover an aggregate surveyed surface in Minnesota, from the commencement of operations to June 30, 1867, of twenty-two million eight hundred and seventy-nine thousand seven hundred and sixteen acres, while the progress made in the preparation of office work has been active and satisfactory. Immigration into the State during the past and present season has been very large, composed to a great extent of farming population, many settling beyond the surveyed region. In order to afford them an early opportunity to acquire titles, the surveying department makes an estimate for so extending the lines as to embrace settlements between St. Louis and Mississippi rivers in eastern Minnesota north of Mille Lac, and in the western and southwestern portions of the State, that country being mostly agricultural, with the exception of the pine lands in the northern section of the State.

The exploration of the timbered regions has shown considerable abatement

in spoliation, owing to the steady vigilance exercised by the land officers in preventing depredations and enforcing fines against trespassers.

The early survey and offering of the timbered land would be an efficient means towards arresting depredations and securing economy in the use of lumber and wood for fuel, which are cut at a distance from places of consumption and by persons having no interest in preserving the growth of the forest. Looking to these considerations, the estimate of the surveyor general, slightly reduced, is submitted for an appropriation for surveys during the next fiscal year.

DAKOTA embraces a large scope of unoccupied territory, fringed with white settlements in its southern border along the Missouri river. It may be divided into two tracts nearly square, of which the eastern extends from the boundary of Nebraska northward to the national frontier, and measures a little more than 400 miles square. The western portion forms a sort of echelon to the eastern and extends from the boundary of Colorado northward to that of Montana, being an oblong figure, the length of which and breadth respectively are 330 and 260 miles. The extreme length of the Territory is 900 miles, its extreme breadth 535, its area being 240,597 square miles, or 153,982,080 acres. The eastern section is traversed by the Missouri river, the numerous affluents of which form an extensive system of internal navigation and drainage. Dakota has been described by geographers as an undulating plain rising gradually westward to the Rocky mountains, with an occasional approach to hills or terraces. There is nothing that can be called mountain within its limits. The eastern and southern parts of the eastern section are known to present very considerable agricultural facilities. Imperfect information has caused the country west of the Missouri to be reported as insufficiently watered. Further advices induce doubt in that respect. In other parts of the Missouri basin a deficiency of rain has been found; but experience has discovered that this inconvenience was very greatly remedied by the nature of the soil and by stores of subterranean moisture. There is reason to suppose that these alleviating influences will be found to exist to a considerable extent in the lands of the upper Missouri. The western portion of the Territory is traversed by ranges of the Rocky mountains. The agricultural character of this part, though imperfectly understood, is supposed to be much better than has been represented. It is well wooded in the portions which have been traversed by surveying parties and others. The population in 1860 was 4,837, including 2,261 civilized Indians. There are about 30,000 uncivilized Indians within the limits of the Territory. These, however, are passing away by accelerating causes. Yankton, the capital, containing about eight hundred inhabitants, manifests an active and thriving spirit of industrial progress. Vermillion is also a point of considerable influence, the seat of the United States land office for the Dakota district. The public lands undisposed of in the Territory are equal to about one hundred and forty-five million two hundred and ninety thousand acres.

In Dakota during the last year the correction line coincident with the 43° 30' of north latitude has been extended nearly seventy-six miles from Dakota river west to its intersection with the left bank of the Missouri. Besides this, the township and range lines north and west of the Yankton Indian reservation have also been established, equal to four hundred and eighty miles. Besides, fifty-five whole and fractional townships have been subdivided into sections, equal to over three thousand lineal miles, embracing nine hundred and sixty-nine thousand six hundred and sixty-six acres, which, with the one hundred and twenty-nine townships, or eight hundred and sixty thousand one hundred and eight acres, make an aggregate of two million eight hundred and twenty-nine thousand seven hundred and seventy-four acres surveyed in the Territory from the initiation of the system to the 30th of June, 1867, while the preparation of maps and other records has kept pace with the field service. Engage-



ments have been made for the performance of services requiring most of the appropriations for the year ending June 30, 1868. That service will effect the extension of standards from near the mouth of Wild Rice river in Minnesota, in  $47^{\circ} 18' 30''$  of north latitude, to the Pembina region in Dakota, adjoining the international boundary or  $49^{\circ}$  of north latitude, near the Red River of the North, where a considerable settlement exists. There, too, under the provisions of the eighth article of treaty with the Red Lake and Pembina bands of Chippewa Indians of October 2, 1863, and article seven of supplemental treaty of April 12, 1864, certain residents have a right to selection, each a quarter section, when the surveys are made. To accommodate those distant settlements of years standing, a surveyor was despatched for the purpose of connecting the locality with the lines of the survey in Minnesota. The deputy was also directed to subdivide the Pembina lands to the extent of the means allowed for that service. He is progressing with the field work, the settlers awaiting surveys. The surveyor general therefore submits estimates of twenty-two thousand dollars for the service of the fiscal year ending June 30, 1869. The localities indicated by the surveying department as requiring field operations are on the Red River of the North, on the Missouri, between Fort Randall and Fort Sully, and in the vicinity of the Black Hills of Dakota, where there is a vast extent of pine timber of excellent quality, needed for building material all over Dakota. Besides, this locality, it is reported, abounds also in mineral wealth, such as gold, silver, copper, and coal, and, by memorial, the legislature has sought the extension of the surveys in the White River valley to the pine lands of the Black Hills.

For these considerations it is suggested that when the existing Indian difficulties are settled, and their title extinguished in the locality of the Black Hills, that region could be reached by lines counting from the sixth principal meridian west of the Missouri river.

It is further reported that information has reached the surveyor general of the existence of settlers around Fort Laramie, and along the Union Pacific railroad in the Territory, and that there are now three thousand inhabitants asking for surveys in those places. In view of these facts, it is submitted that an appropriation of fifteen thousand dollars would be necessary to meet the requirements of the service, and an estimate is accordingly submitted for the year which will end June 30, 1869.

The War Department on the 12th of September, 1867, relinquished that portion of the Fort Randall reservation which lies north and east of the Missouri river and west of the Yanceton Indian reservation. The area thus released is estimated at twenty-one thousand acres, but it cannot be disposed of, owing to the general interdict in the sixth section of the act of June 12, 1858, (volume 11, page 336.) It is recommended that the interdict be removed by legislation, restoring the premises not needed to the mass of the public domain, so that settlers may acquire legal title to the tracts they severally occupy.

NEBRASKA, the youngest State in the American Union, extends from the Missouri westward to the Rocky mountains, with an extreme length of 412 miles, decreasing to 310 miles on the southern border, its extreme width being 208 miles, diminishing to 138 miles on the west.

Its area is 75,905 square miles, or 48,636,800 acres.

The country through its entire length dips toward the Missouri river, being upon the western slope of the great central basin of the North American continent. The larger portion is elevated and undulating prairie; there are no mountains or high hills; the bottom lands of the river valleys are generally level. Above these, from forty to one hundred feet, are second bottoms or table lands, sloping backward to the bluffs, which range with the general level of the country. These bluffs sometimes rise hundreds of feet above the river level; back of these is the undulating prairie, well watered with springs and running streams,



being covered with excellent grasses. This prairie resembles the waves of ocean suddenly arrested in their swell and changed into soil and rock.

In remarkable contrast with the general appearance of the State is the tract known as Mauvaises Terres, in the western part of the State, 90 miles long and 30 wide, produced by some powerful agencies of denudation and degradation of the land. Viewed from a distance it seems like some deserted abode of civilization; the prismatic and columnar masses appear as residences of modern architecture or public buildings, with towers, columns, and walls. A near approach dispels the illusion, the imposing forms of architectural beauty resolve themselves into masses of rocks with labyrinthine defiles. These first appearances, however, are not correct exponents of geological character, as they are found upon examination to contain some excellent lands.

The population of Nebraska in 1860 was 28,841; the inviting features of the country have stimulated immigration to such an extent that in 1867 the State was admitted into the Union, having attained the requisite number of inhabitants. Its location is such as to command especial attention of immigrants.

The soil of the eastern portion is exceedingly fertile; the prairies are covered with a heavy sod, the matted growth of ages of vegetation, several teams of oxen being required to break it; the subsequent tillage is comparatively easy, the ground being rendered light and mellow. Along the rivers are groves of oak, walnut, cottonwood, hickory, and willow; very dense forests of cottonwood grow along the Missouri river above the mouth of the Platte.

The climate is milder than the eastern States within the same parallel of latitude; the summer is of high temperature, but the sultriness is alleviated by cool, refreshing winds blowing over the prairies. The quantity of rain is less than falls on the Atlantic side. This dryness does not become appreciable east of the 98th meridian. West of that meridian the soil, so far as known, is arid and not so well suited to agriculture; that part of the State to the eastward, however, is not deficient in moisture.

In 1860 the farms of Nebraska embraced 128,789 acres of improved land, and 512,425 of unimproved. The productions of that year amounted to 1,482,080 bushels of maize, 147,867 bushels of wheat, 75,502 bushels of oats, 162,188 bushels of potatoes, 24,458 tons of hay, and 341,541 pounds of butter. In that year the return was made of about 5,000 horses, 7,000 cows, 30,000 oxen and other cattle, 2,500 sheep, and 25,000 swine. The peculiar characters of soil and climate indicate that stock-raising will become a very important and remunerative branch of its agricultural enterprise. The dryness of the climate and the copious vegetation, especially of nutritious grasses, will attract capital, with a view to the establishment of wool-raising interests.

The trade of Nebraska is in its infancy. Its facilities, natural and artificial, must soon develop an immense volume of domestic commerce, in addition to the aggregate of the carrying trade that will pass through the State upon the completion of the Union Pacific railroad. Five hundred miles of that route are completed, and a wonderful progress is announced in the prosecution of the remaining portions. Within a score of miles further lies the foot of the Rocky mountains. The massive grades and excavations of that portion of the route will, of course, not admit of the rapid daily progress that has been shown in the extraordinary operations of the past year. The mineral resources of Nebraska will be considered under another head. Nebraska City, on the Missouri, is a well built town in the centre of an extensive domestic commerce, requiring transportation amounting to 13,337,734 pounds in 1864, and employing 1,792 men, 1,410 mules, 13,808 oxen, and 1,587 wagons, the total expense of which was \$2,134,037. The population of the town is estimated at 8,000.

Omaha City, the capital, is located upon high, undulating ground between the same river and the posterior bluffs, commanding a very fine view. Limestone for building is found in great quantities in the neighborhood of the city. This

city is the eastern terminus of the northern branch of the Pacific railroad, which gives it an immense importance as a commercial point, and is enlarging its wealth and population at a very remarkable rate. Its population in 1865 was 4,500, and is now estimated at 12,000.

In the State the public lands remaining undisposed of are equal to about forty-two and a third millions of acres.

By the act of July 28, 1866, the removal was ordered of the surveyor general of Iowa and Wisconsin from Dubuque to Plattsmouth, Nebraska, and Iowa and Nebraska were made one surveying district, thereby detaching it from Kansas. As far as the surveys in Nebraska had been contracted for by the Kansas surveyor general at Leavenworth, they were prosecuted in the field to completion, and returns made to that office.

For the portion of the last year in which the Nebraska service was under the Kansas surveyor general, five different contracts were completed, involving a liability of over \$28,000, the cost of 72 lineal miles of standard, 740 of townships, and 4,583 of sections, embracing 81 whole and fractional townships, equal to 1,656,184 acres, the locality of those surveys falling within the counties of Monroe, Madison, Merrick, Hall, and Buffalo.

When the surveyor general for Iowa and Nebraska entered on the discharge of his duties, which was on the 2d day of April, 1867, the necessary books, furniture, and surveying instruments were transferred from Dubuque to Plattsmouth, on the 5th day of May last, together with the records appertaining to Nebraska, which had been in the office of the surveyor general at Leavenworth.

The surveying archives of Iowa, as the service is completed in that State, are suffered to remain at Dubuque, in charge of a responsible party, without compensation, until the legislature of the State shall pass a law for their acceptance, according to the terms of congressional legislation in that respect.

Upon opening the surveyor general's office at Plattsmouth, he proceeded to carry out his instructions respecting the service in Nebraska.

Surveying contracts were made for the extension of guide meridians, standard parallels, and subdivision of 21 whole and fractional townships, the work to be paid for out of the appropriation of \$15,000 by act of July 28, 1866, no report having reached here of returns of the work. Certain deputies contracted for the establishment of standard lines extending from the Pawnee reservation west to the vicinity of the eastern boundary of Colorado, embracing the lands granted by Congress in aid of the Union Pacific Railroad Company, up the Platte river and Lodge Pole creek, a tributary of South Platte river. They have, however, encountered difficulties caused by Indian hostilities.

The surveying department suggests the importance of the survey of the boundary between Nebraska and Colorado and of the western boundary of Nebraska. The establishment of these boundaries is required in order properly to make the allotments in aid of the Union Pacific railroad, which has been completed from Omaha almost to the western line of the State, and is further required to accommodate settlers along the route, as well as to determine political jurisdictions, the uncertainty in that respect causing inconvenience in the collection of national and State revenues, and in the maintenance of law and order in communities adjacent to territorial and State lines.

In view of the rapid progress made in the construction of the Union Pacific railroad, and of settlements keeping pace with the improvements, the surveyor general has presented an estimate to realize the objects contemplated, but, in consideration of the wants of other surveying districts, the estimate has been reduced by this office to \$50,000 for the surveys during the fiscal year ending June 30, 1869.

Under the treaty with the Omahas, concluded March 6, 1865, a contract has been awarded by the department for the subdivision of that reservation, to be in the first instance divided into northern and southern portions, the former

having been sold to the United States for the home of the Winnebagoes, and the latter to be occupied by the Omahas. The returns of survey have been received amounting to 302,832 acres, consisting of 205,335 acres of the Omaha reservation and 97,497 acres of the Winnebago Indian lands.

Allotments to the Omahas under treaty stipulations are to be made for their exclusive use, in parcels not exceeding forty acres, to persons eighteen years of age, and to each head of a family 160 acres. The lands in Nebraska surveyed from the commencement of operations, in 1855, embrace 15,520,249 acres. Besides these surveying operations, in that State, authority of law was given for a geological reconnoissance, results of which will be presented under another head in this report.

KANSAS, one of the youngest and largest States in the Union, occupying the western slope of the Missouri valley, varies in length, from east to west, from 344 to 408 miles, with uniform breadth of 208. Its area is 81,318 square miles, or 52,043,520 acres.

The eastern half is undulating prairie, alternating with timber. The latter is generally found skirting the streams, which flow through beautiful valleys. The western part of the State is more level, the depressions more gradual, and timber less abundant. - The extreme western portion forms part of a sterile belt running from the 47th parallel to New Mexico. The State is drained by a number of large rivers, affluents of the Missouri. No mountains, swamps, or marshes, have been discovered. The timber consists of cottonwood, sycamore, oak, ash, hickory, walnut, hackberry, sugar maple, sumac, and willow. The growth of timber is probably adequate to home demand, but not sufficiently abundant to form the basis of an export lumber trade.

The population in 1860 was 107,206. At the time of the previous decennial census the whole State was a wilderness, with a few scattering white settlements. The present population is estimated at three hundred thousand to four hundred thousand. The general features of the country are of a character to attract large immigration.

The soil of the eastern part is excellent, there being two classes of land, the first embracing the alluvions of the river and the strips of timber. Of this class there are at least 10,000,000 acres in the State, or fully five times the amount of improved land. For the production of the heavier kinds of cereals this land is surpassed in richness by none of the neighboring States. For wheat and other small grains, the second-class lands, embracing the upland or rolling prairies, are preferred. These are covered by a soil averaging from two to three feet in depth, with a sub-soil of fertilizing qualities sufficient to furnish inexhaustible fertility if skilfully managed.

The scarcity of building timber is amply compensated by the general distribution of rocks admirable for the construction of dwellings and fences. Water-courses are well distributed. Unfailing springs of pure cold water are very abundant, and wells, furnishing copious supply, need not be sunk over twenty to forty feet.

Facts collected from old settlers show that the soil of Kansas has a remarkable power of compensating the absence of rain by its subterranean stores of moisture. The records of meteorological observations at military posts indicate that the average precipitation of rain during the months of June, July, and August is about one-fourth of an inch in favor of Kansas as compared with the neighboring States.

The climate of the State is temperate and healthful. Its locality, half-way up the slope of the eastern Cordilleras, gives it the advantage of the higher strata of the atmosphere, with more general circulation. The equability of temperature is especially favorable to stock-raising.

The statistics of 1860 show remarkable aggregates of different kinds of live



stock. From a report of the surveyor general it is seen that horses have increased in number in seven years, since the last decennial census, from 18,882 to 150,000; mules from 1,430 to 10,000; cattle of all kinds from 87,000 to 1,000,000, and sheep from 15,000 to 100,000. The total value of live stock has advanced from \$3,205,522 to \$40,300,000. The aggregate of animal products, cereals, and potatoes shows like expansion. The fruit and garden crops lately raised have developed a capacity in the soil and climate for such production.

The mineral deposits of Kansas are as yet imperfectly known; but sufficient has been developed incidentally to warrant the belief that the State has a liberal endowment of the useful minerals. The coal measures of the eastern portion are supposed to cover an extensive region. The upper stratum crops out in the eastern and middle counties. In Leavenworth, Osage, and Bourbon counties, in which alone the veins have been worked to any extent, the supply seems abundant and the quality superior. The surveyor general is of opinion from late surveys that the coal veins to the westward will be found of increasing abundance. West of this out-cropping of the coal strata is an irregular belt, from fifty to seventy-five miles wide, of permian rocks, in which are found salt springs, inexhaustible beds of gypsum, and inferior iron ore; platinum has also been discovered. Sand rock and lime rock crop out all over the State. Fine magnesian limestone of beautiful color has been quarried on the Kansas river near Fort Riley, and is now used in erecting public buildings.

The progress of public land surveys develops an increased number of salt springs, highly impregnated with this very necessary mineral. The most extensive salines are in the extreme southwest, which will ultimately supply millions of bushels.

The manufactures of 1860 are represented by 344 establishments, with a capital of \$1,084,935, working up raw materials to the value of \$1,444,975, and paying for labor \$880,346. The year's product was \$4,357,408, leaving a profit of \$2,032,087, or 187 per cent. on the capital. In the seven years since 1860 this industrial interest has increased rapidly. The trade of the State is advancing with other great interests. The internal navigation is not so extensive as that of the neighboring States; hence railroad enterprise is stimulated by the necessities of trade. One branch of the great continental railroad route, with its connections, passes through the entire length of the State. This branch will, by the 1st of January, 1868, have completed three hundred and sixty-one miles. Over five hundred miles of road are now in full operation, with a large number of routes of commanding commercial facilities and importance, and are pushed with great energy and skill.

Leavenworth, the largest city, is situated on the right bank of the Missouri, about a mile below Fort Leavenworth. It is surrounded by a fine agricultural country, well watered, and furnished with excellent building materials. Its churches, schools, literary publications, manufacturing and commercial institutions are on a scale to meet the wants of a large and intelligent population, which is now 30,000 or 40,000.

Lawrence is a beautiful, thriving town in Douglas county, on the Kansas river, 45 miles from its mouth. Population, 12,000.

Atchison with a population of 10,000, Fort Scott of 3,000, and Topeka of 4,000, are promising towns. The latter, now the capital of the State, is well located on the right bank of the Kansas, 25 miles above Lawrence.

There are yet to be disposed of in the State about 43,140,000 acres of public land.

In the fiscal year surveying arrangements were made by the surveyor general to the extent of the appropriations. The returns of work amount in that period to 237 miles of standard lines, 1,207 of townships, and 2,946 miles of section lines, comprising 49 townships, embracing 1,127,695 acres. These added to



former surveys in Kansas make a total of 20,510,443 acres in that State over which the lines of public surveys have been extended.

The field operations during the last season have been interrupted by the Indians. The surveyors whose sphere of operations was on the Smoky Hill, the Saline fork of the Kansas river, the meridian of Fort Kearney and Fort Zarah, were attacked, one of the surveying party killed, and the others dispersed with loss in outfit and provisions. Upon reorganizing, the deputies, with fresh assistants and supplies, started again with commendable energy for the field to complete the service which had been undertaken.

Besides the surveys referred to, which were executed under the superintendence of the surveyor general of Kansas, others were in progress in that State under the direct control of the Commissioner of the General Land Office, in conformity with the treaty of July 19, 1866, with the Cherokees, of that of 29th September, 1865, with the Great and Little Osages, whereby these Indians partly sold and ceded in trust to the United States the lands situated in the southern part of the State, extending from the western boundary of Missouri to the 100th degree of longitude west from Greenwich.

An award of contracts was made by the department proper to different surveyors for the extension of those lines at an estimated cost of \$82,000, payable out of the appropriation of \$50,000 by the act of July 28, 1866, "for surveying Indian and other reservations under treaty stipulations," and in part out of the proceeds to be realized from the sale of those lands.

The returns of survey of the Cherokee neutral and Osage tracts have been made to the extent of 2,895,966 acres, the field operations having been during the last year only as far west as the Arkansas river. The soil is represented to be of the first rate, being extremely productive; the lands having already attracted numerous settlers, who are awaiting the completion of arrangements now in progress for the disposal of the premises.

Those arrangements require the appraisalment in the field, as ordered by the department, of the Cherokee neutral lands. When approved by the Secretary of the Interior, after due advertisement, the lands will be sold in accordance with the terms of the treaty. In regard to the Osage lands, plats of the surveys are in progress of duplication for the local land officers, to enable them to make sales after the President's proclamation.

In the survey of the Cherokee neutral, and those of the Great and Little Osage reservations, the fact has been discovered that a strip exists, lying between those lands and the southern boundary of the State of Kansas, on the 37th parallel of north latitude, as determined and surveyed in 1857 under the direction of the War Department. The strip is found to extend over two miles from north to south. That part of it stretching west from the State line of Missouri to the intersection of the Neosho river, lying between the Cherokee neutral lands on the north and Quapaw lands on the south, is found to be public lands; that portion west of the Neosho, and running due west to the 100th meridian, is ascertained to belong to the Cherokee nation, and which, under the provision of the 17th article of the treaty of July 19, 1866, was apparently intended to have been ceded by the Indians in trust to be surveyed and sold in their behalf.

It has not, however, been surveyed, because of the evident incongruity in the treaty, which refers to the 4th article of the treaty of December 29, 1835, that article treating of other lands than the strip in question. This being the case, it is the opinion of this office that, before the survey of the strip which is included in the patent issued to the Cherokee nation under the treaty of 1835 can be made, it will require a supplemental agreement on the part of the Cherokee nation, explanatory of the intent and meaning of the 17th article of the treaty of 1866, to the following effect, to wit:

The Cherokee nation hereby cedes in trust to the United States that strip of land ceded to the nation by the 2d article of the treaty of December 29, 1835,

and embraced in the patent of December 31, 1838, and now falling within the State of Kansas.

Under the appropriation of fifteen thousand dollars made by Congress, March 2, 1867, for surveys in Kansas, contracts have been made embracing the lands on the Smoky Hill, Saline, and Solomon forks of Kansas river, which are required to be surveyed into legal subdivisions in order to enable the Pacific Railroad Company to make selections under the grant of Congress.

As the progress of the railway is very rapid in the construction of the Smoky Hill route, additional surveys are requisite, and hence an estimate is submitted of \$40,000 for the extension of public surveys in Kansas during the next fiscal year.

COLORADO TERRITORY is an auriferous region, traversed by ranges of the Rocky mountains spreading out and enclosing beautiful table lands called Parks, elevated several thousand feet above the sea. The San Luis Park, in the southern portion, is an immense elliptical bowl, the bed of a primeval sea, elevated by volcanic agency. Its bottom, seemingly smooth as water surface, embraces an area of 9,400 square miles. It is watered by thirty-five mountain streams, descending from an encircling rim of snow-capped peaks and ridges, exhibiting a remarkable symmetry of configuration. The scenery, everywhere sublime, presents the ever varying phases of the kaleidoscope; successive escarpments of terraced hills terminate in an amphitheatre of mountains enclosing an area of 18,000 square miles. Upon their rugged sides the point of cessation of all arborescence is clearly distinguishable, above which the naked granite and snow mark the reign of perpetual winter. The atmosphere is perfectly pure, transmitting the wondrous beauty and variety of the scenery, and the vivid and gorgeous colorings of the sky, iris-like, playing in interchanging lights and shades as varied and copious as the altering angles of the solar rays. There is scarce any spring or autumn, the year being divided between a winter and a summer, both characterized by mildness of temperature and narrow range of barometric and thermometric oscillation. The clouds, incessantly formed upon the crest of the sierras, rarely interrupt the genial sunshine, but refract the rays, clothing the canopy with a silver sheen intense and enchanting. They, however, serve to irrigate the flanks of the mountains, and call into being those immense forests of pine, fir, spruce, hemlock, aspen, oak, and cedar which protect the sources of springs and running streams. These alternate with mountain meadows, covered with luxuriant and nutritious grasses. The depressed elevation of the interior surface of the Park condenses these clouds sufficiently for the growth of grasses, which furnish pasturage the year round, but not enough for the growth of trees. This elevated region, with pure atmosphere, is eminently salubrious.

The San Luis Park forms a sort of geological cabinet. From the primary rocks, outcropping at the mural summits, to the sedimentary drift, "covered with soil and varnished with vegetation," around San Luis lake, all the elements of the geologic series seem to be represented. The crevices of the secondary rocks on the mountain sides are charged with richest ores, the source of the golden detritus found in the gulches below.

These deposits become diluted and impoverished as the geologic series ascends and as the slope of the mountain descends. The descending terraces present a fauna and a flora increasing in richness and variety; cereals, flax, vegetables, and fruits flourish upon the plain; sheep and cattle attain superior development upon the hills of luxuriant grass. The products of the dairy, the orchard, and the garden give promise of value yet to be realized by a systematic industry. Beneath the soil is a subsoil of peat which not only moistens the surface, but stores an exhaustless supply of fuel in the very improbable exigency of a final destruction of the magnificent mountain forests. The middle region of the plain forms a crater of twenty miles diameter, enclosed by an almost circular wall or

"barranca" five hundred feet high, composed of lava, pumices, calcined lime, metamorphosed sandstone, vitrified rocks, and obsidian. This barranca is perforated by the rivers Rio Del Norte, Culebra, and Costilla; corrosive forces have also, in places, broken it into hills. The bottom of the crater is filled with soils, resulting from the abrasion and disintegration of the various strata, brought down by the streams and bevelled to a perfect level. It is of matchless fertility and thoroughly drained by underlying porous formations. Access to the Park is facilitated by natural passes through the mountain rim. Northward are three other Parks, named in their ascending order South Park, Middle Park, and North Park; they are smaller in size and less variegated in beautiful and sublime scenery, yet not unworthy of association with San Luis Park. The remaining portion of Colorado may be briefly described as mountainous, with occasional reproductions of the peculiar features above described. The elements of an agricultural character are as yet variously reported, but unquestioned facts represent enormous yields of cereals from imperfect agricultural enterprise. Sixty bushels of wheat to the acre is a crop well attested in several localities. The mineral wealth of the country is enormous; the yield of gold in 1862 was reported at \$12,000,000. Silver has been mined on Snake river which produces \$600 per ton. Large tracts of bituminous coal are also reported. The population in 1860 was 34,277; in 1863 it was 80,000; the present population is a matter of conflicting estimates. It is probably near 100,000. The immigration is rapid. The completion of the Pacific railroad will soon enable it to reach a still higher aggregate. Denver City, Central City, Colorado City, and Nevada City are the principal towns. The public lands undisposed of in Colorado are over sixty-two million eight hundred and fifty thousand acres.

During the last fiscal year the field operations in Colorado embraced one million three hundred and ten thousand one hundred and fifteen acres, which, added to the lines previously extended, make a surveyed surface of two million eight hundred and forty-four thousand eight hundred and fifty-seven acres actually surveyed.

These surveyed lands are on the eastern slope of the Rocky mountains, north of the Arkansas river, extending eastward to the headwaters of Terrapin, Kiowa, Bijoux, Beaver, and Big Sandy creeks, and in the valleys of the Platte and Arkansas, of which these creeks are tributaries. The surveys are wholly of agricultural territory, the extent unsurveyed in Colorado being estimated by the surveyor general at seven millions of acres, lying both east and west of the Rocky mountains.

Under the appropriation for the service during the fiscal year ending June 30, 1868, contracts have been closed for the extension of the first correction line north of the base, and the second correction line south across the summit of the mountains; also for the running of the ninth guide meridian, west of the sixth principal in Kansas and Nebraska. As these standards reach the South, Middle, and North Parks of the Rocky mountains, the township and subdivisional surveys will be run not only in the agricultural regions, but in those containing rich minerals.

The ninth guide meridian will pass through the Gilpin and Clear Creek mineral district as established by the surveyor general, looking to an early survey of mineral premises under the act of Congress of July 26, 1866. Besides these standard lines, measures have been taken for surveying the townships immediately north of the base line, between the seventh and eighth guide meridians, and north of the second correction line, to the northern boundary of Colorado, in the region included between the eighth and ninth guide meridians.

The two branches of the Pacific railroad have already advanced along the Platte and the Smoky Hill fork of the Kansas, the Omaha line to within one hundred and eighty miles of Denver City; the Union Pacific, eastern division,



to within three hundred miles of that city. As they are being rapidly advanced, with diminishing obstacles, the surveyor general, anticipating their completion by the end of the present fiscal year, suggests the necessity for extensive surveys of lands falling within the congressional grant in order to fulfil the requirements of the concession to the railroad companies, and submits an enlarged estimate for the next fiscal year, which, looking also to the public exigencies in other surveying districts, has been reduced to \$40,000 for field-work.

The surveyor general, for reasons stated by him, suggests the survey of timbered lands in the mountains, and urges the necessity for the survey of the northern and eastern boundaries of the Territory, in order to separate its jurisdiction from that of Kansas, Nebraska, and Dakota, and because the public surveys in Kansas and Nebraska have nearly reached the eastern limits of Colorado; and for the reason, also, that the construction of the Union Pacific railroad has progressed for a considerable distance along its northern boundary, requiring selections of public lands from different States and Territories to be transferred by legal subdivisions under congressional concessions. It is important that the several jurisdictions should be astronomically determined by surveys in the field. Satisfied that the time for the demarcation of these boundaries has arrived, the requisite estimates are submitted for the establishment of the same during the next fiscal year.

The mineral resources, particularly of gold and silver, are described by the surveyor general as very rich, and although the miners have not as yet fully recovered from the effects of the late depression consequent upon reckless speculations and experimental trials of machinery, yet the conviction is prevalent among them that when the mineral wealth shall have been developed, the results will show Colorado to be in this respect second to no other region. Discoveries of coal in large quantities have been made along the base of the mountains, with indications that to the east there is an extensive underlying basin. Nor have agricultural pursuits been neglected during the last year, but, on the contrary, the labors of the husbandman have been crowned with abundant crops of wheat, oats, barley, corn, and potatoes, the supplies being quite equal to home consumption.

UTAH TERRITORY, forming part of the surveying district of Colorado, is without an organization for the disposal of the public lands, no land district having as yet been authorized. No surveys, therefore, have been prosecuted in Utah during the last year, except the subdivision of the vacated Indian reservations of Deep creek and Corn creek into forty-acre tracts, as required by the provisions of an act of Congress of May 5, 1864, for vacating and selling the present Indian reservations therein. The returns of these surveys show the area embraced within those reservations to be ninety-two thousand six hundred and seventy-three acres, which with the former surveys of similar lands, as also of the public domain, exhibits an aggregate of surveyed lands in Utah of two million five hundred and seventeen thousand nine hundred and twelve acres.

In the absence of an effective system for the general disposal of the public and mineral lands, evidences of surveys heretofore made in that Territory are fast being destroyed and obliterated by time and accident. In this view the surveyor general submits an estimate for that kind of work during the next fiscal year, looking also to the extension of the lines to mineral localities, discoveries of rich veins of argentiferous galena and silver having already attracted numerous miners, who, it is reported, are building towns. When it shall be the policy of Congress to order the organization of a land district, and put in motion the surveying machinery, an appropriation of \$5,000 will be necessary, and looking to such an event an estimate is submitted. The public land undisposed of in this Territory amounts to fifty-one million one hundred and thirty-nine thousand acres.

NEW MEXICO was acquired from the republic of Mexico, it having been for ages occupied with the institutions of Spanish civilization. The average length from north to south is 352 miles, and average breadth 332, with an area of 121,201 square miles, or 77,568,640 acres.

East of the Sierra Madre the general aspect of the country is mountainous, with the exception of the longitudinal valley of the Rio Grande, about twenty miles wide. The mountain ranges vary from 6,000 to 12,000 feet in altitude, and are composed of igneous rocks. The interior forms a varied country, well wooded and of generally good agricultural character. The soil of the valley of New Mexico, though to superficial observation not promising, is rich in elements of fertility which a judicious irrigation easily develops. The most fertile part of this valley is below Sante Fé, and is called Rio Abajo, or country down the river. It is not uncommon here to raise two crops a year. The table lands are admirable for grazing, producing a sort of grass which is naturally cured by the operation of the climate. The latter is, on the whole, very equable and salubrious. The mutton raised in New Mexico is renowned for its excellence. The production of cereals, potatoes, and other articles of food for man and beast is very large for the amount employed in agriculture. The harder kinds of wood are very scarce. Cottonwood, however, is found in considerable quantities on the banks of the streams.

The scenery of New Mexico presents many sublime and picturesque landscape views. The mountains abound in high precipices and cataracts. A cañon is described as extending up the Virgen river for 300 miles, the lofty, precipitous sides of which suggest the idea that the river has cleft its way through the mountain. The waters wash clear up to the sides, leaving no intervening beach.

The population in 1860 was 93,516. A decided improvement is shown by the agricultural statistics of that year. A large trade has been carried on hitherto with the western States in caravans, which will soon be superseded by modern improvements in transportation. The quantity of lands yet to be disposed of in New Mexico is equal to about seventy-three millions of acres.

The progress of surveys in New Mexico during the last fiscal year consisted of the extension south of the second correction line, starting from San Andre's mountain, thirty miles east of the Rio Grande del Norte, passing a few miles south of Fort Stanton, the valleys Ruidoso, Bonito, and Rio Hondo rivers to the intersection of the Pecos; also in the establishment of the third correction line south, and in running township lines embracing Tulerosa town.

Surveys have also been executed on the upper waters of the Rio Mimbres, in the region surrounded by Fort Thorn, Fort Cummings, Fort West, and Fort Bayard, embracing Pinos Altos, Santa Rita copper mines, and Mowry City, this locality having been reached by extending the fourth correction line south, west of Rio del Norte; subdivisional surveys having been prevented by Indian incursions.

Returns have been made of the survey of San Pedro and Cañon del Agua, Mexican grants, embracing over thirty-nine thousand four hundred acres.

The surveyor general recommends the segregation of the Apache and Navajo Indian reservation of forty miles square on Pecos river, including Bosque Redondo and Fort Sumner, in order to prevent conflict between the white settlers on the Pecos and the Indians concentrated on the reservation, and under military supervision.

As the reservation is upon unsurveyed territory and no appropriation available, it remains unsegregated.

The surveying department further suggests, which is recommended, that the tract selected by the agent of the Gila Apaches on the Gila as a home reservation be opened to settlement, the Indians evincing no desire to settle there, and having for the last six years been at war with the whites. The Pueblo civilized Indians of Santa Aña desire their grant confirmed, the boundaries surveyed and

established, to prevent controversies—a measure of justice requiring the sanction of law.

By the 8th section of the act of 22d July, 1854, Statutes, vol. 10, page 309, authority is given for submitting to the surveyor general for report to the department and submission to Congress all Spanish and Mexican titles claimed as valid under the treaty of 1848 at Guadalupe Hidalgo between the United States and Mexico, but there is no provision under which official cognizance is required to be taken of any foreign titles falling within the limits of what is known as the Gadsden purchase by treaty of 1853, concluded at the city of Mexico. It is of the first importance that all such titles in New Mexico and Arizona shall be speedily and definitely adjudicated. To this end it is recommended that authority of law be given for initiating processes to obtain confirmation by petition to the courts, that the time for filing and prosecuting to final decree shall be specified.

If, however, it should be preferred to settle such claims otherwise, it is recommended that the provisions of the act of 22d July, 1854, shall be so enlarged as to include titles under treaty of 1853; that a period shall be fixed within which the evidence of all such shall be filed in the office of the surveyor general at Santa Fé, barring in law and equity all not filed within the period of limitation, making it the duty of the surveyor general to render his decisions not only as to the validity of claims, but the limits and area thereof; requiring those decisions to be immediately reported to the General Land Office; and investing a board, consisting of the Secretary of the Interior, Attorney General, and Commissioner of the General Land Office, with power to enter final decree of confirmation or rejection, yet restricting the extent as to area in which decree of confirmation shall be rendered by the board, and requiring all in excess of that extent to be referred for final action to Congress.

Numerous discoveries of gold and silver lodes have been made since last report, intermingled with copper, almost a universal accompaniment of the precious metals. Lead, iron, and coal are common throughout the Territory, and zinc, antimony, kaolin, and other minerals are found, but no applications for survey have yet been made to the surveyor general for the survey of mineral claims in New Mexico, under the act approved July 26, 1866, and the instructions therewith connected.

Since the organization of the surveying district in 1854 for New Mexico two million three hundred and thirty-two thousand five hundred and fifty-five acres of public lands have been surveyed and prepared for market, but never offered for sale, owing to the unsettled condition of the country, while confirmed private claims have been surveyed equal to over two million two hundred and ninety thousand acres.

ARIZONA TERRITORY, one of the extreme southwestern political divisions of the United States, forms part of the basin of the Colorado. Its surface consists of elevated table lands, broken by mountain ranges and interspersed with fertile valleys and sandy wastes. Its northern and northeastern portions are comparatively unexplored and mostly in the occupancy of Indians. South of the Gila and west of the 112th meridian the country is sandy, supposed not generally arable, except along that river. In other portions there are many beautiful valleys, containing millions of acres of extraordinary fertility, producing wheat, barley, oats, tobacco, fruits, and vegetables. In the south cotton and sugar crops are remunerative, and on the hills and mountain sides is found a rich and abundant pasturage. Indeed, here are some of the finest grazing lands in the Union.

The river system of Arizona presents points of great interest. The Colorado, with its affluents, the Gila, Bill Williams fork, and Flat river, or Colorado Chiquito, drains an extensive region south of the Great Salt Lake basin, and west



of the Sierra Madre. These various streams with their affluents head up among mountains covered with valuable timber. At the head of Bill Williams fork is the "Black Forest," but little, if at all, inferior to the "Schwarzwald" of Baden, separating the basins of the Rhine and the Neckar. Pine and cedar forests of indefinite extent cover the Mogollon and Pinaleno mountains, and valuable timber is found at the heads of the Rio Verde, Salado, and Gila. The mesquite furnishes good fuel in all parts of the Territory. In the valleys the larch, ash, elm, walnut, oak, and sycamore are found in copious supply, and exceedingly valuable for farming purposes.

The Colorado on the American continent will probably serve the historic purpose of the Nile in Egypt. It is subject to annual overflow from the melting of the snows on the mountain ranges flanking its valley to the height of several thousand feet above the ordinary level of the country. Thus the valleys of this river and its affluents are thoroughly fertilized. A system of artificial irrigation may be made to utilize these surplus waters, thus rescuing millions of acres from hopeless barrenness, and making them the scene of productive agricultural industry. By a system of irrigating canals the water may easily be conducted to immense tracts unvisited by its annual overflow.

The celebrated Colorado desert, bordering this river on both sides for one hundred and fifty miles, is below its bed, and possesses a soil composed of alluvial earths, marl, and shells, needing only the stimulation of moisture to awaken its fertility. Other tracts along the course of the river are susceptible of the same improvement. The system of irrigation, which once transformed the barren valley of the Nile into the granary of the east, supporting a population of twenty millions besides exporting corn to all the surrounding nations, applied to the Colorado will fertilize a wider expanse of country than that reached by the waters of the Nile, with a finer climate and soil of equal productiveness.

The Colorado valley was an early seat of Spanish civilization and missionary enterprise. The Santa Cruz and its tributaries teemed with an agricultural and mining population early in the eighteenth century, and flourishing settlements existed in the valleys of the Gila, the Rio Verde, and the Salinas. The relics of this busy industry are still seen in the ruins of cities, cathedrals, and farms, scattered up and down the Colorado and its branches. The remains of irrigating canals show the extensive and elaborate scale on which Spanish agriculture was then prosecuted. But priest and layman alike fell beneath the tomahawk of the Apaches or were expelled by the jealousy of the revolutionary government of Mexico. The Yuma and Mohave Indians, taking advantage of the annual overflows of the river, secure with little labor and a very rude husbandry crops sufficient for their sustenance. The river has been navigated as high up as Callville by light-draught boats, and is believed to be navigable at least six hundred miles above that point. The San Pedro and Santa Cruz flow from the southeastern part of the Territory into the Gila, the former through a rich valley one hundred miles in length, expanding in places to a width of many miles. Its tributary valleys are of nearly equal extent. A beautiful, fertile, and well-wooded region lies at its junction with the Arrowapa, extending to the Gila. Ruins of haciendas and ranches show an abortive attempt to introduce the institutions of civilization into these wilds. One of the finest portions of the Territory is the country bordering on the Santa Cruz. Its valley, wider than the San Pedro, is equally rich and well timbered. Both these valleys are supplied with running waters, nutritious gama and mesquite grasses green and growing at all seasons. The Santa Cruz region was occupied by Jesuit missionaries as early as the year 1600, the ruins of whose establishments are still seen. The ever present remains of irrigating canals show scientific and systematic agriculture once flourishing in these valleys, but subsequently perishing, either by savage invasion or revolutionary violence. Such churches as that of San Xavier del Bac attest, even in their dilapidation, the wealth, refinement, and

religious public spirit of the generation which has passed away. The Spanish settlements are either deserted or reduced in numbers and wealth.

American settlements are being formed, introducing a higher and more energetic tone of social life, and overpowering the feeble efforts of the Mexicans to occupy these inviting regions.

The depredations of the Apaches have restrained the settlement of large portions of this Territory and of New Mexico, regions possessing a delightful climate and containing large tracts of the finest arable and grazing land. The climate of the entire Territory, excepting the lower Gila and Colorado, is represented as delightful, exempt from extreme heat, with nights of refreshing coolness. Snow rarely falls; fruit trees bloom in February and March; cotton, corn, wheat, tobacco, melons, with a great variety of temperate and semi-tropical fruits, are raised in abundance.

The settlements in the southern part and along the Colorado are numerous. On account of Indian hostilities it is found safe to occupy the country only in colonies for mutual protection. The mineral resources of the Territory and the small part occupied for agricultural purposes must render farming a very profitable pursuit, with an increasing home demand.

The lands are yet unsurveyed; but where settlements in good faith are made upon those belonging to the government, accompanied by residence and cultivation, the settlers will be protected in their rights and permitted, after survey, to complete their pre-emption and homestead entries.

The surveyor general estimates the quantity of irrigable land at one million acres. An extension of the system of irrigation by the formation of reservoirs in the mountains will doubtless very much enlarge this aggregate. It is thought that five million acres is a very moderate estimate.

The grazing lands are about three-fourths of the entire area, or fifty-five millions of acres.

A large quantity of land in the Territory may be made productive without irrigation, especially the lands occupied by the Pimos Indians, who being instructed in agriculture by the Jesuit fathers, have continued ever since to gather two crops per annum. The rainy season generally lasts from June to December. Rain also falls in January.

Irrigated lands in Arizona may be safely estimated as of double the productiveness of the unirrigated in the Atlantic States.

The timber, though not so abundant as in Oregon or California, is nevertheless adequate to home demand. In some places forests of heavy timber cover extensive areas. The United States have in this Territory 72,906,304 acres of public land.

While this country was under the jurisdiction of the surveyor general at Santa Fé, measures were adopted for the survey of the base, meridian, and standard parallels, but while in progress the work was interrupted by the hostility of the Indians. The surveyors, however, succeeded in establishing the Gila and Salt river principal meridian, which was extended north from the intersection with the principal base at the mouth of Salt river for a distance of twenty-four miles; from that termination the first standard parallel north was extended forty-two miles east, and a like distance west, the base having been run and marked to the extent of thirty-six miles east of the intersection. The initial point of surveys in Arizona is a conical hill one hundred and fifty feet in height, upon the pinnacle of which the Mexican boundary commission in 1851 established a corner to mark the mouth of Salt river, it being on the  $33^{\circ} 22' 57''$  of north latitude, and  $112^{\circ} 15' 46''$  of west longitude from Greenwich.

By the 4th section of the act of March 2, 1867, Arizona, which had formed part of the New Mexico surveying district, was attached to that of California, all the original archives relating to the Arizona service having been transferred by the surveyor general at Santa Fé to the surveyor general of California at San Francisco. The Indian difficulties in Arizona prevailing to considerable

extent, rendered it hazardous for surveyors to continue in the field; consequently neither township nor subdivisional surveys have been executed. The distance of the Arizona field of operations from San Francisco rendering it difficult to obtain experienced and trustworthy deputies to enter into contracts for surveys in this Territory at the maximum rates allowed by law, it is not expected that public lands will be surveyed there during the present season.

CALIFORNIA extends along the Pacific coast seven hundred and fifty miles, with an average breadth of two hundred and thirty. Its area is 188,981 square miles, or 120,947,840 acres, of which not less than eighty-nine millions, including swamp and tule lands capable of reclamation, are suited to some kinds of profitable husbandry. Of these over forty millions are fit for the plough, and the remainder present excellent facilities for stock-raising, fruit-growing, and all the other branches of agriculture. This agricultural area exceeds that of Great Britain and Ireland, or the entire peninsula of Italy. The State also contains about forty millions of acres of mineral land, unsurpassed for productiveness.

About thirty millions of acres have been surveyed, leaving a residue unsurveyed of ninety millions. Nearly nine millions have been granted to the State by the general government, under various acts of Congress, for common schools, agricultural colleges, public buildings, and internal improvements.

Of the forty million acres of arable land, fourteen millions are found in the basin of the Sacramento and San Joaquin rivers, sixteen millions in the coast valleys, and the residue in the region called the "Colorado desert," in Owen's River valley and the Klamath basin. When irrigation is practiced on an extensive scale, as it must be within a few years, and the valley of the Colorado is brought under its influence, much of what is now characterized as "desert" will become productive and valuable. The land not fit for the plough, but valuable for grazing and in a measure for horticultural purposes, especially the grape culture, is to be found on the foot-hills and slopes of the Sierra Nevada and Coast Range mountains.

The soil and climate of California are eminently adapted to the growth of wheat, barley, oats, potatoes, hops, tobacco, hay, and sorghum; in certain localities to corn, cotton, the southern sugar cane; to almost every variety of garden vegetables cultivated east of the Rocky mountains; to the apple, peach, pear, plum, cherry, apricot, nectarine, quince, fig, and grape, and along the southern coast to the orange, lemon, citron, olive, pomegranate, aloe, filbert, walnut, hard and soft-shell almond, currants, prunes, pineapples, and the plantain, banana, cocoanut, and indigo. Strawberries, raspberries, gooseberries, blackberries, figs, grapes, and the hardier fruits, as the apple, peach, and pear, succeed well in every portion of the State. There are very few parts of the world where fruit trees grow so rapidly, bear so early, so regularly, so abundantly, and produce fruit of such size, and where so great a variety can be produced, and of such superior quality, as on the southern coast of California.

Fruit trees in that State are generally as large after two years' growth as on the Atlantic coast in three and four. At Petaluma a cherry tree two years old after being grafted, and three from the seed, had a trunk seven inches and three quarters round; a plum tree three years from the seed was eleven feet high, with a circumference of seven inches; a peach tree one year from the bud was eight feet high, with a circumference of eight and a half inches; and an almond tree planted in January, 1855, being cut down to within a few inches of the earth, in three years had grown to be a tree twenty feet high, with branches starting from the surface of the earth, and a trunk twenty-four inches in circumference. The pear is more specially the fruit tree of California. It thrives in all parts of the State; neither tree nor fruit is subject to any form of disease, the fruit being everywhere of delicious flavor and of large size. There are trees now standing each of which produces annually forty bushels of pears.

The varied climate on the Pacific, its freedom from frosts, severe cold, and



furious storms, give it special advantages as a fruit-growing region, and although the trees grow more rapidly and bear much earlier than on the Atlantic, they are not subject to early decay. The fruit trees of the Missions, many of them thirty and forty years old, are still in excellent condition and full bearing, not having failed at any season during the past twenty years to produce good crops.

Experience has established the fact that the soil and climate of California are equal to any in the world in their adaptation to grape culture and the manufacture of wine. The yield of the grape has been larger, its freedom from disease greater, than in the most celebrated European vineyards. Three hundred varieties have been already successfully cultivated, including the choicest foreign wine-producing grapes; and so diversified is the soil and climate that all wines can be produced here, and even superior in quality to the imported.

The vine in California is not subject to the oidium, or grape disease, frequently so destructive in other countries, nor is it liable to mildew.

The vineyards of the State seldom or never yield less than one thousand pounds of grapes per acre, and even twenty thousand pounds have been produced. The crops are regular every year, and as there are neither severe frosts nor hail, rain, or thunder storms from the budding of the vines until the grape is gathered, they are not liable to the accidents and drawbacks attending them in other places. In Europe the vine is trained with a stock four feet high, and supported by a pole put up every year, to which the vine is fastened. In California it stands alone, the labor thus far being nothing compared with that bestowed upon the best European vineyards. The number of vines already set, all of which will be in full bearing in three years, is estimated at nearly thirty millions. In 1863 the total number planted in vineyards in the State was three and a half millions, showing an increase of 25,000,000 in four years. Hock, champagne, port, and claret constitute the varieties of wine already exported. No doubt is entertained that when the California wine-makers have had the necessary experience and their wines have attained sufficient age, they will take rank with the very best, and that its manufacture on the Pacific coast is destined to become of vast importance, while a series of vineyards, stretching from San Diego to Mount Shasta, will, within another quarter of a century, add not only beauty, but substantial wealth to the State. Among the fruits cultivated on the southern coast during the present year have been the orange, lemon, fig, lime, the English walnut, almond, olive, apricot, and nectarine, numbering in the aggregate between 400,000 and 500,000 trees, in a greater or less state of maturity. The cultivation of these and other fruits is rapidly extending in California, with marked success.

Another branch of industry progressing with satisfactory results is the cultivation of the mulberry and the silk-worm. The general absence of rain from May to November, and of explosive electricity, is said to be a climatic condition highly favorable to the raising of the silk-worm. Cocoons raised in this State and sent to France for examination have been pronounced of superior excellence, and, on measurement, found to exceed the European by from 50 to 100 yards of silk; consequently large orders have been received for silk-worm eggs from the French silk-growing establishments, where the worms, from various maladies, have deteriorated; only a limited number was sent from California to France, but the expectation that they would produce worms superior in health to the stock of the cocoeneries of Europe has been fully realized. As both the mulberry and the silk-worm are so thrifty, there is no reason to doubt that silk culture will succeed, and that it will become an important interest in the State.

Eight hundred thousand cocoons were brought into market in 1865, and six times that number in 1866. Two large silk factories have been established in the State, and silk of very excellent quality is being manufactured.

The cultivation of the Chinese tea plant has received attention, but we have no reliable information as to how far successfully, during the last few years.

The wheat product is large and constantly increasing. In favorable seasons 50 and 60 bushels to the acre is no unusual yield. The wheat of certain localities is especially rich in gluten, commanding, for its superior quality, the highest price in New York. It is also remarkable for its flintiness or dryness, being especially adapted for shipment to tropical countries, where the moister flour is soon subject to fermentation.

The climate of California is favorable to stock raising, and in many parts this is the leading branch of husbandry. Horses, mules, oxen, beef cattle, cows, and sheep are extensively raised.

Sheep husbandry is rapidly becoming an important interest. The mild winters permit the sheep to graze throughout the year, it being claimed that sheep bred in California are at two years of age usually as large and heavy as those three years old on the Atlantic coast. Improved breeds have been extensively imported. The slopes of the Coast Range and the Sierra Nevada form sheep walks hundreds of miles in extent, with abundance of excellent pasture throughout the year.

Woollen manufactures already take high rank, and much of the wool raised is manufactured within the State into cloths and blankets.

California has an abundance of timber of the finest varieties. The northern part of the coast is well covered with spruce, pine and red-wood, and the valleys have beautiful groves of oak. The western flank of the Sierra is a long, wide slope, timbered and grassy, with intervals of arable soil copiously watered by numerous streams. Its length is 500 miles, with a width of 70 from the summit to the termination of the foot-hills in the edge of the valleys of the Sacramento and San Joaquin.

This wide slope of gentle ascent is covered with timber, first with the oak, the manzanita, and nut pine to half the elevation of the mountain, which is called the oak region, that being the predominating tree; then there are the pines, cypresses, and cedars, the pines being the most numerous, and hence the upper benches of the mountain constitute the pine region.

In the valleys of the Sacramento and the San Joaquin, and on the Coast mountains south of  $35^{\circ}$  of latitude, the supply of timber is deficient. The red-wood is found only in California and southern Oregon, growing within 30 miles of the ocean from latitude  $37^{\circ}$  north to the mouth of the Umpqua river, in the State of Oregon. The wood is straight grained, free splitting, durable, soft, and light, being of rich dark red color. It is one of the most valuable of all varieties of timber. The trees grow in dense forests, often reaching in height 275 feet, with a diameter of from 18 to 19 feet. Many of these furnish 20 saw-logs to the tree, each ten feet long, and an acre of them will frequently make 1,000,000 feet of sawed lumber. The growth covers an area in the State of about 10,000 square miles. Its vitality is so great that the young shoots growing from the stumps of felled trees rapidly reproduce the forest, and as the soil can never be put to more profitable use, it should be devoted through all time to this remarkable growth.

The sugar pine, in the value of its timber and prolific growth, is next to the red-wood, sometimes even equalling it in length and diameter. The wood is similar to the white pine, and is the chief building material where it grows, in the Sierra Nevada. It takes its name from a sugar-like resin exuding from the tree and resembling the manna of drug stores. The western yellow pine, the nut pine, and coulter pine are valuable trees growing in the Sierra Nevada.

Of firs, the Douglass spruce, or red fir, is the most noted, often three hundred feet high, with a trunk ten feet in diameter. The wood is strong, but coarse and uneven in grain, the timber being used in ship-building. Many other firs and cedars are in the upper portions of that range.

The white oak is a characteristic tree of California, having much resemblance

to the oak of England. It grows to the height of 60 or 70 feet, throwing out large horizontal boughs within eight and ten feet of the earth. The trunk grows from six to ten feet in diameter, the width of the tree from the extremities of branches on opposite sides varying from 100 to 130 feet. Although a beautiful and majestic object to the sight, the tree is not valuable for timber.

Other trees, both deciduous and evergreen, abound in the forests, as the evergreen oak, the evergreen chestnut oak, the buckeye, and sycamore.

The most remarkable tree in California, and the largest in the world, is the *Sequoia gigantea*, or mammoth tree, growing with a clear, straight stem sometimes to the height of 400 feet, with a diameter from 30 to 40 feet in the largest specimens. It is found only on the western slope of the Sierra Nevada, in southern California, growing in scattered groves at various points through hundreds of miles. Fifteen or twenty groves are now known, one of which is in Calaveras county, three in Mariposa, one in Tuolumne, and one in Tulare. The three Mariposa groves are within two miles of each other, the largest containing 427 trees, covering a space about half a mile wide and three-quarters long; the second contains 86 trees, and the third 35.

In the largest grove there is one tree 34 feet in diameter and over 300 feet high, two trees 33 feet in diameter, thirteen between 25 and 33, thirty-six between 20 and 25, and eighty-two between 15 and 20 feet in diameter, making a total of 134 trees between 15 and 34 feet in diameter, of height ranging from 275 to nearly 400 feet.

The Calaveras grove was discovered in 1850; the Mariposa groves in 1855, prior to which we have no knowledge that these immense giants of the forest were ever known to white men. The Calaveras grove contains one tree three hundred and sixty feet in height, eight trees each over three hundred, and sixteen from two hundred and fifty to three hundred. Trees larger than any of these are said to exist in some of the more recently discovered groves.

In 1854 one of the largest trees, ninety-two feet in circumference and three hundred high, was cut down. Another, which appears to have been felled for some time, must have been four hundred and fifty feet high and forty feet in diameter.

The wood of this tree bears close resemblance to red cedar. It is soft, elastic, straight-grained, free splitting, and light when dry. It belongs to the family of conifers, and is of the same genus as the red-wood found on the Coast mountains, the timber being very durable.

These trees grow in a deep fertile soil, the trunks rising perpendicularly with little or no diminution of size for more than a hundred feet without a limb, and stand so close together that their uniting branches become a mingled mass of foliage.

By the act of Congress of June 30th, 1864, the land containing the "Big Tree grove," in Mariposa county, embracing an area of 2,589 acres, has been ceded to the State, to be held for all time as a place of public resort and recreation. The same act of Congress, upon like conditions and having similar objects in view, granted to the State the Yosemite valley, embracing 36,111 acres, celebrated as one of the curiosities of the globe. As seen from the wild and rugged summit of one of the western spurs of the Sierra Nevada, eight thousand feet above the level of the sea, its appearance is that of a great chasm or cleft in the mountain crest, having a depth of four thousand feet in vertical descent, enclosed between perpendicular walls of rock varying in height from three thousand to five thousand feet. Through the centre of this valley winds the Merced river, from sixty to seventy feet wide, entering the valley by a descent of 2,000 feet in the progress of two miles, and forming two falls of 639 and 475 feet, respectively, with intervening cascades and rapids. Standing in and over the valley are stupendous piles of massive purple-tinted granite, many thousand feet in perpendicular height, resembling the sculptured domes, columns, spires



and arches of some ancient architecture, or the ruins of temples and cathedrals of colossal dimensions.

The State of California, unequalled in the grandeur and extent of its marvellous beauty and unlimited resources, has been rapidly occupied by an appreciative, energetic, and industrious people.

The census of 1860 shows an increase of one hundred and fifty per cent. in ten years in the acreage enclosed in farms, while the value of farms and farm implements advanced at least fifteen fold. The live-stock enlarged in numbers at rates varying from four fold to two hundred fold, and in value twelve fold. Cereals, peas, beans, and potatoes expanded from thousands to millions of bushels. The same multiplied results are seen in the values of orchard and garden products.

The progress of Californian agriculture during this period, so extraordinary even in this age, has been measurably quickened since that time. As an illustration, the yield of wheat in 1860 was over five millions of bushels. Reliable estimates place the yield of the late harvest at twelve millions; of this aggregate four millions will be sufficient for home consumption, leaving eight millions for export.

The manufacturing industry of the State has increased at rates no less remarkable. The number of establishments in 1860 was 8,468, with a capital of \$22,051,096, using raw material valued at \$27,051,674, the cost of labor being \$28,402,287, and the product of the year's operations was valued at \$68,253,228, leaving a profit of \$12,799,267, or 58 per cent. on the capital invested.

No authoritative returns have been received showing the progress of manufactures since that time. Sufficient, however, has been gathered from various sources of public and private information to show that the advance in this branch of industry has been no less remarkable than the agricultural development.

The great and distinguishing feature of California is, however, unexampled mineral wealth. The first discoveries of gold were made in 1848, when \$10,000,000 were taken from the mines, increasing to \$40,000,000 in 1849, and upwards of \$65,000,000 in 1853.

No returns are made of the quantity taken from the mines, and the mint records are the only official data existing upon the product for any portion of the Pacific coast. Various estimates have been made by mining engineers, bankers, and other intelligent and practical business men in San Francisco and elsewhere in California as to the total product of that State since 1848. These estimates vary from eight hundred millions to one billion. From the commencement of 1849 to the close of 1866 upwards of seven hundred and eighty-five millions have been manifested at San Francisco for exportation, all of which, with the exception of sixty-five millions, appears to have been the product of California. How large a portion of gold found its way out of the State without being manifested for exportation is, of course, a matter of conjecture, different authorities estimating it from one hundred millions to three hundred millions. But either estimate is sufficient to furnish an idea of the immensity of the mineral wealth of the State.

Silver mines in the State are comparatively inconsiderable, yet quantities of that metal are annually obtained by separating it from gold, with which it is, in small portions, generally united when taken from the mines. The quicksilver mines of California are among the most valuable, and have since their discovery materially contributed to the prosperity of the mining interests, not only of California and the adjoining States, but also in Mexico and South America. All the useful metals, such as iron, lead, copper, tin, and zinc, exist in this region. Coal has been discovered in different localities, and marble, gypsum, and valuable building stones are abundant. Some of the rarer and more valuable minerals, as the agate, topaz, carnelian, and in unfrequent instances the diamond, have been found.

The foreign commerce of California has been immensely enlarged by the opening of direct trade with Asia. This oriental commerce has been stimulated by the establishment of a line of steam communication with China and Japan, the forerunner of an immense system of ocean navigation centring at San Francisco.

The surveys in this State during the year ending June 30, 1867, were generally restricted to the eastern and northern portions, embracing Long valley, Surprise valley, the region situated between Honey lake and Surprise valley, Sacramento valley, western slope of Sierra Nevada, the Big Meadows in the vicinity of the head waters of Susan river, and the north fork of Feather river.

The high roads leading from Red Bluff and Chico pass through these valleys in their course to the Territories of Idaho and Montana.

The returns of surveys reported by the surveyor general include one hundred and twelve townships and fractionals, embracing one million two hundred and fifty-six thousand nine hundred and twenty-seven acres, which, added to those previously surveyed, make an aggregate of twenty-eight million seven hundred and eleven thousand three hundred and twenty-seven acres of public lands surveyed since the year 1852, the beginning of the subdivisional surveys in California.

A portion of the surveys during last fiscal year embraced eleven foreign titles, of an aggregate area of about one hundred and sixty-two thousand eight hundred acres, at cost of claimants under the congressional enactments of June 2, 1862, and July 1, 1864.

The lines were also extended over the Aguas Nieves, otherwise called Hensley rancho, in Butte county, the title to which had been rejected by the Supreme Court of the United States, this procedure being required by the 7th section of the act of Congress approved July 23, 1866. (Statutes at Large, 1865 and 1866, p. 220.)

The surveyor general reports progress in the survey of the mineral lands in California under the act of Congress approved July 26, 1866, (United States Laws, 1865 and 1866, page 251,) and Commissioner's instructions dated January 14, 1867, nine mineral districts having been established, and deputy surveyors commissioned for most of them, embracing the following counties :

Mineral district No. 1. Del Norte, Klamath, and Humboldt.

Mineral district No. 2. Siskiyou, Shasta, and Trinity.

Mineral district No. 3. Plumas, Butte, and Sierra.

Mineral district No. 4. Yuba and Nevada.

Mineral district No. 5. Placer, El Dorado, and Sacramento.

Mineral district No. 6. Amador and Calaveras.

Mineral district No. 7. Alpine, Mono, and Inyo.

Mineral district No. 8. Tuolumne, Mariposa, Merced, Stanislaus, and Fresno.

Mineral district No. 9. Los Angeles, San Bernardino, San Diego, Kern, and Tulare.

The extent of field service accomplished during the last fiscal year in that State was four thousand five hundred lineal miles; there had previously been executed one hundred and seven thousand three hundred and sixty-nine miles of base, meridian, standard, traverse, meander, township, and section lines; an aggregate extent of one hundred and eleven thousand eight hundred and sixty lineal miles of actual surveys executed in California from the foundation of the system in that State to the 30th June, 1867.

Under the acts of Congress approved May 30 and June 2, 1862, authorizing surveys at the cost of applicants and owners, there has been deposited by individuals, and applied to that purpose during the last fiscal year, an aggregate of eighteen thousand and ninety dollars.

The surveyor general submits an estimate for the fiscal year ending June 30, 1869, of one hundred thousand dollars for surveys within the congressional grants to the Central Pacific and Western Pacific railroads, the former having

been already completed from Sacramento to Donner lake, within a few miles of the eastern boundary of California.

The estimate is intended also to cover the expenses of extending the lines of confirmed private titles, estimated at over three hundred, where surveys may not be applied for by the owners within ten months after the passage of the act of 23d July, 1866, quieting land titles in California. Those grants are principally in the southern part of the State, embracing lands well adapted for tillage, grazing, and the cultivation of tropical fruits and esculents.

The estimate of the surveying department, as reduced by this office to fifty thousand dollars, will apply to the surveys in the mineral districts to connect the mineral lines with the proper, regular township, range and legal subdivisions.

NEVADA was admitted into the Union October 31, 1864. Its area, according to the boundaries defined in its own constitution, is 81,539 square miles, or 52,184,960 acres. By an act of Congress approved May 5, 1866, provision was made for incorporating within its limits additional territory on its eastern and southeastern borders, and which now constitutes a part of the soil of the State, increasing its area to 112,090 square miles, equal to 71,737,741 acres, included within the following boundaries, to wit: commencing on the 42d parallel of north latitude at the intersection of the meridian of the 37th degree of longitude west from Washington; thence south on said meridian to the middle of the river Colorado of the West; thence down the middle of said river to the eastern boundary of the State of California; thence with the eastern boundary of California to the 42d parallel of latitude; thence east with said parallel to the place of beginning. The water surface of its numerous lakes may cover an area of 1,690 square miles, or 1,081,600 acres, leaving a land surface within the State of 110,400 square miles, equivalent to 70,656,141 acres, being more than twice the size of the State of Illinois, nearly four times the size of Indiana, and containing about one-fourth the area of the Persian empire, to which, in geological formation, it has sometimes been compared. About 1,000,000 acres of the public lands have been surveyed, and about 5,000,000 are held by the State under the various acts of Congress granting lands for internal improvements, schools, and roads.

Nevada constitutes a part of the great interior basin included between the Wasatch and Sierra Nevada mountains, and lies from 4,000 to 6,000 feet above the level of the sea, everywhere traversed by longitudinal mountain ranges, rising from 2,000 to 8,000 feet above the adjacent country, with intervening valleys and plains, the waters of which are absorbed in saline lakes or swallowed up by the earth, its rivers and lakes finding no outlet to the sea, except in the southeast corner bordering on the Colorado river.

The eastern part of the State is intersected by the East Humboldt, the Silver, the Mammoth, and Augusta ranges of mountains, and contains Pyramid, Winnemucca, Tahoe, Washoe, Humboldt, Carson, Walker, and Fish lakes. It is watered by the Truckee, the Carson, the Walker, Humboldt, King's and Quinn's rivers and their tributaries.

In the central part of the State are the New Pass, Shoshone, Tai-ya-he, Simpson Park and Lough mountains, the Humboldt and Reese rivers, and a few tributary streams.

The East Humboldt, Ah-Young Spring, Shonicodit, and Diamond Spring mountains intersect the eastern portion of the State, where Pahrnagat, Preuss, Goshoot, and Franklin lakes are found, with the Humboldt river in the north and the Colorado in the south.

The Humboldt river rises in the western slope of the East Humboldt mountains, and runs in a westerly course about 350 miles, emptying into Humboldt lake.

The climate of Nevada, considering the general elevation of the country above



the sea level, is mild, not being subject to great extremes of either heat or cold. The days of summer are not warmer than on the east side of the Rocky mountains, while the nights are uniformly cool and refreshing. The winters in the valleys are less severe than in northern New York or New England, and but little snow falls except on the mountain ranges. As in all elevated mountain countries, the temperature is subject to sudden transitions on account of the changing currents of the wind, but the atmosphere is at all times remarkably pure, and when not obscured by clouds or rain exhibits a transparency and gives a distinctness to distant objects never witnessed in less elevated regions. There is an exhilaration and tonic effect in the air of this interior mountain plateau, to those who have become accustomed to breathing it, that is represented as eminently salutary and delightful.

But little rain falls between April and October in the northern and western part of the State. In the southern and eastern there is more rain, and showers are not unusual during the summer months. The greatest quantity of water falls during the autumn and winter.

The arable lands are found on the borders of lakes and rivers, and in alluvial belts at the bases of mountain ranges. These alluvial valleys and belts are of the very highest fertility, and wherever there is sufficient water for irrigation, or during seasons of sufficient rain, their productiveness is extraordinary.

There is nowhere to be found, perhaps, a more profitable branch of industry than farming in these mountain valleys.

When water can be obtained for artificial irrigation the yield is regular and abundant, and in the vicinity of mining settlements the demand for all kinds of agricultural products is active and constant, the ruling prices much higher than in the Atlantic States or on the Pacific. Wheat, barley, potatoes, and hay are in constant demand at remunerative prices.

Even without the aid of irrigation, and with inadequate methods of cultivation common in new settlements, Nevada produced in 1866, in all parts of the State where agriculture was attempted, superior crops of wheat, barley, oats, hay, potatoes, and other vegetables, demonstrating not only the prolific character of the numerous valleys in the State, but that the quantity of tillable land is sufficient, with proper cultivation, to support a population as numerous as that which is at present occupying the State of New York.

Irrigation would further render valuable many acres of land in this State now regarded as worthless, and drainage and protection from overflow would reclaim hundreds of thousands of acres more.

Were means adopted thus to render available for the purpose of cultivation all the lands susceptible of such improvement, and within convenient reach of the necessary supply of water for purposes of irrigation, it is believed that the tillable lands would amount in the aggregate to several millions of acres, probably equal to the aggregate of the surfaces of Connecticut, Rhode Island, and Delaware.

The grazing lands of the State may be said to embrace about one-half of its entire surface. The valley of the Humboldt river is perhaps the most extensive. It follows the borders of that stream for nearly 300 miles, and is a rich alluvion, covered with a variety of nutritious grasses, and fringed with willow and cottonwood trees. This valley lies on the route usually travelled by emigrants to California and Oregon, and has for many years furnished the vast trains passing along this route with continued supplies of water, wood, and grasses.

There are perhaps in this valley, capable of cultivation at the present time, half a million of acres, with opportunities for greatly enlarging the quantity by proper efforts in the way of irrigation.

The Pacific railroad pursues the valley of this river from its head-waters to its mouth, enhancing its importance over valleys more remote from the great thoroughfare between the Atlantic and Pacific States.

The valleys of Carson and Walker rivers, in the western part of the State, may rank as next in importance. These rivers are both beautiful, clear-water streams, about 100 miles in length, flowing from the eastern spurs of the Sierra Nevada and respectively emptying into Carson and Walker lakes. They form large bottoms of excellent farming land, amounting probably from 150,000 to 200,000 acres, the breadth of which is susceptible of great enlargement by using the waters of Lake Tahoe for the purpose of irrigating a large belt of land lying west and southwest of Carson City, and which by such process would be rendered as valuable as any lands in the State.

Northward from Carson river are Washoe, Steamboat, and Truckee River valleys, partially occupied and cultivated, and producing excellent crops of hay, grain, and vegetables.

Probably one-half of the land in Carson and Walker valleys is occupied and cultivated, and until within the last few years the agriculture of Nevada may be said to have been almost entirely confined to these and the valley of the Humboldt, and their productiveness has been such as to meet the highest expectations of their occupants.

In the northern part of the State are King's, Quinn's, and Paradise valleys, on King's, Quinn's, and Little Humboldt rivers. These contain considerable quantities of good land, most of which is still unoccupied. They lie in Humboldt county, and with the exception of narrow belts of alluvion at the base of Silver mountains, and certain portions of the west Humboldt range, and a narrow valley along the Humboldt river, they constitute the principal agricultural lands in the county. In the central portion of the State, and in the southwest part of Lander county, is the valley of Reese river, walled in by the Shoshone and Tai-ya-he mountains, consisting of a narrow belt along the river; but wherever cultivation has been attempted, the soil has shown extraordinary fertility.

In the same county are Lone, Smith's, Smoky, Grass, Keys, Cold Spring, Crescent, Ruby, Clover, Steptoe, Antelope, and Thousand Spring valleys, formed at the bases of various mountain ranges, and fertilized by the wash and abrasion of their sides. Most of these ranges, extending above the snow-line, are covered at their summits during a great part of the year with snow; which, melted by the summer heats, flows down the sides of the mountains, and the particles of rock and clay becoming disintegrated by the combined action of water and air, are held in solution by the descending currents; and being constituent elements of all vegetable structures and the food of plants, impart to the valleys skirting the bases of such mountains the astonishing fertility which they are known to possess, and which has enabled the Pima Indians, in southern Arizona, to take two annual crops from their lands in continued succession for two hundred years, without manuring and without impoverishing the soil.

In the southern part of the State other valleys of like character are found, in Nye and Lincoln counties, as Monitor, Ralston, Stretch's, Sierra, Coal, Cave, Pahranaagat, Ash, Utah, Buel's, Death, and Amayosa valleys. Fish lake and Indian valleys are in Esmeralda county; and in the southeast corner of the State, in the tract cut off from Arizona by the act of May 5, 1866, are the valleys of the Rio Virgen and its tributaries, the East fork and Muddy river, being the only part of Nevada not constituting a portion of the Salt Lake or Great Interior basin.

All these valleys in the eastern and central part of the State are settled, and those in the western are partially occupied. Many of the mountains are covered with pine. Wells and springs abound throughout the State, and many eligible localities are to be found where valuable farming lands might be obtained, surrounded by extensive grazing scopes; where mining has not yet been carried on, but is destined in a few years to fill the mountains with a busy population, furnishing a market for the products of the soil, for beef, mutton, and the dairy.

Although many of these valleys are narrow, and the amount of land and the

means of irrigation limited, and the facilities for acquiring large plantations not so great as in the States east of the Rocky mountains, the opportunities for the industrious settler, without capital, are perhaps none the less favorable.

The constant demand for the products of his labor, and the high price they usually command, give to the farmer in the mining districts of the west many advantages over his co-laborers upon more expansive fields, and enable him often to realize from twenty or forty acres of land skirting the base of some gold or silver bearing mountain, more satisfactory returns than could be obtained from five or ten times the amount of land in localities remote from market and where transportation is expensive.

Silver mining is the leading industrial pursuit of this State. The average monthly yield of the mines in the districts of Virginia, Gold Hill, Reese River, Esmeralda, and Humboldt, during the first nine months of 1865, was \$1,331,555. Of this amount the greater part was extracted from a lode near Virginia City, in the western part of Nevada, where there is a ledge of ore running along the side of a mountain for three miles, with a width of fifty to one hundred feet, having a depth as yet unascertained. Over thirty companies have been working the same. The most prominent one of these has mined to the depth of eight hundred feet. Prior to April, 1866, the product of this lode was valued at \$51,380,588; since then it is understood that fourteen millions more have been extracted. The bullion shipped from Virginia City and Gold Hill districts by express, during 1866, exceeded the shipment of the previous year by \$2,074,174.

The mineralogist of the California State geological survey has expressed an opinion, supported by many scientific men, that the lode referred to is a fissure vein of extraordinary width and productiveness, and that ore will be found as deep as it is profitable to extend underground operations. The extension of railroad communications to such localities will render profitable the extraction of a low grade of ore with a fair margin of profit, adding \$5,000,000 to the annual product of these mines.

The effect of increased railroad facilities upon the product of other parts of the State will be even greater. These are rapidly progressing. The Central Pacific will be open from San Francisco to the Nevada State line by December 1, 1867. The grading through the latter State being comparatively light, it is supposed the road will be finished to the territorial line of Utah in eighteen months, leaving but a few hundred miles, over which the Union Pacific, with its present remarkable energy of progress, will soon complete the final link between the Atlantic and Pacific. A branch called the Truckee and Virginia railroad, twenty-two miles long, connecting the cities of Virginia and Gold Hill with the Central Pacific, will probably be completed within fourteen months. The completion of these roads will enhance the silver product of the State to an extent now beyond calculation. The mines further up the Humboldt river at the west Humboldt ridge are estimated by men of excellent capacities and opportunities as even more valuable than the lode before alluded to. The riches of the mineral country of Nevada are but very imperfectly known. New mines are constantly announced. Coal, copper, and lead have been discovered in different parts of the State, abundant in quantity and superior in quality. Gold has been mined to some extent. Salt, however, is, next to silver, the most copious mineral deposit. About fifty miles south of Mineville is a salt field of some sixteen thousand acres, of great purity; excavations to the depth of three feet are soon filled up by fresh deposits of equal purity. It has been observed that the power of preserving organic matter manifested by the salt of this locality surpasses that of any salt deposits in the world. Sand Spring mine is another copious deposit. Salt springs exist in different parts of the State. Mineral springs abound, and with extraordinary capacities for the cure of chronic and other diseases. Many of these are of a very elevated temperature.

This country possesses large and beautiful lakes; Pyramid lake is especially



remarkable for immense flocks of waterfowls. Carson City, the capital of the State, is situated in Eagle cañon. It is a flourishing and rapidly increasing town, in the midst of a fertile and well-watered country, with several fine rivers of very cold water from the Sierra Nevada in the neighborhood. Its population is about 3,500.

Virginia City, in Story county, is the head of an immense mining interest. It is situated in a cañon of very productive land. The original shanties raised to meet pressing demands of rapid immigration have given way to well-built brick structures of tasteful style and imposing appearance, the population being 20,000. Gold Hill and American Flat may be considered as suburbs of the city.

Aurora, in Esmeralda county, is the centre of an important mining district, with a population of 2,000.

Geneva, the oldest settlement in the State, is on Carson river, surrounded by rich agricultural land.

Austin, in Lander county, with a population of 12,000, Belmont, the third city in the State, in Nye county, and Pahranaगत, in Lincoln county, are prominent points of mineral production.

The undisposed-of public lands in the State amount to upwards of ninety-seven millions of acres.

Six years ago, when Nevada was a Territory, it was organized as a separate surveying district; afterwards it was united to the California surveying service; then to the Colorado; subsequently reannexed to the California; and finally in 1866, as a State, was made a separate surveying department, with the surveyor general's office at Virginia City.

During the fractional part of the last fiscal year, extensive reconnoissance has been made by the surveyor general, looking to future surveying operations. The valleys of Humboldt, Paradise, and Quinn's river were found the richest agricultural districts, Paradise valley producing wheat from 30 to 60 bushels, and of barley from 40 to 80, to the acre. The surveyor general during the present fiscal year has made engagements for the establishment of the Humboldt River guide and the Reese River guide meridian; also for the standard parallels and for the exterior lines of townships. By these lines the best portions of the agricultural and mineral regions can be reached without the delay and large outlay requisite for the ordinary gradual extension of the surveys. In order to accommodate numerous settlers, Carson River valley, the soil of which may be made highly productive by irrigation, has been placed under contract for survey. The Walker River valley, the counties of Douglass and Esmeralda, the latter containing rich mineral lands, will also be surveyed during the present fiscal year, as well as the country traversed by the railroad grant along the Humboldt river, whilst the Ruby Valley guide meridian north and south of the fourth standard parallel north will be extended.

It is important that the precise limits of jurisdiction should be known between Nevada and Utah, and hence the survey of the eastern boundary of Nevada, the dividing line, is suggested by the surveying department, and it is now recommended, with an estimate for that purpose submitted. To expedite the surveys of mineral lands, the surveyor general reports that the State has been divided into eight different mineral districts, and district surveyors appointed in accordance with the system adopted for carrying into effect the congressional enactment of 26th July, 1866, respecting the disposal of mineral lands, a measure represented as giving general satisfaction, and likely to result in substantial benefit to the mining interest.

While the surveying service of Nevada was under the control of the surveyor general at San Francisco for part of the last fiscal year, sixteen thousand three hundred and nineteen acres were surveyed; and from the organization of the

surveying district in 1861 up to June 30, 1867, the lines have been extended over seven hundred and sixty-three thousand nine hundred and sixty-nine acres.

As it is expected that the Pacific railroad will be extended from San Francisco to the eastern boundary of California by the 1st of December, 1867, as hereinbefore indicated; and as the grading of the road in the Humboldt valley will be easy and expeditious, insuring its completion to the western boundary of Utah by the 30th June, 1869, the surveyor general submits an estimate of \$50,000, which is recommended, for the survey of the public lands in Nevada, looking to the necessity of the surveys along the line of the route, in order that the land grant may be made effective. For further details of the surveying operations, and other matters connected with the rapid development of various resources of the State, reference is suggested to the very interesting report of the surveyor general.

OREGON has California on the south and Washington Territory on the north, extending from the Pacific ocean to Snake river, the latter constituting a part of its eastern boundary. It is 350 miles long from east to west, and 275 wide from north to south, containing 95,274 square miles, or 60,975,360 acres, being about half as large as the State of California.

The Coast mountains and the Sierra Nevada, traversing California, continue northward through Oregon; the latter, after leaving California, are named the Cascades. Near the southern boundary the chain throws off a branch called the Blue mountains, which extends northeastwardly through the State, passing into Washington and Idaho.

The course of the Cascades through the State is generally parallel with the shore of the Pacific, and distant therefrom an average of 110 miles. In California the direction of the Coast mountains and coast valleys is that of general parallelism with the sea-shore; the mountains sometimes approaching close to the shore and then receding miles from it, leaving belts of arable land between them and the ocean. In Oregon the Coast Range consists of a series of high lands running at right angles with the shore, with valleys and rivers between the numerous spurs having the same general direction as the highlands.

In reference to climate and agricultural capacities, Oregon may be divided into two distinct parts, the eastern and western, lying respectively on the east and west sides of the Cascades.

Western Oregon, the portion of the State first settled, and containing the great preponderance of its present population, is 275 miles in length, with an average width of 110, being nearly one-third of the whole State, and contains about 31,000 square miles, or nearly 20,000,000 acres, all of which is valuable for agriculture, for grazing, or for timber growing, excepting the crests of some of the highest mountains. It is more than four times as large as Massachusetts, nearly three times as large as Maryland, and is greater in extent than the united areas of Maryland, New Jersey, Massachusetts, and Rhode Island.

The valleys of the Willamette, the Umpqua, and Rogue rivers are embraced within this portion of the State. The soil of these valleys is very rich and deep, resting upon a foundation of clay retentive of the elements of fertility. Larger portions of the valleys are open prairie, just rolling enough for the purposes of agriculture. All the productions common to temperate regions, whether of the field, orchard, or garden, can be cultivated here with the highest degree of success. The chief products of the field are wheat, oats, barley, rye, hay, maize, buckwheat, flax, hemp, sorghum, peas, beans, millet, broom corn, pumpkins, and potatoes; of the garden, turnips, squashes, cabbages, tomatoes, onions, cucumbers, gourds, beets, carrots, and parsnips; and of the orchard, apples, pears, plums, cherries, apricots, quinces, peaches, and grapes. Many of these productions are of mammoth growth, and superior quality and flavor.

The yield of wheat is frequently forty and fifty bushels per acre, and when the land is properly cultivated the crop never fails, and in no State or Terri-



tory can an equally remunerative crop, year after year, be cultivated with less labor or trouble. As to fruits, no country could produce finer apples, pears, plums, or cherries. The trees come into bearing several years earlier than usual in the Atlantic States, and a failure in the crop is rarely known.

The Willamette valley is more exposed to the sea breezes than the more sheltered ones of the Umpqua and Rogue rivers, and the nights are too cool for corn and the peach to succeed well. Rogue River valley, being more sheltered than the valleys to the north of it, appears admirably adapted to the grape, and its culture is becoming a more prominent interest every year, while the peach, Indian corn, and sorghum, it is reported, succeed better here than in other portions of western Oregon.

Skirting the prairie land of these valleys, and intervening between them and the mountain ranges on either side, there is a succession of hills and ridges, frequently of rounded, cone-shaped form, rising sometimes to the height of a thousand feet, and half a mile removed from each other at their bases, covered to their summits with thick grasses, and numerous springs gushing from their sloping sides, with scattered trees of oak, maple, and alder, not so thick as to retard the growth of the native grasses, nor too sparse to shade the grazing flocks and herds. This is called the hill country, and is a region of mixed prairie and woodland, hill and valley, a large portion of it being excellent farming land, and in horticulture and gardening is equal to the plains; but its chief characteristic is grazing, and no country, by its configuration, the quality of its soil, and the temperature of its climate, could be better adapted to sheep, and wool-growing is already a leading interest, and is constantly increasing, from the success that has attended this branch of industry.

The climate of this part of the State is mild and equable. The winters are usually short, with but little fall of snow. The pastures are generally green throughout the year, and a winter so cold as to require dry food for stock is of rare occurrence. The nights are always cool, even in midsummer. From November to April the rainy season prevails. A clear season usually occurs in February or March, continuing several weeks or a month, and followed again by a month more of rainy weather. Between April and November rain falls sufficient to prevent drought, but seldom to injure the harvest or produce freshets. The summer is dry, yet seldom to the destruction of crops. The Oregon farmers realize the necessity of irrigating fields by artificial means much less than those of southern California.

Back of the hill country, on each side of the Willamette valley, are the Coast mountains on the west and the Cascade mountains on the east. Between the head of the Willamette and the Umpqua valleys a mountain spur called the Calapooia mountains runs across from the Coast to the Cascade range. A similar spur, called the Umpqua mountain, separates the Umpqua and Rogue River valleys, and another, having the same transverse direction, called the Siskiyou mountain, on the boundary between Oregon and California, separates the valleys of Rogue and Klamath rivers.

All these mountains, together with the Cascade and Coast ranges, are covered with immense quantities of the sugar pine, the white and yellow pine, the nut pine, the red fir or Douglass spruce, the black fir, yellow fir, western balsam fir, the noble fir, the Oregon cedar, and the fragrant white cedar, all trees of extraordinary size and symmetrical form, standing in dense forests, and some of them rising to the height of two hundred and fifty and even three hundred feet, with trunks from four to fifteen and sometimes twenty feet in diameter. Less striking and important are the western yew, the western juniper, the Oregon oak, the Oregon alder, the Oregon ash, the hemlock, myrtle, and other trees.

The Coast mountains, from San Francisco to the mouth of the Columbia river, are heavily timbered with the red-wood, pines, firs, and cedars. Immediately north of San Francisco the forest is composed almost exclusively of red-wood.



Going northward the trees become more numerous, and with the red-wood are found the sugar and the yellow pine, forming about the Oregon boundary one of the most magnificent forests in the world, the red-wood and sugar pine attaining nearly equal dimensions, trees of both species being not uncommon twelve to fifteen feet in diameter and three hundred feet high.

After crossing the Oregon boundary the red-wood becomes scarcer, and ceases entirely in the vicinity of the Umpqua river. It is succeeded by the arborvitæ or Oregon cedar, and the red and black firs, and these form the almost impenetrable coating of vegetation which covers the Coast mountains, from Port Orford to the Columbia, the red fir here attaining its greatest dimensions, fully equalling those of the red-wood and sugar pine.

The forests of Oregon, like those of California, contain many of the most valuable timber trees in the world, many of which would furnish straight timber a yard square and a hundred feet long, valuable for furniture, for domestic architecture, for ships' spars, for the powerful framework of heavy machinery, for bridge building, for railroad purposes, and the general purposes of the farmer, the millwright, and the shipwright.

The soil upon which these forests grow is generally good, the undergrowth over the greater extent of it being hazel, often three inches in diameter and twenty feet high, elder, alder, dogwood, myrtle, maple, ash, and willow, together with such other shrubs and grasses as indicate rich, moist, and first-rate soil. Upon the Coos and Coquille rivers, in the Coast range, the land has been cleared and its fertility found extraordinary, producing all kinds of grains and vegetables in abundance.

Throughout these extensive mountain forests there are immense tracts lying sufficiently even for cultivation; but lands producing timber of such valuable qualities and in such extraordinary quantities should be preserved as timber lands through all time. As the larger trees are felled the forest should be allowed to reproduce itself again from the younger and smaller trees and the shoots and sprouts that will rapidly spring up. Nor can the land be devoted to any more profitable purpose than the production of these monarchs of the forest, many of which are of rapid growth and attain a great height and size even in the lifetime of a human being. A million feet of lumber at the moderate price of ten dollars per thousand feet are worth ten thousand dollars, which would be equivalent to one hundred dollars per acre for one hundred years; and from all the information received touching the character of these amazing forests, it is believed to be no exaggeration to suppose them capable of producing one million feet of lumber to the acre. Although much of it may be comparatively worthless at present, for want of means of transportation to market, yet the time is approaching when that inconvenience must in a great measure cease to exist. The demand for lumber is annually increasing in all parts of our own and other countries, and upon the extensive plains west of the Mississippi but little timber exists, and the first settlers must of course have supplies. A railroad from the head of navigation on the Columbia or Snake river, to intersect the Union Pacific at Salt Lake City or other point east of that, would open up a market for the lumber of Oregon and Washington Territory that would annually increase for many years to come, and over which it would be sent not only to supply demands east of the Rocky mountains, but in Nevada and down the Colorado to southern Utah and Arizona.

Eastern Oregon, extending from the Cascade to Snake river, is an elevated, rough, broken country of hills and mountains, benches, table lands, deep gorges, almost impenetrable cañons, with numerous fertile and arable valleys. The greater portion is incapable of tillage, but furnishes an extensive scope for grazing. The climate is dryer than on the west of the Cascade range; is subject to greater extremes of heat and cold and to sudden changes of temperature, but generally milder than the same latitude east of the Rocky mountains.

The tillable lands in this portion of the State are along the Columbia river and in the valleys of the Umatilla and Walla-Walla rivers, in the valleys of Klamath lake, Lost river, Goose lake, Harney and other lakes, and Alvord and Jordan Creek valleys, in the southern part of the State, and in the valleys of Grande Ronde, Snake, Powder, Burnt, Malheur, and Owyhee rivers, in the eastern part.

Numerous thriving settlements, with extensive improvements in agriculture and manufactures, exist in the valleys of the Columbia, the Umatilla, and Walla-Walla rivers, and grazing is extensively carried on. The soil of the valleys is highly fertile, and its agricultural capacity, so far as tested, is found excellent, producing small grains, fruits, and vegetables in great abundance and of very excellent quality. The locality enjoys advantages in reference to market and business, on account of its contiguity to the navigable waters of the Columbia and the mining districts lying to the east and south.

The country bordering on the Des Chutes and John Day rivers and the declivities of the Blue mountains is fit only for grazing land, and for this purpose much of it is excellent. Much good land exists in the southern part of the State for agriculture and for grazing, but being comparatively unsettled, little of it has been subjected to the test of experience.

In the eastern part of the State, in the valleys of Snake river and its tributaries, many settlements exist; the soil is generally rich and agriculture flourishes. Indian corn, melons, and many varieties of garden vegetables are said to succeed better in some of these valleys than on the Willamette, on account of the higher temperature of the summer. Timber is less abundant in eastern Oregon than west of the Cascades, and the oak is wanting in the eastern, which is found upon the lower hills and in the valleys of western Oregon in small groups or in solitary trees, and with its low and spreading form, imparting such a picturesque beauty to the landscape; but on the sides and summits of the Blue mountains, and the various spurs and ridges which traverse this part of the State in different directions, are found the fir, cedar, hemlock, pine, and other varieties of forest trees, which will furnish an abundant supply. The Blue mountains are noted for the best quality of timber and natural grasses, which cover their sides from base to summit.

The salmon fisheries of Oregon form an important item, and may be indefinitely increased to meet almost any imaginable demand. These fish make a fall and spring run from the ocean, penetrating most of the Oregon rivers to the smaller branches from which they flow, and stem the powerful current of the Columbia for more than a thousand miles. Vast quantities are annually caught, and the business of putting them up for commerce is prosecuted with great success.

The Columbia is the chief river of Oregon, the largest on the Pacific coast, and one of the largest in the United States. For thirty or forty miles from its mouth it expands into a bay from three to seven miles wide. It is navigable to the Cascade mountains, one hundred and forty miles from its mouth, when navigation is interrupted by rapids for a distance of five miles, over which a railroad portage is constructed. On the east side of the Cascades it is again navigable for forty-five miles to the Dalles, and again becoming unnavigable on account of rapids, another railroad fifteen miles long has been built from the Dalles to Cebillo. From the latter point the river is navigable, and daily or tri-weekly steamers are running to Umatilla, eighty-five miles; Wallula, one hundred and ten miles; and to White Bluffs, one hundred and sixty miles further up the stream.

The Oregon Steam Navigation Company had, in 1866, eighteen or twenty first-class steamboats on the river and warehouses at all the principal towns, and had transported to the Upper Columbia, in the four years ending in 1865,



60,320 tons of freight, and carried up and down the river in the same time nearly 100,000 passengers.

By constructing a portage from White Bluffs, one hundred and fifty miles north, and cutting off an impassable angle in the river, the stream is again struck at a navigable point close to the forty-ninth parallel, from which steamers can run from one hundred and fifty to two hundred miles further north to near the fifty-third parallel, in the Cariboo country, the famous gold region of British Columbia. The Oregon Steam Navigation Company expected to have steamers running upon these upper waters in 1867. The Snake or Lewis river, one of the principal affluents of the Columbia, is navigable from the mouth of Powder river, one hundred and ten miles from Wallula, a distance of one hundred and fifty to two hundred miles into southern Idaho, and within two hundred miles of Salt Lake City, and the placing of several steamboats upon this part of Snake river during the present season was another object of that enterprising corporation. Whether these enterprises have been realized, and the navigation of the Columbia and its tributary thus extended, this office is not informed. If they have been, steam navigation from Salt Lake City to the mouth of the Columbia is practically secured, with the aid of about three hundred miles of wagon road.

Oregon enterprise already contemplates the construction of a railroad from Wallula to Salt Lake City, through the gold regions of Idaho, a distance of five hundred and fifty miles, crossing the Blue mountains by a very favorable pass. From Wallula the Pacific ocean is reached by the navigation of the Columbia at the distance of three hundred and twenty miles further, or eight hundred and seventy miles from Salt Lake City to the mouth of the Columbia, making the shortest route from Salt Lake to the Pacific, and avoiding the great labor of surmounting the Sierra Nevadas.

In all parts of this State vast tracts of agricultural, grazing, and timber lands, both surveyed and unsurveyed, are open to settlement under the homestead and pre-emption laws, and in western Oregon large quantities may be obtained by private entry.

Farming and grazing are very profitable in the neighborhood of mining settlements, and not only competence but wealth is within the reach of the industrious and enterprising, who, selecting a farm and a home in a favorable locality, either in eastern or western Oregon, devote themselves faithfully to improving and developing its resources.

The population of the State, which at the present time is estimated at over 100,000, is steadily increasing, and when the means of communication now in contemplation are open, the increase will be still further stimulated.

The undisposed of public lands in the State amount to about fifty-two million seven hundred thousand acres.

Contracts during last fiscal year were made for the extension in Oregon of the lines of public surveys on the head-waters of Umatilla river, in the north-eastern portion of the State, to the upper waters of Williamson's and Sprague rivers, emptying into Klamath lake, in the southern part of Oregon, through which the Oregon Central military road passes, on the coast of the Pacific ocean; along the military road from Corvallis to Acquinna bay and other localities, embracing actual settlements. Those lines include over four hundred thousand acres, which, added to former surveys in the State, will embrace an aggregate surface of six million one hundred and forty-four thousand six hundred and thirty-six acres, leaving about fifty-five millions unsurveyed, including donations under the act of Congress, approved September 27, 1850, which made grants to persons who had emigrated to Oregon. The service, when finished under agreements, will absorb the appropriation of \$35,000 for last fiscal year.

Contracts have been closed for surveys during the present fiscal year to the



extent of the means provided, the surveyors having entered the field selected for the service, which is situated on the John Day, Willow, Grande Ronde, and other rivers, tributaries of the Columbia.

The surveyor general invites attention to the necessity for the survey of lands along the Oregon Central military road, particularly to Surprise valley, where he reports several settlements. In view of the military road from Eugene City to the eastern boundary of the State, an energetic prosecution of the survey of public lands is requisite to enable the company to realize the benefit of selections of lands, from time to time, as the requisite number of miles of road are completed, under the 4th section of the grant of July 2, 1864, and amendatory act of Congress, approved December 26, 1866. In view, also, of the limitation of the former act, which will expire July 2, 1869, for the completion of the road, and the fact brought to the attention of the Commissioner of the General Land Office, emanating from the president of the road company, that by the close of the present season the work will be completed for a distance of one hundred miles, the extension of the surveys along the Central military road is recommended, the interests of the public, as well as the company, requiring an early construction thereof. Estimates, therefore, for surveys adjacent to the route and other localities, are submitted to the extent of \$25,000, the greater part of which is designed for furthering early completion of the military road, the necessity of which is important to advancing settlements in the southern portion of the State of Oregon.

WASHINGTON TERRITORY, immediately north of the State of Oregon, is 345 miles from east to west, and 230 from north to south, containing about 69,994 square miles, or 44,796,160 acres; about three and a half millions of which are surveyed. The Cascades divide it, like Oregon, into eastern and western sections, differing from each other in climate, soil, and natural and cultivated products. Although occupying higher latitude than Oregon, the climate of the western section is very similar to that State. It is said to resemble also the climate of England, in the amount of rain-fall, as well as in the range of the thermometer throughout the year.

The products of Washington Territory, west of the Cascades, are like those of the Willamette valley. All the cereals, Indian corn excepted, succeed admirably, the wheat crops being equal to those of the very best wheat-growing countries.

In fruits the apple, pear, cherry, plum, strawberry, raspberry, gooseberry, blackberry, and currant, yield abundant crops of excellent quality. The grape succeeds with little trouble, although we have no information yet as to vineyard culture. The land in the valley is generally of an excellent quality, and west of the Cascade of extraordinary fertility. Much not tillable is first-rate for grazing, and all kinds of stock thrive in either section of the Territory. In the western part but little dry fodder is prepared, as the pasturage usually continues through the winter, yet the prudent farmer always provides enough in the fall to feed his stock from a month to six weeks, if circumstances should require it. The western section has an average width between the ocean and the Cascade of 100 miles, and contains about 11,000,000 acres; being equal to the aggregate area of the States of New Hampshire and Massachusetts, or to the three States of Maryland, Delaware, and Connecticut. The Territory lies several degrees south of the latitude of England, being embraced between the parallels of 45° and 49°, corresponding with the geographical position of the greater part of France or of the Austrian empire. Some of the principal valleys are—Chehalis, on a river of the same name emptying into Gray's harbor. Most of the land there has been surveyed. The valley contains about 400,000 acres, part prairie and part timber; about 250,000 acres of which are yet unoccupied. The population of the valley consists of about 200 settlers and their families.

The Chehalis river is navigable for sixty miles from its mouth by small steamers. Willopa valley, on Willopa river, emptying into Shoalwater bay, contains about sixty settlers. The land produces from fifty to sixty bushels of wheat per acre. Grass grows from three to four feet high, and large crops of potatoes and garden vegetables are raised. The soil is generally covered with heavy timber, but some prairie still remains unoccupied.

Cowlitz valley, on Cowlitz river, contains half a million acres of very fertile land, a large portion of which has been surveyed. The land is mixed prairie and woodland. All grains thrive well except Indian corn. About 250 settlers are located there, many of them among the oldest in the Territory, and among its most prosperous farmers.

The valleys of the Nesqually, Puyallup, Dwamish, White, Green, Cedar, Snoqualmoo, Stalukahamish, Skagit, and Nooksahk rivers, emptying into Admiralty inlet and Puget sound, are broad and fertile, consisting of prairie and land covered with immense forests. All kinds of fruit that will thrive in the State of New York or Pennsylvania, except the peach, succeed in these valleys, and fortunes have already been made in this distant Territory from the cultivation of the apple, the pear, and the plum, for which the Pacific coast for more than a thousand miles offers an unfailing market.

East of the Cascade the country is generally unoccupied, the settlements being confined to several excellent valleys, as the Walla-Walla, Colville, Yakama, Columbia, and Palouse valleys. Walla-Walla valley contains over a million acres of arable land, producing in abundance grains, fruits, and vegetables, with a population of over two thousand, enjoying a high degree of prosperity as a community and making rapid progress in agriculture and manufactures. The same remarks apply to Colville valley, although the population is not so great nor the elements of prosperity developed to the same extent; yet the valley has been settled for thirty years, and the population is increasing. The Yakama, Columbia, and Palouse valleys possess much excellent land, adapted to the cultivation of products similar to those raised west of the Cascade. In all these valleys except the Palouse considerable tracts have been surveyed. The extent of grazing tract in these valleys and in the hill country surrounding each is immense. Throughout the eastern section grazing land enough exists to feed countless flocks of sheep and cattle, and the climate, being dryer and more elevated than on the west side of the mountains, is even better adapted to sheep and wool raising than the western section.

Timber, although scarcer on the east side of the mountains than on the west, is nevertheless sufficient for all the purposes of domestic use, and in some portions sufficiently abundant for exportation in large quantities; and while the climate is colder than on the coast, it is not as rigorous as in many parts of Austria and Prussia, and in southern Russia, where populous communities have existed for ages, and at the present day occupy an advanced position in all the elements of civilization and refinement.

The fishing interest is destined to hold a prominence in its future commerce. Salmon of the finest kind, cod, halibut, and other fish are taken in its waters, and exist in quantities sufficient to meet the demands of the most extensive trade.

In respect to its interior water system and its immense forests of fine timber this Territory stands unrivalled. It possesses more excellent harbors than any other State or country of equal extent on the face of the globe.

The Straits of Juan de Fuca and the Gulf of Georgia, lying south and east of Vancouver island, extend into the Territory and ramify into numerous straits, bays, inlets, sounds, and estuaries, free from rocks, of depth sufficient for the largest vessels, and numerous bends are common, where the most perfect protection may be found against winds or waves. Puget sound has an average width of two miles, a depth never less than eight fathoms, and runs inland in a southern direction one hundred miles from the Straits of Fuca. Hood's canal,



twelve miles further west, with an average width of one mile and an equal depth with Puget sound, runs sixty miles in a southwest direction. Between these various sounds and inlets, extending from the 47th to the 49th degree of latitude, there are islands and bays furnishing numerous harbors. Besides these there are Gray's harbor and Shoalwater bay, and the capacious bay of the Columbia river, south of the straits of Fuca. Numerous rivers empty their waters into these bays and sounds, some of which are navigable for short distances, and all will serve the purpose of floating into the sound the lumber manufactured upon their banks. The whole Territory is favored with navigable waters. The Columbia courses through more than seven hundred miles, for the greater part of which it is navigable. Snake river, during one-half of the year, is navigable to Lewiston, and the waters of the sound furnish navigation of many hundreds of miles at all seasons. Facilities for commerce so extensive are seldom found. Nor are these opportunities neglected by its enterprising citizens. Already a number of mammoth saw-mills are located on its shores, and Puget sound has become the great lumber market of the Pacific coast. The extensive forests of pines, firs, and cedars covering the Coast and Sierra mountains in California, and the Coast and Cascade in Oregon, extend into Washington, covering a large portion of it west of the Cascade, the forest increasing in density and in amount of lumber growing upon an acre of ground in its northern progress. Fir trees two hundred and two hundred and fifty feet high, and six and seven feet in diameter, are seldom out of view in these forests; eight and ten feet in diameter and three hundred feet high are not at all uncommon. Trees of fourteen and fifteen feet in diameter are not difficult to find, and a fallen tree near Olympia measures three hundred and twenty-five feet in length, and another, at a distance of ninety feet from the root, measures seven feet in diameter. Masts for ships may readily be obtained, straight as an arrow, without knot for more than one hundred feet. Some of the mills on Puget sound have capacity to turn out daily 100,000 feet of lumber, and the present export of the sound in prepared lumber, masts, and spars amounts to over one and a half million of dollars annually. San Francisco is the largest customer, but exports are made to the Sandwich Islands, China, Japan, the Mexican and South American ports on the Pacific, and even to the South American ports on the Atlantic; and spars and masts are sent to France. This trade is annually increasing, and Puget sound is destined at no distant future to surpass in the extent of its lumber trade the greatest lumber market east of the Rocky mountains. Chicago now sells annually nearly 1,000,000,000 feet, over 200,000,000 shingles, and 100,000,000 pieces of lath; but the market of Chicago is geographically limited to the valley of the Mississippi, while Puget sound may readily find sale for building materials on both shores of the Pacific, and eastward to the Rocky mountains and the great plains stretching towards the Missouri, and for masts and spars without limit.

The subject of forest tree culture has of late years attracted much attention in Europe on account of the increasing scarcity of all the more valuable kinds of timber, especially ship timber; and the subject is of no less importance in our own country, where regions exist comparatively destitute of trees, and where the supply of the more valuable kinds of timber is limited and becoming so scarce that it even now commands large prices in places west of the Rocky mountains. It is time that our best timber lands should be prized, not only in regard to present but future value.

The quantity of public lands to be disposed of in this Territory is equal to about forty-one million six hundred thousand acres.

Since last report the public surveys in that distant portion of the Union have been gradually extended, eleven contracts having been made for the survey of standard, township, and subdivision lines, mainly east of the Cascade mountains, at an estimated cost of twenty-three thousand dollars, of which deputy



surveyors have made survey returns, embracing whole and fractional townships, comprising three hundred and fifty thousand and twenty-six acres.

The trade of the country, by way of Columbia river, is carried up by steamers regularly plying to White Bluffs, seventy miles above Wallula, the former head of navigation, situated at the mouth of Walla-Walla river, twelve miles south of the confluence of Snake with Columbia river—the Snake river affording, for four or five months in the year, additional navigation from Lewiston, in Idaho, down to the Columbia, for one hundred miles. One-third of the entire area of the Territory, or about eighteen millions of acres, are adapted to agricultural and grazing purposes. A similar extent is covered by timber, of which ten millions of acres are valuable for lumber, and if surveyed, it is reported, would find ready sale. The surveyor general recommends the extension of surveys over that region, representing that, if these timbered lands are brought into market, considerable revenue would accrue to the government, relieving it from the loss by spoliation which, it is represented, is practiced by lumbermen to the extent of nearly one hundred million lineal feet per annum, seventy millions of which are shipped to San Francisco, and twenty-six millions to foreign ports, while a portion is destroyed by fire.

The surveying department submits estimates for surveys in the Colville valley, in the northeast part of the Territory, between Columbia river and Clarke's fork, and in the vicinity of St. Ignatius Catholic mission; Priest's rapids, on the Columbia river, in the latitude of Mount Rainier; Upper Yakama river, and on Puget's sound.

In these localities are settlements, and particularly at Colville, where surveys have been desired for years past. It is therefore deemed of importance to accommodate the settlers, by the extension to those localities of the guide meridians, standard parallels, and subdivisional surveys, and for this purpose an estimate of fifteen thousand dollars is submitted for surveys during the next fiscal year.

**IDAHO.**—Pursuant to the act of Congress creating "the office of surveyor general in Idaho Territory," approved June 9, 1866, the surveyor general was appointed, and on the 7th of November, 1866, opened his office at Boise City.

The initial point of surveys for the Territory was fixed upon the summit of a rocky butte standing isolated in the plain situated between the Snake and Boise rivers, on the parallel of  $43^{\circ} 36'$  of north latitude, and distant nineteen miles from Boise City, in the direction of south  $29\frac{1}{2}^{\circ}$  west.

The selection of that spot for the intersection of the principal base with the Boise meridian is reported by the surveyor general as judicious, a fact since established in extending the base meridian and standard parallels to the cardinal points.

Under the appropriation of ten thousand dollars made by act of July 2, 1864, three contracts have been made for the establishment of standard lines from the initial point, the returns to this office showing that there have been surveyed, to the 30th June, 1867, two hundred and eighty-eight lineal miles of the meridian, one hundred and thirty-eight\* of base, and one hundred and five of standard parallels. The termini of the Boise thus far surveyed are two hundred and sixteen miles north of the initial, reaching the point of intersection thereof with Clearwater river, and south of the point seventy-two miles, to a point within twelve miles of the northern boundary of the State of Nevada.

Engagements have been made for the survey of township and section lines, payable out of the appropriation of fifteen thousand dollars made March 2, 1867, for the surveys during the present fiscal year.

While extending standards in Idaho across Payette, Weiser, Boise, Clearwater, and Salmon valleys, the character of the soil was ascertained to be highly productive. In that region, too, the most urgent demand exists for the surveys

of agricultural lands, as well as for the township lines in Owyhee, Alturas, Boise, and Nez Percés counties, so as to embrace the most prominent quartz ledges or placer mines. With this in view, the surveyor general submits an estimate of appropriation of thirty-five thousand seven hundred and sixty dollars to meet the contemplated surveys during the fiscal year which will end June 30, 1869.

The soil in the valleys sheltered by mountains, much of which is decomposed granite, is capable of producing cereals and vegetables, extensive crops being raised where irrigation is practiced.

The extensive table lands produce wild grasses and wild rye, the mountains affording the only pine and fir timber, while rich quartz lodes of gold are found and extensively worked in some mining districts, where several thousand gold and silver claims have been taken and recorded under local miners' rules.

In the Territory it is reported there are twenty thousand inhabitants, exclusive of a floating population. Farmers are erecting substantial dwellings and making other improvements, paying special attention to the cultivation of fruit trees, such as apple, plum, pear, cherry, and even peach.

Under a recent appropriation by Congress, a contract was awarded by the department for the survey of that part of the western boundary of Idaho which lies south of the confluence of the Owyhee with Snake river, extending due south to the northern boundary of Nevada.

The Territory of Idaho, from north to south, is 410 miles; its width on the southern boundary 385; while on the northern it is about 50. It contains 90,932 square miles, or 58,196,480 acres, nearly all of which is subject to disposal as public lands.

**MONTANA TERRITORY.**—By the first section of the act approved March 2, 1867, the office of surveyor general in the Territory of Montana was created, the statute conferring upon that officer like powers to those prescribed by law for the surveyor general of Oregon; the boundaries of the Territory having been fixed by the first section of the act approved May 26, 1864, to "provide a temporary government for the Territory of Montana." (United States Statutes at Large, volume 13, page 86.)

The surveyor general was duly appointed, and having entered into bond on the 29th of April last, the necessary instructions, bearing date 9th of May, 1867, were despatched to him, with a sketch of the limits of his surveying district, to which the public surveys have not yet been extended. The instructions require the field operations to be carried on in such portions of the Territory as are most occupied and settled, and those likely to attract agricultural immigration or which may be required for mining purposes.

It was made the first duty of the surveyor general to determine the initial point of survey, or the point for the intersection of a principal base with the principal meridian line, to govern all the public surveys in Montana, and to that end "Beaver Head Rock,"\* a remarkable landmark overhanging a river of that name, was designated by this office, unless a more prominent and suitable point exists, that prominent natural object being situated in the centre of the largest valley in the great Horseshoe Basin of the Rocky mountains, drained by the Jefferson, Madison, and Gallatin forks of the Missouri river. The stage road from Bannock City to Virginia City passes by the spot, which is represented to be about midway between those two places, the rock being reported visible for fifty miles up and down the stream, and hence eminently suitable for the initial point of the public surveys in Montana.

Since the foregoing was prepared a return dated November 2, 1867, has been received from the surveyor general, showing that it had been found preferable to establish the initial point on the summit of a limestone hill, eight hundred feet

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\* Said to be 150 feet high.

high, between the Jefferson and Madison rivers, near the junction of Willow creek with Jefferson river, and twelve miles southwest of the junction of the Three Forks of the Missouri river, and was therefore selected as the initial point of surveys in Montana Territory.

The surveyor general, whose office is located at Helena, has been furnished, for his information and government, with all the existing formulæ adapted to facilitate and secure uniformity under the surveying system, and in order to accommodate miners or claimants on mineral lands under the provisions of the act of Congress approved July 26, 1866, he is directed, after first extending the lines of public surveys to portions of the mining regions, to proceed with the survey of the mining claims in strict conformity to the law and instructions, and at cost of claimants.

As the present and future prosperity of the people of Montana, in so far as their land interests are concerned, will materially depend upon the certainty of title, at the basis of which are the lines of public surveys, it has been enjoined upon the surveyor general, as indispensable to the successful discharge of his duties, to restrict his selection of deputies to men of high professional skill, experience, and established reputation for fidelity.

The surveying instructions direct that contracts shall be made for the survey of the base meridian, standard parallels, and for the township and sectional lines. It is required that the deputy surveyors shall be familiar with the use and practice of Burt's improved solar compass, and in order to insure uniformity in the establishment of the principal base meridian and standard parallels, in accordance with the principles laid down in the printed manual of surveying instructions, the surveyor general is directed to survey with the greatest care, and chain with the strictest accuracy, as upon those lines will depend the whole structure and correctness of the public surveys.

Lands deemed unfit for cultivation are not to be subdivided into sections, except in the mineral regions when required by claimants under the act of Congress approved July 26, 1866, deputies being inhibited from charging for any lines but such as may be actually run and *marked in the field, or for any* not actually necessary to be run under existing laws.

The organic act providing temporary government for the Territory of Montana prescribes no surveying rates per lineal mile. The Commissioner, therefore, in virtue of the third section of the act of Congress approved May 30, 1862, to "reduce the expenses of the survey and sale of the public lands in the United States," has fixed the price for the surveys in Montana in accordance with the appropriation act of July 28, 1866.

The attention of the surveyor general has been invited to the "act for the disposal of coal lands and of town property in the public domain," approved July 1, 1864, the supplemental act of March 3, 1865, and to the recent town-site act approved March 2, 1867.

In extending the surveys over towns or cities already existing on the public lands, it is stipulated that deputies shall designate in their field-notes the intersections of the public lines with the municipal out-boundaries, so as to determine their precise localities in reference to the particular township, range, and section, with a view to the ultimate adjustment of those out-boundaries with the surveys of public lands.

The Montana surveying department has been furnished with a four-pole chain of true standard measure, to be retained in the surveyor general's office for regulating the working chains of the deputy surveyors, each of whom is required to take to the field a similar standard for comparison and test, from time to time, of the chains in practical use.

A standard yard measure from the Superintendent of Weights and Measures has been obtained, so as to test the standard chain in the surveyor general's office.



While the maximum allowance per mile is established, the surveying department is required to have the work performed at as much less a rate as it can be done by experienced, well-tried, and faithful surveyors, intimately conversant with the system.

As a general rule, surveying contracts are to be restricted to limited fields of labor, so as to insure the work being thoroughly done within the period fixed in contracts, usually from four to six months.

It is required that the original township plats shall be protracted from the field-notes of surveys, the original plats to be retained in the surveyor general's office; duplicates and triplicates, to bear the same dates of approval as the originals, are to be prepared for the register of the district, and for the General Land Office.

By the first section of the act of Congress of 30th May, 1862, for reducing "the expenses of the survey and sale of the public lands in the United States," the Commissioner's approval of surveying contracts is prerequisite to their becoming binding, "except in such cases as the Commissioner shall otherwise specially order."

As the Montana fields of operation are so remote from the capital, it has been ordered that the exception shall apply to contracts for the surveys which are there to be made, and hence the Commissioner's sanction in all such legally executed contracts is given in advance, each contract, however, to be promptly reported for final action.

The 10th section of the act of May 30, 1862, authorizes the survey, at cost of parties, of the public lands not mineral or reserved by the government.

When an application may be made to the surveyor general under the law for the survey of a township, he is directed to estimate its cost according to established rates. When the expenses are thus ascertained, which are to be paid by survey applicants, and the latter shall have presented duplicate certificates showing that the requisite sums are placed to the credit of the surveying fund with a United States depository, it will then be the duty of the surveying department to have the survey properly executed.

In surveying the lines of the public lands containing coal it is required that the mineral shall be indicated in the field-notes, not only on the intersecting lines, but further, that the contour to such an extent shall be shown as will afford necessary data for delineating in dark purple, in smallest legal subdivisions, the coal beds and fields upon official plats.

In August last the attention of the Commissioner was drawn to an application presented by the governor of Montana for a geological survey. This Office then reported, and now submits, that there is no appropriation or any available means applicable to a geological survey of Montana. There exists in fact an interdict in a proviso to the act of Congress approved July 21, 1852, (Statutes at Large, volume 10, page 21,) to the following effect: "that there shall be no further geological survey by the government unless hereafter authorized by law."

The only geological survey now authorized by Congress is in process of execution in Nebraska, under an appropriation only to the extent of five thousand dollars, to be paid out of the unexpended balance of the appropriations made for defraying the expenses of the legislative assembly of the Territory of Nebraska. (Vide Laws 1866 and 1867, page 470.) In this connection it may be proper to state that in addition to the small geological appropriation for Nebraska, Congress, as shown in the 3d section of the act approved 2d March, 1867, have delegated authority to the War Department for a geological and topographical exploration of the territory between the Rocky mountains and the Sierra Nevada, including the route or routes of the Pacific railroad, provided the same can be done out of existing appropriations.

Montana, with the exception of a small projection, lies between the 45th and 49th parallels of latitude and the 104th and 116th meridians of longitude, embrac-

ing an area of 143,776 square miles, or 92,016,640 acres, all of which is subject to disposal as public lands.

#### RIGHTS OF PROPERTY—OPERATION OF THE PRE-EMPTION LAWS.

The relation of man to real property is a natural right, yet modified and regulated by institutions of the state. As all things originally belonged in common, according to the doctrine of writers on natural law, the exclusive right of property or land in severalty resulted from the acts of organized society, because the appropriation by an individual to himself of a portion of the earth's surface could not be effected consistently with justice unless the consent of mankind was given, either tacitly or by express declaration.

It is the remark of that distinguished American jurist, Chancellor Kent, that "the sense of property is inherent in the human heart, and the gradual enlargement and cultivation of that sense, from its feeble force in the savage state to its full vigor and maturity among polished nations, forms a very instructive portion of the history of civil society."

We realize the force of this view in tracing out the principles upon which rest the rights of property, and in doing so we mark the progress of mankind from the condition of hunters and fishermen to their advance in agriculture, in the mechanic arts, and in commerce, with all the civilizing influences of those elements of progress. Experience teaches that in the early ages, and in every age, labor, however, is the great agent of success and prosperity.

Directed in the infancy of the world by some knowledge of agriculture, its results were realized in the superabundant supplies drawn from the fertile valleys of the East. That knowledge was carried to Greece by Egyptian enterprise, the teachings of which withdrew the people from a wandering life, directed their attention to the culture of the earth, and founded a city, on the site of which subsequently arose in magnificence the citadel of Athens, the ancient and modern capital of the Hellenic states.

The science of agriculture subsequently passed to the Latin peninsula, and was there developed with all its benefits accruing in the property relations of the mighty state which held supremacy in the ancient world for a thousand years.

At a later historic period, when that state was dissolved and overthrown, the most numerous and powerful tribe of the Germans which appeared in Europe had no knowledge, or at most a very imperfect idea, of property in severalty. Like the American aborigines, real property was possessed by them in common.

It is the observation of the philosophic author of *De Finibus*, that "as in a theatre, though it be common, yet there are proper places for the several spectators it contains, so, though the world or a city is in common, yet this is no bar to every individual possessing a determinate share of property in either;" as man emerges from a primitive condition in the social scale, his relations to landed property gradually become changed and shaped for the ends of civilization.

The products of uncultivated soil are, as a general thing, of inferior quality. Writers on natural law assert the truth, that by labor and industry man soon renders the products of the earth more abundant and much superior, results of the utmost importance; and as by labor he thus changes the character of the soil, it is natural the occupant should have a right to that to which he had imparted enhanced value.

Rutherford, in philosophizing on the subject of property and contemplating the same in its primitive relations, maintains that when an individual enters upon land which had not previously been appropriated, with the purpose of making it his own, it will fairly become such when the members of the community, with opportunities of observing and understanding his purpose, show, in not molesting him, "they agree to let his design take effect;" but the evidence of that purpose the same author holds to be the act of occupancy, as the out-

ward sign by which the settler's purpose is made manifest, it being necessary, however, that the thing seized upon should be certain and determinate, assent not being implied where it is so uncertain and indefinite as to leave the intention obscure or doubtful.

These principles of natural law interwoven with congressional legislation are now found everywhere illustrated in the land administration. The proclamation of Congress in 1785, forbidding settlement on public domain; the act of 1804, of like import; the law of 1807, giving power to the President for the removal of any persons attempting to make a settlement therein until authorized by law, *all* yielded to the justice and policy of the pre-emption principle, which at the opening of this century had in special instances been legislatively asserted, and was afterwards developed in the general pre-emption laws of 1830, 1832, 1834, retrospective in their bearings, yet guarding pre-existing actual settlements by throwing around them the protection of law, and investing the settler with the right in soil to which he had imparted value by the labor of his hands. Seven years thereafter Congress laid the foundation of a permanent prospective pre-emption system by the law of September 4, 1841, which, with the act of March 3, 1843, operates upon lands remaining undisposed of after having been offered at public sale, as well as upon those not brought into market pursuant to the proclamation of the President of the United States, yet restricts the preference privilege to lands over which the lines of the public surveys have been extended. These laws, just to the actual settler, liberal in conceding to him one hundred and sixty acres, require of him the erection of a dwelling with actual inhabitation and cultivation.

They were enacted in the spirit of natural justice, so forcibly developed in the Ordenanzas de Terras y Aguas, by Galvan,\* in which regarding property as one of the fundamental principles of social order, it is held to have for its basis the relation between man and the fruit of his labor; that if the earth produced without effort all that was necessary for man's existence, property would be useless; that the field becomes to some extent a part of him who cultivates it by his will, his strength, the individual qualities inherent in his person, and that property should be distinct because each individual is distinct from every other. With earnest and steady purpose Congress has still further legislated in aid of actual settlers by holding out encouragement to take possession of the national soil without even awaiting the extension of surveys, and this has been done by acts of Congress passed in 1853, 1854, and 1862, opening the way to the agriculturist in most of the organized land districts stretching from the valley of the Mississippi to the Pacific ocean; also in subjecting the alternate even-numbered sections along the line of railroads to the preference right where settlements exist prior to final allotment, extending the preference principle to tracts once covered by invalid foreign titles, confirming occupants in their improvements on the odd sections along such lines where settlement was made before withdrawal for railroads, securing to cultivators their tracts even on school lands where the settlement was made before the survey and official designation of the school sections, yet allowing the cause of education full indemnity. These legislative measures carry with them stipulations requiring that the first evidence to be given of individual right shall be the visible signs of residence and cultivation, thus redeeming the soil from a state of nature, appreciating its value, and, while the cultivator draws from it comfortable support, the wealth of the country is in constant process of augmentation by the increase of its productive forces. Nor has the legislative department been unmindful of the importance of encouraging the founding and growth of towns and cities, provision of law for such interests having first been made in 1844, then by the acts of July 1, 1864, March 3,

\* De la Propriedad en General, por Galvan, in which the authorities he refers to are Garcia Malo en su Política Natural, and Locke in his Treatise on Civil Government.



1865, and finally with enlarged proportions by the act of March 2, 1867, "for the relief of the inhabitants of cities and towns upon the public land," whereby municipal settlements are authorized either upon surveyed or unsurveyed lands, and the extent of the grant with limitation graduated according to the number of inhabitants. By the pre-emption and homestead policy, places once desolate have been dotted with farms, villages, towns, and cities, showing that the land system has done its part in the great movement and unprecedented progress of the people of this country, which in 1775 had a population of 2,389,900,\* with limited resources, but which now contains over thirty-eight millions of inhabitants, whose industry, energy, and genius have established two million seven hundred thousand farms under cultivation, thirty thousand urban settlements, consisting of villages, towns, and splendid cities, linked together by telegraph and railways, our principal cities vying in the enlightened condition of the people in their industrial relations, social comforts, luxuries, and even in palatial establishments, with some of the capitals of Europe.

Experience, however, has shown the importance of some further legislation to generalize and give greater vigor to the pre-emption and homestead measures. To this end legislation is recommended, fixing limitation as to time within which pre-emptors upon unoffered lands shall make proof and payment, prescribing limitation as to appeals, and requiring, when a claim is initiated under the pre-emption or homestead, that the claimant shall consummate the same pursuant to the requirements of statute under which his claim had inception.

#### PRE-EMPTION RULING.

The question has been raised whether "an unmarried woman, over the age of twenty-one years, not the head of a family," has the right to pre-empt, on making proof of settlement and cultivation, as required by the pre-emption act of 1841.

The law extends the privilege to three classes, each having the qualification of citizenship, or having filed a declaration to that end :

1. "Every person being the head of a family."
2. "A widow."
3. "A single man over the age of twenty-one years."

The case presented not coming within the first or second class, the question arises whether it does fall within the third class, according to the spirit and intent of the statute.

In the opinion of all etymologists, the name designating our race is derived from the power or faculties of body and mind, with which man has been furnished by nature above all other animals.

The Anglo-Saxon word *mag-an* means to be able or strong; this, by elision, naturally glides into the word "man," a generic term, applying to both sexes, the original Saxon from which the English word is derived having been used in a sense so comprehensive as to mean "mankind," man, woman, a vassal, also any one, like the French "*on*," Gothic "*manna*"—the Hebrew meaning species, or kind. "That's woman's ripe age, as full as thou art at one and twenty."

Understanding the terms of the law in their wider sense, this Office has decided that an unmarried or single woman over the age of twenty-one years, not the head of a family, but able to meet all the requirements of the pre-emption law, has a right to claim its benefits, and that while *man* is the general term including each sex, the specific name in the Anglo-Saxon of wif-man having been given to the female from her in-door employment at the *woof*, shows that in the ordinary doings of society the sphere of woman is generally in household, rather than in the duties requiring labor in the field essential to the establishment of a farm.

\* Seybert's Statistics, page 27.

Therefore district officers have been charged in administering the law, under this construction, that it must be borne in mind the relations to agricultural labor of single women are generally different from those of single men; the former possessing more delicate organization are not usually separated from their parents or natural protectors, and hence that care must be taken this ruling shall not lead to abuse; that the claims of unmarried daughters are not to be recognized when their parents are householders, and where the purpose of the applicants in separating from their families may be merely to secure several different tracts of land, so that the title may eventually centre in a common head.

All the facts of individuality of interest, of residing on and cultivating the tract for a period long enough to show good faith, are required to be fully proven, so that, while abuse of the privilege is avoided, the right to the meritorious may be secured.

#### HOMESTEADS.

Although the pre-emption system has achieved results of such signal and permanent importance to the national prosperity, encouraging and protecting advancing columns of settlement on the public domain, with all the elements of civilization, of comfort and happiness to individuals and communities, its great adjunct, the homestead law of May 20, 1862, and supplements, hold out still further inducements to settlement in the spirit of enlarged liberality.

What a contrast in the relations of our people as freeholders with those of the British islands! There the ratio of landholders to the population has been steadily decreasing for centuries; here the increase by multiples is without precedent in the progress of nations.

In England, at the close of the eleventh century, William the Conqueror had a general survey made of all the lands in the kingdom, the extent in each district, their proprietors, tenures, value, the quantity of meadow, pasture, wood and arable land, whereof the Domesday Book was the record, containing an exact account of all the landed estate of the realm, the population of which, it is supposed, was then a million and a half, while the landholders numbered forty-five thousand seven hundred and six. At the British revolution in 1688, six centuries after the death of the conqueror, a careful exhibit was prepared of the income and expenditures of the people of England for that year, when the population was estimated at five million five hundred thousand, the freeholders at one hundred and sixty thousand, recently revised data making the number as high as one hundred and seventy thousand. From that period to the present age the inequality has gradually become greater in the distribution of territorial wealth, as the British census of 1861 shows that while in that year the population of England was twenty million sixty-six thousand two hundred and twenty-four, the landed proprietors had decreased to only thirty thousand seven hundred and seventy-six, so that the whole landed property of England is owned by less than one six hundred and fifty-third part of the people.

Turning from that condition of things in the European world, where, as we are told, the great commercial phenomenon of the age is, that consumption is outstripping production, and the products of the soil cannot be had in sufficient abundance for human wants, let the immigrant look to this land, where in ninety years we have founded an empire republic, in every region of which are farms and cities, continually increasing, where the freeholders, rural and urban, may be set down at five millions, and where every man by a few years' labor may become the owner, for a nominal consideration, of one hundred and sixty acres of land, by which, with industry, he can make a comfortable home, and produce the means of subsistence sufficient to furnish not only the necessities but conveniences of life.

To our own citizens, also, those who are restless under the slow struggle for independence incident to the crowded population of the eastern and middle

States, the broad prairies of the west and fertile regions of the south offer fine fields for the exercise of energy, the homestead laws presenting special inducements for the realization of their beneficent provisions.

In return for the generous grant of land offered by the homestead statutes, they require not only that the settler shall build upon the tract a house for himself, but that he shall make it his home, cultivating and improving the land. Nothing less, indeed, could reasonably be demanded as a recompense for the donation, yet the statute insists on the fulfilment of its conditions of honest labor, and unless the claimant yields such equivalent the law withdraws the gift, tendering it to others willing to meet the requirements.

What hitherto has been the result of these great measures?

From the commencement of operations their advantages have become gradually developed, the settlements have increased annually, the last fiscal year showing nearly two millions of acres of homestead entries, while the total area of the public domain thus absorbed to the 30th June, 1867, exceeds seven millions, represented by over fifty-nine thousand farms; of this quantity since the passage of the act of June 21, 1866, two hundred and sixty-four thousand four hundred and eighty acres have been entered in the southern land States alone, that area representing nine hundred and sixteen farms of forty acres each, and two thousand eight hundred and forty-eight farms, each containing eighty acres, being a total of three thousand seven hundred and sixty-four homesteads added to the productive forces of those States, the residue of the homestead settlements being scattered over the national territory from the fertile valley of the Mississippi to the shores of the Pacific.

The wealth of the nation has been materially increased by the redemption of these seven millions of acres from the wilderness of nature, their conversion into fifty-nine thousand settlements, in appreciating the value of the soil, and augmenting the agricultural products of the country.

The administration of the homestead system has given rise to numerous questions affecting the rights of parties as indicated in the following

#### HOMESTEAD RULINGS.

A case was before the Commissioner, upon an application to cancel homestead entry, in which the testimony showed it to have been made while the claimant was serving in the army of the United States; that he was mustered out of the service in May, 1866; soon thereafter built a small shanty and commenced work upon the homestead, continuing to occupy the same, with frequent absences, though not at distant intervals.

It was held that the claimant had not abandoned his tract; yet the character of his improvement and manner of residence were not such as the law contemplates. The cancellation of this entry was declined on the evidence adduced, while a more complete compliance was called for under the law. It was insisted that the settler must put upon the land such a house as may answer for permanent residence—not merely a place of temporary resort in order to show his intention to comply with the law—and make the land what the statute intends—his actual homestead. A period of sixty days from the date of notice was allowed within which to complete his house and move therein, it being required at the expiration of that time that he should appear before the register and receiver and show by affidavit, supported by corroborative testimony, compliance with such requirements.

An entry has been presented in which the homestead was made and commuted before the expiration of five years from its date, and the point submitted was whether the settler could make another like entry. The sixth section of the homestead act of 1862 is specific in its declaration “that no individual shall be permitted to acquire title to more than one quarter section under the



provisions of this act." Therefore it is held that when a party acquires title under any of the provisions of this act, his privilege is thereby exhausted.

Inquiry has been made whether persons employed in the military or naval service of the government may take homesteads under the amendatory act of 21st March, 1864, and obtain title to the land, supposing their time of service to absorb all of the five-year period for settlement and cultivation.

The ruling is that actual settlement and cultivation of the land are required by law; hence title cannot be acquired unless the party, immediately upon discharge from service, enters upon the land, makes it his home, and cultivates the same, as required by the original act of 20th May, 1862; actual settlement upon and cultivation being required in all cases.

In the second section of the law of 20th May, 1862, it is stipulated in regard to settlers that in the case of the death of both father and mother, leaving an infant child, or children under twenty-one years of age, the right and fee shall enure to the benefit of the infant child or children; and that the executor, administrator, or guardian may sell the premises for the benefit of the infant heirs at any time within two years after death of the surviving parent, and in accordance with the law of the domicile.

The question has been made as to whether it is imperative the land shall thus be sold under the statute for the benefit of the heirs, or whether they can retain title under the original settlement.

The Commissioner rules that there is no objection under the general provisions of the law to the maintenance of settlement and cultivation on the part of the heirs, and the issue of the patent in their names at the expiration of the required time; yet in such case the minor heirs must continue to reside upon the homestead, and the settlement and cultivation of the same must be continued for their benefit.

In the case of a homestead settler who died unmarried, and whose father applied for preference right to take by ordinary purchase at \$1 25 per acre, it is held that although privilege could not be granted, yet on satisfactory showing of the death of the settler, with proof of his previous settlement and cultivation, the land could be paid for at \$1 25 per acre by the heirs of the deceased settler, under the eighth section of the act of 20th May, 1862, and entry made under that section in favor of the heirs of the decedent, following in this respect the rule prescribed by the second section of the act of 3d March, 1843, in regard to deceased pre-emptors.

#### HOMESTEAD COMMUTATIONS WITHIN RAILROAD LIMITS.

In the Secretary's decision of 22d June, 1866, as communicated in our circular of 25th August, 1866, the question discussed was the rights of pre-emption settlers to commute their filings on odd sections after the railroad withdrawal had been made. The Secretary then decided "the homestead settler's right attaches only from the date of entry," the pre-emptor from the date of his actual personal settlement; hence, if the commutation is not made prior to withdrawal, it cannot be made afterwards, the railroad grant taking effect immediately upon the abandonment of the pre-emption for the homestead.

By parity of reasoning this principle will apply to the *even sections* within the granted limits, in the matter of price; hence, if a party fail to commute prior to the increase from minimum to double minimum, he cannot commute afterwards at the rate of \$1 25 per acre, because upon the relinquishment of the pre-emption claim, the double minimum immediately attaches, and he will be required either to prove up as an original pre-emptor at \$1 25 per acre, or in commuting to restrict the homestead claim to 80 acres.

Inquiries have been presented as to what is required of heirs at law desirous of making payment under the 8th section of the act.

The requirements are the production of evidence of heirship, with proof that

the deceased settler had fully met the requirements of the statute by residing upon and cultivating the tract up to the date of decease; and, further, that the improvements had been continued and residence maintained by the heirs upon the homestead after the death of the settler; or, in case residence and cultivation had not been continued, proof that at the date of the application a sufficient time had not elapsed since the decease to work a forfeiture of the claim.

Instances have occurred in which a widow has made a homestead settlement and thereafter marries a person who likewise made a similar settlement on another tract. It is ruled that the parties may elect which tract they will retain for permanent residence, and that on proving up settlement under the 8th section of the act of May 20, 1862, the title to the remaining entry may be perfected by the original settler.

#### THE RIGHTS OF FOREIGNERS IN RELATION TO THE ACQUISITION OF TITLE TO PUBLIC LANDS.

As aliens cannot acquire valid titles to real estate under the pre-emption and homestead laws, the privileges of which are restricted to citizens, or those who have declared their intention to become such, it is important that foreigners seeking identification with the American community should be advised of the legal steps necessary to acquire citizenship. To that end it is submitted that any free white alien, over the age of twenty-one years, may at any time after arrival declare before any court of record having common law jurisdiction (with a clerk or prothonotary and seal) his intention to become a citizen, and to renounce forever all foreign allegiance. The declaration must be made at least two years before application for citizenship. (U. S. Statutes, vol. 2, page 153, and vol. 4, page 69.)

At the expiration of two years after the declaration, and at any time after five years' residence, the party desiring naturalization, if *then* not a citizen, denizen, or subject of any country at war with the United States, should appear in a court of record, and there be sworn to support the Constitution of the United States and renounce foreign allegiance. If he possessed any hereditary title or order of nobility, such also must be renounced, and satisfactory proof produced to the court by the testimony of witnesses, citizens of the United States, of the five-year residence in the country, one year of which must be within the State or Territory where the court is held, and that during the five-year period he was a man of good moral character and attached to the principles of the Constitution; whereupon he will be admitted to citizenship, and thereby his children under twenty-one years of age, if dwelling in the United States, will also be regarded as citizens. (U. S. Statutes, vol. 2, page 155.)

Where the alien has made his declaration and dies before being actually naturalized, the widow and children become citizens of the United States and entitled to all rights and privileges as such, upon taking the prescribed oaths. (U. S. Statutes, vol. 2, page 292.)

Any free white alien, being a minor, and under the age of twenty-one years at the time of arrival, who has resided in the country three years next preceding his majority of twenty-one years, may, after reaching such period and on five years' residence, including the three years of his minority, be admitted to citizenship without a preliminary declaration of intentions, provided he *then* makes the same, averring also on oath and proving to the court that for the past three years it had been his intention to become a citizen; also showing the fact of his residence and good character. (U. S. Statutes, vol. 4, page 69.)

Children of citizens of the United States born out of the country are deemed citizens, the right not descending, however, to persons whose fathers never resided in the country; and any woman who might legally be naturalized, married, or who shall be married to a citizen of the United States, is held to possess citizenship. (U. S. Statutes, vol. 10, page 604.)

An alien twenty-one years of age and over, who has enlisted, or shall enlist, in the regular or volunteer armies of the United States, and be honorably discharged, may be admitted to citizenship upon his simple petition and satisfactory proof of one year's residence prior to his application, accompanying the same with proof of good moral character and honorable discharge. (U. S. Statutes, vol. 12, page 597.)

#### LAND CONCESSION IN THE CAUSE OF EDUCATION.

The importance attached to an educational system by the founders of the republic is shown by the provisions they made for its encouragement. Indeed, in the earliest settlements on this continent of the Anglo-Americans, measures were adopted in the cause of education not only as essential to morals, social order, and individual happiness, but as necessary to new and liberal institutions. Every immigrant ship had its schoolmaster on board, each settlement erected its school-house, and the cultivation of the mind advanced with the culture of the soil from the landing of the Mayflower through our colonial history. A prominent illustration of this is found in a memoir published in 1749 at Philadelphia, by Benjamin Franklin, in advocacy of the establishment of an institution of learning, attributing the prosperity of the people of the provinces to the wisdom and good management of the first settlers, who were well educated men, and suggesting a course of study in which should be taught those branches "likely to be *most useful* and *most ornamental*," suggesting, in style peculiar to that great statesman and philosopher, the noble purposes which should constitute "the great *aim* and *end* of all learning."

After the erection of the States into an independent republic, and before the adoption of the Constitution, the continental Congress, by the ordinance of 20th May, 1785, respecting the territory northwest of the Ohio, prepared the way for the advance of settlements and education as contemporaneous interests. They determined that in every six miles square there should be established the school system, to be supported from a fund derived from the grant of section sixteen, of six hundred and forty acres, in every township; and at a later period for indemnity, where the section in place was not available; thus at that early day conceding one thirty-sixth part of the public lands in the interests of public instruction.

The movement in the cause of education was not then confined to the legislative department, for at an early period the public mind was aroused to the importance of the subject by elaborate papers emanating from eminent men, among whom stands conspicuous Dr. Benjamin Rush, one of the signers of the Declaration of Independence, who in 1786 memorialized the legislature of Pennsylvania in favor of a thorough system of popular instruction, maintaining that it was favorable to liberty, as freedom could only exist in the society of knowledge; that it favors just ideas of law and government; that learning in all countries promotes civilization and the pleasure of society; that it fosters agriculture, the basis of national wealth; that manufactures of all kinds owe their perfection chiefly to learning; that its beneficial influence is thus made coextensive with the entire scope of man's being, mortal and immortal, individual and social. At a later period, 1790, the same great man addressed a congressional representative from Pennsylvania, declaring that the "attempts to perpetuate our existence as a free people by establishing the means of national credit and defence" are "feeble bulwarks against slavery compared with the habits of labor and virtue disseminated among our people;" adding, "Let us establish schools for that purpose in every township in the United States, and conform them to reason, humanity, and the state of society in America," and then will "the generations which are to follow us realize the precious ideas of the dignity and excellence of republican forms of government."

In all this is distinctly seen the paramount importance attached to a system



of instruction as the undisputed element of individual and national prosperity, and the interest thus felt moulded public sentiment and gave shape and direction to public affairs.

Enlarging upon this idea, it was determined in the new land States and Territories, the localities of which were distant from the political centre or centres of settlements, to increase the school concessions to two sections, or twelve hundred and eighty acres in each township, so that the school-house, high-school, and seminary could be so advantageously placed in the township as to avoid inconvenience in daily attendance on scholastic discipline.

Besides the school allotment, provision has been made, on a liberal scale, for seminaries of learning and colleges, so that the land fund may be adequate to the support of institutions in which are taught all the higher branches of a liberal education, and which, as a central light in the field of science and literature within such limits, may serve to inspire confidence and greater interest in kindred institutions created by the people, from their own resources; and in the practical application of the knowledge thus acquired, to give additional impetus to substantial progress—to intellectual and moral elevation.

The first settlements were confined to a comparatively narrow strip on the Atlantic coast; but as immigration increased and the settlers sought homes further to the west, Territory after Territory became organized, and State after State added to the original thirteen, until our limits are from ocean to ocean.

At each successive step in national extension, provision has been made in the interest of education. To each organized Territory the sections in place and townships for seminaries have been reserved, and by the act of admission as a State into the Union the reservation has been carried into grant and confirmed. If there be added to the quantity already conceded to the public land States for school purposes, the area that will pass, according to the principles of existing legislation, to the organized Territories when they shall become States, it will be found that the aggregate will reach seventy million five hundred and fifty-nine thousand one hundred and twelve acres. Besides, there have been granted for seminaries of learning one million two hundred and forty-four thousand one hundred and sixty acres, making an aggregate thus conceded in the cause of learning of seventy-one million eight hundred and three thousand two hundred and seventy-two acres, much of it of great value, and from which, if properly invested, ample funds may be derived for the continual support of the great object contemplated by the munificent grant.

Neither has Congress been indifferent to the cause of education in the former Spanish cities and towns of Missouri, for by the acts of 1812, 1824, and 1831, one-twentieth of the vacant public land within the limits of the places named in these laws has been conceded, from which has inured a most liberal donation to the city of St. Louis.

For the support of colleges for education in agriculture, mechanics, and in the mineral interests, a concession has been made by the act of 2d July, 1862, and its supplements. These laws make provision not only for the States holding public domain, but for others which have none, giving to the former the right to select within their limits, and to the latter scrip redeemable in land; the amount conceded being thirty thousand acres for each senator and member of the House, and when made applicable to all the States, will include an area of nine million six hundred thousand acres.

Our progress in civilization, with liberal principles of government, is attributable to education, beginning in the nursery, nurtured and stimulated in primary schools, expanded by academic teachings and in the higher institutions of learning. In regarding the subject in its bearing upon the whole State, its importance cannot be overestimated.

Most of our early statesmen gave earnest of the deep interest they felt in this subject. President Washington, in the first annual message, January 8, 1790,

after bringing to the attention of Congress other subjects of public moment, declared that "Knowledge is in every country the surest basis of public happiness. In one in which the measures of government receive their impressions so immediately from the sense of the community as in ours, it is proportionally essential. To the security of a free Constitution it contributes in various ways: by convincing those who are intrusted with the public administration that every valuable end of government is best answered by the enlightened confidence of the people, and teaching the people themselves to know and value their own rights; to discern and provide against invasion of them; to distinguish between oppression and the necessary exercise of lawful authority—between burdens proceeding from a disregard of their convenience and those resulting from the inevitable exigencies of society; to discriminate the spirit of liberty from that of licentiousness—cherishing the first, avoiding the latter, and uniting a speedy but temperate vigilance against encroachments with an inviolable respect to the laws."

These views were reiterated and enforced in the last message of President Washington, December 7, 1796.

The elder Adams, in his inaugural, with a force and beauty peculiar to his powerful intellect and ripe scholarship, indicated a love of science and letters, and his wish to patronize "every rational effort to encourage schools, colleges, universities, academies, and every institution for propagating knowledge, virtue, and religion among all classes of the people, not only for their benign influence on the happiness of life in all its stages and classes, and of society in all its forms, but as the only means of preserving our Constitution from its natural enemies, the spirit of sophistry, the spirit of party, the spirit of intrigue, the profligacy of corruption, and the pestilence of foreign influence, which is the angel of destruction to elective governments."

His illustrious successor, Mr. Jefferson, in his message of December 2, 1806, enforces the same idea, declaring that "public instruction can alone supply those sciences which, though rarely called for, are yet necessary to complete the circle, all the parts of which contribute to the improvement of the country, and some of them to its preservation." President Madison, too, in several messages recommended the establishment of a national seminary of learning, maintaining that, "though local in its character, it would be universal in beneficial effects, by enlightening the opinions, by expanding the patriotism, and by assimilating the principles, the sentiments, and the manners of those who might resort to this temple of science, to be redistributed in due time through every part of the community, so that thereby the sources of jealousy and prejudice would be diminished, the features of a national character multiplied, and greater extent given to social harmony." Not only has this interest received the countenance and support of the statesmen of the Revolution, but the cause has had its earnest advocates in successive occupants of the presidential chair, and to these may be added the name of the great American statesman, Daniel Webster, who, in referring to the importance of learning and its results, looked forward to the period when in the villages and farm-houses "there may be undisturbed sleep within unbarred doors," the successive acts of our national legislature in liberal land endowments having justly reflected the universally prevailing popular sentiment in this important respect.

As the educational system has thus received the support of illustrious statesmen, its basis—a common school tuition—having been enlarged so as to embrace the higher departments of science and letters, and immense grants having been given for the establishment of agricultural and mechanic colleges, it is suggested that the time has arrived when in this respect our great mineral interests should be considered. It is estimated that the existing imperfect system for reducing ores results in an annual loss of twenty millions of dollars. It is known that minerals "are so combined and intermixed with each other and with worthless matter as frequently to resist the most skilful attempts to

separate and successfully and economically work them by the application of the most approved methods known to men best versed in the analytical sciences applicable to the art of the metallurgist." It is therefore respectfully suggested and recommended that an adequate land fund be set apart for establishing a college in which may be taught all the sciences and arts connected with this important interest.

#### CONCESSIONS FOR MILITARY AND NAVAL SERVICES.

From the earliest era of our history the policy in rewarding the defenders of the country has been marked by liberality, keeping pace with the progress and growth of the republic, and indicating in this respect the national gratitude and appreciation.

For services in the war of the Revolution the Congress of the United States made provision by appropriating lands for the officers and soldiers in the Virginia line and navy, according to the promises of State legislation, the aggregate thus conceded, including scrip, amounting to 6,080,725 acres. Patents, or fee-simple titles, have been issued in favor of the individual owners to within a fraction of that quantity.

For services in the continental line, as stipulated in congressional resolution of September 16, 1776, an act was approved June 1, 1796, setting apart four thousand square miles in Ohio, known as the United States military district, of which 1,156,300 acres were selected for military claims, the residue having been subsequently laid open to disposal as other public lands.

For services in the war of 1812 with Great Britain, there were issued, pursuant to the act of May 6, in that year, and its supplements, 29,186 warrants, embracing an aggregate of 4,845,920 acres. For nearly all of these, patents have been issued to the individual warrantees or their heirs, in tracts, the greater portion of one hundred and sixty acres each, and the residue, or double bounties, of three hundred and twenty acres.

In early legislation certain tracts of country with defined limits were set apart for the satisfaction of the warrants, to which in locating they were restricted. The reservations were known as "military districts."

The United States warrants for services in the war of the Revolution were restricted to the "United States military district, Ohio."

The warrants for services in the war of 1812 could only be laid upon tracts in the six million acres embraced in the "military districts of Illinois, Missouri, or Arkansas." Subsequently, in virtue of the act of July 27, 1842, reviving authority for the issue of warrants for services in the Revolution and war of 1812, all military land warrants may be located upon any of the public lands "subject to sale at private entry."

The object of the "military reservation" system was to induce settlement and cultivation in those localities by the soldier. The then remoteness of those districts from the great centres of population, the eastern and middle States, defeated the object, leaving the patented lands to pass into the hands of speculators, or become liable to forfeiture for non-payment of State taxes. These results led to the abandonment of the system, and to the extension of the privilege to the soldier or his assignee to select in satisfaction of the warrant any lands of the United States subject to private entry.

The soldier was still further benefited and protected by a stipulation existing in all the bounty-land laws prohibiting the seizure or sale by legal process of the warrant to pay any debt contracted prior to the issue of patent for the land selected, and all sales, letters of attorney, or written instruments affecting the title to the warrants executed prior to the issue thereof, are declared to be null and void, thus effectually securing to the soldier if so disposed, a home for himself and family.

The war with Mexico was proclaimed on the 13th of May, 1846, and on the



11th of February, 1847, an act was passed pursuant to which 88,217 warrants were issued, representing 13,204,880 acres. For the greater part of these, grants, in 160-acre tracts, have been made to individuals entitled, leaving about one-fifteenth unlocated, which the General Land Office is prepared to satisfy by the issue of patents to the owners as rapidly as they may be presented from time to time, with the description of the tracts selected.

Pursuant to the act of 28th September, 1850, there have been issued for services in all the Indian wars since 1790, in the war of 1812, and to the commissioned officers in the war with Mexico, one hundred and eighty-nine thousand one hundred and six warrants, covering an aggregate of 13,164,960 acres, of which less than a thirteenth remains unsatisfied, a residuum the obligation in regard to the settlement of which will be met on demand.

The law of the 22d March, 1852, making land warrants assignable, extended the provisions of the act of 1850, and under that extension eleven thousand nine hundred and eighty-three warrants have been delivered, embracing 693,880 acres, complete titles for the greater portion having been granted to the individual claimants.

Finally, on the 3d March, 1855, a statute was passed still further enlarging the basis of such concessions. It grants to all officers and soldiers who had served in any war in which our country had been engaged, from the Revolution to the 3d March, 1855, 160 acres each, or so much, with what had been previously allowed, as would make up that quantity. It extends the concession to a service of only fourteen days or an engagement in a single battle, and, in case of death, to the widow or minor children.

From the period in 1776, in which this republic took its position in the family of nations to the year 1855, the quantity conceded for military and naval services has reached an aggregate of 71,714,555 acres—sufficient to make nearly nine hundred thousand farms of eighty acres each, and that, too, not of inarable or medium lands, but choice, select soil, in congenial latitudes.

#### INDIAN INTERESTS CONNECTED WITH THE GENERAL LAND OFFICE OPERATIONS.

An examination has been instituted at this office to determine the limits of the Cherokee neutral lands, in order to survey them, in conformity to the provisions of the treaty of September 29, 1865, and particularly in regard to the southern boundary thereof, which is coincident with the common boundary between the Osage reservation and the Cherokee lands as surveyed under the provisions of the second article of the treaty of December 29, 1835, with the latter Indians.

That examination has elicited the fact of the existence of a parcel of land between the southern boundary of the State of Kansas (astronomically established on the 37th parallel) and the Osage reservation. The eastern part of it, extending west from the State line of Missouri to the intersection with the Neosho river, and situated between the Cherokee neutral lands on the north and Quapaw lands on the south, is found to be public lands, while that portion lying west of the Neosho river and extending due west 288 miles 13 chains and 66 links by actual survey, as the northern boundary of the Cherokee neutral lands under treaty of December 29, 1835, and terminating on the 100th meridian west from Greenwich, is ascertained to be Indian land, being situated between the common boundary of the Osage and Cherokee neutral tract on the north and the southern boundary of the State of Kansas on the south.

The tract in question was found to be about two and a quarter miles in width, by actual admeasurement of a meridional line at a distance of one mile east of Verdigris river, on the southern boundary of the State of Kansas, while determining the western line of the Osage lands sold by them to the United States by treaty of September 29, 1865.

These premises, though evidently intended to have been ceded in trust by the Cherokees to the United States, to be surveyed and sold in their behalf, have not been subdivided, or even in contract for that purpose, owing to an incongruity existing in the seventeenth article of the treaty, which appears to refer to the fourth article of the previous treaty of 1835, and to quite an irrelevant matter, and requiring, in the opinion of this Office, an amendatory treaty with the Cherokees, in order to perfect the treaty of July 27, 1866, in that respect.

*Pueblos.*—These Indians are tillers of the soil, living in houses of peculiar structure, built, generally, of adobe, many of them two stories high, with the entrance at the top by ladders, drawn up when the inmates were housed or in case of danger. This peculiar style of construction was adopted for protection from enemies, the Pueblos being frequently attacked by roving hostile bands of Indians. The Pueblos several times revolted against the conquerors, but, after subjugation, grants bearing the village names were made to them under the former governments.

By the act of Congress approved 22d December, 1858, the titles to seventeen of these pueblos in New Mexico were confirmed, the surveys in sixteen of them approved, and patents for the same have been issued, covering over four hundred and fifty-three thousand four hundred acres. These consisted of the pueblos of Jemez, San Juan, Picuris, San Felipe, Pecos, Cochiti, Santo Domingo, Taos, Santa Clara, Jesuque, San Ildefonso, Pojoaque, Zia, Sandia, Isleta, and Nambe. For the pueblo of Acoma, confirmed by same act, no survey has been returned, nor for the Laguna, confirmed by act of 21st June, 1860.

Report has been received from the surveyor general of the pueblo of Santa Ana, which has been sent to the department for submission to Congress. In relation to this pueblo, it appears that, by decree of August 6, 1766, of Governor Tomas Velez Cachupin, a grant was made to the pueblos of Jemez, Zia, and Santa Ana, *in common*, of the lands situated between those pueblos and the Puerco river, the grant extending, from north to south, from the Ventand to the Stone ford, eight leagues, more or less, and from the pueblo of Zia west to the Puerco river, about six leagues. The surveyor general, under date August 6, 1867, reports that the original papers in regard to this concession were brought by the Indians of Zia to the surveyor general's office, where a transcript and translation were made and the original returned to the Indians of the pueblo.

The tracts embraced in this grant, according to the report from the alcalde, sent by the Spanish government to examine the matter, are only fit for pasture. The additional grant claimed under the proceedings of Governor Cachupin would add two hundred thousand acres to the lands of the three pueblos above named.

There is no record in the office of the surveyor general concerning the pueblo of Zuñi. That officer reports that he has seen their cultivated fields fifteen miles east and six miles west of the village, and has been informed they cultivate for a considerable distance north and south of the town. For the geographical position of the Pueblo villages in New Mexico, reference is made to the map accompanying annual report herewith of the surveyor general.

*Indian lands.*—During the fiscal year ending 30th June, 1867, and the first quarter of the current fiscal year, five hundred and fifty Indian patents have been issued, embracing in the aggregate eighty-nine thousand eight hundred and twenty-four acres.

The patents were issued under various treaties and acts of Congress relative to the Winnebagoes, Sacs and Foxes of the Mississippi, Sacs and Foxes of Missouri, Kansas Indians, Stockbridges, Pottawatomies, Pawnees, Poncas, Shawnees, Osages, Delawares, and Creeks. Of this quantity thirty-three thousand and eighty-nine acres were patented under acts of Congress for the disposal of Indian lands in trust for the use and benefit of the Winnebago and Kansas Indians.

## FOREIGN TITLES WHICH ORIGINATED UNDER THE FRENCH, SPANISH, BRITISH, AND MEXICAN GOVERNMENTS.

In acquiring territory the United States have stipulated in different treaties for the recognition and protection of private property. This has been done, not only as a measure of justice, but in coincidence with the public law.

*California.*—Under the several acts of Congress for the settlement of Spanish and Mexican claims in that State, surveys have been reported in three hundred and sixty-seven cases, covering five million six hundred and ninety thousand five hundred acres; and of these patents have been issued for two hundred and seventy-five claims, embracing four million three hundred and sixty-three thousand three hundred acres.

*Florida, Louisiana, and Missouri.*—The act of Congress approved 2d March, 1867, continues in force for three years the provisions of the statute of 22d June, 1860, “for the final adjustment of private land claims in the States of Florida, Louisiana, and Missouri, and for other purposes.” That act constituted the registers and receivers of the several land offices in Florida, Louisiana, and the recorder of land titles at St. Louis for the State of Missouri, commissioners to hear and decide, under instructions from the General Land Office, all matters respecting claims to land within their several districts. The law confers power upon them to receive only such claims as are founded on *written* grants, and hence interdicts action upon any interest founded merely on ancient settlement, when the same is unaccompanied by paper title from the authorities of the former government.

These statutes authorize the reception and action upon such claims for tracts within the several districts as have emanated from any foreign government, bearing date prior to the cession to the United States of the territory out of which the States were formed, or during the period when any such government claimed sovereignty or had the actual possession of the district or territory in which the lands so claimed are situated. This warrants them in receiving and acting, not only upon claims which originated under the former governments while the authorities exercised the granting power *de jure*, before the cession of the country, but also allowed claims to be received which were made by the Spanish authorities while they were in actual occupancy of territory as the government *de facto*. Thus, for example, Spain parted with authority over the province of Louisiana by the secret treaty of 1800 at San Ildefonso, when that power ceded Louisiana to France. During the period that elapsed from that time to the cession to the United States in 1803, by Napoleon, the Spanish authorities exercised the granting power; and so, several years subsequent to 1803, Spain, while in occupancy of the ancient province of Louisiana between the Iberville or Manchac and the Perdido, continued to make land concessions; and during this period the grants were, of course, those of the government *de facto*. Titles of this class stood excluded by the ruling of the Supreme Court of the United States in the case of Foster and Elam *vs.* Neilson, (2 Peters’s Supreme Court of the United States,) in which an elaborate decision was rendered by the Chief Justice against their validity under the then existing laws and treaties. Now, by the force and effects of the said acts of 1860 and 1867, a status is given to claims founded on titles from *de facto* governments after the authority *de jure* had passed from them, a principle being thus legislatively recognized which had not previously been done nor admitted in the judicial rulings of the Supreme Court of the United States.

Numerous claims that had their origin from governments which preceded the United States in sovereignty on this continent, have been finally confirmed by boards of commissioners, and by judicial decrees; but the greater number have been affirmed by direct legislative acts operating upon official reports submitted from time to time to Congress, from an early period.



In multitudes of cases parties in interest seem to have rested, as sufficient evidence of their right, upon the decrees or acts of confirmation and actual possession, and hence the apathy in that respect which has existed in not applying for patents or complete titles as authorized by acts of Congress.

The General Land Office, however, is prepared to meet all lawful demands in the way of conferring such complete titles, where the terms of confirmation shall have been fully met by the rendition of authenticated plats of surveys, accompanied by the patent certificates, the statutory provisions generally making such instruments the necessary basis of patents from the United States.

#### LEGISLATION IN RELATION TO DISCONTINUANCE OF SURVEYING DISTRICTS.

An act for the discontinuance of the office of surveyor general in the several districts, so soon as the surveys therein shall be completed, was approved June 12, 1840. (Section 1, Statutes, vol. 5, p. 384.)

Another law was passed January 22, 1853, (Statutes, vol. 10, p. 152, amendatory of that of June 12, 1840,) providing that the field-notes, maps, records, and papers, may be turned over to the State authorities when a surveyor general's office is discontinued; the amendatory statute clothes the Commissioner of the General Land Office with authority to act *ex officio* as surveyor general, the statute stipulating in behalf of the United States for free access to the archives after the same shall have been delivered to the State.

Pursuant to those enactments the archives were delivered, years ago, to the authorities of Ohio, Indiana, Michigan, Alabama, Mississippi, and more recently to Missouri and Wisconsin, the public surveys having been completed in those States. The records for Arkansas and Illinois, where the field-work has been finished, are awaiting, as preliminary to delivery, the State legislative acceptance, according to the terms presented by acts of Congress. In Arkansas the completed archives, in 1859, were placed for safe-keeping with the register at Little Rock; other records connected with the surveys in that State are in charge of the General Land Office, while the surveying records for Illinois remain in the custody of the recorder of land titles at St. Louis. In Iowa, where the field-work is completed, the surveying records are at Dubuque, in anticipation of the requisite State legislative acceptance of the same.

In Louisiana and Florida the surveys are far advanced towards completion; but the events of the last few years have produced such results in regard to that service as to render proper the suggestion that legislative provision be made for filling the offices of surveyors general for these States for a period long enough to place the service in a satisfactory condition for winding it up; the archives for Louisiana being now in possession of the United States land office at New Orleans, while those for Florida are at Tallahassee.

#### LEGISLATION RESPECTING THE DISCONTINUANCE OF LAND OFFICES.

The law of June 12, 1840, second section, (Statutes, vol. 5, p. 384,) orders that whenever the quantity of land remaining unsold in any district shall be less than one hundred thousand acres, the district shall be discontinued, and the land unsold made subject to sale at the land office most convenient to the place in which the land office shall have been discontinued.

The 7th section of the act of September 4, 1841, (Statutes, vol. 5, p. 455,) declares that land districts may be continued, if the quantity of land unsold does not equal one hundred thousand acres, should such continuance be required for public convenience, or in order to close the land system in the State.

The law of March 3, 1853, (Statutes, vol. 10, p. 194,) provides that land offices may be annexed to adjacent districts by the President, whenever the cost of collecting revenue from sales of public lands in a district amounts to one-third of the whole revenue there received, if, in his opinion, the consolidation is not incompatible with the public interest.

By the act of March 3, 1853, (Statutes, vol. 10, p. 244,) authority is conferred upon the chief executive to change the seats of land offices.

The first section of the act of February 18, 1861, vol. 12, page 131, authorized the register and receiver of the consolidated office, at Boonville, Missouri, to receive fees for certain services. The second section of that law allows office-rent and clerk-hire, if sanctioned by the Secretary of the Interior. The third section extends the provisions of that statute to all consolidated offices.

In the fifth section of the law of 30th May, 1862, vol. 12, page 409, it is declared that upon recommendation of the Commissioner of the General Land Office, approved by the Secretary of the Interior, the President may direct the discontinuance of any district, and the transfer of its business and archives to any other land office within the same State or Territory.

By the seventh section of the act of 26th July, 1866, Laws, p. 252, the President is authorized, in reference to mining interests, to establish additional land districts, and appoint officers under existing laws, whenever he may deem it necessary for the public convenience. In executing the provisions of the law, registers and receivers, under this act, are held by this office as possessing powers coextensive with all other interests connected with the disposal not only of mineral but agricultural lands.

Under the above-mentioned act, additional land offices have been created and established as follows :

At Sacramento, California, district composed of the counties of Sierra Nevada, Placer, El Dorado, Amador, Calaveras, Alpine, and Sacramento.

At Austin, Nevada, district composed of the county of Lander.

At Belmont, Nevada, district composed of the counties of Nye, Esmeralda, and the unorganized county of Lincoln.

At Lewiston, Territory of Idaho, district embracing all that part of the Territory lying north of the Salmon river range of mountains.

At Fair Play, Territory of Colorado, district composed of the counties of Lake, Park, and Summit.

Under the act of 27th of June, 1866, Laws, p. 77, a land office has been established at Boise City, Idaho Territory, the district embracing all that part of the Territory lying south of the Salmon river chain of mountains.

Under authority of the act of March 2, 1867, Laws, p. 542, a land office for the Territory of Montana has been established at Helena, and the site of a land office for the Territory of Arizona has been fixed at Prescott.

In accordance with the provisions of the act of 3d March, 1853, the President, under date of 16th February, 1867, directed that the office for the sale of public lands, in the southwestern district of Alabama, be removed from St. Stephen's to the city of Mobile, in that State.

In April, 1867, an order was given for the discontinuance of Elba land district, in the State of Alabama, and the vacant public lands therein were made subject to sale at Montgomery.

By notice, dated the 8th May ultimo, the land offices at St. Augustine, Newnansville, and Tampa, in the State of Florida, were discontinued, and the vacant lands in the several districts were made subject to sale at Tallahassee, thus consolidating all the land offices in the State at the capital.

It is suggested that the head of the department be clothed with authority to discontinue land districts in which an inconsiderable quantity of vacant public land remains unsold, to the end that the government may be relieved from the expense of maintaining local land offices when they cease to subserve public interest and necessity ; and that upon such discontinuance the Commissioner of the General Land Office be invested with all the authority of district land officers to dispose of any unsold land, should any remain, thus enabling citizens to acquire title from the department.

## PUBLIC SALE OF LAND.

By the President's proclamation, No. 723, dated the 28th August, 1867, there are proclaimed for offering at public sale on the second day of December next, at St. Peter, Minnesota, 310,000 acres of valuable lands in that part of the Sioux Indian reservation, on the Minnesota river, lying within the limits of the St. Peter's land district, in that State.

## MILITARY RESERVATIONS.

By the act of Congress approved 3d March, 1819, vol. 3, page 520, the Secretary of War, under direction of the President, was authorized to cause to be sold such military sites, belonging to the United States, as had been found, or should become, useless for military purposes, and to furnish the requisite deeds of conveyance. The provisions of the act were extended by fourth section of act of 3d March, 1857, (Stats. at Large, vol. 11, page 200,) to all military sites, or to such parts thereof as are or may become useless for military purposes.

All laws authorizing the sale of military sites, useless for military purposes, are repealed, except certain reservations in Florida, by the sixth section of the act approved 12th June, 1858, vol. 11, p. 336.

The act approved 3d March, 1859, (vol. 11, p. 408,) to protect the timber growing upon lands of the United States reserved for military and other purposes, visits with a penalty of fine and imprisonment any one offending by cutting or destroying any timber growing on such reservations, which, even when abandoned, cannot, except in Florida, be disposed of, unless Congress shall so order, which is recommended.

## QUARTERLY ACCOUNTS OF SURVEYORS GENERAL AND DEPUTIES, OF RECEIVERS OF PUBLIC MONEYS, AND DISBURSING AGENTS.

All the accounts of these different classes of officers have been examined at this office, adjusted to the 30th June, 1867, the end of the fiscal year, and reported to the treasury for settlement. As rapidly as they may be received for the quarter ending on the 30th September, 1867, they will be disposed of in like manner.

The rules of the department are peremptory in the requirement that all receivers of the public moneys shall promptly deposit the funds in their hands at the close of a quarter, so that it seldom occurs that an officer holds at such periods over \$2,000, which is the maximum the treasury regulations allow to remain with a receiver until drawn for or otherwise specially ordered.

Accounts for the five per cent. fund accruing by law to certain States from the net proceeds of the sales of public lands have been adjusted to the end of the calendar year and reported to the treasury for payment.

## TRANSCRIPT ARCHIVES PREPARED.

This office has been engaged in making good the loss of plats and other archives destroyed during our domestic difficulties in one section of the country, and by fire in the other.

For the southern States there have been prepared one thousand and twenty-seven townships plats, with fifty ledgers or tract-books, containing nearly nine hundred thousand entries of sales and locations which had been made, beginning in years past and extending to the latest land operations.

The cost of labor in the preparation of these plats and books is estimated at fourteen thousand five hundred dollars.

There have also been prepared for land offices in Minnesota and California three hundred and seventy-one plats and fifteen tract-books, the latter containing nearly sixty thousand entries of sales and locations, at a cost of three thousand four hundred dollars.



## TIMBER.

In the early history of the country the extensive forests which existed seemed adequate to the exigencies of advancing settlements to an indefinite future.

At a later period Congress found it necessary to intervene for the protection of live oak and red cedar as a reserve for ship-building. Accordingly, in 1817, a statute\* to that end was passed, which was followed by a law in 1831, to arrest spoliation. By judicial rulings and executive decisions, these laws may be invoked for the protection of all timber on the national domain. A system of agency many years ago was established for protection of trees; but resulting in no substantial advantage, was abandoned. The district land officers were then specially charged with the duty of timber protection. This measure has proved to be an improvement; yet it has been found difficult, with all the instrumentalities at hand, effectually to correct the evil. Special instructions from time to time have been issued to registers and receivers, impressing upon them the necessity for constant vigilance and energetic proceedings to suppress depredations. In the case of a wilful violation of the law, where the requisite proof is at hand, it has been ordered that the timber cut, wherever found and identified, shall be seized and sold; the intervention of the district attorney and marshal having been called into requisition to bring offenders to strict accountability. The dictates of wise policy, however, have suggested exception to a rigid mode of procedure, where extenuating circumstances exist, and in such case a reasonable tariff as stumpage for timber cut has been received, by way of compromise, as an equivalent for the civil injury, while the criminal prosecution is dismissed by the district attorney, under the belief that as the party acted with no wilful or criminal intent to defraud the government, the offence would not be repeated.

This system has operated beneficially. Instead of mulcting the government in heavy costs, after long and unsuccessful prosecutions according to the old system, doubtful cases have been compromised, and a considerable revenue thereby placed in the treasury. In the entire management of the business, the main object in view has been not so much the accumulation of a fund from this source, as the suppression of a mischief which strikes so directly at the material interests of the country. While thus checking trespass, the most liberal privileges have been extended to settlers under the pre-emption and homestead laws, by allowing them to use the timber growing upon their claims for all necessary domestic purposes, in opening up and improving new homesteads, for building and fencing purposes, for firewood, in clearing fields for cultivation, and whatever may enhance the value of and beautify and adorn their farms.

This much is freely conceded in the interest of placing good and permanent freeholders upon the public lands, whose energy in developing the country will add to national wealth.

The settler cannot lawfully transcend these limits, and whenever a pre-emptor before proving up and paying for his tract, or the homestead claimant before perfecting his title by five years' actual residence, attempts a speculation on his place, he is regarded as a trespasser and becomes liable to the penalties fixed by the statute, the inceptive right acquired by the actual settler, before his title shall have been perfected by a full compliance with all the requirements of law, giving him no license to waste the timber or speculate with the same, but, on the contrary, imposing an obligation for its protection.

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\* Acts of March 1, 1817, 3 Stats., 347, and March 2, 1831, 4 Stats., 472; 3 Wheaton, 181, and 9 Howard, 351. Attorney Generals' Opinions: Mr. Wirt's, May 27, 1821, vol. 1, p. 471; Mr. Nelson's, August 11, 1843, vol. 4, p. 221; and Mr. Mason's, July 16, 1845, vol. 4, p. 405. Annual report Commissioner General Land Office for 1866, p. 33.

## SPECIAL IMPROVEMENT GRANTS.

*River grants.*

*Fox and Wisconsin rivers.*—By the acts of Congress approved August 8, 1846, 2d March, 1849, 3d August, 1854, joint resolution of 3d March, 1855, and act of June 9, 1858, granting lands to the State of Wisconsin "to aid in the improvement of the Fox and Wisconsin rivers, and to connect the same by a canal," that State became entitled to 684,269 acres.

The claim of Wisconsin has been finally adjusted, and the full quantity heretofore duly certified to the State.

*Des Moines river, Iowa.*—In virtue of the act of August 8, 1846, joint resolution of March 2, 1861, and act of July 12, 1862, granting lands to the State of Iowa "to aid in the improvement of the navigation of the Des Moines river," there has inured to the State 833,079.90 acres. The department transferred to Iowa previous to June 30, 1866, 831,762.58 acres, leaving a residuum of 1,317.32 acres; which has been duly certified since last annual report, thus fully satisfying the claim under the several acts.

*Ship canals.*

*Portage lake, Michigan.*—By the act of March 3, 1865, granting lands to the State of Michigan "to aid in building a harbor and ship canal to connect the waters of Lake Superior with the waters of Portage lake," the president of the company, under the requirements of the law, filed a map, and the State appointed an authorized agent to make the selections, who has performed the service, having filed preliminary lists to cover the grant of 200,000 acres.

In addition to the former grant, Congress, on the 3d of July, 1866, made an additional concession of 200,000 acres to be selected in the upper peninsula, upon which initiatory steps have been taken by the canal company to complete selections in view of speedily satisfying the last-named grant.

*Sturgeon bay, Wisconsin.*—The act of April 10, 1866, granted lands to the State of Wisconsin "to aid in the construction of a breakwater and harbor and ship canal at the head of Sturgeon bay to connect the waters of Green bay with Lake Michigan."

The State was authorized to select the quantity of 200,000 acres nearest the location of said harbor and canal. Pursuant to law the State agent duly made and filed lists of selections to cover the grant, and the department, on the 4th of May, 1867, invested the State with title.

*Lac La Belle, Michigan.*—Congress, by the act of July 3, 1866, granted lands to Michigan "to aid in the construction of a ship canal to connect the waters of Lake Superior with the lake known as Lac La Belle." The State was authorized to select one hundred thousand acres of land nearest the location of the canal. The selection having been made by an authorized agent, the department, on the 26th of March last, issued a patent accordingly.

## INTERNAL IMPROVEMENTS.

In the adjustment of the claim of Nebraska to 500,000 acres for internal improvements under act of September 4, 1841, the point was considered as to whether the State should be charged with the lands granted by the eighth, ninth, tenth, and eleventh sections of the Nebraska enabling act of 19th April, 1864.

The Secretary ruled that "the lands mentioned in the act of 1864 were granted for purposes totally distinct from those contemplated by the grant of 1841;" that "it is also questionable whether those lands" could be considered as "granted to the State before its admission and while under a territorial government;" and that it might well be insisted that this provision in the act of 1841 refers not to the time when in a future contingency the grant was to take effect, but

to the period when it actually vests; and that, according to this view, the only lands contemplated by said act are those the right to which has passed to the Territory, and were made subject to its disposal for the purposes declared by Congress. In this view the Secretary decided that the lands granted by the aforesaid sections of the act of 1864 should not be deducted from the amount granted by the act of 1841, and accordingly under that ruling the internal improvement grant to Nebraska will be duly adjusted.

SWAMP AND OVERFLOWED LANDS GRANTED BY ACT OF 2D MARCH, 1849,  
28TH SEPTEMBER, 1850, AND 12TH MARCH, 1860.

The necessities of man in all ages have compelled him to dispute with nature the possession and use of lands primitively unfitted for occupancy or utility.

Instances of this are frequent in the history of nations in the eastern hemisphere, where, for the purpose of supporting dense population, the personal safety of communities, the convenience of commerce, or from sanitary reasons, immense tracts, once entirely or partially submerged by water, have been made subservient to populous communities, while yielding rich products to the enterprising hand of the agriculturist.

The once powerful republic of Venice was first founded on the deposits of numerous rivers in the midst of lagunes, the land approaches leading through almost impassable morasses.

The city of St. Petersburg was commenced, and mainly built, upon a marsh caused by the widening of the Neva, at an expense of years of severe toil and immense loss of life from malaria; while a large proportion of the inhabitants of the kingdom of Holland to-day derive their sustenance from lands wrested from the dominion of the sea.

In the United States the attention of Congress was early directed to the subject of worthless regions lying as marshes, or periodically overflowed by large water-courses.

Efforts to make them the subject of national legislation were first made in 1826 by a distinguished senator from Missouri, who then unsuccessfully endeavored to obtain a cession to Missouri and Illinois of the swamps within the limits of those States respectively.

Other efforts were made at intervals, but no definitive action was taken until the passage of the act of March 2, 1849, applicable exclusively to Louisiana.

That statute was followed by the general grant of September 28, 1850, under which the larger portions of territory, classed as swamp or overflowed, have been ceded to the States.

The reasons assigned for this munificent donation were:

1. The alleged worthless character of the premises in their natural condition, and the inexpediency of an attempt to reclaim them by direct national interpolation.

2. The great sanitary improvement to be derived from the reclamation of extensive districts notoriously malarial, and the probable occupancy and cultivation that would follow.

3. The enhancement in value, and readier sale, of adjoining government property.

The measure as originally reported granted only such tracts as were designated on the plats of the government surveys as swamp and unfit for cultivation. Subsequent amendments added to this the "overflowed lands," conveying to the States the swamp, or inundated, without reference to their description on the plats of survey. It was held in the debates that these amendments would make the grant more definite, and enable the executive department specifically to designate the lands transferred. Experience has shown that this change in the original bill has in fact been a retarding cause in administering the grant, and has given rise to multitudes of controversies and cases of litigation, by reason



of the indefinite terms of the statutory concession. For this cause also the quantity of land selected as swamp and certified to the States has exceeded by many millions the estimates made at the incipient stages of legislation. Under its expansive terms tracts have been claimed which for certain purposes of farming are as desirable as the choicest uplands. The overflowed lands bordering on great rivers generally afford the finest timber, and present soil of rich alluvion. The marshes and sloughs of the prairies are almost indispensable additions to every well-selected grazing tract, because affording the best grass and supplying water for farm stock.

The year embraced in this report has been industriously occupied in bringing to conclusion the work required by the swamp concessions.

There have been approved to the States entitled during the fiscal year ending June 30, 1867, 1,030,020.22 acres, while within the same period there have been patented 328,997.08 acres.

Under the indemnity laws of March 2, 1855, and March 3, 1857, there have been awarded 36,429.93 acres in lieu of swamp disposed of by the government in bounty-land locations. Besides this, there has been refunded for swamp lands sold by the United States for cash the sum of \$99,143 19. Of that amount there was paid to the State of Iowa the sum of \$92,899, and the remainder to Illinois.

The act of July 23, 1866, to quiet titles in California, has received special attention, every effort consistent with accuracy having been made to complete the work required by the statute.

The lists reported by the surveyor general have been promptly acted upon, and all correct selections have been certified and patented to the State. The anomalous condition of a portion of the selections, caused by conflicts and irregular surveys, necessarily requires special investigation, which has been ordered as preliminary to final disposal.

Since the date of the first grant there has been selected by the States entitled, thirteen in number, an aggregate of 60,246,532.10 acres.

There have been approved of this area 47,377,523 23 acres, of which there have been patented 43,585,272.17 acres. Of these selections over 39,000,000 acres, or more than one-half, are within the limits of Louisiana, Florida, Arkansas, and Michigan, and of that amount more than 30,000,000 have passed in fee-simple to these four States.

Not only have over forty-three and a half millions of acres been patented outright to the States, but Congress, by the acts of March 2, 1855, and March 3, 1857, has granted in cash or other tracts an indemnity for premises disposed of to individuals where those premises have been proved to be swamp. Under those acts there have been awarded as *indemnity*, up to June 30, 1867, 514,466.86 acres, and \$696,344 56 have been refunded in cash from the United States treasury.

The act of March 12, 1860, extending the swamp grant to Minnesota and Oregon, however, restricts selections to tracts not disposed of by the United States prior to confirmation of swamp title—thus abolishing the indemnity principle so far as it pertains to selections made *since* that date; the same act imposing a limitation for selections, yet making that limitation coincident with a period to elapse subsequent to the State legislative session next ensuing the official notice of the completion of the public surveys. Legislation is recommended requiring all selections of swamp “in place” to be made within, say, two years from the return of surveys, and that the evidence upon which awards are to be made of indemnity in cash or other lands shall hereafter assume the form and character of regular judicial investigations, instead of being made upon *ex parte* affidavits.

The reclamation of swamp or inundated lands in any and all localities must result in local advantage. Experience has established the correctness of the

theory that the effect of drainage elevates the temperature, rendering the locality drained less liable to frosts. By lessening the water surface, evaporation is lessened, and the frigidity incident to evaporation is proportionably diminished. A cold soil invariably pertains to the borders of marshes, and frosts visit those localities earlier and more frequently than in the drier uplands of the same latitude. The sanitary effects of these climatic changes are, of course, of greater importance than all others. It is related of the district of the Maremme of Italy, known sometimes as the Tuscan marshes, that as late as the year 1840, of ten thousand labors who went from the mountain regions to the plains to gather crops, nearly all of them were subjected to the malignant fevers caused by the prevalent miasma. The average duration of life at that time—including both the healthful and malarial districts—was stated at twenty-three years, the mortality statistics showing that 75 per cent. of the deaths were among persons engaged in agricultural pursuits. At earlier dates the exhalations of these plains were considered as almost certain destruction to human life. By judicious efforts put forth, in a series of works of systematic draining, the insalubrity of the region has undergone remarkable changes. In a total population of eighty thousand, the number of fever cases was, in four years, reduced from 35,619 to 9,200. The same remarkable results, although to a less degree, have been produced by the draining of the Lincolnshire fens of England, where a district of four hundred thousand acres, notorious for its being insalubrious and inarable, now compares favorably in both respects with ordinary plains.

The energy of man, in his struggles to surmount obstacles in nature, is illustrated in the history of the Pontine marshes—the *Pomptinea paludes* of the Romans. Formed, like the *aggere* of Venice, by the disemboguing of innumerable rivers, and situated comparatively in the vicinity of Rome, these marshes, from an early historic period to the present time, have, in a sanitary point of view, exerted baneful influences on both the ancient and modern capital of Italy, and from the days of Appius Claudius—three centuries B. C.—to the present, they have been the object of almost constant effort on the part of the government to change or modify their character. The construction of the classical *Appian way* through this once impassable region was the first step toward subjecting it to the use and habitation of man. Since then successive efforts of different administrations tending to the same end, and a variety of plans adopted to accomplish the same, have furnished the world with voluminous and comprehensive data in the art of hydrography and engineering.

These efforts, while partially successful, have yet failed to bring the entire region under control, and these historical marshes, with the district of the Maremme, are still known and shunned to a great extent by the Italian as the “region of the *mal' aria*.”

The provinces of the Netherlands exhibit, perhaps, the most remarkable instances of success in land reclamation. Of the early history of this territory comparatively nothing is known anterior to the days of Cæsar, its conqueror, and first historian. It was then a half submerged waste, which the Romans were at a loss to designate whether as land or water. In the words of a modern historian, “inundated by mighty rivers, quaking beneath the level of the ocean, belted about by hirsute forests, this low land, nether land, hollow land, or Holland, seemed hardly deserving the arms of the all-accomplished Roman.” And yet this meagre territory, “a region outcast of ocean and earth, wrested at last from both domains their richest treasures.” For centuries the dunes thrown up by westerly winds upon their ocean borders had gradually caught and retained the slimy deposits of the inland rivers, until an island here and there was formed that, in a measure, provided the nomadic tribes of that locality a precarious subsistence. As civilization advanced and the wants of man increased, rude efforts were made to restrict the channels of the fresh waters, and in the thirteenth century the construction of the famous sea-dikes was commenced. These, at an



expense that can be scarcely estimated, were constructed in such manner as to resist the irruptions of the sea moved by strong westerly winds, at the same time allowing the emission, at low tide, of inland waters. They were carefully arranged to retain the accretions brought down by the rivers, until by this process the *polders* or low lands embraced by the dikes were gradually filled up, the sea front being carefully protected by a revetment of stone or fascines. The soft foundation on which they are built in some localities causes them to sink slowly, in some instances to the depth of sixty feet, constant care being required to retain the proper elevation.

The erosions of the sea also call for critical watching, and in many instances, where these have been improvidently disregarded, large tracts have again reverted to the dominion of the ocean.

It is estimated that by these stupendous works, the toil of centuries, one-tenth of the area of the kingdom has been gained to the agricultural surface of the Netherlands, exclusive of forty-five thousand acres secured by the draining of Haarlem lake. Nor does this estimate include the large quantity reclaimed in Schleswig and Holstein.

Our admiration is awakened in contemplating these instances of man's achievements in his formidable struggles with nature. The massive piles of antiquity south of the Mediterranean, stupendous though now comparatively useless, are as nothing compared with these outworks thrown up to check the aggressive march of the turbulent ocean; and the wonders of the ancients affords nought so impressive to the mind of practical men as the teeming villages of the Netherlands securely resting on plains once traversed by the mariner, or the countless herds of the thrifty Hollander now grazing on what was once "the bottom of the sea."

The alluvial plains of the lower Mississippi, embracing by estimate five and a half millions of acres, more than five-eighths of the area of the whole kingdom of Holland, and possessing, when reclaimed, a soil of unsurpassed fertility, need only the persistent efforts of man in aid of nature to make them eligible for dense population as the rolling prairies of the west. It is even probable that during the life of many now living, and perhaps within the next decade, the rivers and bayous of Louisiana may be restricted to proper and distinct channels, and the bordering plains freed from inundation. An elaborate report was made in 1829 by one of my predecessors on this subject, which may be found in the 5th volume American State Papers, Public Lands, pages 206 to 211, in which the writer discusses with eminent ability the practicability of draining the entire inundated district by artificial connections made at different feasible points on the Mississippi and its lower tributaries, and leading direct to the Gulf, the distance necessary for excavations to be shortened by chains of bayous and lakes, with several discharging outlets to each main artificial channel. This theory of outlets is, however, controverted by recent scientific investigations under direction of the corps of United States engineers. In the interesting and exhaustive published report of those investigations,\* made by the present chief of that corps and an associate, it is held that while such outlets might deplete the waters of the main river in flood time, they would be expensive, and endanger districts now under cultivation, the objection, however, not extending to the effect upon the river, but to the impracticability of controlling the waters drawn off by these waste-weirs. In lieu of these outlets the engineer's report presents, as the surest protection to the inundated districts, the completion of the levee system now imperfectly constructed. This, in the opinion of the engineers, should extend from the mouth of the Ohio to the Gulf, to be built not less than three feet above the level of high water at any point, and increasing in height as the nature of the river at different points might demand.

\* See report upon the Physics and Hydraulics of the Mississippi River, No. 4 professional papers, engineer corps, prepared by Captain A. A. Humphreys and Lieutenant H. L. Abbot, United States engineers, 1861.



To perfect the levees now existing it is supposed would involve the expenditure of seventeen millions of dollars, the destruction caused by the flood in 1850 in the Tensas bottom alone having been estimated at more than one-fourth that amount; and the value of lands that would be relieved by the system and rendered permanently susceptible of cultivation is estimated at two hundred and sixty millions of dollars.

When it is considered that the aggregate of lands already conveyed for swamp reclamation is more than three times the surface of Holland, Belgium, the Duchy of Limburg, Luxembourg and the Roman marshes, it will be admitted that the swamp concession of the United States is on a scale of munificence unequalled in respect to similar interests in the history of any nation. In considering the recommendations in the foregoing as to the necessity of fixing more specific limitations as to the period for indemnity and other selection, it will be for Congress further to determine the propriety not only of prescribing regulations for the adjustment of swamp claims "in place," but of making such stipulations as will secure a complete fulfilment in all cases of the conditions of the swamp grant, not only for the benefit that must accrue to individuals and to local communities from the reclamation of large tracts of sugar, cotton, and rice lands, but of extensive regions in other latitudes within the range of the swamp grant, where the yield of other staples may be immensely increased, thus materially and permanently adding to national prosperity.

#### RIPARIAN INTERESTS.

It is a settled principle in the English law that the right of soil of owners of land bounded by the sea, or on navigable rivers where the tide ebbs and flows, extends to high-water mark, and the shore below common but not extraordinary high-water mark belongs to the state as trustee for the public; and in England the crown, and in this country the public, have the absolute proprietary interest in the same.\* At common law the public have a right to navigate every part of a common navigable river, as also the large lakes. In England even the crown cannot interfere with the channels of navigable rivers; they are public highways, the use of which is inalienable. Yet the shores of navigable waters and the soil under them belong to the state in which they are situated. The rights of sovereignty in rivers above the flow of the tide are the same as in tide waters. They are *juris publici*, except that the proprietors adjoining such rivers own the soil *ad filum aquæ*; yet grants of land bounded on rivers or upon their margins above tide-water, carry the exclusive right and title of the grantee to the centre of the stream, unless the terms of the grant clearly denote the intention to stop at the margin of the river, and the public, in cases where the river is navigable for boats and rafts, have an easement therein or a right of passage subject to the *jus publicum* as a public highway.

If a fresh-water river, running between the lands of separate owners, insensibly gains on one side or the other, the title of each continues to go *ad filum medium aquæ*; but if the alteration takes place sensibly and suddenly, the ownership remains according to the former bounds; and if the river should for sake its channel and make an entire new one in the lands of the owner on one side, he will become owner of the whole river so far as it is enclosed by his land. The same principles govern in the case of national and State boundaries, the question in regard to which is thoroughly discussed and numerous authorities cited in the United States Attorney General's opinion, dated November 11, 1856, volume 8, page 175, relative to arcifinious boundaries.

The Roman law regards alluvions as the means of acquiring a kind of accession, holding that, as the augmentation is effected in a slow and imperceptible

\*Vide the elaborate arguments of Mr. Livingston and Mr. Jefferson in the *Batture* case, American State Papers, Public Lands, volume 2, pages 1 to 84 inclusive.

manner, it remains with the inheritance to which it may be united, the portion thus insensibly added not being considered new land, but a part of the old, which becomes possessed of the same qualities and belongs to the same master in like manner as the growth of a tree does to the owner. The right of increase by alluvion is grounded in the maxim of right, which bestows the profits and advantages of a thing to him who is exposed to suffer its damages and losses.

It is a settled principle that the person whose land is bounded by a stream of water which changes its course gradually by alluvial formations, shall still hold by the same boundary, including the accumulated soil. No other rule can be applied on just principles, and hence it is the general doctrine of alluvions that every proprietor whose land is thus bounded is subject to loss by the same means which may add to his territory, and as he is without remedy for his loss in this way, he cannot be held accountable for his gain.\*

The United States have political rights in the waters of the Mississippi, Missouri, and other rivers, and in the soil under them, but have no proprietary rights there disposable to individuals.

The political rights are in virtue of the Declaration of Independence in 1776, acknowledged in the definitive treaty of peace in 1783, and of the treaties by which the territory of the republic has been enlarged. Before the adoption of the Constitution of the United States, Congress, in the fourth article of the ordinance dated 14th July, 1787, for the government of the territory northwest of the Ohio, declared that "the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same shall be common highways, forever free, as well to the inhabitants of said territory as to the citizens of the United States and those of any other State that may be admitted." Thereafter the proprietary rights were dealt with in the fifteenth section of the act of Congress of 4th June, 1812, which declares that the Mississippi and Missouri rivers, and the navigable waters flowing into them, shall be common highways, and forever free to the citizens of the United States.

The proprietors of the adjoining banks have a right to use the land and water of the river in any way not inconsistent with the easement, and neither the State nor any individual has the right to divert the stream and render it less useful to the owners of the soil.

In 3d Scammon's Illinois Supreme Court Reports, in the case of Middleton *vs.* Pritchard, the rights of riparian proprietors and their relations to islands in the Mississippi were considered. In that case, the justice who delivered the opinion of the court refers to the distinction at common law between streams navigable *de facto* and those not so at common law, which regards only arms of the sea and streams where the tide ebbs and flows as navigable. The court then held that the Mississippi river is not a navigable stream at common law, and that the title of a riparian proprietor, whose lands are bounded by it, extends to the middle thread of the stream, and includes islands which are separated from the main land by sloughs, yet recognizes the right of navigators, not merely in floating upon the water, but of fastening their vessels on the shore, as a privilege to be borne by the owners of the lands as a part of the public easement.

The separate opinion, in that case, of the chief justice, denies the conclusion drawn from the principles laid down by the court, and rejects such an application of the common law rule as would give the islands to the water-front owners. In that opinion the chief justice refers to the general principle of the common law, that a grant of land upon a river extends the title of the grantee to the middle of the river if the grantor has authority to extend it that far, yet holds that there are exceptions to the rule, which in this country must be so far modified as not to allow a government patent to land on the river margin to include the islands between the shore and the middle of the stream. The conclusive

\*3d Kent, 427; 3d Howard, 212; 10 Peters, 662; 5 Wheaton, 374; 3d Scammon, 510; 3d Smedes and Marshall, 366; 4 Pickering, 268; 8 Attorney General's Opinions, 175.



reason assigned is, that the law confers no authority on the officers of the government to make sales of water-front lands so as to include such islands; and further, that it is indispensable to a valid title that the land shall be surveyed and appear on the official plats, which are the guides of the United States officers in making sales, they not having authority to dispose of a single acre of unsurveyed land; that without such official designation by survey, the premises have no description known to the law; that frequently islands remain unsurveyed until the lands on each side of the river have been sold, and that thereafter they have been surveyed and sold without any claims by owners on either side of the river, and that the unquestioned claim by the government of title to unsurveyed islands, notwithstanding the previous transfer of the lands on the opposite sides of the river, coupled with the constant practice of surveying and selling them without reference to the sale of the adjacent lands, must be regarded as fixing the construction of a government patent for lands lying on a river so as to exclude the opposite islands whether surveyed or unsurveyed.

The principles and doctrine thus enunciated are in entire coincidence with the decisions and established practice of the General Land Office.

The Mississippi and its tributaries not being arms of the sea, nor, therefore, tidal streams, are, it is true, not navigable in contemplation of the common law of England, which had its origin and development in view of the rivers of the British islands surrounded by the sea. But shall the theory of that law apply to and govern in that respect in regard to the very different natural structure of the rivers of that portion of this continent in which the Mississippi and its seventy-six affluents, including the Missouri, Ohio, and Red rivers, drain a region of a million two hundred thousand square miles, capable of supporting in abundance more than one hundred millions of inhabitants, passing from north to south through eighteen degrees of latitude, from soils and climates where the cereals and harder products exist, to the land of sugar-cane, cotton, and tropical fruits, possessing an aggregate steamboat navigation of sixteen thousand six hundred and ninety-four miles, and bearing upon the bosom of their waters one thousand five hundred steam-vessels, with an aggregate burden of more than twice the entire steam tonnage of the British commercial marine? We think not, first, because they are navigable in *fact*, and so designed by nature as great highways of intercommunication for man, and as avenues of trade continually increasing, and, next, because the common law in that relation has, in our judgment, been changed so as to declare them navigable, such being not only the reason of things, but the force and effect of the northwestern ordinance of 1787, and the congressional enactment of the 4th June, 1812, as hereinbefore mentioned.

For the considerations thus appearing this office has held the soil or bed of the Mississippi and its tributaries, to the extent to which they are navigable in fact, as belonging not to the riparian proprietors, but to the public, and that islands therein, no part of which are embraced in surveyed premises which have been disposed of by the United States, are liable to be dealt with as other public lands. When, however, an island appears which has been detached from a sold tract on the main land, such island of course is not liable to further survey or disposal, and so in a recent case before us, in which an application was made for the survey of certain land as an island in the Mississippi river, opposite Cahokia, where the waters of the river had forced a channel through part of a tract embraced in the survey of the commons, the application was denied, as the loss suffered by the village in consequence of the inroad of the river through its lands could not only furnish no grounds for disposing of the remnant left, but a good reason for regarding it as the village property, with its accretions.

A case has arisen in which lands were surveyed and sold in the State of Kansas, lying on the west side of the Missouri river. Subsequently that river forsook its ancient course at a certain eastern bend, making a direct shoot nearly due south, so as to detach premises in the bend from Kansas and place them on



the east side of the new course of the river. Now the point raised was, how shall the tract thus placed by the change in the river on its east side be dealt with by the department? It was ruled that its powers in regard to it had been exhausted by the survey and sale which had been made in Kansas, and the owners would hold according to the original lines of survey without reference to the change in the course of the river, in our judgment the political jurisdiction in relation to the detached tract remaining as originally established.

Where lakes have been meandered as navigable and permanent bodies of water, but the beds of which afterwards become dry by evaporation or other cause, this office deals with the premises as with other public lands over which the lines of survey may be extended by the department, and which thereafter are liable to disposal by the United States. When, however, the meandered lake proves to be permanent, yet an accretion may arise from an inconsiderable recession of the water, such accretion inures to the use of the front proprietors.

#### GEOLOGICAL SURVEY IN NEBRASKA.

In the second section of the act of Congress, approved March 2, 1867, making appropriations and to supply deficiencies, it is declared, "that the unexpended balance of the appropriations heretofore made for defraying the expenses of the legislative assembly of the Territory of Nebraska shall be diverted and set aside for the purpose of procuring a geological survey of Nebraska, to be prosecuted under the direction of the Commissioner of the General Land Office."

It has been estimated that the unexpended balance applicable to the geological survey is \$5,000. Under that authority Dr. F. V. Hayden was appointed on the 29th April, 1867, to make a geological examination and survey, with compensation of \$2,000 per annum. With the limited means provided, he was allowed an assistant geologist and paleontologist, at the rate of \$1,000; three collectors and laborers, at not exceeding \$700, the sum of \$300 having been set apart for chemistry and natural history; while the sum of \$1,000, or the residue of the means, was designed for general expenses of outfit and incidentals in the service, which was restricted to one year from the date of the appointment.

The geologist was directed to proceed as soon as necessary arrangements could be made to the sphere of his operations. He was instructed to ascertain the order of succession, arrangement, relative position, dip, and comparative thickness of the several strata and geological formations in the State; to search for and examine all the beds, veins, and other deposits of ores, coals, clays, marls, peat, and other like mineral substances, as well as the fossil remains of the various formations; to obtain chemical analyses of such of those substances, and of the different varieties of soils, whereof it may be deemed desirable to ascertain the elementary constituents. He was required also to determine by careful barometrical observations the relative elevations and depressions of the different parts of the State of Nebraska, and to gather in the field of his explorations collections in geology, mineralogy, and paleontology, to illustrate the notes taken in the field.

In order to enable the Commissioner to present to Congress the results of the geological survey, it was stipulated that a preliminary report should be made of the progress of the work, accompanied by such maps, sections, and drawings as might be considered requisite to illustrate the report; it having been ordered that the final report under the appropriation should embody the results of the entire survey, and be accompanied by a geological map, with carefully prepared sections and diagrams, showing by different colors and other marks and characters the principal localities and geographical range of the various geological formations to the extent explored, and by drawings and descriptions of the characteristic fossil remains of the different groups of strata, advance data having been called for at short intervals in order that the department might know the progress of the work.

It was required in our instructions that the region of Nebraska south of the Platte river should be first examined, it being occupied by the limestones of the true coal measures, and that a careful search should be instituted for the localities, depths, and extent of deposits of that most valuable mineral. It was deemed important to extend the explorations and examinations along the Missouri to Sioux City, as it had been reported that there was a bed of coal outcropping from rocks of the chalk formation near the Omaha reserve, then under survey for the accommodation of the Omaha and Winnebago Indians. It was desired that the geologist, who was furnished with a map of public surveys, should locate geological formations by townships and ranges of the sixth or governing principal meridian in Nebraska. As the unsurveyed region also includes settled portions of the State, it was required that the explorations should also be then directed to determine the location and extent of natural resources in coal, metallic ores, hydraulic and common limestone, fire-clays, freestone, flagstone, and marbles properly belonging to the various formations there existing, and which would be of immediate use to the people. As the predominant interest in the State is farming, his attention was directed to the examination of its soils and subsoils, to their adaptability to particular crops, as well as to the best methods of preserving and increasing their fertility. Information was also called for in regard to the introduction of suitable forest trees, in order to promote the growth of timber. Pursuant to instructions the geologist has prosecuted his labors with diligence and energy, reporting results of his explorations in preliminary returns, of which the following is an outline :

The geological exploration has embraced the counties of Cass, Douglas, Gage, Jones, Jefferson, Johnson, Lancaster, Lucas, Nemaha, Otoe, Pawnee, Richardson, and Sarpy, comprising the larger portion of the settled counties south of the Platte.

An extensive collection has been procured of carboniferous fossils, and abundant materials are expected illustrative of the geology of the State, which for agricultural and grazing purposes promises to be second to none in the Union.

The present geological survey has been looked to with anxiety, in expectation of the discovery of coal-beds adequate to the supply of fuel for a dense population. Coal-measure rocks from Des Moines across Iowa to Nebraska City have been traced, rendering it probable that this important fuel will be found by boring below the water level of the Missouri. The clays and limestones, it is supposed, may increase in thickness in their westward extension, so that in Nebraska it may be necessary to bore six hundred to eight hundred feet before reaching good beds of coal, which even at that depth might be profitable. In England coal has been mined 1,794 feet beneath the surface, and numerous pits are worked there from 800 to 1,200 feet in depth.

In Nebraska thin coal-beds, fifteen to eighteen inches thick, have been found in various localities, and worked with considerable profit; an outcrop at Nebraska City having been advantageously wrought by drifting in a distance of three hundred yards. On the Missouri bottom, in Otoe county, in sinking a well sixteen feet, a seam of coal was penetrated four inches thick on one side of the well and ten on the other. At Brownsville a seam of coal is found, showing that many plants had existed peculiar to the carboniferous rocks in other States. In Nemaha county, at Aspinwall, the most favorable exhibition of coal exists which has yet been observed in the State, the general dip of the beds appearing to be up the Missouri, or nearly north or northwest. The rocks at Aspinwall are all geologically at a lower horizon than the Nebraska City strata, and generally beneath the Brownsville beds, so that the inclination must be eight to ten feet per mile. There are two seams at Aspinwall, one cropping out near the river fifteen feet above the water, twenty-four inches thick, the coal of good quality. The rocks hold such a position at this point that it is



presumed the finding of profitable coal-beds here would determine the existence of available coal strata running through Nemaha, Pawnee, Richardson, and Johnson counties.

Abrupt termination of the seams is a peculiarity everywhere along the Missouri, probably attributable to an inclination towards the river of the superincumbent beds; irregularity in the thickness of seams being here quite apparent, varying from one to twenty-four inches. A short distance below Rulo a bed of coal has been successfully worked by drifting, the vein having been struck by a shaft sunk from a point higher up the side of the hill, and found twelve feet below the position at the outcrop, showing considerable inclination of the beds from the river towards the west. This dip may be accounted for by the extensive erosion of the rocks prior to the deposition of the yellow marl or drift deposits. This erosion has given rise to many perplexing local inclinations of strata, the thickness of the coal-bed at this point being ten to twelve inches, increasing in one instance to seventeen inches. On the Iowa reserve, along the Great Nemaha river, a bed crops out in the ravines or banks of little streams, several hundred bushels of coal having been taken out from time to time for years past. Underlying the coal is a bed of gray fire-clay full of fragments of plants, as fern leaves and stems of rushes, the same as occur in the underlying clays in the Ohio and Illinois coal fields.

Nine miles southeast of Hiawatha, the county seat of Brown county, Kansas, a bed of coal is worked with success, the quality being highly spoken of. It is supposed to be of the same character as that found along the Missouri river in Nemaha and Richardson counties, in Nebraska. Although no seams were observed at any considerable distance from the Missouri, in Richardson county, yet, soon after reaching Pawnee, coal was discovered.

This important fuel has not been found on the Nemaha river itself, but has been discerned on its branches. The reason of this is supposed to be the great erosion of the underlying rocks in the river valley, and the subsequent depression of alluvion of vast thickness, effectually concealing all outcroppings. The coal seems to be packed down on the clay like masses of flat rock, the clay below being hard, filled with fragments of fern leaves and stems of rushes, similar to the clay underneath the coal seams in Ohio and Pennsylvania. The under surface of the coal appears to be composed of stems of grasses, as if the vegetable debris began upon a thick, grass-covered surface. The vegetable impressions do not go down into the seam, for where the coal ceases all traces of vegetable matters disappear. In Johnson county, at Tecumseh, a thin seam, varying from ten to fifteen inches thick, has been opened and worked with success. The returns thus far do not indicate the discovery, by the geologist, of any thick coal-beds in the region he has traversed.

#### FOREST CULTURE.

It is reported by the geologist that sufficiently numerous experiments have been made to demonstrate the fact that forests, in comparatively brief periods, may be restored to the almost treeless prairies of the west. It is supposed that during the time the brown coal-beds were deposited all these treeless plains were covered with a luxuriant growth of forest trees, like those of the tropical and sub-tropical climates, such as palm trees, gigantic sycamores, maples, poplars, cedars, hickories, cinnamon, and fig trees; large portions of the upper Missouri being now covered with the silicified trunks of trees of huge dimensions, exhibiting the annual rings of growth with great distinctness.

The counties of Otoe, Nemaha, and Richardson, in Nebraska, contain more timber than any other portions of the State. Hundreds of acres have been covered with fine, healthy growth of hickory, walnut, oak, soft maple, coffee bean, and basswood, within the past ten years, since the young trees have been



guarded from fires and protected by settlers. The geologist has given this matter special attention, reporting the theory as untenable which holds that trees could not be reared successfully on the prairies of the west, and that the climate and soil are unfavorable to forest culture. The trees now in cultivation are generally indigenous varieties, such as the cottonwood, soft maple, elm, basswood, black walnut, honey locust, and willow.

At a point selected six hundred feet above the level of the Missouri, near Omaha, cottonwood trees were found ten years old between two and three feet in circumference, thirty feet in height, while often substantial trees of different species and lesser proportions succeed, such as the soft maple, common locust, honey locust, and black walnut; a cottonwood reared in the vicinity of Nebraska, of same age, having been reared from the seed, four feet in circumference and fifty feet in height—a fine grove of the variety mentioned existing ten miles south of Plattsmouth.

The Scotch, Austrian, white, and Russian pines, spruce, balsam fir, arbovitæ, red cedar, and Lombardy poplars, are all of healthy and vigorous growth in the State. The cultivated forests, it is supposed, will prove more desirable than the natural growth. A large number of intelligent, enterprising farmers are engaged in planting forests in some of the counties of the State, in nearly the whole extent of which all the common fruit trees can be raised from the seed as easily as corn. The planting of ten to fifteen acres of forest trees on each quarter section is recommended by the geologist, with a view to increase the moisture, adding greater fertility to the soil, and producing beneficial effects upon the climate. It is ascertained that for twelve or fourteen years past the rain has gradually increased in quantity, and is more equally distributed through the year. It is supposed this change will continue to extend across the dry belt to the foot of the Rocky mountains, as settlements are extended and the forest trees are planted in proper quantities.

Experiments have been eminently successful in the propagation of all kinds of hardy fruits and vegetables; apples, peaches, pears, cherries, apricots, plums, blackberries, currants, gooseberries, and grapes, having been cultivated to great perfection. Of the grape, the Hartford Prolific, Catawba, Clinton, Concord, and Delaware varieties have been propagated with entire success; such being the case also with the Diana grape at the mouth of the Platte.

#### PEAT.

Peat is regarded by the geologist as ranking next to coal as fuel, there being several kinds of it, the grass turf, leaf turf, heath turf, mud turf, &c. That found in Ireland is generally composed of a kind of moss or sphagnum. It is an accumulation of half-decomposed vegetable matter formed in wet or swampy places, and may therefore be composed of any plants growing in such localities. Under the water the vegetable matter undergoes slow decomposition or combustion as it were, so that spontaneous charcoal is formed, principally differing from true coal in not having been subjected to the immense pressure by which the latter is formed.

Several kinds of peat were found by the geologist in Otoe, Nemaha, Richardson, Pawnee, and Johnson counties, there being but few parts of the State, it is supposed, in which peat may not be found; and although the areas of the peat bogs are limited, yet they must be considered as one of the most reliable sources of fuel in that region. Near Table Rock, six miles northeast of Pawnee City, there is a low flat marsh of one hundred acres, which will furnish peat of good quality, two feet or more thick over the whole surface. In the vicinity of Pawnee City, there is a small peat bog six hundred feet in length and three hundred in width in which the peat is ten to twelve feet in thickness; and twenty-four miles southwest of Brownsville, in Nemaha county, there are places

where peat is found to the depth of ten to fifteen feet, and ten miles west of that place there are other peat bogs which have attracted considerable attention, there being quite extensive beds at Falls City and Salem, in Richardson county.

#### SALT.

The great salt basin, situated near the town of Lancaster, covers an area of four hundred acres. Several minor basins and isolated springs also exist in that vicinity, covering miles in extent. These basins are depressions in the surface, which is covered with accumulations of salt, appearing in the distance like the mirage of a desert.

The brine, in small quantities, issues from the surface of the great basin in a number of places, the water flowing from it being estimated at from six to eight gallons per minute. Another basin of importance is situated between Oak and Salt creeks, covering an area of two hundred acres, and another of like extent, known as Kenosha basin, is found on Little Salt creek. Numerous small basins exist on Middle creek, having an estimated surface of six hundred acres, a number of much less extent being situated between Middle and Salt creeks.

The largest spring is on Salt creek, issuing from sand rock, in one stream, at the rate of four gallons per minute. The geological formations in the vicinity of these basins are of the upper carboniferous and lower cretaceous age. These salt springs are supposed to come from the upper carboniferous rocks, at a great depth below the surface.

From June to November, 1866, two companies were operating in these basins, producing, in that time, about sixty thousand pounds of salt.

#### THE ROCKS OF NEBRASKA.

Sandstones abound in the country along the Little Blue river, nearly to the mouth of Big Sandy, where masses of whitish limestone appear on the summits of the hills; about ten miles west of the Big Sandy these rocks assume an important thickness.

They are composed of bivalve shells, closely packed, with carbonate of lime enough to cement them. They are very useful for building purposes, and make excellent lime. The same hard rocks occur on Swan and Turkey creeks, also on the Big Blue, above the mouth of Turkey creek. The belt of country underlaid by the sandstone of the Dakota group runs northeast and southwest, and, extending through Kansas and Nebraska into Iowa and Minnesota, is from forty to fifty miles wide. In this group are strata from forty to fifty feet thick, of yellowish white friable sandstones, of economical importance, containing small quantities of quartz. The bottom lands of all the streams in this region are said to have a soil from five to fifty feet in depth, and to be of the greatest fertility.

South of Beatrice are numerous exposures of limestone, and four miles east of that place, on Bear creek, is a large ledge from fifteen to twenty feet in thickness. The same bed is seen along the Big Blue to Beatrice, forming some of the most important quarries in that portion of Nebraska. Fine large columnar masses, a foot or more thick, and from ten to twelve feet in length, are worked for buildings. They are of beautiful cream color, soft but tenacious in texture, and from which caps and sills can readily be fashioned. Limestone suitable for building purposes is abundant all over Pawnee county, scarcely a farm being without a quarry. The best quarry in Pawnee county is eight miles west of Pawnee City; it is soft, of cream color, full of small cavities, and the true fusulina limestone, valued for building purposes. The general inclination of all the beds in this part of the State being towards the west and northwest, new beds are constantly making their appearance in advancing westward.

The whole of Johnson county is underlaid by rocks of the upper coal measure; very few exposures of rocks being found along the Nemaha and its branches.



In the alluvial clays near Tecumseh, interesting remains of animals exist, which appear to have been numerous, at one period, all over the west.

Just over the cap rock of the coal seam two molar teeth of a mastodon were discovered while stripping away alluvial clays, one of which was obtained by the geologist.

About six miles west of Tecumseh a molar tooth of the species *Elephas Americanus* was discovered. This huge animal, it is conjectured, ranged all over the region east of the Mississippi, its remains of late years having been found in California and Colorado, and that the molar referred to is the first evidence of its existence found in the Missouri valley. The geologist discovered, in 1858, the remains of a number of extinct animals in some pliocene tertiary deposits, on the Niobrara river, and among them a species of mastodon, which an eminent naturalist of Philadelphia described as *mastodon munificus*; also of an elephant, called *elephas imperator*, a third larger than any before known. The surface of Richardson is more rugged than any of the interior counties, the underlying rocks being composed of limestone, sandstone, and clays, belonging to the age of the upper coal measures.

In Nemaha county, near Peru, the bluffs along the Missouri seem to be formed of irregular beds of soft sandstone and laminated clays. High up on the hills, at some distance from the river, is a bed of sandstone twelve to eighteen inches thick, which is extensively quarried. A fine quarry of limestone of very superior quality for building purposes has also been found at Brownsville; the bed being about three feet thick, and near the edge of the Missouri river. The observations of the geologist, north of the Platte river, in Douglas and Sarpy counties, resulted in the belief that the limestones of the upper coal measures pass from sight beneath the water level of the Missouri river at De Soto, and are then succeeded by sandstones of the cretaceous age. These coal measure limestones occupy about two-thirds of Douglas county—limestone of good quality being found near Omaha, in that county, all over Sarpy, and on both sides of the Platte, as far up as the mouth of the Elkhorn river. The geologist reports a remarkable peculiarity he has discovered in regard to the surface of this rock, which, on the superincumbent drift being removed, is found planed so smoothly by glacial action, that it will, without further working, make excellent facings for caps and sills; this glacial action being also visible at Plattsmouth.

The southern portion of Lancaster county is underlaid by rocks of the permo-carboniferous period, the basis rocks of three-fourths of this county being composed of the rusty sandstone of the cretaceous formation or Dakota group. No exposures of the underlying rocks are found after passing from the sources of the Nemaha to those of Salt creek; yet in this portion of the country are found some of the exposures of the permo-carboniferous rocks, occupying an area of about five miles square.

The entire thickness of the rocky strata at this point is from ten to fifteen feet, arranged in layers from six inches to two feet. The texture of the rocks is very fine, and they are of a light cream-color. Several quarries at that point are of importance, as they yield the only good building material for nearly fifty miles north, south, and west, and from ten to twelve miles east of the designated capital of the State. On the Platte, near the northwest corner of Cass county, a yellow magnesian limestone, not observed in any other part of the State, is obtained for building, being durable, tenacious, and easily worked.

The geological formations in Cass county are of the upper carboniferous strata capped along the west and southwest portions with the sandstones of the Dakota group. The coal-measure rocks appear near the water's edge at the mouth of Salt creek, in the vicinity of Ashland, in Saunders county. East of this point for some distance the red sandstones occupy the hills along the Platte; but the limestone continues to rise higher, assuming more importance; the sandstone disappearing fifteen miles west of Plattsmouth. In both sandstones and lime-



stones extensive quarries have been opened, the former adapted to general building purposes, the latter used for walls and ornamental work. On the Weeping Water, in the central part of Cass county, heavy beds of limestone are found of great economical value.

In the State of Nebraska the beds of rocks are horizontal, or nearly so, with a slight inclination of the strata to the west or northwest.

A superficial deposit of yellow silicious marl occupies much of the country, and is largely developed in the valley of the Missouri river, extending from its mouth to the foot of the great bend above the mouth of White river. It is called the "bluff formation," because it forms the picturesque hills or bluffs along the Missouri, especially on the Iowa side between Council Bluffs and Sioux City. In the drift or gravel deposit in the bottom lands of the streams of Nebraska are abundant exhibitions of turbulent waters, but never in the yellow marl beds. The marl is full of nutritious matter for vegetation, it being probable that to this deposit is to be attributed the almost inexhaustible fertility of the river counties of Nebraska. The soil on the upland is usually from twelve to eighteen inches thick, and along the bottoms of streams fourteen to twenty feet. In the yellow marl formation are numerous shells identical with recent species showing the modern character of the deposit. There are also bones of extinct animals, as the mastodon, the American elephant; also a species of beaver of huge dimensions, and other animals mingled with bones of species now living.

Along the Missouri the bluffs formed by the marl deposit are very steep, yet vegetation has been seen growing upon them where the sides had an inclination of fifty degrees.

These hills, although furnishing good grass, cannot be used for the raising of cereals; yet, as the soil is chemically about the same as that of the loess of the Rhine, it is inferred it would be very suitable for the culture of the grape, and at some future time these marl hills may present some of the finest vineyards in America. The valleys of the streams are remarkably fertile, the upland soil being thinner and less productive; still there is scarcely a place not covered with a luxuriant growth of excellent grass. In proceeding westward in Nebraska the valleys are found suitable for agricultural purposes, while the uplands are more useful for grazing.

The materials for brick-making, such as clays and sands, are reported inexhaustible. The fertility of the soil of this region is best shown by its crops; the average yield of wheat being from thirty to thirty-five bushels per acre, of oats from forty to fifty, and of corn from sixty to seventy-five bushels. The high prairies yield from one to two tons of hay per acre; the valleys, from two to three tons.

The soil in the belt of country underlaid with the Dakota group of rocks, being composed largely of silica, is particularly adapted to the raising of heavy crops of wheat and oats; the former weighing more to the measured bushel than the wheat produced on any other geological formation.

To more fully develop our vast mineral wealth and other natural resources, the establishment of geological surveys in the new and comparatively unexplored regions of the States and Territories of the west is recommended. The first object should be to obtain correct knowledge of the general geological structure of the country; that is, of the age, geographical extent, thickness, and boundaries of each of the great geological systems of rocks within its area; at the same time the nature of the various subordinate groups of rocks, their order of succession, thickness, composition, dip, and probable influence upon the soils, springs and drainage of the country, should be determined. Especial attention, from the first, should also be given to the various valuable minerals, their geological position, quality, quantity, mode of occurrence, location with relation to fuel, material for fluxes, and the construction of furnaces, as well as navigable streams or other means of transportation.

Attention should likewise be given to the materials for the construction of roads, houses, bridges, such as building-stones, limestones for the manufacture of quicklime, sand, clays for making bricks and tiles, as well as for potters' use.

Particular attention should be given to the various soils and subsoils, and their adaptability to the growth of different kinds of crops, fruit and ornamental as well as forest trees. If the district is hilly or mountainous, barometrical observations should be made to determine the heights of the elevations above the sea and the principal streams, and attention should likewise be given to the climatology of the country.

Full sets of collections of all the different kinds of rocks, soils, ores, minerals, and mineral waters of every description, as well as of the various organic remains, characterizing the different formations, should be carefully collected and preserved for study and analysis. These collections to be arranged and permanently preserved in the department.

It is proposed that specimens of every kind be transported to the department for careful investigation, in order that final and more detailed reports may be made out, illustrated by maps, sections, diagrams and drawings of the various fossil remains, characteristic of the different rocks. Authority should be given for the publication of the final reports in a suitable form, and in such manner as to be creditable to the country.

A few such reports properly prepared by competent and reliable authorities, with full statistics of our resources, would, if distributed abroad, have a tendency to stimulate immigration, and cause the rapid settlement of our vast unoccupied public domain, thus increasing the national wealth and power, and relieving the burdens of general taxation.

It is submitted that a comparatively small outlay in this way would be followed by manifold returns to the national treasury.

#### BOUNDARY LINES BETWEEN COLORADO AND NEW MEXICO, CALIFORNIA AND OREGON, AND OREGON AND IDAHO.

In the appropriation act of March 2, 1867, authority is given and provision made at the rate of not exceeding sixty dollars per mile for the survey of the 37th parallel of north latitude, so far as it constitutes the northern boundary of the Territory of New Mexico, estimated to be in length three hundred and twenty miles.

The work is one of unusual difficulty, on account of the Rocky mountains, the several lofty spurs of the Sierra Madre, San Juan, La Plata, La Late, and the summit of the Raton mountain, extremely rugged, snow-capped, and only accessible in the middle of summer.

In order to run, mark, and permanently establish the boundary, great perseverance, ability, and experience are required, so as to fix astronomically the line, involving the ascertainment and determination of the parallel of latitude and longitude.

In May last, the propositions of several gentlemen of skill and ability were submitted, among which was the application of Governor William Gilpin, of Colorado, who proposed to associate with him two highly accomplished and skilful artists. That gentleman was earnestly recommended as possessing superior knowledge of the mountain system over which the line of demarcation will pass, as he had, in various expeditions, traversed those mountains, and possessed a knowledge of their topographical features and surrounding objects of the country, with the ability to represent them. The department having selected Governor Gilpin, a contract was made with him on the 6th of June, 1867, in which it was agreed that he should establish by astronomical observations the 37th parallel of north latitude between the 103d and 109th degrees of west longitude from Greenwich, being a boundary common to New Mexico and Colorado as defined by acts of Congress approved September 9, 1850, section



2 Statutes at Large, volume 9, page 447, and February 28, 1861, section 1, of the act providing "a temporary government for the Territory of Colorado," Statutes at Large, volume 12, page 172.

As this is so important a geographical line, it was stipulated that the contractor should determine the same by a series of astronomical observations, eleven nearly equidistant stations near the 37th parallel of north latitude included between the aforesaid points, in order to establish the boundary, and that he should take at least six hundred observations of circum-meridian and circumpolar stars for latitude, and east and west stars near the prime vertical for time. These observations to be reduced and subjected to a rigorous discussion, and the final results deduced in accordance with well-established mathematical formulæ, a complete record of the astronomical, magnetic, and other observations, with the various reductions and final results, to be forwarded to the Commissioner of the General Land Office, in proper form, to be permanently preserved for future reference.

Opposite each of the eleven astronomical stations it is required there shall be erected on the parallel a monument, to be a shaft of not less than twelve inches in diameter in any part, and at least six feet in length, three feet of which to project above the surface, one-half the length being imbedded in the earth. Twelve inches at the top of the shaft are to be squared to correspond with the cardinal points of the compass, on which are to be durably inscribed, by chiselling the stone, on the north, "Colorado;" on the south, "New Mexico;" on the east, "1867;" on the west, "37° N. L." Around this shaft a circular mound is to be constructed five feet in diameter, of stone boulders firmly imbedded in the ground, and tapering up to the shaft at the height of two feet. On each of the four sides facing the shaft the contractor is to dig a pit two feet square, eighteen inches deep, and six feet from the base of the mound, and if there be any permanent natural objects which can be made available in perpetuating the monument, the bearings and distances of such objects from the monument are to be carefully ascertained and described in the notes as "witnesses," while full and accurate descriptions of the monument are to be given.

When the eleven astronomical monuments shall have been established, the intermediate boundary line is to be surveyed and marked. In doing this it is agreed that a "transit" of approved manufacture and Gunter's chain shall be used, and an extra standard chain carried, with which the one used shall be compared and tested every morning, and as much oftener as may be necessary to insure accuracy. As the work progresses, observations at night on polaris, upper and lower culmination, will be taken, and at the greatest elongation of the same star, the instrument being reversed, a similar test of the accuracy of the line will be made.

Offsets from tangent to parallel are to be made from every astronomical monument east and west to the equidistant points between them, perpetuating the true points in the parallel of latitude as follows:

At the end of each mile an earthen or stone mound is to be raised four feet high, of a conical shape, with a pit two feet square and eighteen inches deep on the east and west of the mound, and six feet from its base. Prior to the construction of the mound, an excavation is to be made in its proposed centre, three feet six inches deep, at the bottom of which there is to be placed a marked stone, charcoal, or a charred block, and above this there is to be planted a post eight feet in length, six inches square, bevelled at the top, three feet in the ground, leaving twelve inches to project above the top of the mound. Upon the post there will be durably marked, on the north side, "C.," for Colorado; on the south, "N. M.," for New Mexico; on the west, "1867;" and on the east, number of each mile from the initial station or point of intersection of the 103d degree of west longitude with the 37th parallel of north latitude.

Where the physical obstacles of the country on the parallel may be found such



as to preclude the possibility of overcoming them, such as the inaccessibility of snowy mountains, high and abrupt ridges, deep cañons or other insurmountable impediment to the direct measurement of the tangent, and the ascertainment of the difference of longitude between the astronomical station, then, and in that case, triangulation must be resorted to, checked by frequent determination of the latitude where the features of the country will afford the facilities for so doing, in order to obtain the distances over impassable barriers. In marking the parallel in such contingencies the contractor, to perpetuate the line, is required to avail himself of natural monuments, such as peaks of mountains, or other bold and prominent landmarks, though at irregular distances, yet standing on the parallel.

As the leading object in view is to make the boundary between New Mexico and Colorado visible to the people of the respective jurisdictions, it is agreed, in regard to monuments which cannot be placed at the proper mile-posts, that they shall be established near travelled roads, rivers, and mountain passes.

Sketches are required to be made of the topography of the country immediately along the parallel, and that there shall be platted remarkable ranges of mountains, lofty peaks by which the vicinity of the boundary and of the monuments perpetuating it can be identified. The maps of the line, in triplicate, are to exhibit the eleven astronomical monuments, erected on the parallel, together with other topographical data, and the returns are to be accompanied by report showing the character of the observations, results, and their application to the determination and marking of the 37th parallel, coextensive with the common boundary between the Territories of New Mexico and Colorado. The initial and terminating points of the line, or the northeast and northwest corners of New Mexico, are to be commemorated by the erection of more conspicuous and prominent monuments than those which will be built in intermediate places.

#### OREGON-CALIFORNIA, OREGON AND IDAHO BOUNDARIES.

On the 17th June last, Daniel G. Major, an astronomer of experience and energy, was designated by the department for the determination and survey of those boundaries; the former of an estimated length of 220 miles, starting from the intersection of the 120th meridian west of Greenwich with the 42d north latitude, and extending thence westward to the Pacific ocean; the latter 160 miles long, running from the mouth of the Owyhee, an affluent of Snake river, thence due south to the intersection of the northern boundary of the State of Nevada on the 42d degree of north latitude.

The principles and requirements of the contract for the survey of the northern boundary of New Mexico are made applicable for the survey of the Oregon-California and Oregon-Idaho lines, the service having been authorized and provision made for the same in the appropriation act of 2d March, 1867, (Statutes 1866 and 1867, pages 465 and 466.)

In the year 1864 Astronomer Major completed the determination, survey, and marking of that portion of the 46th parallel of north latitude included between the Columbia and Snake rivers, forming the boundary between the State of Oregon and the Territory of Washington.

From the head of Walla-Walla valley, thence on to Snake river, that line traverses a continued succession of precipitous ridges of the Blue mountains, heavily covered with timber, through which the astronomer and party found it a slow and laborious task to work their way, made the more difficult by almost impassable barriers of fallen timber and embanked snow.

The field duties of the survey were thus completed, and subsequently there were transmitted, and are now on our files, the observations, reductions, field-notes, and maps of that boundary, duplicates of which were forwarded to the authorities of the State of Oregon and of Washington Territory.

Public exigencies require the survey and determination of the following lines :

The eastern boundary of Colorado, of 280 miles.

The northern boundary of the same, 367 miles.

The northern and eastern boundary of Nevada, of an aggregate length of 735 miles.

Separate estimates are submitted for this important service.

#### LEGISLATION GRANTING RIGHT OF WAY TO RAILROADS AND TURNPIKES.

An act was approved August 4, 1852, (Statutes, vol. 10, p. 28,) granting the right of way to all rail and plank roads and macadamized turnpikes passing through the public land belonging to the United States for ten years, that law having been subsequently extended by act 3d of March, 1855, (vol. 10, p. 683,) to all public lands in the *Territories* of the United States. The privilege was again granted, and for a period of five years from 4th of August, 1862, by the act of July 15, 1862, (vol. 12, p. 577.) By the limitation of the statute this important privilege terminated on the 4th of August, 1867. Its extension is hereby recommended, because it in no respect lessens the land revenue, but, on the contrary, affords important aid in the construction of works of intercommunication, and is eminently conducive to the public welfare.

#### THE PACIFIC SLOPE.

Within its limits there is an endless succession of rugged steepes, gentle slopes, fertile valleys, with varied and salubrious climate, its soil yielding in abundance all the cereals and esculents of the temperate zone, fruits and other products of the semi-tropical latitudes, and the grape in all its varieties, the olive, and, in its southern part, the orange, lime, fig, even cotton and tea being within the range of its production—its mountain sides covered with nutritious grasses for cattle, with forests affording immense quantities of lumber of the finest quality for domestic purposes and ship-building. Scattered over its surface are extensive deposits of coal, iron, copper, tin, lead, and quicksilver, its mountains being stocked with the precious metals.

This slope presents an irregular outline of an average length, from north to south, of one thousand miles—in width, six hundred and eighty—including California, Oregon, Nevada, the Territories of Washington, Idaho, Utah, Arizona, and the western parts of Montana, Colorado, and New Mexico, the whole region of 830,000 square miles, equal to 531,000,000 acres, traversed on the west by the Coast Range, the Sierra Nevada, the Cascade, and in the interior by the Wasatch, the Humboldt, the Blue, and Bitter Root mountains; its shore line, the Pacific, 2,281 miles, exclusive of bays, sounds, islands, and harbors on the coast, San Francisco and Puget sound being justly celebrated as among the first in the world, while the harbor of San Diego and the bay of Monterey, in southern California, and Bellingham bay, in Washington Territory, are capacious and well protected. Its agricultural capacity is adequate to the support of one hundred millions of inhabitants. Its deposits of coal, the great propulsive element, and of the useful metals, iron, copper, tin, lead, and zinc, are sufficient to put in operation machine shops and manufacturing establishments to any extent which the genius and interests of its population may desire to bring into requisition under the science of this age. Its varied industries, as well as those of the whole republic, will be stimulated by the annual gold product, the aggregate of which, since the year 1848, is estimated at a thousand one hundred millions.

Such is the region of our national domain on the Pacific, while on the east is another region of that domain, in the valley of the Mississippi, of boundless fertility, equal in its capacity to the support of a like population, and between these great divisions are situated one thousand millions of acres of undisposed of public lands. Already our annual domestic trade has reached, according to the

estimate of high authority,\* over five thousand millions of dollars, in which the whole people have participated, in the thirty-seven States and nine Territories, without the intervention of custom-houses. What effect upon this trade and upon the prosperity of the republic is the gradual settlement to have of the public lands yet undisposed of between the Mississippi and the Pacific! Some idea may be formed by the results of the past. The more effectually to unite the interests of our people, Congress has lent the aid of the government for the construction of means of intercourse from an early period of our national existence to the present date, as shown by the legislation in regard to roads and railways.

#### ROADS.

Indispensable to the success and growth of commerce is a well-adjusted system of thoroughfares, by which regular and speedy intercommunication may be maintained. When communities advance in agricultural pursuits roads become an imperative necessity, and hence nations which have progressed in civilization have left the memorials of regularly constructed facilities for transit. The semi-civilization of the Aztecs is shown by the remnants of ancient highways which have outlived even the traditions of that people, while the rigor of the Spaniard has failed to obliterate from the land of the Incas the evidence of Peruvian skill in the construction of the causeway which for fifteen hundred miles still skirts the border of the Andes, and with its massive masonry and pendulous bridges favorably compares with similar works of the present age. Not only are such means essential to commercial prosperity, but they constitute the most reliable element of national strength. The prosperity of ancient Italy may be measured to some extent by the increase of the wonderful highways which, in the zenith of that state, stretched from the capital to grasp and unite the provinces which, from time to time, were added to the state. These stupendous lines at last reached from the wall of Agricola to the distant waters of the Tigris, the utmost confines of Italian dominion, and of which an aggregate length of fourteen thousand miles had been constructed within the limits of Italy proper.

The first Napoleon comprehended the policy and economy of such improvements, estimating their advantages to the commerce and power of a nation. Besides constructing the grand *chaussées* interlacing France, he connected, by more direct routes, the land commerce of Italy and Austria with western Europe in the construction of routes through the Alps at Mont Cenis and at the Simplon, the latter only thirty-eight miles in length, yet passing over six hundred and eleven bridges, through numerous tunnels, and along solid galleries, and requiring the constant labor of ten thousand men for a period of six years.

A distinguished English historian has declared that, "of all inventions, the alphabet and printing press alone excepted, those which abridge distance have done most for the civilization of our species, regarding every improvement of the means of locomotion as benefiting mankind morally and intellectually, as well as materially."

In the United States the government has liberally encouraged efforts in the construction of public routes. From the date of the statute, in 1806, authorizing the construction of the national highway to connect the waters of the Atlantic with the western rivers, to the present time, seventy-eight statutes have been passed aiding directly or indirectly such improvements.

The first of these, the Cumberland road, led in its days to important results. It was the pioneer route that conducted the emigrant from the eastern States to the then wilderness of the Mississippi valley. It was the line of communication which, in after years, enabled emigrants to send to the seaboard the

\* See letter herewith from the Hon. Robert J. Walker, former Secretary of the Treasury, received since the date of the foregoing, showing the views of that distinguished statesman on the subject.



products of their toil. Villages sprang up in the wild sections through which it passed, land was enhanced in value, travel from the Ohio to the Chesapeake reduced two-thirds in time, and, as early as 1829, the transportation from Wheeling to Baltimore, conveyed over the line in a thousand wagons, was thirty-two million pounds.

The numerous roads of an early era for commercial or military uses, while serving important purposes in the development of the country, were forerunners of that higher degree of commercial intercourse which to-day characterizes this country.

#### THE RAILWAY SYSTEM OF THE UNITED STATES.

In the first half of the year 1830 there were no steam railways in the United States. In 1840, 2,167 miles existed. In 1850, there were 8,827 miles. In 1860, there were 31,185 miles; and to-day, 37,000 miles are in complete operation, being a thousand miles for each year since the construction of the first route, the cost being estimated at one thousand eight hundred and fifty millions of dollars. In addition to this completed extent there are by estimate seventeen thousand six hundred and eighty-five miles in process of construction.

The conveniences of local districts, the facilities of domestic trade, the binding power of these iron ligatures are no longer the only incentives to the construction of lines of internal communication; for, as a people, we have now the prospect of extending our ocean commerce, whereby increased wealth from trade with the older hemisphere may be realized.

The zeal of the navigators who followed in the pathway of the first discoverer of this continent was mainly directed in search of interoceanic communication. Failing in this, succeeding explorers sought for the most feasible routes by which the continent could be spanned. Until the present age it was supposed that communication between the two oceans could be most effectively secured only through ship canals uniting the Atlantic and Pacific, Baron Humboldt, in the early part of the present century, having reported several routes, by either of which he supposed the end could be effected. The Panama, Nicaragua, and Tehuantepec presented the fewest natural obstructions, while other methods looked to the union of the waters of the Rio Grande del Norte with those of the Colorado, or connecting the waters of the Columbia with those of Peace river.

The attention of the government was directed, as early as the administration of President Jefferson, to the importance of direct western communication over the wide spread plains and through the extensive ranges of mountains west of the Missouri. Explorations to this end had been made, but the long distance to be traversed through hostile Indian countries, and the limited means of transportation, then rendered the project practically useless to the commercial world. Up to the year 1848 the interior of the region west of the valley of the Mississippi was comparatively *terra incognita* to the great mass of the people of the United States—as much so perhaps as are to-day our recent acquisitions on the North Pacific.

The discovery of the gold districts on the western slope awakened a desire for more definite knowledge of its resources, while the speedy growth of cities and towns on the Pacific coast, with the consequent commercial incentives, demanded the construction of feasible land routes leading direct to the western confines of the republic, and which in less than five years will be no longer a project, but a fact accomplished.

The network of railroads from the Atlantic, traversing the middle and western States, will reach the three main lines projected for the Pacific railway, viz: The Union Pacific, starting from Omaha, Nebraska, extending along the valley of the Platte, through Bridger's pass in the Rocky mountains, thence by way of Great Salt Lake City to its connecting point with the Central Pacific.

The Central Pacific line starts eastward from Sacramento, in California, and is making its way to the point of junction at or near Great Salt Lake City, one hundred and thirty-eight miles of which are completed and in full operation. The Union Pacific having proceeded on its way westward to the extent of five hundred miles, more than six hundred miles of the total distance has been finished since the commencement of the work.

The Union Pacific eastern division leaves the Missouri at Kansas City, following the valley of Kansas river to Fort Riley; thence up the Smoky Hill fork to Fort Wallace, near the western boundary of Kansas; thence onward to the city of Denver, Colorado Territory, and *proposed* from Fort Wallace, via Forts Lyon and Union, to Albuquerque, and through New Mexico and Arizona, along the 35th parallel, to the Colorado of the west; and thence to the city of San Francisco, California. There are now two hundred and ninety miles of this route completed.

The Atlantic and Pacific railway, with its eastern terminus at Springfield, Missouri, it is proposed shall pass southwesterly through the Indian territory, New Mexico, Arizona, and to connect with the Southern Pacific road in the southeastern part of California.

In addition to these is the Northern Pacific route, not yet definitely located, but designed to connect the upper waters of Lake Superior with the Pacific coast at Puget sound.

The Memphis, El Paso, and Pacific route is also projected, to start at a point opposite Memphis; thence through Arkansas and Texas to the Rio Grande, opposite El Paso, and onward to the Pacific, through the southern portion of New Mexico, Arizona, and California.

In aid of these enterprises, Congress, by different enactments, have granted, by estimate, 124,000,000 acres. Land concessions have also heretofore been granted to Illinois, Iowa, Michigan, Kansas, Missouri, Minnesota, Wisconsin, Arkansas, Alabama, Mississippi, Florida, Louisiana, and California, amounting to 57,588,581.40 acres. Including the quantity granted for wagon roads, it is estimated that in the aggregate there have been conceded in round numbers one hundred and eighty-four millions eight hundred and thirteen thousand and nine hundred acres; of which quantity there have been already certified to the proper beneficiaries within a fraction of 21,000,000 of acres.

This munificence is further augmented by the financial credit, in the issuing of bonds in favor of certain companies.

Eminently advantageous as the result may be from these franchises, it is submitted that the future policy should so economize the public land fund as to restrict it only to such works as may be of indispensable public necessity, and then confining the concession to the most limited basis compatible with the success of the enterprise, because the public domain is a great national heritage, and should be looked to as a source of wealth for ages to come.

The quantity of lands conveyed by these grants is of empire extent, exceeding in the aggregate, by more than 5,000,000 of acres, the entire areas of the six New England States, added to the surface of New York, New Jersey, Pennsylvania, Ohio, Delaware, Maryland, and Virginia.

Not only do these immense quantities eventually pass from the United States, and beyond the reach of those desiring to avail themselves of the benefits of the pre-emption or homestead laws, but pending their adjustment it becomes necessary to withdraw from market large tracts bordering on the roads, in order to await the consummation of the railroad grants. It should further be the purpose to guard the public lands from a tendency to lesson to any considerable extent the sphere and opportunities of our people for obtaining homes upon easy conditions.

The celerity with which two of the main lines west of the Missouri and east of the Rocky mountains are being constructed, and the corresponding industry

shown in the connecting lines on the Pacific side, give assurance of the early completion of these stupendous undertakings.

Already are felt the invigorating results of these enterprises in the influx of foreign immigration, the demand for government lands, the settling of remote districts, and the rapid growth of new towns and cities. They carry with them relief to the pioneer people, who, in the midst of remote mountain districts and in the adverse circumstances of isolation, have revealed the long-hidden resources of the mountains; have there unlocked the great treasure-house of nature; and, in giving to the world the product of their toil, have added to their country's glory in the formation of prosperous towns, cities, and States.

The progress made in the last two decades promises early increased intercourse with the regions of the West, and full development whether of the precious and useful metals, the products of the soil, or yield of the forest. With continuous iron railways, over which the fabrics and wares of Asia on reaching our western shores may be carried to the ports of Europe in less time and with greater security than by other routes, it needs not the spirit of prophecy to predict the speedy revolution in the channels of the world's commercial intercourse, eventuating in their concentration on the railroads and water-courses of this continent.

In this view, and regarding the expansion of domestic and foreign trade as a quickening element in advancing settlements upon the unoccupied public domain, which, exclusive of our new North Pacific territory, is equal in area to forty States of the size of Ohio, it is proposed to advert to our commercial relations, changed within recent years by the new and commanding position the United States now occupy towards the Asiatic people.

The trade of the East from the earliest ages has been regarded by western nations as a source of wealth and power. The advance of Alexander the Great, more than three centuries before the Christian era, to the Indus, had in contemplation higher objects than mere conquest, as his line of march became a line of civilized settlements—in fact, centres of trade. The Egyptian commerce by the Red sea was secured by that great captain, and enlarged by the establishment of his western capital. The Greek settlements which had been made along the Hellespont and Euxine were the bases for opening the northern route by the Caspian and Aral, by which in caravans were brought the products of northern and eastern Asia to European markets.

The routes thus marked out became the channels of trade under the Roman dominion, when the fleets of Augustus passed through a canal then existing from the Nile to the Red sea, and thence to India. The dissolution of the Roman state, the rise of the Parthian and extension of the Mohammedan rule, succeeded with results paralyzing to the trade of the East, continuing until it was reopened in the fourteenth and fifteenth centuries, when the Venetians and Genoese became rich and powerful in furnishing the European markets with the products of Asia. Upon the discovery by the Portuguese, in 1498, of the route by the Cape of Good Hope, commerce, which had been obstructed and impaired by commercial jealousies growing out of the prejudices of different races and religions, forsook the shorter inland channels for the free ocean route. The commercial movement over this highway by the Portuguese, Dutch, English, French, and Danes resulted in the establishment of British supremacy in India, yet not without a formidable inland rival in imperial Russia, whose military frontier has been pushed across the Jaxartes on the right, and now rests within eight hundred miles of Pekin on the left, with large acquisitions on the Amoor through its length to the ocean, draining an area of more than half a million of square miles. Meanwhile, France has been enlarging her influence by recent extension of territory in Cochin China and Siam.

These events and the increasing desire of European powers for ascendancy in the east have given, in this age of steam, to the Suez canal isthmean route most important relations to the commerce of Asia.



For the last quarter of a century British commerce had sought, but not realized, the establishment of a route to India by way of the Euphrates and Persian gulf. For years past the transit of travel and trade breaking bulk from Alexandria to Suez has been first by an ordinary road, and now by railway. The ship canal will open a complete passage for ships passing from the Mediterranean down the Red sea to India. The existing status of that canal and terms of transit are presented in the communication herewith, dated the 29th of August, 1867, at Paris, from M. De Lesseps, elicited by the kind intervention of the Hon. William H. Seward, Secretary of State, in answer to inquiries from this office. That communication shows that the canal, at a cost of four hundred millions of francs, will be completed October 1, 1869; that it is now open from Port Said, on the Mediterranean, to the southern shore of Lake Timsah, a distance of 52.8 miles; the remainder of the canal, extending 45.3 miles to Suez, not to be opened until completion of the main canal, navigation for flat-boats in the mean time existing through the Sweet Water canal, or channel of fresh water connecting the Nile with the Red sea.

This republic is now a candidate for a full share of the trade of the east. The aggregate British import and exports from India and China for the five years ending with 1864 was £378,587,122, according to parliamentary papers of 1865.

The net British revenue from India for 1860 was £7,081,107, to which may be added individual savings in the Anglo-Indian empire of £7,536,443, making an aggregate of \$73,090,750.

The tables herewith will show that upon the completion of our Pacific railway, and the development of our steam communication with Asia, San Francisco and New York will be nearer than London to a large number of Asiatic ports both in time and distance, even with the advantage of the abbreviated Suez route.

These tables will show that, measuring from San Francisco, our superior advantage on the score of distance reaches across the Pacific and extends around the peninsula of Malacca to a point between Singapore and Penang; that starting from New York, our great commercial centre, 3,000 miles further eastward, our local advantage reaches beyond the Philippine islands, finding the point of equalization with British transit somewhere between Manila and Singapore, and that as to Melbourne, the commercial metropolis of Australia, London loses in comparison with San Francisco 3,379 miles, and in comparison with New York 379 miles.

These facts must lead to important results. They indicate a probable monopoly of the carrying trade of the Pacific by American bottoms.

The Pacific Mail Steamship Company, a great commercial line, established under authority of law and with liberal subsidies, have a line of steamers from San Francisco to Shanghai and Hong Kong via Yokohama in Japan. The first voyage of the pioneer steamer—the Colorado—to Shanghai, was accomplished in twenty-seven and one-fourth days; and on her return, with tempestuous weather, reached San Francisco within three weeks from her departure from Yokohama. The completion of the Continental railway will place New York within twenty-six days and Liverpool within thirty-five days' travel of Japan.

From London to Yokohama by the shortest eastern line, via Marseilles and Suez, is a distance of 10,530 miles and fifty-three days' travel, while the shortest line of continuous navigation, via Gibraltar and Suez, is 11,509 miles and over sixty days. The travel from Japan, Russian Asiatic possessions, Philippine islands, Eastern India, Indian Archipelago, and Australia, to Europe, must prefer the route by San Francisco and New York, if only on the score of economy in time. For the lighter and more costly articles of trade, the transportation of which forms but a small proportion of the price, the facilities afforded by our ocean and continental lines will largely supersede even the continuous navigation of the Suez canal route, which at any time is liable to interruption by Euro-

pean hostilities. The rapidity of transit will, in a large number of instances, counterbalance the higher rates of railroad transportation and the double transshipment, first at San Francisco and then at New York.

It may be expected that a very considerable portion of the teas and silks of China will reach England and France after transit over our railways, and a corresponding amount of their higher-priced exports will reach Asia by the same route—the teas and silks imported into the British islands during the five years ending in 1864 having amounted to 541,428,329 pounds, valued at over two hundred and six millions of dollars. The foreign trade of Japan is of recent development, but rapidly growing in importance.

The Colorado on her recent return trip brought to San Francisco a freight nearly three times the value of the entire trade between that place and Japan during the first quarter of the year 1866, while our direct trade with China for 1866 was more than three times that of the previous year.

The precious metals, which in times past for greater promptitude and safety went to the Oriental ports via London, will be sent by our own more direct and speedier ocean routes at a saving of half the cost of transmission, besides the English assurance from London to China. This direct treasure shipment will make San Francisco and New York the financial centres, the clearing-houses of the world's trade, controlling as they do the production of its metallic circulating medium.

With the elements of success thus imperfectly glanced at, the United States are now entering upon an imperial chapter of national prosperity. The control of the eastern trade is at present what it was in the past, the basis of commercial ascendancy. The supremacy it conferred was seen in the splendor of the Queen of the Adriatic in mediæval ages. What it has aided in accomplishing is shown in the massive accumulations and proud corporations of merchant princes in the commercial centres of western Europe. What it will effect in the near future under a fully developed democratic civilization, with accumulating elements of progress, increased energies, and completeness of organization, will appear in the universally diffused material prosperity and intelligence, the extent of which the experience of the past affords no adequate bases to conjecture.

With this report will be found a paper prepared in this office, giving a brief view of the gold and silver-producing countries of the present day; the proportion contributed by each to the stock of the precious metals; total amount taken from the mines since the discovery of America, as estimated by various authorities, and the quantity now existing in the form of coin, plate, jewelry, and ornaments; the actual consumption for purposes other than money; the loss by abrasion; with remarks in reference to the effect upon prices of the increased quantities of the precious metals produced at the present date, with a summary of the mineral wealth of the United States.

There is submitted herewith a map of the world on Mercator's projection, to show the geographical position of this Union, in reference to its commercial relations with the states of Europe, Asia, South America, Australia, the islands of the Caribbean sea and the Pacific, with names of the ports in certain eastern countries open to trade with the United States, as shown in the accompanying communications of the 7th and 12th of October, 1867, from the Secretary of State of the United States.

Accompanying this is a connected map of the United States, indicating the sites of all the land and surveyors generals' offices; the localities of the precious and useful metals in the public domain; the railway system, showing the routes, actual and projected, of the continental lines.

Also herewith are separate maps of the public land States and Territories of Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Missouri, Alabama, in which the surveys are completed, and of Louisiana and Florida, in which they are nearly so; with maps showing the extent of surveys in Minnesota, Dakota,

Kansas, Nebraska, Colorado, New Mexico; of Montana, in which the system has been but recently inaugurated; of Idaho, Utah, Arizona, Nevada, California, Oregon, and Washington Territory; also of the Indian country, and of our Russian purchase.

There are also herewith a historical and statistical table; returns from the surveyors general; exhibits of the disposal of public lands under the various laws during the last fiscal year; a complete exhibit under 22 different heads, showing different ways in which the national territory has been disposed of since the foundation of the government; with exhibits of the concessions for the construction of wagon and military roads, railways and canals; these maps, tables, and exhibits illustrating operations under the land system.

Respectfully submitted:

JOS. S. WILSON,  
*Commissioner.*

Hon. O. H. BROWNING,  
*Secretary of the Interior.*

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DEPARTMENT OF STATE,

*Washington, September 30, 1867.*

SIR: With reference to your application made previously to the 6th of August last for information concerning the Suez and Sweet Water canals, I transmit a copy of a despatch of the 12th instant, and of the papers which accompanied it, from our legation at Paris, giving the information desired.

I am, sir, your obedient servant,

WILLIAM H. SEWARD.

JOSEPH S. WILSON, Esq.,  
*Commissioner of the General Land Office, Washington, D. C.*

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LEGATION OF THE UNITED STATES,

*Paris, September 12, 1867.*

SIR: I have the honor to transmit herewith a translation of a letter from Mr. Ferd. de Lesseps, president of the Suez canal, giving full information (for the Commissioner of the General Land Office) in regard to the Suez and Sweet Water canals asked for in your despatch of the 6th of August last, No. 104.

The reports referred to by Mr. Lesseps will go forward to the department in the despatch bag to-morrow. A chart of the canal addressed to the department was sent by the steamer that sailed from Brest on the 31st of August last.

No expense has been incurred in gathering this information.

I am, sir, with great respect, your obedient servant,

WICKHAM HOFFMAN.

Hon. WILLIAM H. SEWARD,  
*Secretary of State.*

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[Translation.]

PARIS, August 29, 1867.

MONSIEUR LE MINISTRE: You have done me the honor to ask for replies to certain interrogations made by the Commissioner of the General Land Office of the United States, relative to the Suez canal.



I have just returned from Holland, and I hasten to give you the replies asked for, and for greater precision I here reiterate the questions:

I. "Will the Lessees canal be open to all nations, and what will be the probable tonnage toll exacted to pay interest on the total cost of the canal?"

Answer. The maritime canal will be open as a neutral passage to all merchant vessels crossing from one sea to the other, without distinction or preferences of persons or nationality, on the payment of tolls and the observance of certain rules established by the company.

The tonnage necessary to pay the interest which will accrue to the shareholders upon the total cost of the canal will depend upon the tariff adopted.

Allowing, for example, that the tolls be fixed at ten francs per ton, the company having to pay interest on its capital stock, amounting to two hundred millions, would have to calculate upon an annual passage through the canal of one million of tons to pay interest at five per cent.

Moreover, it would have to pay the expenses of working the canal and to provide for the interest of a loan of one hundred millions, which it is upon the eve of making.

A passage of two millions of tons would, at ten francs per ton, giving twenty millions of revenue, be more than sufficient to remunerate the company; but it is authorized to count upon a transit of more than two millions of tons when the canal shall have been completed.

When the company was organized, in 1858, it estimated at three millions of tons per annum the passage of vessels through the canal.

That estimate is now much below the figures, and the company to-day makes but a low estimate of its future revenue in *doubling that tonnage*.

Now six millions of tons at ten francs per ton would give a revenue of sixty millions. It appears, then, that not only will the revenue of the company be sufficient, but that it will yield very large profits.

II. "What will be the total cost of the canal, and what time is its completion expected?"

Answer. The canal will be completed the 1st October, 1869, and the total cost of its construction will be four hundred millions, represented thus:

Capital stock.....	200, 000, 000
Indemnity from the viceroy and certain payments made by the Egyptian government.....	100, 000, 000
Loan.....	100, 000, 000
Francs.....	<u>400, 000, 000</u>

Interest at five per cent. is payable upon the capital stock of two hundred millions. There is no interest payable upon the one hundred millions indemnity and payments by the Egyptian government. The loan of one hundred millions, upon which interest is payable from its beginning, will be redeemable in a certain number of years.

III. "Is the canal from Port Said to Suez now open for any kind of craft?"

Answer. The maritime canal is open from Port Said to the southern extremity of Lake Tensah, a distance of eighty-five kilometres. The remainder of the canal to Suez will not be opened until its completion, so that the progress of the work may not be interrupted. It would be useless to open sooner the second half of the maritime canal, because, commencing from Lake Tensah, the fresh-water canal, which comes from the Nile, communicates by locks with the maritime canal, and receives all the merchandise which comes from Port Said, and is carried by it to Suez, and *vice versa*. At this moment there is a large transit of merchandise between the two seas by the double route that I have indicated, viz., partly by the maritime canal, partly by the fresh-water canal. The ser-

vice is performed by flat-boats, upon which they tranship the goods to Port Said and Suez. Thus, as has been remarked, this state of things will last until the work is completed—that is to say, until the 1st of October, 1869. On that date the maritime canal will be opened to navigation from the Mediterranean to the Red sea, and *vice versa*. It will be one hundred (100) metres in breadth at the water-line, twenty-two (22) metres at the bottom, (ceiling,) and eight metres in depth, so that all merchant vessels can easily pass through.

IV. "Is the Sweet Water (fresh water) canal now open for small craft?"

Answer. The fresh-water canal has an average of fifteen metres of width and about two metres of depth. It receives all craft which do not exceed these dimensions, and its business is very brisk.

Such, sir, is the information that I am glad to give you, and that I shall be obliged by your transmitting to the government of the United States.

I send with my letter several copies of a report (with maps) which I read at the general meeting of the stockholders of the company on the 1st of August last.

I will be gratified if you will present these reports to the departments of the government which you think would be interested in receiving them.

Receive, &c.

FERD. DE LESSEPS, *President*.

General DIX, &c., &c., &c., *Paris*.

#### DEPARTMENT OF STATE,

*Washington, October 7, 1867.*

SIR: I have the honor to acknowledge the receipt of your letter of the 7th ultimo, requesting to be furnished with the names of the ports in certain eastern countries open to trade with the United States, under treaty or otherwise, and in reply to inform you that in China the ports of Canton and Chau-Chau or Swatow, in the province of Kwang-Tung; those of Amoy, Fu-Chau, and Tacwan, in Formosa, in the province of Fuh-Kien; the ports of Ningpo, in the province of Cheh-Kiang, and Shanghai, in the province of Kiang-su, and the ports of Chin-Kiang, Hankoa, Chee-Foo, Kin-Kiang, Newchwang, and Tientsin, are open to trade. Hong Kong, which is also open, is a British colony. The ports in Japan now open are Simoda, Hakodadi, Kanagawa, and Nagasaki. Hiogo and Osacca will be open on the 1st of January next.

As we have no diplomatic or consular agents in Cochin China, I must refer you to the honorable the Secretary of the Treasury for information concerning trade with that country. I may remark, however, that in Siam, a part of the same peninsula, all of the seaports are open to American trade, under the treaty of the 20th of May, 1856. It is understood that in 1862 the three provinces of Bienhoa, Saigon, and Miho, and the island of Poulo Condore, forming the southern part of the peninsula, were formally ceded to France, and that still other acquisitions have been made by the same power there since.

As there are no treaty stipulations with France requiring her to throw open colonial ports to our trade, and as that country regulates the trade of each colonial dependency by such decrees as may seem best adapted to that purpose, and has not, as yet, communicated to this government any regulation affecting trade with her new possessions in Cochin China, I am unable to give you definitive information in the premises.

I have addressed an inquiry to the minister of France on the subject, and shall communicate to you the result.

With reference to your inquiry concerning the ports of the British East Indies, I have to state that all of the ports of those colonies are open to the

trade of the United States, upon terms and under authority explained in volume 1 of the Report on Commercial Relations, prepared in this department, accompanying the President's message to the House of Representatives of March 4, 1856, page 76.

I am, sir, your very obedient servant,

WILLIAM H. SEWARD.

JOSEPH S. WILSON, Esq.,

*Commissioner of the General Land Office.*

*Extract referred to in the preceding letter, from volume 1, Report on the Commercial Relations of the United States, &c., (H. Ex. Doc. No. 47, first session thirty-fourth Congress,) page 76.*

#### EAST INDIES.

The commercial intercourse of the United States with the territories of the East India Company is regulated by the different local governments thereof, under the supreme control and approval of the governor general of India in council. The regulations prescribed by these authorities are not of a permanent character, being liable to modifications and changes whenever, in their opinion, such become necessary. To present, however, the true basis upon which this intercourse rests, it will be necessary to refer briefly to the treaty stipulations existing between the governments of the United States and Great Britain, premising that, prior to the convention of London signed on the 3d of July, 1815, between the United States and Great Britain, the commercial intercourse of the former with the East India possessions was regulated, as was that of other foreign nations, by a general clause in the company's charter providing that "vessels of countries in amity with Great Britain may import into and export from the British possessions in India such goods and commodities as may be specified in rules to be prescribed by the East India Company; provided, that such rules shall not be inconsistent with any treaty now [then] made, or which may be made, between Great Britain and any foreign state in amity with her, or with any act of Parliament for regulating the affairs of India."

By the convention above referred to, and the subsequent convention of October, 1818, continuing the former, it was stipulated:

1st. That vessels of the United States shall be admitted and hospitably received at the principal settlements of the British dominions in the East Indies, viz: Calcutta, Madras, Bombay, and Prince of Wales island; and the citizens of the United States may freely trade between the said settlements and the United States, in all articles of which the importation and exportation, respectively, to and from the said territories shall not be entirely prohibited. And,

2d. It was provided that the citizens of the United States shall pay for their vessels, when admitted, no higher or other duty or charges than shall be payable on the vessels of the most favored European nations; and they shall pay no higher or other duties or charges on the importation or exportation of the cargoes of said vessels than shall be payable on the same articles when imported or exported in the vessels of the most favored European nation. And,

3d. It was expressly agreed that the vessels of the United States shall not carry any articles from the said settlements to any port or place, except to some port or place in the United States of America where the same shall be unladen.

This convention is still in force, and regulates the commercial intercourse of the United States with the East India possessions, except as to paragraph 3, which has been superseded by the repeal of the British navigation laws in 1849, the effect of which has been to open the ports of Great Britain and of all her



colonial possessions abroad to "goods of any sort, in a ship of any country, from any part of the world."

By an act of the imperial Parliament, entitled 13 Victoria, chapter xxix, sections 3, 4, 5, and 6, the governor general of the East India possessions was clothed with full powers to admit, whenever he should deem it advisable to do so, to the coasting trade in the East Indies, the vessels of all foreign nations. This privilege is now enjoyed by every flag.

With these two exceptions, the convention of 1818 is still in full force, and constitutes the only guarantee which the United States possesses of equal privileges with the most favored nation in its intercourse and commerce with the East India possessions.

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DEPARTMENT OF STATE,

*Washington, October 12, 1867.*

SIR: With reference to the letter of the 7th instant, addressed to you by this department in reply to certain inquiries concerning ports in the east open to our commerce, I have the honor to enclose an extract which has been prepared from an official publication of 1866, issued under the authority of the French government, which work is entitled "*Notices sur les Colonies Françaises.*"

This extract relates to the conditions on which trade may be carried on at the port and river of Saigon, in the French province of that name, mentioned in the letter from this department of the 7th.

No information is contained in the same work in relation to trade with the other provinces acquired by France in Cochin-China.

I have the honor to be, sir, your obedient servant,

F. W. SEWARD.

Hon. JOSEPH S. WILSON,

*Commissioner of the General Land Office.*

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COMMERCE AND NAVIGATION.

*Legislation.*—The port and river of Saigon have been opened to the commerce of all nations by a decree issued by Rear-Admiral Page, dated February 10, 1860. In accordance with the regulation which followed the above decree\* merchant vessels had been compelled to pay a tax for anchorage of two piasters per ton; this tax was reduced to one-half piaster from and after January 23, 1861.

The commercial regulation dated August 25, 1862,† liberates from that tax the French and Spanish vessels, as well as those chartered by the state, or which arrive in ballast. The payment of the tax for anchorage discharges the commercial transactions from all custom-house duties on importation as well as on exportation for all kinds of merchandise, with the exception of opium, upon which a tax *ad valorem* of ten per cent. is levied and collected by the authorities appointed for that purpose.

The light-house tax is fixed at three and one-third piasters for every ton, and cannot be exacted but once a year for the same ship.

Will be exempted from that tax the following vessels, viz: Men-of-war, merchantmen, vessels or steamers carrying the mail, and the vessels chartered by the state. Some modifications have been made to the act of 1862 by a decree dated May 25, 1865. The tax for anchorage has been reduced to one-fourth of a piaster for foreign ships arriving in ballast to take cargoes in Saigon. Some regulations have been established to protect the public health in case an epidemic disease should be declared on board a vessel in the harbor.

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\* This regulation was inserted in the *Moniteur de la Flotte*, May 13, 1860.

† This regulation was inserted in the *Bulletin Officiel de la Cochin-China*, 1862, No. 16.

The expenses of piloting are moderate and regulated according to the custom of the neighboring ports.

A tug-boat is always in readiness for towing the vessels which may require it to go up the river.

*Table showing the comparative distances of London, by Gibraltar and Suez canal, and San Francisco, from commercial points in Australia and Asia.*

Oriental points.	From London, via Gibraltar and Suez canal.	From San Fran- cisco, direct ocean route.	Differences in favor of San Francisco.	Differences in favor of Lon- don.
Melbourne.....	11,281	7,902	3,379	.....
Yokohama.....	11,504	4,520	6,984	.....
Shanghai.....	10,469	5,555	4,914	.....
Hong Kong.....	9,669	6,355	3,314	.....
Manilla.....	9,639	6,135	3,504	.....
Singapore.....	8,239	7,785	454	.....
Penang.....	7,859	8,165	.....	306
Calcutta.....	7,946	9,665	.....	1,719
Ceylon.....	6,646	9,378	.....	2,732

*Table showing the comparative distances of London, via Gibraltar and Suez canal, and New York, via San Francisco, from the same points.*

Oriental points.	From London, via Gibraltar and Suez canal.	From New York via San Francisco.	Differences in favor of New York.	Differences in favor of Lon- don.
Melbourne.....	11,281	10,902	379	.....
Yokohama.....	11,509	7,520	3,989	.....
Shanghai.....	10,469	8,555	1,914	.....
Hong Kong.....	9,669	9,355	314	.....
Manilla.....	9,639	9,135	504	.....
Singapore.....	8,239	10,785	.....	2,446
Penang.....	7,859	11,165	.....	3,306
Calcutta.....	7,946	12,665	.....	4,719
Ceylon.....	6,646	12,378	.....	5,732

The foregoing tables have been compiled mostly from a translation by English authority of Berghaus and Stulpnagel's Mercatorial Chart of the World, published at Gotha in 1866.

The closing of the Suez canal by a European war, in which England may become involved, will deprive her of the advantage of this abbreviated route, and compel her to resume the old route around the Cape of Good Hope, by which her heavier articles of commerce continue to be transported. This will add four thousand eight hundred miles to the foregoing distances from London to the ports of eastern Asia, and about three thousand miles to the distance from London to Melbourne, in Australia.

JOS. S. WILSON,  
Commissioner.

DEPARTMENT OF THE INTERIOR, General Land Office.

WASHINGTON, D. C.,

November 4, 1867.

DEAR SIR: In reply to the two questions which you have addressed to me, I beg leave to say that the main route of the proposed railroad to Mazatlan, in Mexico, would run from New York through Philadelphia, Baltimore, Washington, Lynchburg, and Knoxville, to a point at or near Chattanooga. Thus far the road is already completed. From this last point the road should progress by the best and shortest route through the States of Alabama, Mississippi, Louisiana and Texas to the Rio Grande, at or near the mouth of the San Juan river, thence passing through or near Monterey and Durango to Mazatlan. This road is nearer by many hundred miles than any other practicable route from New York to the Pacific; the grades are more easy, the construction less costly, and the country through which it passes rich and productive. Mazatlan, on the Pacific, is on the same parallel of latitude with the Sandwich Islands, and with Canton, China. It is also on the most direct line from New York to Australia and southeastern Asia. Eventually our country, besides the roads now progressing to the Pacific, will require one from the head of Lake Superior to Puget's sound, with branches to the mouth of the Oregon and to a junction with the present road at Sacramento; also the road from Memphis through Arkansas and Albuquerque to San Francisco, connecting with Cairo and St. Louis; also from Vicksburg through Texas, New Mexico, and Arizona, to San Francisco, with branches to San Diego, Guyamas, and Albuquerque; this road would connect with that running from Kansas through New Mexico. We, shall, of course, need railroads through Tehuantepec, Honduras, Nicaragua, and Chiriqui, and especially a ship canal through the isthmus of Darien. With all these completed we should soon command the commerce of the world. How, or when, or to what extent any or all of these great enterprises are to be aided by the nation, must be left to the wisdom of Congress. I must say, however, after having travelled through Egypt and observed the progress of the ship canal through the isthmus of Suez, that, if we mean to contend with Europe for the trade of Asia, a ship canal through the isthmus of Darien is indispensable.

Your second question relates to the estimate of \$4,000,000,000, as constituting the value of the annual domestic trade of the country, and requests the data on which that estimate is founded. These are to be found mainly in the tables of the last census of the United States. The quantities there given were converted by me into values, and will be found in my letters printed in London and on the continent when I was acting as the financial agent of the government and negotiating its foreign loans. These data are most fully given in my letter No. 5 from London of the 8th of February, 1864, and the appendix accompanying the third edition of those letters. You will find the statement based on the census of 1860. Total product of 1859, namely, of agriculture, manufactures, mines, and fisheries, \$5,290,000,000; of this the gross value of the products of manufactures, mines, and fisheries was \$1,900,000,000. See census of 1860, table 33, page 130, making the ratio of the increase from 1850 to 1860 \$86 91 per cent.; same book, 8th census, page 59. The gross value of the products of agriculture for 1859 was \$3,390,000,000; same book, table 36, pages 198 to 210.

From the gross value of manufactures we must deduct \$1,012,000,000, being the value of the raw materials used, (see table 33,) leaving the net value of \$888,000,000. From the agricultural values we must deduct (see table 36) \$830,550,162, converting the gross value of live stock into the value of its annual products. This would leave the real value of the agricultural products of 1859, \$2,559,449,838, making the ratio of increase, from 1850 to 1860, 95.07 per cent. To this, however, we must add at least \$200,000,000 net value of mechanical productions below the annual value of \$500, of which no official cognizance is taken in the census. (See page 59.) This, added to the table of manufactures



would make the amount \$1,088,000,000. There were omitted, also, in the census of 1860, milk and eggs, fodder, firewood, moss, manures, poultry, and feathers, and products under a bale, ton, barrel, &c—estimated value \$300,000,000—which, added to the agricultural products of 1859, would make the whole amount \$2,859,449,838. But, on looking at the census tables of 1860 by counties, I find nearly one-tenth of these wholly omitted, (many of which are given in the census of 1850,) and in many counties only partial returns. Allowing five per cent. for these omissions, \$197,372,491, the net value in 1859 of the products of our agriculture, manufactures, mines, and fisheries, would be \$4,144,822,329. Now, if the ratio of increase from 1859 to 1869 equals that of the last decade, the *augmentation* would be \$3,855,000,000. But from this must be deducted one-fifth, the calculation being for eight years, from 1859 to 1867, instead of ten years. This would make an addition to the product of 1867 of \$3,084,000,000. But, from this increase we should deduct, from various causes, growing out of the late rebellion, not exceeding one-fourth, and the real increase would be \$2,313,000,000. Add this increase to that of 1859, and the result would be that the value of the product of the year 1867 would be \$6,457,822,329. In order, however, to exhibit this result in the next census, it must be more accurate, and there must be no omissions.

Now, the total net value of the product of 1867 being, as we have seen, \$6,457,822,329, in order to ascertain the aggregate domestic trade of that year, we must deduct, for exports of these products abroad, not exceeding \$300,000,000; this would leave \$6,157,822,329. Now, by domestic trade I presume you mean what remains after deducting the amount of these products consumed by the producers. When we reflect that nearly every bale of cotton, and nearly every hogshead of sugar, is sold by the producers, that nearly all the wheat is sold to those who convert it into flour, and how small a portion of our manufactures is not sold by the manufacturer, the deduction on all these accounts could not exceed one billion of dollars, which would leave the value of domestic trade of the country, in 1867, \$5,157,822,329.

My answer to your letter has been delayed by a desire that the estimate should be as accurate as possible. Believing that the statistics heretofore presented by you, as well as those now being prepared, must prove of incalculable benefit to the country,

I am yours, very truly,

R. J. WALKER.

JOSEPH S. WILSON, Esq., *Commissioner, &c.*

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NEBRASKA CITY, *July 1, 1867.*

SIR: I take the first opportunity which has presented itself to me to report to you the progress of my explorations. During the month of June, I have examined, with considerable care, the counties of Douglas, Sarpy, Cass, Otoe, and Lancaster, and will leave to-morrow to examine the counties of Nemaha and Richardson, returning northward through Pawnee, Johnson, and Lancaster counties to the northern part of the State, returning again southward, as far as time will permit, through the third tier of counties. These three tiers of counties will comprise most of the settled portions of the State.

I have already accumulated much interesting information, although no striking discoveries have been made. There are few, if any, important minerals in the State, but our collections of carboniferous fossils are very extensive. We shall secure, in the course of the year, most abundant material to illustrate the geology of the State. We have made most earnest search for coal. This question seems to be one which now excites the attention of the people more than any other, and they are earnestly asking for a solution of the problem.

By my direction Mr. Meek passed across the State of Iowa to Nebraska City with Dr. C. A. White, State geologist, and they succeeded in tracing the coal measure rocks from Des Moines to Nebraska City, and the conclusion they arrived at was, that the workable beds of coal in Iowa occur in the lower coal measures, and that those beds would be found by boring from 300 to 500 feet below the water level of the Missouri at Nebraska City. All the facts that we have so far secured in our subsequent examinations seem to confirm that conclusion. It may so happen that the limestones and clays increase in thickness in their westward extension, and in Nebraska it may be necessary to bore 600 or 800 feet before reaching a workable bed of coal. Even at that depth a good bed of coal would be profitable. In England coal has been mined 1,800 feet beneath the surface, and there are numerous pits from 800 to 1,200 feet in depth.

We shall give this question of coal our earnest attention as we proceed southward. I enclose a section of an artesian boring made at Omaha by the Union Pacific Railroad Company, near 400 feet, also a second section made by Mr. Croxton at Nebraska City. The observations made by the parties engaged in the boring were not made with that positive accuracy that I could have desired, still I have put their notes into such a form by means of colors, in accordance with your instructions, that you will readily understand the character of the beds for a great depth beneath the surface of the two localities.

I shall forward to you all the sections of this kind which I can secure. Mr. J. Sterling Morton has sunk a shaft on his farm 100 feet in depth, without success. I have advised boring hereafter, and to save expense, to continue Mr. Croxton's boring, which is already 400 feet deep, to a depth of 800 feet, if necessary, so as to settle a vexed question one way or the other. Several thin beds fifteen to eighteen inches thick of coal have been found in various parts of the State, and these beds have been wrought with some profit.

The results of our examinations north of the Platte were that the limestones of the upper coal measures pass from sight beneath the water level of the Missouri at De Soto, and are then succeeded by sandstones of a cretaceous age; that these coal measure limestones occupy about two-thirds of Douglas county; that no coal beds of workable character can be found in this county at a less depth than from 800 to 1,000 feet beneath the water level of the Missouri. Limestone of good quality for economical purposes generally is found at Omaha, and all over Sarpy county. On both sides of the Platte river as high up as the Elkhorn are excellent quarries of limestone. There is one ledge of limestone on the Platte about four feet in thickness, very compact and durable, which fully satisfied the wishes of Mr. J. L. Williams, one of the commissioners for accepting the Union Pacific railroad, and he informed me that its discovery would settle the location of the great railroad bridge across the Missouri. One singular geological phenomenon occurs which I have not before observed in any part of the west. The surface of this rock, where the superincumbent drift is removed, has been planed so smoothly by glacial action that it will make most excellent material for caps and sills without further working. Sometimes there are deep grooves and scratchings, all of which have a direction nearly northwest and southeast. This glacial action is also seen at Plattsmouth, and the evidence is that if the superficial deposits were stripped off, a large area of the upper surface of the limestones would appear to be planed in this way. This is an exceedingly important geological discovery. At various points I found potters' clay in abundance. A factory for making potters' ware is about to be established at Nebraska City. At Plattsmouth, Rock bluff and Nebraska City there is a bed of this clay about 15 feet in thickness, of various colors, mostly red, colored with the sesquioxide of iron. This clay is not only most excellent for potters' use, but it is employed in Iowa as a paint, and by a judicious mixture of the different colored clays any shade desirable may be produced. This is a matter of some interest

to the people. Numerous beds of sand occur also, which are of much value for building purposes.

With the sand and the yellow marl, the materials for making brick are without limit in this State.

#### THE SALT BASINS OF LANCASTER COUNTY.

I returned last evening from a tour of five days to the salt basins in Lancaster county, about fifty miles west of Nebraska City. It has been determined by the State to locate the capital near these basins, and therefore the examination of them and the country in the vicinity became a matter of some importance. The basins and scattering springs occupy a large area several miles in extent, but the main basin is located near the town of Lancaster. These basins are depressions in the surface nearly destitute of vegetation, and the white incrustations of salt give the surface the appearance in the distance of a sheet of water. The great basin, as it is called, is situated about one mile from Lancaster, township 10, range 6, section 22, and covers an area of about four hundred acres. The brine issues from a large number of places all over the surface, but in small quantities. All the salt water that comes to the surface from this basin unites in one stream, and we estimated the entire amount of water that flowed from this basin at from six to eight gallons per minute. The second salt basin lies between Oak and Salt creeks, and covers an area of two hundred acres. Third basin is on Little Salt creek, called Kenosha basin, and covers two hundred acres. Numerous small basins occur on Middle creek, which occupy in all about six hundred acres. Between Middle and Salt creeks are several small basins, covering forty or fifty acres. From the surface of all these basins more or less springs ooze out. In former years great quantities of salt have been taken from the surface and carried away. During the war as many as sixty families at a time have been located about these basins employed in securing the salt.

Besides the numerous basins above mentioned, Salt creek, Hayes's branch, Middle creek, Oak and Little Salt creeks have each a dozen springs coming out near the water's edge. One spring on Salt creek issues from a sand rock, and gushes forth with a stream as large as a man's arm, at the rate of four gallons a minute.

This is the largest spring known in the State. The geological formations in the vicinity are of the upper carboniferous and lower cretaceous age. The salt springs undoubtedly come up from a great depth, probably from the upper carboniferous rocks, and are the same in their history and character as those in Kansas. The cretaceous sandstones occupy the hills and high ground, but do not go deep beneath the water level of the little streams. We settled an important point for the citizens in this county, that no coal beds of workable value can possibly be found at a less depth than one thousand to fifteen hundred feet beneath the surface, which renders further search for this mineral useless.

Much time and money has already been spent prospecting and digging for coal in this region, and the almost entire absence of timber would render the presence of coal here a matter of vital importance. I would be glad to find a workable bed of coal for the good people, but it cannot be. The farmers must plant trees, and in a few years the demand for fuel will be supplied. Two methods have been used to some extent in this region in preparing the salt—boiling and evaporation. The only method which can be employed profitably in this country, where fuel is so scarce, is solar evaporation, and this can be carried on more effectually than in any State east of Nebraska. The unusual dryness of the atmosphere, the comparatively few moist or cloudy days, the fine wind which is ever blowing, will render evaporation easy. The surface indications do not lead me to believe that Nebraska will ever be a noted salt region. It seems to me that if all the brine that issues from all the basins and isolated springs were



united in one they would not furnish more than brine enough to keep one good company employed.

What will be the result of boring can be determined only by actual experiment. Some large springs may yet be found in that way, but I saw no brine that was much stronger than ocean water. I will forward specimens of the salt and two bottles of the brine, which ought to be carefully analyzed. I shall collect more of the brine at a later and more favorable season. The rains have been so frequent this spring that it is much diluted with rain water. The Nebraska Salt Company made, from July to November, 1866, 60,000 pounds of salt. Another company, at work at the same time, made about the same amount. Good working days 6,000 pounds have been made in a day. The kettles used for boiling are very rude steam boilers split into two parts. In a vat 12 by 24 feet average evaporation was 125 to 130 pounds per day. An extra day was 250 pounds. I think it not improbable that a company with a large capital, and employing all the improved methods of manufacturing the salt, would succeed. The salt is said to be good, though not as strong as the common salt of commerce.

The best building stone yet observed in the State occurs in the southern portion of Lancaster county. The quarries have been opened, and several fine houses built of the stone. The rocks are of the permo-carboniferous, or upper carboniferous age, and are usually called magnesian limestones; are very durable, easily wrought, and make most beautiful building material. There is also plenty of potters' clay, sand, and all the materials for the manufacture of brick without limit.

#### THE CULTIVATION OF FRUIT AND FOREST TREES.

I think a sufficient number of experiments have already been made in this western country to show clearly that the forests may be restored to these almost treeless prairies in a comparatively short period of time. There are certain trees which are indigenous to the country, and which grow with great rapidity under the influence of cultivation. I have given special attention to this matter, in accordance with your instruction, and shall continue to do so throughout the period of the survey. About four miles west of Omaha City Mr. Griffin, an intelligent farmer, has planted about forty acres of forest trees, which are now in a fine condition of growth. I have obtained as many measurements as possible, in order that my statements might have their proper weight. The common cottonwood of the country grows everywhere finely, on upland or lowland. I would remark here that Mr. Griffin's experiment is rendered more emphatic from the fact that he chose one of the highest points in the vicinity of Omaha, 600 feet above the water-line of the Missouri river.

The soil is the usual yellow silicious marl of this region, which is regarded by Lyell and other geologists as the American equivalent of the loess of the Rhine, which is so well adapted to the culture of the grape. The indigenous trees of the country all do well, as might be expected, and many others which have never been found in the west grow rapidly and healthfully. The trees most in cultivation are the indigenous ones, as the cottonwood, (*Populus monilifera*,) soft maple, (*Acer rubrum*,) elm, (*Ulmus americana*,) basswood, or linden, (*Tilia americana*,) black walnut, (*Juglans nigra*,) honey locust, (*Gleditsia triacanthus*,) and several varieties of willows.

At Mr. Griffin's farm I found cottonwood trees, ten years' growth, with a circumference of 2 feet 11 inches, 30 feet high; seven years' growth, with a circumference of 2 feet; seven years' growth, with a circumference of 2 feet 6 inches; soft maple, ten years' growth, with a circumference of 2 feet 8 inches; soft maple, seven years' growth, with a circumference of 1 foot 10 inches; soft maple, seven years' growth, with a circumference of 2 feet 1 inch, 15 feet high; common locust, ten years' growth, with a circumference of 2 feet, 15 feet high;

honey locust, ten years' growth, 1 foot 8 inches; black walnut, ten years' growth, with a circumference of 12 inches, 15 feet high; black walnut, ten years' growth, with a circumference of 13 inches, 15 feet high.

At Dr. Euos Lowe's place, near Omaha, about 300 feet above the water-line of the Missouri, cottonwood trees, ten years' growth, circumference 2 feet 6 inches, 40 feet high; cottonwood trees, ten years' growth, circumference 2 feet 4½ inches, 25 feet high; cottonwood trees, ten years' growth, circumference 2 feet 5 inches; cottonwood trees, ten years' growth, circumference 2 feet 4 inches; cottonwood trees, ten years' growth, circumference 2 feet 9 inches; cottonwood trees, ten years' growth, circumference 2 feet 10 inches; common locust, ten years' growth, circumference 2 feet, 1 foot 10 inches, 1 foot 9 inches, 1 foot 10 inches, 2 feet, 2 feet 1 inch, 2 feet, 1 foot 10 inches, 2 feet 5 inches, 1 foot 10½ inches; soft maple, seven years old, circumference 8 inches; box elder, ten years old, circumference 2 feet 2 inches; apple trees, ten years' growth, circumference 1 foot 3 inches, 1 foot 1 inch, 1 foot 2 inches, 1 foot, 1 inch; twelve years' growth, 1 foot 6 inches, 1 foot 3 inches, 1 foot 6½ inches, 1 foot 6 inches; common red cherry trees, ten years' growth, circumference 12 inches; silver poplar shade trees, seven years' growth, circumference 2 feet 4 inches.

Dr. Lowe's garden shows a most healthy and vigorous growth of the smaller fruits, and he has raised successfully out of doors the following vines: Hartford Prolific, Catawba, Clinton, Delaware, and Concord. These vines are loaded with young fruit at this time. Pears, apples, and cherries abundant; peaches plentiful, but I do not think they will endure the climate. Dr. Lowe has the following evergreens, which are growing finely: Scotch pine, Austrian, Russian, white pine, spruce, balsam fir, white cedar, or arborvitæ, and red cedar.

Near the mouth of the Platte Rev. J. G. Miller raises successfully the Diana grape. Lombardy poplars grows well; four years old, 20 feet high, 2 to 5 inches in diameter. Cottonwood, four years old, circumference 18 inches, and 20 feet high.

Mr. Miller's place is one of the most highly cultivated in the State. He has twenty-five apricot trees, raised from the seed, which are now loaded with fruit; English red raspberries, blackberries, &c., all bearing thriftily.

At Rev. Mr. Hamilton's, Bellevue, Sarpy county, I saw most of the smaller fruits in a high state of cultivation, as strawberries, blackberries, raspberries, currants, gooseberries, &c., and I am convinced that none finer could be produced in any country.

On Mr. J. Sterling Morton's farm, near Nebraska City, I observed a cottonwood tree that had grown from the seed in ten years to a height of 50 feet, with a circumference of 4 feet.

About ten miles south of Plattsmouth there is a fine grove of trees upon a high elevation, composed of cottonwoods, maples, locusts, and black walnuts. Those of ten years' growth are from 8 to 10 inches in diameter, and 10 to 30 feet high. The black walnut trees may be raised from the seed with ease, and, though of slower growth than the others, are very valuable from the fact that the astringent, pungent bark forms their defence, not only against cattle, but the gopher, the most destructive of the wild animals. The gopher gnaws off the roots of some of the most valuable trees, and is a source of great annoyance to the farmer. The native or honey locust is not disturbed by the boring insect, which is destroying the common locust. The borer sometimes attacks the cottonwoods.

I have said enough to show already that most of the hardy northern trees may be cultivated on these western plains with entire success. The cultivated forests will prove much more desirable than those of natural growth, and their arrangements may be made as beautiful as the taste of the proprietor may dictate. The greater portion of the more intelligent and thrifty farmers are planting forests to greater or less extent. This is done so easily that there is no

excuse for a farmer to be destitute of fuel after a few years. Nearly all the common forest trees can be raised from the seed as easily as corn or beans. As soon as it is understood that coal is restricted to a small portion of the State, even if it occur at all, every one will adopt the plan of raising his own fuel. So far as the cultivation of the smaller fruits is concerned, I am convinced that Nebraska will not be surpassed by any other State in the Union. The climate seems to be severe for peaches, though Mr. Morton will have thirty or forty bushels this season. The dwarf fruits seem to do best. A row of forest trees around the gardens and orchards proves great protection from strong winds and cold of winter. The osage orange is used very successfully all over the State for hedges.

I have dwelt on this subject here, from the fact that it is a popular notion at the east that trees cannot be made to grow successfully on the western prairies, and especially that the climate and soil are unfavorable to the cultivation of the fruits. I held that opinion until within two years, but I now believe that within thirty to fifty years, forest trees may be grown large enough for all economical purposes.

Mr. Griffen, in ten years' time, is able to supply his own fuel from the limbs and dead trees which would otherwise go to decay, and within four or five years he will have fuel for sale. I will endeavor hereafter to report the results of my labors to you weekly. If you wish to have me elaborate any special point more fully, please give me instructions to that effect.

The great pest of this country appears to be the grasshopper. This year it seems to be restricted in its distribution. I did not observe any north of the Platte, and very few north of Nebraska City. But at the latter place, and for four or five miles around it, the grasshopper is very abundant and destructive.

Mr. Gilmore, one of the wealthiest farmers in the State, has lost seventy acres of wheat and sixty-five acres of clover and timothy grass. Many other crops have been injured—others have suffered in this vicinity.

I am making a collection of them of different ages and intend to investigate their nature and habits with great care. I hope to be at Brownsville, Nemaha county, in a few days, and from that point will report on Otoe county.

#### OTOE AND NEMAHA COUNTIES.

Otoe is one of the most fertile and thickly settled of the counties of Nebraska. The fertility of the soil is shown by the richness and abundance of the crops, which are remarkably fine. The winters are so severe and the snows so thin that winter wheat will not do well, and spring wheat is raised altogether and is grown most successfully in ordinary seasons. Thirty and forty bushels to the acre is not an uncommon yield throughout the State, and last autumn Nebraska wheat brought from ten to fifteen cents more per bushel in the market at St. Louis than wheat from any other portion of the west.

The great fertility of the soil in the river counties of Nebraska is mainly due to the beds of silicious marl which cover those counties to a greater or less depth. This is usually called loess, from a similar formation which occurs along the Rhine, in Germany. The sections which I enclose to you from time to time will reveal the prospect of workable beds of coal in the State, so far as the surface exposures are concerned. One outcrop at Nebraska City has been wrought by drifting in a distance of three hundred yards, and several thousand bushels of pretty good coal have been taken therefrom. The seam was about eight inches in thickness. On account of the scarcity of fuel in this region this thin seam has been made somewhat profitable. At Otoe City, eight miles below Nebraska City, the lithological character of the beds seems to change, so that we have red shales and clays passing up into soft yellow sandstones, with comparatively little rock useful for building purposes. There is here also a bed of slate and coal about eight inches in thickness, which has been wrought to some



extent and the coal used in a blacksmith's shop. Still higher up in the bank is another thin bed of black carboniferous shale, which has been worked to some extent.

At Peru, about six or eight miles further south, there is another complete lithological change in the beds exposed. The bluffs along the Missouri seemed to be formed of irregular beds of soft sandstone and laminated arenaceous clays. High up in the hills at some distance from the river there is a bed of limestone twelve to eighteen inches in thickness, which is quarried extensively and profitably. On the Missouri bottom, about on a level with high-water mark, a well was dug sixteen feet in depth; a seam of coal was penetrated, which is represented as four inches thick on one side of the well, and about ten on the other. These beds in the vicinity change rapidly, both in thickness and texture, within very short distances. Again, at Brownsville there is a seam of coal accompanied by many of the plants which are peculiar to the carboniferous rocks in other States. There is from four to six inches of good coal; the whole bed of black shale and coal is about twelve inches in thickness. There is a fine quarry of limestone at this point, which is of very superior quality for building purposes, but there is too much sand and clay in it to be converted into a good quality of lime. The bed is about three feet in thickness near the water's edge, concealed by high water at this time. There is a bed of micaceous fine-grained sandstone which cleaves naturally into most excellent flagstones, which are much used here. These rock quarries are of great value to the people of Nemaha county. The materials for making brick abound everywhere in this region—clays, marl, and sands are abundant and of excellent quality.

Should the future prosperity of the country demand it, there are abundant materials for the manufacture of what is called in England, and recently brought into use in this country, "patent concrete stone." It is composed of small fragments of stone or sand reduced to a paste by a fluid silicate, then moulding the material into any required form and dipping into the chloride of calcium. The little particles of sand are thus cemented together, and it is wonderful how rapidly this rock can be formed and how durable it becomes. This is a matter which seems to me worthy of notice in the final report.

Several kinds of peat occur in small quantities in Otoe and Nemaha counties, which as fuel will rank next to coal. There are several marshes or boggy places about six miles west of Nebraska City, from which I have obtained some excellent specimens. On Long Branch, Franklin, in Nemaha county, twenty-four miles southwest of Brownsville, there are spring places where a pole may be thrust through the peat to the depth of ten or fifteen feet. About ten miles west are several other peat bogs, which have attracted more or less attention.

At Aspinwall, in Nemaha county, we discovered the most favorable exhibition of coal yet observed in the State. The general dip of the beds seems to be up the Missouri, or nearly north or northwest. It is difficult to determine this point with precision. The rocks at Aspinwall are all geologically at a lower horizon than the Nebraska City beds, and mostly beneath the Brownsville beds, so that the inclination must be considerable—eight or ten feet per mile. Two seams of coal are met with at Aspinwall; one crops out near the river, about fifteen feet above the water, twenty-four inches in thickness—very good quality. A few feet above this seam is a second seam—six inches of good coal. Some English miners are sinking a shaft here, with full confidence that the thickest bed can be made profitable, and I am inclined to think that, with the present scarcity of fuel, they will succeed well. Coal commands a ready sale at from forty cents to eighty cents per bushel; and even at eighty cents a bushel of coal is cheaper than wood. The miners have already sunk the shaft about forty feet; have passed through the 6 inch seam, and are confident of soon reaching the 24-inch bed, when the work of drifting in various directions will commence and the coal be taken out for market. The beds hold such a position

here that, if these miners are successful, this effort determines the existence of a workable bed of coal for Nemaha, Richardson, Pawnee, and Johnson counties, which will be a most important matter for the whole State. We have very abundant notes in detail, and many specimens to illustrate the geology of the river counties.

Mr. Meek leaves me at Rulo and returns to Washington. The remainder of the year I must perform the field-work alone. My next examinations will be in Richardson and Pawnee counties.

I am informed that excellent hydraulic lime for cement exists in Nemaha county, section 9, township 6, range 14; but I have not been able yet to make a personal examination of the locality.

#### FOREST AND FRUIT TREES.

I would again speak of the great importance of planting trees in this country, and the great ease with which these cultivated forests may be produced. I do not believe that the prairies proper will ever become covered with timber except by artificial means. Since the surface of the country received its present geological configuration no trees have grown there, but, during the tertiary period, when the lignite or "brown coal" beds were deposited, all these treeless plains were covered with a luxuriant growth of forest trees like those of the Gulf States or South America. Here were palm trees, with leaves having a spread of twelve feet; gigantic sycamores—several species; maples, poplars, cedars, hickories, cinnamon, fig, and many varieties now found only in tropical or sub-tropical climates.

Large portions of the Upper Missouri country, especially along the Yellowstone river, are now covered with the silicified trunks of trees, sixty to seventy feet in length and two to four feet in diameter, exhibiting the annual rings of growth as perfectly as in our recent elms or maples. We are daily obtaining more and more evidence that these forests may be restored again to a certain extent, at least, and thus a belt or zone of country about five hundred miles in width east of the base of the mountains be redeemed. It is believed, also, that the planting of ten or fifteen acres of forest trees on each quarter section will have a most important effect on the climate, equalizing and increasing the moisture and adding greatly to the fertility of the soil. The settlement of the country and the increase of the timber has already changed for the better the climate of that portion of Nebraska lying along the Missouri, so that within the last twelve or fourteen years the rain has gradually increased in quantity and is more equally distributed through the year. I am confident this change will continue to extend across the dry belt to the foot of the Rocky mountains as the settlements extend and the forest trees are planted in proper quantities. In the final report I propose to show that these ideas are not purely theoretical, and that the influence of trees on climate and humidity has been investigated by some of the ablest scientific men in this country and in Europe. A French savant, M. Boussingault, states that in the region comprised between the bay of Cupica and the gulf of Guayaquil, which is covered with immense forests, the rains are almost continual, and that the mean temperature of the humid country rises hardly to 80° Fahrenheit. The author of "*Travels in Bulgaria*" says that in Malta rain has become rare since the forests have been cleared away to make room for the growth of cotton, and that, at the time of his visit, in October, 1841, not a drop of rain had fallen for three years. The terrible droughts in Cape Verde island are attributed to the destruction of the forests. The wooded surface of the island of St. Helena has extended considerably within a few years, and it is said that the rain is now double in quantity what it was during the residence of Napoleon. A German author remarks: "In wooded countries the atmosphere is generally humid, and rain and dew fertilize the soil. As

the lightning rod abstracts the electric fluid from the stormy sky, so the forest abstracts to itself the rain from the clouds, which in falling refreshes not it alone, but extends its benefits to the neighboring fields."

The forest presenting a considerable surface for evaporation gives to its own soil and the adjacent ground an abundant and enlivening dew. Forests, in a word, exert in the interior of continents an influence like that of the sea on the climates of islands and of coasts; both water the soil and thereby insure its fertility. Sir John F. W. Herschel says that the influences unfavorable to rain are absence of vegetation, in warm climates, and especially of trees. He considers this one of the reasons of the extreme aridity of Spain. Babinet, in his lectures, says: "A few years ago it never rained in lower Egypt. The constant north winds, which almost exclusively prevail there, passed without obstruction over a surface bare of vegetation; but since the making of plantations an obstacle has been created which retards the current of air from the north. The air thus checked accumulates, dilutes, cools, and yields rain."

I might cite many examples from the African deserts how the planting of palm trees is redeeming those barren sands.

Much might also be said in regard to the influence of woods in protecting the soil and promoting the increase in number and the flow of springs, but all I wish is to show the possibility of the power of man to restore to these now treeless and almost rainless prairies the primitive forests and the humidity which accompanies them.

The counties of Otoe, Nemaha, and Richardson contain more timber land than any other portion of the State, and the aggressive character of the patches of woodland can be seen everywhere. Hundreds of acres have been covered over with a fine healthy growth of hickory, walnut, oak, soft maple, coffee bean, basswood, &c, within the past ten or twelve years, since the fires have been kept away, and protection afforded the young trees by the settlements.

In the more southern counties the success in planting trees and in raising fruits, especially the smaller kinds, is even more marked than north of the Platte. All kinds of garden vegetables grow better in Nebraska than in any region with which I am acquainted. The crops, when not injured by the grasshopper, are looking very fine at this time. The corn has escaped so far, and is pressing forward with great rapidity. Up to the 1st of July I did not see any grasshoppers, except within a radius of four or five miles around Nebraska City. There they were most abundant and destructive. July 2d and 3d they commenced their flight northward, filling the air as high as the eye could reach, looking much like flakes of snow. They have committed some depredation in South Nebraska, but more especially in Kansas. Whenever counties become more thickly settled and more densely wooded, so that the annual amount of moisture is more equally distributed over the year, this pest I believe will entirely disappear.

I am informed that notwithstanding the grasshopper there will be at least half of a crop of wheat. In Richardson county the harvesting of winter wheat has commenced, (July 8th.) Last year it commenced June 22d. The corn looks finely everywhere. All the crops are late this season on account of the wet weather.

#### RICHARDSON COUNTY.

Richardson county is in some respects the finest county in the State. It lies in the southeastern corner of the State and borders on the Missouri river, and forms the type of fertility of soil and climate. Being located near the 40th parallel, the climate seems to favor the cultivation of all the hardy fruits and cereals.

The surface is more rugged than many of the interior counties, partly on account of the extreme thickness of the superficial deposit of soft yellow marl and the numerous layers of limestone which crop out along the river banks. The



county is fully watered with ever-flowing streams and innumerable springs of the purest water.

There is more woodland in this county than in any other I have examined, and on this account the planters have neglected the planting of trees too much. I did not find the farms quite as well improved as in Nemaha county, but the county is now becoming thickly settled by actual settlers, who are devoting themselves to the improvement of their farms and the raising of large crops.

It is not an uncommon thing for a farmer to have ground growing 40 or 50 acres of corn and about the same number of acres of wheat and oats, and not unfrequently as high as 100 or 200 of each.

There is a ready market for all kinds of produce at the highest price. Although nearly all the settlers came into the country poor—many without any money at all—nearly all are becoming moderately rich, and every man with industry and prudence may become independent in a few years. This country may certainly be called the poor man's paradise. There is scarcely a foot of land in the whole county that is not susceptible of cultivation. I have never known a region where there is so little waste land. The underlying rocks of the whole county belong to the age of the upper coal measures, and are composed of alternate beds of limestones, sandstones, and clays of almost all colors, textures, and compositions. There are several localities along the Missouri river and the larger streams where there are good natural exposures of the rocks, but, as a rule, the beds are concealed by the superficial covering of yellow marl or loess, which gives the beautiful undulating outline to the surface, gentle slopes, with only now and then an exposure of the basis rocks. This aids in rendering the investigation of the geological structure of the county more complicated and difficult.

The river counties present better exposures of the rocks than any other counties in the State, and it is partly on this account that I have given them my first attention. Even these exposures are by no means good.

In my last communication I spoke of the coal seam at Aspinwall, Nemaha county; that about 16 feet above the water level of the Missouri a bed of coal 22 to 24 inches in thickness was observed cropping out from the bluff, and a few feet above this in the same range of hills was a second seam six inches in thickness. These beds do not appear again for considerable distance down the river, until we come to Rulo, except at one or two localities near St. Stephen's. At Arago I saw no outcroppings of coal at all and could not hear that any had been observed, but there are some good quarries of limestone, beds of clay, sands, &c. The next marked exhibition of coal is at Rulo and its neighborhood, about two miles above Rulo, on land belonging to Mr. S. F. Nuckolls, of Nebraska City. At this locality Mr. N. has drifted into the bank 100 feet or more, and taken thence over 200 bushels of coal, which has been used by blacksmiths with success. The outcrop was about five inches in thickness, but increased as the drift was extended in the bank to 11 inches, and again suddenly diminished to one inch of good coal, the remainder being composed of impurities or "muddy coal," as the miner called it. The coal which has been thus far taken from this mine sells readily for 35 to 40 cents per bushel. The abrupt termination of the coal seam, or "fault," is undoubtedly due to the sliding down toward the river of the superincumbent beds, a phenomenon which is very common everywhere along the Missouri. Still the irregularity in the thickness of this coal seam is everywhere apparent, vibrating between 4 and 20 inches, thus alternating, exalting and depressing the hopes and prospects of the miner. On the farm belonging to Mr. St. Louis, about  $1\frac{1}{4}$  mile below Rulo, the same bed of coal has been worked with some success by drifting and a considerable quantity of coal taken out. Mr. St. Louis unwisely sunk a shaft at a higher point on the hill, thinking to cut the coal seam at a more favorable point, the expense attending it

exhausting his means at 45 feet. He sunk a drill, however, into the bed of coal and found it 12 feet below the position at the outcrop, showing an extensive inclination of the beds from the river, or toward the west.

This dip may be readily accounted for by the extensive erosion of the rock prior to the deposition of the yellow marl and drift deposits, which erosion has given rise to many perplexing local inclinations of strata. These local dips will not interfere with the miner so much further in the interior of the county. The thickness of the coal-bed at this locality is 10 to 12 inches, increasing in one instance to 17 inches. On the Iowa reserve, along the Great Nemaha river, the same bed again crops out in the ravines or banks of little streams, and has been wrought with some success, several hundred bushels of the coal having been taken out from time to time for several years past. The country along the Nemaha is quite rugged, or "rough," as it is termed by the settlers, owing to the several beds of sandstone, and the overlying or cap rock of the coal bed, which prevents the water from forming gentle slopes, as in the case of the more yielding clays or marl beds. This bed of coal is probably the equivalent of the two-foot bed seen at Aspinwall, while the upper six-inch bed is not exposed at all. The rocks in contact with the coal are as follows:

1st. Underlying the coal a bed of light gray fire-clay, full of fragments of plants, as fern leaves, stems of rushes, calamites, &c., the same as occur in the underlying clays in Ohio and Illinois coal-fields. Above the coal there is about four feet of very hard laminated or shaly clay, varying from black to dark ash color, all of which must be removed with great labor before the bed of limestone, or cap rock, as it is called, can afford suitable protection to the miner as he drifts into the bank. Thus the small amount of coal is obtained with great labor, and it is only the great scarcity of fuel that will warrant any labor being expended upon it at all.

We passed over the almost treeless prairie, from Rulo to Falls City, the county seat, about nine miles distant. Some beds of limestone crop out from the hills occasionally, but usually all the basis rocks are concealed from view, and the surface is gently and beautifully undulating. The fertility of the soil is everywhere shown by the luxuriance of the crops. Falls City is located upon high ground overlooking the valley of the Nemaha. There is not a native shrub or tree of any size growing within a mile of the town. Although the same coal-bearing beds formed the underlying basis rocks about Falls City, yet not an outcropping of coal could be found in the vicinity. Some good quarries, however, were examined. Having heard that a boring had been made at Hiawatha, the county seat of Brown county, Kansas, ten miles south of Falls City, I visited that place to ascertain the result. I was informed that a company had bored near that place two hundred and forty feet without success, and that the project had been abandoned; and as the strata in all this region are very nearly horizontal, the same result would follow any attempt at boring at Falls City, to that depth at least. About nine miles southeast of Hiawatha, a bed of coal is worked with considerable success, and many hundred bushels of coal are taken out of the mines and sold annually. Mr. Laycock, a lawyer at Hiawatha, informed me that during the past winter he used about one hundred and thirty bushels of coal, for which he paid fifty cents per bushel; and he found it cheaper than wood, even at that price. He spoke highly of its qualities as fuel. I am disposed to believe that it is the same bed seen along the Missouri, in Nemaha and Richardson counties, although I did not examine it in person. Continuing our course westward to Salem, we observed no marked change in the country; indeed, there is a remarkable uniformity in the character of the country over a large area. The changes that take place are usually the result of some change in the underlying geological formations, and are, therefore, quite gradual. No outcroppings of coal could be found at Salem or vicinity, and it is quite possible that none will be found exposed to the surface in that portion of the county,

except along the Missouri river. I am convinced, however, that boring at a moderate depth, at almost any point, would penetrate the thin bed seen at Rulo. The quarries of limestone, for building purposes, &c., are much finer at Salem than at any other point observed in the county. The town is located upon an elevation on the point of the wedge of land between the two forks of the Nemaha. Forming a part of the town-site is a high hill, with two beds of limestone, both of which form large quarries, which yield an abundance of stone for all economical purposes. All along the Nemaha and its numerous branches are quite well wooded tracts of land, which are held at a high price, though no portion of the county would be called well timbered in any of the States east of the Mississippi.

#### BLUFF FORMATION.

I have not unfrequently alluded to a superficial deposit of yellow silicious marl, occupying much of the country, and concealing the underlying basis rocks, thus rendering the study of the details of the geology somewhat difficult. The geologist is dependent upon natural exposures of the basis rocks by streams, or by uplifts of the beds by internal volcanic action, or by artificial excavations. Now in a new country there are very few artificial works, and all over the State of Nebraska the beds of rock are horizontal or nearly so. Indeed, it is very seldom that the beds incline to such an extent as to be perceptible to the eye. That there is a general inclination of the beds to the west or northwest is evident, but it is very gradual. This yellow marl deposit, or bluff formation, as it was called in the geological report of the State of Missouri, is found largely developed in the valley of the Missouri, and extends from its mouth to the foot of the great bend above the mouth of White river. This deposit was first noticed by Sir Charles Lyell in his visit to this country in descending the Mississippi many years ago, and he regarded it as the equivalent of the loess of the Rhine. It is called the "bluff formation," because it forms the picturesque hills or bluffs which are seen along the Missouri river, especially on the Iowa side, between Council Bluffs and Sioux City. This deposit was accumulated just prior to the present period, after the surface had received its present outline by erosion, and after the great valley of the Missouri had been carved out. It would appear that one of the comparatively recent geological events was the settling back of the waters of the Gulf of Mexico by a depression of all this western country in such a way that there was a vast fresh-water lake, extending up the valleys of the larger streams for a considerable distance into the interior of the country, generally not more than from 50 to 130 miles. Its greatest thickness is along the Missouri river, where it is sometimes seen in vertical exposures from 50 to 150 feet in thickness. Sometimes the stratification is quite distinct; but, as a rule, no lines of deposition are visible, showing that the materials were brought down into the lake by the myriad little streams, and mingling with the waters of the lake settled to the bottom quietly like gently falling snow. In the drift or gravel deposit underneath are abundant exhibitions of turbulent waters, but never in the yellow marl beds. All this marl is full of nutritious matter for vegetation, and it is probable that it is to this deposit that the inexhaustible fertility of all the river counties of Nebraska may be attributed.

Upon this marl rests the soil, which is usually darker colored, and is composed largely of humus arising from the annual decay of a luxuriant growth of vegetation. The soil on the upland is usually from twelve to eighteen inches thick, and along the bottoms of streams is sometimes ten to twenty feet in thickness. In the yellow marl formation are found numerous shells, all identical with recent species, and most of them living in the vicinity. This shows the modern character of the deposit. There are also some bones of extinct animals, as the mastodon, elephant, a species of beaver of huge dimensions, and other



animals, mingled with bones of species now living. Along the Missouri the bluffs formed by this deposit are very steep, and I have seen vegetation growing upon them when the sides had an inclination of fifty degrees. These hills, although furnishing good grass, cannot be devoted to the raising of the cereals; but, as the soil is chemically about the same as that of the loess of the Rhine, which makes that valley one of the finest vine-growing countries of Europe, the same may be inferred of this region, and it is my belief that at some future period these marl hills will produce some of the finest vineyards in America.

Erratic blocks or boulders are most abundant along the river, yet a few are found from time to time half buried beneath the surface. They reveal the fact at once to one acquainted with the rocks of Nebraska that they are foreigners and were transported from Dakota, Minnesota, or the country bordering upon the Rocky mountains. Many of them are red quartzite, comparatively little worn, but now and then are seen masses of the different varieties of granite, gneiss, hornblende, &c., which remind one of the rocks in the mountains. The red quartzite is the underlying rock all over the north, and is the formation in which the red pipe-stone layer of the Indians is located. It is supposed by Professor James Hall to belong to the period of the Huronian system, so largely developed about Lake Superior and Canada.

Fences are made mostly of wood and in the rude way, which indicates either great carelessness or want of timber. Wire fences seem to be the cheapest and best, and are now coming into general use. Alongside of them may be planted the osage orange hedge, and by the time the wire fence begins to yield to decay, a good hedge, which will turn any stock, supplies its place and adds greatly to the beauty of the farm. Most of the energetic farmers appreciate this, and are setting out hedges; but improvements of all kinds must be gradual, from the fact that nearly all the settlers come into the State poor. I believe that in ten years from this time there will be some of the most beautiful farms in Nebraska to be found in the United States. I have urged the farmers to make use of the honey locust, (*Gleditschia tricanthus*), three-thorned locust, a native tree which grows finely, and may be so trained as to make an impenetrable hedge. When cultivated as a forest tree it makes very handsome and durable timber for fence posts, railroad ties, &c.

Tree planting has received comparatively little attention in Richardson county, on account of the greater amount of native timber. Along the Missouri and most of the larger streams the wooded portions are extending themselves, so that the area is nearly doubled since the country was first settled. Many groves of fine, healthy young trees, of oak, hickory, elm, cottonwood, black walnut, honey locust, &c., are seen. Some persons are so sanguine as to believe that if the fires are kept out of the prairie the whole country will become covered with forest trees in a few years; but that is certainly an impossibility, and the old tertiary forests can be restored only by the hand of man.

It is my belief that the subject of *peat* will soon attract the attention of the people of this State. But few persons seem to know what it is, or where it may be found. Their ideas of it are founded upon what they have read of the peat bogs of Ireland, where it is composed mostly of a kind of moss, or "sphagnum." Peat is really an accumulation of half-decomposed vegetable matter, formed in wet or swampy places, and may therefore be composed of any plants that are fond of growing in wet places. Underneath the water the vegetable matter, which is composed of the roots and stems of the weed, grass, and rushes growing most abundantly in low places all over the west, undergoes a slow decomposition, or combustion, as it were, so that a sort of imperfect coal is formed, not subject to that pressure by which the true coal is formed. In the State of Iowa, opposite Nebraska, I am informed that peat beds are now worked with success. It is estimated that in Massachusetts alone there are 120,000,000 cords of peat, and an organized company is now operating at Pittsfield, Massachusetts, making

100 tons of crude peat per day, which, when dry, makes 30 tons of fuel, ready for use.

My attention has been directed to several valuable peat beds in Otoe, Nemaha, and Richardson counties, and although the area covered by these wet places is not great in the State, yet I regard it as the most certain source of fuel to the people during the interval that must elapse before the artificial forests will have reached a suitable size to quantity the country with timber. There is scarcely a township in the State that will not have a small quantity of peat, which ranks next to coal as fuel. At Falls City I observed some quite extensive beds; also at Salem. There are several kinds of peat, as hearth turf, grass turf, leaf turf, mud turf, pitch turf, &c., and when the people of the State give this matter their serious attention, I have no doubt that various kinds will be found, in a far more abundant supply than I have suspected from my observations. When the annual fires sweep over these prairies, in the autumn, they not unfrequently burn down into the boggy places a foot or two. I shall hereafter make careful observations on this subject, and preserve specimens of the peat, from time to time, as opportunity presents.

*Building stone* is found in moderate quantities all over the county, but it is by no means as well supplied as some of the more interior counties, especially the second tier from the Missouri. Still there is sufficient to supply the wants of the people, and suitable material for burning to lime.

At Hiawatha, Kansas, a number of buildings are built of a yellow limestone that is composed almost entirely of organic remains. It is a soft but very tenacious rock, and is easily wrought into good and durable building material. This bed undoubtedly forms one of the underlying rocks of this county, though I did not observe it in my examinations. At Hiawatha an excellent cement is made from lime and sand, which, when dry, is as hard as the rock it cements. The materials for brick-making, &c., are everywhere without limit. There are a number of good mill sites along the Nemaha; probably all that are needed.

The crops throughout the county are looking very fine, indeed. The grasshoppers have not disturbed the corn, and they have left a good half crop for the farmers. The grass crop is unusually fine; the upland will cut  $1\frac{1}{2}$  to 2 tons to the acre, and the bottom 1 to 3 tons.

I have but little time to elaborate these brief reports, merely seizing a little time now and then to write them hurriedly, but they will afford material which can be expanded into the final report. I hope they will at least furnish suitable material to be incorporated into the appendix of your annual report. I shall be glad to get any suggestions that may present themselves to you from time to time.

#### PAWNEE COUNTY.

This county is equally fertile with Richardson, the latter possessing only the geographical advantage of bordering on the great navigable river Missouri. Its surface is more rolling or undulating, the slopes are more gentle, and, to the eye, it is even more desirable for farming purposes. Both counties are remarkably well watered and well drained by nature, so that there is hardly a foot of land in either that is not susceptible of cultivation. I cannot ascertain that one produces better crops than the other. Richardson county may have more woodland than Pawnee, but the numerous branches of the North and South Nemaha, circulating all over the county, render the land very attractive to the settler and speculator, who have absorbed, already, every acre of land in it.

It is not irrelevant for me to state, in a report which is to convey information in regard to a district of country and promote immigration, that the inhabitants of Pawnee county belong to a superior class, with respect to their industry and morals, and that there is not a locality in the county where ardent spirits are

sold as a beverage. There was an attempt on the part of some person to establish a saloon at Pawnee City. The proprietor was at once waited upon by the ladies of the place and politely but firmly requested to leave the county within twenty-four hours. Of course the prosperity of this beautiful region is decided. Pawnee county lies directly west of Richardson, forming one of the southern tier of counties. It is entirely underlaid by rocks of the upper coal measures, which give a remarkable uniformity of character to its surface. These rocks are composed of alternate beds of clays, sandstones, and limestones, with some thin beds of coal. Although no seams of coal were observed in Richardson county at any distance from the Missouri river, yet soon after reaching the limits of Pawnee county a bed of coal appears, which is creating some excitement among the people. It has not yet been observed along the Nemaha river itself, but on its small branches; but I suppose the reason of this is the great erosion of the underlying rocks in the river valley, and the subsequent deposition of a vast thickness of alluvial material, effectually concealing all the outcroppings. The first locality where the coal appears is about fifteen miles west of Salem, on Turner's branch, on school section township 1, range 12, one and a half mile northeast of Frieze's mill. The following section of the beds is given in descending order:

4. Limestone, somewhat irregular in cleavage at top, but rather massive at base, four to eight feet thick.

3. Bluish black indurated clay, some portion slaty, and filled with fossils, three to four feet thick.

2. Rather pure coal, ten to sixteen inches thick.

1. Yellow plaster clay, passing up into a hard blue clay, upon which the coal lies as if pressed down, twenty feet thick.

No rocks below bed 1 are seen in this immediate vicinity. The coal seemed to be packed closely down on to the clay beneath, like masses of flat rock, as if it had been originally deposited there like a layer of clay or sand. The clay below is quite hard and filled with fragments of fern leaves, stems of the rush-like calamites, like the clay underneath the coal seams in Ohio or Pennsylvania. The under surface of the coal seems to be composed of stems, like grasses, as if the vegetable debris began upon a densely grass-covered surface. The vegetable impressions do not go down into the clay more than an inch or two, and above the seam, where the coal ceases, all traces of vegetable matter disappear and the clay is charged with a variety of molluscous remains. The clay above the coal is very hard, and yields with difficulty to the pick, and the coal is extracted with great labor. Several hundred bushels have been taken out and sold, and the bank of the creek reveals fifteen or twenty openings like that shown by the illustration. This shows the coal seam at the base, the bed of indurated clay above, which is generally three to four feet thick, all of which has to be removed, and the heavy-bedded limestone forms an excellent cap-rock above. At Frieze's mill, still further on, this same bed of coal is again wrought with some success.

On Mr. Boston's farm, township 1, range 12, section 34, several openings have been made; and here the coal seam increases in thickness to sixteen inches. Mr. B. has taken out nine hundred bushels of coal here. He finds a ready market for it at the mine at thirty cents per bushel. This coal seam averages a bushel of coal to a square foot of surface. I have collected abundant specimens of this coal at different localities, and they will be properly investigated for the final report.

This seam is also worked on Lee's branch and on Miner's creek, so that it is now wrought, more or less, over an area of ten miles square, at least. The coal seems to have been worked with more system, industry, and success than in any other portion of the State.

Near Pawnee City there is another small seam of coal holding a higher geo-



logical position, which has attracted some attention. I made a careful examination of all the localities, and found it not more than four inches in thickness generally. On Mr. Jordan's farm, at the water level of Turkey creek, a branch of South Nemaha, this seam increased to eight inches, but so impure and full of sulphuret of iron as to be quite unfit for use.

A company has been organized at Pawnee City, called the Pawnee County Coal Company, with Governor Butler as president, with the object of searching for coal in this district. They had intended to commence boring last spring, but waited for my coming to advise them of the best locality to begin operations. I gave them the best information in my power, but I could not risk my reputation upon any positive statement in favor of the existence of coal at all in this region, or any workable bed in the State.

There are some reasons in favor of the existence of a bed of coal in Nebraska, at a moderate depth beneath the surface, and there are others against it. I am inclined to the belief that the coal measures of Nebraska form a portion of the western rim of the great western coal basin, and that none but similar thin seams to those now cropping out along the Missouri river, and at other localities, will ever be found. But the exact truth can never be determined except by boring. At Des Moines, in Iowa, about one hundred and seventy-five miles east of Nebraska City, a bed of coal six feet in thickness was penetrated at a depth of two hundred feet.

Professor White, of the Iowa geological survey, and Mr. Meek, paleontologist of the Nebraska survey, traced the rock in which this bed of coal is located from Des Moines, across the State of Iowa, to Nebraska City. They made an estimate, by taking into account the general dip of the rocks west or northwest, that this same bed would be reached at from four hundred to six hundred feet beneath the surface at Nebraska City.

According to a section given by Major Hawn of the Missouri coal-fields, there should be a six-foot bed at a depth of five hundred or six hundred feet beneath the surface at Rulo, for the rocks rise from beneath quite rapidly in descending the Missouri. The reasons that cause me to hesitate to give positive encouragement are, the entire want of success in the borings made at Omaha and Nebraska City; the failure, or only partial success, at St. Joseph, Missouri, at Leavenworth City, and all over the northern part of Kansas, where the rocks hold a geological position several hundred feet lower than at either of the points mentioned; the apparent thickening of the coal measure rocks in their westward extension from Des Moines; the fact, also, that Mr. Broadhead, a geologist and civil engineer connected with the Missouri survey, has published a detailed section of the rocks of northern Missouri, opposite Nebraska, and finds about two thousand feet of upper coal measure beds, with only the thin seams of coal already mentioned; also, that in these same upper coal measures, limestones are found thrown up by the Black Hills, and exposed fully all along the eastern slope of the Rocky mountains, without the remotest indication, even by a slate bed, of coal having existed in them. You will, therefore, readily see why I hesitate to give a positive opinion, and why I am inclined still again to express the opinion given some years ago, that the State of Nebraska borders on the great western coal basin.

I have stated to the members of the Pawnee County Coal Company that a boring may be made eight hundred feet for about one thousand six hundred dollars, which will settle the question, for that depth, for the whole county for all time to come. It would hardly be profitable to go any deeper, and the question would arise whether it would not be cheaper to hasten the building of railroads and the transportation of fuel from Iowa or other neighboring States.

*Building stone, limestone, &c.*, are very abundant all over Pawnee county. Thin beds, from six inches to two feet in thickness, crop out from the sides of the hills in many places, and almost every farm has a quarry.

The best quarry yet worked is located on a farm belonging to Governor Butler, cropping out near the edge of the hill bordering a small stream, about eight miles west of Pawnee City. It is a soft, cream-colored limestone, full of small cavities caused by the decaying out of a small shell, "*fusulina cylindrica*." It is a true *fusulina* limestone, and is a great favorite with masons for building purposes. It is easily wrought into any desirable shape, is very tenacious in texture, and durable. It seems to hold a position about one hundred feet above the water level of Turkey creek, and belongs to the age of the "permo-carboniferous," or intermediate between the upper coal measures and the permian series—the general inclination of the beds being toward the west and northwest. New and more recent beds are continually making their appearance as we proceed towards the west, and this choice bed of limestone has made its appearance here for the first time. It will doubtless be found to extend over considerable area in a southeasterly direction. There is still another bed of bluish limestone cropping out of the hills, which, though useful, is not regarded with the favor bestowed on that just mentioned. It does not dress as nicely—is not as handsome for caps or sills. It is equally durable with the other. There are several beds in the county which are employed, to a greater or less extent, for various economical purposes.

Potters' clay, fire-clay, brick materials, &c., are abundant all over the county.

Peat-beds are found to some extent, sufficient, I think, to attract attention in the future. Near Table Rock, about six miles northeast of Pawnee City, on Elder Giddings's farm, on the Nemaha bottom, there is a low, flat marsh, covering about one hundred acres or more, which will furnish a peat of good quality, two feet in thickness or more, on an average, over the whole surface.

Near Pawnee City, there is a small peat-bog on which one can stand and jar the ground for a considerable distance. The surface of this bog is about six hundred feet in length and three hundred in width, and the peat is ten to twelve feet in thickness.

The best peat-beds are those which are formed of the decayed roots and stems of the large rushes and the reed grasses of the country. These bogs are covered with water a large portion of the year, and are the favorite abode of muskrats, which pile up the reeds and rushes for their houses like hay-cocks. Very few people seem to know what a peat-bed is; but their attention once turned in that direction, they will find them quite abundant in this county.

No iron ore of any economical value has been discovered in Nebraska. Even if there were rich beds of ore, the absence of fuel would render them almost valueless.

There is a great amount of sulphuret of iron—"iron pyrites"—scattered through the county, sometimes presenting some beautiful crystalline forms, attracting the curiosity, as well as hopes, of many of the settlers, who have frequently mistaken it for gold.

Mill-sites are numerous along the Nemaha and its larger branches, and some mills are now in process of erection.

The crops are very promising; corn and potatoes are excellent, and the grass-hoppers have left a full half crop of wheat.

The grass land is about the same as in Richardson county, yielding from two to three tons per acre. Tree planting has received but little attention as yet, but many of the settlers are fully alive to its importance. A few hedges have been planted, and fruit trees are attracting some attention. The best of success attends all efforts in that direction. Mr. Hollingshead, of Pawnee City, will have this year 150 bushels of peaches.

Water is abundant all over the county, so that there is scarcely a section of land without a running stream or a flowing spring.

Water is obtained by digging, at moderate depth. Near the streams, in almost all cases, water is reached near the water level in the alluvial formations, and



when the basis rocks are penetrated on the higher elevations, the clay beds act as reservoirs for holding water, and yield a most abundant supply when struck.

I have not seen or heard of a well or spring of poor water in the county, and most wells have a continual supply of from six to ten feet.

For the raising of fine, healthy stock, horses, cattle, sheep, &c., it seems to me that this county is unsurpassed.

#### GAGE COUNTY.

Leaving Pawnee City we took a course nearly southwest across the open, high prairie, crossing the divide between the valley of the Nemaha and that of the Big Blue. Very few exposures were to be seen for ten miles or more.

The surface is rolling, covered with a heavy deposit of alluvium, so that the underlying basis rocks are concealed from view, even along the little streams.

The soil is very rich and deep, producing from one and a half to three tons of hay to the acre. All the crops look remarkably well. In passing over this divide I saw the first long interval of waterless and treeless prairie, and one that reminded me of the dry plains further west. There was no living water and no houses to be seen for seven miles. The timber is also very scarce, not enough even for the thin settlements.

About seven miles before reaching the Otoe agency a bed of limestone crops out of the hills, forming a sort of terrace about fifty feet above the beds of the streams. This hard bed of rock gives to the country a more abruptly rugged character; the little branches have steeper banks, and there is greater variety to the scenery. There is a belt of land, ten to twelve miles in width, between the Nemaha and Big Blue, that is doubtless underlaid by the more yielding clays and sands of the carboniferous period, and therefore the effect of erosion seems to have been to produce gentle slopes or lawns, as it were, beautiful but monotonous, effectually concealing, down to the water edge of the streams, all the basis rocks.

At the Otoe agency the bed of limestone before alluded to is exposed. It is a cherty limestone, breaking into small fragments. There are one or two layers, six to twelve inches in thickness, of good limestone for buildings. At various localities within two miles of this place I obtained a pretty fair section of the rocks:

7. Superficial deposits of soil and yellow marl.
6. Yellowish white limestone, rather soft, yielding readily to atmospheric influences, 2 feet.
5. Slope, same as No. 3, 6 feet.
4. Yellow fine-grained arenaceous limestone, 18 inches.
3. Slope, supposed to be laminated clay, but covered with grass, 20 feet.
2. Yellow and gray limestone, portions of it filled with seams and nodules of chert or flint.
1. Bluish gray, laminated, calcareous clay, with numerous fragments of fossils, as crinoids, corals, &c., 30 feet above water.

The outcroppings of the rocks form benches or terraces along the streams, the hard layers yielding less readily to erosion. There is an abundance of excellent limestone for all economical uses on the Otoe reserve.

The soil is very fertile all over the reserve, but there is the appearance of the far western prairies to some extent—few springs, and long intervals without wood or water.

The cherty limestone bed extends beyond Blue Spring, and forms the same bluff-like bench along all the streams; it then passes beneath the water level of the Blue. At this point it presents the appearance of mason work, the cherty material forming the cement between the blocks of limestone.

At the Blue Spring there is a fine mill-site, the banks and bottom of the



stream being formed of rock. A fine saw and grist mill is in process of erection at this place. There are building materials of all kinds in this region sufficient for the wants of the settlers.

A section of the rock as exposed at Blue Spring may be of some interest, as they soon pass beneath the water level of the Blue and are seen no more in our examinations westward:

4. Two feet worn pebbles and sand, and the remainder yellow marl, with about ten inches soil. The roots of trees pass all through this bed, fastening into the bed below.

3. Layers of cherty nodule of variable thickness, with intercalations of fine gray sand, *Productus*, *Orthis*, and other fossils, 2 to 2½ feet.

2. Bluish ash-colored argillaceous limestone, easily decomposing on exposure to the atmosphere; will not answer for building purposes; containing great numbers of shells, especially a species of *Productus* of large size, 6 to 8 feet.

1. Greenish, ash-colored clay, breaking into small, angular fragments, and containing an irregular seam of argillaceous limestone, only about twelve inches above water.

Along the Blue the second terrace is sometimes cut by the river, revealing thirty to fifty feet of alluvium. There is about two to two and a half feet of vegetable soil or humus, and the remainder is yellow silicious marl. If any portion of this bed, throughout its entire thickness, is brought to the surface, it produces vegetation, showing that it contains more or less nutriment for plants. The bottom land of all these streams may be said, therefore, to have a soil from five to fifty feet in depth, possessing the highest fertility.

On our road to Beatrice were a number of exposures of limestone. On Bear creek, about four miles east of Beatrice, there is a ledge of limestone fifteen to twenty feet thick, yellow magnesian, full of cavities or geodes. This same bed is seen along the Blue to Beatrice; is cut through by the little branches, so that it forms some of the most important quarries in this portion of Nebraska.

Fine large columnar masses are worked for buildings, a foot or more in thickness, and ten to twelve feet long, a beautiful cream color, soft but tenacious in structure, and easily cut with a knife; can be made very smooth for caps and sills with a jack-plane.

This rock is abundant here, and is in very high favor with masons and builders, and would be superior to the Pawnee City limestone were it not for some small geode cavities which mar its beauty.

The following is the general section of the rocks around Beatrice:

6 Dark-brown ferruginous sandstones, of variable color and texture, used for buildings; contains many leaves of plants—50 to 60 feet.

5. Yellowish-gray sandstone, soft, easily crumbling and wearing away, exposed on Blakely's run, two miles west of Beatrice—30 to 50 feet.

4. Slope in most places, but composed of variegated clays of doubtful age—potters' clay—40 to 50 feet.

3. Loose layers of yellow limestone, full of geode cavities, porous, spongy.

2. Yellow, rather compact limestone, good for building purposes—2 to 2½ feet.

1. Dark gray argillaceous limestone, becoming light gray on exposure, filled with geodes, with cavities full of crystals of carbonate of lime. This bed is at times massive, heavy-bedded limestone, of a beautiful cream color—10 feet.

Beds 1, 2, and 3 of the above section are undoubtedly of permian or permio-carboniferous age, though they contain fossils common to both permian and carboniferous rocks.

Bed 4 is of doubtful age. Beds 5 and 6 are exceedingly interesting in a geological point of view, from the fact that they represent a new geological formation not before seen east of this point.

Bed 4 seems to form a sort of transition bed between the permian and cretaceous formations. The permian rocks pass beneath the water level at Beatrice

westward, and over a belt ten to fifteen miles wide, in a northeast and southwest direction; the brown sandstones prevail to the exclusion of all other rocks.

The village of Beatrice is pleasantly located on a second terrace in a bend of the Big Blue, and is a prosperous place, surrounded with a thickly-settled farming region, and bids fair to become an important inland town. It contains thirty or forty houses, several stores, a saw and grist mill, &c.

The soil of Gage county does not equal that of Pawnee county, or the counties along the Missouri, as a whole. The bottom lands are excellent, but the upland soil is thin. The grass is less luxuriant and the timber along the streams less abundant. For wheat, however, this soil, composed as it is largely of the eroded materials of the cretaceous sandstones, contains a large amount of silica and seems to be most favorable. A bushel weighs more than that of the river counties, but the corn and other kinds of grain are not quite as good. Yet too much cannot be said in favor of Gage county as an agricultural and grazing region. No coal will ever be found there, and the sooner the farmers commence planting trees the more prosperous and happy they will be.

Comparatively little peat will be found in the county, so that the question of fuel must be determined by the intelligence and industry of the people. If they plant trees now they cannot suffer for fuel, for before that which they now have is gone the planted forests will be ready for use.

In regard to fruits, garden vegetables, &c., the same may be said of Gage county as of the other counties before described. Success will attend all well-directed efforts that way.

There are several fine springs of water in this county, but they are not numerous. Good water is always obtained by digging wells, and the depth beneath the surface generally depends on the elevation above the principal water-courses. Wells vary from twenty to sixty feet in depth. Near Blue Spring Mr. Tylor dug a well twenty-five feet deep through the yellow marl to a point on a level with the bed of the Big Blue river, or perhaps a little below it, and obtained a copious supply of water which never fails. At the village of Blue Spring a well was dug on an elevated terrace fifty-five feet through clays and quicksands without passing through a particle of rock—all alluvium or superficial deposits. At the depth of fifty-four feet the bones of a mastodon were found. At another locality a well was dug forty-four and a half feet through alluvial marl and gravel to a bed of clay on a level with the bed of the Big Blue, and the water flowed in and now continues permanently eight feet in depth.

The excellence of the water in springs and wells in this county is a most important feature in a sanitary point of view.

There are no minerals that can be worked to advantage in this portion of the State. In the cretaceous sandstones there are large masses of limonite, (hydrated sesqui-oxide of iron,) but they are so full of silicious matter that they can never be of much value. Even if there was an abundance of iron in this county there is no fuel to prepare it for use. Every county bears testimony to the statement that Nebraska is wholly an agricultural and grazing State. For building-stone, gravel, lime, different kinds of clay, materials for making brick, &c., this county compares favorably with any others in the State.

Most of the settlers came into the county poor and have not yet commenced planting fruit and forest trees to any extent.

Very little attention has been paid to hedges, but all the cereals are most excellent, and the grasshoppers passed by without doing much damage, and the harvests of this autumn will be the best known since the State was settled.

There are many fine horses and cattle in the county; very few sheep as yet.

#### JEFFERSON COUNTY.

The Nebraska legislature of 1866-'67 united the two counties of Jones and Nuckols under the name of Jefferson. Leaving Beatrice we took a southwest



course across the divide between the waters of the Big Blue and those of the Little Blue. The first branch we came to and the first living water that we saw was at Rock creek, a branch of the Little Blue, twenty miles distant. We travelled at least eighteen miles over the almost waterless and treeless prairie; about fifteen miles of our journey without any water at all.

There were no exposures of rock, but a broad level prairie much of the way, too flat to possess a suitable drainage. I knew, however, that the underlying basis rocks were cretaceous, probably the loosely aggregated sandstone seen on Blakely's run, near Beatrice. The configuration of the surface everywhere would indicate that the rocks beneath were of a texture to yield readily to atmospheric influences, and the little ravines and valleys were grassed down to the edge of the water.

All the land that we passed over was clothed with a thick covering of grass, the soil appeared to be fertile, and the great proportion of silica in the soil, derived from the erosion of the cretaceous sandstones, would render these broad, level prairies admirable for wheat. Although the grass is so abundant and nutritious, I fear the lack of living water will prevent certain portions of this region from being useful for stock-raising. It seems to me too flat and wet at certain seasons for sheep to prosper well. There is an interval of about eighteen miles between Big and Little Blue rivers along this road without a dwelling. On Rock creek the settlements begin to grow numerous again, and nearly all the bottom land of the Little Blue is taken up by the actual settlers. There are some excellent farms here, and the crops the present season are very bountiful.

On Rock creek, a little branch six or seven miles long, we saw the first exposure of rock—the red sandstones of the Dakota group. Along the Blue for eight or ten miles quite precipitous ravines are formed by this rock, as shown by the illustration.

Fig. 1 shows a bluff or projecting ledge of sandstones along the Little Blue, and Fig. 2 represents one of the many rugged ravines near the mouth of Rock and Rose creeks. The clays, sand, and sandstones of the Dakota group extend down the Little Blue to a point about two miles below the south line of Nebraska, and of course influence the agricultural character of the entire region.

The soils of a district are generally composed, to a greater or less extent, of the eroded materials of the underlying basis rocks. The sandstones of this formation being largely composed of silica, the soils and sub-soils are largely formed of silica also; and the consequence is that wheat and oats grow remarkably well, but corn crops are not as good.

The wheat raised in the district overlaid by the sandstones of the Dakota group is said to weigh more per measured bushel than that from any other portion of the State.

These districts also produce most excellent nutritious grass, and the hills, though covered with a thin soil would be superior for sheep grazing. Indeed, as we go west of this latitude, the uplands are more suitable for stock-raising. The water, though somewhat scarce, is most excellent, and the climate healthy. A section of the rocks along the Little Blue, below the Big Sandy, would be as follows, descending:

5. Yellow and dark brown rust-colored sandstones of the cretaceous or Dakota group, so well known in many other portions of the west. A few dicotyledonous leaves were found. This bed is of irregular thickness—from 50 to 100 feet.

4. Moderately coarse, yellowish white sand, with irregular laminæ of deposition—50 feet.

3. Dark-colored, arenaceous, laminated clays, with particles and seams of carbonaceous matter. All through are beds of carbonaceous clay, 18 inches to 3 feet thick—much sulphuret of iron and silicified wood—30 to 50 feet.

2. Variegated arenaceous clays; the slopes exposed are so great that I can-



not give the exact thickness; probably 50 to 70 feet. Some seams of excellent potters' clay.

1. Dark bluish shaly clay, upon which the foundation of Mr. Jenkins's mill rests. It is, undoubtedly, permian or permo-carboniferous, but is not exposed to view by natural excavations until we reach a point south of the Nebraska line, near Marysville, Kansas.

The dark bed in division 3 of the above section has been regarded by the settlers with a good deal of interest as indicating the proximity of a workable bed of coal. I gave all the exposures a careful examination, and found them of no possible value.

Large masses of iron pyrites, some with brilliant crystalline forms, were found; others mixed with bits of charcoal and large masses of petrified wood, showing the vegetable structure with great distinctness.

Bones of some extinct saurian animal are frequently found in these beds. In the sandstones of the upper bed many impressions of leaves similar to those of our existing forest trees are found. They comprise the cinnamon, fig, laurel, sycamore, sassafras, magnolia, and many others belonging to genera common to both tropical and temperate climates, but all belonging to extinct species.

Indeed, the cretaceous period marks the dawn of the existence of dicotyledonous trees, or those similar to our existing forest, fruit, or ornamental trees on our planet, and consequently forms a new and most important era in the progress of American geological history.

I shall have more to say in regard to them in my description of the geology of other counties.

These sandstones continue up the Little Blue until we arrive within four miles of the mouth of the Big Sandy, when masses of a whitish limestone make their appearance on the summits of the hills, and eight or ten miles west of the Big Sandy these rocks assume an important thickness.

They are composed of a bivalve shell, (*Inoceramus problematicus*.) which is as closely packed together in these rocks as if they had been submitted to pressure, with enough carbonate of lime to cement the shells together. The settlers find it useful for building stones, but more useful for converting into lime. It is a chalky shell limestone, and burns into the best lime of any rock in the State. Whether it will be found in great quantities either in the valley of the Little or Big Blue rivers remains still to be determined.

On account of the hostility of the Indians in that region, I did not think it safe or prudent to extend my examination more than about eight miles above the mouth of the Big Sandy.

The same rock occurs on Swan creek, Turkey creek, and the Big Blue above the mouth of Turkey creek. This rock was first studied on the Missouri river, and first appears capping the hills about 30 miles below Sioux City, Iowa, and extends to the foot of the Great Bend, near Yancton, the capital of Dakota Territory. It occupies the whole country, to the exclusion of all other rocks, and a portion of it assumes the appearance of chalk. It has been hitherto supposed that the chalk of commerce is not found in any portion of America, and although this rock has the appearance and nearly the chemical composition of impure chalk, the formation itself has not yet been clearly shown to be the geological equivalent of the true chalk beds of Europe.

On the Missouri river this formation covers an area about 200 miles wide and 400 long. The cretaceous rocks in the valley of the Missouri were, several years ago, separated into five divisions by Mr. Meek and the writer, and were for a long time designated by numbers, as 1, 2, 3, 4, and 5.

In a paper published in the proceedings of the Academy of Natural Sciences of Philadelphia, December, 1860, we published a general section of the cretaceous rocks of the northwest. The sandstones which we have referred to in this report we designated the Dakota group, or Formation No. 1, because these

rocks were then supposed to reach their largest development along the Missouri river near Dakota Territory; Formation No. 2 was called the Fort Benton group, having its greatest thickness adjacent to Fort Benton, near the sources of the Missouri river.

Formation No. 3 was named the Niobrara division, from the fact that it is most conspicuous near the mouth of the Niobrara river. These three divisions constitute the lower series of cretaceous rocks in the west, and are supposed to be the equivalent of the lower or gray chalk and upper green sand of British geologists.

Formation No. 4 we called the Fort Pierre group, because it reaches its greatest thickness near this post along the Missouri river.

Formation No. 5 was called the Fox Hills beds, from the fact that they form a conspicuous range of hills between the Big Cheyenne and Moreau rivers. These two groups of rocks constitute the upper cretaceous series of the west, and are regarded as the equivalent of the upper or white chalk and the Maestricht beds of Europe.

This brief description of the nomenclature of the cretaceous rocks of the west is considered necessary in this place, from the fact that I shall be compelled to refer constantly to the various subdivisions in all my future reports.

The limestone rocks referred to as exposed on the high hills near the Big Sandy, and on the upper portions of the Big Blue and its tributaries, belong to cretaceous Formation No. 3, or the Niobrara division; Formation No. 2, or the Fort Pierre group, I did not see exposed to view in this region with certainty.

The foundation of a saw-mill on the Little Blue, about four miles above the junction of the Big Sandy, rests upon a dark pudding-stone, which I suspect belongs to this group, but it cannot be of very great thickness. About a mile above the mill, 50 or 60 feet of a dark gray calcareous shale occurs, holding a position beneath the true limestone, which I suppose belongs to the Niobrara division, but which may possibly be included in the Fort Benton group. I would remark just here, that paleontologically Formations Nos. 2 and 3 are embraced in one division, and Formations 4 and 5 also—the fossils of one group of rocks passing up into the other.

As a general rule, all these formations are lithologically distinct. The soil of the valleys of the streams in Jefferson county is excellent, and produces abundant crops. Some of the most productive and highly cultivated farms which I observed in the State were seen in the valleys of the Little and Big Blue rivers and their tributaries.

The belt of country underlaid by the sandstones of the Dakota group runs northeast and southwest, extending through the States of Kansas and Nebraska, into Iowa and Minnesota, and is about 40 to 50 miles wide. In this group there is about 40 to 50 feet of yellowish-white friable sandstone, the small particles of quartz scarcely adhering together, which I am confident will yet be made of great economic importance. The sand, which is very abundant, could be used in plastering, in the manufacture of bricks, and more especially in the construction of the patent concrete which is so popular in some portions of this country and Europe.

The soil is largely composed of silica from this rock, and thus it seems to be well adapted to the production of valuable crops of wheat, the berry being more plump than that raised on any other geological formation in the State.

On the more elevated prairie the soil is thinner, and we miss the yellow marl deposits which cover the first two tiers of counties along the Missouri. Still the grass is short and nutritious, and the surface is dry and covered with a great variety of small pebble stones, rendering this district a most excellent one for sheep-raising.

There are many fine springs of the purest water scattered through the county,



but there are extended intervals between them, and there are many entire townships of land with no permanent living water in them.

Iron is found in considerable quantities in the sandstones, but there is no fuel to render it useful. There is only a narrow fringe of trees along the streams, and no workable bed is even within the range of probability.

There are a few good mill-sites, and several valuable saw and grist mills are now in process of erection.

There is really no fine valuable building rock in Jefferson county. From Beatrice for 30 or 40 miles up the valley of the Big Blue, only the rusty sandstones of the Dakota group are found, and these are exposed only in a few localities.

The same sandstones prevail in the valley of the Little Blue from the Nebraska line to the mouth of Big Sandy.

Even the whitish limestones of the Niobrara division, which are quite abundant west of the sandstone belt, although excellent for lime, are not tough and hard enough for building stone; so that no portion of the county can be regarded as well supplied with economical rocks.

Still, in the absence of the massive limestones of the carboniferous beds farther east, these cretaceous sandstones and limestones will prove of much service. The ease, however, with which these rocks yield to atmospheric influence has given a most beautiful outline to the surface of most of the county.

The wide bottoms and gently sloping hills along the Big Blue and its tributaries can hardly be surpassed for their monotonous beauty. The high prairies are gently rolling yet well drained.

I was not a little surprised at the advance of settlers so far westward. The valleys of the two Blues are nearly all occupied by the actual settlers. There are a large number of Germans who have taken farms in this county. Six years ago they came into this region and took possession of these homesteads, many of them without any money at all; now they have highly cultivated farms, with 20 to 40 acres of wheat that will average 30 bushels to the acre; oats, 40 to 50 bushels; corn 60 to 70 bushels; a large number of fat horses and cattle, with everything comfortable around them.

By their industrious and frugal habits these Germans have made for themselves an independence in the short space of six years.

Surely the great west, with its broad fertile acres, to be had almost for the asking, through the generosity of our government, is the poor man's paradise.

#### BRIEF NOTES ON THE PRESENT CONDITION OF THE OTOE INDIANS.

In our wanderings over the State of Nebraska we came to the Otoe reserve, and pitched camp near the hospitable mansion of the agent.

In the absence of Major Smith we were most pleasantly entertained by Mr. Moore, the farmer of the Otoe Indians. It occurred to me that I could not occupy my time better, in the brief space allowed me to remain here, than in securing, as far as possible, such information as suggested itself in regard to the present condition of this once powerful tribe of Indians, now fast dwindling away.

The Otoe reserve is located on the Big Blue river, mostly in the southern portion of Gage county, but extending into Jefferson county. It occupies a surface  $10 \times 24 = 240$  square miles  $= 153,600$  acres of the finest land in southern Nebraska. The Big Blue, one of the most beautiful of the inland streams, with several of its most important branches, passes through it. Like all other portions of the State, there is, comparatively, little timber, yet as much as on other streams. Some of the branches have the most desirable farms bordering on them. They occupy a small village bordering on the Blue, and are not distributed over the reserve. The land is not divided out to them, but they are all aggregated together in the village of mud huts. They seem to have no idea of individual independence, but have all things in common, as it were.



They have now about 300 acres in corn in good condition, which will prevent them from starving if judiciously cared for by the agent and farmer. It seems hardly possible that a tribe with over 150,000 acres of this tillable land should have no more than 300 or 400 acres in cultivation. These Indians have the same lazy, improvident habits of the wild Indians further west, and the result is that there is at least from three to four months of the year that they are in a pitiable state of starvation. Last spring they ate all the cats and dogs within their reach; horses, cows, or sheep that had been dead for ten or twelve days, and were in a complete state of putrefaction, were eagerly devoured by them. Anything, however filthy or decayed, that had ever been in the form of food, was eagerly devoured; and yet no lesson is taught them by such severe experience, for nothing could be easier than to place themselves beyond the possibility of want. Even at this time they have nothing to eat but corn, which they cook by boiling in the kernel. Most of the tribe, both men and women, have gone on a hunt at this season to the Republican, where buffalo are said to be plenty. They usually prepare about 500 robes annually, for which they get \$5 to \$7 apiece. The meat they dry for winter use.

There are now about 430 persons in the tribe, men women and children, a small remnant of a once powerful tribe. They persist in living in filthy, ill-ventilated mud huts, which at night they close up as tightly as possible, so that they are swept off annually by various diseases, and those that remain are deficient in energy and strength.

Two or three of the families live in rude board houses, but they are not pleased with them, preferring their rude huts.

There are three groups of huts occupying three different elevations on the same ridge, representing three different bands, which are governed by sub-chiefs. The head chief is quite a shrewd man. Some one asked him, when the agent and farmer first came, how he thought he would like them. He at once replied that he could tell that better when he had seen their table; so they made the head chief and his principal men (eight in number) a feast; and they prepared themselves to do justice to the agent's dinner by a three day's fast previously—one hundred pounds of mutton, bread and coffee in proportion—and they made way with it all. Their powers of endurance are exhibited in as marked a manner in devouring food as in abstaining from it. It is a rule with them to eat all that is set before them, however much it may be.

The Indians have a saw-mill and grist-mill all under one roof, and a great amount of lumber is sawed and grain ground for the inhabitants of the neighboring region, the avails of which are supposed to go into the Indian fund.

The dirt huts have a diameter of about thirty feet. They are formed by placing a circular row of upright posts in the ground and then fastening to the tops of these horizontal poles, and to these horizontal poles are fastened the poles that form the roof, all slanting towards the top, at which point a round hole is left, two feet in diameter, for the smoke to pass out, then this frame-work is covered over with sods and dirt. The fire is placed in the centre in a circular depression of about six inches deep and four feet in diameter. All around the inside of the hut are board bunks of the rudest kind, usually designed for two persons. Upon these are spread skins or blankets, which serve them for beds. I have seen ten of these in a single hut. On the sides and posts are suspended a great variety of articles—cooking utensils, clothing, the hunting apparatus, &c., which constitute the furniture of the dwelling.

The entrance is about ten or twelve feet long, and is protected by a thick sod covering. Sometimes twenty or thirty persons sleep at night in these huts, every avenue for the admission of fresh air closed up, so that it can hardly be expected that their children will grow up healthy.

Many of these Indians have been educated to some extent at the mission

school, but all that has been taught them, and all that they have seen of the superior comfort of the whites around them, has had no influence in changing their mode of life. They seem to be destitute of the desire for improvement and averse to change, preferring their ancient habits and customs. If they can avoid it they will not travel in the roads made by the whites, but follow their old trails.

A few of the half-breeds live in bark huts. In August, when the heat is excessive, and when the fleas and other vermin become too abundant, they go down by the river in the timber and erect temporary bark huts, and live in them until cold weather commences.

Not far distant from the village are the graves of their dead. In this matter, also, they adhere to their ancient customs. They dig a hole in the ground just about large enough to receive the body, and then pile a mound of earth on it from two to four feet high, and if the deceased possessed a horse, it is killed at the grave, so that the spirit need not be compelled to walk to the celestial hunting-grounds. When the flesh of the horse decays the skull is usually placed upon the grave.

There are, also, two oak trees near the burial ground in which were a large number of bodies, some in small board coffins, and others in the original wrappings of skins and blankets; these were piled one across the other, as many as could rest in the tree.

The Indians have great veneration for their places of burial, and are always loth to leave the graves of their ancestors. They have attempted to protect them by means of permanent graves.

On a high hill across Plum creek may be seen the nicely fenced graves of two native interpreters of this tribe, who were killed by them some years ago. It is supposed that while on their annual hunt they committed some depredation on white people which they wished to have kept a secret. These interpreters were privy to it, and being on most friendly terms with the white men, the Indians suspected they intended to expose them. They were shot in a ravine in the night near the same spot, and within two days of each other.

We-ha-ta, "Wild-fire," was the presiding genius of our camp. He considered himself specially commissioned to look after our interests in return for his board and that of his family. He wore a turban about his head and a huge necklace of bears' claws around his neck, and conducted himself with all the dignity of a chief.

As I have before mentioned, these Indians possess a reservation covering over 150,000 acres of land. They do not make use of 2,000 acres. They are now surrounded with white settlers who are bitterly prejudiced against them, and the Indians do very little to remove that prejudice. On the contrary, depredations are committed not unfrequently which are attributed to them, for which they must suffer, in the estimation of the white settlers, whether guilty or not.

Situated as they are at present, they are like a small tree under the shadow of a large one: they will dwindle away slowly and soon become extinct.

If the agents of the government that are sent among them would do their duty, and they (the Indians) would put forth a proper amount of industry and energy, they might become very comfortable and prosperous, even rich; but they are constantly deteriorating, and they now possess none of the warlike, manly qualities which are exhibited by some of the wild tribes further west. They are a filthy, begging, lying, thieving race, lazy and improvident in the extreme, doing nothing that can possibly gain the respect of any white man. It would be better for both Indian and white man if all these wild tribes that are located in Kansas and Nebraska could be removed far west, where they would be prevented from contact with the whites.



The study of the language of the different Indian tribes of the west is one of peculiar interest to the philologist. In my memoir on the "Ethnography and Philology of the Indian Tribes of the Missouri Valley," in the possession of the Commissioner, I have attempted to give some illustrations of the languages of the tribes roaming about the sources of the Missouri. I hope, at some future period, to prepare a second part, containing examples of the languages of the different tribes along the lower Missouri. I have prepared these notes to aid me in making out their history.

The language of the Otoes belongs to the Dakota group, which comprises a large number of tribes: Iowa, Otoe, Missouri, Winnebago, Kansas, Osage, Quapaw, Omaha, and Ponka, of the lower Missouri. All the different bands of the Dakotas, Sioux, Crows, Minnetarees, Mandans, and the Assiniboinas of the upper Missouri, belong to one group, and the careful student will discover a relationship more or less close in all their dialects; yet most of the tribes cannot understand each other, and interpreters are required for each.

The Rev. William Hamilton, of Bellevue, Sarpy county, who lived many years among the Iowa and Otoe Indians as a missionary, has written a very good grammar of their language, a copy of which I was able to procure.

NOTE.—I forgot to mention the Green Corn dance. This is going on every evening at this season of the year, as the corn is becoming fit for roasting. They build a fire in the centre of the lodge, and dance around, keeping time with a rude thumping on a gong. Their women and children all join in the dance.

I found two old village sites, one at Blue Spring, on the Big Blue; the foundations of the huts can be distinctly seen by the greater growth of weeds, and old pottery and arrow-heads have been found there. I think it was once the village of the Pawnees. At another locality, between Turkey creek and Big Blue, at their junction, a most beautiful locality, some specimens of pottery were dug up three feet under ground. It is plain there was a village here many years ago; how far back in the past it is impossible to tell. Some information may be obtained from the tribe, perhaps.

#### JOHNSON COUNTY.

The north branch of the Great Nemaha river runs nearly diagonally through Johnson county, in a southeasterly direction. It is the only important water-course in the county, and its value to the inhabitants cannot be overestimated. The entire county is underlaid by rocks of the age of the upper coal measures; hence the geology is comparatively simple.

There are very few exposures along the Nemaha and its branches, and the high divides on either side present only rolling prairies covered with a luxuriant growth of grass, exhibiting every evidence of remarkable fertility, but having no timber and comparatively little living water.

From Beatrice our course was nearly northeast, passing over the divide between the waters of the Big Blue and those of the Nemaha. This divide, as usual, was treeless and nearly waterless for 18 miles; yet, either to the right or to the left of our road, water and small trees could have been found within five or six miles. The grass was excellent, showing a fertile soil, and the surface was monotonously beautiful to the eye, but not an exposure of the underlying rocks could be seen.

On Yankee creek, a branch of the Nemaha, the first exhibition of the rocks was observed. A few limestone quarries were opened for obtaining building materials. The beds are thin, not more than from six to twelve inches in thickness, intercalated with beds of clay and sand. The surface is rather rugged, some abrupt hills, but usually clothed with grass down to the water's edge.

At Tecumseh a thin seam of coal has been opened, and is now worked with some success by Mr. Beatty. The drift is very similar to that before described



in my report of Pawnee county, and extends into the bank about 100 yards. Mr. Beatty has taken out about 1,000 bushels of coal, which he sells readily at the mine for twenty-five cents per bushel. It is undoubtedly the same bed that is opened on Turner's branch and at Frieze's mill, in Pawnee county, but it is not quite as thick or as good; it contains large masses of the sulphuret of iron and other impurities. The coal seam here varies much in thickness, from ten to fifteen inches. The cap-rock is a bed of limestone not more than two or three feet in thickness. A well was sunk in the village of Tecumseh sixty feet; a drill was driven down through rock and hard clay a few feet further, and passed through what the workmen thought to be three feet of good coal. This discovery created much excitement at the time, and increased the demand for the public lands in Johnson county. It afterwards turned out to be the same seam of coal worked by Mr. Beatty on the Nemaha, and was only eleven inches in thickness. The prospects, therefore, for workable beds of coal in Johnson county are no better than in the neighboring counties already examined. The evidence against any important bed of coal being found within the limits of Nebraska diminishes in force continually. I have already presented a portion of the evidence in former reports. The fact that all efforts in searching for coal in neighboring districts have resulted in failures, renders the prospect very doubtful. All the rocks at St. Joseph, Missouri, Leavenworth and Atchison, Kansas, hold a lower position geologically; yet borings have been made about 500 feet at Atchison and St. Joseph, and a shaft has been sunk about the same depth at Leavenworth, resulting in the discovery of a bed of very impure coal three feet thick, quite unfit for use. The evidence is quite strong that, as I have before suggested, Nebraska is unfortunately located on the western rim of the western coal basin, and that no workable bed will ever be found in the State at a reasonable depth.

Tecumseh is the county seat of Johnson county, a small town located on the elevated prairie near Nemaha river. The following sketch will give some idea of its size, as well as the surface of the surrounding country:

From Tecumseh to the source of the Nemaha, about forty-five miles, I did not discover a single exposure of rock, and I could not ascertain that any had ever been observed by the settlers. We must conclude, therefore, that building materials in the shape of rock are not well distributed over the country; indeed, I do not know of any one in which I observed less.

The soil is very fertile, however, and in that respect will compare favorably with any in the State. In what are called the alluvial clays, near Tecumseh, were discovered some interesting remains of extinct animals, which appeared to have been abundant all over the west at that period. Just over the cap-rock of the coal seam, in stripping away the alluvial clays, Mr. Beatty discovered two molar teeth of a mastodon, in a fine state of preservation, one of which I was fortunate enough to secure.

About six miles west of Tecumseh, Mr. Caldwell, in digging a cellar, unearthed a fine molar tooth of an elephant, which probably belongs to the well-known species *Elephas americanus*. This huge animal seemed to have ranged all over America, east of the Mississippi, and of late years its remains have been found in California and Colorado. This is the first specimen ever found in the Missouri valley, to my knowledge.

In 1858 I was fortunate enough to discover the remains of a number of species of extinct animals, in some pliocene tertiary deposits on the Niobrara river, and among them was a species of mastodon which Dr. Leidy, of Philadelphia, described as *M. minimus*, and an elephant a third larger than any ever before known, extinct or recent, *Elephas imperator*. These two species have never been found at any other localities, and were geologically much older than those first mentioned.

There are many fine farms in this county, and some of them are under a good state of cultivation. The best one I saw is improved by Mr. Luke Corson, about one and a half mile from the village of Tecumseh. He has planted with success almost all the common varieties of forest trees of this latitude, and his experiments in all kinds of hardy fruits have been eminently successful. Apples, pears, peaches, cherries, apricots, plums, blackberries, strawberries, gooseberries, and currants, have been raised in great perfection.

He has surrounded his farm with the willow hedge, which, in his case, has been remarkably successful. The willow makes a most beautiful hedge to the eye. Five years ago he put the cuttings three or four inches long in the ground, and now these willow trees are fifteen feet high, and often four to six inches in diameter at the base, and in most cases as a fence it is capable of turning cattle. Although fully as handsome in its appearance to the eye, it does not equal the osage orange hedge as a fence. The attention of farmers in this county has been directed to the importance of planting hedge fences as soon as possible. One gentleman put out fourteen miles of osage orange hedge this season; another two and a half miles, and there is probably from one hundred to one hundred and fifty miles of young fence in Johnson county at this time.

Building materials, as clays, sands, &c., with the exception of limestone, are abundant. The water is excellent all over the county, and on the Nemaha there are some good mill sites. Peat is found in limited quantities. Fuel is scarce, and must be supplied by the planting of forest trees.

In conclusion, I would say that there is no county in the State with better farming land, or land more suitable for the cultivation of trees and fruits, and its position will depend entirely upon the industry and skill with which these, its only resources, are developed.

#### ADDITIONAL NOTES ON LANCASTER AND CASS COUNTIES.

From the sources of the Nemaha river we simply pass over a somewhat elevated prairie, which forms the divide between that stream and the head branches of Salt creek.

Like the Nemaha, in Johnson county, Salt creek passes diagonally through Lancaster county, in a northeasterly direction. It empties into the Platte river about thirty-five miles above its mouth. This creek, with its branches, forms the entire drainage of the county.

The southeastern portion of Lancaster county is underlaid by rocks of the permian or permo-carboniferous age. The basis rocks of three-fourths of the county are the rusty sandstone of the cretaceous formation, No. 1, or Dakota group. After passing the divide from the sources of the Nemaha to those of Salt creek, we find no exposure of the underlying rocks. At Mr. Mills's farm, about twelve miles down the valley, are some exposures of the permo-carboniferous rocks, occupying an area of about five miles square. The entire thickness of the rocky strata here is ten to fifteen feet, arranged in layers six inches to two feet in thickness.

In abstracting the rocks from the quarry the fracture is so regular, breaking into massive square or oblong blocks, and the texture so fine, compact, and of light cream color, that they are highly esteemed by builders, and make beautiful as well as durable houses. There are quite a number of large dwelling-houses (made of this stone) in the vicinity. It works quite easily. The finest springs of water in this county issue from this rock.

There are five or six of these quarries opened at this time, but the principal one occurs on the farm of Mr. S. B. Mills.

These fine quarries must become of great value to this county, for they yield



the only good building material for thirty to fifty miles north, south, and west, and from ten to twenty miles east, of the place.

The rusty, rather soft, friable sandstones of the Dakota group are used, to some extent, for dwelling-houses. It presents an exceedingly sombre and unpleasant appearance to the eye, and possesses no elements of durability. It can be relied on only in the absence of other building material. About twelve miles below these quarries, near the salt basins, Lincoln, the capital of the State, is located. Pretty good water is obtained here by digging, but there is a liability even then to strike brackish water, on account of the proximity to the salt lands.

From a point five miles above Lincoln to a point five miles above the mouth of Salt creek, there is a scant supply of building material, of timber, and of fresh water; so that it can be seen at a glance that this valley is not as desirable as many other portions of the State.

Near Miss Warner's, about ten miles above Lincoln, a well was dug on the high hills, bordering the valley, to the depth of sixty feet, without striking rock. At Yankee Hill, two miles above Lincoln, a well was dug sixty-six feet, without reaching the basis rocks.

These facts show the great thickness of the superficial alluvial deposits of this region, and also the skeleton form of the surface prior to the deposition of these deposits. I shall treat more fully on this subject at a future time.

The sandstones of the Dakota group are quite largely developed in this region, and exhibit their usual variability of texture and color. The prevailing color is a deep drab rusty brown, sometimes yellow, or nearly white. Some layers contain many impressions of dicotyledonous leaves. I was unable to find as large and perfect impressions as I have collected at many other localities.

So far as the surface of the country is concerned, in Lancaster county it may be regarded as remarkable for its beauty.

It is always gently rolling, well drained, and from elevations the views are very fine, forming most excellent building sites.

When the soil is not influenced by salt springs, it is equal to any in the State, but in an agricultural point of view there is no doubt that Salt creek, with the numerous salt springs that issue forth near it, is a disadvantage to the valley.

That portion about two miles above Lancaster does not seem affected by the salt. The farm of Mr. S. B. Mills, of over one thousand acres, about ten miles above the county seat, is one of the most fertile and valuable in the State. Although the salt springs in this county may eventually be of some value to the State in the production of salt, yet I am convinced that if there was not a salt spring of any kind in the county, the difference in the value of the lands for agricultural and grazing purposes would much more than balance all income that will ever arise from the salt springs.

In that case Salt creek, instead of being almost useless, or rather an impediment, would be a fine fresh-water stream, making it one of the finest stock counties in the State.

The surface of the uplands lies very beautifully, is very attractive to the eye, but there is scarcely any timber in the county.

The soil is excellent, and forest trees may be planted with success whenever settlers choose to do so, though very little has been done as yet.

Cass county is the best settled county in the State. It is covered with fine farms, and many of them begin to show their capacity not only in the production of the grains, as wheat, oats, and corn, but also of fruits, forest trees, hedges, &c. Along the Platte valley as well as the Missouri the surface is rough, the hills being sometimes very steep and the ravines deep and numerous; but the soil is of inexhaustible fertility and well watered with streams and multitudes of springs of the purest water.



In all that pertains to successful agriculture and the raising of all kinds of stock, I could not conceive of a more desirable district.

There are rock quarries enough in Cass county to supply all that portion of the State south of the Platte if it could be equally distributed.

On the Platte, near the northwest corner of the county, a yellow magnesian limestone is obtained, which is regarded with great favor as a building stone. It is very durable, with a tenacious texture, but so soft that it can be cut with a knife or plane, thus rendering it easily worked for caps or sills, &c.

I have not observed this bed of rock in any other portion of the State. The geological formations in this county are the upper carboniferous beds, capped along the west and southwest portions with the sandstones of the Dakota group. The coal measure rocks appear near the edge of the water at the mouth of salt creek, near Ashland, the county seat of Saunders county. East of this point for twenty to twenty-five miles the red sandstones occupy the hills along the Platte, but the limestone continues to rise higher and higher and assume more importance.

The sandstones disappear entirely about ten to fifteen miles west of Plattsmouth.

In both the sandstones and limestones extensive quarries have been opened; the sandstone is used for all ordinary purposes, while the limestones are made into the walls of buildings and for ornamental purposes. Some fine dwelling houses have been made of these limestones.

The quarries of sandstones have been wrought to considerable extent, and the stone is used for cellar walls, wells, and some other purposes where nice work is not required.

The cretaceous rocks of Cass county are composed of the same beds of clays, sands, and sandstones before observed in formations of the same age in the valley of the Little Blue river.

About twenty-five miles west of Plattsmouth a bed of fine argillaceous grit is exposed, which was regarded by the settlers as gypsum. It may become of some economical value at some future time as fine clay for mingling with other earths in the manufacture of bricks. On the Weeping Water, an important stream near the central portion of Cass county, are some heavy beds of limestones, which are of great economical value for building purposes.

The limestone is readily burned into lime, and numerous dwelling houses, mills, &c., are constructed of this rock.

These alternate beds of limestones, sands, and clays give to the surface of the country bordering on the Weeping Water an unusually rugged character. The bottoms of the little streams are narrow, the soil is good, water excellent, and the valley is well settled and prosperous.

Near the mouth of Stone creek, section 12, range 10, township 10, indications of coal were observed, and Mr. E. L. Reed, residing at Weeping Water, sunk a shaft through the following beds:

9. Sandstones which form the bed of the creek, 10 feet.

8. Slate and clay, 3 feet.

7. Coal, 9 inches.

6. Whitish fine clay, 3 feet.

5. Crystalline quartz, 3 inches.

4. Bluish clay, 4 feet.

3. Whitish fine clay, 6 feet.

2. Red clay, 3 feet.

1. Soft white limestone, —.

The coal above, although so thin a seam as to render it unprofitable for working, is of good quality, and is useful to the blacksmiths in the vicinity.

We must therefore conclude that neither in Lancaster nor Cass counties will

there ever be found any thick beds of coal, but in the valleys of all the streams and in numerous other localities there are low, boggy places which seem to promise peat, especially on the broad, low bottoms of the Platte.

I am continually more and more impressed with the importance of this material as an article of fuel for the people of Nebraska, and I am confident that before many years it will become an object of earnest pursuit and of great profit.

The red sandstones of the Dakota group contain a considerable quantity of iron ore, but the absence of fuel renders it unavailable, so that exclusive of the common building materials these counties may be said to have no mineral resources. Their wealth lies in their inexhaustible soil, which is this year producing most luxuriant crops.

Wheat yields 30 to 35 bushels per acre; oats 40 to 50, and corn 60 to 75 bushels per acre; and in this respect it is easy to predict for Nebraska a remarkable destiny in the future.

#### ADDITIONAL NOTES ON SARPY AND DOUGLAS COUNTIES.

Sarpy county borders on the Platte river and the Missouri, and thus has a large share of bottom land as well as the rather rugged or hilly portions along those streams. It has superior advantages over the more northern counties in its numerous quarries of limestone, which are destined to prove of great value.

Already do the quarries along the Platte and the Papillion furnish the greater portion of the lime and building stone used at Omaha, but most of the rock needed for the contemplated railroad bridge across the Missouri must of necessity be obtained there.

The basis rock which underlies the surface of the greater portion of Sarpy and Douglas counties is carboniferous limestone. These limestones are evidently of the age of the upper coal measures, as their fossil remains indicate.

The western portions of the counties are occupied by the rusty variegated sandstones of the Dakota group. The soil is of great fertility, seeming to be composed of a mingling of the eroded materials of the sandstones and limestones with the yellow marl of the loess deposit, which covers the surface of the country here to a greater or less depth.

The result is a surface soil eminently adapted for the growth of all the cereals, as wheat, oats, and corn. The scenery is beautiful indeed; the rolling or undulating character of the country, while it relieves the monotony, does not obstruct the vision, so that objects may be seen with distinctness ten to twenty miles on every side.

The river bottoms, especially through Missouri and the Platte, are of inexhaustible fertility. With a soil not unfrequently ten to thirty feet in depth, they sustain a most luxuriant vegetation, while during the greater portion of the year the broad upland prairies are clothed with grass and flowers of great variety and beauty.

The yellow silicious marl covers the greater part of Douglas county, so that the limestones are exposed only in a few localities.

Near Omaha City a few beds are revealed at the water's edge, perhaps ten to fifteen feet, and over these layers is a deposit of gravel and marl one hundred to one hundred and fifty feet in thickness.

At Florence, about five miles above Omaha, these limestones are again seen at very low water in the bottom of the Missouri, but as a rule the rocks of the country are concealed from view by this great deposit of marl. In consequence of this fact the limestone quarries along the Platte assume a far greater importance and value.

There is a quarry of limestone at Bellevue Landing, near Sarpy's old trading post, which has been wrought for many years; but the most valuable layers of



the rock are not visible in time of high water. Watson's quarry, on the Papillion, three miles west of Bellevue, has been worked for many years, and contains several layers of valuable rock for building purposes. This quarry is a source of considerable revenue to the owners, and the materials are taken to Bellevue and Omaha in great quantities.

The following is a section of the beds, in descending order :

6. Vegetable soil, two to four feet thick, with a few stray water-worn rocks.  
5. A bed like No. 3, with fragments of fossils capped with loose layers of limestone, eighteen inches to two feet thick.

4. Three inches of light yellow clay—a hard layer.

3. Yellow, indurated, calcareous clay, full of shells; ten inches.

2. Several layers of hard limestone, very compact with *Crinoids*, *Corals*, *Chonetes mucronata*, *Athyris subtilita*, *Productus*, &c.; six feet.

1. Greenish-yellow clay, underneath the most valuable and massive bed of limestone, as shown in the illustration; twenty inches thick. Below this there is a layer of yellow limestone eighteen inches thick.

Bed 2 in the section is the one that produces the valuable rock for building purposes. The organic remains determine at once the geological position of the rocks.

About six miles above the mouth of the Platte I observed a large number of boulders or erratic rocks scattered over the hills, composed of granite and red quartzite. These were undoubtedly transported hither by glacial action; and the rocks themselves come from the north and northwest—from Dakota, Minnesota, and perhaps from the region of Lake Superior, where the rocks abound. Near this point, also, a ledge of rusty sandstone of cretaceous age was seen capping the hills. Its character has been described before, as a dark, ferruginous, coarse-grained, micaceous sandstone, but sometimes becoming a tough, close-grained, compact, silicious rock, or quartzite. It is very difficult to find rocks of this group resting directly upon the beds below, from the fact that in almost all cases a grassy slope intervenes, and it became a matter of much importance to find the junction of the two great formations, or ascertain what beds come between.

In 1857, while making an exploration of this region, I was so fortunate as to discover this apposition of the two formations, and the results were published in a memoir in the Transactions of the American Philosophical Society in 1862. The section taken at that time was observed near the old Otoe village, about eight miles above the mouth of the Platte river.

The cretaceous rock set directly upon the limestone, although we know what a vast thickness of beds of various ages are absent. This illustrates what Professor Rogers has denominated, in his Geology of the State of Pennsylvania, an unconformable sequence of beds; that is, the eye will observe no apparent want of conformity, the lowest bed of one formation reposing upon the highest of the other, as if no interval had occurred during the deposition. The section, in descending order, is as follows :

1. Gray, compact, silicious rock, passing down into a coarse conglomerate, an aggregation of water-worn pebbles, cemented with angular grains of quartz; then a coarse-grained micaceous sandstone—twenty-five feet.

2. Yellow and light gray limestone of the coal measures, containing numerous fossils—*Spirifer cameratus*, *Athyris subtilita*, *Fusulina cylindrica*, with abundant fragments of coral and crinoid remains—twenty to fifty feet. A, quartz rock; B, conglomerate; C, coarse micaceous sandstone; D, carboniferous limestone.

This conjunction of the two great formations at this point is quite instructive. We see the tremendous effects of erosion prior to the deposition of the sandstones, in the fact that hundreds of feet of limestones must have been swept away.

In Kansas, near Fort Riley, there are several hundred feet of permian and



permo-carboniferous rocks, not a trace of which can be seen in this valley. Even in the Salt Creek valley, above Lancaster, there is one hundred feet or more of rocks that do not appear here; and yet I can see no good reason for not supposing that all these rocks were deposited here in the great oceans of the coal period, but have been worn away and ground up into materials for rocks of more recent date by the waters of subsequent oceans.

Then, again, between the coal measures and the cretaceous rocks, as shown in the illustrative section, the two great ages, triassic and jurassic, are not represented at all.

We have reason to believe that rocks belonging to these eras were even deposited here, and yet every trace of them has been washed away.

In Kansas, on the Smoky Hill fork, there are a series of variegated beds of clays and sands interposed between the permian and cretaceous, which we believe belong to the triassic or jurassic period, or both. Along the eastern slope of the Laramie, Big Horn, Wind River mountains, and the Black Hills of Dakota, the red beds of the triassic and the marls and marly limestone of the jurassic eras are developed to a thickness of several hundred feet, while on the Platte not a trace of them is to be seen.

The evidence seems to me to be clear that beds of greater or less thickness, belonging to all these periods, once existed in this region, and that they have been swept away by the erosive action of water.

This subject, which is one of the most interesting as well as important in the geology of the west, will be discussed more fully in the final report.

Like all other portions of the State, the interest in the discovery of workable beds of coal in this region is very great. Along the Platte a seam of carboniferous shale crops out, occasionally twelve to eighteen inches in thickness, and wherever it occurs it is regarded by the settlers as a sure indication of coal. I have examined all the indications with care, and I see no evidence of any coal at a reasonable depth. I hold the same opinion now that I expressed in a scientific paper in 1858, that I was "inclined to the belief that it was a geological impossibility for a workable bed of coal to be found within the limits of the Territory of Nebraska. A bed of coal, to be really valuable for economical purposes, should be at least three feet in thickness; and even then it would not prove profitable, if a large amount of labor were required in opening the mine."

The several beds of limestone have been open for twenty-five or thirty miles along the Platte, and the greatest abundance of the best building material can be procured. Duclos's quarry, on the farm of Mr. J. I. Paynter, township 13, range 13, section 27, there is the following section:

6. Yellow marl, a superficial recent deposit.
5. Yellow clay, full of white lumps, like magnesia pebbles.
4. Three or four layers of limestone, excellent for building purposes, varying from ten to fifteen inches in thickness each; five feet. This bed is most extensively quarried; the rock is a great favorite with masons. Its upper surface has been smoothed by glacial action.
3. Slope; doubtless intercalations of clay and thin beds of rocks; thirty feet.
2. Heavy layers of limestone, yellowish white, full of organic remains, as, *S. cameratus*, *Productus*, *Athyris*, *Fusulina*, &c.; ten to fifteen feet.

Although this rock is not quite as good as that in bed four, yet it is much used for lime and for building purposes.

1. Slope; probably same as bed 3, twenty-five feet above the bed of the Platte. The surface of bed 4 exhibits some very remarkable phenomena, which I have observed in very few localities in the west, and nowhere except in this region. It has been so thoroughly smoothed by glacial action, that the upper layer can be quarried out and used for caps and sills, without any further finish to them, and the process seems to have been carried on with wonderful

uniformity, for the upper surface seems to be as level as it could be wrought with a plumb-line.

There are a few small grooves or scratches on the surface, and by means of a surveyor's compass I ascertained with a good degree of precision the direction, which was generally  $27^{\circ}$  east of north.

There were some exceptions, as can be seen in the illustration, which is an exact copy from the rock. The variation of the needle here is about  $11^{\circ} 45'$ . The whole process here seems to have been a smoothing one, with a few small pebbles perhaps in the bottom of the glacier.

The following illustration will show the character of the scratches, and the fact, also, that there are indications of two sets; the scratches crossing each other at different angles.

I will now quote two or three paragraphs from a memoir published in 1862, which had a very limited circulation, and is now out of print:

"Near the mouth of the Elkhorn the sandstone presents much the same character as before described. At this point it reaches nearly to the water's edge, showing that the dip of the formations in this region is toward the north-west. Here formation No. 1 is at least eighty feet in thickness, about fifteen feet of carboniferous limestone being exposed beneath. The latter soon passes beneath the water-level of the river, and the sandstone occupies the country.

"The bottoms along the lower Platte are quite broad, and extremely fertile, possessing a rich soil, and admirably adapted to the wants of the farmer. Fine crystal springs issue from the limestone banks; a sufficiency of timber skirts the river or clothes the bluffs; the climate is quite dry and healthy, and if it were not for the extreme cold of winter, this region would be one of the most desirable agricultural districts in the west.

"The timber of the uplands consists chiefly of ash, elm, oak, soft maple, box-wood, &c., while along the bottoms the cottonwood forms nine-tenths of the woodlands. The land, when in a state of nature, supports a most luxuriant vegetation, and when cultivated by the farmer, brings forth very abundant crops.

"The valley of the Elkhorn is similar to that of the Platte, and the land is at this time mostly taken up by the actual settler. The bluffs are formed of sandstone, No. 1, often presenting lofty vertical walls, which, from the yielding nature of the rock, are of great service to the Indian upon which to record his hieroglyphical history."

On my return to Bellevue, I passed over the upland prairie, several miles north of the Platte. Already nearly every valuable claim was occupied by the persevering pioneer, and, as far as the eye could reach, the plain was dotted over with farm-houses, giving it much the appearance of an old settled country. Very little timber, however, is to be seen, except that which skirts the small tributaries of the Platte. The soil upon which the surface is composed is of a rich vegetable mould, the result of the annual decay of a luxuriant vegetation, underlaid by a yellowish silicious marl, and is admirably adapted for the cultivation of all kinds of cereal grains, and for grazing purposes.

When the prairie turf is broken up by the plough, and allowed to decay, the land becomes like a garden. The soil is so loose that it is tilled with great ease, but, from this very fact, it is liable to suffer extensively from the wash of the heavy drenching rains of May and June.

The crops of wheat, oats, and corn in both of these counties, the present year, show unmistakably the very great capacity of the soil, thirty-five to forty bushels of wheat, fifty to sixty of oats, sixty to seventy-five of corn per acre, being a no uncommon yield, and the present season there will be even more than the average yield of former years.

Grass is also fine everywhere, each acre averaging from one and a half to three tons per acre.

## GEOLOGY OF NEBRASKA NORTH OF THE PLATTE RIVER.

With the exception of a small portion of Douglas and Sarpy counties, bordering on the Missouri and Platte rivers, the whole State of Nebraska north of the Platte river is underlaid with rocks belonging to the great geological eras, cretaceous and tertiary.

The cretaceous rocks make their appearance in their eastward extension in rather thin beds, capping the summits of the hills, and only the more compact layers, resisting the eroding effects of water or atmospheric agencies, remain to indicate its boundaries and extent. I am inclined to the belief that the rusty sandstones of the Dakota group once extended in full force directly across the Missouri into Iowa, and that the sandstones recently discovered by Dr. White on the Nishnabotna river form a portion of the series, disconnected only by the wearing away of the intervening rocks. There is no doubt that the greater portion of northwestern Iowa is underlaid by rocks of the Dakota group.

The green color on the geological maps of Nebraska in process of preparation will show the eastern boundaries of this group with accuracy. The limestones early begin to disappear north of the Papillion river.

At Sarpy's old trading post, near Bellevue landing, some thin layers of rock occur in the hills, and a thin seam of coal has been found, and at low water two or three layers of rock are revealed which can be made useful for building purposes.

At Omaha five to ten feet of limestones are revealed near the water's edge. The rock is grained to considerable extent; but from the fact that Omaha is almost entirely supplied with rocks and lime for building purposes from the Platte, we may infer that the quarries at Omaha are not extensive. The cost of stripping the vast thickness of superincumbent gravel and yellow marl at Omaha must render the working of this quarry very expensive.

The next exposure is at Florence, where the limestones are seen only at low water.

The last exhibition is at Rockport, near De Soto, where at very low water the limestones are seen at the edge of the river, but at neither of the localities above named are there quarries of any special value.

Along the Missouri bluffs there is no exposure of the underlying rocks again until we reach Tekama, Burt county. Here the nuclei of all the hills are sandstones and clays of the Dakota group. From Florence to Tekama, the bluffs or hills bordering on the Missouri are very rugged and high, but are composed entirely of drift gravel at the bottom, and a great thickness of yellow marl at the top—indeed, this yellow marl or loam is not unfrequently fifty to one hundred feet in thickness. It is so soft and yielding in its nature that little temporary streams flowing down the bluffs wear out immense gorges one hundred to one hundred and fifty feet in depth. The sides of these hills along the Missouri bottom, on the Iowa as well as Nebraska side, are often very steep with angle of descent of  $30^{\circ}$  to  $40^{\circ}$ , and I have seen vegetation clinging quite thickly to their sides when the descent was  $50^{\circ}$  to  $55^{\circ}$ , although the great geographer, Ritter, says that the grade at which it is possible for earth to cling is  $45^{\circ}$ . At Tekama are some exposures of the sandstones of the Dakota group, but mostly so soft and friable as to be of little value as building material.

In the absence of all other rocks the inhabitants quarry out the harder portions and use them. Underneath the sandstones are the usual variegated clays and sands, red, white, gray, and drab, with nodules of the sulphuret of iron. In the sandstones above there is quite a variety in the texture of the rock. Sometimes there are thin intercalations of clay; then little pockets, as it were, of clay enclosed in a thin shell of iron; then the thin layers are oblique, as if the waters in which the sands were deposited were in currents, or in a disturbed condition. Indeed it would hardly be possible to describe all the varied conditions which



this rock presents. Between Tekama and Decatur, a distance of about sixteen miles, there are frequent exposures of the sandstones and clays, but none worthy of special notice until we reach the vicinity of the little town of Decatur, near the border of the Omaha reserve. Here some harder layers of rock are exposed, which are used for the foundations of buildings and other economical purposes. There is one layer of quartzite.

There are also thin seams of iron ore, which, when broken with a hammer, give forth a sound much like that from old pot metal. It is really pretty fair iron ore, but quite silicious and impure, and even if this ore was of the best quality, and in great abundance, there is no fuel in the county to render it of any value.

At the Blackbird mission, on the Missouri, eight miles above Decatur, the bluffs of sandstone are quite conspicuous, and often present very high mural fronts, upon which the Indians have carved many rude pictures, doubtless portions of their hieroglyphical history. At this locality are quite numerous layers, from one to four feet thick, of a very compact massive quartzite, the hardest and most durable rock in the State. It has the appearance of a metamorphic rock, so very hard and close-grained is it. The harder portions have been quarried out and used for the construction of a very large three-story building for the mission school.

As the construction of several railroad bridges across the Missouri are contemplated, no rock in the State would be so unyielding and durable for abutments as this, providing enough of it can be found. It seems to assume a concretionary form in the sandstone, and is of very uncertain thickness and extent.

About two miles above the mission the hills are cut by the river so as to reveal vertical bluffs, the rocks of which, in the distance, have a yellowish white appearance, and from this fact are usually called chalk bluffs. The sandstone is massive, almost without stratification, and very friable and soft.

4. Yellow marl; recent; ten to fifty feet.

3. Eight inches of earthy lignite resting upon twelve inches of yellowish drab arenaceous clay, underlaid by eight inches impure lignite.

2. Massive yellow sandstone, with some thin intercalations of clay, soft and friable, readily yielding to the erosive effects of water, sixty to eighty feet thick.

1. Yellow plastic unctuous clay, toward the top becoming a grayish blue; contains flat argillaceous concretions two feet.

This is, perhaps, the finest and largest exposure of the rocks of this group along the river. The mural exposures of soft sandstone present good surfaces for the Indian to make use of to write his rude history, and on the chalk bluffs there are many of these hieroglyphics in positions totally inaccessible to the Indian at the present time. None of them now living know anything about them, and it is supposed that they must be very ancient, and that since they were made great changes must have been wrought in these bluffs by the waters of the Missouri. These markings are at least fifty feet above the water and fifty feet or more below the summit of the bluff, so that they must have been made before the lower portion of the bluff was washed away by the Missouri. It seems strange that none of these hieroglyphical writings which occur quite often on the chalk rocks of the Niobrara group, higher up the Missouri, are known to any Indians now living. Manuel's creek is called in Dakota language the creek where the dead have worked, on account of the markings on the rocks.

The above illustration conveys an idea of the sandstones of the Dakota group as they front the Missouri, and shows the wearing away of the material of the rock underneath during high water. This erosion is continued for a series of years until the superincumbent rocks fall down and are washed away by the river. Near the mouth of Omaha creek are some very high vertical bluffs of sandstone, from which some rock has been taken for building purposes. It is useful, since no better can be found in the vicinity. For a considerable distance

along the hills opposite Sioux City, beds of the gray quartzite are found, which are worked to considerable extent, and furnish a very good supply for the inhabitants. A few impressions of plants and a few fossil shells were found here. Near Sioux City, on the Iowa side of the Missouri, is a high cut bluff extending to the mouth of the Big Sioux river.

Here was formerly a large exposure of the rocks of the Dakota group, and these rocks exhibited well their variegated texture and composition. The color seems to differ, depending upon the amount of ferruginous matters in them. Only about twenty feet of the different layers are exposed, and only about five feet hard enough for building purposes.

This quarry has been wrought for twelve years or more, and at this time seems to have given out, for very little suitable building stone can be found, mostly loose sandstone and clay. In former years I have obtained impressions of dicotyledonous leaves, as *salix*, *laurel*, &c., with some fossil shells of the genera *Pharella*, *Axinea*, and *Cyprina*, which are either estuary or marine in their character.

Near the northern boundary of the Omaha reserve traces of a whitish chalky limestone, almost entirely made up of the shells of a species of *Inoceramus*, make their appearance on the high hills. This rock indicates the first appearance of the cretaceous division.

Number 3, or the Niobrara. In passing northward, as we continue up the Missouri we find this formation becoming more and more conspicuous, until opposite Sioux City it is 50 to 100 feet in thickness. It is of much value to this region of the country on account of its qualities as lime, and it supplies a large district with that valuable material. Omaha is largely supplied with lime from the region of the Platte. Between Omaha and the northern boundary of the Indian reservation, a distance of eighty miles or more, extending southward to the Platte, near Columbus, there are five or six counties entirely destitute of limestone. This limestone of the Niobrara group becomes very valuable therefore, and it will be from this upper district that the counties underlaid by sandstones of the Dakota group must obtain their supply of lime. Number 2, or Fort Benton group, seems to be wanting until we reach a point near the mouth of Iowa creek. This is a thin bed, not over 40 feet in thickness at any one point, and is characterized by black plastic clay filled with beautiful crystallized sulphuret of iron. It is pretty well exposed below the mouth of Iowa creek, where the Missouri cuts the bluffs, and here we see all the rock in their order:

4. Yellow marl, a recent deposit.

3. Niobrara group, layers of white and yellow chalky lime, passing down into gray marly rock.

2. Black plastic clay, with hard layers, containing *inoceramus*, a species of *Ostrea*, like *O. congesta*, remains of fishes, many crystals of sulphuret of iron, selenite, &c.

1. Dakota group, sulphuret of iron, fragments of wood, impressions of leaves, willow, laurel, &c.

Near the mouth of the Niobrara river the black shaly clays of the Fort Pierre group begin to make their appearance on the hills over the Niobrara division, so that within the limits of Nebraska proper we have four out of five of the important divisions of the cretaceous rocks of the west.

Near the mouth of Iona creek there seems to be a bed of impure lignite in the Fort Benton group or in the transition between the Dakota and Fort Benton groups. This bed, which has been worked to a considerable extent, and the coal used by blacksmiths in this vicinity with some success, does not seem to be the same as that seen along the Indian reserve, which is undoubtedly in the sandstone of the Dakota group.

I am inclined to the opinion that this bed of lignite near Ponka City is a local

bed or at least restricted in its geographical extent, and is the result of an accumulation of drift-wood in an estuary of the cretaceous sea.

I am informed that it is seen over on the Elkhorn river, about 55 miles west of this point.

Mr. Clark tells me that he dug twelve or fifteen feet below this bed and struck another seam of coal much better than the one cropping out. The lower bed must be the one in the Dakota group. Lithologically it is impossible to draw a line of demarcation between these formations here. Number 1 passes so imperceptibly into number 2, and number 2 into number 3, that there is no break, and yet their principal characteristics are very distinct. The first is a sandstone; second, a black plastic clay; third, a chalky limestone; and yet I cannot tell the exact point where one commences and the other ends.

The impressions of leaves have ceased to appear before the close of the Dakota group. The sandstones of the Dakota group occupy the whole country along the Platte from the mouth of the Elkhorn to a point some twenty miles beyond the entrance of the Loup fork. The intermediate counties between the Missouri and Platte have very few exposures of rock of any kind, so that quarries in this region, even though the rock is of inferior quality, are much prized.

The tertiary beds which make their appearance along the greater portion of the Niobrara, and really occupy a very large portion of western Nebraska, do not furnish much good building-stone. In order that the general geology of all this region may be better understood, I will give a general section of the cretaceous and tertiary rocks of the Missouri valley, which was first published by Mr. Meek and myself in the proceedings of the Academy of Sciences at Philadelphia. I have made such changes as the present state of our knowledge of this region requires, which are not of great importance.

The accompanying profile, also, along the Missouri river, from Fort Benton to the southern line of Nebraska, will show the basin-like character of the geological formations, and especially the subdivisions of the cretaceous rocks, and their relations to the tertiary.



*General section of the cretaceous rocks of Nebraska.*

UPPER SERIES.			Localities.	Thickness.	
		Divisions and subdivisions.			
UPPER SERIES.	Fox Hill beds—formation No. 5.	Gray ferruginous and yellowish sandstone and arenaceous clays, containing <i>Belemnites</i> Bulbosa, <i>Nautilus</i> , <i>Dekayi</i> , <i>Ammonites</i> placenta, <i>A. lobatus</i> , <i>Scaphites</i> conradi, <i>S. Nioellet</i> , <i>Baculites</i> grandis, <i>Busycon</i> Bairdi, <i>Fusus</i> Culbertsoni, <i>F. Newberryi</i> , <i>Aporrhais</i> americana, <i>Pseudo-buccinum</i> Nebraskaensis, <i>Maetra</i> Warrenana, <i>Cardium</i> subquadratum, and a great number of other molluscous fossils, together with bones of <i>Mosasaurus</i> Missouriensis.	Fox hills, near Moreau river, near Long lake, above Fort Pierre, along base of Big Horn mountains, and on North and South Platte rivers.	500 feet.	Eq. Upper or white chalk and Maestricht beds. (Senonian, D'Orbigny.)
	Fort Pierre group—formation No. 4.	Dark gray and bluish plastic clays, containing near the upper part <i>Nautilus</i> Dekayi, <i>Ammonites</i> placenta, <i>Baculites</i> cvatus, <i>B. compressus</i> , <i>Scaphites</i> nodosus, <i>Dentalium</i> gracile, <i>Crassatella</i> Evansi, <i>Cueullaea</i> Nebraskaensis, <i>Inoceramus</i> Sagensis, <i>I. Nebraskaensis</i> , <i>I. Vanuxemi</i> , bones of <i>Mosasaurus</i> Missouriensis, &c. Middle zone nearly barren of fossils. Lower fossiliferous zone containing <i>Ammonites</i> complexus, <i>Baculites</i> ovatus, <i>B. compressus</i> , <i>Helioceras</i> mortoni, <i>H. tortum</i> , <i>H. umbilicatum</i> , <i>H. echleatum</i> , <i>Ptychoceras</i> mortoni, <i>Fusus</i> vinenum, <i>Anisomyon</i> borealis, <i>Amauropsis</i> paludiniformis, <i>Inoceramus</i> subulatus, <i>I. tenuilineatus</i> , bones of <i>Mosasaurus</i> Missouriensis, &c. Dark bed of very fine unctuous clay, containing much carbonaceous matter, with veins and seams of gypsum masses, sulphuret of iron, and numerous small scales of fishes, local, filling depressions in the bed below.	Sage creek, Cheyenne river, and on White river, above the Mauvaises Terres, Fort Pierre, and out to Bad Lands, down the Missouri, on the high country, to Great Bend.  Great bend of the Missouri, below Fort Pierre.  Near Bijou Hill, on the Missouri.	700 feet.	
	Niobrara division—formation No. 3.	Lead gray calcareous marl, weathering to a yellowish or whitish chalky appearance above, containing large scales and other remains of fishes, and numerous species of <i>Ostrea</i> congesta attached to fragments of <i>Inoceramus</i> , passing down into light yellowish and whitish limestone, containing great numbers of <i>Inoceramus</i> problematicus, <i>I. pseudonytiloides</i> , <i>I. aviculoides</i> , and <i>Ostrea</i> congesta, fish scales, &c.	Bluffs along the Missouri, above the Great Bend, to the vicinity of the Big Sioux river; also below there, and on the tops of the hills.	200 feet.	
LOWER SERIES.	Fort Benton group—formation No. 2.	Dark gray laminated clays, sometimes alternating near the upper part with seams and layers of soft gray and light-colored limestones, <i>Inoceramus</i> problematicus, <i>I. tenuirostratus</i> , <i>I. latus</i> ? <i>I. fragilis</i> , <i>Ostrea</i> congesta, <i>Venilia</i> mortoni, <i>Pholidonia</i> papyracea, <i>Ammonites</i> mullani, <i>A. percarinatus</i> , <i>A. vespertinus</i> , <i>Scaphites</i> Warreni, <i>S. larvaeformis</i> , <i>S. ventriosus</i> , <i>S. vermiformis</i> , <i>Nautilus</i> elegans, &c.	Extensively developed near Fort Benton, on the Upper Missouri; also along the latter from ten miles above James river to Big Sioux river, and along the eastern slope of the Rocky mountains, as well as at the Black Hills.	800 feet.	Eq. Lower or gray chalk (and upper G. sand) of British geologists. (Turonian and cenomanian of D'Orbigny.)
	Dakota group—formation No. 1.	Yellowish, reddish, and occasionally white sandstone, with, at places, alternations of various colored clays, and beds and seams of impure lignite; also silicified wood, and great numbers of leaves of the higher types of dicotyledonous trees, with seeds of <i>Pharella</i> ? <i>Dakotensis</i> , <i>Axinea</i> Siouxensis, and <i>Cyprina</i> Arenarea.	Hills back of the town of Dakota; also extensively developed in the surrounding country in Dakota county, below the mouth of Big Sioux river, thence extending southward into northeastern Kansas, and beyond.	400 feet.	

## DAKOTA GROUP.

Although we have hitherto regarded this as a distinct group of cretaceous rocks, with a strong physical line of separation from the group above, I now think the evidence is clear that it passes imperceptibly in its lithological relations up into the Fort Benton group, without any break in time.

In the hills back of Dakota City there are repeated exposures which show the transition layers between the two sandstones of the one and the dark plastic clays of the other. The fossils, however, so far as we now know, are distinct, and for the practical purpose of investigating this rock they may be regarded as distinct groups.

We have referred the rocks of the Dakota group to the cretaceous epoch, from the fact that they have yielded numerous species of dicotyledonous leaves. Among these leaves, Dr. Newberry and Professor Heer have identified those of trees belonging to the genera *Populus*, (poplar,) *Salix*, (willow,) *Alnus*, (alder,) *Platanus*, (sycamore,) *Liriodendron*, (tulip,) *Ficus*, (fig,) and many others. In the history of geology no dicotyledonous leaves have been found in fossil condition in rocks older than the cretaceous era. As they are found here in beds lying underneath rocks containing well-known cretaceous fossils, their age is beyond a doubt.

The discovery of these vegetable impressions in sandstones of the cretaceous period at this locality has afforded to geologists an instructive lesson. A geologist of high character, and one of the best botanists in Europe, Professor Heer, declared these plants to be of tertiary age, and even identified some of them with plants already known in the Old World in tertiary rocks.

In 1863, Professor Capellini, of the University of Bologna, Italy, and Professor Marcou, of Switzerland, made a journey up the Missouri river to study these rocks, and to settle this vexed question.

The results of their labors were published in the French and Swiss geological journals. The article of Professor Capellini was first translated by me in this country for Silliman's Journal.

Professor Capellini, in a short but very interesting article, confines his observations mostly to the rocks of the Dakota group, and remarks that he does not hesitate to regard the observations of American geologists as entirely just. The following remarks close the article of Professor C:

"After all we have observed in relation to the environs of Sioux City, it is easily seen that a stratigraphic series, so complete, throws a clear light upon the isolated facts first noticed at Tekamah and Blackbird Hill, and indicates the exact position of the rocks with dicotyledonous leaves, analogous to the tertiary leaves of Europe, but belonging in reality to the chalk.

"It may be estimated that the thickness of these cretaceous strata in the environs of Sioux City is about forty metres. They may be divided into two distinct parts, one rich in leaves, a fresh water formation; the other truly chalky, with fishes and inoceramus of marine origin. Both are probably not older than the chalk of Maestricht.

"This has been my opinion from the time I admitted that the dicotyledonous leaves of the Big Sioux and Tekamah were cretaceous.

"Once the age of the Mollasse with leaves established by the aid of the stratigraphy and the animal fossils, it would be interesting if it were possible to arrive at the same results by the vegetable remains. On this account Professor Heer came to my aid and investigated the specimens I collected in my explorations. More than a dozen species were recognized among the leaves from Tekamah, Blackbird Hill and Big Sioux, but it was especially the first locality which furnished the best specimens.

"We are convinced that when observations are exact and determinations

made from careful examination of specimens, there is never any disagreement between stratigraphical and paleontological laws."

The remarks of Professor Heer, which preface his descriptions of the fossil plants by Professor Capellini, are so interesting and important that we copy them entire:

"The collection of Mr. Cappellini contains sixteen species; four are badly preserved, twelve are determinable; nevertheless, of the latter several are but fragments, so that their determination is difficult and not sufficiently positive. This is especially the case with Phyllites, which I have referred to the genera *Platanus* and *Andromeda*.

"It is certain that all the leaves found by Mr. Capellini are dicotyledonous, and with great probability one may be referred to the genus *Ficus*, one to *Salix*, one to *Diospyrus*, two to *Populus*, and two to *Magnolia*, although there are no accompanying fruits or other parts to confirm these determinations. These genera are yet living, and they are also found in the tertiary formations.

"If we compare these plants of Nebraska with the cretaceous plants of Europe, we find no identical species among them. I sent drawings of them to Dr. Debey, of Aix-la-Chapelle, who discovered in that locality a cretaceous flora. He has written to me that he has not found one species identical. Even the greater part of the genera are different. There is but one *Cissite*, (*C. aceroides*, Debey,) which recalls slightly the *C. insignis*. (Plate 4, Fig. 5.) The cretaceous plants of Henant, Belgium, those of Blankenburg and Quedlinburg, are also very different.

"Professor Schenck has recently sent to me a collection of plants of Quedlinburg for determination. Besides conifers and fern characteristic of the chalk, it contains dicotyledonous leaves, but no forms like those of Nebraska. The cretaceous flora of Moletein, Moravia, which I have lately studied, exhibits more resemblance. It contains two species of *Ficus*, which much resemble the *Ficus* of Nebraska, two superb species of *Magnolia*, one with a fruit cone.

"There is a relationship between the flora of Nebraska and that of the upper chalk of Europe, although identical species are wanting. But to the present time no characteristic genus of the cretaceous flora of Europe has been found in Nebraska.

"If we compare the plants of Nebraska with the tertiary plants we find no identical species, but seven genera (*Populus*, *Salix*, *Ficus*, *Platanus*, *Andromeda*, *Diospyrus*, and *Magnolia*) are miocene, and likewise living.

"It then appears that the Nebraska flora is related more to the tertiary than to the cretaceous flora of Europe, a fact which struck me when I first saw drawings of the former. But it should be remarked that we know but a very small number of American species, and on the other hand the European cretaceous flora has more relationship with tertiary flora than I at first supposed. I have found in the cretaceous flora of Moletein, Moravia, species of *Ficus* and *Magnolia* which resemble tertiary species; a *Myrtacea*, which is a near neighbor to the *Ucalyhtus rhododendroides*, (Mass.) of Mt. Bolca, a *Juglans* and a *Laurinea*, which also have their analogues in the tertiary flora; a *Pinus* and two other conifers which belong to the genus *Sequoia*, which was extensively distributed in Europe and America in the miocene epoch, and which is now only found in California.

"As the cretaceous fishes are more nearly related to the tertiary than to the jurassic fishes, the upper cretaceous flora is also entirely different from the jurassic and more nearly allied to the tertiary floras, and it appears that in America the relation between the tertiary and cretaceous flora is yet more intimate than in Europe.

"It is remarkable that the plants of Nebraska (as *Magnolia* and *Liriodendron*) present relations with the existing flora of America, whilst the cretaceous flora of Europe has more of an Indo-Australian character. It thus appears that since



the cretaceous epoch the American flora has not undergone a change so great as the European flora. While the cretaceous flora of Europe is entirely different from the existing European flora, that of Nebraska contains eight genera yet found in America, and it is the more remarkable that the greater part are yet found in a country under the same latitude."

Professor Heer describes the following species of plants from this group in this memoir:

*Populus litigiosa*, (?) *Debeyana*, *Salix nervillosa*, *Betulites denticulata*, *Ficus primordialis*, *Platanus* (?) *Newberryana*, *Proteoides grevilleaformis*, *P. daphnegenoides*, *P. acuta*, *Aristolochites dentata*, *Andromeda parlatorii*, *Diospyrus primaevus*, *Cissites insignis*, *Magnolia alternans*, *M. Capellini*, *Liriodendron meekii*, *Phyllites ranonæ*.

One instructive lesson is derived from the mistakes of these eminent men, that in the progress of geological development, America was almost or quite one epoch ahead of Europe—that the fauna and flora of the cretaceous period in this country was really more nearly allied to those of the tertiary period in Europe, and that, geologically speaking, America should be called the Old World and Europe the New. This point will be again alluded to in our remarks on the tertiary rocks.

Again, there is evident simplicity in the form and ornamentation of these leaves, which marks the dawn of the appearance on this planet of trees like our forest, fruit, and ornamental trees.

The beauty of foliage in our present dicotyledonous trees is largely due to the serrations and various forms and patterns which they present, but, so far as my observations have extended, the reverse is the case with this cretaceous vegetation for the most part—thus slowly progressing through the tertiary period from simplicity up to greater complexity and beauty.

The question would arise naturally, have any remains of land animals been found in this group mingled with these vegetable impressions? None have yet been observed along the Missouri at this locality, and as they have now been studied with considerable care, we may never find any. That land animals did exist we cannot doubt, for the forests which furnished these leaves could not have existed far away.

The leaves are so perfect that they could not have been transported to a great distance before they were imbedded in the sand. On the eastern slope of the Big Horn mountains there are a series of beds which hold a position between the jurassic beds and the Fort Benton group, which I have referred to the Dakota group.

Here occur beds of impure earthy lignite, large quantities of silicified wood and uncharacteristic bones, which Dr. Leidy thinks belonged to some huge saurian. No remains of strictly land animals have ever been found.

The geographical extension of this group of rocks outside of this State has been found to be very extensive. The belt of country occupied by them in Nebraska runs nearly southeast and northwest, and is from 60 to 80 miles wide, extending far south into New Mexico, and possibly further and northward into Iowa and Minnesota, and probably far up into British America. It is believed also to occur all along the Rocky mountains, although as yet no positive proof from fossils has been obtained.

There are a series of beds between well-known cretaceous and jurassic rocks in those regions, which have been regarded as belonging to the Dakota group; also, near the sources of the Missouri, are a series of beds differing from any other yet described, containing many species of shells and a bed of lignite, which seems to belong to this group. These latter beds need more careful study before the position can be positively fixed in this section.

Along the Atlantic coast, especially in New Jersey, the lower cretaceous beds seem to be lithologically similar, in containing numerous dicotyledonous leaves, so that it is now regarded as the equivalent of the Dakota group of the west,

It is, therefore, evident that this formation is very widely distributed, perhaps even east and west from one ocean to the other.

#### FORT BENTON GROUP.

This group bears the above name from the fact that it is largely developed in the vicinity of Fort Benton, near the sources of the Missouri river. In ascending the Missouri, it is first seen in thin outliers below the mouth of Big Sioux river, and on the Big Sioux six miles above its mouth. It is characterized as a dark leaden-gray plastic clay, but when saturated with water it is of a black color.

A few fossils have been found at various localities, as *Inoceramus problematicus*, *Ostrea congesta*, *Ammonites Serpula*, &c. Near the mouth of Iowa creek there is the best exposure of this group, as well as groups above and below.

3. Gray and light yellow calcareous marl or chalky limestone, with great numbers of *Inoceramus problematicus*, *Ostrea congesta*, and remains of fishes. Niobrara division 40 to 50 feet.

2. Dark plastic clay, with abundant remains of fishes, *I. problematicus*, *O. congesta*, *Ammonites peracutus*, *Serpula tenuicarinata*, and a species of oyster, like *O. congesta*. Fort Benton group 30 to 40 feet.

1. Variegated sands and clays of Dakota group, 15 to 20 feet above water's edge; impressions of leaves of willow, laurel, and many crystals of sulphuret of iron.

The beds of the Fort Benton group are widely distributed throughout the west, but in no portion has it revealed any useful minerals or economical rocks of any kind, to my knowledge. The black plastic clays may be rendered useful at some period, but it is quite doubtful. They are everywhere filled with sulphuret of iron.

At the locality where the above section was taken I obtained some of the finest specimens of crystallized sulphuret of iron I have ever seen. There were also many species of selenite. So far as I know, this formation does not exert any favorable influence on the country.

The beds of impure coal near the mouth of Iowa creek are very interesting in a geological point of view. At no other locality do I know of the existence of any seams of carbonaceous matter. This coal is too impure and contains too much sulphuret of iron ever to be made available.

#### NIORARA DIVISION.

In many respects this is the most interesting and most valuable group of the cretaceous rocks in the west. Its principal character is a gray or light yellow chalky limestone; much of it is so pure as to make good chalk for commercial purposes.

It would also be useful, doubtless, as a fertilizer. In ascending the Missouri it is first seen in thin outliers on Pilgrim's Hill, a portion of the Omaha reserve. It then grows gradually thicker as we ascend, and south of Dakota City, in the hills, it becomes ten to twenty feet thick. At Ponka City, St. Helena, and mouth of the Niobrara it is exposed fifty to two hundred feet in thickness, exhibiting a great variety of color and texture.

All along the Missouri this rock is much used for the construction of buildings with success. The fact that so large an area of country exists below the first appearance of this formation destitute of any rock for lime must render this group of much economical importance to the settlers. Its soft, yielding nature gives rise to long ranges of precipitous bluffs along the river.

It is easily cut into innumerable ravines by the temporary streams, and these bluffs often present the appearance of a series of cones.

This formation extends up the river to the foot of the Great Bend, where it passes beneath the water level. The fossils in this group are few in the number

of species, but the individuals are abundant. Layers of considerable thickness are mostly composed of the shells of *Inoceramus problematicus* and *Ostrea congesta*.

Fish remains of great perfection and beauty also are found. Only a few good specimens have ever been taken from the rock; but the myriads of fragments, as bones, scales, and fins, show that they existed in great abundance in the cretaceous seas. The connection of this group with the Fort Benton group below is quite plain, there being no line of demarcation in most localities. At St. Helena, however, the transition is abrupt, passing directly from the black plastic clays of the one to the yellow chalk of the other.

This fact seems to me to show clearly that the grouping of these formations in the manner already done is correct.

Between the Dakota group and the group above there are transition rocks at different places which obliterate any abrupt break, while at other localities the break is evident.

All our investigations show more and more clearly that in the cretaceous series of the west there are three divisions paleontologically, and five groups lithologically.

The Niobrara division undoubtedly extends all along the mountain elevations; but it seems to possess an intermediate character between Nos. 2 and 3, as seen on the Missouri river, so that it is difficult to decide to which the rocks belong, the *Ostrea congesta* being common to both. This formation, like the Dakota group, extends across the country, in the form of a belt or zone, southeast and northwest.

It is found extending north high up the Big Sioux, Vermillion, and James rivers, in Dakota Territory, and southward into Kansas and New Mexico.

#### FORT PIERRE GROUP.

This formation is most largely developed from the Great Bend to a point 200 miles above Fort Pierre. It begins to make its appearance on the summits of the hills near the mouth of the Niobrara, and soon gives the character to the country. The surface underlain by this formation looks barren and arid, and is really the commencement of the reputed sterile belt southward. It is composed mostly of laminated shaly clay, is usually quite uniform in its composition and texture, and contains so much alkaline matter that it prevents the growth of most plants except those that are peculiar to such soil.

The hills above Fort Randall, on both sides of the Missouri, have a barren, black appearance, and are often called the "burnt hills" by the voyageur. Sometimes numerous masses of selenite are scattered over these hills, which glistening in the sun has suggested the name of the "shining hills." The burnt appearance is undoubtedly due to the decomposition of iron pyrites by exposure to the atmosphere or water.

When much vegetable matter exists in the beds, as in the Niobrara group at one locality near Bijoux Hills, and in the lignite tertiary beds, it takes fire and bakes the superincumbent beds of rock, so that the remains look in the distance like a pile of ruins.

Inasmuch as the rocks of the Fort Pierre group do not occupy any considerable portion of the State of Nebraska, I shall not discuss their character to any extent in this connection. It makes its appearance only in a few localities, as an overlapping rock south of the Niobrara river, and therefore exerts comparatively little influence on the country below that point.

The eroded materials of the rock are no doubt mingled greatly with the superficial deposits which cover the northern portions of the State. It is sufficient to remark that it occupies a vast area in the Territories of the northwest, and that it has yielded many most interesting organic remains. It is in many instances



intimately blended with the group above, which we have designated in the section as the Fox Hills group. This latter group is not found in Nebraska at all, but is seen in its typical condition on a conspicuous and quite fertile ridge of land between the Big Cheyenne and Cannon Ball rivers, higher up on the Missouri. It extends from the eastern side of the Black Hills across the country northeastward. These beds give a more cheerful appearance to the country; there is more timber, and springs of pure water are common. It is also full of organic remains of great variety and beauty. This is an arenaceous deposit for the most part, and has doubtless contributed its share toward giving fertility to the Nebraska soils.

## TERTIARY FORMATIONS OF NEBRASKA.

These formations in the valley of the Missouri present features of the highest interest to the geologist, and perform a prominent part in revealing the geological history of the west. They mark the dawn of those internal forces which culminated in the present physical configuration of the vast area between the Mississippi and the Pacific ocean. So far as known, only the more modern tertiary deposits of the fourth basin occur within the limits of the State of Nebraska. But in order that the relations of these deposits may be shown to those of the cretaceous period, and the connection of the basins with each other, I shall give a brief description of them all in their order. The following general section of the tertiary deposits of the northwest will show their extent and relation to each other in order of time :

*General section of the tertiary rocks of Nebraska.*

Names.	Subdivisions.	Thickness.	Localities.	Foreign equivalents.
Loup river beds.	Pine loose sand, with some layers of limestone; contains bones of Canis, Felis, Castor, Equus, Mastodon, Testudo, &c., some of which are scarcely distinguishable from living species; also Belix, Phrysa Succinea, probably of recent species. All fresh water and land types.	300 to 400 feet.	On Loup fork of Platte river, extending north to Niobrara river, and south to an unknown distance beyond the Platte.	Pliocene.
White river group.	White and light drab clays, with some beds of sandstone, and local layers of limestone; fossils: Oreodon, Titanotherium, Chaeropotamus, Rhinoceros, Anchitherium, Hyainodon, Machairodus, Trionyx, Testudo, Helix Planorbis, Limnea, petrified wood, &c.—all extinct. No brackish water or marine remains.	1,000 feet or more.	Bad lands of White river, under the Loup river bed, on the Niobrara, and across the country to the Platte.	Miocene.
Wind river deposits.	Light gray and ash-colored sandstones, with more or less argillaceous layers; fossils: fragments of Trionyx, Testudo, with large Helix, Vivipara, petrified wood, &c. No marine or brackish water types.	1,500 to 2,000 feet.	Wind River valley; also west of Wind River mountains.	?
Fort Union or great lignite deposits.	Beds of clay and sand, with round ferruginous concretions, and numerous beds, seams, and local deposits of lignite; great numbers of dicotyledonous leaves, stems, &c., of the genera Platanus, Acer, Ulmus, Populus, &c., with very large leaves of true fan palms; also Helix, Melania, Vivipara, Corbicula, Unio, Ostrea, Potamomya, and scales Lepidotus, with bones of Trionyx, Emys, Compsemys, Crocodilus, &c.	2,000 feet or more.	Occupies the whole country around Fort Union, extending north into the British possessions to unknown distances; also southward to Fort Clark; seen under the White River group, on the North Platte river, above Fort Laramie; also on west side of Wind River mountains.	Eocene?

The details of all these formations will be discussed more fully in the final report.

Commencing with the oldest of these tertiary basins we have—

1st. Judith river basin, which is located near the entrance of the Judith into the Missouri, and is separated by the latter river into two nearly equal portions. It covers an area of about fifteen to twenty miles east and west, and forty miles from north to south.

This basin is one of much interest, as it marks the dawn of the tertiary period in the west, by means of the transition from near brackish to strictly fresh-water types. It is also remarkable for containing the remains of some curious reptiles and animals, reminding the paleontologist of those of the Wealden of England.

2d. The great lignite basin, which occupies all the country from Heart river to the Muscle Shell—most of the valley of the Yellowstone—extends for an unknown distance northward into the British possessions and southward at least to the North Platte, where the beds of the fourth basin overlap, coming to the surface again at Pike's Peak, and extending to Raton pass, in New Mexico.

The limits of this great basin have not yet been determined. Although not known to occur within the present defined limits of the State of Nebraska, it will undoubtedly have an influence on the prosperity of the State, on account of the extensive lignite beds which occur in it. Along the Missouri and Yellowstone rivers are forty or fifty beds of lignite, varying from one to seven feet in thickness, of various degrees of purity.

In the vicinity of Denver, Colorado Territory, according to Mr. E. L. Berthord, civil engineer, there are several beds of lignite twelve to eighteen feet in thickness, which must furnish an immense mass of fuel, which will soon become accessible to the people of Nebraska through the Union Pacific railroad :

“Our coal seams extend, to my knowledge, sixty miles due east from Pike's Peak, in one direction, south to Raton mountains and the Raton pass, and northward to near Denver, on Cherry creek, and on the west side of the South Platte as far north as the Caché la Poudre, and to the foot of the main mountain range.

“Here, in Golden City, we have a large outcrop of coal, which has been opened successfully, and which inclines toward the town. In one of the newly opened mines on the same outcrop of the Golden City vein, which lies north on Coal creek, about nine miles from Golden City, I saw, in 1861, the trunk of a tree taken out of the eleven-foot vein then opened and mined, which trunk, though turned into coal of a good quality, exhibited carbonized bark, knots, and woody fibre, with concentric rings of growth, such as our dicotyledonous trees plainly show ; indeed, one of the miners remarked that, from the bark, and the grain and fibre of the coal, it was very much like bitter cottonwood, (*Populus angulata*.) examples of which grow close to the mine.

“In 1862, while on a scout east of Pike's Peak sixty-five miles, I found a bed of coal almost identical with the Golden City bed, nine feet thick, lying almost horizontal, with bluffs one and a half mile north containing fine specimens of belemnites.

“Again, in November, 1866, I went northeast of Golden City to see the coal beds on Rock creek, sixteen to nineteen miles distant. I found beds of coal fourteen to eighteen feet in thickness, almost horizontal, or dipping eastwardly at a small angle ; above them, ferruginous sandstone, and vast beds of bog-iron ore and clay ironstone, in nodules, with numberless fragments of bones. In the sandstone I have obtained fossils like hippurites, but in none of the beds so far have I found a single marine or fresh-water shell, with the exception I have before mentioned.

“Everything that I have so far seen points out that the coal is either cretaceous or tertiary, but I believe it to be tertiary, or of the same age as the coal near Cologne, on the Rhine ; but I am perplexed at the inversion of the dip of the

coal, sandstone, and the iron ore, which here incline toward the mountains instead of away from them, and nothing else that I have observed can compare with these tilted-up beds.

"I have not time now to follow up this subject, nor to give you all the data that I have gathered so far; I shall report to you in full in regard to the points you mention, but will give you, as soon as time permits, a full report, with elevations, profiles, &c.; also some specimens to prove the relative age of the strata shown in my sketch."

In the newspapers may be seen advertisements of coal for sale, so much per ton delivered, and so much at the mine.

This coal, as well as that at Ratón Pass district, is of tertiary age, and it is questionable whether the true coal measures furnish any coal in any portion of the Rocky Mountain region.

3d. The Wind river deposits, which occupy an area about one hundred miles in length and forty to fifty in breadth.

These deposits are located between the Wind river and Big Horn mountains, and are of no economical importance.

4th. The basin of the Mauvaises Terres, or bad lands of White river, cover a large region, at least 100,000 square miles, and from isolated patches on both sides of the Missouri river, I would infer that this great fresh-water lake must have spread over 150,000 square miles. It is this latter formation which covers the greater portion of western Nebraska. The colors on the geological map will show the area. The cretaceous beds occur along the Niobrara for eighty to one hundred miles above its mouth; then the loose sandy and marl beds of the tertiary basin overlap them. From thence to the source of the Niobrara, about three hundred miles, the river runs through the tertiary deposits only.

This stream forms the northern boundary of the State. All of Nebraska west of longitude  $101^{\circ}$  is occupied by the sands and clays of the fourth basin.

The "bad lands of White river" are so called because, being composed of indurated sands, clays, and marl, they have been so cut up into ravines and cañons by streams, rains, and other atmospheric agencies, as to leave cones, peaks, isolated columns, and towers, presenting the appearance in the distance of a gigantic city in ruins.

It is so exceedingly rugged and difficult of access that it is only within a few years that any route but the Laramie road, which runs through the middle of them, was considered passable. Of late years it has been shown by various expeditions, both public and private, that any portion of the great west can be traversed with teams, if necessary.

The cretaceous beds of the Fort Pierre group extend along White river from its entrance into the Missouri, except about fifty miles near the forks, where the White river tertiary overlaps them.

Even now some isolated patches of tertiary are seen, as Medicine and Bijoux Hills.

From the forks or the junction of Little White river with the larger streams the tertiary beds occupy the whole country to its source. All the intervening country between White and Niobrara rivers is covered with the sands, clays, and marl of the White river deposits, but along portions of the Niobrara and south of that river the lower sands of the Loup river deposits make their appearance. Here we find a singular region of country called the "Sand Hills," which occupy an area of about twenty thousand square miles. These hills lie mostly between the Niobrara and the Platte, though a portion of them extend northward of that river.

On the south side of the Niobrara the Sand Hills commence at Rapid river and extend westward about 100 miles. Along Loup fork they commence near the forks or the junction of Calamus branch with Loup fork.

The whole surface is dotted over with conical hills of moving sand. These



hills often look like craters or small basins, the wind whirling and as it were scooping out the sand, leaving innumerable depressions with a well-defined circular rim. There is a great deal of vegetation scattered through this portion, grass and plants peculiar to sandy districts.

Many of the hills are so covered with a species of *yucca* that their sides are well protected from the winds by their roots. It is the favorite range for buffalo and antelope, and these animals become very fat, and from this fact we may infer that this district may be adapted for grazing purposes. It can never be used for purely agricultural purposes.

Travelling is also very difficult among these hills; the wheels sink deep into the loose sand, rendering it impossible to transport loaded teams through them. The water, though not abundant, is usually quite good, mostly in small lakes.

There are also many alkaline lakes, which may be readily distinguished from the fresh water by the absence or presence of vegetation around their borders. We may therefore conclude that an area of 20,000 square miles forming the northwestern portion of the State is totally unfit for cultivation, and is even doubtfully suitable for grazing. There is scarcely any timber on the whole area. Along the Platte and south of that river the surface is less sandy and the soil more fixed, so that there is at least a moderate degree of fertility, but the absence of timber and timely rains will render the whole quite undesirable for the farmer.

As I have before remarked, the cultivation of crops and the planting of forest trees by the settlers further to the eastward may so modify the climate as to produce a more equable distribution of moisture throughout the year. But at present I do not see how it can be settled except by a pastoral people.

Although these tertiary deposits cover so extensive an area and contain no minerals of any economical value, and are of greatly diminished value for agricultural purposes, yet for the geologist they offer the most tempting treasures in the abundance of curious organic remains.

Two most remarkable extinct faunæ are found here, namely, the fauna of White river and that of the Niobrara, including the Loup fork. The first is found in what is called the "Bad Lands" proper, along White river and its tributaries.

The first animal remains noticed from this deposit were described by Dr. Leidy in the geological report of the northwest by Dr. D. D. Owen.

The lowest bed of this portion of the tertiary basin is composed mostly of clay and is called the *Titanotherium* bed, from the circumstance that it contains the bones and teeth of this gigantic pachyderm. There was also a *Hyopotamus* and the *Lophiodon*. It would seem as if the earlier condition of this lake was that of a great marsh in which these animals of the hippopotamus tribe could wallow at pleasure.

The next stratum above is called the *Oreodon* bed, from the remains of vast numbers of this genus that occur there.

There were three species, *Oreodon major*, *O. minor*, and *O. culbertsoni*. The latter was the most abundant and seems to have existed in flocks like the antelope of the prairies. Dr. Leidy has already examined portions of more than 700 individuals of this species. It was a ruminant hog, chewing its cud, and at the same time possessed of canine teeth for tearing flesh.

There were also three species of the hyena family, a sabre-toothed tiger, and a gigantic weasel. The sabre-toothed tiger would have tremendous conflicts with the hyenas, and the wounds still can be seen in the skulls.

In one of the skulls of a hyena, completely changed to stone, can be seen two wounds on each side of the nose, which had partially healed before the death of the animal, and the apertures just fitted the canines of a skull of a hyena that was found in the same locality.

There were also two species of rhinoceros, which must have been somewhat

similar in their habits to those of the present day, but were supposed to have been hornless; one of them was about as large as the Asiatic species and the other about two-thirds as large. This White river fauna composed about thirty-five species, all of them extinct forms, and all restricted to this locality.

The fauna of the Niobrara is all extinct, and more recent in age, belonging to the pliocene period, which in other countries contains more or less species identical with living ones.

But this fauna comprises more than thirty species, all of them new to science, and not one of them identical with any living species. Over thirty species have been found along the Niobrara and Loup fork, and others may be looked for on more careful examination.

Among the carnivora were four species of wolves, one about the size of the large wolf of the plains, the others of smaller size; two cats, one intermediate in size between the panther and lynx, and the other nearly as large as the panther.

Among the rhodentia was a porcupine about the size of the crested porcupine of Europe, and a small beaver about half the size of the living one. Of the ruminant there were some remarkable species—two species of deer, about the size of the common red deer of this country, and four species of camel, one about the size of the common Bactrian camel, a second species two-thirds as large, and a third about the size of the llama of South America. The fourth species was closely allied to the living camel, but was of smaller size. Another species was more nearly allied to the mountain sheep, and another was ruminant—hogs like the *Oreodon* of White river. The solipedia were remarkably wellrepresented, there being remains of not less than a dozen species of horses.

There were two species of the genus *Equus*; one of them (*E. excelsus*) was about the size of the largest varieties of the living species; the other was smaller. The remainder were of various sizes and forms; one of them was not larger than a Newfoundland dog.

It is the law in animal development that groups reach their culminating period and decline. It would seem that during the later tertiary period the horse tribe reached its highest point of development, and that now it is on the decline. Among the pachyderms was a species of rhinoceros about the same size and apparently closely related to the living Indian rhinoceros, *R. Indicus*; a species of *Mastodon* much smaller than the one whose remains are so common in all parts of North America in the recent quaternary deposits.

The remains of the elephant occur in the Niobrara, which is remarkable for being a third larger than any other ever known, extinct or recent. In view of this fact, Dr. Leidy named it *Elephas imperator*, the emperor of all the elephants.

There was also one species of turtle in this more recent deposit, and a species in the White river beds. The latter was exceedingly numerous in this great fresh-water lake, for the specimens are scattered all over the country, many of them preserved with great perfection. We know that this was purely a fresh-water lake, from the fact that numerous species of fresh-water and land shells of the genera *Helix*, *Planorbis*, *Physa*, *Linnea*, &c., are found in fine state of preservation. There are also some indistinct remains of fishes. From these two faunæ, as well as the fauna and flora of other formations of this valley, there are some instructive lessons to be learned.

The fauna of White river, although entirely extinct as to species, contained representations of some living genera. The greater part of the fauna of the Niobrara and Loup fork belonged to living genera, although every species was extinct, but the latter fauna is more closely allied to the living fauna of Asia than to any of our own continent.

Indeed, it seems to have a true oriental character, and it is shown clearly that, geologically speaking, our continent should be called the Old World instead of the eastern continent. There are several other instances derived from the study of the flora and fauna of the Missouri valley which go to show this fact.

In the great lignite basin the molluscous remains, although extinct, have their living representatives in China and Siam.

The comparison of the flora of the Dakota group, cretaceous, shows the same relationship of age, and has been alluded to before. Again, these fossil remains show that a tropical or sub-tropical climate prevailed throughout this western country up to a very late period, at least to the close of the pliocene.

The prolific flora of the great lignite basin, which is supposed to be of miocene age, is at least sub-tropical, or similar to that of our Gulf States. There is a mingling of true tropical and temperate forms. One species of palm was found fossil on the Yellowstone, the leaf of which must have had a spread of twelve feet. At the present time the true palms are found only within the tropics. The faunæ of all these deposits at the different geological periods were tropical in their character, and from these we infer that a tropical climate prevailed over this country during their existence.

The fertility of the soil of the extended area described in this report is beyond a question. It is for the most part covered with a great thickness of the yellow marl, varying from a few feet to one hundred or more. From Omaha City to the mouth of Niobrara the country bordering on the Missouri is quite rugged, or one continued irregular series of rounded hills, as is shown in the following sketch:

These superficial deposits yield readily to atmospheric agencies, and these hills are formed by the myriads of temporary streams produced by rains. As we go further into the interior the surface is more undulating, yet the drainage is always excellent.

The superficial marl very readily absorbs the rain, so that even the most level prairie is always sufficiently drained for all the purposes of agriculture. The counties of Washington, Dakota, Blackbird, Cumming, Dodge, Saunders, and portions of Sarpy, Douglas, Platte, Stanton, and Dixon, are underlaid by the sandstones of the Dakota group, and in consequence a large quantity of silica enters into the composition of the soil, and hence their great reputation in the production of wheat. The average quantity of wheat raised on an acre in the counties above mentioned is from twenty-five to thirty bushels; forty to fifty bushels not an uncommon yield.

On one farm in Sarpy county, in 1866, three thousand two hundred bushels of wheat were raised, and the whole average was over thirty bushels per acre. In Burt county, on Omaha creek, Mr. George Smith's crop averaged forty-three and a half bushels per acre; Mr. Dugan harvested twenty-four acres, averaging forty-four bushels. In this region the uplands seem to produce the best grain. Colonel Baird raised this year six acres of wheat that averaged thirty-three and one-third bushels; Mr. Cornelia has taken from an eleven-acre lot, this year, the ninth successive crop, and it averaged thirty-five bushels; Mr. Neil had twenty-two acres of wheat, averaging forty-three bushels. A gentleman near Tekama, Burt county, hoed in three acres of wheat in 1866, and harvested fifty-one and two-third bushels per acre.

I have accumulated a mass of statistics in regard to the growth of wheat in this region, and I am convinced that twenty-five bushels per acre is a small yield, while forty to fifty bushels is not unusual. It is a curious fact that wheat raised in this district brings in the market at St. Louis eight to ten cents more per bushel than wheat exposed for sale from any other State.

The great severity of the climate in winter, and the absence of the thick covering of snow, renders it impossible to cultivate winter wheat, so that spring wheat is the only kind raised. Dixon, Cedar, and L'Eau Que Court counties are beginning to be settled, and good crops are produced; but the land is not as desirable, generally, as that further south.

The soil is thinner and drier; water is far less abundant as we proceed north-



ward. The basis formation of these counties is the chalky limestone of the Niobrara group, and the rocks furnish moderately good building stone, and it is converted into excellent lime. The eroded materials, also, are freely mingled with the soils of the river bottoms, adding much to their fertility.

Among the most fertile portions of the State are the bottom lands of the Missouri, as the Tekama and Dakota bottoms. These bottoms cover so large an area that they deserve especial mention here.

The Tekama bottom is about forty miles long, and will average five miles in width, and the luxuriance of the vegetation upon it attests most emphatically the richness of the soil. Good grass grows on it, which will yield two to four tons to the acre. Wheat and oats grow most abundantly, with comparatively little cultivation. Wheat has been raised here at the rate of fifty-two bushels by weight per acre. But the bottom is low for the most part, and must be somewhat unhealthy; for such an abundant vegetation—almost tropical in its luxuriance—cannot decay without sending forth into the atmosphere more or less malaria.

The water is not good in many places, though it is obtained by digging within a few feet of the surface. The soil, to a great depth, has been formed by the repeated overflow of the Missouri river, the water of which held in suspension the clays and marls of the cretaceous and tertiary formations further up the river, which are always impregnated with alkaline matters, and these have given something of their nature to these bottom soils, and these alkaline earths necessarily affect the water.

Above Decatur there is a second bottom, about two miles wide and eight or ten in length, which is owned by the Omaha Indians. This is a low bottom also, which is easily overflowed in high water, but possesses the same fertility with the Tekama bottom.

The next great bottom is the Dakota, upon which Dakota City is located. This is the most important, not only on account of size and fertility, but because it is several feet higher than the others, and is more healthy and seldom overflowed. The Missouri river at times makes its ravages upon it, removing many acres in a single season. The village of Omadi, which was formerly quite a flourishing town, located some distance from the channel and supposed to be safe, has been swept away.

All these bottoms, as well as the immense bottom of the Platte, contain some alkaline spots which are not usually productive. I am informed by an old farmer on the Platte bottom that the second crop is successful, and also that a coating of manure neutralizes the alkaline influence. This alkaline matter increases in quantity as we proceed westward, and beyond Fort Kearney all the soil of the bottom is more or less impregnated with it.

When the water has stood for a time and dried away, a whitish efflorescence is left on the surface.

The valley of the Elkhorn and the valleys of its branches, Logan, Pebble, and Maple creeks, are among the most fertile and beautiful in the State, underlaid as they are for the most part by the soft, yielding sandstones of the Dakota group. The surface is gently rolling and undulating, giving to the landscape a somewhat monotonous but exceedingly beautiful appearance.

There is scarcely a foot of land in this great valley, covering an area of over one hundred miles in length and fifty to sixty in breadth, that is not susceptible of cultivation. But the great deficiency is a suitable supply of stone and fuel. In this whole valley there are but few exposures of the basis rock, and these are very small.

On the Elkhorn, about eight miles above Pebble creek, there is an exposure of the limestones of the Niobrara division, and two lime-kilns are in operation burning lignite, which finds a ready market at Frémont, on the line of the Union Pacific railroad. On the Logan there is one exposure of the lignite bed seen

near Blackbird Hill, on the Missouri. It was discovered here by digging beneath the water level of the Logan, and is not over eighteen inches in thickness—a very impure material.

Our observations north of the Platte show plainly that there are no workable beds of coal in Nebraska. There are not probably a half dozen exposures of rock in the Elkhorn basin, and the fuel consists mainly of a narrow fringe of cottonwood along the streams. On the bluffs of the Elkhorn there are a few dwarf oaks, but not enough to furnish any permanent supply of wood for fuel or timber for the settlers.

It is evident that the greater portion of the western half of the State of Nebraska must remain unsettled or be inhabited sparsely by a people devoted to pastoral pursuits. It is a well-known fact that the same hills or other portions of the west that appear the most sterile and most deficient in wood and water are the favorite resorts of the wild game, and that they become exceedingly fat. The short grasses which grow upon these supposed arid, sterile plains seem to suit the palates of the wild animals, and they find sufficient water at all seasons of the year. I would infer from this fact that it may yet become a fine stock-growing country, and, aided by the facilities to market which will be furnished by the Union Pacific railroad, I cannot but believe that some of the finest wool in America will one day reach the market from western Nebraska.

I should judge that peat beds will be found in great numbers along the Missouri north of the Platte, and in the valley of the Elkhorn and along the Platte. No effort has yet been made to search for them, and yet the indications are excellent.

The raising of timber, both on the upland and lowland north of the Platte, is proven a success beyond a doubt. The example of Mr. Griffin, west of Omaha, on the highest land, and some experiments on the bottom land at Tekama, Burt county, afford ample proof. Still, so little has been done in the way of supplying this country with living forests, that I again call attention to this most vital matter to the future prosperity of the State.

At Mr. Thomas's, near Tekama, twenty-four cottonwood trees, eight years old, averaged two feet and ten and one-eighth inches in circumference; sixteen locust trees, (*Robinia pseudo acacia*), five years old, from seed, carefully cultivated, averaged twenty-three inches in circumference; twenty-five locust trees, six years old, from seed, but planted on sod ground not cultivated, averaged seventeen and seventeen twenty-fifths inches in circumference.

It will be seen by the above that cultivation of forest trees is as important to their success as to that of any of our annual crops. The cottonwood trees would each furnish one to two ties for a railroad, and the locusts good posts for a wire fence.

This question of the planting of forest trees is one of the most important that can demand the attention of the citizens of the State, and too much cannot be said in regard to it.

There is another question of importance to the west generally. While there are most abundant materials for the manufacture of brick all over the State, the fuel that is required to burn them forms a serious drawback, and it is an important matter to ascertain whether the making of pressed brick would not prove in this country a success. The dryness of the atmosphere in this country is most favorable for the experiment. Mr. S. P. Reed, superintendent of construction on the Union Pacific railroad, a most intelligent and liberal-minded gentleman, tells me that he has made the experiment at Frémont, Dodge county, where he made 40,000 bricks in this way, and that his success was complete. This fact shows that a great obstacle is removed out of the way of the immediate settlement of a great portion of this State.

I would here say that the numerous successful experiments upon building

materials, and for other purposes, by this powerful and wealthy corporation, will be of incalculable value to the State, the future prosperity of which, it seems to me, will be very largely due to its energy and skill.

Very respectfully, your obedient servant,

F. V. HAYDEN,  
*United States Geologist.*

Hon. JOS. S. WILSON,  
*Commissioner of the General Land Office.*

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*Observations accompanying annual report of 1867 of the Commissioner of the General Land Office on the precious metals.*

In presenting a brief sketch of the countries furnishing the present supplies of gold and silver, this republic, on account of the large quantities it annually contributes to the world's commerce, and the extent of the territory included within its auriferous districts, claims the first attention.

Its gold fields are divided into those of the Atlantic and of the Pacific slopes, sometimes designated respectively as the Appalachian and Sierra Nevada gold regions.

The Appalachian mountains rise in Lower Canada, south of the St. Lawrence, extending in a system of parallel ridges, in a southwesterly direction, about 1,300 miles, passing through the States of Vermont, New York, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia and Tennessee, into Alabama.

Skirting the eastern margin of this chain is a narrow belt of metamorphosed rocks of the lower palæozoic age in an undulating range of elevations, known in Vermont as the Green mountains, in New York as the Highlands, in Pennsylvania as the South mountains, and in Maryland, Virginia, North Carolina, South Carolina, Georgia, and Alabama, generally as the Blue Ridge.

Apparently of the same geological age, and running nearly parallel with this ridge, immediately to the southeast of it, lies the great auriferous belt of the Atlantic, varying in width from 15 to 70 miles, containing gold in workable deposits in Lower Canada, in Virginia, the Carolinas, Georgia, Tennessee, Alabama, and in a few isolated lumps and scales throughout the whole length of this mountain system. The predominating rock of this belt is talcose slate, passing into other varieties and alternating with formations of granite and syenite.

From 1830 until 1861 mining was regularly carried on in Virginia, and from \$50,000 to \$100,000 annually received at the mint from that State, the whole amount deposited up to the year 1866 being \$1,570,182 82, the first deposit of \$2,500 having been made in 1829. The gold belt in Virginia is from 15 to 20 miles in width, and thus far developed chiefly in the counties of Fauquier, Culpeper, Orange, Spottsylvania, Louisa, Fluvanna, Goochland, Buckingham, Campbell, and Pittsylvania.

Gold was known to exist in North Carolina before the commencement of the present century, a good-sized nugget having been found in Cabarrus county in 1799, and another afterwards, weighing 28 pounds avoirdupois. In the same locality it is estimated that over 100 pounds were collected prior to 1830, in pieces each over one pound in weight. In the adjoining counties lumps were found weighing from one to sixteen pounds. From 1804 to 1827 North Carolina furnished all the gold of the United States, amounting, according to the mint returns, to \$110,000. Up to the year 1866 the State deposited at the mint \$9,278,627 67. The counties in which mining has been conducted are Rockingham, Guilford, Davidson, Rowan, Cabarrus,



Rutherford, and Mecklenberg. Previous to 1825 the metal had been obtained from washings, but in that year auriferous vein stones were discovered and 625 ounces of gold obtained by rock mining, after which other leads were found in most of the counties above named.

In 1829 \$3,500 were deposited at the mint from South Carolina, and from 1830 to 1861 mining was prosecuted in that State with varying success. In 1852 the Dorn mine was opened in the Abbeville district, and in a little more than a year produced \$300,000 worth of gold by the aid of a single Chilian mill worked by two mules. The total deposit from this State amounts to \$1,353,663 98. The whole northwestern part of South Carolina contains gold, but the districts in which it has been mainly developed are Abbeville, Pickens, Spartanburg, Union, York, and Lancaster.

In 1830 \$212,000 were received from Georgia as the first contribution of its mines, which from that date to 1861 yielded a product of \$6,971,681 50. The whole of the State lying along the base of the Blue Ridge has been found more or less auriferous, but the counties in which mining has been principally conducted are Carroll, Cobb, Cherokee, Lumpkin, and Habersham.

Gold has been found in Tennessee and Alabama, but the quantity has been small, the whole amount deposited from the former State since 1828 being only \$81,406 75, and from the latter, since 1838, \$201,734 83.

Specimens of silver ore have been discovered in several of the States aforesaid, but, so far, in paying quantities only at the Washington mine in Davidson county, North Carolina, where ores of great richness exist. The gold obtained by washing in the southern States was eagerly purchased by jewellers, anxious to secure the same on account of its great purity; and one-half of the product, it is supposed, was thus consumed.

The whole amount deposited at the mint from the six States between 1804 and 1866 is \$19,457,297 55; and if an equal quantity passed into manufactures and foreign commerce without reaching the mint, the total gold product of the Atlantic slope up to 1868 may be set down at \$40,000,000.

Efforts are now being made to develop the quartz veins of the southern States with the aid of the improvements in mining found to be effective in California and elsewhere.

But the most important gold fields of the United States and of the world are found in the States and Territories extending from the northern to the southern boundaries of the republic, and from the Pacific ocean to the eastern spurs and outliers of the Rocky mountains, embracing an area of more than a million of square miles.

This extensive region is included within California, Oregon, Nevada, Arizona, New Mexico, Colorado, Utah, Dakota, Montana, Idaho, and Washington. Everywhere throughout this vast extent are found districts rich in the precious metals, including mines surpassing, in the quantities of treasure yielded, the most celebrated of other countries.

The existence of gold on the Pacific, within the limits of the present State of California, was well known to the Jesuit fathers long before the territory became a part of the United States; but the first discovery which became practical in the development of an extensive mining interest was made in the spring of 1848. A contractor, having engaged to furnish lumber to a retired Swiss officer of the Guard of Charles X, erected a saw-mill on the south fork of the American river, at a place now called Coloma, in California, on the western declivity of the Sierra Nevada. The mill was completed in March, 1848, and on setting it in operation, the water, rushing through the new tail-race, exposed numerous small particles of a light metallic lustre, recognized as gold. The news of the discovery soon spread far and wide, and as early as July of that year four thousand persons were engaged in washing on the Ameri-

can river and its tributaries, obtaining from thirty to forty thousand dollars' worth of gold every day, and by the month of November had extracted from four to five millions.

In July, 1849, fifteen thousand persons had reached the new El Dorado, including miners from Mexico, Peru, Chili, and elsewhere. These were soon after joined by immense immigrations from the United States and Europe, making an aggregate number before the close of 1849 of fifty or fifty-five thousand persons, who had washed from the river beds of California, before the commencement of the year 1850, gold equal to forty millions of dollars, increased during the following year to ninety millions.

The gold-bearing rocks of California are a belt of talcose and other varieties of slate, varying in width from forty to fifty-five miles, alternating with masses of trap and serpentine, flanking the Sierra Nevada on the west, extending into the valley of the Sacramento and San Joaquin, where these rocks are overlaid by recent deposits of a sedimentary nature. Within the slate in metamorphic rocks are enclosed veins of auriferous quartz, believed to be the most prolific source from which is taken the gold of California, and to the detritus of which, separated from the original matrix by disintegration, abrasion, and distribution by aqueous and other agencies, the shallow placers owe their origin.

The gold-bearing rocks of the Ural mountains, of Australia, and of the Andes belong to the palæozoic or silurian age, Sir Roderick Murchison claiming to have established the fact that *all* the more productive auriferous rocks belong to that geological period. The gold-producing slates of California and Nevada appear, however, to form a remarkable exception to this general rule, as numerous fossils of undoubted jurassic origin have been found *in situ* in several different localities upon the most auriferous rocks in these States.

West of the Sierra Nevada silver ores first appear, and at the Comstock lode, in Nevada, an annual yield has been obtained nearly twice as great as that of the celebrated Potosi mines during the most prosperous periods of their history. The product of California is almost entirely gold, yet some silver is obtained by separation, while the product of Nevada is principally silver, the deposits of gold being less numerous and less extensive. In the Territories of Arizona, New Mexico, Colorado, Utah, Idaho, and Montana, both the precious metals abound. Silver mining began in 1860 in Nevada, and it is estimated that to the present time the quantity extracted is equal to one hundred millions of dollars.

The first gold-mining operations were confined to shallow washings, where the metal lay near the surface, and was obtained without expensive machinery. As these deposits became exhausted, methods were resorted to for the purpose of carrying water to levels above the course of present streams, to wash the auriferous gravel found at such elevations. This method is known as the hydraulic process. At a still later period the system of mining in quartz rock was commenced, which appears at the present time to be well established in California, and is annually producing increased quantities. To render this branch of mining successful, an established and permanent population, with due proportion of skilled mechanics and establishments for the manufacture of machinery, appears to be necessary.

Of the quantities of the precious metals already taken from the mines of the United States, different estimates have been formed, some placing the product of California alone, since the commencement of 1848, at over one thousand millions of dollars. The special commissioner for the collection of statistics of gold and silver west of the Rocky mountains estimates the product of California, from 1848 to the end of 1865, at nine hundred millions, and that of the neighboring States and Territories, including the province of British Columbia, at \$100,000,000, making an aggregate of \$1,000,000,000. To reach this result the manifests at the custom-house at San Francisco have been taken, amounting to

\$740,832,623, to which was added the sum of \$45,000,000 for gold and silver in use as currency on the Pacific, with an estimate of \$115,000,000 for jewelry and plate manufactured in California, gold dust carried to the Atlantic States and foreign countries by miners returning home, without passing through the custom-house, and for dust buried or concealed by miners at remote points. It is safe to assume the total yield of Nevada, up to the end of 1867, at \$100,000,000; that of Colorado, at \$30,000,000; of Oregon and Washington Territory, \$25,000,000; Idaho and Montana, each, \$25,000,000; and Arizona, New Mexico, and Utah, \$5,000,000. If the product of California, up to the end of the same period, be assumed as equal to \$900,000,000, the total product of the western mines up to the first of January, 1868, will amount to \$1,110,000,000, or, in round numbers, \$1,100,000,000, of which \$1,000,000,000 may be set down for gold, and \$100,000,000 for silver.

As to the annual product of the mines, opinions are likewise divided, some claiming eighty and others a hundred millions.

In 1865 and 1866 a revenue tax of six-tenths of one per cent. was collected on all gold and silver bullion in lumps, ingots, bars, or otherwise as assayed, which in 1866 amounted to \$499,455, including a total value of bullion assayed, upon which a tax was paid, of \$83,242,551 in paper currency value; equal in gold value to \$56,000,000. A considerable quantity of bullion doubtless escaped taxation, but it is not probable the amount was greater than a fifth of the whole quantity subject to a revenue duty.

In the remote and unsettled regions mining is generally conducted by large parties operating in such a manner as to afford mutual protection against hostile Indians, and the localities become well known and are not likely to be passed over by the internal revenue collector. The chances for evasion are greater in the more settled districts, where the miners are more scattered. But these are not so numerous as to render it probable that an amount greater than we have assumed could escape the excise duty. Arizona, New Mexico, and Utah produced a certain quantity, which, but for the Apaches, would have amounted to many millions; considerable quantities passed into manufactures without being previously assayed, and left the country in the form of dust by miners returning to foreign parts, or was shipped in the form of ore; and \$5,000,000 may be set down as a contingent under these heads, making a total of \$75,000,000, gold value, for the year 1866, of which \$18,000,000 represent the silver product.

The amount deposited at the mints for the year 1866 was less than \$32,000,000, gold value, the mint returns exhibiting about four-sevenths of the amount of assayed bullion produced during that year upon which a revenue tax was assessed and paid. A license tax was paid by sixty-eight private assayers, nearly all of whom were located in the mining territory, and it may be safely affirmed that for some years past the larger portion of the gold and silver product of the United States has been cast into bars or ingots by these licensed assayers, and thus passed into the market without being returned to the mint.

The tax on bullion for the fiscal year ending June 30, 1867, was five-tenths of one per cent., amounting to \$441,339, indicating a currency value of bullion on which a tax was paid of \$88,267,900, equal in gold value to about \$60,000,000; gold in the Pacific States being at a premium on paper of about fifty per cent.

It is not probable the product of the last fiscal year differs materially from that of the preceding, the increased amount of taxes collected being due rather to greater efficiency in the execution of the revenue laws. The yield for the *calendar* year of 1867 can hardly fail to be less than that of 1866, on account of Indian troubles in Montana, Idaho, and Arizona, and also because many mining companies wishing to import mills and other machinery are awaiting the completion of the railroads across the mountains, as offering greater facilities for transportation; hence mining in many localities is, for the present, in a measure



suspended. Under these circumstances it is not likely the product for the year ending December 31, 1867, will exceed \$70,000,000 gold value.

Placer mining, from the exhaustion of deposits, must necessarily decline on the Pacific slope, as it has in all other countries, but rock and hydraulic mining are destined to increase largely when our western regions become occupied by a settled population.

The field for enterprise in these branches is almost unlimited, and with the completion of proper railroad facilities, and the termination of Indian difficulties, the gold bearing rocks of the western States and Territories will furnish profitable employment for millions of men and hundreds of millions of capital; and with the aid of suitable machinery and accomplished metallurgists, our annual supply of the precious metals may easily be increased to several hundred millions.

Mexico, since its conquest by the Spaniards in 1521, has contributed large quantities of silver, amounting, for 347 years, to an annual average of more than nine millions of dollars.

Humboldt estimates the product of its mines, from the conquest to the end of the year 1803, at \$2,028,000,000,\* of which about \$79,000,000 were gold.

Of the whole amount, \$1,767,952,000 had passed through the mints and were accounted for upon the official records; the balance, amounting to \$260,000,000, and nearly one-seventh of the whole, was reckoned as a furtive extraction, finding its way into the market without any official recognition.

Chevalier calculated the silver product of Mexico from 1521 to 1845 at 162,858,700 pounds, troy; worth \$2,605,739,200. Humboldt's estimate for the silver alone up to 1803 was \$1,948,952,000. The silver coinage of the country between 1803 and the end of 1845 amounted to \$506,000,000. If this amount, with one-fifth of the whole for the produce of the mines not passing through the mint, be added to Humboldt's estimate, the result will be nearly the same as the computation of Chevalier.

In the article "Mexico," in the *New American Cyclopædia*, we find a statement of the amount of the gold and silver coinage in all the Mexican mints from the conquest to 1856, with the mint returns for each year from 1822 to 1856, furnished by the *ministerio de fomento*. The total coinage to the year 1856 is set down at—

Silver.....	\$2, 534, 115, 679
Gold.....	96, 892, 542
Total.....	2, 631, 008, 221

If to this one-seventh be added for the unregistered produce of the mines, the amount will reach the sum of \$3,007,000,000. The same result will be obtained by adding the produce from 1803 to 1856 to Humboldt's figures, thus attesting the substantial accuracy of the conclusions reached nearly three-quarters of a century ago by that eminent philosopher.

The mint returns from 1822 to 1856, furnished by the "*ministerio*," foot up \$478,392,014 for both gold and silver, the coinage of the two metals not being stated separately. For the period from 1804 to 1821 recourse may be had to the reports made to the British government by its consuls in Mexico, from which it appears that during the twenty-six years from the commencement of 1804 to

\* The proceeds of the Mexican and South American mines from 1492 to 1803, being stated in piasters or Spanish dollars, a coin of very nearly the same value as our own dollar, it is treated in this article as equivalent, and all values given in the gold currency of the United States. When reference is made to the produce of the American mines previous to 1803 Humboldt's computations are implied, unless otherwise stated. For the information contained in the returns of the British consuls, we are mainly indebted to the paper read before the Statistical Society of London, by Mr. J. T. Danson, an English statist.

the end of 1829 the silver coinage amounted to \$350,579,867, and the gold returned to the mints during the same time to about \$18,368,811, or an annual average of \$13,484,000 in silver, and \$700,000 in gold, equal to \$14,184,000 of both metals, and to \$255,312,000 for the eighteen years from 1804 to 1821, both inclusive. For the twenty-six years from 1822 to the commencement of 1848, the year of the gold discoveries in California, the coinage of both metals in the Mexican mints was \$313,661,674, thus exhibiting the amount of \$568,973,674 gold and silver coinage for the forty-four years from 1803 to 1848. For the proportion of gold coinage in this amount it is believed the annual average of \$700,000 may be adopted for the whole period. In the early part of the century, when the coinage amounted annually to more than twenty millions of dollars, that of gold was slightly in excess of a million.

During the Spanish revolutionary troubles, commencing in 1810, when the mint records show a yearly supply of less than ten millions, that of gold declined sometimes to less than half a million. In 1832 the mints again returned a product of more than twelve millions, increased to thirteen millions in 1838, fifteen millions in 1845, and nineteen millions in 1848, when the gold coinage amounted to about one million. An annual average of \$700,000 for forty-four years would produce \$30,800,000, and may be stated, in round numbers, at \$31,000,000, and the silver at \$538,000,000.

In estimating the produce of the Mexican mines in 1841, M. St. Clair Duport, who had been engaged in refining gold and silver at the mint of the city of Mexico, states, in a work published in 1843, that the silver passing through the Mexican mint was about four-fifths of the whole, while the gold returned was only about three-eighths of the amount produced. Humboldt's addition of one-seventh to the registered product was made under the old Spanish régime, when the police regulations of the mines were enforced with an extreme rigor that has not been practiced since.

In reference to mining operations during the revolutionary period, Mr. Ward remarks: "It is a fact universally admitted that although the towns of the mining districts have been ruined by the emigration of capitalists formerly interested in mining, the lower classes have, throughout the revolution, found means to draw their subsistence from the mines.

"Under the denomination of *buscones* or searchers, they have never ceased to work, and have, in general, continued to extract from the upper levels, or from the old workings, a very considerable quantity of silver. This desultory system is still pursued in many parts of the country, and in many districts a large population is even now maintained by it."

When it is considered that in our own country the amount deposited at the mints for the year 1866 was less than \$32,000,000, gold value; while, for the same year, a revenue was assessed and paid upon assayed bullion equal, in gold value, to \$56,000,000—the mint returns thus indicating an amount equal to four-sevenths only of the quantity upon which the tax was collected—it will be conceded that the estimate of Duport is quite reasonable. We will therefore adopt it, with a slight modification as to gold, by assuming that one-half of the actual product of that metal is indicated by the records of the mints. This will produce for the forty-four years subsequent to 1803 a product of \$734,500,000; or \$672,500,000 of silver, and \$62,000,000 of gold.

For the nine years from 1848 to 1856 the returns show a product of both metals of \$164,730,340, or an annual average of \$18,303,371; gold amounting to about \$950,000, silver to \$17,350,000.

Applying the same estimate for unregistered metal as above, we obtain a total for the nine years of \$212,287,000, or \$23,587,000 annually, of which about \$2,000,000 may be set down for gold.

Of the produce of the mines since 1856 no official data are to be had. A gradual progress appears to have been made up to the advent of Maximilian,

when the yield was about \$26,000,000 of silver, and \$3,000,000 of gold. Although the war following the French invasion in 1863 does not appear to have interfered much with the English mining companies operating in Mexico, it doubtless acted prejudicially in other instances; and it may be supposed that the annual yield throughout the whole country was somewhat reduced. There can be little risk, however, in applying the average for the nine years preceding 1856 to the whole period of twenty years from 1848 to 1868. As the proportion of gold has witnessed a gradual increase for a number of years it may safely be estimated at \$2,500,000 annually, and the silver product at \$21,000,000. This will amount to \$420,000,000 of silver, and \$50,000,000 of gold, for twenty years.

Adopting Humboldt's estimates for the period prior to 1804 the yield of the Mexican mines will stand thus:

Periods.	Gold.	Silver.	Both metals.
1804 to 1848.....	\$62, 000, 000	\$692, 500, 000	\$734, 500, 000
1848 to 1868.....	50, 000, 000	420, 000, 000	470, 000, 000
1804 to 1868.....	112, 000, 000	1, 092, 500, 000	1, 204, 500, 000
1521 to 1804.....	79, 000, 000	1, 948, 952, 000	2, 027, 952, 000
1521 to 1868.....	191, 000, 000	3, 041, 452, 000	3, 232, 452, 000

Making a total gold product of \$191,000,000 and silver of \$3,041,452,000 from the opening of the mines to the present day, and a total of both metals amounting to \$3,232,000,000.

The present annual product may be estimated at—silver \$26,000,000, gold \$3,000,000, both metals \$29,000,000.

The remaining localities upon the North American continent where gold has been found are British Columbia, Canada, and Nova Scotia.

As early as 1856 the governor of Vancouver Island reported the discovery of gold in British Columbia, but it was not until 1858 that miners in sufficient numbers to overpower the opposition of the aborigines entered the province and commenced prospecting the valleys of Fraser's river and its tributaries.

Since 1858 gold-washing has been continued, and the whole valley of the Fraser and some of its tributaries have been found to be more or less auriferous.

The amount of gold obtained since 1858 has been estimated at from \$30,000,000 to \$45,000,000, and the annual supply at the present time from \$2,500,000 to \$3,000,000. Nearly all thus far obtained has been the produce of washings or shallow placers.

Gold washings have been carried on in Lower Canada, on the Chaudière, St. Francis, and Gilbert rivers since 1850. The auriferous region covers from 3,000 to 4,000 square miles, occupying a part of that portion of the province lying between the St. Lawrence and the United States boundary, and east of the Green Mountain range, prolonged into Canada. The product up to the present time has not been large, although sufficient to indicate that gold exists over a considerable extent of territory.

The amount obtained last year was from \$150,000 to \$200,000, the whole amount extracted from the commencement of mining operations being estimated at \$1,000,000. Recently several shafts have been sunk on quartz veins, and thirteen hundred-weight of ore worked in New York by mill process it is said yielded at the rate of \$40 per ton, while some of the ore is reported to have assayed still more favorably. At last accounts measures were being taken to erect machinery for the purpose of conducting rock mining in the neighborhood of St. Francis. Under the most favorable circumstances this region will scarcely yield over a half million of dollars annually.



A third auriferous district in British North America is in Nova Scotia, in a zone of metamorphic rocks bordering on the Atlantic coast, from six to eight miles wide at its eastern extremity and from forty to fifty at its widest points, comprising six thousand square miles of surface. Gold has been found in quartz veins and in the sands on the beach, the first discoveries having been made in 1860 or 1861.

Mining is now carried on at Fauquier harbor, Wine harbor, Sherbrook, Owens, Waverly, Oldham, Stormont, Lawrencetown, Renfrew, Country harbor, Isaac's harbor, Montague, Uniacke, and other places. The gold of Nova Scotia is of remarkable purity, being on the average twenty-two carats fine, and the bars or ingots are said to be current in Halifax at \$20 an ounce.

The annual product for the last few years has been 25,000 ounces troy, or \$500,000, the whole amount taken from the mines since 1862 being estimated at two millions, or two millions two hundred thousand dollars.

In Central America there are numerous mines of gold and silver, formerly yielding a very considerable product, but which, on account of the many revolutions and distractions that have disturbed the peace of the country for the last forty or fifty years, have been in a great measure neglected.

The statistics of their produce, either previous to or since 1803, are exceedingly meagre, leaving it difficult to come to any satisfactory conclusion on the subject.

The investigations of Humboldt were not extended to this part of the Spanish-American colonies, although there can be little doubt that the quantities of the precious metals obtained, in what then constituted the captain-generalship of Guatemala, were by no means insignificant; but in reference to the mines, as to many other matters pertaining to the early history of this part of America, there is much yet to be collected by future explorers.

Of the five states constituting the political divisions of Central America, Honduras appears to be the most abundantly supplied with mineral wealth, and Mount Merendon has long been celebrated for its mines of silver and gold. Silver is found in combination with lead, iron, copper, and antimony, and the ores are said to be very rich. The gold obtained is mostly washed from the sands of the rivers in the departments of Yoro, Olancho, and Santa Barbara.

In 1860 and for some years previous the bullion export of Honduras amounted in value to about \$400,000 annually, and the mines, although in native hands and carried on without much enterprise, probably return a product not varying much from that amount, consisting mostly of gold collected by the Indian population from shallow washings.

In the republic of Guatemala there is a mining district in the Alotepec mountains, which, three-quarters of a century ago, yielded large quantities of silver. It is found combined with lead and copper, and also as a sulphide of silver. Building stone, wood, and water, and other conveniences for carrying on mining operations, are at hand. The Central American Mining Company, operating in this locality, between 1858 and 1865 sold ore and bar silver amounting to 621,000 ounces, worth over \$700,000.

The river sands of the department of Chiquimula are auriferous, and are washed by the Indians; but there are no means of estimating the amount obtained.

The districts of Segovia, Matagalpa, and Chontales, in Nicaragua, border upon the great metalliferous mountain region of Honduras, and are rich in mineral deposits. Under Spanish dominion these gold and silver mines were very productive, but at present they appear to be carried on without much energy or skill, and very little is known as to the quantities of the precious metals obtained.

The Chontales gold and silver mines had been worked for many years by the natives, who had no means of erecting proper machinery, and were obliged to carry the ore to mill by hand; yet in this way they obtained, in the month of January, 1865, from some of these mines, 230 ounces of gold, worth about \$4,000. This was mined in the rock, and yielded 112 ounces of gold to 60

tons of ore, and in other cases the ore of some of these mines yielded as high as from 40 to 300 ounces per ton.

These mines have lately passed into the hands of an English company, and it is believed, with proper machinery, they will make a very profitable return.

An authority before us estimates the product of Nicaragua in 1860 at about \$250,000, but it is rather a matter of conjecture than of estimate.

In the republic of San Salvador the silver mines of Tabanco, in the department of San Miguel, have been celebrated for many years. The ores are properly lead ores, easily worked, and yield from 47 to 2,537 ounces of silver to the ton. These mines have been irregularly worked for many years, but of late without proper machinery, or sufficient capital fully to develop their hidden treasures.

Costa Rica, though less productive in mineral wealth than the other states of Central America, has gold mines in the Aguacate mountains, and some of its alluvions are profitably washed by the Indian population, but the produce is mostly smuggled out of the country, and the amount obtained is a matter of conjecture.

The range of mountains included within Central America is about 1,200 miles in length, and from all the information existing upon the subject there is reason to believe that when peace and order shall take the place of turbulence and war, and a thriftless inactivity shall give way to an enlightened industry among the population, this part of the Cordilleras will be found to be no less amply supplied with gold and silver than other portions of the system traversing the South American continent at one extremity, or Mexico, California, and British Columbia at the other.

If the mines were properly opened and developed silver would form the leading product; but at present, owing to the fact that shallow washings require less capital and skill, and are therefore better adapted to the means of the native population of the country, more gold is probably obtained than silver.

The gold fields of the Atlantic States, from 1804 to 1848, produced an amount of gold equal in value, according to the mint returns, to some twelve or fifteen millions of dollars, but in reality equal to twice that amount.

This region is neither as extensive nor as productive as the metalliferous districts of Central America, and under similar circumstances would produce but a small proportion of the amount yielded by them. An estimate of the product of Central America, therefore, at a value about equal to that of the Alleghany mines, as shown by the mint records, would appear sufficiently moderate, in the light of all the information we have been able to obtain. We compute for the States of Honduras, Guatemala, Nicaragua, San Salvador, and Costa Rica, collectively, for the period from 1804 to 1848, \$300,000 annually; \$200,000 representing the gold product and \$100,000 that of silver, amounting, in the forty-four years, to—gold, \$8,800,000; silver, \$4,400,000, or \$13,200,000 for both metals. During the last twenty years the supply has certainly been increasing somewhat, as several companies of sufficient capital have been operating upon a more extensive scale than had hitherto obtained, and we compute it at \$250,000 for gold and \$150,000 for silver yearly, producing in the twenty years \$5,000,000 of the first and \$3,000,000 of the other, or \$8,000,000 of both metals; yielding a product during the sixty-four years of—gold, \$13,800,000; silver, \$7,400,000; or \$21,200,000 of both metals.

## PRODUCE OF CENTRAL AMERICA.

	Gold.	Silver.	Both metals.
1804 to 1848.....	\$8,800,000	\$4,400,000	\$13,200,000
1848 to 1868.....	5,000,000	3,000,000	8,000,000
1804 to 1868.....	13,800,000	7,400,000	21,200,000

The present yearly supply may be stated at \$300,000 gold and \$200,000 silver, or half a million annually.

From the discovery of the continent to the end of 1803 the product of South America in the precious metals, according to Humboldt's estimates, amounted to \$3,878,748,000, of which \$2,409,204,000 represented the supply of silver and \$1,268,500,000 that of gold; \$2,951,748,000 being ascertained from the official records, and \$727,000,000 estimated as a contraband product, not passing under the eyes of the authorities.

Mr. Danson, upon a revision of Humboldt's figures, makes a correction in the product of the South American mines, amounting to \$138,506,000, and reduces the total to \$3,540,242,000.

These corrections consist, first, in changing the produce of the mines of Gualgayoc, Guamachuco de Couchucos, from \$185,339,900 to \$18,533,990, a mistake which had evidently occurred from inadvertently misplacing the separating point, and a deduction of \$166,806,000 on this account appears to be proper. Secondly, he assumes that the \$200,000,000 estimated by Humboldt as a contraband product of the mines of Pasco, Gualgayoc, and the rest of Peru, exclusive of the mines of Potosi, was intended to be one-fourth of the registered metal, as in the case of Potosi, and hence deducts another \$40,000,000 on account of the afore-said error. At the time of Humboldt's visit, in 1802, the South American colonies were divided into the vice-royalties of Peru, New Granada, and Buenos Ayres, the captain-generalships of Chili and Venezuela, and the Portuguese colonies of Brazil. Bolivia then formed a part of Buenos Ayres, but previous to 1778 was included within the vice-royalty of Peru. Each of these divisions now constitutes an independent republic; New Granada and Brazil furnish the principal supplies of gold, and Peru, Bolivia, and Chili those of silver. Mines of the precious metals exist in the Argentine Republic, in the mountains separating the provinces of Tucuman and Catamarca, in the Famatina range, in the province of La Rioja and in the Sierra de Cordova. Uruguay formerly produced small quantities of gold and silver, and both metals are found in the republic of Paraguay, and perhaps in some of the other divisions bordering on the Rio de la Plata, but the amount of treasure obtained from these states is believed to be small, and never in fact considerable. At the commencement of the century all these divisions were included in the vice-royalty of Buenos Ayres. At that time the South American continent produced about 33,500 pounds of gold and 691,625 pounds of silver, equal in value to about \$18,600,000.

In 1848 the gold product had declined to about 24,000 pounds and that of silver to 685,400, worth together about \$16,400,000.

At the present time the yield of each metal has slightly improved. Both metals are obtained in Peru, its most celebrated mines being those of Pasco, discovered in 1630, and which had, in 1803, produced an amount of silver worth \$375,000,000. These are situated in the Peruvian Andes, at an elevation of 13,673 feet above the level of the sea, about 1,500 feet below the line of perpetual snow. The town of Cerro de Pasco, in this mining district, stands at the same elevation, and when the mines were prosperous contained a population of 18,000.

The mines of Gualgayoc were discovered in 1771, and up to the year 1803 had produced an annual supply of silver worth nearly a million of dollars. The metal was so near the surface that wherever the turf was removed filaments of native silver adhered to the roots of the grasses.

These mines surround and underlie the town of Micuipampa, near 12,000 feet above the sea, where water freezes nearly every night throughout the year.

The other more important silver mines of Peru are those of Hualanca, Luncanas, and Huantajaya. Gold is found in most of the mountain passes, and many of the rivers from the Andes wash down auriferous sands. It is very difficult to obtain any exact knowledge of the amount annually obtained. The



business of washing the sands, and, indeed, of mining for both metals, is pursued to a great extent by the Indians, frequently with much secrecy, without capital or machinery, and the product smuggled out of the country, to avoid the payment of the government duties levied at the mints, which some years ago amounted to  $7\frac{1}{4}$  per cent. on the value of all silver returned.

The wide distribution of the precious metals throughout the sierras of Peru, the deposits of silver oftentimes lying very near the surface, together with the wild and sparsely settled character of the country, and the want of a wholesome administration of the laws, facilitate an irregular system of mining and a contraband traffic in the proceeds. Perhaps not one-half of the gold obtained, and not more than two-thirds of the silver, are returned to the mint. The actual proceeds of the mines are to some extent, therefore, a matter of conjecture, the value of any estimate depending very much upon a familiar knowledge of the country and of the character and habits of its population.

In the five years from 1797 to 1801 the coinage of the mint at Lima amounted to \$26,032,653, of which \$2,322,667 were gold and \$23,709,986 silver, being about \$5,300,000 per annum.

In the five preceding years it had amounted to an annual average of \$6,000,000. In 1800 the mint coined \$378,596 in gold and \$4,399,409 in silver; or \$4,778,005 in both metals. The total product for that year, including contraband, has generally been estimated at 400,000 pounds of silver and 2,400 pounds of gold, worth, at \$16 a pound for silver and \$225 for gold, \$6,940,000.

Between the commencement and the middle of the century the coinage of the mint varied considerably, the smallest returns being from 1820 to 1830, since which last-named date an improvement has been manifest, which, with occasional interruptions, has been continued, it is believed, to the present time. In estimating the produce of the mines for the forty-four years commencing with 1804 and ending with 1847, the average adopted by Humboldt at the beginning of the century, of \$6,240,000 per annum, would appear to be too high. The British consul at Lima, Mr. Bedford Wilson, reported to his government that the quantity of silver smelted under official inspection for the thirty-six years from 1804 to 1839 amounted to the value of \$119,853,494, or an annual average of \$3,329,264. As this represents the quantity of the metal passing under official notice, and upon which the government duty was paid, the necessity of adding a proportionate amount for contraband, in order to obtain the actual product, is as obvious as in the case of the coinage returns, and the ratio of Duport in reference to the silver product of Mexico would seem to be equally proper in the case of Peru. Adding one-fourth to the amount returned would make the yearly product \$4,161,580 for the districts included in the reports of the British consul. For the districts not so included, he estimated an annual yield of 100,000 marcs. We will, however, for greater safety, assume a product of 60,000 marcs at nine dollars per marc, and call the annual yield of silver throughout the whole of Peru, from 1804 to 1839, \$4,700,000. In 1845 Chevalier estimated the product of Peru in silver at 300,000 pounds, troy, worth at \$9 40 per marc, of Castile, about \$4,600,000, or \$100,000 less, it will be seen, than the above average for the thirty-six years. As mining operations in that country have for a long time been subject to continual fluctuations, but upon the whole varying but little in long periods of fifteen or twenty years, we will adopt the estimate of \$4,700,000 as the average silver product for the whole period of sixty-four years from 1804 to the end of 1867.

The product then, for the 44 years ending with 1847, would be \$206,800,000, and for the 20 subsequent years \$94,000,000, and for the 64 years \$300,000,000. The average here assumed is about \$1,000,000 less than the estimated silver product at the time of Humboldt's visit, in 1802, but since that period many of the old Spanish families, by whose enterprise and capital mining operations had been mainly conducted, have left the country. Many of the most productive

mines have become filled with water, while comparatively few new ones have been opened. Perhaps at no time during the last fifty years has the same amount of capital been invested, nor the business of the mines conducted upon as enlarged a scale as at the beginning of the century.' That there should be some sixty or sixty-five millions less in the aggregate product up to the present time than if these changes had not taken place would seem to be a very probable result. From 1804 to 1823, the gold coinage, according to the British consul's returns, amounted to \$8,987,000, being an annual average for the 20 years of nearly \$450,000. From 1824 to 1839, it amounted to \$1,735,133, or a yearly average for the 16 years of \$108,446. The whole amount coined for the 36 years was \$10,722,165, and the yearly average for the whole period about \$298,000, or, in round numbers, say \$300,000. This sum would be to the registered silver, for the same period, in nearly the same proportion as the gold coinage at the beginning of the century was to that of silver. In reality, it would be something less, and from all that can be ascertained of the operations of the Peruvian mints since that date, it appears that the coinage of gold has declined somewhat more than silver. In weight, the \$300,000 of gold will hold the relation to the \$3,329,204 of smelted silver as returned by the British consuls, of 1 to 173; and Chevalier, from an examination of the mint returns, has calculated that the amount of gold produced by the Andes of Peru and Bolivia from the earliest times is to the quantity of silver as 1 to 170. It may therefore be adopted as the annual coinage of the country for the period from 1804 to 1867, both inclusive. Mr. Bedford Wilson, who seems to have taken much pains to communicate to his government all the information attainable, states that "the greater portion of the gold produced in the country is smuggled out of it in the shape of bullion, its exportation in that state being altogether prohibited;" and this appears to be the general opinion of those who have given the matter much attention. We will assume, therefore, as we have heretofore done in reference to the gold of Mexico, that the mint returns represent one-half the entire yield. Mr. Danson, adopting the opinion of Duport, treats the coinage returns as representing three eighths of the gold product both as to Mexico and Peru. An annual yield of \$600,000 would produce for the 44 years ending with 1847 \$26,400,000, and for the 20 subsequent years \$12,000,000, making a total gold product for the 64 years of \$38,400,000. The product of Peru in the precious metals will then stand thus:

1804-1848, 44 years, silver.....	\$206, 800, 000 ;	gold \$26, 400, 000
1848-1868, 20 " " .....	94, 000, 000 ;	" 12, 000, 000
1804-1868, 64 " " .....	300, 800, 000 ;	" 38, 400, 000

The total for both metals for the 44 years is \$233,200,000, and for the 20 following years \$106,000,000, and for the 64 years \$339,200,000. Mr. Jacob, who wrote in 1831, figured up for Peru during the 20 years commencing with 1810 a product of gold and silver amounting to \$64,688,429, equal to an annual average of \$3,234,422, or more than \$2,000,000 less than the average adopted here for the whole period since the commencement of 1804. On the other hand, Mr. Danson has estimated for the 45 years subsequent to 1804 a product of about sixteen millions more than is here computed for the corresponding period of 44 years.

The republic of Bolivia joins Peru on the east and south. During Spanish ascendancy it was known as Upper Peru, and prior to 1778 formed a part of that vice-royalty.

It contains the celebrated mines of Potosi, discovered in 1545, in the eastern ridge of the Andes, at an elevation of from 13,000 to 14,000 feet, which, according to Humboldt, had furnished up to 1803 an amount of registered silver valued

at \$1,096,000,000, and an unregistered or contraband quantity of the value of \$274,000,000, making an aggregate of \$1,370,000,000. The mines included within the present limits of Bolivia supplied nearly the entire product of the precious metals furnished by the vice-royalty of Buenos Ayres. Besides those of Potosi there are mines at Porco, Oruro, La Paz, Chucuito, and other places in Bolivia. Those of Porco had been worked by the Indians long before the arrival of the Spaniards, and had furnished large portions of the treasure plundered from the Incas by Pizarro and his followers.

Most of the rivers descending from the eastern declivity of the eastern Cordillera carry golden sands to the valleys below, and in some of the streams forming the head-waters of the Amazon the metal is still obtained in very considerable quantities by the aborigines. At the beginning of the century the vice-royalty of Buenos Ayres contributed of gold 2,200, and of silver 481,830 marcs of Castile; the former worth \$320,760, and the latter \$4,499,200. After the commencement of the revolutionary troubles the produce of the mines declined in this as in other South American states. Since 1840 or 1845 the annual supply of both metals has been increasing, and a relatively greater improvement is being made in the Bolivian mines than in those of Peru.

The reports of the British consuls show that the quantity of silver passing through the royal mint at Potosi in the five years from 1804 to 1808 amounted to \$16,573,795, and the quantity of gold for the same period to \$2,960,958, being an annual average of silver coinage of \$3,316,959, and of gold coinage \$592,191, the yearly gold coinage being about \$270,000 in excess of the amount reported for the year 1800, and that of silver about \$70,000 less than it was for the corresponding period.

In 1812, Potosi, in which was located the royal mint, was taken possession of by the revolutionary army, and, for a number of years after, the territory now forming the republic of Bolivia was devastated by contending factions. Although no returns of the coinage have been seen for the period between 1808 and 1830, there can be no doubt that it suffered a very considerable decline. The English consul at Buenos Ayres sent home to his government in 1830 an account of the silver bought by the Rescate Bank of Potosi from 1807 to 1826. This bank had for the twenty years previous to 1807 very regularly received about five-sixths of the silver passing through the mint of Potosi. For the eighteen years from 1809 to 1826 the quantity of silver purchased by this bank amounted to \$29,073,868, or an annual average of \$1,615,215. This last sum is five-sixths of \$1,938,258, which, if the bank continued to receive about the same proportion of the amount passing through the mint, would represent the amount of silver coined annually. The returns for the eight years from 1830 to 1837 show a silver coinage at the mint of Potosi amounting to \$15,559,646, or \$1,944,956 annually, which it will be seen corresponds very nearly with the annual purchase made by the Rescate Bank, increased one-fifth. It would appear, therefore, that the purchases of the bank for the eighteen years commencing with 1809 were about five-sixths of the quantity annually brought to the mint, as had been the case for the twenty years ending with 1809, and that the coinage for the eighteen years amounted to \$34,888,641.

The average for the three years from 1827 to 1829 is supposed to have been about the same, amounting to \$5,814,774; the sum coined during the eight years from 1830 to 1837, as we have already seen, was \$15,559,646; and if we suppose that no great change took place in the eleven succeeding years, there would be for that period an amount of coined silver equal to \$21,394,516, making an aggregate of \$94,231,372, which it is supposed passed through the mint from 1804 to 1848. We see no sufficient reason to depart from the rule heretofore adopted in reference to Mexico and Peru, that the amount of registered or coined silver represents about four-fifths of the whole product, and making that addition in this case we have for the whole period of forty-four years



\$117,789,215 as the value of the silver product of Bolivia. The annual average for the period is \$2,677,000, and by increasing it to \$2,800,000, it may be taken as the average for the subsequent twenty years, and \$56,000,000 as the product for that period, making a total for silver of \$173,789,000 for the sixty-four years.

The gold brought to the royal mint of Potosi from 1804 to 1808 amounted to \$2,960,958. After this no returns appear until 1835, and the amount coined in that and the two following years was \$453,250, showing a yearly average of \$151,083, which may perhaps apply to the whole period from 1809 to 1837, producing in that time \$4,381,407. An authority before us states the quantity of gold coined in 1840, at the mint of Potosi, at \$222,970, and in 1845 it appears to have been \$270,000. Assuming the first sum as the yearly average for the five years from 1838 to 1842, and the last as the average for the five years from 1843 to 1847, we have for the ten years the sum of \$2,464,850, and for the forty-four years \$9,807,215, showing a yearly gold coinage of \$223,000. Assuming as heretofore that the mint returns represent one-half of the gold product, we have for the actual yield \$19,614,430. Adopting the same average for the succeeding period, we obtain \$8,920,000 as the gold product for the twenty years ending with 1867, and for the sixty-four years \$28,534,430, and the treasure product of Bolivia will stand thus :

Periods.	Silver.	Gold.	Both metals.
1804 to 1848.....	\$117, 789, 215	\$19, 614, 430	\$137, 403, 645
1848 to 1868.....	56, 000, 000	8, 920, 000	64, 920, 000
1804 to 1868.....	<u>173, 789, 000</u>	<u>28, 534, 430</u>	<u>202, 323, 645</u>

The estimates of Humboldt as to the produce of South America, in silver, from the discovery to 1803, applied only to what was then called Upper and Lower Peru, covering the same territory as is now embraced in Peru and Bolivia. No estimate was made of the amount of gold produced in this territory, nor of the amount of silver yielded in the mining districts outside of Peru and Bolivia. New Granada, Chili, and Brazil produced gold; Upper and Lower Peru yielded silver, and no attempt is made to estimate the silver product of the first nor the gold of the second, for the period which elapsed from 1492 to 1803. This seems the more singular from the fact that at the time of his visit the mines of Peru and Bolivia were yielding an annual supply of 5,600 marcs of gold, worth, by his estimate, \$816,480; while Chili was producing 29,700 marcs of silver, equal in value to \$279,180.

The value of the silver yielded by the Peruvian mines from 1545 to 1803 was estimated by him, as correctly footed up by Danson, at \$2,203,698,000, being \$250,000,000 more valuable than the product of the whole of Mexico for a period of 282 years. Adding the sum of \$324,589,000 to the above product gives the amount of \$2,528,287,000, and adding \$150,000,000 more, we have \$2,678,287,000 as the value of the silver product of the Andes of Peru and Bolivia from the earliest times to 1848 and 1868 respectively. The addition of \$66,934,430 more for the gold product of these districts from 1804 to 1868 gives for the total product the sum of \$2,744,421,000. Chevalier has calculated the amount of silver produced by the mines of Peru and Bolivia, from their opening by the Spaniards to 1846, at 155,839,180 pounds troy, worth about \$2,376,500,000, and that the amount of gold produced by the same districts is, by weight, to the amount of silver as 1 to 170, which would give a gold product for the same period of 916,700 pounds, worth \$215,000,000, which added to the silver product gives a total value for both metals of \$2,591,547,495, or, with the additional product for 1846 and 1847, \$2,608,000,000 as the total value of the precious metals yielded by these districts from 1545 to 1848. If

the value of the gold and silver taken from these mines from 1804 to 1848 be added to Humboldt's estimates to 1803, the amount produced is \$2,674,300,000, or about \$68,000,000 more than the total gold and silver estimates of Chevalier for the same period. Recapitulating what has been stated, the united products of Peru and Bolivia, in gold and silver, may be presented as follows :

Periods.	Silver.	Gold.	Both metals.
1804 to 1848.....	\$324,589,000	\$46,014,430	\$370,643,645
1848 to 1868.....	150,000,000	20,920,000	170,920,000
	<hr/>	<hr/>	<hr/>
	474,589,000	66,934,430	541,523,645
1492 to 1803.....	2,203,698,000	.....	2,203,698,000
	<hr/>	<hr/>	<hr/>
	2,678,287,000		2,745,221,645
	<hr/>		<hr/>

The celebrated mines of Potosi, Oruro, Pasco, and Hualgayoc, which for several centuries have poured forth a mass of metal amounting in value to thousands of millions of dollars, are, in the opinion of competent judges, far from being exhausted, and might, under the protection of an enlightened and stable government, in a great measure be brought back to their former state of prosperity. According to Whitney, there were in the district of Potosi in 1852 more than eighteen hundred abandoned silver mines, and only twenty-six at work ; and in the remaining mining district of Bolivia 2,365 abandoned and forty working mines. The chief drawback to working them is their great height and the impossibility of transporting machinery to them on the backs of mules, the only present means of conveyance to these mines. Those of Potosi, like those of Pasco, are situated at an elevation of more than 13,000 feet above the level of the ocean. Yet, at this elevation, they were profitably worked under Spanish rule for several centuries ; and in 1810 the city of Potosi had a population numbering 130,000, whose prosperity was entirely dependent upon the product of the mines. At present it numbers about 25,000 inhabitants. Quick-silver is abundant at Huancavelica ; good coal has been found on the Cerro de Pasco, at an elevation of 14,700 feet. Improved methods of draining the mines, and greater enterprise in their management, would, in the opinion of all travellers, vastly increase their annual product.

The English consuls at Buenos Ayres and Montevideo reported shipments of gold and silver from these ports amounting to a million and a half of dollars annually from the first for the five years from 1822 to 1826, and to \$9,982,496 from the last named port for the years 1803 and 1804 ; and thereupon Mr. Danson, assuming that this treasure was necessarily produced in what constituted at the beginning of the century the southern provinces of the vice-royalty of Buenos Ayres, and at present the several States of the Argentine Republic, the republics of Paraguay and Uruguay, and the territory ceded to Brazil under the treaty of 1828, figures up an aggregate product for this part of South America of \$312,800,000 for the forty-five years ending with 1845, being an annual average of \$7,000,000 for the whole period. Bolivia in 1802 produced gold and silver to the value of \$4,200,000. It then constituted a part of Buenos Ayres, and it is stated by the author of New Spain that "the great mass of the precious metals supplied by the vice-royalty of Buenos Ayres is entirely derived from the most western part, the provincias de la Sierra, which in 1778 were separated from Peru." He then proceeds to designate the districts supplying the principal part of the metals, and they are all included within the present limits of Bolivia, which in 1778 was separated from Peru and attached to Buenos Ayres. That such a statement could be made by such a man as Humboldt, while at the same time the southern provinces were supplying twice the quantities of gold and silver that were furnished by Bolivia, that the mines

contributing this treasure should never be referred to by him, nor included in any of his estimates, is, to say the least, very improbable. Mines returning a product in 1803 and 1804 worth from six to seven millions of dollars a year could not have so completely escaped the attention of every statist that neither their locality nor their names can be specified, and there can be but little doubt that the treasure seeking a European market through the mouth of the river La Plata was obtained chiefly in the mines of Upper and Lower Peru.

Gold and silver in small quantities are known to exist in Paraguay, and mines of both metals are said to have been worked in Uruguay and the seven missions, the Banda Oriental of the Spaniards, and these would seek the port of Montevideo in passing into the market; but from all the information we can obtain in reference to the quantity furnished by these localities, we have some hesitancy in placing it as high even as half a million yearly. More valuable deposits of the precious metals are contained in the Argentine Confederation, in the States of Salta, Tucuman, Catamarca, La Rioja, San Juan, and Cordova; and, before the commencement of the revolutionary troubles, Salta and Tucuman had mines in operation, the machinery of which was generally destroyed during the war for independence, and the proprietors mostly banished on account of their adherence to the cause of Spain. The mines in the Famatina mountains, in the Sierra de Cordova, in San Juan and Catamarca, are just beginning as it were to assume some importance, and are represented as being very valuable. An estimate of half a million yearly for the States lying east of the Parana, for the whole period of sixty-four years, with a similar amount for the States lying west of the river, for the forty-four years ending with 1847, and \$1,500,000 for the twenty following years, will be sufficiently high. The proportion of gold to silver being probably about the same as in Bolivia, may be stated at \$75,000 annually, leaving \$425,000 for the silver product in Paraguay and Uruguay during the period from 1804 to 1868, and in the Argentine Confederation for the forty-four years, and \$225,000 gold and \$1,275,000 silver for the last twenty years; making for the western side \$4,500,000 gold and \$25,500,000 silver for the twenty years. The whole amount for Paraguay and Uruguay will be \$4,800,000 gold and \$27,200,000 silver, or \$32,000,000 of both metals, and \$7,800,000 gold and \$44,200,000 silver, or \$52,000,000 of both metals for the Argentine Confederation, amounting, on both sides of the river, to \$12,600,000 gold and \$71,400,000 silver, and \$84,000,000 of both metals, for the period from 1804 to 1868. The result may be stated as follows:

*Product of republics of Paraguay and Uruguay.*

Periods.	Gold.	Silver.	Amount of both metals.
1804 to 1848.....	\$3,300,000	\$18,700,000	\$22,000,000
1848 to 1868.....	1,500,000	8,500,000	10,000,000
1804 to 1868.....	4,800,000	27,200,000	32,000,000

*Product of the Argentine Confederation.*

Periods.	Gold.	Silver.	Amount of both metals.
1804 to 1848.....	\$3,300,000	\$18,700,000	\$22,000,000
1848 to 1868.....	4,500,000	25,500,000	30,000,000
1804 to 1868.....	7,800,000	44,200,000	52,000,000



In 1803 Chili produced 12,212 marcs of gold, of the value of \$1,780,000, and 29,700 marcs of silver, worth about \$280,000. Up to that date the country had produced, according to Humboldt, gold to the value of \$138,000,000, and, according to Chevalier, silver amounting in weight to about 680,000 pounds troy, worth about \$10,880,000, making a total value of precious metals of \$148,880,000.

The quantity of silver produced previous to the discovery of the rich mines of Copiapo, in 1832, was not very large. After that date it rapidly increased, and at present amounts to a yearly supply of about 300,000 lbs. Gold, on the other hand, has declined to half, or even less than half, the quantity produced at the commencement of the century. The coinage of the latter metal, for the twenty years from 1804 to 1823, amounted to \$12,214,892, and if the actual product be considered double the amount coined, the yearly average will stand at \$1,221,489, showing a decline of half a million yearly since 1803. Previous to 1826 the Chilian government prohibited the exportation of the precious metals without being coined, consequently, after that, the mint returns declined to a very small amount. Among the returns of the English consuls are annual accounts made up by the Chilian government of the gold and silver known to have been exported, coined and uncoined, for the eight years from 1834 to 1841. These accounts, it is stated, are confessedly made up on very defective information. They show an exportation of gold to the value of \$5,444,469, and of silver to the value of \$11,434,643. If we assume that one-half the amount of gold produced during the eight years came under official notice in such a way as to be included in these accounts, the actual product for the time mentioned was \$10,888,938, or \$1,361,117 yearly, an amount very nearly the same as the yearly average for the twenty years from 1804 to 1823. Half the sum of these averages is \$1,291,300. The annual product in 1800 is stated by Whitney at 7,500 pounds fine gold. In 1850 it is put at about 2,900 pounds. If the yearly decline is supposed to have been somewhat regular during the period of half a century, a mean of the two quantities would very nearly express the average annual production. Such a quantity would be 5,200 pounds, worth, being fine gold, \$1,289,600, very similar in amount, it will be seen, to the average number heretofore obtained, and we may take half the sum of the two numbers as the annual production of the period from 1804 to 1848, with some confidence that it cannot be far out of the way. A yearly supply of \$1,290,000 would, in forty-four years, produce \$56,760,000. Since 1835 the supply of gold appears to have been increasing, the product in 1850 being about 400 pounds more than in the former year. In 1865 Chevalier estimated it at 1,200 kilograms, equal to about 3,215 pounds troy, being an increase, since 1850, of about 300 pounds. An average of these several quantities is 3,057 pounds, equal in value to about \$758,000, which may be assumed as the average yield since 1848, producing for the twenty years \$15,160,000, and making for the sixty-four years a gold product of the value of \$71,920,000.

Mr. Danson has been quoted as placing the gold product of Chili at \$99,963,000 for the forty-five years ending with 1848; but by looking into the paper read by that gentleman before the Statistical Society of London, in 1850, it will be discovered that, in dealing with the accounts of treasure shipments from 1834 to 1841, furnished by the Chilian government, he inadvertently subjected quantities expressing the value of one metal to arithmetical processes intended for quantities representing the value of the other, producing an error in the result as to gold of nearly thirty millions of dollars. The amount that would have been obtained, according to his theory, had no error occurred in the calculation, is \$70,757,532. The result obtained for the silver product was \$38,555,205; but if the error just mentioned had not occurred, it would have been \$56,525,000, nearly twice the amount at which Chevalier estimated the product for nearly the same period. In 1803, we have already seen, the supply of silver amounted in value to \$280,000. In the twenty years from 1804 to 1823 the amount coined

was \$5,009,622, and if this be supposed to represent but two-thirds of the actual product, (a more liberal allowance for contraband than has heretofore been made for silver,) the quantity produced in the twenty years would amount to \$7,562,698, or an annual average of \$378,135, which being considered as the yearly product during the twenty-eight years from 1804 to 1832, when the mines of Copiapo were discovered, the whole product up to that date would be but \$10,587,780, and we may feel considerable assurance that this estimate is sufficiently high. From 1832 to 1845 we find the yearly product stated by Mr. Whitney and other authorities as averaging about 107,000 pounds troy, worth \$1,712,000, and producing, in the fourteen years, \$23,968,000. In the following two years the yield was something greater, and we may add for these \$3,474,672, making, with the supply from 1804 to 1832, \$38,030,459, being nearly the same result reached by Mr. Danson by a lucky miscalculation.

M. Chevalier estimated the amount of silver produced in Chili from 1804 to 1845, both inclusive, at 1,803,636 pounds troy, worth \$28,858,176. By adding the produce of 1846 and 1847, the value of the silver obtained in the forty-four years would, according to his estimate, amount to \$32,322,848, a sum \$5,697,611 less than has been obtained by the foregoing calculation; but the quantity herein estimated is only \$27,442,672 for the sixteen years from the opening of the mines of Copiapo, being an annual yield of \$1,715,000 during that period; and this does not appear an extraordinary production when it is considered that these are among the richest silver mines in the world, and that those of Potosi and Pasco, situated in a region of perpetual barrenness and desolation, more than 13,000 feet in elevation, produced for many years after their discovery a much larger quantity, and that the great Comstock mine in Nevada is producing a yearly supply ten times as great.

Mr. Whitney has put the produce of the Chilian mines for the eight years from 1846 to 1853 at 1,750,000 pounds, worth \$28,000,000, or an annual value of \$3,500,000; and Mr. J. Arthur Phillips, a mining engineer of Kensington, England, places the product of 1865 at 300,000 pounds, worth \$4,800,000.

In 1851 the export of silver in bars and ingots from the port of Caldera amounted to 3,030,874 ounces, worth \$3,788,593, and in ores of different degrees of purity, of from eight to seventy-three per cent., 2,312,829 pounds. In 1855, the export of silver and silver ores amounted to \$4,725,655. Since the last named date a railroad has been completed from Caldera to Copiapo, which it was expected would greatly reduce the expenses of mining, and lead to the exportation of some 300,000 tons of ore collected at the mines, which will yield from forty-eight to four hundred ounces of silver to the ton, but which had been thrown aside as too poor to pay the expenses of transportation. Increased activity in the mines has been apparent ever since the completion of the road, about 1858, and an annual average of \$4,500,000, for the twenty years since 1848, will not be too much. This will produce \$90,000,000, and the production for the sixty-four years may be stated thus:

	Gold.	Silver.	Both metals.
1804 to 1848.....	\$56,760,000	\$38,030,459	\$94,790,459
1848 to 1868.....	15,160,000	90,000,000	105,160,000
1804 to 1868.....	71,920,000	128,030,459	109,950,459
Previous to 1803.....	138,000,000	10,880,000	148,880,000
From opening of mines to 1868	209,920,000	138,910,459	348,830,459

New Granada, formerly constituting a part of the viceroyalty of that name, from 1819 to 1830 forming a part of the republic of Colombia, and at present under a reformed constitution, with its former provinces erected into confederated

states known as the "United States of Colombia," had contributed, according to Humboldt, up to 1803 a gold product of the value of \$275,000,000, obtained from washing the rich sands of the provinces of Antioquia, Choco, and Veraqua, in the valleys of the rivers Cauca and Atrato, and on the coast of Barbacoas. At present the precious metal is obtained by washings and by rock mining, several English companies operating in the latter branch on the river Porce. Chevalier, in 1847, made an estimate of the amount of gold produced in the country from the opening of the mines to 1810, and placed it at \$295,000,000, which is substantially the same as the estimate of Humboldt.

The latter, in his work on "New Spain," mentions the fraudulent exportation of gold from New Granada, under Spanish rule, as being quite extensive by the way of the Rio Atrato and the ports of Carthagena and Portobello; yet he allows but one-eighth of the whole for contraband, which might be regarded as rather too low an estimate, as he computed one-fifth of the whole for the silver of Potosi, a metal much less easily smuggled than the former on account of its less compendious character, and also because the illicit commerce from the Peruvian mines was mostly conducted over the mountains and solitary wilds of Brazil on the backs of llamas, while that of Granada found easy access to the frequent routes of trade. From 1789 to 1795 the coinage of the two mints at Bogota and Popayan amounted annually to \$2,095,000. In 1801 \$2,100,000 were coined, and an estimated amount of \$400,000 exported in ingots and wrought gold.

In this case it will be perceived that the amount exported uncoined was calculated at very nearly one-sixth of the whole. The actual product at the beginning of the century was reckoned at 20,500 mares, worth about \$3,000,000, of which 18,000 marks had passed through the mints. The product from 1810 to 1846 has been computed by Chevalier at \$81,500,000, and the annual yield at the latter date at 13,276 pounds troy, of the value of \$3,200,000. Allowing \$3,000,000 a year for the seven years from 1804 to 1810, and for the year 1847, we have for the forty-four years \$105,500,000; by Chevalier's estimate. Mr. Danson, by adopting the opinion of Duport in reference to the gold of Mexico, that the mint returns represent only three-eighths of the actual product, and upon information based upon the returns of the English consuls coming down to 1829, calculates the amount from 1804 to the end of 1848 at \$204,255,328, or nearly twice the quantity estimated by Chevalier, while the "New American Cyclopaedia" puts the annual product at from \$10,000,000 to \$12,000,000. None of these consular returns in reference to the gold and silver product of New Granada, of a later date than 1829, appears to have been published, and resort must be had to other data in endeavoring to estimate its amount. All authorities unite in representing the country as rich in gold, and capable of being made to yield a much larger annual tribute than it has ever yet done either under Spanish or native rule. Exclusive of the amount extracted by the English companies, most of the gold obtained in this as in other South American countries is the product of shallow washings, prosecuted chiefly by Indians and persons without capital, who depend mainly for their subsistence upon the quantities of the precious metals thus procured. Such a system of mining, while its aggregates may be comparatively small, will nevertheless be attended with considerable uniformity in the product from year to year, until the deposits become exhausted; a result which does not seem to have been reached in New Granada. As the annual supply in 1800, and also in 1846 and 1847, appears to have ranged from 12,600 to 13,276 pounds troy, worth from \$3,100,000 to \$3,300,000, according to the best information upon the subject we possess, and as the yearly coinage appears to have varied but little during the fourteen years of war, from 1810 to the defeat of the royal army in 1824, from what it had been during the ten peaceful years preceding the war, we may be justified in assuming that the product during the forty-four years differed but little from year to year,



or, if irregularities did sometimes take place, that they reciprocally balanced each other, and that a yearly average of \$3,200,000 would come as near the true amount as it is practicable now to ascertain it. We thus obtain, for the period from 1804 to 1847, both inclusive, \$140,800,000. As the country during the last twenty years has, upon the whole, been prosperous, undergoing slow but substantial improvement, we may increase the assumed average to \$3,400,000 for the period ending with 1867, and set down \$68,000,000 for that, which is very near the estimate of Chevalier for the same time. The product for the sixty-four years amounts to \$208,800,000.

Valuable silver mines are said to exist in New Granada, but it does not appear that they have ever been developed—at least, not to any great extent. Having no data at hand from which to compute the quantity of that metal produced, we adopt Mr. Danson's estimate of \$170,000 for the period from 1804 to 1847, and for the remaining period of twenty years that of M. Chevalier, of \$260,000 annually, producing \$5,200,000. The supply of silver during the sixty-four years will be \$5,370,000.

The treasure product of New Granada will then stand thus :

	Gold.	Silver.	Amount of both metals.
1804 to 1848.....	\$140,800,000	\$170,000	\$140,970,000
1848 to 1868.....	68,000,000	5,200,000	73,200,000
1804 to 1868.....	208,800,000	5,370,000	214,170,000
Previous to 1804.....	275,000,000	.....	275,000,000
Total.....	483,800,000	5,375,000	489,170,000

The remaining South American republics, Venezuela and Ecuador, have not hitherto furnished much gold or silver. In the sixteenth century gold was obtained in the first-named republic in quantities sufficient to lay the foundation of several opulent cities in the western departments, but in the seventeenth century the deposits had mostly become exhausted. Of late years new deposits have been discovered in the eastern borders of the republic, in the departments of Guayana and Cumana, and considerable quantities of gold are said to be obtained from the washings. Silver ores of great richness have recently been found in the mountains of Merida, south of lake Maracaibo, in quantities sufficient to insure a profitable return to capital invested in opening mines. So far, they do not appear to have been developed. Both metals also exist in Ecuador, and might be profitably mined if a more enterprising population had them in possession. The sands of the rivers of Guayaquil, and some of the affluents of the Amazon, contain grains and scales of gold, and the province of Oriente is represented as rich in both the precious metals; but the Indians, who are almost the only inhabitants and miners in these localities, habitually conceal from Europeans all knowledge of the mines.

When the comparatively unoccupied departments of these republics shall become settled by an energetic and industrious people, their annual supplies of these metals may amount to many millions of dollars. We estimate their products for the forty-four years at an annual supply of \$300,000, and for the

twenty years at half a million yearly. The supplies of Ecuador and Venezuela are presented as follows :

	Gold.	Silver.	Amount of both metals.
1804 to 1848 .....	\$13, 100, 000	\$100, 000	\$13, 200, 000
1848 to 1868 .....	8, 000, 000	2, 000, 000	10, 000, 000
1804 to 1868 .....	21, 100, 000	2, 100, 000	23, 200, 000

The only remaining political division of South America requiring notice on account of the quantities of treasure furnished to commerce is the empire of Brazil. The amount of gold produced in this empire from its discovery to 1803 was estimated by Humboldt, upon the authority mainly of the Abbe Raynal's "Political and Philosophical History of the European Settlements in the East and West Indies," published about 1778, at \$855,500,000. Chevalier has computed the amount, from the opening of the mines to 1845, at 3,576,192 pounds of pure gold, worth about \$886,895,616, which, reckoned up to 1803, would be some fifty millions less than Humboldt stated it. Since 1803 the annual gold production, according to Whitney and Chevalier, has been about \$2,000,000. The greatest yield of this political division was about the middle of the last century, when the annual supply varied from four millions to five and a half millions of dollars. At present the shallow washings appear to be nearly exhausted, and almost the entire supply is the product of the English companies mining in the solid rock. The silver produced in the empire is chiefly obtained by separation from gold, and may be estimated at about \$18,000 annually for the whole period of sixty-four years. The produce of the Brazilian mines is stated as follows :

	Gold.	Silver.	Amount of both metals.
1804 to 1848 .....	\$88, 000, 000	\$792, 000	\$88, 792, 000
1848 to 1868 .....	40, 000, 000	360, 000	40, 360, 000
	128, 000, 000	1, 152, 000	129, 152, 000
1500 to 1804 .....	855, 500, 000	.....	855, 500, 000
1500 to 1864 .....	983, 500, 000	1, 150, 000	984, 650, 000

The total product of the South American mines in gold and silver, from the discovery of the continent to January 1, 1868, is set forth in the following table. On page 346, volume 3, "New Spain," Black's translation, Humboldt has presented the annual produce of the mines of Hualgayoc, &c., from the year 1774 to 1802, amounting to 2,180,470 marcs of silver, which, at the estimated price of eight dollars and a half per marc, produces the sum of \$18,533,995. On footing up the values of the products of the several Peruvian mines, he puts, on page 415, the yield of these same mines, during the same time, at the value of \$185,339,900, which is inconsistent with the statement on page 346. As the figures are the same, the presumption is that they were erroneously pointed off. In the table below we adopt the correction as made by Mr. Danson, adding to the \$2,203,698,000 thus found Chevalier's estimate of \$10,880,000 as the silver product of the Chilian mines prior to 1803. In other respects Humboldt's computations are followed.

*Produce of the South American mines from the discovery of the continent to the end of the year 1867.*

	From the discovery of the continent to the end of the year 1863.		From 1864 to the end of 1867.		From 1848 to the end of 1867.		Total value of each metal since 1863.		Total value of both metals since 1863.
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	
Pertu .....			\$36,400,000	\$206,800,000	\$12,000,000	\$94,000,000	\$38,400,000	\$300,000,000	\$339,300,000
Bolivia .....			19,614,430	117,789,215	8,930,000	56,000,000	28,534,430	173,789,000	202,323,430
Paraguay .....			3,300,000	18,700,000	1,500,000	8,500,000	4,800,000	27,200,000	32,000,000
Argentine Confederation .....	\$414,000,000	\$2,214,578,000	3,300,000	18,700,000	4,500,000	25,500,000	7,800,000	44,200,000	52,000,000
Chili .....			56,760,000	38,030,459	15,160,000	90,000,000	71,920,000	132,030,459	139,930,459
New Granada .....			140,800,000	170,000	68,000,000	3,200,000	208,800,000	3,370,000	214,170,000
Ecuador and Venezuela .....	855,500,000		13,100,000	100,000	8,000,000	2,000,000	21,100,000	2,100,000	23,200,000
Brazil .....			88,000,000	732,000	40,000,000	360,000	138,000,000	1,152,000	139,152,000
Total .....	1,263,500,000	2,214,578,000	351,274,430	401,081,674	158,080,000	281,560,000	509,354,430	682,641,459	1,191,995,889

Total amount of gold from 1492 to 1862, \$1,778,854,430; silver, \$2,897,219,459; both metals, \$4,676,073,889.  
Gold product from 1864 to 1868, \$509,354,430; silver product, \$682,641,674; both metals, \$1,192,000,000.

*The present annual product of the several divisions of South America may be computed as follows:*

	Gold.	Silver.
Pertu .....	\$5,000,000	\$600,000
Bolivia .....	2,800,000	450,000
New Granada .....	260,000	3,400,000
Chili .....	4,500,000	750,000
Brazil .....	18,000	2,000,000
Paraguay and Uruguay .....	425,000	75,000
Argentine Confederation .....	1,275,000	925,000
Ecuador and Venezuela .....	100,000	400,000
Total .....	14,378,000	7,900,000



Having passed over the several divisions of the American continent, and endeavored to describe the metalliferous character of each, and its contributions to the world's wealth in the precious metals, the result may be stated as follows:

*Product of the whole American continent from its discovery, in 1492, to the commencement of 1868, a period of 376 years.*

	Produce of the mines from 1492 to 1804.		From 1804 to 1848.		From 1848 to 1868.		Total value of each metal from 1492 to 1868.		Total value of both metals from 1492 to 1868.
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	
United States.....					\$1,015,000,000	\$100,000,000	\$1,040,000,000	\$100,000,000	\$1,140,000,000
Mexico.....	\$79,000,000	\$1,948,952,000	62,000,000	\$672,500,000	50,000,000	420,000,000	191,000,000	3,041,452,000	3,232,452,000
South America.....	1,269,500,000	2,214,578,000	351,274,430	401,081,674	158,080,000	281,560,000	1,778,854,430	2,897,219,459	4,676,073,889
British America.....					37,000,000	1,000,000	37,000,000	1,000,000	38,000,000
Central America.....			8,800,000	4,400,000	5,000,000	3,000,000	13,800,000	7,400,000	21,200,000
Totals.....	1,348,500,000	4,163,530,000	447,074,430	1,077,981,674	1,265,080,000	805,560,000	3,060,654,430	6,047,071,459	9,107,725,889

Amount of both metals prior to 1804..... \$5,512,030,000  
 Amount of both metals since 1804..... 3,595,696,104

Difference..... 1,916,334,000

Average annual gold product from 1804 to 1848..... \$10,160,782  
 Average annual gold product from 1848 to 1868..... 63,254,000  
 Average annual silver product from 1804 to 1848..... 24,590,000  
 Average annual silver product from 1848 to 1868..... 40,278,000

Product from 1804 to 1848, (both metals).....	\$1, 525, 056, 104
Excess of silver over gold .....	630, 907, 244
Produced from 1848 to 1868, (both metals).....	2, 070, 640, 000
Excess of gold over silver .....	459, 520, 000
Gold product in the sixty-four years.....	1, 712, 154, 430
Silver product in the sixty-four years.....	1, 883, 541, 674
Excess of silver in the sixty-four years.....	171, 387, 244
Amount of both metals in sixty-four years.....	3, 595, 696, 104
Gold product from 1804 to 1868 .....	1, 712, 154, 430
Gold product prior to 1804 (311 years) .....	1, 348, 500, 000
Excess in the sixty-four years .....	363, 654, 430
Gold product from 1848 to 1868.....	1, 265, 080, 000
Difference between this product and that of 311 years prior to 1804.....	\$3, 420, 000

From the above table it appears that during the 20 years just closed there has been produced in North and South America an amount of gold only \$83,420,000 less than the whole quantity computed by Humboldt as the product of the American mines for a period of 311 years prior to 1804.

Of the \$1,265,080,000 produced in the 20 years \$1,015,000,000 were obtained in the United States, and \$250,000,000 in other portions of the American continent; the United States producing, as it appears, four-fifths of the gold furnished by the whole continent during the last 20 years.

The quantity of silver supplied during the same time was \$805,560,000, of which the United States have, within the last seven years, contributed \$100,000,000.

It will be observed that the quantity of gold supplied during the last 64 years is greater by \$363,654,430 than the total amount of gold contributed during the 311 years previous to 1804, and that the amount of gold and silver furnished since 1804 is equal to nearly two-thirds of the total of both metals produced previous to that date.

The amount of gold and silver contributed during the last 20 years is \$545,583,896 greater than the quantity obtained during the 44 previous years.

The total product of the whole American continent from its first discovery in 1492 to the commencement of 1868, of both metals, amounts to \$9,107,725,889, or, in round numbers, \$9,108,000,000.

Average and annual product for the whole continent during the 44 years.....	\$34, 660, 366
During the last 20 years.....	103, 532, 000
During the last 64 years .....	56, 182, 752

The product of the whole continent for the year 1868 may, from present indications, be estimated as follows:

	Gold.	Silver.	Both metals.
United States .....	\$60, 000, 000	\$20, 000, 000	\$80, 000, 000
Mexico.....	3, 000, 000	26, 000, 000	19, 000, 000
South America .....	7, 900, 000	14, 378, 000	22, 278, 000
British America .....	3, 500, 000		3, 500, 000
Central America.....	300, 000	200, 000	500, 000
Total .....	74, 700, 000	60, 578, 000	135, 278, 000

From this it will be seen that at the present day the United States furnishes four-fifths of the gold and one-third of the silver product of the American continent, and more than four-sevenths of the annual supply of the precious metals from North and South America.

## EUROPE.

The European continent, which during the middle ages furnished the principal supplies of the precious metals, contributed, during the 16th century, an annual amount of less than one million of dollars.

During the succeeding century, under the stimulus imparted by the extraordinary productiveness of the American mines, those of Europe returned an average yield of about a million and a half, increased in the eighteenth century to four millions, after which they began to decline, and at the commencement of the present century produced about three millions two hundred and thirty thousand dollars.

The amount of gold produced in Europe at the present day is but little over two millions of dollars. The supply of silver has, however, considerably increased of late years, owing to improvements in the process of separating it from lead, and the European product of that metal may now be estimated at something over eight millions.

Great Britain, at the time of the Roman conquest, must have furnished considerable quantities of gold, and even at the present day small quantities are obtained at the mines at Merionethshire, Wales, the value of which, since 1860, may amount to about \$250,000; in 1865 it amounted to 1,664 ounces of gold, equal in value to about \$33,000, and this amount is not likely to be much increased in any future year. It is, however, by working its mines of argentiferous galena that Great Britain contributes most to the stock of the precious metals; the silver thus obtained amounting, in 1852, to 818,325 ounces, worth \$1,091,104.

In 1865 the supply from this source was 724,856 ounces, troy, worth \$966,474. Since the beginning of 1856 the quantity of silver separated from lead ores in the United Kingdom amounts to about seven and a half millions of troy ounces, worth over nine millions of dollars.

France has no gold mines of any value. The sands of the Rhine contain small quantities of the precious metal, and formerly it is thought produced considerable gold. Washings in certain localities are still carried on, and in 1846 the amount obtained in this way was about \$9,000. Its silver lead mines are of more importance, and in 1865 produced 18,000 pounds of silver of the value of \$288,000.

Spain has been celebrated for its mines of both the precious metals from the earliest ages, and the Phenicians laid them under heavy tribute several centuries before the commencement of the Christian era. The Romans, and afterwards the Moors, continued to work them, and gold was obtained not only from washing the sands of the Duro, the Tagus, and other rivers, but also by mining in the solid rock. The amount of that metal contributed by Spain at the present day is very small, not exceeding \$10,000 annually. Of silver it furnishes a more liberal supply, chiefly obtained from its mines of argentiferous galena, amounting in late years annually to over one hundred thousand pounds, worth over \$1,600,000.

The most important mines are those of Hien dela encina, which have produced since 1846, 7,717,000 English ounces of silver, worth about \$10,000,000. These are so rich in silver near the surface that the galena often yielded from 130 to 180 ounces to the ton. They have been worked to a depth of 1,200 feet, the yield of silver appearing to decline with the depth of the mine.

That gold was found in Scandinavia at a very early period seems evident from an examination of the implements taken from numerous Scandinavian tumuli of very remote ages, which are preserved and arranged in the museum at Copenhagen, among which are swords, daggers, knives, and other edged instruments, the blades of which are made of gold or copper, with an edge of iron, formed for the purpose of cutting; the profuse application of copper and gold, contrasted with the parsimony used in the expenditure of iron, seeming to prove that gold and copper were much more abundant than iron among the unknown people



who raised the tumuli. But at the present day the silver mines at Kongsberg, in Norway, and the silver lead mines of Sala, in Westmannia, Sweden, are the only Scandinavian mines of any importance. The first have been worked regularly since 1624, and from that date to the present time have yielded 1,840,000 pounds of fine silver, worth twenty-nine and a half millions of dollars. For the last thirty years the annual produce has been \$254,000, and the net profit \$158,000. The Swedish mines at this day yield rather less than 3,000 pounds of silver, worth \$45,000. Of late years the Scandinavian mines have very much declined in value.

The Austrian empire furnishes annually of the precious metals a quantity valued at from two to three millions of dollars. The provinces most productive are Transylvania, Hungary, the Banat and Bohemia. Saltzburg, Tyrol, and Styria formerly produced considerable quantities of gold and silver, but the yield of these provinces has declined until their annual produce is insignificant. The principal mines of Hungary are those of Schemnitz, Kremnitz, and Neusohl, employing about 15,000 miners, and producing large quantities of the precious as well as of the useful metals. Those of Schemnitz were opened in 745, and of Kremnitz in 770, and with temporary interruptions have been carried on to the present time. The ores are auro-argentiferous, and are treated with great scientific skill, the results of centuries of experience. They are not of a very productive character, but owing to the extensive scale upon which mining operations are conducted, the eminent engineering and metallurgical skill employed, connected with a rigid system of economy, the mines are still profitably worked, and have enriched their successive proprietors for more than a thousand years. The extensive adit level to drain the Schemnitz mines, commenced in 1782, was about two-thirds completed in 1850, at an expense of about \$200 per fathom. This work is to be ten miles long, and will cut the veins at a depth of 1,380 feet. Mines of gold and silver occur on the western border of Transylvania, near the towns of Nagybanya, Kapnik, and Felsobanya, and also at Zalathua. The ancient works at these mines are on a gigantic scale, but the yield of the precious metals is much less than it was several hundred years ago. The Transylvania mines produce the rare and interesting combination of gold and tellurium. The mines of the Banat are found in a narrow gorge made by the waters of the Danube, forcing a passage through the Carpathian mountains. The ores are principally argentiferous copper, yielding about 120 ounces of silver to the ton, together with a little gold. The mines of Hungary, Transylvania, and the Banat yield annually about 5,400 pounds of gold, worth \$1,215,000. The other provinces of the Austrian empire yield, perhaps, 100 pounds more, worth from \$22,000 to \$23,000. Hungary, Transylvania, Bohemia, and the Banat furnish yearly over 90,000 pounds of silver, worth about a million and a half of dollars. That produced in the provinces of Tyrol, Saltzburg and Styria is so trifling in quantity that no estimate is attempted. Yet these provinces, anciently a part of the Italian province of Illyria, lying in the region of the Noric Alps, poured out such a copious stream of gold two thousand years ago that its great quantity, according to Strabo, caused a decrease of one-third in its price throughout all Italy, and induced the proprietors to employ fewer workmen in order to raise its value again; and Pliny relates that the Roman senate, in order to restrain the excessive production of the precious metals and the consequent fall in their value, limited the number of slaves allowed to work in the mines to 5,000. So rich in gold at that day, and for many centuries afterwards, was the part of the Austrian empire now under consideration, and portions of northern Italy, that the precious metal was found partly in large grains upon the surface and partly in mines, so pure that and eighth part only was lost by the process of smelting and refining. Near Brixen, in the Tyrol, were mines which, as late as 1525 produced 52,000 pounds of silver when that metal was six times as valuable as it is now. These mines were the El Dorado of the sixteenth century, and with those of Hungary,

Saxony, Bohemia, the Hartz mountains, and the Spanish peninsula, furnished the supplies of the precious metals during the middle ages. But the mines of Brixen are exhausted, and those of the Noric Alps have long since ceased to exercise a disturbing influence on prices by the teeming abundance of their treasures. Tyrol and Saltzburg yield at the present day but trifling quantities of gold and silver.

The total annual product of the Austrian empire in both the precious metals may be set down at an average value of \$2,700,000.

Since its incorporation of the kingdom of Hanover, of Saxony, and the duchy of Nassau, Prussia furnishes more silver than any other state in Europe. The amount of gold furnished is very small, consisting of a few pounds obtained in the Hartz and from washing the sands of the Rhine and other rivers in Germany, not exceeding in all ten pounds.

The Erz Gebirge mountains, dividing Saxony from Bohemia, have been the scene of mining operations ever since the tenth century.

The mines of Freiberg, on the Saxony side of the mountains, were opened about the close of the twelfth century, and since 1524 have yielded about 7,000,000 pounds troy of silver, worth \$112,000,000. More than nine hundred veins are said to exist in this mining district, interesting as affording one of the finest examples of silver veins retaining their character for richness at great depths, many of them being now worked at a depth of nearly 1,400 feet, while the quantities of silver obtained are constantly increasing. Many other silver mines are found in Saxony, but those of Freiberg are the most important. The annual product is about 80,000 pounds, equal in value to \$1,280,000, of which the Freiberg mines produce nine-tenths. Another very interesting district is found in the Hartz mountains, principally belonging to Hanover and Brunswick, and since 1866 constituting a part of Prussia. The principal mines are those of Clausthal, Andreasberg, and Rammelsberg. Operations commenced in the last district A. D. 968, and in the others during the sixteenth and seventeenth centuries. The business connected with these mines gives employment to about 60,000 persons. The Andreasberg mines are the most productive, and have been the most extensively wrought. The great Sampson vein has been worked to the depth of 2,580 feet, being the deepest mine now in operation in the world. At the depth of 2,160 feet one of the finest accumulations of ore ever met with was struck, and the works have been carried down 420 feet further without any considerable change in the richness of the ore. The mines are carried on profitably, not so much on account of the quality of the ore (which is argentiferous galena) as the highly improved system upon which all mining operations are conducted. The vein system is of great complexity, and the metalliferous combinations of great variety, their successful treatment presenting examples of the highest achievements yet attained in chemical and metallurgical science. The annual production of silver from the Hartz mines is 27,000 pounds, valued at \$432,000.

From five to ten pounds of gold are annually obtained by separation, worth from \$1,200 to \$2,500.

The galena of the upper Hartz contains generally from thirteen to twenty-three ounces of silver to the ton.

The little duchy of Nassau, of only eighty-two German square miles in extent, has several hundred mines in operation, of which thirty are of argentiferous lead, some of which have been mined since 1158, and produce about 2,500 pounds of silver annually.

In the province of Silesia are similar ores, which have been mined near Tarnowitz since 1526. In the Rhenish provinces, near Coblenz, Siegen, and Aix la Chapelle, the same kind of mines have recently been opened, which appear to promise well, the ores of several yielding 80 ounces of silver to the ton.

The silver of Prussia is mostly the product of such ores, and in Silesia, the

Rhenish provinces, and the duchy of Nassau the annual supply is 70,000 pounds or more, equal in value to \$1,120,000. The product of the whole kingdom, as recently enlarged, including the supplies of Saxony and the Hartz, is 180,000 or 190,000 pounds, equal in value from \$2,880,000 to \$3,000,000.

Italy has furnished the precious metals from very early times. The sands of the rivers descending from the Pennine and Leopontine Alps were washed for gold before the founding of Rome, and still continue to contribute small quantities. The most important mines now in operation are in Piedmont, which in 1844 yielded only about 560 pounds of gold, worth about \$130,000. English and French companies have recently undertaken the working of some of these mines with very encouraging results, we are informed in a late excellent work on "The Mines and Metallurgy of Gold and Silver," by J. Arthur Phillips, of Kensington, England; and the probabilities are that the product is much greater now than in 1844.

The silver furnished by Italy is mostly obtained from its argentiferous lead mines found in Piedmont, Sardinia, Tuscany, and other provinces, amounting annually of recent years to about 30,000 pounds, and is worth nearly half a million of dollars.

If the results of recent mining enterprises in the Italian states have been as successful as there is reason to hope they have been, they must at the present day contribute a supply of gold and silver equal to the value of about \$750,000.

Small quantities of gold or silver, or of both metals, are obtained in European Russia, or so much of that empire as lies west of the Ural mountains, in Turkey in Europe, in Greece, and in Switzerland, sometimes by washing the nearly exhausted sand of some of the rivers of these countries, occasionally by rock mining conducted on a very limited scale, and, more frequently, as a product of the silver-lead mines. The quantities thus obtained in many localities are separately of small amount, but in the aggregate become important, and help to swell the supply of Europe to an amount varying at different times, but averaging, of late years, about 8,000 pounds of gold and 500,000 pounds of silver, equal in value in round numbers to about \$10,000,000.

The product of Europe in the precious metals appears to have reached its lowest point for several centuries about 1830. In 1800 it furnished 5,300 mares of gold, equal to 3,485 pounds troy, and 215,200 French marcs of silver, equal to 141,150 pounds. In 1830 the amount of silver obtained was about the same, but the supply of gold had declined to 3,500 mares, or about two-thirds the quantity produced in 1800. In 1850 the gold product had increased to over 5,000 pounds, and in 1860 to about 6,000 or 6,500 pounds, and at the present time it must be between two and three thousand pounds more. From 1830 to 1850 the yield of silver in Europe increased about 250,000 pounds, since which last date it has probably increased 100,000 pounds more. This has been partly the result of the discovery of valuable mines in Spain in 1843, the increasing richness of the ore of the Freiberg mines in Saxony, and of the improvements introduced by Pattison's process of dissilvering lead.

The additional quantities of gold now obtained are due entirely to improved systems of mining and drainage, and not to the discovery of new deposits. Some of the Austrian mines which are still profitably worked yield only four parts in 1,000,000 of the stamp-work, and in Italy some of the mines yield only 8 pennyweight of gold to the ton.

At the Russian mines at Beresov the stamped ore returns only from .0013 to .00208 per cent. of gold.

#### ASIA.

Previous to the discovery of gold in California and Australia the Russian empire contributed the principal supplies of that metal from its mines in the eastern slopes of the Ural mountains, in Siberia, and in the Caucasus. The



mines of the Ural were discovered in the middle of the last century, and operations commenced at Beresov in 1752 by mining in the solid rock. These mines are still continued, although their yield is very small, and in 1850 was less than one hundred pounds. Towards the close of the last century their product was from six hundred to eight hundred pounds of gold annually. Fifty years ago there were sixty-six localities in the Ural where mining operations were carried on, most of which are now abandoned. Even in those now existing the percentage of gold is very small, and it is only from the combined causes of low wages and skilful management that they can be profitably worked; and such is the perfection of the apparatus employed of late years that the amount of gold is increasing, notwithstanding the poverty of the veins.

The large quantities of gold furnished by Russia during the last forty years have not, however, been obtained from these mines, but from washing the auriferous sands of Siberia in the valleys of the Ob, the Irtysh, and the Yenisei, and the rivers descending from the Ural, commenced in this last locality in 1814, in western Siberia in 1829, and in the east in 1838, carried on partly by the government and partly by individuals upon paying a progressive tax, amounting, in some cases, to thirty and thirty-five per cent. on the gross product, independent of other special taxes. The total amount of gold obtained from the Russian washings, from their commencement in 1814 to this date, is about 1,880,000 pounds, troy, and the amount furnished by rock mining from 1752 to the present about 130,000 pounds, making an entire product of about 2,000,000 pounds of gold, worth from \$450,000,000 to \$500,000,000.

The silver of Russia is obtained from silver ores, argentiferous galena, copper, and by separation from native gold. Silver mines are found in the Altai mountains, in the valley of the Ob, which, from the beginning of the last century to 1855 had produced nearly 3,000,000 pounds of that metal, containing 100,000 pounds of gold, worth over \$70,000,000. The annual produce of the Altai mining district in silver at the last-named date was 45,000 pounds, since which it has gradually declined. Another mining district lies in the province of Irkutsk, southeast of Lake Baikal, in the valley of the Amoor, which in 1771 yielded 27,600 pounds of silver. Mines of argentiferous galena have been opened in the Yablonoi mountains, between the valleys of the Amoor and the Lena, which in 1865 yielded 21,000 pounds of silver.

Veins of similar ores have recently been explored in the Caucasus, in the country of the Kirghises, in the Ural mountains, and in the valley of the Don.

The present product of Russia in silver is probably about 80,000 pounds, and of the value of \$1,280,000.

The total value of Russian silver since 1810 appears to be about \$45,000,000. The annual product at the present is about \$15,000,000 of gold and \$1,000,000 of silver, making a total of \$16,000,000 as the value of both metals.

Previous to 1800 the Russian mines had not yielded an annual amount of over \$200,000, and about the time of the opening of the deposit mines in 1814, those of Beresov had declined to \$65,000. After this period there was a progressive increase until 1847. In 1826 the yield was \$2,578,000; in 1830, \$3,485,000; in 1840, \$5,800,000; and in 1847, \$18,200,000. Since the last-named period there has been an apparent decline, the yield since 1854, and for several years previous, having been \$15,000,000.

The Russian authorities ascribe the falling off to the exhaustion of the deposits and the unskilfulness of those in the business.

The metalliferous districts of Russia are of immense extent, and are doubtless capable of contributing much more copious supplies of the precious metals than have yet been reported from the mines. It is said the Emperor Alexander, in that spirit of wisdom which has already so eminently distinguished his reign, intends making a large deduction in the duties imposed on the produce of private mines, and at the same time will throw open the Crown mines and washings to

the public; and there can be no doubt that such a policy would result in a very considerable increase in the supplies of gold and silver from Russia.

A certain amount of gold annually enters the commerce of western nations from Asia and Africa, but the amount thus obtained is rather a matter of conjecture than of reliable information.

Both China and Japan are known to contain gold, and it is asserted the deposits are very extensive. Sir R. Murchison states that the Chinese have ceased working their mines, according to certain theories of political economy. In the seventeenth century the palace of the Emperor of Japan and the houses of the chief nobility, it is represented, were literally covered with gold; and the Dutch in sixty years' trade are said to have carried away from \$125,000,000 to \$250,000,000. But so little is known of the internal affairs of that empire that no attempt has been made to estimate its product of the precious metals. The relation between gold and silver, in 1857, was stated by Mr. Harris, United States consul at Simoda, Japan, to be that of 1 to  $3\frac{1}{2}$ , the relation between them in Europe and America being, at the time, as 1 to 15.

The sands of the rivers of Thibet, of the Burmese empire, of India beyond the Ganges, of the Maylay peninsula, the island of Borneo, of the Celebes and Philippine islands, are well known to be auriferous, and some of them have been celebrated from remote ages for their golden treasure. Sir James Brooke states that 5,000 persons, mostly Chinese, wash from the sands on the western coast of Borneo \$5,000,000 annually. The washings of the Burrampooter were estimated by Jacob, in 1830, to amount to from \$600,000 to \$700,000 annually. Various estimates have been made of the amount of gold annually obtained from southern Asia and the Eastern archipelago. Mr. Whitney, in his very useful work, "The Metallic Wealth of the United States," stated the amount at 25,000 pounds annually, or about \$5,600,000.

Africa, though supposed to be one of the richest gold countries of the world, has, since the Christian era, contributed comparatively little to the commerce of civilized nations. In Kordofan, on the White Nile, the natives obtain gold by washing the auriferous earth in wooden bowls, which they store in quills of the vulture and pass it into the hands of the traders. The gold of Sannar and Abyssinia occurs in the form of scales and grains in quartz enclosed in granite, gneiss, and slates. That of Nubia is of a deep yellow color and remarkably pure. The sands of Mozambique, on the southeast coast, near the Tropic of Cancer, are also washed by the natives, and a portion of the gold obtained annually reaches the English colony at Cape Town. But probably the richest gold district is in the Bambouk country, south of the Senegal river, where the soil is represented as so auriferous that every cubic foot contains gold in the shape of lumps, grains, and spangles. It is washed by the natives and given to the Moors in exchange for salt.

Birkmyre has estimated the annual amount of gold furnished by Africa at 4,000 pounds, and this has generally been adopted by subsequent writers. As it is all obtained by washing, and is of great purity, it may be valued at \$1,000,000.

All attempts to develop the gold mines of Africa by civilized nations have hitherto failed. The Portuguese, tempted by the rich mines of Bambouk, took possession of the country in the fifteenth century; but the ruins of the Portuguese forts and houses are all that remain of their temporary occupancy. At present the climate, even more than the hostility of the natives, seems to bid defiance to every effort on the part of Europeans to work these mines.

This sketch of the countries furnishing the supplies of the precious metals at the present day will be concluded by a notice of one of the most important gold producing countries of modern times.

In the spring of 1851 gold was discovered in Australia by a returned California miner, and a rush for the unwrought placers immediately commenced by crowds of miners from all quarters of the world.



The island of Australia, embracing an area of about 3,000,000 square miles, nearly equalling the whole continent of Europe in extent, includes the colonies of Victoria, New South Wales, South Australia, Queensland, and West Australia. Victoria has produced much the largest quantity of the gold exported from the island since 1851, having furnished thirty-three and a half millions out of a total product of 38,260,000 troy ounces, the balance being chiefly supplied by New South Wales and South Australia.

So exceedingly rich in gold were the placers of Australia, that in the very year of its discovery more than five and a half millions of dollars' worth of the precious metal was exported; in the following year the export amounted to fifty-six and a quarter millions, and in 1853 to more than sixty-one millions of dollars, an amount which has not since been equalled in any one year.

The colony of Victoria lies in the southeast part of the island, and has an area of 87,000 square miles, being somewhat larger than the State of Minnesota. Its gold-bearing strata belong to the lower palæozoic or silurian age, consisting chiefly of schistose and slaty rocks, accompanied by quartzose and micaceous substances, and cover a surface estimated at not less than 30,000 square miles. In geological series they correspond with the auriferous rocks of the Ural mountains, and appear to belong to a much earlier epoch than those of California.

In Australia, as in California, gold is obtained either from shallow placers, deep diggings, or veins of auriferous quartz; and more recently it has been found in the clay-stone itself, and bands of gold quartz have been discovered in dikes of diorite which intersect upper silurian or lower devonian rocks.

The present product of Victoria is about 1,500,000 ounces, that of New South Wales 32,000, and South Australia and Queensland 50,000, making a present annual product for the whole of Australia of 1,870,000 troy ounces.

The gold of Australia being of great purity, averaging about  $\frac{960}{1000}$  or about twenty-three carats fine, may be estimated at the price of \$20 per ounce, making the present yearly product worth \$37,400,000.

Quartz mining is being successfully prosecuted.

In the latter part of 1857 the existence of gold in Otago, one of the provinces of New Zealand, was made known. At different times from that period up to 1862 further evidences of its existence were discovered, and numbers of miners had commenced washings on the western coast of Nelson, and several companies were organized for working quartz veins.

In February, 1862, two California miners started on a prospecting tour up Molyneux river, and in three months brought into Dunedin eighty-seven pounds of gold, and received from the provisional government a bonus of £2,000 for making known the locality from which it had been obtained.

New deposits are found from time to time, the island having already exported 3,240,000 ounces, which, if of equal purity with the gold of Australia, may be estimated at the value of \$64,800,000.

The present annual product of New Zealand is about 497,000 ounces, equal in value to about \$9,900,000.

The money value of the gold product of Australia and New Zealand may be stated in round numbers at \$47,000,000.

The silver furnished by these islands is obtained by separation from native gold, and amounts to 9,000 pounds per annum, worth \$144,000.

New Zealand contains an area of 95,500 square miles, and is nearly of the same size as the State of Oregon. Its auriferous veins and drifts are numerous and extensive, and promise an abundant supply of the precious metals for many years to come.

The gold thus far obtained has been mainly procured from shallow places and deep diggings in the alluvions. Much of it is produced by sluice washing. The



geological age of the auriferous drifts of New Zealand has not been fully determined.

In 1830, Mr. William Jacob estimated the total amount of gold and silver produced by the continent of Europe, by Asiatic Russia and certain parts of northern Africa, from 1492 to the end of 1829, at 162,000,000 pounds sterling. Mr. William Newmarch, in the sixth volume of Tooke's "History of Prices," published in 1857, computes the product of the same, from 1492 to 1803, at £80,000,000 of gold, equal to \$388,800,000; and £60,000,000 of silver, equal to \$291,000,000; and from 1492 to 1848 at £170,000,000 of gold, equal to \$826,200,000; and £90,000,000 of silver, equal to \$437,400,000.

Adopting the estimates of Mr. Newmarch up to the year 1848, we compute as the product of the twenty years since that date, for Europe, an annual average of \$2,000,000 gold and \$7,000,000 silver; or for the whole period \$40,000,000 gold and \$140,000,000 silver, making a total of \$180,000,000 of both metals. For the Russian empire \$15,000,000 gold and \$1,000,000 silver yearly, or \$300,000,000 of the first, and \$20,000,000 of the second, for the whole time, being a total of \$320,000,000 of gold and silver.

The product of Australia and New Zealand we compute at \$890,000,000 gold and \$5,500,000 silver for the sixteen years since the first discovery of gold in Australia, making a total of \$895,500,000 of gold and silver.

The amount of gold received by western nations from Asia and Africa during the last twenty years, or any preceding period, cannot be ascertained with any approximation even to certainty. That a certain quantity is received, perhaps variable in amount from year to year, there can be no question, but both the amount produced and the proportion received in Europe and America are so much matters of conjecture that it is thought better not to include these countries in the following table. Chevalier computed the product of Asia, excluding Russia and Turkey, in 1848, at \$4,400,000 silver, and \$13,700,000 gold; and that of Africa at \$2,700,000. In 1865 he computes the yield of India to have been \$5,500,000; the Philippine and Sandwich Islands, \$17,200,000 gold; China, \$17,911,000 gold, and \$13,300,000 silver; and Japan, \$7,500,000 gold, and \$8,800,000 silver; and the product of Africa at \$6,800,000 gold. If we take an average of these figures for Asia and Africa respectively for the product of the last twenty years, we obtain about \$600,000,000 for the gold of Asia, and \$240,000,000 as its silver product; and about \$100,000,000 for the gold of Africa. This would add \$700,000,000 more to the value of the present supply of gold in all countries, and \$940,000,000 to the world's wealth in both metals.

These estimates of Chevalier of the produce of gold and silver in Asia and Africa differ widely from those of Jacob and Birkmyre, but agree very nearly with those of M. Otreschkoff, a Russian author, who computed the gold and silver product of Asia, (exclusive of Russia,) and the islands of the Southeastern Archipelago, for the four years ending with 1854, at a yearly average of \$22,900,000, and that of Africa at \$2,800,000. Very little reliance, however, can be placed upon any of these estimates; and besides, whatever the mines of these countries may yield, the product has comparatively little influence on the markets of the civilized world.

The estimates of Newmarch for the European continent from 1492 to 1848, embraced in the following table, include the product of Asiatic Russia, and the gold dust of certain parts of northern Africa, supposed to have found its way into Europe:

*Product of gold and silver from 1492 to the commencement of 1868 in America, Europe, Asiatic Russia, Australia, New Zealand, and portions of Northern Africa.*

	Produce of the mines from 1492 to 1804.		Produce of the mines from 1804 to 1848.		Produce of the mines from 1848 to 1868.		Amount of each metal from 1492 to 1868.		Total amount of both metals from 1492 to 1868.
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	
America.....	\$1,348,500,000	\$4,163,530,000	\$447,074,430	\$1,077,981,674	\$1,265,080,000	\$805,560,000	\$3,069,654,430	\$6,047,735,459	\$9,107,725,889
Europe and Asiatic Russia .....	388,800,000	291,600,000	437,400,000	145,800,000	340,000,000	160,000,000	1,166,200,000	597,400,000	1,763,600,000
Australia and New Zealand .....	.....	.....	.....	.....	890,000,000	5,500,000	890,000,000	5,500,000	895,500,000
Existing in Europe in 1492 .....	1,737,350,000	4,455,130,000	884,474,430	1,223,781,674	2,495,080,000	971,060,000	5,116,854,430	6,649,971,459	11,766,825,889
	60,000,000	140,000,000	.....	.....	.....	.....	60,000,000	140,000,000	200,000,000

The precious metals existing in Europe at the date of the discovery of America have been computed as amounting to \$50,000,000 gold, and \$140,000,000 silver, which if added to the totals as stated in the above table will produce \$5,176,854,430 gold, \$6,789,971,459 silver, and \$11,966,825,889 in both metals, as the amount of gold and silver in use among civilized nations since 1492. If to these aggregates we add the somewhat conjectural product of Africa and central and southern Asia for the last twenty years, we obtain as a grand total, \$5,876,854,430 gold, \$7,029,971,459 silver, and \$12,906,825,889 as the amount of both metals appropriated to the uses of mankind during the last 376 years.

Amount of gold produced from 1804 to 1868.....	\$3, 379, 554, 430
Amount of silver produced from 1804 to 1868.....	2, 194, 851, 674
Amount of both metals produced from 1804 to 1868.....	<u>5, 574, 406, 104</u>
Amount of gold extracted up to 1848 .....	\$2, 621, 774, 430
Amount of silver extracted up to 1848.....	<u>5, 678, 911, 674</u>
Amount of both metals extracted up to 1848.....	<u><u>8, 300, 686, 104</u></u>

It will be seen from the preceding tables that of the gold taken from the mines of the western nations from 1492 to 1868, America furnished three-fifths, and of the silver more than ten-elevenths of the whole; that from 1804 to 1848, the Old World furnished nearly as much gold as the New, but less than one-seventh as much silver; that from 1848 to 1868 the American continent furnished more gold than Europe and the Russian empire, and Australia, and New Zealand, and nearly four times as much as Europe and Asiatic Russia together; that of the \$2,495,080,000 gold produced from 1848 to 1868, the United States contributed nearly one-half, and the United States and Australia together nearly the four-fifths of the whole.

The present annual supply of the American continent, Europe, Russia, Australia and New Zealand, may be computed as follows :

	Gold.	Silver.	Both metals.
America.....	\$74, 700, 000	\$60, 578, 000	\$135, 278, 000
Europe.....	2, 000, 000	8, 000, 000	10, 000, 000
Russia .....	15, 000, 000	1, 000, 000	16, 000, 000
Australia and New Zealand	47, 000, 000	200, 000	47, 200, 000
Total.....	<u>138, 700, 000</u>	<u>69, 778, 000</u>	<u>208, 478, 000</u>

Of the whole amount of gold contributed at the present day by civilized nations, the United States contributes nearly one-half, and of the whole product of silver nearly one-third.

It appears that since 1492 there has been taken from the mines of civilized countries a total product of gold and silver amounting to about twelve billions of dollars. How much of this mass of precious metal is now existing? How much is in the form of coin, in manufactured articles, and what proportion has perished entirely? These are highly interesting questions, but cannot be fully discussed in this paper without extending it much beyond its intended length.

Mr. Jacob, in 1830, estimated that of the amount of gold and silver extracted from the mines of America and Europe up to that date, \$940,186,000 had perished from abrasion, fires, shipwreck and other losses; \$2,674,000,000 had been converted into articles other than coin, and \$2,126,000,000 had been exported into eastern Asia, leaving a balance of coined money in circulation in Europe and America of \$1,516,800,000.

Mr. Newmarch places the quantity of gold furnished by America, Europe, including Russia, and certain parts of northern Africa, from 1492 to 1848, at £603,000,000 sterling, or \$2,930,580,000, and the quantity of silver at £1,170,000,000 sterling, or \$5,686,200,000, and the amount of both metals produced up to 1848 as equal to \$8,616,780,000. This is about \$300,000,000 more gold than has been computed in this paper, and arises from the fact that Mr. Newmarch has in the main, as to the American yield, adopted the estimates



of Mr. Danson, who not only reckoned the quantities of gold in Mexico and South America passing into the market without being returned to the mint as equal to five-eighths of the whole product, (rather an extreme estimate for practical adoption,) but appears to have been led into several errors in reference to the gold of Chili and that produced by the countries bordering on the river De La Plata, as already pointed out.

Of the whole amount produced, and including the \$60,000,000 gold and \$140,000,000 silver supposed to have been existing in Europe at the time of the discovery of America, Mr. Newmarch computes that \$267,300,000 of the gold product and \$1,934,280,000 of the silver product had disappeared from Europe and America during the 356 years from the discovery to the year 1848, by wear and tear, and casualties on the stock of these metals in use on both sides of the Atlantic, and by transportation to Asia, after allowing for partial redux from Asia at various periods, leaving as the quantity existing in Europe and America in 1848, in various forms, gold \$2,721,600,000, silver \$3,888,000,000, amounting to \$6,609,600,000.

The loss on both metals amounted to \$2,201,580,000, according to Mr. Newmarch, which is about \$865,000,000 less than had been computed by Mr. Jacob for such loss from 1492 to 1830.

Albert Gallatin, former Secretary of the United States Treasury, in 1831 estimated the amount still existing in Europe and America in the form of coin and manufactured articles at \$4,500,000,000, gold and silver—a sum about \$300,000,000 greater than that computed by Mr. Jacob for the same period; and as the product from 1830 to 1848 of the mines of America and Europe, including Russia, did not exceed \$1,000,000,000, it is doubtful whether at the latter period, the mass of the two metals in coin and manufactured articles amounted to \$6,000,000,000.

Upon an examination of the very careful inquiries instituted by Mr. Jacob as to the exportation of the precious metals and disappearance by abrasion and other casualties, the allowance made by Mr. Newmarch for losses under these heads appears too small.

As, however, great accuracy in such investigations may be unattainable, an average of the different computations will be adopted, and six billions of dollars is assumed as the quantity of gold and silver remaining in America and Europe in 1848, of which \$1,900,000,000 may be set down as gold, and \$4,100,000,000 as silver, existing either in the form of coin or other articles.

From 1848 to 1868 the quantity of gold produced was equal to \$2,495,080,000, and that of silver to \$971,060,000, making a total of \$3,466,140,000.

During the twenty years the process of destruction was reducing the mass remaining in 1848, as well as the accumulating stock, not only by wear and tear, but by shipwrecks, by consumption in gold and silver leaf, gold lace and thread gilding, gold-foil used by dentists, and other contingencies.

The loss by abrasion, or wear and tear, as it is called, would act principally on the metal in circulation as coin, the quantity of which existing in 1848, and from that period to the present day, must be to a certain extent a matter of conjecture. Jacob computed the amount in Europe and America in 1830 at \$1,516,000,000; while Storch estimated the quantity circulating in Europe alone at \$1,600,000,000, and Gallatin supposed from \$1,500,000,000 to \$1,800,000,000 in use on both sides of the Atlantic in 1831. We will suppose that of the mass of metal remaining in 1848 \$2,000,000,000 were used as currency, and the residue as plate, jewels, and other manufactured articles; and that of the two billions about \$600,000,000 were in gold, and \$1,400,000,000 in silver coin. A loss of one-half of one per cent. per annum on the silver currency, and one-fifth of one per cent. on the gold, would amount to an annual loss of \$8,200,000. It is a moderate calculation to compute the loss on the new

product at an average of \$1,800,000 a year, making a total of \$10,000,000, annually disappearing from abrasion, shipwrecks, and other accidents.

The loss of metal by gilding by the fluid process, by gold and silver leaf, in the manufacture of gold lace and thread and gold-foil used by dentists, is very considerable at the present day, and it will be quite within the truth to compute it at \$5,000,000 a year since 1848. We thus obtain a total loss of \$300,000,000 for the twenty years ending with 1867. During the same period there were exported from European ports to China, Japan, and the East Indies, gold coin and bullion to the value of \$129,000,000, and silver amounting to \$818,000,000.

The shipment of gold and silver from the port of San Francisco, direct to China and Japan, has greatly increased of late years, and since the beginning of 1864 has averaged over \$6,000,000 annually. The amount exported from that port since 1848 is equal to \$70,000,000, of which about \$30,000,000 were gold. In addition to these outlets to eastern Asia there has passed into China, overland through Siberia, an amount of silver equal to at least \$27,000,000; making as a total export to the east, silver \$885,000,000, gold \$159,000,000. Silver coins wear away by handling about four times as rapidly as gold coins; but on the other hand gold is perhaps more extensively employed in those manufactures from which very inconsiderable quantities of the metal can be recovered after use, as in gold lace and leaf, gold thread, fluid gilding, and foil used by dentists. And as gold has been more extensively produced during the last twenty years than silver, its liability to loss at sea in passing to European ports would be proportionately greater. Of the \$15,000,000 computed as an annual loss, we may estimate that upon gold as equal to \$5,000,000, and that of silver at \$10,000,000, making a total upon gold of \$100,000,000, and upon silver of \$200,000,000.

The metal supposed to be on hand in 1848, with the new product accumulating since that date, would stand as follows:

Gold, \$4,395,000,000; silver, \$5,071,000,000; from which there must now be deducted for exportation of gold \$159,000,000; for other losses on gold stock \$100,000,000; for exportation of silver \$885,000,000; other losses on silver \$200,000,000; or \$259,000,000 on account of gold, and \$1,085,000,000 on account of silver; leaving on hand on the first of January, 1868, among the civilized nations of Europe and America, a supply of gold in various forms equal to \$4,136,000,000, and of silver \$3,986,000,000, or a total of both metals of \$8,122,000,000, which the gold received from northern Africa during the twenty years may increase to \$8,200,000,000, and put the supply of gold about \$200,000,000 in excess of that of silver, a circumstance not heretofore witnessed for a period of three centuries.

If these calculations are approximately correct, (and it would be much more easy to prove that the estimate of eight billions is rather over than under the quantity actually existing at the present day,) it follows that the increase of the stock of gold and silver remaining in Europe and America since 1848 has been at the rate of one and eighty-three one-hundredths of one per cent. per annum; gold having increased at the rate of six per cent., while silver declined at the rate of four and one-sixth; and this, notwithstanding the mines returned a yearly product of more than \$173,000,000. The great avenue for the escape of such an immense treasure has been the eastern trade, exacting from the commerce of the west an annual tribute of about \$70,000,000. After meeting this demand and repairing the losses herein computed at the low estimate of \$15,000,000 a year, there has remained for the use of civilized nations a yearly product of about \$88,000,000, or about twice the value of the treasure yielded by the mines of Europe and America at the beginning of the century, when their population, business transactions, amount of exchanges, external and internal commerce, and various other industries were at least fifty per cent. less expanded than they are at present, and the demand for the precious metals still more limited.



McCullough estimated the consumption of precious metals in Europe and America in 1830, in works of art, at \$21,670,000 annually, while Jacob computed the annual consumption at \$27,767,000; which the *Encyclopedia Britannica* thinks too low an estimate even in 1830, and computes the consumption in 1858 at about \$60,000,000 annually, in Europe, America and Australia. It estimates the loss from wear and tear, from consumption in gold lace, gold leaf, gilding, electrotyping, dentistry, shipwrecks, fires, from remelting and other casualties, as equal to \$35,000,000 a year, and puts the increasing demand for coin, on account of increase of population, extension of commerce, increase of wealth and various industrial enterprises, at an annual amount of \$50,000,000. If these computations were correct ten years ago, they may be increased somewhat at this day, because wealth and population have both increased to an unusual extent in most civilized countries within the last ten years.

Another cause creating a demand for gold at the present day is to be found in the disposition of mankind in times of civil commotion to convert a portion of their wealth into forms most convenient for concealment or hoarding, and there is little doubt that the threatening aspect of political affairs in Europe for the last few years has led to large quantities of gold being disposed of in that way.

Many apprehensions have been indulged for some years lest the great increase in the supply of gold since the discovery of the new mines of California and Australia should so enhance the prices of other articles as to effect injuriously the interests and the welfare of large classes of people; but whoever will consider carefully the many circumstances tending to counteract such effects must become assured that there is but little cause for alarm.

So long as the mines of Europe and Ural mountains can be profitably worked there is certainly no cause to think that gold has experienced much of a decline in value. Most of these mines consist of ores of so low a grade that it would be impossible to work them at all, if the value of the product should undergo any change for the worse; but if all mines returning only ten per cent. profit upon capital invested were compelled to suspend by a decline in the value of gold to such a percentage, the effect would be to diminish the supply and prevent a further decline.

A decline in its value even so much as ten per cent. would unquestionably increase the demand for articles manufactured of gold, and would require much more than ten per cent. upon the quantity previously manufactured, to meet the demand. And should prices of other articles experience a rise; should the farmer, the manufacturer, the mechanic and the laborer, receive an apparently increased compensation, the result would be increased production, traffic and wealth, and as a consequence increased consumption of the precious metals in articles of use and ornament.

It may readily be admitted that an increased supply of any article, whether of money or anything else, other things remaining the same, will be attended with a decline in its price or value, but it by no means follows that an increased supply will of itself lead to such a result. An abundant supply of the precious metals, or what is nearly the same thing, an abundant supply of money, has a tendency to stimulate enterprise, to enlarge commerce, to open new routes of trade, and to foster and extend almost every branch of industry, all of which require larger quantities of money. The spirit of the age is vastly different now from what it was in 1550 or 1570, when the treasure from the New World caused a rise of prices throughout Europe. It required nearly a century for the nations of Europe to adapt themselves to the change, but when the spirit of improvement was once fully aroused, no subsequent increase in the volume of the precious metals, although much greater than before, was attended with like results. The impetus imparted to trade, to enterprises at home and abroad, by the silver of America, was such as to cause the demand for gold and silver to keep pace with the supply, and to increase with it, and there is little doubt that whatever



may be the produce of gold in the future, the spirit of the age is such, that the mass will be rapidly appropriated and the demand keep pace with the supply.

Respectfully submitted :

JOS. S. WILSON,

*Commissioner of the General Land Office.*

Hon. O. H. BROWNING,

*Secretary of the Interior.*

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*Paper accompanying the annual report for 1867 of the Commissioner of the General Land Office.*

#### REMARKS ON USEFUL MINERALS.

At the close of the eighteenth century there were a few scattered mines of several of the useful metals in different parts of the country. Copper ores were worked in Connecticut, New Jersey, and Pennsylvania the copper deposits of Lake Superior having been known to the Jesuits. Lead had been mined on the upper Mississippi by Dubuque, a Frenchman, whose name, now borne by a flourishing northwestern city, the site of which, then within the ancient province of Louisiana, still marks the locality of his operations. A lead mine in Wythe county, southwestern Virginia, was successfully worked and is still productive. The only coal mines were on the James river, near Richmond, Virginia, their extent and value then but little appreciated. Of iron, our production was so crippled by the preponderating imports from England that there was no knowledge of the immense extent and value of our own extensive deposits. A few small blast furnaces worked bog oars, and some bloomeries in New York and New Jersey made bar iron direct from the rich magnetic ores.

The growth of these great interests in the present century forms an interesting and instructive chapter in the history of social progress. With the advancing settlements of the country, there has been disclosed an endowment of mineral resources transcending those of all other parts of the world, so far as known. These represent a dynamic force and a commercial value which indicate a future expansion of all kinds of industrial movements to which nothing in the past furnishes any parallel. The methods of utilizing these stores of undeveloped wealth are becoming more effective and perfect with the advancement of science and the demands of manufacturing and commercial movements. Since 1830, the mineral resources of most of the States have been investigated by scientific boards of survey. These researches have been of immense value in defining the boundaries of the different geological areas, and thus in limiting and directing explorations for mineral deposits. There is, however, a wide margin of knowledge yet to be explored before the highest results of mining enterprise can be attained. A generous zeal for the cultivation of those important branches has been evoked, and institutions have been established in different parts of our country for their advancement and diffusion. The general government has been liberal in the landed endowment of these literary enterprises, which have also been liberally aided by the different States, and patronized by the energetic and far-seeing business intelligence of the country. It is here proposed to present some details as to the production of several of the most useful minerals.

*Iron.*—During our dependency upon Great Britain, colonial enterprise was restricted to the production of pig iron. This was the result of that policy by which England aimed to make other countries mere producers of raw material, the elaboration of which, in the higher processes of art, was to be reserved for her skilled industry. This relation, so far as American iron production was

concerned, was temporarily broken by the revolutionary war, which compelled our people to improvise the manufacture of malleable iron by rude methods ascertained by hasty original experiment. The cessation of the war practically restored the old system of manufacturing dependence. The experience, skill, and moneyed resources of British iron production were too powerful for a partially organized and imperfect industrial system, and we began to ship ores to England in exchange for manufactured iron. Fluctuations of prices in Europe, and capricious periodical changes in our own tariffs on foreign imports, have alternately elevated and depressed our iron production. It has, however, advanced, on the whole, to a very healthy development and commanding position.

In 1810 this country produced 54,000 tons; in the commercial collapse of 1820 the aggregate declined to 20,000 tons; in 1830 it had arisen to 165,000 tons, and in 1840 to 315,000 tons; in 1842, under the operation of the declining duties of the "compromise tariff," it had fallen to 230,000 tons; under the combined influence of enhanced protective duties and high prices in England, caused by the sudden expansion of railway construction, it had arisen, according to the estimate of Hon. R. J. Walker, Secretary of the Treasury, to 765,000 tons; it rose to 800,000 tons in 1848, and fell to 650,000 tons in 1849, continuing to fall until 1852, when the entire product did not exceed 500,000 tons; in 1855 it had arisen to 1,000,000 tons, an aggregate which it nearly or quite maintained up to 1860. During our late difficulties the production of pig iron arose to 1,300,000 tons. Of manufactured iron in 1864 we produced 283,560 tons of railroad bars, with a capacity of increase to 700,000 tons per annum. With the close of the war, however, this enhanced production again declined. But underneath all these fluctuations it is gratifying to observe a permanent expansion of the iron interest of the country, based upon foundations which no changes in tariffs, and no combinations of foreign labor and capital, can shake.

The principal ores from which iron is manufactured in the United States are hematites, magnetic and specular ores, red oxides from the secondary rocks, and the carbonates. More than three-fourths of American iron is from the first three, of which hematites are the favorites, constituting the most valuable of the deposits worked in the United States. The greatest range of this class of ores embraces the palæozoic formation of the valley between the Alleghany and Blue Ridge, from northern Alabama and Georgia; through Virginia, Tennessee, New Jersey, and New York, to Canada.

Magnetic ore contains a larger proportion of metal; in fact, it is the richest of iron ores. It is largely used in manufacturing malleable iron by the ancient process, direct from the ore, in the open forge. Mixed with the hematite its accompanying silica compensates an important defect in that ore. The especial range of these ores is the great azoic belt encircling the Appalachian chain, spreading out in the various localities to a considerable width. In North Carolina are found extensive deposits of this ore in the mountains, the densely timbered slopes of which furnish abundant materials for making charcoal for smelting. In Virginia, Maryland and Pennsylvania the scope of magnetic ores is limited. In New Jersey and New York they exist in massive deposits exceeding in availability those of any other iron region in the world, and requiring much less labor to extract them. They are accompanied by coal and limestone, superior in quality and inexhaustible in quantity. The brown hematites found in close proximity furnish an excellent admixture with these more refractory magnetics. The pig iron produced in this region in 1864 amounted to 318,500 tons. The most remarkable development of these ores is found in Sterling mountain, within thirty-two miles of New York city, equalling the Iron mountains of Missouri in extent and richness of deposit. The azoic belt of Lake Superior is the great iron region of the globe. Though yet undeveloped, it furnishes in the single county of Marquette, in the upper peninsula of Michigan, one-eighth of the iron produced in the United States. The iron trade of this region has advanced from an export of 1,445 tons in 1855, to 235,123 tons in



1864. The facilities for making charcoal there favor an extended production of fine malleable iron, while the inexhaustible supply of coal will supply fuel for the cheaper kinds of iron production. The red oxides of the secondary rocks are mostly the red fossiliferous and oolitic ores of the lower silurian, cropping out in Pennsylvania, Maryland, and East Tennessee, and from Oneida county, New York, westward though Canada to Wisconsin. These oxides, with specular ores, form those great mineral masses, Iron mountain and Pilot Knob, in Missouri, which, by a singularly persistent error, are still designated as magnetic. Iron mountain, rising 228 feet above a base of 500 acres, presents a cone of 230,000,000 tons. It is thought that every foot beneath its base level will yield an average of 3,000,000 tons; at a depth of 180 feet the artesian auger is still penetrating solid iron ore. Pilot Knob, the base of which, 581 feet beneath the summit, is an area of 360 square miles, is known to be solid ore to a depth of 440 feet below the surface. The upper section of 141 feet perpendicular thickness contains 14,000,000 tons of ore. Shepherd's mountain, one mile west of Pilot Knob, is a mass of very pure magnetic and specular ore, rising to a height of 660 feet. Iron ore has been found in thirty-six counties in Missouri; mining of all kinds, however, is comparatively in its infancy in this region.

The only carbonates of practical importance in this country are the silicious and argillaceous ores of the coal measures found near Lake Superior with hematites, the deficiency of which in silicious matter they supply in smelting together, and similar ores of purer character among the tertiary clays of the western shore of Chesapeake bay.

The census of 1860 presents an aggregate of 402 establishments making malleable iron, with a capital of \$23,343,073, using raw material valued at \$21,961,437, and paying \$7,436,538 to 22,014 hands. The products of the year amounted to \$36,537,259, affording a profit of \$7,140,284, or 30 per cent. upon the capital. Of cast-iron manufactures there were 1,405 establishments; capital, \$24,368,243; cost of raw material consumed, \$15,524,619; cost of labor, \$10,328,722; hands employed, 26,961; value of annual product, \$36,537,259; profits, \$10,683,918, or nearly 44 per cent. on the capital.

*Copper.*—The great copper mining districts of the world are found mostly in two distinct geological positions: First, the older crystalline rocks, and in the metamorphic palæozoic. Second, in the strata between the coal measures and the lias formations. The mines of Cornwall, Australia, and Lake Superior belong to the former, and those of Mansfeldt, in Prussia, and Ural, in Russia, to the latter.

Copper in this country occurs in a native state, and in a variety of combinations with other substances. The workable ores are chiefly copper pyrites, vitreous copper, variegated copper, red oxide, green carbonate, or malachite, and chrysocolla. The first named, though containing the smallest per cent. of metal, has yielded a greater net product than all the other ores together. Vitreous copper, a sulphuret known as glance copper, is not often found in large quantity.

Variegated or purple copper, and the red oxide, are also limited in supply. Malachite is a highly ornamental greenstone found in copper mines, resembling chrysocolla in appearance.

The first mines worked in the United States produced very rich ores, mostly vitreous and variegated copper, with occasional masses of malachite. These were mostly along the line of junction between the red sandstone and the gneiss and granite rocks in Connecticut and New Jersey. These have been abandoned on account of the exhaustion of their deposits.

Mr. J. D. Whitney\* classes the copper districts of the United States as follows:

1. Lake Superior copper region, yielding native copper in true veins, in trappean rocks and associated conglomerates and sandstones of the lower silurian age. These are now extensively worked.

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\*Author of "Metallic Wealth of the United-States."



2. Copper deposits of the Mississippi valley, yielding ores, chiefly pyritous, in the lower silurian rocks. These are not now worked to any extent.

3. Cupriferous deposits of the Atlantic States, embracing copper-bearing veins of the metamorphic palæozoic age in the Appalachian chain; deposits in the new red sandstone, occurring in Connecticut and New Jersey, and now abandoned; and veins traversing the new red sandstone and the older metaphoric rocks in Chester and Montgomery counties, Pennsylvania, and extensively worked.

Of these the Lake Superior mines are immeasurably the richest. Previous to the opening of St. Mary's canal, no exact records were kept of the copper shipped from this region. Up to the close of 1854, the aggregate production is estimated at 7,642 tons of pure copper. The subsequent annual shipments, up to 1860, are as follows:

1855.....	4,544 tons.
1856.....	5,357 "
1857.....	6,094 "
1858.....	5,896 "
1859.....	6,041 "
1860.....	8,543 "

The substitution of bituminous coal for wood has greatly cheapened the process of smelting, while freights have declined at least twenty-five per cent., thus materially lessening the cost of bringing the metal into market.

Copper mining is prosecuted in different localities represented under the third head of Whitney's classification as above. From Virginia the copper ores sent eastward over the Virginia and Tennessee railroad increased from 1,931,403 pounds in 1855, to 3,679,673 pounds in 1860. Considerable quantities are also produced in New Hampshire, Vermont, New York, and Tennessee.

Copper manufactures, in 1860, were represented by 90 establishments, in all branches above the extraction of ore from the mine, employing a capital of \$4,752,550. The cost of the raw material used was \$7,631 598, and the cost of labor, paid to 1,639 hands, was \$655,256. The profit was \$1,245,536, or 27 per cent. on the capital.

*Lead.*—Mr. Whitney arranges our lead-bearing veins and deposits into two grand divisions: 1. Those of the Atlantic States; and 2. Those of the Mississippi valley.

In the first grand division the mines lowest in the geologic series are found in the azoic formation in St. Lawrence county, New York, in the vicinity of Rossie. The veins are transverse, cutting the gneiss rock in nearly vertical lines. The ore is galena, generally free from zinc and iron, but intercalated with calcareous spar. In the belt of metamorphic palæozoic rocks flanking the Appalachian chain on the east and cropping out in numerous localities, especially in New England, are considerable deposits of galena more or less argentiferous and always associated with blende, copper and iron pyrites. The veins are usually parallel to the dip of formations and of the segregated class, though often of large development, forming powerful and well-marked lodes. They have failed to be profitable on account of being mixed with too great a proportion of other substances, the manipulation of which requires greater expenditure of capital and skill than has yet been secured. In the unaltered lower silurian rocks of New York are some apparently irregular deposits not very extensive, recently worked to a limited degree.

The lead regions of the Mississippi valley are divided into two districts: 1. Upper Mississippi; 2. Missouri.

In the former the deposits consist of non-argentiferous galena, in irregular and gash veins, in the lower silurian limestone. These are found principally in Wisconsin, yet extending into Illinois and Iowa, including an area of 2,880 square miles. The galena is remarkably pure, with a rare occurrence of car-

bonates, phosphates, or other oxidized combinations. It is found in masses commonly called "gravel mineral" or "float mineral" in the latest alluvial strata, or deposited in vertical rock fissures or in horizontal flat sheets. These deposits are not sufficient to warrant very extensive machinery or great outlay of capital. Their superficial location, however, does not demand any such elaborate working. The lead production of this region has probably reached its maximum.

The lead mines of Missouri being in nearly the same geological position as those of the upper Mississippi, are mostly of a similar character. As late as 1848 our exports of lead exceeded our imports. Since that time the tide has turned, the imports exceeding the exports \$1,102,825 in 1852, and \$2,613,000 in 1859.

The manufactures of lead as disclosed in the census reports of 1860 were carried on by fourteen establishments with a capital of \$1,739,963, consuming raw material valued at \$2,679,453, and paying for labor to 346 operatives \$103,056. The product of the last year's operations was valued at \$3,166,029, affording a profit of \$382,520, or twenty-two per cent. on the capital.

*Zinc.*—While the lead product of the United States has been decreasing, the zinc product has been steadily increasing for fifteen years. Its ores are extensively distributed through the United States and in great abundance, but as yet have scarcely begun to be worked. A variety of ores are worked for zinc; among these is the sulphuret of zinc or blende, called by the Cornish miners black jack. It is associated with the ores of lead, copper, and tin, and in some mines it constitutes the prevailing ore. The long roasting process necessary to free the metal from sulphur has caused it to be neglected. It lies in immense heaps about many lead mines, awaiting the discovery of some more speedy and economical process of reduction. In England it has become an article of commerce within the last few years, and in France there are five establishments working the same. Red oxide of zinc, found principally in New Jersey, owes its color to the presence of oxide of manganese, as the artificial oxide of zinc is always white when pure. It is found at Franklin and Sterling mechanically mixed with franklinite and associated with calcareous spar. A mass of it weighing 16,400 pounds was exhibited at the Crystal Palace in London. Electric calamine, or the silicate of the oxide of zinc, and other silicates of the metal with smithsonite, or the carbonate of zinc, are found in Pennsylvania, New Jersey, New York, and Tennessee.

Very pure ores of these kinds also exist in Arkansas, imbedded in red ferruginous clay among the magnesian limestones. As a general truth, in the older rocks zinc is mostly associated with the more valuable metals, especially silver and copper. The ores found in such geological positions being sulphurets, are not particularly valuable. The carbonates and silicates, of much greater value, occur generally in calcareous or dolomitic rocks, forming part of or associated with the carboniferous system. These deposits are sometimes in beds intercalated in the strata or disposed in irregular masses occupying depressions in them.

In New Jersey and New York the sulphuret is found associated with galena, copper pyrites, iron pyrites, and crystallized quartz. Zinc is found in abundance in the mines in the western lead region. The silicates and the sulphurets are frequently met with, especially in Wisconsin and Missouri. The manufacture of zinc from these ores against foreign competition is not profitable by the present processes.

According to Whitney, the world's production of zinc in 1853 was as follows :

Russia, (including Poland).....	4, 000 tons, or 7.3 per cent.
Great Britain.....	1, 000 tons, or 1.8 per cent.
Belgium.....	15, 000 tons, or 27.3 per cent.

Prussia .....	32,000 tons, or 58.2 per cent.
Austria .....	1,500 tons, or 2.7 per cent.
United States .....	1,500 tons, or 2.7 per cent.
Total .....	55,000 tons, or 100 per cent.

The production of zinc in this country in the following year was estimated as high as 5,000 or 6,000 tons. A single company in New Jersey took from two beds in Stirling Hill, between 1854 and 1860, 30,000 tons of ore. In the Saucon valley, Lehigh county, Pennsylvania, 5,000 tons were mined during 1860. Zinc paint, the white oxide, is extensively manufactured in this country. The manufacture of this and other oxides, in 1860, employed five establishments with a capital of \$2,228,000, consuming raw material valued at \$233,690, paying to 241 hands \$87,720, and producing articles valued at \$476,860. This leaves a profit of \$157,450, or seven per cent. on the capital invested, a remarkable disparity with other branches of manufacture.

*Platinum.*—Traces of this metal have been found in the lead and copper ores of Lancaster county, Pennsylvania, but no grains of the native metal have been discovered north of North Carolina, where a single grain was obtained in Rutherford county, in gold washings. This grain weighed 2.541 grains troy, and had a specific gravity of 18. In California it is found associated with gold, and very frequently rejected by the miners through ignorance of its value. The native gold received at the United States mint at Philadelphia from California in 1852 contained traces of platina, but not enough to pay for detaching it. Gold received from Oregon in 1863 contained an appreciable percentage of platina. In 1850 there were imported 34,000 ounces, worth, at \$6 10 per ounce, \$20,740.

*Iridium and osmium.*—An alloy of these metals, called iridosmine, is found associated with native platina. Near Port Orford, to the north of Rogue river, iridium appears associated with gold to the amount of fifteen per cent. Still further north, between Cape Blanco and Coquille, there exists an alloy composed of fifteen per cent. of iridium and five per cent. of platinum. Between Randolph and Cape Arago thin metallic scales have been found, composed of seventy per cent. of iridium and six per cent. of platinum. It is used in manufacturing nibs of gold pens, and has ranged as high as \$250 per ounce.

*Mercury.*—No deposits of this metal are known east of the Mississippi river. In California, its red sulphuret, called cinnabar, was first discovered on the south side of the valley of San José, about sixty miles southeast of San Francisco. It had been used by the Indians on account of the bright vermilion color it afforded as a pigment to ornament their persons. The Mexicans first worked it to extract gold and silver. In 1850, a company of Mexicans and English engaged vigorously in the extraction and metallurgical treatment of this ore, giving to their mine the name of New Almaden. In eight years they had mined 20,000,000 pounds of cinnabar, and had realized an annual profit of more than \$1,000,000, when, in 1858, their proceedings were arrested by injunction from the United States court, on the ground of invalid title. The American parties who succeeded to the ownership extended their discoveries in the same range of hills. In December, 1858, they opened a new mine called Eurequita, the production of which has increased to the utmost limit of their reducing apparatus. The product of these mines in the five years ending with 1858 amounted to 13,318,350 pounds. The ore is found in connection with sedimentary strata, composed of alternating beds of argillaceous shales and layers of flint, tilted at a high angle and much flexed in rocks in close proximity to the tertiary formations. Some writers locate these deposits as high up in the geologic series as the miocene or middle tertiary.

*Cobalt.*—The oxide of this metal is sought after in order to give brilliant



colorings to glass. The great demand for this article is from the British manufactories of porcelain and stained glass. The ores of cobalt are generally combinations with arsenic, sulphur, nickel, and iron. The chief of these, arsenical cobalt, was obtained at Chatham, Connecticut, as far back as 1787. Pyritous cobalt is found in Maryland, in North Carolina, and Missouri.

*Nickel*.—Metallic nickel, according to Whitney, is confined exclusively to bodies of extra-terrestrial origin, commonly called meteoric iron. These masses often contain a nickel alloy amounting to five or ten per cent. on the whole. It forms several combinations. The principal depository of its ores in this country is at Chatham, Connecticut, where, associated with cobalt, it is found in veins traversing gneiss and mica slate. It also exists in company with copper ores at an old mine lately reopened in Lancaster county, Pennsylvania. This mine in 1859 was producing nickel ore at the rate of two hundred tons per months. A pyritous ore is also found at Mine La Motte, in Missouri.

*Coal*.—The known deposits of coal in the United States transcend in extent and richness those of all the residue of the world combined. The areas of the different coal-fields, as estimated by Daddow and Bannan, in their work on "Coal, Iron, and Oil," published in 1866, are represented in the following table :

Names of the principal coal-producing countries.	Territorial area.	Coal area.	Workable coal area.	Proportion of coal area to territorial area.	Relative workable coal areas.	Tons of annual production.	Tons of estimated coal deposits.
	<i>Sq. miles.</i>	<i>Sq. m's.</i>	<i>Sq. m's.</i>				
Russia in Europe.....	2,095,000		100	1.20000	1		
Spain.....	177,781	4,000	200	1.1000	2		
Belgium.....	11,314	520	510	1.22	5	10,000,000	30,000,000,000
Austria.....	257,830	2,000	800	1.322	8	5,000,000	46,000,000,000
France.....	203,736	2,000	1,000	1.200	10	10,000,000	57,690,000,000
Arcadia.....	100,000	18,000	2,200	1.45	22	500,000	42,240,000,000
Great Britain.....	121,000	12,000	6,195			90,000,000	144,000,000,000
Australia.....	3,120,000	100,000	15,000			250,000	288,000,000,000
Total outside United States..	6,086,660	138,520	26,005	1.234	258	115,750,000	607,930,000,000
U. S., (not including our late acquisition from Russia)....	3,000,000	500,000	200,000	1.15	2,000	22,000,000	3,740,000,000,000

In 1845 our coal area was stated at 133,000 square miles. It is now known to be over 200,000 square miles, or eight times the known available coal area of all the rest of the globe. The specific areas of the American coal-fields are estimated as follows :

	Square miles.
Massachusetts and Rhode Island .....	300
Pennsylvania—anthracite 4,700, bituminous 12,656 .....	13,126
Maryland.....	500
West Virginia.....	15,000
East Virginia .....	225
North Carolina .....	45
Tennessee .....	3,700
Georgia .....	170
Alabama .....	4,300
Kentucky .....	13,700
Ohio.....	12,000
Indiana .....	7,700
Illinois .....	44,000
Michigan .....	13,000
Iowa .....	24,000
Missouri.....	21,000
Nebraska.....	4,000

	Square miles.
Kansas.....	12,000
Arkansas.....	12,000
Indian territory.....	10,000
Texas.....	3,000
Oregon—anthracite 100, bituminous 500.....	600
Washington Territory.....	750
West of the Rocky mountains.....	5,000

\* Total.....220,166

In addition to the above it is supposed that adjacent to the Rocky mountains there are some 200,000 square miles of lignites, tertiary, and other inferior coals. Another estimate arranges the areas within the ancient Appalachian basin as follows :

	Areas. Square miles.	Length. Miles.	Max. breadth. Miles.
Alleghany or Eastern basin.....	55,000	875	180
Great Middle basin.....	50,000	370	200
Northwestern basin and Michigan.....	75,000	550	200
Western or Rocky Mountain basin.....	20,000	400	50
Texas or Southern basin.....	3,000	.....	.....
	203,000	.....	.....

Of the American coal-fields the Pennsylvania anthracite, though one of the smallest in area, is now the most copious in production, and the most available to the commercial and industrial interests of the nation. It is arranged in basins as follows :

	Area. Square miles.	Tons of coal shipped in 1864.
Wyoming or Northern coal-field.....	198	3,625,834
Middle coal-field, Shamokin region.....	50	389,779
Middle coal-field, Mahoning region.....	41	1,425,068
Lehigh basins.....	35	1,353,744
Southern or Schuylkill coal-field.....	146	2,920,094
	470	9,714,519

This production, averaging 20,667 tons per square mile, equals the average of the most productive British coal-field in 1864. Since that time, however, the English coal trade has increased in volume about fifty per cent. English statisticians estimate that their coal resources will be exhausted, at the present rate of production, with an average increase no greater than has been observable of late years, in about three hundred years. Our mining system is not carried on with the close economy of the British mines. With us "the waste is equal to the vend." At least one-third more of the coal extracted from the mines might be made available in the market with a more economical method. Instead of a yield of 60,000 tons per acre, we might reasonably hope for 80,000 or 90,000 tons. The latter aggregate would still leave a mass of 6,780 tons per acre left in pillars and otherwise unavoidably wasted. At the rate of 60,000 tons per acre the anthracite coal-field promises an aggregate of 18,000,000,000

\* Daddow and Bannon, in their estimate of the coal-fields of the United States, assign 7,100 square miles to Ohio, 6,700 square miles to Indiana, and 30,000 square miles to Illinois, which would reduce the above total to 200,266 square miles.

tons. An addition of fifty per cent. to this enormous aggregate is worthy the attention and efforts of scientific and business men. Our present production is about 10,000,000 tons per annum. In all probability it will be 15,000,000 tons in 1870. The present generation will probably see this aggregate doubled and even quadrupled. Of our aggregate coal product of 22,000,000 tons in 1864, near 10,000,000 tons were mined in the anthracite region of Pennsylvania. They represent a commercial value of \$60,000,000. Passing westward, several outlying patches, separated from the main body by denudation, form a sort of connecting link between the anthracite regions of the northeast and the massive bituminous deposits of the great Appalachian coal basin. Of these, the Broad Top coal-field, occupying an area of from forty to eighty square miles in Huntington, Bedford, and Fulton counties, Pennsylvania, south of the Juniata river, is the most prominent. The coal of this region is called semi-anthracite, from its partaking the qualities of anthracite and bituminous. The mines of this region in 1864 produced 386,645 tons, valued at \$544,000. North Mountain, Barclay or Towando, Ralston, and Blossburg basins also mark the transition from the anthracite to the bituminous regions lying upon the northeastern edge of the latter.

The great Alleghany or Appalachian coal basin extends along the Alleghany range from Lock Haven, Pennsylvania, southwest into Alabama. Its areas in the different States are as follows :

	Sq. miles
Pennsylvania .....	12, 656
Ohio .....	12, 000
Maryland .....	550
West Virginia and Virginia.....	15, 900
Kentucky .....	10, 700
Tennessee .....	3, 700
Alabama .....	4, 300
Georgia .....	170
Total .....	59, 976

Its length is 875 miles, and its breadth varies from 30 to 180 miles. It undulates westward, forming six principal basins and five prominent anticlinals, independent of the Maryland basin. The deposits are naturally divided by Mahoning sandstone into two groups, of which the lower, corresponding to the white-ash anthracite formation, occupies the much larger area—perhaps three-fourths of the entire field.

It is traversed by several water-courses which have cut channels entirely through the coal measures. These coal-fields are all basin-shaped, and the depth of the basin increases going eastward. The thickness of the seams ranges from fifty to seventy-five feet, with an average of about one-half this aggregate throughout the entire coal-field.

The Pennsylvania section of this coal-field, embracing nearly 13,000 square miles, extends through twenty-four counties. In 1864 the coal mined amounted to 5,839,000 tons of 2,000 pounds. The Cumberland coal region in Maryland, separated from the Alleghany coal-field by the high axis of Negro mountain, is sometimes called the Frostburg basin. It covers an area of from 150 to 180 square miles. The other Maryland basins enlarge this area to 550 square miles. The coal shipped from Cumberland in 1864 amounted to 657,996 tons, a net decrease of 90,349 tons as compared with 1863, a decline fully accounted for by important military operations interrupting the working of the mines.

That portion of the Alleghany coal-field lying in West Virginia is the best and most available of the whole, being mostly accessible through numerous navigable streams. Recent improved relations of the industrial forces and the



new arrangements of lines of travel and transportation will develop the magnificent mineral deposits of this region and present special attractions for mining enterprise. The coals of this region are purer and more available for all kinds of manufacture than in any other part of the Alleghany coal-field. The seams of coal are also thicker and more numerous and can be more cheaply mined. Charleston is 200 miles nearer Cincinnati and the western ports than Pittsburg. With energetic exertion it may yet become the metropolis of this mining region.

The productive coal-fields of Ohio embrace about 12,000 square miles. The coal measures, however, including the carboniferous limestone, cover fully one-third of the State. The strata generally dip towards the Ohio river, and the smaller streams follow their inclinations with considerable exactness. The coal seams here are identified with those lying opposite in Pennsylvania, West Virginia, and Kentucky. The coal area of the latter State appears to be but little understood. It runs through some twenty of the eastern counties. The deposits, in position and character, are clearly assimilated to those of West Virginia and Pennsylvania. The coal measures in Tennessee are limited in area, occupying the high mountain plateaus which terminate abruptly on the east, above the escarpments of the Cumberland mountains. Being thus inaccessible, these deposits must, for purposes of fuel, remain for some time undeveloped. Chattanooga, and a few points in Georgia, are favored with copious and accessible supplies of coal in close association with iron. In Alabama the Alleghany coal-field widens out into a basin covering 4,300 square miles, with an unmistakable depression of the entire geologic series southeast from Lookout and Sand mountains. The thinning out of the palæozoic strata westward is very observable. Large deposits of iron surround this coal-field, mostly hematites, especially rich to the eastward. The production of the Alleghany coal-field in 1864 is represented in the following table :

	Tons.
Pennsylvania .....	5, 870, 712
Ohio .....	*1, 000, 000
Maryland .....	657, 996
West Virginia .....	500, 000
Kentucky .....	250, 000
Tennessee .....	500, 000
Alabama .....	300, 000

Total ..... 9 078, 708

The northern coal-field, embracing about 13,000 square miles, lies wholly within the lower peninsula of Michigan. Its coal seams are fewer and thinner than in the Ohio coal measures. But little has been done for its development, its annual product not much exceeding 100,000 tons.

The great central coal-field occupies an area of 50,000 square miles in Indiana, Illinois and Kentucky. Its extreme length is 350 miles, with a breadth varying from 150 to 200 miles. The palæozoic column, which in Pennsylvania exceeds a height of five miles, in Illinois is but 3,300 feet high, the coal measures being about 900 feet thick. The maximum depth of the coal measures increases in Indiana, and especially in Kentucky, where the basins are the deepest. The produce of the central coal-field in 1864 was as follows :

	Tons.
Illinois .....	1, 000, 000
Indiana .....	500, 000
Western Kentucky .....	250, 000

Total ..... 1, 750, 000

\* The commissioner of statistics of the State of Ohio estimates the quantity at double this amount.

The western coal-field in Missouri and Iowa is, properly, a continuation of the great central. It occupies an area of 45,000 square miles, of which 21,000 are in Missouri and 24,000 in Iowa. The geology of Missouri resembles that of Illinois, but the coal measures are not so thick by 150 feet, thinning out rapidly towards the northern edge of this coal-field in Iowa, where they are but 100 feet thick, with workable beds of only four or five feet. Its product in 1864 was about 500,000 tons. The coals of Arkansas and Nebraska are but the thin western edges of the great western coal-field, as yet but partially developed. All of these coal-fields are parts of the Appalachian coal, or Mississippi system, embracing a total area of 190,000 square miles, from which we mined in 1864 a total of 11,428,708 tons. The Mississippi basin, embracing an area of 1,500,000 square miles, is eminently available, in all its wondrous agricultural and mineral resources, to the demands of industry and commerce. Its territorial configuration, with its matchless system of internal navigation, is unrivalled in all the requisites for the seat of a mighty civilization. Its entire area can be as densely populated as England, with greater facilities for the support of animal life.

The New England coals are anthracite in character, but thin and irregular in stratification, continually interrupted by faults, dikes, troubles, &c. This coal-field occupies its true palæological position in our American system, but its accompanying sedimentary strata have been largely metamorphosed by heat into the sub-crystalline. The basins are very irregular, indicating a degree of dislocating volcanic action highly unfavorable to even and uniform stratification during the period of coal deposit. Subsequent lateral contractions, doubling the strata in sharp waves, have also caused the entire coal series to slide above or below their true geological position. The immense thickness of the palæozoic formations in Pennsylvania doubtless protected the wonderful coal deposits of the State from the same destructive movements, and perhaps added materially to their growth by supplying the necessary carbon and bitumen. Mining for coal does not at present offer any inviting prospects to remuneration in New England.

The Arcadian coal-field in British North America embraces a workable area of 2,200 square miles, divided into several basins and sub-basins. The amount of sulphur and iron pyrites in the measures and seams of this coal-field are a serious injury to the coal, which is of a rich and highly bituminous character, indicating remoteness from the great heat which produced the Pennsylvania anthracites. The coal seams are of moderate thickness.

In Eastern Virginia and the Carolinas there are five distinct coal formations. These deposits compared with the great fields of the west are small, but being located in populous districts have a very considerable local value for fuel and the generation of steam.

The Richmond coal-field, though lying within the granite basins of the primitive formations, is yet the latest deposit. Much injury has been done in parts of this field by the small pits sunk along the outcroppings, which, being filled with water, are dangerous to approach from deeper excavations. The Piedmont coal-field, further inland, lies within the gneissic or crystalline sedimentary deposits of the metamorphic era. Its area is small and excessively undulating; its seams range from six to thirty inches. In some localities near the gneiss rock the coal changes to impure anthracite. It is valuable only for domestic purposes. Dan river and Deep river coal-fields are unimportant basins assimilated to the Piedmont. The New river deposit is perhaps the oldest coal in existence, the creation of the proto-carboniferous ages. These coals, however, are only available for domestic use. The surrounding country is rich and promises great commercial and industrial activity.

The coal deposits of the Pacific slope are as yet imperfectly developed. Their

area, so far as ascertained, is about equal to the coal-fields of Great Britain, or over 6,000 square miles.

Nearly ten years ago it was estimated by high scientific authority that the coal annually employed in England in propelling machinery generated a productive force equal to the labor of 66,000,000 men, and that if the entire coal product had been so employed, this aggregate would have swelled to 400,000,000. The London Times estimates the mechanical steam-power of England at double the muscular force of the entire human race. Reducing this estimate one-half, and applying the same ratio to our resources, what limits shall we assign to American dynamic industrial power, remembering that our coal area is thirty-three times greater than that of England, and of at least equal average value? The problem transcends ordinary speculation. It grows with our advances in economic science and art, and with each day's experience in the working of those resources. Even the agricultural advantages of soil, climate, and territorial configuration do not promise to surpass the majestic results of the mineral industry of the Union when once the hand of intelligent enterprise shall unlock the stores of subterranean wealth. The wonderful production of the precious metals must be enormously enhanced in order to afford adequate expression of the values soon to be reduced by the development of the useful minerals of this republic.

JOS. S. WILSON,

*Commissioner of the General Land Office.*

Hon. O. H. BROWNING,

*Secretary of the Interior.*

*List of papers accompanying Commissioner's annual report.*

No. 1. Tabular statement showing the number of acres of public lands surveyed in the land States and Territories up to June 30, 1866, during the last fiscal year, and the total of the public lands surveyed up to June 30, 1867; also the total area of the public domain remaining unsurveyed within the same.

No. 2. Statement of public lands sold; of cash and bounty-land scrip received therefor; number of acres entered under the homestead law of May 20, 1862; of commissions received under the sixth section of said act; also land located with scrip under the agricultural college and mechanic act of July 2, 1862, and commissions received by registers and receivers on the value thereof; and statement of incidental expenses thereon in the first half of the fiscal year commencing July 1, 1866, and ending June 30, 1867.

No. 3. Statement showing like particulars for the second half of the fiscal year ending June 30, 1867.

No. 4. Summary for the fiscal year ending June 30, 1867, showing the number of acres disposed of for cash, with bounty-land scrip, by entry under the homestead laws of May 20, 1862, and March 21, 1864, with aggregate of \$10 homestead payments, homestead commissions; also locations with agricultural college and mechanic scrip, under act of July 2, 1862.

No. 5. Statement showing the quantity of swamp lands selected for the several states under the acts of Congress approved March 2, 1849, and September 28, 1850, and March 12, 1860, up to and ending September 30, 1865.

No. 6. Statement exhibiting the quantity of swamp land approved to the several States under the acts of Congress approved March 2, 1849, September 28, 1850, and March 12, 1860, up to and ending September 30, 1867.

No. 7. Statement exhibiting the quantity of swamp land patented to the several States under the acts of Congress approved September 28, 1850, and



March 12, 1860; and also the quantity certified to the State of Louisiana under the act approved March 2, 1849.

No. 8. Exhibit of bounty-land business under acts of 1847, 1850, 1852, and 1855, showing the issue and locations from the commencement of the operations under said acts to June 30, 1867.

No. 9. Statement showing the State selections under the "internal improvement" grant of 4th of September, 1841, on the 30th June, 1867.

No. 10. Statement respecting the accounts of receivers of public moneys, disbursing agents, and adjustment of the five per cent. fund.

No. 11. Statement showing the selections made by certain States of lands within their own limits under agricultural and mechanic act of July 2, 1862, and its supplemental acts of April 14, 1864, and June 21, 1866; also the locations made with scrip under said acts.

No. 12. Statement exhibiting land concessions by acts of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1867.

No. 13. Statement exhibiting land concessions by acts of Congress to States for canal purposes from the year 1827 to June 30, 1867.

No. 14. Statement showing the homestead fees and commissions required to be paid under the several homestead acts.

No. 15. Estimate of appropriations required for the office of the Commissioner of the General Land Office for the fiscal year ending June 30, 1869.

No. 16. Estimates of appropriations for the surveying department for the fiscal year ending June 30, 1869.

No. 17. Estimates of appropriations required for surveying the public lands for the fiscal year ending June 30, 1869.

No. 18. Reports of surveyors general, A to L inclusive.

No. 19. Statement of confirmed Indian pueblo grants and private land claims in New Mexico.

No. 20. General tabular statement exhibiting the following: No. 1, States and Territories containing public land; No. 2, square miles and areas of States and Territories containing public land; No. 3, quantity sold; No. 4, entered under the homestead law; No. 5, granted for military services; No. 6, granted for agricultural colleges; No. 7, approved under grants in aid of railroads; No. 8, approved swamp selections; No. 9, quantity granted for internal improvements; No. 10, donations and grants for schools and universities; No. 11, locations with Indian scrip; No. 12, located with float scrip; No. 13, estimated quantity granted to wagon roads; No. 14, quantity granted to ship canals; No. 15, salines; No. 16, seats of government and public buildings; No. 17, granted to individuals and companies; No. 18, granted for deaf and dumb asylums; No. 19, reserved for benefit of Indians; No. 20, reserved for companies, individuals, and corporations; No. 21, confirmed private land claims; No. 22, quantity remaining unsold and unappropriated June 30, 1867.

No. 21. Historical and statistical table of the United States of North America.

No. 22. Statement showing the area and population of the British possessions north of the United States boundary.

No. 23. Statement showing the area and population of the West Indies, Mexican states, Central America, and New Granada.

No. 24. Set of twenty-eight maps of all the public land States and Territories, to wit: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Dakota, Missouri, Arkansas, Louisiana, Mississippi, Alabama, Florida, Nebraska, Kansas, Indian Territory, Colorado, New Mexico, Montana, Idaho, Nevada, Utah, Arizona, California, Oregon, Washington Territory, and Russian America.

Each map shows the extent of the public surveys where such have been extended; also the names of countries and resources, so far as furnished by the data on hand.

No. 25. Connected map of the United States from ocean to ocean, exhibiting

the extent of the public surveys, localities, land districts, seats of surveyors general's offices and district officers; also localities of railroads of general interest and mineral deposits.

No. 26. Map of the world on Mercator's projection.

No. 1.—*Tabular statement showing the number of acres of public lands surveyed in the following land States and Territories up to June 30, 1866, during the last fiscal year, and the total of the public lands surveyed up to June 30, 1867; also the total area of the public domain remaining unsurveyed within the same.*

Land States and Territories.	Area of the land States and Territories.		Number of acres of public lands surveyed up to June 30, 1866.	Number of acres of public lands surveyed during the fiscal year ending June 30, 1866, but not included in last year's report.	Number of acres of public lands surveyed within the fiscal year ending June 30, 1867.	Total of the public lands surveyed up to June 30, 1867.	Total area of public lands, including Russian territory, remaining unsurveyed and of course unmodified and undisposed of; also, private land claims surveyed and not reported up to June 30, 1867.
	In acres.	In square miles.					
Wisconsin.....	34, 511, 360	53, 924	34, 511, 360	.....	.....	34, 511, 360	.....
Iowa.....	35, 228, 800	55, 045	35, 228, 800	.....	.....	35, 228, 800	.....
Minnesota.....	53, 459, 840	83, 531	22, 045, 867	50	864, 690	20, 510, 443	30, 549, 228
Kansas.....	52, 043, 520	81, 318	16, 171, 776	45, 897	c4, 292, 775	31, 533, 077	.....
Nebraska.....	48, 636, 800	75, 995	13, 561, 132	.....	d1, 959, 117	15, 520, 249	33, 116, 551
California.....	120, 947, 840	188, 981	27, 680, 685	130, 761	899, 881	28, 711, 327	92, 236, 513
Nevada.....	71, 737, 741	112, 090	728, 119	19, 531	16, 319	763, 969	70, 973, 772
Oregon.....	60, 975, 360	95, 274	5, 730, 186	.....	414, 450	6, 144, 636	54, 830, 724
Washington Ter.....	44, 796, 160	69, 994	3, 530, 645	54, 843	294, 550	3, 880, 038	40, 916, 122
Colorado Ter.....	66, 880, 000	104, 500	1, 622, 251	91, 831	1, 130, 775	2, 844, 857	64, 035, 143
Utah Ter.....	56, 355, 635	88, 056	2, 425, 239	.....	e92, 673	2, 517, 912	53, 837, 723
Arizona Ter.....	72, 906, 304	113, 916	.....	.....	.....	.....	72, 906, 304
New Mexico Ter.....	77, 568, 640	121, 201	2, 293, 142	.....	f39, 413	2, 332, 555	75, 236, 085
Dakota Ter.....	153, 982, 080	240, 597	1, 859, 989	.....	803, 671	b2, 663, 660	151, 318, 420
Idaho Ter.....	58, 196, 480	90, 932	.....	.....	.....	.....	58, 196, 480
Montana Ter.....	92, 016, 640	143, 776	.....	.....	.....	.....	92, 016, 640
Missouri.....	41, 824, 000	65, 350	41, 824, 000	.....	.....	41, 824, 000	.....
Alabama.....	32, 462, 080	50, 722	32, 462, 080	.....	.....	32, 462, 080	.....
Mississippi.....	30, 179, 840	47, 156	30, 179, 840	.....	.....	30, 179, 840	.....
Louisiana.....	26, 461, 440	41, 346	23, 461, 440	.....	.....	23, 461, 440	3, 000, 000
Arkansas.....	33, 406, 720	52, 198	33, 406, 820	.....	.....	33, 406, 720	.....
Florida.....	37, 931, 520	59, 268	26, 631, 520	.....	.....	26, 631, 520	11, 300, 000
Ohio.....	25, 576, 960	39, 964	25, 576, 960	.....	.....	25, 576, 960	.....
Indiana.....	21, 637, 760	33, 809	21, 637, 760	.....	.....	21, 637, 760	.....
Michigan.....	36, 128, 640	56, 451	36, 128, 640	.....	.....	36, 128, 640	.....
Illinois.....	35, 462, 400	55, 410	35, 462, 400	.....	.....	35, 462, 400	.....
Indian territory.....	44, 154, 240	68, 991	.....	.....	.....	.....	44, 154, 240
American purchase from Russia.....	369, 529, 600	577, 390	.....	.....	.....	.....	369, 529, 600
Total.....	1, 834, 998, 400	2, 867, 185	474, 160, 551	342, 913	10, 808, 314	485, 311, 778	1, 349, 686, 622

a. Of which 606,065.05 acres are Dakota or Sioux Indian lands. Act March 3, 1863, United States Laws, vol. 12, p. 819.

b. Of which 115,107.60 acres are Dakota or Sioux Indian lands. Act March 3, 1863, United States Laws, vol. 12, p. 819.

c. Of which 798,613 acres are Cherokee neutral lands. Treaty July 27, 1866.

c. Of which 871,751 acres are Osage lands, sold to United States. Treaty September 29, 1865, article 1—United States Laws, 1866 and 1867, p. 135.

c. Of which 1,225,602 acres are Osage lands, ceded in trust to United States. Treaty September 29, 1865, article 2—United States Laws, 1866 and 1867, p. 136.

d. Of which 302,832 acres are Omaha lands. Treaty March 16, 1854, vol. 10, p. 1043. Of which 205,335 acres belong to Omaha under treaty of March 6, 1865—United States Laws 1864 and 1865, p. 13; and 97,497 acres to Winnebago Indians—United States Laws 1865 and 1866, p. 17.

e. Vacated Indian reservations. Act of Congress approved May 5, 1864—Statutes at Large, vol. 13, p. 63.

f. Private claims in New Mexico.

JOS. S. WILSON, *Commissioner*.

DEPARTMENT OF THE INTERIOR.

General Land Office, October 15, 1867.

No. 2.—*Statement of public lands sold, of cash and bounty-land scrip received of commissions received under sixth section of said act; also, of land located commissions received by registers and receivers on the value thereof, and state mencing July 1, 1866, and ending June 30, 1867.*

States and Territories.	Land offices.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same for the first half of the fiscal year ending December 31, 1866.		Exhibit of the amount paid for in cash and in bounty-land scrip, respectively, for the first half of the fiscal year ending December 31, 1866, mentioned in first column.	
		Acres.	Amount.	Cash.	Military scrip.
Ohio.....	Chillicothe.....	.....	.....	.....	.....
Indiana.....	Indianapolis.....	80.00	\$100 00	\$100 00	.....
Illinois.....	Springfield.....	120.00	300 00	300 00	.....
Missouri.....	Boonville.....	19,912.22	29,492 03	29,058 70	\$433 33
Do.....	Ironton.....	3,868.57	6,446 90	6,446 90	.....
Do.....	Springfield.....	.....	.....	.....	.....
Total.....	.....	23,780.79	35,938 93	35,505 60	433 33
Alabama.....	St. Stephens.....	.....	.....	.....	.....
Do.....	Huntsville.....	.....	.....	.....	.....
Do.....	Elba.....	.....	.....	.....	.....
Do.....	Montgomery.....	.....	.....	.....	.....
Total.....	.....	.....	.....	.....	.....
Mississippi.....	Jackson.....	.....	.....	.....	.....
Louisiana.....	New Orleans.....	.....	.....	.....	.....
Do.....	Monroe.....	.....	.....	.....	.....
Do.....	Natchitoches.....	.....	.....	.....	.....
Total.....	.....	.....	.....	.....	.....
Michigan.....	Detroit.....	10,217.30	12,852 67	12,852 67	.....
Do.....	East Saginaw.....	55,386.16	69,494 24	63,238 21	6,256 03
Do.....	Ionia.....	21,259.35	43,906 90	43,406 90	500 00
Do.....	Marquette.....	18,531.50	24,114 45	24,114 45	.....
Do.....	Traverse City.....	24,130.75	36,811 47	36,611 47	200 00
Total.....	.....	129,525.06	187,179 73	180,223 70	6,956 03
Arkansas.....	Little Rock.....	.....	.....	.....	.....
Do.....	Washington.....	.....	.....	.....	.....
Do.....	Clarksville.....	.....	.....	.....	.....
Total.....	.....	.....	.....	.....	.....
Florida.....	Tallahassee.....	.....	.....	.....	.....
Iowa.....	Fort Des Moines.....	4,161.79	6,427 79	6,427 79	.....
Do.....	Council Bluffs.....	108.21	254 44	254 44	.....
Do.....	Fort Dodge.....	760.10	1,084 80	984 80	100 00
Do.....	Sioux City.....	361.37	531 42	531 42	.....
Total.....	.....	5,391.47	8,298 45	8,198 45	100 00



*therefor, number of acres entered under the homestead law of May 20, 1862, with scrip under the agricultural college and mechanic act of July 2, 1862, and ment of incidental expenses thereon, in the first half of the fiscal year com-*

Quantity of land entered under homestead acts of May 20, 1862, and June 21, 1866, with aggregate of the \$10 payments required by section 2 of the act; and also with aggregate of commissions of registers and receivers, under section 6 of said act, and of act approved Mar. 21, 1864, amendatory thereof, for the first half of the fiscal year ending Dec. 31, 1866				Aggregate disposed of for cash; also bounty-land scrip and of cash, under homestead act of 1862, and act amendatory.		Quantity of land located in first half of fiscal year, with scrip issued under the agric'l col. and mech. act of July 2, 1862, and registers' and receivers' com'ns on value of land sold.		Incidental expenses.
Area in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of reg. and rec. com'ns under sec. 6 of homestead act of 1862, and the amendatory act of 1864.	Aggregate of \$10 payments and commissions.	Acres.	Amount.	Acres.	Amount.	Amount.
115.00	\$10 00	\$2 86	\$12 86	115.00	\$10 00	.....	.....	\$626 80
.....	.....	.....	.....	80.00	100 00	.....	.....	627 97
.....	.....	.....	.....	120.00	300 00	.....	.....	966 50
71,025.20	7,630 00	2,380 04	10,010 04	90,937.42	37,122 03	45,884.23	\$384 50	1,867 05
34,308.02	3,020 00	1,069 90	4,089 90	38,176.59	9,466 90	56,559.62	152 00	603 67
105,333.22	10,650 00	3,449 94	14,099 94	129,114.01	46,588 93	102,443.85	536 50	2,470 72
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
1,994.02	145 00	58 00	203 00	1,994.02	145 00	.....	.....	2,894 22
1,994.02	145 00	58 00	203 00	1,994.02	145 00	.....	.....	2,894 22
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
58.52	5 00	2 00	7 00	58.52	5 00	.....	.....	406 33
58.52	5 00	2 00	7 00	58.52	5 00	.....	.....	406 33
6,174.04	470 00	157 12	627 12	16,391.34	13,322 67	33,381.78	528 00	950 89
16,915.22	1,344 00	483 34	1,827 34	72,301.38	70,838 24	148,910.39	3,134 00	1,889 96
42,759.99	4,080 00	1,450 57	5,530 57	64,019.34	47,986 90	67,504.67	1,701 00	1,581 36
533.10	40 00	13 33	53 33	19,064.60	24,154 45	14,071.05	381 00	999 85
52,433.81	3,570 00	1,319 02	4,889 02	76,564.56	40,381 47	58,108.51	1,472 00	1,500 87
118,816.16	9,504 00	3,423 38	12,927 38	248,341.22	196,683 73	321,976.40	7,216 00	6,922 93
9,061.71	347 00	400 89	747 89	9,061.71	347 00	.....	.....	2,325 03
.....	.....	.....	.....	.....	.....	.....	.....	651 68
9,061.71	347 00	400 89	747 89	9,061.71	347 00	.....	.....	2,976 71
65,241.88	1,213 07	1,660 00	2,873 07	65,241.88	1,213 07	.....	.....	453 91
3,271.17	380 00	89 79	469 79	7,432.96	6,807 79	.....	.....	949 85
4,502.06	600 00	213 22	813 22	4,610.27	854 44	.....	.....	548 83
21,429.45	2,160 00	792 61	2,952 61	22,189.55	3,244 80	.....	.....	605 61
28,112.14	2,500 00	956 00	3,456 00	28,473.51	3,031 42	.....	.....	562 61
57,314.82	5,640 00	2,051 62	7,691 62	62,706.29	13,938 45	.....	.....	2,666 90

## No. 2.—Statement of public lands sold, of cash and

States and Territories.	Land offices.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same, for the first half of the fiscal year ending December 31, 1866.		Exhibit of the amount paid for in cash and in bounty-land scrip, respectively, for the first half of the fiscal year ending December 31, 1866, mentioned in first column.	
		Acre.	Amount.	Cash.	Military scrip.
Wisconsin .....	Menasha .....	10,667.69	\$12,269 07	\$12,269 07	.....
Do. ....	Stevens's Point .....	14,001.88	17,505 52	17,505 52	.....
Do. ....	La Crosse .....	10,488.62	14,313 06	14,313 06	.....
Do. ....	Eau Claire .....	14,903.49	19,772 89	19,182 36	\$590 53
Do. ....	Bayfield .....	5,609.28	11,764 94	11,664 94	100 00
Do. ....	Falls of St. Croix .....	5,692.33	11,256 74	11,256 74	.....
Total .....	.....	61,363.29	86,882 22	86,191 69	690 53
Minnesota .....	Taylor's Falls .....	1,362.50	1,706 86	1,706 86	.....
Do. ....	St. Cloud .....	14,441.49	18,647 76	18,347 76	300 00
Do. ....	Winnepago City .....	3,250.43	4,992 24	4,992 24	.....
Do. ....	Greenleaf .....	2,536.20	4,952 77	4,952 77	.....
Do. ....	Du Luth .....	26.43	33 04	33 04	.....
Do. ....	St. Peter .....	4,006.15	6,733 65	6,733 65	.....
Total .....	.....	25,623.20	37,066 32	36,766 32	300 00
California .....	San Francisco .....	17,989.53	47,123 07	47,123 07	.....
Do. ....	Marysville .....	26,340.55	34,547 40	34,347 40	200 00
Do. ....	Humboldt .....	2,455.30	3,069 12	3,069 12	.....
Do. ....	Stockton .....	11,940.51	15,631 83	15,631 83	.....
Do. ....	Visalia .....	3,731.26	4,664 08	4,664 08	.....
Total .....	.....	62,457.15	105,035 50	104,835 50	200 00
Nevada .....	Carson City .....	2,674.49	3,643 11	3,643 11	.....
Oregon .....	Oregon City .....	5,950.15	8,198 46	8,198 46	.....
Do. ....	Roseburg .....	15,699.11	19,624 02	19,624 02	.....
Do. ....	Le Grand .....	.....	.....	.....	.....
Total .....	.....	21,649.26	27,822 48	27,822 48	.....
Kansas .....	Topeka .....	3,811.54	4,900 44	4,900 44	.....
Do. ....	Humboldt .....	2,834.21	3,642 79	3,642 79	.....
Do. ....	Junction City .....	1,573.23	2,083 01	1,942 95	140 66
Total .....	.....	8,218.98	10,626 24	10,486 18	140 66
Nebraska Territory .....	Omaha City .....	715.49	1,059 24	1,059 24	.....
Do. ....	Brownsville .....	2,764.66	3,455 81	3,455 81	.....
Do. ....	Nebraska City .....	1,571.38	2,023 31	2,023 31	.....
Do. ....	Dakota City .....	1,273.53	1,591 90	1,591 90	.....
Total .....	.....	6,325.06	8,130 26	8,130 26	.....
New Mexico Territory .....	Santa Fé .....	.....	.....	.....	.....
Dakota Territory .....	Vermillion .....	1,792.45	2,253 23	2,253 23	.....
Colorado Territory .....	Denver City .....	7,863.05	9,828 82	9,828 82	.....
Idaho Territory .....	Boise City .....	.....	.....	.....	.....
Washington Territory .....	Olympia .....	4,156.39	5,195 48	5,195 48	.....
Do. ....	Vancouver .....	4,029.92	5,037 40	5,037 40	.....
Total .....	.....	8,186.31	10,232 88	10,232 88	.....

*bounty-land scrip received therefor, &c.—Continued.*

Quantity of land entered under homestead acts of May 20, 1862, and June 21, 1866, with aggregate of the \$10 payments required by section 2 of the act; and also with aggregate of commissions of registers and receivers, under section 6 of said act, and of act approved Mar. 21, 1864, amendatory thereof, for the first half of the fiscal year ending Dec. 31, 1866.				Aggregate disposed of for cash; also bounty-land scrip and of cash, under homestead act of 1862, and act amendatory.		Quantity of land loc'd in first half of fiscal year, with scrip issued under the agric'l col. and mech. act of July 2, 1862, and registers and receivers' comm's on value of land sold.		Incidental expenses.
Area in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of reg. and rec. com's under sec. 6 of homestead act of 1862, and the amendatory act of 1864.	Aggregate of \$10 payments and commissions.	Acres.	Amount.	Acres.	Amount.	Amount.
2,029.33	\$230 00	\$58 74	\$288 74	12,697.02	\$12,499 07	40,501.08	\$1,012 52	\$1,033 40
3,893.13	550 00	110 39	660 39	17,895.01	18,055 52	29,701.17	742 52	1,100 95
50,919.43	4,520 00	1,326 12	5,846 12	61,498.05	18,833 06	5,241.10	131 62	572 27
12,155.95	1,000 00	362 11	1,362 11	27,059.44	20,772 89	266,445.01	6,661 12	986 94
				5,609.28	11,764 94	5,920.00	148 00	770 44
22,053.60	2,380 00	869 67	3,249 67	27,745.93	13,636 74	5,440.00	136 00	1,236 74
91,051.44	8,680 00	2,727 03	11,407 03	152,414.73	95,562 22	353,248.36	8,831 18	5,700 74
12,991.99	1,090 00	401 15	1,491 15	14,354.49	2,796 86	480.00	12 00	718 32
81,730.54	5,890 00	2,287 91	8,177 91	96,172.03	24,537 76	132,941.98	3,324 54	1,139 58
42,737.45	3,630 00	1,280 21	4,910 21	45,987.88	8,622 24	7,200.00	180 00	643 13
18,221.93	2,180 00	818 81	2,998 81	20,758.13	7,132 77	9,054.14	226 48	878 68
				26.43	33 04	10,454.91	261 38	500 31
27,162.93	2,670 00	941 38	3,611 38	31,169.08	9,403 65	9,603.93	240 10	811 95
182,844.84	15,460 00	5,729 46	21,189 46	208,468.04	52,526 32	169,734.96	4,244 50	4,691 97
4,677.19	380 00	300 00	680 00	22,666.72	47,503 07	.....	.....	1,266 94
2,441.49	170 00	97 64	267 64	28,782.04	34,717 40	.....	.....	1,805 94
1,900.81	120 00	70 90	190 90	4,356.11	3,189 12	.....	.....	658 29
3,264.87	230 00	126 93	356 93	15,205.38	15,861 83	.....	.....	1,158 96
3,854.47	250 00	143 64	393 64	7,585.73	4,914 08	.....	.....	244 07
16,138.83	1,150 00	739 11	1,889 11	78,595.98	106,185 50	.....	.....	5,134 20
320.00	20 00	12 00	32 00	2,994.49	3,663 11	.....	.....	535 31
20,839.54	1,435 00	780 99	2,215 99	26,789.69	9,633 46	.....	.....	862 34
17,218.77	1,120 00	648 68	1,768 68	32,917.88	20,744 02	.....	.....	1,300 34
38,058.31	2,555 00	1,429 67	3,984 67	59,707.57	30,377 48	.....	.....	2,162 68
19,088.96	1,860 00	671 52	2,531 52	22,900 50	6,760 44	21,930.02	548 24	978 07
24,010.65	2,150 00	801 64	2,951 64	26,844.86	5,792 79	45,746.78	1,143 68	845 99
48,186.47	3,750 00	1,437 89	5,187 89	49,759.70	5,833 01	7,116.12	177 90	540 46
91,286.08	7,760 00	2,911 05	10,671 05	99,505.06	18,386 24	74,792.92	1,869 82	2,364 52
8,660.75	720 00	285 19	1,005 19	9,376.24	1,779 24	7,038.50	175 96	99 85
46,594.24	3,040 00	1,165 05	4,205 05	49,358.90	6,495 81	27,157.83	678 94	723 83
23,134.10	1,600 00	629 77	2,229 77	24,705.48	3,623 31	19,473.96	487 08	669 69
7,622.62	490 00	188 07	678 07	8,896.15	2,081 90	1,236.20	30 90	683 17
86,011.71	5,850 00	2,268 08	8,118 08	92,336.77	13,980 26	54,906.49	1,372 88	2,176 54
								381 00
17,256.41	1,070 00	424 48	1,494 48	19,048.86	3,323 23	.....	.....	514 78
13,566.29	890 00	508 73	1,398 73	21,429.34	10,718 82	.....	.....	752 58
4,127.57	270 00	172 66	442 66	8,283.96	5,465 48	.....	.....	1,229 22
8,111.23	520 00	303 61	823 61	12,141.15	5,557 40	.....	.....	630 16
12,238.80	790 00	476 27	1,266 27	20,425.11	11,022 88	.....	.....	1,859 38



No. 2.—*Statement of the public lands sold, of cash and*

## RECAPIT

States and Territories.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same, for the first half of the fiscal year ending December 31, 1866.		Exhibit of the amount paid for in cash and in bounty-land scrip, respectively, for the first half of the fiscal year ending December 31, 1866, mentioned in first column.	
	Acres.	Amount.	Cash.	Military scrip.
Ohio.....				
Indiana.....	80. 00	\$100 00	\$100 00	
Illinois.....	120. 00	300 00	300 00	
Missouri.....	23, 780. 79	35, 938 93	35, 505 60	\$433 33
Alabama.....				
Mississippi.....				
Louisiana.....				
Michigan.....	129, 525. 06	187, 179 73	180, 223 70	6, 956 03
Arkansas.....				
Florida.....				
Iowa.....	5, 391. 47	8, 298 45	8, 198 45	100 00
Wisconsin.....	61, 363. 29	86, 882 22	86, 191 69	690 53
Minnesota.....	25, 623. 20	37, 066 32	36, 766 32	300 00
California.....	62, 457. 15	105, 025 50	104, 835 50	200 00
Nevada.....	2, 674. 49	6, 343 11	3, 643 11	
Oregon.....	21, 649. 26	27, 822 48	27, 822 48	
Kansas.....	8, 218. 98	10, 626 24	10, 486 18	140 06
Washington Territory.....	8, 186. 31	10, 232 88	10, 232 88	
Nebraska Territory.....	6, 325. 06	8, 130 26	8, 130 26	
New Mexico Territory.....				
Colorado Territory.....	7, 863. 05	9, 828 82	9, 828 82	
Dakota Territory.....	1, 792. 45	2, 253 23	2, 253 23	
Idaho Territory.....				
Total.....	365, 050. 56	533, 338 17	524, 518 22	8, 819 95

To which add number of acres located with agricultural scrip, and commissions  
Also, commissions received on homestead entries, as shown in column No. 3 of

*bounty-land scrip received therefor, &c.*—Continued.

ULATION.

Quantity of land entered under homestead acts of May 20, 1862, and June 21, 1866, with aggregate of the \$10 payments required by section 2 of the act; and also with aggregate of commissions of registers and receivers, under section 6 of said act, and of act approved Mar. 21, 1864, amendatory thereof, for the first half of the fiscal year ending Dec. 31, 1866.				Aggregate disposed of for cash; also bounty-land scrip and of cash, under homestead act of 1862, and act amendatory.		Quantity of land loc'd in first half of fiscal year, with scrip iss'd under the agric'l col. and mech. act of July 2, 1862, and registers and receivers' com's on value of land sold.		Incident'l expenses.
Area in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of reg. and rec. com's under sec. 6 of homest'd act of 1862, and the amendatory act of 1864.	Aggregate of \$10 paym'ts and com-missions.	Acres.	Amount.	Acres.	Amount.	Amount.
• 115.00	\$10 00	\$2 86	\$12 86	115.00	\$10 00	-----	-----	\$626 80
				80.00	100 00	-----	-----	627 97
				120.00	300 00	-----	-----	966 50
105,333.22	10,650 00	3,449 94	14,099 94	129,114.01	46,588 93	102,443.85	\$536 50	2,470 72
1,994.02	145 00	58 00	203 00	1,994.02	145 00	-----	-----	2,894 22
58.52	5 00	2 00	7 00	58.52	5 00	-----	-----	406 33
118,816.16	9,504 00	3,423 38	12,927 38	248,341.22	196,683 73	321,976.40	7,216 00	6,922 93
9,061.71	347 00	400 89	747 89	9,061.71	347 00	-----	-----	2,976 71
65,241.88	1,213 07	1,660 00	2,873 07	65,241.88	1,213 07	-----	-----	453 91
57,314.82	5,640 00	2,051 62	7,691 62	62,706.29	13,938 45	-----	-----	2,666 90
91,051.44	8,680 00	2,727 03	11,407 03	152,414.73	95,562 22	353,248.36	8,831 18	5,700 74
182,844.84	15,460 00	5,729 46	21,189 46	208,468.04	52,526 32	169,734.96	4,244 50	4,691 97
16,138.83	1,150 00	739 11	1,889 11	78,595.98	106,185 50	-----	-----	5,134 20
320.00	20 00	12 00	32 00	2,994.49	3,663 11	-----	-----	535 31
38,058.31	2,555 00	1,429 67	3,984 67	59,707.57	30,377 48	-----	-----	2,162 68
91,286.08	7,760 00	2,911 05	10,671 05	99,505.06	18,386 24	74,792.92	1,869 82	2,364 52
12,238.80	790 00	476 27	1,266 27	20,425.11	11,022 88	-----	-----	1,859 38
86,011.71	5,850 00	2,268 08	8,118 08	92,336.77	13,980 26	54,906.49	1,372 88	2,176 54
13,566.29	890 00	508 73	1,398 73	21,429.34	10,718 82	-----	-----	381 00
17,256.41	1,070 00	424 48	1,494 48	19,048.86	3,323 23	-----	-----	752 58
-----	-----	-----	-----	-----	-----	-----	-----	514 78
996,708 04	71,739 07	28,274 57	100,013 64	1,271,758.60	605,077 24	1,077,102.98	24,070 88	47,286 69
received thereon	-----	-----	-----	1,077,102.98	24,070 88	-----	-----	-----
section 3	-----	-----	-----	2,348,861.58	657,422 69	-----	-----	-----

JOS. S. WILSON, *Commissioner.*

No. 3.—*Statement of public lands sold, of cash and bounty-land scrip received commissions received under sixth section of said act; also, of land located commissions received by registers and receivers on the value thereof, and commencing July 1, 1866, and ending June 30, 1867.*

States and Territories.	Land offices.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same, for the second half of the fiscal year ending June 30, 1867.		Exhibit of the amount paid for in cash and in bounty-land scrip, respectively, for the second half of the fiscal year ending June 30, 1867, mentioned in first column.	
		Acres.	Amount.	Cash.	Military scrip.
Ohio .....	Chillicothe .....	.....	\$45 00	\$45 00	.....
Indiana .....	Indianapolis .....	.....	.....	.....	.....
Illinois .....	Springfield .....	861. 51	1, 516 85	1, 466 85	\$50 00
Missouri .....	Booneville .....	3, 280. 22	4, 544 61	3, 861 28	683 33
Do. ....	Ironton .....	1, 172. 83	1, 866 06	1, 866 06	.....
Do. ....	Springfield .....	5, 632. 76	9, 962 30	9, 962 30	.....
Total .....	.....	10, 085. 81	16, 372 97	15, 689 64	683 33
Alabama .....	Montgomery .....	.....	.....	.....	.....
Do. ....	Mobile .....	.....	.....	.....	.....
Do. ....	Huntsville .....	.....	.....	.....	.....
Total .....	.....	.....	.....	.....	.....
Mississippi .....	Jackson .....	.....	.....	.....	.....
Louisiana .....	New Orleans .....	.....	930 00	930 00	.....
Do. ....	Monroe .....	.....	.....	.....	.....
Do. ....	Natchitoches .....	.....	.....	.....	.....
Total .....	.....	.....	930 00	930 00	.....
Michigan .....	Detroit .....	6, 389. 28	7, 986 61	7, 911 23	75 38
Do. ....	East Saginaw .....	21, 056. 44	30, 446 02	29, 384 22	1, 061 80
Do. ....	Ionia .....	11, 632. 98	30, 060 40	30, 060 40	.....
Do. ....	Marquette .....	21, 178. 96	27, 897 19	27, 897 19	.....
Do. ....	Traverse City .....	8, 812. 39	12, 537 24	12, 537 24	.....
Total .....	.....	69, 070. 05	108, 927 46	107, 790 28	1, 137 18
Arkansas .....	Little Rock .....	.....	37 12	37 12	.....
Do. ....	Washington .....	.....	.....	.....	.....
Do. ....	Clarksville .....	.....	.....	.....	.....
Total .....	.....	.....	37 12	37 12	.....
Florida .....	Tallahassee .....	.....	282 07	282 07	.....
Iowa .....	Fort Des Moines .....	683. 21	854 01	854 01	.....
Do. ....	Council Bluffs .....	.....	.....	.....	.....
Do. ....	Fort Dodge .....	1, 091. 05	1, 398 19	1, 398 19	.....
Do. ....	Sioux City .....	35. 35	69 19	69 19	.....
Total .....	.....	1, 809. 61	2, 321 39	2, 321 39	.....





No. 3.—*Statement of public lands sold, of cash and*

States and Territories.	Land offices.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same for the second half of the fiscal year ending June 30, 1867.		Exhibit of the amount paid in cash and in bounty-land scrip, respectively, for the second half of the fiscal year ending June 30, 1867, mentioned in first column.	
		Acres.	Amount.	Cash.	Military scrip.
Wisconsin.....	Menasha.....	7,094.06	\$9,267 35	\$9,267 35	.....
Do.....	Stevens's Point.....	7,857.95	9,921 21	9,921 21	.....
Do.....	La Crosse.....	6,662.86	14,661 05	14,661 05	.....
Do.....	Eau Claire.....	13,570.73	17,383 55	17,358 55	\$25 00
Do.....	Bayfield.....	2,840.18	4,775 01	4,775 01	.....
Do.....	Falls of St. Croix.....	3,379.65	6,318 97	6,318 97	.....
Total.....	.....	41,405.43	62,327 14	62,302 14	25 00
Minnesota.....	Taylor's Falls.....	1,532.67	1,916 94	1,916 94	.....
Do.....	St. Cloud.....	13,867.61	18,003 52	17,878 52	125 00
Do.....	Winnebago City.....	1,386.90	2,294 03	2,294 03	.....
Do.....	Greenleaf.....	1,483.74	2,890 13	2,890 13	.....
Do.....	Du Luth.....	296.11	370 14	370 14	.....
Do.....	St. Peter.....	3,508.50	6,854 77	6,854 77	.....
Total.....	.....	22,075.53	32,329 53	32,204 53	125 00
California.....	San Francisco.....	96,636.01	122,273 43	122,273 43	.....
Do.....	Marysville.....	41,397.70	53,646 67	53,646 67	.....
Do.....	Humboldt.....	1,801.23	2,251 54	2,251 54	.....
Do.....	Stockton.....	51,067.58	64,484 52	64,484 52	.....
Do.....	Visalia.....	5,298.90	6,623 73	6,623 73	.....
Total.....	.....	196,201.42	249,279 89	249,279 89	.....
Nevada.....	Carson City.....	4,125.60	5,257 25	5,257 25	.....
Oregon.....	Oregon City.....	4,811.66	6,014 59	6,014 59	.....
Do.....	Roseburg.....	13,543.36	16,929 34	16,929 34	.....
Do.....	Le Grand.....	.....	.....	.....	.....
Total.....	.....	18,355.02	22,943 93	22,943 93	.....
Kansas.....	Topeka.....	802.12	1,074 38	1,074 38	.....
Do.....	Humboldt.....	1,248.21	1,712 38	1,612 38	100 00
Do.....	Junction City.....	1,327.75	1,918 78	1,677 12	241 66
Total.....	.....	3,378.08	4,705 54	4,363 88	341 66
Nebraska.....	Omaha City.....	4,584.80	6,521 21	6,421 21	100 00
Do.....	Brownsville.....	2,735.71	3,450 46	3,450 46	.....
Do.....	Nebraska City.....	2,185.48	2,765 63	2,765 63	.....
Do.....	Dakota City.....	2,118.29	2,647 92	2,647 92	.....
Total.....	.....	11,624.28	15,385 22	15,285 22	100 00
Washington Territory.....	Olympia.....	3,533.61	4,417 00	4,417 00	.....
Do.....	Vancouver.....	2,769.53	3,447 90	3,447 90	.....
Total.....	.....	6,303.14	7,864 90	7,864 90	.....
New Mexico Territory.....	Santa Fé.....	.....	.....	.....	.....
Colorado Territory.....	Denver City.....	3,977.63	4,972 28	4,972 28	.....
Dakota Territory.....	Vermillion.....	2,295.94	2,869 94	2,869 94	.....
Idaho Territory.....	Boise City.....	.....	.....	.....	.....

*bounty-land scrip received therefor, &c.—Continued.*

Quantity of land entered under homestead acts of May 20, 1852, and June 21, 1866, with aggregate of the \$10 payments required by sec. 2 of the act, and also with aggregate of commissions of registers and receivers under sec. 6 of said act, and of act approved March 21, 1864, amendatory thereof, for the second half of the fiscal year ending June 30, 1867.				Aggregate disposed of for cash, also bounty-land scrip and of cash under homestead act of 1862, and act amendatory.		Quantity of land loc'd in second half of fiscal year with scrip issued under agric'l college and mech. act of July 2, 1862, and registers and receivers' com's on value of land sold.		Incidental expenses.
Area in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of registers & receivers' commiss'ns.	Aggregate of \$10 payments and commiss'ns.	Acres.	Amount.	Acres.	Amount.	Amount.
3,957.16	\$385 00	\$109 92	\$494 92	11,051.22	\$9,652 35	41,280.00	\$1,032 00	\$653 62
3,823.10	370 00	102 19	472 19	11,681.05	10,291 21	45,600.00	1,140 00	733 37
25,701.68	2,220 00	688 54	2,908 54	32,364.54	16,881 05	4,740.00	115 00	595 60
7,796.45	660 00	232 78	892 78	21,367.18	18,043 55	105,280.00	2,513 66	769 17
10,134.65	1,030 00	386 94	1,416 94	2,840.18	4,775 01	29,990.00	731 66	1,279 49
				13,514.30	7,348 97	1,120.00	27 92	846 72
51,413.04	4,665 00	1,520 37	6,185 37	92,818.47	66,992 14	227,940.00	5,560 24	4,967 97
27,315.26	2,145 00	823 66	2,968 66	28,847.93	4,061 94	1,616.00	151 90	769 57
80,815.44	5,605 00	2,176 89	7,781 89	94,683.05	23,608 52	136,160.00	3,396 00	993 02
19,489.86	1,870 00	689 60	2,559 60	20,876.76	4,164 03			568 52
19,204.08	2,380 00	916 23	3,296 23	20,687.82	5,270 13	2,080.00	52 00	644 12
3,730.00	30 00	12 00	42 00	3,496.11	400 14	39,680.00	992 00	518 75
21,195.06	2,105 00	781 34	2,886 34	24,703.56	8,959 77	160.00	4 00	1,519 48
171,219.70	14,135 00	5,399 72	19,534 72	193,295.23	46,464 53	179,696.00	4,595 90	4,953 46
3,739.87	270 00	162 00	432 00	100,375.88	122,543 43			1,921 83
8,198.29	540 00	322 36	862 36	49,595.99	54,186 67			2,688 23
1,435.45	95 00	53 82	148 82	3,236.68	2,346 54			1,826 91
6,412.35	450 00	265 75	715 75	57,479.93	64,934 52			2,286 82
8,335.86	540 00	314 71	854 71	13,634.76	7,163 73			1,111 98
28,121.82	1,895 00	1,118 64	3,013 64	224,323.24	251,174 89			9,235 77
3,634.40	270 00	137 79	407 79	7,760.00	5,527 25			385 58
15,264.90	1,000 00	572 47	1,572 47	20,076.56	7,014 59			868 29
19,112.78	1,230 00	716 77	1,946 77	32,656.14	18,159 34	1,920.00	48 00	1,926 81
34,377.68	2,230 00	1,289 24	3,519 24	52,732.70	25,173 93	1,920.00	48 00	2,795 10
8,857.99	1,010 00	365 99	1,375 99	9,660.11	2,084 38	57,440.00	1,436 00	640 12
17,450.41	1,385 00	535 92	1,920 92	18,698.62	3,097 38	118,080.00	2,952 00	513 20
37,080.88	3,120 00	1,294 90	4,414 90	38,408.63	5,038 78	19,680.00	491 96	502 76
63,389.28	5,515 00	2,196 81	7,711 81	66,767.36	10,220 54	195,200.00	4,879 96	1,656 08
51,838.11	4,190 00	1,665 07	5,855 07	56,422.91	10,711 21	112,160.00	2,801 97	541 48
46,444.05	2,660 00	1,120 63	3,780 63	49,179.76	6,310 46	145,086.49	3,652 00	336 11
30,148.58	2,660 00	1,047 96	3,707 96	32,334.06	5,425 63	69,760.00	1,744 00	405 64
9,201.16	610 00	230 04	840 04	11,319.45	3,257 92	4,000.00	96 18	703 44
137,631.90	10,320 00	4,063 70	14,383 70	149,256.18	25,705 22	331,006.49	8,294 15	1,986 67
3,359.96	220 00	126 01	346 01	6,893.57	4,637 00			660 93
14,623.36	940 00	545 60	1,485 60	17,392.89	4,387 90			993 99
17,983.32	1,160 00	671 61	1,831 61	24,286.46	9,024 90			1,654 92
								125 00
4,749.57	355 00	187 11	542 11	8,727.20	5,327 28			569 34
12,575.81	800 00	314 40	1,114 40	14,871.75	3,669 94			459 04



No. 3.—*Statement of public lands sold, of cash and*

RECAPIT

States and Territories.	Quantity sold for cash and bounty-land scrip, at and above the minimum price of \$1 25 and amount received for the same, for the second half of the fiscal year ending June 30, 1867.		Exhibit of the amount paid in cash and in bounty-land scrip, respectively, for the second half of the fiscal year ending June 30, 1867, mentioned in first column.	
	Acres.	Amount.	Cash.	Military scrip.
Ohio .....		\$45 00	\$45 00	
Indiana .....				
Illinois .....	861. 51	1, 516 85	1, 466 85	\$50 00
Missouri .....	10, 685. 81	16, 372 97	15, 689 64	683 33
Alabama .....				
Mississippi .....				
Louisiana .....		930 00	930 00	
Michigan .....	69, 070. 05	108, 927 46	107, 790 28	1, 137 18
Arkansas .....		37 12	37 12	
Florida .....		282 07	282 07	
Iowa .....	1, 809. 61	2, 321 39	2, 321 39	
Wisconsin .....	41, 405. 43	62, 327 14	62, 302 14	25 00
Minnesota .....	22, 075. 53	32, 329 53	32, 204 53	125 00
California .....	196, 201. 42	249, 279 89	249, 279 89	
Nevada .....	4, 125. 60	5, 257 25	5, 257 25	
Oregon .....	18, 355. 02	22, 943 93	22, 943 93	
Kansas .....	3, 378. 08	4, 705 54	4, 363 88	341 66
Nebraska .....	11, 624. 28	15, 385 22	15, 285 22	100 00
Washington Territory .....	6, 303. 14	7, 864 90	7, 864 90	
New Mexico Territory .....				
Colorado Territory .....	3, 977. 63	4, 972 28	4, 972 28	
Dakota Territory .....	2, 295. 94	2, 869 94	2, 869 94	
Idaho Territory .....				
Total .....	391, 569. 05	538, 368 48	535, 906 31	2, 462 17

To which add number of acres located with agricultural scrip, and commissions received  
Also, commissions received on homestead entries, as shown under head of commissions of

*bounty-land scrip received therefor, &c.*—Continued.

ULATION.

Quantity of land entered under homestead acts of May 20, 1862, and June 21, 1866, with aggregate of the \$10 payments required by section 2 of the act, and also with aggregate of commissions of registers and receivers under section 6 of said act, and of act approved March 21, 1864, amendatory thereof, for second half of the fiscal year ending June 30, 1867.				Aggregate disposed of for cash, also bounty-land scrip and of cash under homestead act of 1862, and act amendatory.		Quantity of land located in second half of fiscal year with scrip issued under agricultural college and mechanic act of July 2, 1862, and registers' and receivers' commissions on value of land sold.		Incidental expenses.
Area in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of registers & receivers' commissions.	Aggregate of \$10 payments and commissions.	Acres.	Amount.	Acres.	Amount.	Amount.
200.00	\$15 00	\$5 00	\$20 00	200.00	\$60 00	-----	-----	\$550 45
-----	-----	-----	-----	-----	-----	-----	-----	461 11
99,676.11	8,439 00	3,113 29	11,552 29	861.51	1,516 85	-----	-----	763 81
45,230.85	100 00	1,135 50	1,235 50	109,761.92	24,811 97	104,592.59	\$527 03	792 46
18,885.70	-----	609 12	609 12	45,230.85	100 00	-----	-----	3,062 04
4,601.00	315 00	126 00	441 00	18,885.70	-----	-----	-----	250 00
85,420.56	6,850 00	2,582 91	9,432 91	4,601.00	1,245 00	-----	-----	960 91
41,367.01	-----	1,277 40	1,277 40	154,490.61	115,777 46	301,974.67	6,019 00	3,945 35
13,916.72	1,410 00	532 73	1,942 73	41,367.01	37 12	-----	-----	1,415 24
46,950.98	-----	1,354 00	1,354 00	46,950.98	282 07	-----	-----	305 00
51,413.04	4,665 00	1,520 37	6,185 37	15,726.33	3,731 39	640.00	16 00	2,079 25
171,219.70	14,135 00	5,399 72	19,534 72	92,818.47	66,992 14	227,940.00	5,560 24	4,907 97
28,121.82	1,895 00	1,118 64	3,013 64	193,287 23	46,464 53	179,696.00	4,595 90	4,953 46
3,634.40	270 00	137 79	407 79	224,323.24	251,174 89	-----	-----	9,235 77
34,377.68	2,230 00	1,289 24	3,519 24	7,760.00	5,527 25	-----	-----	385 58
63,389.28	5,515 00	2,196 81	7,711 81	52,732.70	25,173 93	1,920.00	48 00	2,795 10
137,631.90	10,320 00	4,063 70	14,383 70	66,767.36	10,220 54	195,200.00	4,879 96	1,656 08
17,983.32	1,160 00	671 61	1,831 61	149,256.18	25,705 22	331,006.49	8,294 15	1,986 67
-----	-----	-----	-----	24,286.46	9,024 90	-----	-----	1,654 92
4,749.57	355 00	187 11	542 11	-----	-----	-----	-----	125 00
12,575.81	800 00	314 40	1,114 40	8,727.20	5,327 28	-----	-----	569 34
-----	-----	-----	-----	14,871.75	3,669 94	-----	-----	459 04
881,335.45	58,474 00	27,635 34	86,109 34	1,272,904.50	596,842 48	1,342,969.75	29,940 28	43,314 55
thereon	-----	-----	-----	1,342,969.75	29,940 38	-----	-----	-----
registers and receivers	-----	-----	-----	-----	27,635 34	-----	-----	-----
-----	-----	-----	-----	2,615,874.25	654,418 20	-----	-----	-----

JOS. S. WILSON, *Commissioner.*

No. 4.—*Summary for the fiscal year ending June 30, 1867, showing the homestead laws of May 20, 1862, and March 21, 1864, with aggregate of rural college and mechanic scrip under act of July 2, 1862.*

States and Territories.	Quantity sold for cash and bounty-land scrip at and above the minimum price of \$1 25, and amount received for the same, for the fiscal year ending June 30, 1867.		Exhibit of the amount paid in cash and in bounty-land scrip, respectively, for the fiscal year ending June 30, 1867, mentioned in first column.	
	Acres.	Amount.	Cash.	Military scrip.
Ohio .....		\$45 00	\$45 00	
Indiana .....	80 00	100 00	100 00	
Illinois .....	981 51	1,816 85	1,766 85	\$50 00
Missouri .....	33,866 60	52,311 90	51,195 24	1,116 66
Alabama .....				
Mississippi .....				
Louisiana .....		930 00	930 00	
Michigan .....	198,595 11	296,107 19	288,013 98	8,093 21
Arkansas .....		37 12	37 12	
Florida .....		282 07	282 07	
Iowa .....	7,201 08	10,619 84	10,519 84	100 00
Wisconsin .....	102,768 72	149,209 36	148,493 83	715 53
Minnesota .....	47,698 73	69,395 85	68,970 85	425 00
California .....	258,658 57	354,315 39	354,115 39	200 00
Nevada .....	6,800 09	8,900 36	8,900 36	
Oregon .....	40,004 28	50,766 41	50,766 41	
Kansas .....	11,597 06	15,331 78	14,850 06	481 72
Nebraska .....	17,949 34	23,515 48	23,415 48	100 00
Washington Territory .....	14,489 45	18,097 78	18,097 78	
New Mexico Territory .....				
Colorado Territory .....	11,840 68	14,801 10	14,801 10	
Dakota Territory .....	4,088 39	5,123 17	5,123 17	
Idaho Territory .....				
Total .....	756,619 61	1,071,706 65	1,060,424 53	11,232 12

To which add number of acres located with agricultural scrip, and commissions  
Also, commissions received on homestead entries, as shown under head of commis-



*number of acres disposed of for cash, with bounty-land scrip, by entry under the \$10 homestead payments, homestead commissions; also, locations with agricul-*

Quantity of land entered under homestead acts of May 20, 1862, and June 21, 1866, with aggregate of \$10 payments required by the second section of the act, and also with aggregate of commissions of registers and receivers under section 6 of said act, and of act approved March 21, 1864, amendatory thereof, for the fiscal year ending June 30, 1867.				Aggregate disposed of for cash, also bounty-land scrip, and of cash under homestead act of 1862, and act amendatory.		Quantity of land located in the fiscal year with scrip issued under agricultural college and mechanic act of July 2, 1862, and registers and receivers' commissions on value of land sold.		Incidental expenses.
Aggregate in homestead entries, in acres.	Aggregate in \$10 payments.	Amount of registers and receivers' commissions.	Aggregate of \$10 payments and commissions.	Acres.	Amount.	Acres.	Amount.	Amount.
315.00	\$25 00	\$7 86	\$32 86	315.00	\$70 00	-----	-----	\$1,177 25
-----	-----	-----	-----	80.00	100 00	-----	-----	1,089 08
-----	-----	-----	-----	981.51	1,816 85	-----	-----	1,730 31
205,009.33	19,089 00	6,563 23	25,652 23	238,875.93	71,400 90	207,036.44	\$1,063 53	3,263 18
47,224.87	245 00	1,193 50	1,438 50	47,224.87	245 00	-----	-----	5,956 26
18,885.70	-----	609 12	609 12	18,885.70	-----	-----	-----	250 00
4,659.52	320 00	128 00	448 00	4,659.52	1,250 00	-----	-----	1,367 24
204,236.72	16,354 00	6,066 29	22,360 29	402,831.83	312,461 19	623,951.07	13,235 00	10,868 28
50,418.72	347 00	1,678 29	2,025 29	50,418.72	384 12	-----	-----	4,391 95
112,192.86	1,213 07	3,014 00	4,227 07	112,192.86	1,495 14	-----	-----	758 91
71,231.54	7,050 00	2,584 35	9,634 35	78,432.62	17,669 84	640.00	16 00	4,746 15
142,464.48	13,345 00	4,247 40	17,592 40	245,233.20	162,554 36	581,188.36	14,391 42	10,608 71
354,064.54	29,505 00	11,129 18	40,724 18	401,763.27	98,990 85	349,430.96	8,840 40	9,645 43
44,260.65	3,045 00	1,857 75	4,902 75	302,919.22	357,360 39	-----	-----	14,369 97
3,954.40	290 00	149 79	439 79	10,754.49	9,190 36	-----	-----	920 89
72,435.99	4,785 00	2,718 91	7,503 91	112,440.27	55,551 41	1,920.00	48 00	4,957 78
154,675.36	13,275 00	5,107 86	18,382 86	166,272.42	28,606 78	269,992.92	6,749 78	4,020 60
223,643.61	16,170 00	6,331 78	22,501 78	241,592.95	39,685 48	385,912.98	9,667 03	4,163 21
30,222.12	1,950 00	1,147 88	3,097 88	44,711.57	20,047 78	-----	-----	3,514 30
-----	-----	-----	-----	-----	-----	-----	-----	506 00
18,315.86	1,245 00	695 84	1,940 84	30,156.54	16,946 10	-----	-----	1,321 92
29,832.22	1,870 00	738 88	2,608 88	33,920.61	6,993 17	-----	-----	973 82
-----	-----	-----	-----	-----	-----	-----	-----	-----
1,788,043.49	130,213 07	55,909 91	186,122 98	2,544,663.10	1,201,919 72	2,420,072.73	54,011 16	90,601 24
received thereon	-----	-----	-----	2,420,072.73	54,011 16	-----	-----	-----
sions of registers and receivers	-----	-----	-----	-----	55,909 91	-----	-----	-----
-----	-----	-----	-----	4,964,735.83	1,311,840 79	-----	-----	-----

JOS. S. WILSON, *Commissioner*.

No. 5.—*Statement exhibiting the quantity of land selected for the several States under the acts of Congress approved March 2, 1849, September 28, 1850, and March 12, 1860, up to and ending September 30, 1867.*

States.	Fourth quarter of 1866.	First quarter of 1867.	Second quarter of 1867.	Third quarter of 1867.	Year ending June 30, 1867.	Total since date of grant.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Ohio.....						54,438.14
Indiana.....						1,354,732.50
Illinois.....						3,267,470.65
Missouri.....						4,004,448.75
Alabama.....						479,514.44
Mississippi.....						3,070,645.29
Louisiana, (act of 1849).....						10,774,978.82
Louisiana, (act of 1850).....						543,339.13
Michigan.....						7,273,724.72
Arkansas.....						8,652,432.93
Florida.....						11,790,637.46
Wisconsin.....	751,431.30				741,431.30	4,200,669.58
Iowa.....	3,533.43				3,533.43	2,583,509.72
California.....			842,032.50	317.47	842,829.97	842,829.97
Oregon.....						
Minnesota.....						753,160.00
Total.....	754,964.73		842,032.50	317.47	1,597,794.70	60,246,532.10

No. 6.—*Statement exhibiting the quantity of land certified to the several States under the acts of Congress approved March 2, 1849, September 28, 1850, and March 12, 1860, up to and ending September 30, 1867.*

States.	Fourth quarter of 1866.	First quarter of 1867.	Second quarter of 1867.	Third quarter of 1867.	Year ending June 30, 1867.	Total since date of grant.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Ohio.....						25,640.71
Indiana.....						1,263,653.28
Illinois.....						1,438,265.02
Missouri.....	2,566.66				2,566.66	4,314,590.47
Alabama.....						2,595.51
Mississippi.....						3,068,642.31
Louisiana, (act of 1849).....						8,192,305.64
Louisiana, (act of 1850).....						237,949.09
Michigan.....					40.00	5,691,518.66
Arkansas.....						7,283,763.13
Florida.....						10,901,007.76
Wisconsin.....			713,639.94		713,639.94	3,019,461.20
Iowa.....		23,615.06	41,043.29		88,777.10	838,418.30
California.....	166,328.52	8,080.00	50,588.00	99,201.50	224,996.52	324,678.02
Oregon.....						
Minnesota.....						725,034.13
Total.....	168,895.18	31,695.06	805,271.23	99,201.50	1,030,020.22	47,377,523.23

No. 7.—*Statement exhibiting the quantity of land patented to the several States under the acts of Congress approved September 28, 1850, and March 12, 1860, and also the quantity certified to the State of Louisiana under act approved March 2, 1849.*

States.	Fourth quarter of 1866.	First quarter of 1867.	Second quarter of 1867.	Third quarter of 1867.	Year ending June 30, 1867.	Total since date of grant.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Ohio .....						25,640.71
Indiana .....						1,256,367.56
Illinois .....					8,137.01	1,447,732.93
Missouri .....	2,566.66				17,300.27	3,137,052.90
Mississippi .....						2,681,383.16
Louisiana, (act of 1849) .....						8,192,305.64
Louisiana, (act of 1850) .....						199,593.07
Michigan .....	131,223.44				131,223.44	5,816,964.89
Arkansas .....						6,011,357.03
Florida .....						10,644,468.04
Wisconsin .....					3,564.11	2,349,220.57
Iowa .....	78,424.64	61,610.65	26,299.93		168,772.20	*921,511.42
California .....				184,286.68		184,286.68
Minnesota .....						717,383.57
Total .....	212,214.74	61,610.65	26,299.93	184,286.68	328,997.03	43,585,272.17

\* 194,361.53 acres of this contained in indemnity patents under act of March 2, 1855.

JOS. S. WILSON, *Commissioner.*

DEPARTMENT OF THE INTERIOR,  
*General Land Office, October 15, 1867.*



No. 8.—*Condition of bounty land business under acts of 1847, 1850, 1852, and 1855, showing the issues and locations from the commencement of the operations under said acts to June 30, 1867.*

## ACT OF 1847.

Grade of warrants.	Number issued.	Acres embraced thereby.	Number located.	Acres embraced thereby.	Number outstanding.	Acres embraced thereby.
160 acres.....	80,635	12,901,600	75,420	12,067,200	5,215	834,400
40 acres.....	7,582	303,280	6,258	250,320	1,324	52,960
Total.....	88,217	13,204,880	81,678	12,317,520	6,539	887,360

## ACT OF 1850.

160 acres.....	27,437	4,389,920	26,614	4,258,240	823	131,680
80 acres.....	57,707	4,616,560	52,417	4,193,360	5,290	423,200
40 acres.....	103,962	4,158,480	91,429	3,657,160	12,533	501,320
Total.....	189,106	13,164,960	170,460	12,108,760	18,646	1,056,200

## ACT OF 1852.

160 acres.....	1,222	195,520	931	148,960	291	46,560
80 acres.....	1,698	135,840	1,388	111,040	310	24,800
40 acres.....	9,063	362,520	7,579	303,160	1,484	59,360
Total.....	11,983	693,880	9,898	563,160	2,085	130,720

## ACT OF 1855.

160 acres.....	106,232	16,997,120	93,945	15,031,200	12,287	1,965,920
120 acres.....	96,566	11,587,920	86,067	10,328,040	10,499	1,259,880
100 acres.....	6	600	5	500	1	100
80 acres.....	49,243	3,939,440	45,558	3,644,640	3,685	294,800
60 acres.....	358	21,480	283	16,980	75	4,500
40 acres.....	532	21,280	439	17,560	93	3,720
10 acres.....	5	50	3	30	2	20
Total.....	252,942	32,567,890	226,300	29,038,950	26,642	3,528,940

## SUMMARY.

Act of 1847.....	88,217	13,204,880	81,678	12,317,520	6,539	887,360
Act of 1850.....	189,106	13,164,960	170,460	12,108,760	18,646	1,056,200
Act of 1852.....	11,983	693,880	9,898	563,160	2,085	130,720
Act of 1855.....	252,942	32,567,890	226,300	29,038,950	26,642	3,528,940
Total.....	542,248	59,631,610	488,336	54,028,390	53,912	5,603,220

JOS. S. WILSON, *Commissioner.*

GENERAL LAND OFFICE,  
Washington, D. C., October 15, 1867.

No. 9.—*Statement showing the condition of the State selections under the act of September 4, 1841, on the 30th day of June, 1867.*

## INTERNAL IMPROVEMENT GRANT.

States.	Number of acres to which each State was entitled under the 8th section of the act of Sept. 4, 1841.	Number of acres approved up to June 30, 1867.	Number of acres remaining to each State to be selected on the 1st of July, 1867.
Illinois .....	209,085.50	*209,060.05	25.45
Missouri .....	500,000.00	500,630.00	-----
Alabama .....	97,469.17	*97,469.17	-----
Mississippi .....	500,000.00	500,000.00	-----
Louisiana .....	500,000.00	482,166.97	17,833.03
Michigan .....	500,000.00	498,638.54	1,361.46
Arkansas .....	500,000.00	499,880.03	119.97
Florida .....	499,990.00	450,823.82	49,166.27
Iowa .....	500,000.00	500,000.00	-----
Wisconsin .....	500,000.00	499,973.87	26.13
California .....	500,000.00	116,778.59	383,221.41
Kansas .....	500,000.00	495,552.20	4,447.80
Minnesota .....	500,000.00	252,028.60	247,971.40
Oregon .....	500,000.00	196,099.03	303,900.97
Nevada .....	500,000.00	-----	-----
Nebraska .....	500,000.00	-----	-----
Total .....	7,305,554.67	5,298,470.87	1,008,073.89

\*The States of Illinois and Alabama received grants under prior acts, which, with the quantities here given, make up the quantity of 500,000 acres.

JOS. S. WILSON, *Commissioner.*

DEPARTMENT OF THE INTERIOR,  
*General Land Office, October 15, 1867.*

No 10.—*Accounts of receivers of public moneys, disbursing agents, and adjustment of the five per cent. fund.*

The accounts of the several receivers of public moneys, as also those rendered by them as disbursing agents, have been adjusted to July 1, 1867, and reported to the First Comptroller for settlement. It is a source of gratification to report that the balances have, in general, been promptly deposited in accordance with law and instructions.

Accounts have been examined and adjusted between the United States and the several States entitled to the five per cent. fund accruing to the latter upon the net proceeds of the sales of the public lands situated within their respective limits, as the following table will exhibit :

*Statement showing the amount of five per cent. accruing to the following States :*

States.	The date to which the fund accounts have been examined and adjusted.	Balance reported to be due the States on acct. of five per cent. fund.
Missouri* .....	December 31, 1866 .....	.....
Michigan .....	December 31, 1866 .....	\$11,747 33
Wisconsin .....	December 31, 1866 .....	5,674 11
Minnesota .....	December 31, 1866 .....	2,475 67
Illinois* .....	December 31, 1866 .....	.....
Arkansas* .....	December 31, 1866 .....	.....
Alabama* .....	December 31, 1866 .....	.....
Mississippi* .....	December 31, 1866 .....	.....
Louisiana* .....	December 31, 1866 .....	.....
Florida* .....	December 31, 1866 .....	.....
Iowa* .....	December 31, 1866 .....	.....
Ohio* .....	December 31, 1866 .....	.....
Indiana* .....	December 31, 1866 .....	.....
California† .....	December 31, 1866 .....	.....
Oregon .....	December 31, 1866 .....	3,566 79
Kansas .....	December 31, 1866 .....	924 67
Nebraska‡ .....	December 31, 1866 .....	.....
Total .....	.....	24,388 57

\*No accounts have been reported because the expenses incident to the disposal of the public lands have exceeded the proceeds of sales.

† Not entitled.

‡ No account stated.

JOS. S. WILSON, *Commissioner.*

DEPARTMENT OF THE INTERIOR,  
*General Land Office, October 15, 1867.*



No. 11.—*Agricultural selections within certain States, and also scrip locations under agricultural and mechanic act of July 2, 1862, and supplements of April 14, 1864, and July 23, 1866.*

Land districts.	Quantity selected to June 30, 1867.	Quantity located to June 30, 1867.	Quantity located in July and August, 1867.
<b>MINNESOTA.</b>			
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Taylor's Falls .....		2,096.00	160.00
St. Cloud .....		269,101.98	45,606.00
Winnebago City .....		7,200.00	.....
St. Peter .....		9,763.93	1,920.00
Greenleaf .....		11,134.14	9,986.00
Du Luth .....		50,134.91	.....
Total .....		349,430.96	57,672.00
<b>WISCONSIN.</b>			
Menasha .....		81,781.08	24,649.00
Falls of St. Croix .....		6,560.00	960.00
Stevens's Point .....		75,301.17	6,645.00
La Crosse .....		9,981.10	1,546.00
Bayfield .....		35,840.00	22,470.00
Eau Claire .....		371,725.61	81,110.60
Total .....		581,188.36	137,380.00
<b>KANSAS.</b>			
Topeka .....		79,370.02	960.00
Junction City .....		26,796.12	9,238.00
Humboldt .....		163,826.78	48,259.00
Total .....		269,992.92	58,457.00
<b>NEBRASKA.</b>			
Omaha City .....		119,198.50	38,597.00
Brownsville .....		172,244.32	75,066.00
Nebraska City .....		89,233.96	4,613.00
Dakota City .....		5,236.20	1,525.00
Total .....		385,912.98	119,801.00
<b>MISSOURI.</b>			
Booneville .....	30,587.30	22,159.78	.....
Ironton .....	134,475.28	12,285.72	.....
Springfield .....		7,528.36	3,001.00
Total .....	165,062.58	41,973.86	3,001.00

No 11.—*Agricultural selections within certain States, &c.*—Continued.

Land districts.	Quantity selected to June 30, 1867.	Quantity located to June 30, 1867.	Quantity located in July and August 1867.
MICHIGAN.			
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Detroit.....	13, 174. 22	55, 174. 96	.....
East Saginaw.....	85, 726. 11	171, 986. 54	480. 00
Ionia.....	.....	92, 139. 04	1, 580. 00
Marquette.....	.....	106, 711. 05	17, 114. 00
Traverse City.....	8, 640. 00	90, 399. 15	13, 129. 00
Total .....	107, 540. 33	516, 410. 74	32, 303. 00
IOWA.			
Fort Des Moines .....	.....	640. 00	.....
Council Bluffs .....	.....	.....	.....
Fort Dodge.....	.....	.....	.....
Sioux City.....	.....	.....	5, 544. 00
Total .....	.....	640. 00	5, 544. 00
OREGON.			
Oregon City .....	.....	.....	.....
Roseberg.....	.....	1, 920. 00	.....
Le Grand.....	.....	.....	.....
Total .....	.....	1, 920. 00	.....

## RECAPITULATION.

Minnesota.....	.....	349, 430. 96	57, 672. 00
Wisconsin.....	.....	581, 188. 36	137, 380. 00
Kansas.....	.....	269, 992. 92	58, 457. 00
Nebraska.....	.....	385, 912. 98	119, 801. 00
Missouri.....	165, 062. 58	41, 973. 86	3, 001. 00
Michigan.....	107, 540. 33	516, 410. 74	32, 303. 00
Iowa.....	.....	640. 00	5, 544. 00
Oregon.....	.....	1, 920. 00	.....
Total .....	272, 602. 91	2, 147, 469. 82	414, 158. 00

JOS. S. WILSON, *Commissioner.*DEPARTMENT OF THE INTERIOR,  
*General Land Office, October 15, 1867.*

States.	Date of laws.	Statutes.	Page.	Name of road.	Mile limits.	Number of acres certified under the grants up to June 30, 1866.	Number of acres certified for the year ending June 30, 1867.	Estimated quan- tities inuring un- der the grants.
Illinois.	Sept. 20, 1850	9	466	Illinois Central	6 and 15	2,595,053.00	.....	2,595,053.00
Do.	do.	9	466	Mobile and Chicago	6 and 15	737,130.20	.....	1,004,640.00
*Mississippi	do.	9	466	Mobile and Ohio River	6 and 15	174,550.00	.....	404,800.00
Do.	Aug. 11, 1856	11	30	Southern railroad	6 and 15	.....	.....	.....
Do.	do.	11	30	Gulf and Ship Island railroad	6 and 15	.....	.....	.....
*Alabama	Sept. 20, 1850	9	466	Mobile and Ohio River	6 and 15	419,528.44	.....	230,400.00
Do.	do.	11	15	Alabama and Florida	6 and 15	394,522.99	.....	419,520.00
Do.	do.	11	15	Alabama and Tennessee	6 and 15	440,700.16	.....	481,920.00
Do.	June 3, 1856	11	17	Northeastern and Southwestern	6 and 15	289,535.58	.....	691,840.00
Do.	do.	11	17	Goosa and Tennessee	6 and 15	67,784.96	.....	132,480.00
Do.	do.	11	17	Will's Valley	6 and 15	171,920.51	.....	206,880.00
Do.	do.	11	17	Mobile and Girard	6 and 15	504,145.86	.....	840,880.00
Do.	do.	11	17	Goosa and Chattanooga	6 and 15	.....	.....	150,000.00
Do.	do.	11	17	Tennessee and Alabama Central	6 and 15	.....	.....	576,000.00
Do.	do.	11	32	(No map filed)	6 and 15	.....	.....	.....
*Florida	Aug. 11, 1856	11	15	Florida railroad	6 and 15	281,984.17	.....	442,542.14
Do.	May 17, 1856	11	15	Alabama and Florida	6 and 15	165,688.00	.....	165,688.00
Do.	do.	11	15	Pensacola and Georgia	6 and 15	1,975,212.93	.....	1,508,723.87
Do.	do.	11	15	Florida, Atlantic, and Gulf Central	6 and 15	37,583.29	.....	183,153.99
Do.	do.	11	15	Vicksburg and Shreveport	6 and 15	353,211.70	.....	610,880.00
*Louisiana	June 3, 1856	11	18	New Orleans, Opelousas, and Great Western	6 and 15	719,193.75	.....	907,840.00
Do.	do.	11	32	(No map filed)	6 and 15	.....	.....	.....
Arkansas	Aug. 11, 1856	10	155	Cairo and Fulton	Additional	1,115,408.41	.....	1,100,067.40
Do.	Feb. 9, 1853	Pam. Laws..	338	Cairo and Fulton	Additional	.....	.....	966,722.00
Do.	July 28, 1866	Pam. Laws..	10	Memphis and Little Rock	Additional	127,538.51	.....	438,646.89
Do.	Feb. 3, 1853	Pam. Laws..	10	Memphis and Little Rock	Additional	.....	.....	365,536.00
Do.	July 28, 1866	Pam. Laws..	338	Little Rock and Fort Smith	6 and 15	550,520.18	.....	550,525.24
Do.	Feb. 9, 1853	Pam. Laws..	10	Little Rock and Fort Smith	6 and 15	.....	.....	438,771.00
Do.	July 4, 1866	Pam. Laws..	338	Iron Mountain railroad	Additional	.....	.....	864,000.00
Do.	do.	10	8	Hannibal and St. Joseph	10 and 20	493,821.35	.....	781,944.83
Missouri	June 10, 1852	10	8	Pacific and Southwestern branch	6 and 15	1,158,073.54	.....	1,161,255.07
Do.	do.	10	8	Cairo and Fulton	6 and 15	63,540.11	.....	219,262.31
Do.	Feb. 9, 1853	.....	10	Cairo and Fulton	Additional	.....	.....	182,718.00
Do.	July 28, 1866	.....	155	Cairo and Fulton	Additional	.....	.....	1,400,000.00
Do.	June 4, 1866	Pam. Laws..	83	Iron Mountain, (from Pilot Knob to Helena, Ark.)	10 and 20	.....	.....	.....

\* Grants to Mississippi, Alabama, Florida, and Louisiana, under acts of May 17, June 3, and August 11, 1856, having expired, application will be made to Congress to extend the time for the completion of the railroads in said States.



No. 12.—Statement exhibiting land concessions by acts of Congress to States and corporations, &amp;c.—Continued.

States,	Date of laws.	Statutes.	Page.	Name of road.	Mile limits.		Number of acres certified under June 30, 1866.	Number of acres certified for the year ending June 30, 1867.	Estimated quantities under the grants.
Iowa.	May 15, 1856	11	9	Burlington and Missouri River.....	6 and 15	20	257, 046.34	948, 643.66	101, 110.67
	June 2, 1864	13	95	Burlington and Missouri River.....	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
	May 15, 1856	11	9	Mississippi and Missouri.....	6 and 15	20	775, 717.67	1, 298, 738.00	123, 370.00
	June 2, 1864	13	95	Cedar Rapids and Missouri River.....	6 and 15	20	1, 296, 163.89	1, 296, 163.05	1, 536, 000.00
	May 15, 1856	11	9	Dubuque and Sioux City.....	6 and 15	20	257, 046.34	948, 643.66	101, 110.67
	June 2, 1864	13	98	Authorized change of route from Fort Dodge to Sioux City	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
	May 12, 1864	13	72	McGregor and Western.....	6 and 15	20	775, 717.67	1, 298, 738.00	123, 370.00
	June 2, 1864	13	72	Land granted to State for railroad from Sioux City to the south line of the State of Minnesota, "at some point between the Big Sioux and the west fork of the Des Moines river."	6 and 15	20	257, 046.34	948, 643.66	101, 110.67
	June 3, 1856	11	21	Port Huron and Milwaukee.....	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
	do.	11	21	Detroit and Milwaukee.....	6 and 15	20	775, 717.67	1, 298, 738.00	123, 370.00
Michigan.	do.	11	21	Amboy, Lansing, and Traverse Bay.....	6 and 15	20	1, 296, 163.89	1, 296, 163.05	1, 536, 000.00
	July 3, 1866	Pam. Laws..	78	Time extended seven years.....	6 and 15	20	257, 046.34	948, 643.66	101, 110.67
	June 3, 1856	11	21	Flint and Pere Marquette.....	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
	July 3, 1866	Pam. Laws..	78	An act to change the western terminus of the road.....	6 and 15	20	775, 717.67	1, 298, 738.00	123, 370.00
	June 3, 1856	11	21	Grand Rapids and Indiana.....	6 and 15	20	1, 296, 163.89	1, 296, 163.05	1, 536, 000.00
	June 7, 1864	13	119	Grand Rapids and Indiana, from Fort Wayne to Grand Rapids, &c.	6 and 15	20	257, 046.34	948, 643.66	101, 110.67
	June 3, 1856	11	21	Bay de Noquet and Marquette.....	6 and 15	200 secs.	218, 881.10	218, 880.87	158, 000.00
	Mar. 3, 1865	13	521	Bay de Noquet and Marquette.....	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
	June 3, 1856	11	21	Marquette and Ontonagon.....	6 and 15	20	775, 717.67	1, 298, 738.00	123, 370.00
	Mar. 3, 1865	13	521	Marquette and Ontonagon.....	6 and 15	20	481, 774.36	1, 144, 904.90	116, 276.70
(Joint res.)	June 3, 1856	11	21	Chicago, St. Paul, and Fond du Lac, (branch to Ontonagon)	6 and 15	20	174, 030.41	298, 062.59	188, 507.24
	do.	11	21	Chicago, St. Paul, and Fond du Lac, (branch to Marquette)	6 and 15	20	162, 044.46	188, 507.24	373, 686.00
	July 5, 1862	12	620	Peninsula, (from Marquette to the mouth of the Menominee river.)	6 and 15	20	324, 943.38	188, 507.24	894, 907.81
	Mar. 3, 1865	13	521	Peninsula railroad.....	6 and 15	20	324, 943.38	188, 507.24	894, 907.81
	June 3, 1856	11	21	Toma and Lake Superior, (formerly La Crosse and Milwaukee.)	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	May 5, 1864	13	66	Toma and Lake Superior.....	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	June 3, 1856	11	21	St. Croix and Lake Superior.....	6 and 15	20	318, 740.80	318, 737.74	215, 000.00
	May 5, 1864	13	66	Branch to Bayfield.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
	June 3, 1856	11	21	Chicago and Northwestern.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
	April 23, 1864	12	618	Changes line of route.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
Wisconsin.	Mar. 3, 1865	13	521	Peninsula railroad.....	6 and 15	20	324, 943.38	188, 507.24	894, 907.81
	June 3, 1856	11	21	Toma and Lake Superior, (formerly La Crosse and Milwaukee.)	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	May 5, 1864	13	66	Toma and Lake Superior.....	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	June 3, 1856	11	21	St. Croix and Lake Superior.....	6 and 15	20	318, 740.80	318, 737.74	215, 000.00
	May 5, 1864	13	66	Branch to Bayfield.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
	June 3, 1856	11	21	Chicago and Northwestern.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
	April 23, 1864	12	618	Changes line of route.....	6 and 15	20	211, 143.02	600, 000.00	600, 000.00
	Mar. 3, 1865	13	521	Peninsula railroad.....	6 and 15	20	324, 943.38	188, 507.24	894, 907.81
	June 3, 1856	11	21	Toma and Lake Superior, (formerly La Crosse and Milwaukee.)	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	May 5, 1864	13	66	Toma and Lake Superior.....	6 and 15	20	524, 718.15	675, 000.00	524, 714.95
	June 3, 1856	11	21	St. Croix and Lake Superior.....	6 and 15	20	318, 740.80	318, 737.74	215, 000.00

[illegible]

*Wagon Roads.*

[No. 12.—Statement exhibiting land concessions by acts of Congress and corporations, &amp;c.—Continued.]

States.	Date of laws.	Statutes.	Page.	Name of road.	Mile limits.	Number of acres certified under the grants up to June 30, 1866.	Number of acres certified for the year ending June 30, 1867.	Estimated quantities entering under the grants.
Michigan .....	June 20, 1864	13	140	From Saginaw City, Michigan, by the shortest and most feasible route, to the Straits of Mackinaw.....	6			1, 497, 600. 00
Do. ....	June 20, 1864	13	140	From Grand Rapids, through Newago, Traverse City, and Little Traverse, to Straits of Mackinaw.....	3			720, 000. 00
Oregon .....	July 2, 1864	13	355	From Eugene City, by way of Middle Fork of the Willamette river, and the most feasible pass in the Cascade range of mountains, near Diamond Peak, to the eastern boundary of the State.				
Do. ....	July 4, 1866	Pam. Laws..	86	From Corvallis to the Aquina bay.....	3			76, 800. 00
Do. ....	July 5, 1866	Pam. Laws..	89	From Albany, by way of Canyon City and the most feasible pass in the Cascade range, to the eastern boundary of the State.	3			460, 000. 00

## RECAPITULATION.

States.	Estimated number of acres granted for wagon roads.	Number of acres certified under the grants.	Estimated number of acres granted.
Illinois .....		2, 595, 053. 00	2, 595, 053. 00
Mississippi .....		908, 080. 20	2, 062, 240. 00
Alabama .....		2, 888, 138. 50	3, 739, 130. 00
Florida .....		1, 760, 408. 30	2, 360, 114. 00
Louisiana .....		1, 072, 405. 45	1, 578, 720. 00
Arkansas .....		1, 793, 167. 10	4, 804, 271. 63
Missouri .....		1, 813, 435. 00	3, 743, 160. 21
Iowa .....		2, 770, 702. 36	6, 751, 207. 98
Michigan .....		2, 718, 413. 49	5, 327, 990. 99
Wisconsin .....		1, 379, 545. 35	5, 378, 360. 50
Minnesota .....		1, 644, 602. 64	7, 783, 403. 09
Kansas .....			7, 753, 000. 00
California .....			3, 730, 000. 00
Corporations: Public railroads.....		21, 346, 611. 47	57, 588, 581. 40
		138, 229. 39	124, 040, 000. 00



Wisconsin.....	250,000.00	76,803.20	-----
Michigan.....	1,718,613.27	-----	-----
Oregon.....	1,256,800.00	-----	3,925,413.27
		21,561,654.06	184,813,994.67

DEPARTMENT OF THE INTERIOR,  
General Land Office, October 15, 1867.

JOS. S. WILSON, Commissioner.

# No. 13.—Statement exhibiting land concessions by acts of Congress to States for canal purposes from the year 1827 to June 30, 1867.

States.	Date of laws.	Statutes.	Page.	Name of canal.	Total No. of acres granted.
Indiana.....	Mar. 2, 1827	4	236	Wabash and Erie canal.....	1,439,279
Do.....	Feb. 27, 1841	5	414		
Do.....	Mar. 3, 1845	5	731		
Ohio.....	Mar. 2, 1827	4	236	Wabash and Erie canal.....	266,535
Do.....	June 30, 1834	4	716		
Do.....	May 24, 1828	4	305		
Do.....	May 24, 1828	4	306	Miami and Dayton canal.....	333,836
(5th sec.)				General canal purposes.....	500,000
Illinois.....	Mar. 2, 1827	4	234	Canal to connect the waters of the Illinois river with those of Lake Michigan.....	290,915
Wisconsin.....	June 18, 1838	5	245		
Do.....	April 10, 1866	30	30		125,431
Michigan.....	Aug. 26, 1852	10	35	Breakwater and harbor, and ship canal.....	290,000
Do.....	Mar. 3, 1865	13	519	St. Mary's ship canal.....	750,000
Do.....	July 3, 1866	81	81	Portage Lake and Lake Superior ship canal.....	200,100
Do.....				Portage Lake and Lake Superior ship canal.....	200,000
				Ship canal to connect the waters of Lake Superior with the lake known as Lac la Belle.....	100,000

## RECAPITULATION.

Indiana.....	1,439,279	-----
Ohio.....	1,100,361	-----
Illinois.....	990,915	-----
Wisconsin.....	325,431	-----
Michigan.....	1,250,000	-----
Total quantity of acres granted.....	4,405,966	-----

DEPARTMENT OF THE INTERIOR,  
General Land Office, October 15, 1867.

JOS. S. WILSON, Commissioner.

No. 14.—*Homestead fees and commissions required to be paid under the homestead act of 20th May, 1862, Statutes, volume 12, page 392; the act of 21st March, 1864, Statutes, volume 13, page 35, and the act of 21st June, 1866, Statutes, volume Laws, 1865 and 1866, page 66.*

OHIO, INDIANA, ILLINOIS,\* MICHIGAN, WISCONSIN, IOWA, MISSOURI, MINNESOTA, KANSAS, NEBRASKA, AND TERRITORIES OF DAKOTA AND MONTANA, [UTAH NOT YET ORGANIZED INTO A LAND DISTRICT.]

Area in acres.	Price per acre.	Commissions payable when entry is made.	Commissions payable when patent issues.	Fees payable when entry is made.	Total fees and commissions
160	\$1 25	\$4 00	\$4 00	\$10 00	\$18 00
80	1 25	2 00	2 00	5 00	9 00
40	1 25	1 00	1 00	5 00	7 00
80	2 50	4 00	4 00	10 00	18 00
40	2 50	2 00	2 00	5 00	9 00

\* The public lands in Ohio, Indiana, and Illinois have nearly all been disposed of.

PACIFIC AND OTHER POLITICAL DIVISIONS—CALIFORNIA, NEVADA, AND OREGON AND THE TERRITORIES OF ARIZONA, COLORADO, IDAHO, NEW MEXICO, AND WASHINGTON.

160	\$1 25	\$6 00	\$6 00	\$10 00	\$22 00
80	1 25	3 00	3 00	5 00	11 00
40	1 25	1 50	1 50	5 00	8 00
80	2 50	6 00	6 00	10 00	22 00
40	2 50	3 00	3 00	5 00	11 00

SOUTHERN LAND STATES—ALABAMA, MISSISSIPPI, LOUISIANA, ARKANSAS, AND FLORIDA.

80	\$1 25	\$2 00	\$2 00	\$5 00	\$9 00
40	1 25	1 00	1 00	5 00	7 00
40	2 50	2 00	2 00	5 00	9 00

JOS. S. WILSON, *Commissioner.*

DEPARTMENT OF THE INTERIOR,  
General Land Office, October 15, 1867.

No. 15.—*Estimates of appropriations required for the office of the Commissioner of the General Land Office for the fiscal year ending June 30, 1869.*

Heads or titles of appropriations.	Estimates of appropriations required for the service of the fiscal year ending June 30, 1869.	Estimates of balances of appropriations unexpended June 30, 1868, which may in part be applied to the service of the next fiscal year.	Appropriations for the service of the fiscal year ending June 30, 1869.
For salary of the Commissioner of the General Land Office, per act of July 4, 1836, 5 Laws, p. 111, sec. 10 .....	\$3,000		
For salary of recorder, per same act and act of March 3, 1837, 5 Laws, pp. 111 and 164 .....	2,000		
For salary of chief clerk, per act of March 3, 1853, 10 Laws, p. 211 .....	2,000		
For salary of three principal clerks of public lands, private land claims, and surveys, per act of July 4, 1836, at \$1,800 each, 5 Laws, p. 111 .....	5,400		
For salary of three clerks of class four, per act of March 3, 1853, — Laws, p. 211, sec. 3 .....	5,400		
For salary of twenty-three clerks of class three, per same act, and act of April 22, 1854, 10 Laws, pp. 211 and 276 .....	36,800		
For salary of forty clerks of class two, per same acts.	50,000		
For salary of forty clerks of class one, per same acts.	48,000		
For salary of draughtsman, at \$1,600, and assistant draughtsman, at \$1,400, per act of July 4, 1836, 5 Laws, p. 112, and act of April 22, 1854, 10 Laws, p. 276 .....	3,000		
For salary of five messengers, one chief messenger at \$1,000, and four assistant messengers, at \$840 each, per act of July 4, 1836, and joint resolution of August 18, 1856, and act of July 23, 1866, Laws, p. 207, sec. 7 .....	4,360		
For salary of two packers, at \$720 each, per act of July 4, 1836, act of September 30, 1850, joint resolution of August 18, 1856, and act of July 23, 1866, Laws, p. 207, sec. 7 .....	1,440		
For salary of seven laborers, per joint resolution of August 18, 1856, 11 Laws, p. 145, act of June 23, 1860, act of June 25, 1864, 13 Laws, p. 160, and act of July 23, 1866, Laws, p. 207 .....	5,040		
For salary of seven night watchmen, per same resolution and same acts .....	5,040		
For salary of one day watchman, per act of June 2, 1858, act of June 25, 1864, and act of July 23, 1866, Laws, p. 207 .....	720		
Total .....	178,200		\$178,200



*Estimates of appropriations under military act of March 3, 1855, and heretofore provided per act of August 18, 1856, making appropriations, &c., and subsequent appropriation laws.*

Heads or titles of appropriations.	Estimates of appropriations required for the service of the fiscal year ending June 30, 1869.	Estimates of balances of appropriations unexpended June 30, 1868, which may be applied to the service of the next fiscal year.	Appropriations for the service of the fiscal year ending June 30, 1868.
For salary of one principal clerk as director.....	\$2,000	.	
For salary of one clerk of class three .....	1,600		
For salary of four clerks of class two .....	5,600		
For salary of forty clerks of class one.....	48,000		
For salary of two laborers, per joint resolution of 18 August, 1856, 11 Laws, p. 145, act of June 25, 1864, and act of July 23, 1866, Laws, p. 207, section 7 .....	1,440		
Total .....	58,640	.....	\$58,640

*Provided*, That the Secretary of the Interior, at his discretion, shall be, and he is hereby, authorized to use any portion of said appropriation for piece-work, or by the day, week, month, or year, at such rate or rates as he may deem just and fair, not exceeding a salary of twelve hundred dollars per annum.

*Estimates of appropriations required to meet contingent expenses of the office of Commissioner of the General Land Office for the fiscal year ending June 30, 1869.*

Heads or titles of appropriations.	Estimates of appropriations required for the service of the fiscal year ending June 30, 1869.	Estimates of balances of appropriations unexpended June 30, 1868, which may be applied to the service of the next fiscal year.	Appropriations for the service of the fiscal year ending June 30, 1868.
For cash system, maps, diagrams, stationery, furniture and repairs of the same; miscellaneous items, including two of the city newspapers, to be filed, bound, and preserved for the use of the office; for advertising and telegraphing; for miscellaneous items on account of bounty lands and military patents under the several acts; for contingent expenses under swamp land act of September 28, 1850, and for horse and carriage for the official uses of the office.....	\$10,000	.....	\$10,000

*Estimates of appropriations required to meet expenses of collecting the revenue from the sales of public lands in the several States and Territories for the fiscal year ending June 30, 1869.*

State.	Land office.	Salaries and commissions.	Incidental expenses.	Total.
Ohio .....	Chillicothe .....	\$1,200	\$100	\$1,300
Indiana .....	Indianapolis .....	1,200	100	1,300
Illinois .....	Springfield .....	1,200	100	1,300
Missouri .....	Booneville .....	6,000	500	13,900
	Ironton .....	3,000	200	
	Springfield .....	4,000	200	
Michigan .....	Detroit .....	3,000	200	
	East Saginaw .....	4,000	200	21,000
	Ionia .....	5,000	200	
	Marquette .....	5,000	200	
	Traverse City .....	3,000	200	
Iowa .....	Des Moines .....	3,000	150	10,600
	Council Bluffs .....	3,000	150	
	Fort Dodge .....	2,000	150	
	Sioux City .....	2,000	150	
Wisconsin .....	Menasha .....	6,000	150	21,900
	Falls St. Croix .....	2,000	150	
	Stevens's Point .....	2,000	150	
	La Crosse .....	3,000	150	
	Bayfield .....	2,000	150	27,200
Minnesota .....	Eau Claire .....	6,000	150	
	Taylor's Falls .....	2,000	200	
	St. Cloud .....	6,000	200	
	Winnebago City .....	6,000	200	30,300
	Greenleaf .....	5,000	200	
	St. Peter .....	5,000	200	
	Du Luth .....	2,000	200	
California .....	San Francisco .....	6,000	500	13,200
	Marysville .....	6,000	500	
	Humboldt .....	3,000	200	
	Stockton .....	6,000	400	
	Visalia .....	4,000	200	14,800
Oregon .....	Sacramento .....	3,000	500	
	Oregon City .....	6,000	400	
	Roseburg .....	4,000	300	
	Le Grand .....	2,000	500	11,500
Kansas .....	Topeka .....	3,000	200	
	Humboldt .....	5,000	200	
	Junction City .....	6,000	200	
Alabama .....	Montgomery .....	4,000	500	9,300
	Huntsville .....	2,000	300	
	Mobile .....	2,000	500	
Arkansas .....	Little Rock .....	4,000	500	
	Clarksville .....	3,000	500	8,500
	Washington .....	3,000	500	
Louisiana .....	New Orleans .....	3,000	500	
	Natchitoches .....	2,000	500	
	Monroe .....	2,000	500	6,600
Florida .....	Tallahassee .....	6,000	600	
Mississippi .....	Jackson .....	4,000	600	
Nevada .....	Carson City .....	4,000	400	
	Austin .....	2,000	500	9,400
	Belmont .....	2,000	500	
Nebraska .....	Omaha .....	4,000	200	
	Brownville .....	4,000	200	
	Nebraska City .....	4,000	200	10,600
	Dakota City .....	3,000	200	
Washington Ter.	Olympia .....	5,000	300	
	Vancouver .....	5,000	300	
Colorado Ter....	Denver .....	5,000	400	8,900
	Fair Play .....	3,000	500	

*Estimates of appropriations, &c.—Continued.*

State.	Land office.	Salaries and commissions.	Incidental expenses.	Total.
Idaho Ter. ....	Boise City .....	\$4,000	\$500 }	\$8,000
	Lewiston .....	3,000	500 }	
Dakota Ter. ....	Vermillion .....	5,000	300	5,300
Montana Ter ....	Helena .....	5,000	500	5,500
Arizona Ter. ....	Prescott .....	4,000	500	4,500
	Total .....	244,800	20,500	265,300

NOTE.—The amount expended during the last fiscal year for salaries and commissions of district land officers was \$228,503 72, and for incidental expenses, \$21,306 05.



No. 16 — *Estimates of appropriations required for the surveying department for the fiscal year ending June 30, 1869.*

<i>Objects of appropriation.</i>		Estimates by the surveyor general.	Estimates of appropriations required for the service of the fiscal year ending June 30, 1869.	Estimates of the balances applied to the service of the next fiscal year, which in part may be expended June 30, 1868, of appropriations unexpended June 30, 1868.	Appropriations for the service of the fiscal year ending June 30, 1868.
<i>For compensation of surveyors general and their clerks, in addition to the unexpended balances of former appropriations for the same objects.</i>					
1.	For compensation of the surveyor general of Minnesota, per act of May 18, 1796—1 Statutes, page 464, section 10, and act of March 3, 1857—11 Statutes, page 212, section 1	\$2,000 00	\$2,000 00	.....	\$2,000 00
2.	For compensation of the clerks in the office of the surveyor general of Minnesota, per act of May 9, 1836—5 Statutes, page 26, section 1, and act of March 3, 1857—11 Statutes, page 212, section 1	6,300 00	6,300 00	.....	6,300 00
3.	For compensation of the surveyor general of the Territory of Dakota, per act of March 2, 1861—12 Statutes, page 244, section 17	2,000 00	2,000 00	.....	2,000 00
4.	For compensation of the clerks in the office of the surveyor general of Dakota, per act of March 2, 1861—12 Statutes, page 244, section 17	6,300 00	2,500 00	\$2,700 00	4,300 00
5.	For compensation of the surveyor general of Kansas, per act of July 22, 1854—10 Statutes, page 309, section 10	2,000 00	2,000 00	.....	2,000 00
6.	For compensation of the clerks in the office of the surveyor general of Kansas, per act of July 22, 1854—10 Statutes, page 309, section 10	7,500 00	6,300 00	.....	5,000 00
7.	For compensation of the surveyor general of Colorado and Utah, per act of February 28, 1861—12 Statutes, page 176, section 17, and act of March 14, 1862—12 Statutes, page 369, section 4	3,000 00	3,000 00	.....	3,000 00
8.	For compensation of the clerks in the office of the surveyor general of Colorado and Utah, per act of February 28, 1861—12 Statutes, page 176, section 17, and act of March 14, 1862—12 Statutes, page 369, section 4	5,300 00	4,000 00	.....	4,000 00
9.	For compensation of the surveyor general of New Mexico, per act of July 22, 1854—10 Statutes, page 308, section 1	3,000 00	3,000 00	.....	3,000 00
10.	For compensation of the clerks in the office of the surveyor general of New Mexico, per act of July 22, 1854—10 Statutes, page 308, section 1	2,000 00	.....	7,600 00	.....
11.	For compensation of the surveyor general of California and Arizona, per act of May 30, 1862—12 Statutes, page 410, section 9, and act of March 2, 1867—Laws 1866-67, page 543, section 4	3,000 00	3,000 00	.....	3,000 00
12.	For compensation of the clerks in the office of the surveyor general of California and Arizona, per act of March 3, 1853—10 Statutes, page 245, section 2	17,000 00	11,000 00	.....	11,000 00
13.	For compensation of the surveyor general of Idaho, per act of June 29, 1866—United States Laws 1865-66, page 77	3,000 00	3,000 00	.....	3,000 00
14.	For compensation of the clerks in the office of the surveyor general of Idaho, per act of June 29, 1866—United States Laws 1865-66, page 77	3,300 00	4,000 00	.....	3,000 00
15.	For compensation of the surveyor general of Nevada, per act of July 4, 1866—United States Laws 1865-66, page 86	3,000 00	2,562 72	497 28	3,000 00
16.	For compensation of the clerks in the office of the surveyor general of Nevada, per act of July 4, 1866—United States Laws 1865-66, page 86	8,400 00	4,000 00	.....	4,000 00
17.	For compensation of the surveyor general of Oregon, per act of May 30, 1862—12 Statutes, page 410, section 10	2,500 00	2,500 00	.....	2,500 00
18.	For compensation of the clerks in the office of the surveyor general of Oregon, per act of September 27, 1850—9 Statutes, page 496, section 2	5,400 00	4,000 00	.....	4,000 00

No. 16.—*Estimates of appropriations required for the surveying department, &c.*—Continued.

Objects of appropriation.	Estimates by the surveyor general.	Estimates of appropriations required for the ending June 30, 1869.	Estimates of the balances of appropriations unexpended June 30, 1868, applied to the service of the next fiscal year.	Appropriations for the service of the fiscal year ending June 30, 1868.
19. For compensation of the surveyor general of Washington Territory, per act of May 30, 1862—12 Statutes, page 410, section 9.....	\$2,500 00	\$2,500 00	.....	\$609 00
20. For compensation of the clerks in the office of the surveyor general of Washington Territory, per act of March 3, 1855—10 Statutes, page 674, section 6.....	5,900 00	4,000 00	.....	4,000 00
21. For compensation of the surveyor general of Nebraska and Iowa, per act of August 8, 1846—9 Statutes, page 79, section 1, and act of July 28, 1866—United States Laws 1865-66, page 344.....	2,000 00	2,000 00	.....	2,000 00
22. For compensation of the clerks in the office of the surveyor general of Nebraska and Iowa, per act of August 8, 1846—9 Statutes, page 71, section 1, and act of July 28, 1866—United States Laws 1865-66, page 344.....	7,500 00	6,300 00	.....	5,000 00
23. For compensation of the surveyor general of Montana, per act of March 2, 1867—United States Laws 1866-67, page 542.....	3,000 00	3,000 00	.....	.....
24. For compensation of the clerks in the office of the surveyor general of Montana, per act of March 2, 1867—United States Laws 1866-67, page 542.....	.....	4,000 00	.....	.....
25. For compensation of the recorder of land titles in Missouri, per act of March 2, 1865—2 Statutes, page 336.....	500 00	500 00	.....	500 00
Total.....	.....	\$7,402 72	.....	.....
<i>For contingent expenses of the offices of the surveyors general of different surveying districts, in addition to the unexpended balances of former appropriations for the same objects.</i>				
26. For rent of office for the surveyor general of the Territory of Dakota, fuel, books, stationery, and other incidental expenses, per act of March 2, 1861—12 Statutes, page 244, section 17.....	2,000 00	2,000 00	.....	1,100 00
27. For rent of office for the surveyor general of Kansas, fuel, books, stationery, and other incidental expenses, per act of July 22, 1854—10 Statutes, page 310, section 10.....	2,000 00	1,000 00	\$1,000 00	2,000 00
28. For rent of office for the surveyor general of the Territories of Colorado and Utah, fuel, books, stationery, and other incidental expenses, per act of February 28, 1861—12 Statutes, page 176, section 17.....	2,600 00	1,000 00	1,000 00	2,000 00
29. For rent of office for the surveyor general of New Mexico, fuel, books, stationery, and other incidental expenses, per act of July 22, 1854—10 Statutes, page 308, section 1.....	.....	.....	3,000 00	.....
30. For rent of office for the surveyor general of California and Arizona, fuel, books, stationery, and other incidental expenses, per act of March 3, 1853—10 Statutes, page 245, section 2.....	6,000 00	5,000 00	.....	5,000 00
31. For rent of office for the surveyor general of Oregon, fuel, books, stationery, and other incidental expenses, per act of September 27, 1850—9 Statutes, page 496, section 2.....	2,000 00	1,500 00	500 00	1,500 00
32. For rent of office for the surveyor general of Washington Territory, fuel, books, stationery, and other incidental expenses, per act of July 17, 1854—10 Statutes, page 306, section 7.....	2,000 00	2,000 00	.....	2,000 00
33. For rent of office for the surveyor general of Nevada, fuel, books, stationery, and other incidental expenses, per act of July 4, 1860—United States Laws 1865-66, page 86.....	4,700 00	2,000 00	1,500 00	2,000 00

34. For rent of office for the surveyor general of Idaho, fuel, books, stationery, and other incidental expenses, per act of June 29, 1866—United States Laws 1865-66, page 77.....	3,000 00	2,000 00	2,000 00
35. For rent of office for the surveyor general of Nebraska and Iowa, fuel, books, stationery, and other incidental expenses, per act of June 12, 1858—5 Statutes, page 243.....	2,600 00	2,000 00	2,000 00
36. For rent of office for the surveyor general of Montana, fuel, books, stationery, and other incidental expenses, per act of March 2, 1867—United States Laws 1866-67, page 542.....	.....	3,000 00	.....
Total.....	.....	21,500 00	.....

## EXPLANATION OF THE FOREGOING ESTIMATES.

15. \$2,502 72 is estimated for the reason of unexpended balance of \$497 28, which will exist on the 30th June, 1868, caused by there being no surveyor general appointed and qualified from July 1 to December 1, 1866, and by non-payment of W. B. Thornburgh's salary as surveyor general from March 5 to May 18, 1867, whose appointment was not confirmed by the United States Senate which adjourned on the 4th of March, 1867, the 4th section of "An act regulating the tenure of certain civil offices," approved March 2, 1867, inhibiting the payment.—Vide United States Laws 1866-67, page 430.

10 and 29. No estimates are submitted for the reason that existing balances of former appropriations for those purposes will be more than sufficient for the service.  
26, 27, 28, 31, 32, 33, 34, 35, and 36. The organic acts of Congress provide for the respective surveying districts \$1,000 for incidental expenses of the surveyors general's offices. The amount having proved insufficient, estimates have been submitted from year to year and appropriations made according to the actual necessities.

JOS. S. WILSON, *Commissioner*.

DEPARTMENT OF THE INTERIOR, *General Land Office, October 15, 1867.*



No. 17.—*Estimates of appropriations required for surveying the public lands for the fiscal year ending June 30, 1869.*

Objects of appropriation.	Estimated by the surveyor general.	Estimates of appropriations required for the service of the fiscal year ending June 30, 1869.	Estimates of the balances of appropriations unexpended June 30, 1868, which in part may be applied to the service of the next fiscal year.	Appropriations for the service of the fiscal year ending June 30, 1868.
1. For surveying the public lands in Minnesota, at rates not exceeding \$10 per mile for standard lines, \$7 for township, and \$6 for section lines.	\$25,000 00	\$20,000 00	.....	\$15,000 00
2. For surveying the public lands in Dakota Territory, at rates not exceeding \$10 per mile for standard lines, \$7 for township, and \$6 for section lines.	22,000 00	15,000 00	.....	15,000 00
3. For surveying the public lands in Montana Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	.....	25,000 00	.....	.....
4. For surveying the public lands in Nebraska, at rates not exceeding \$10 per mile for standard lines, \$6 for township, and \$5 for section lines.	85,332 00	50,000 00	.....	15,000 00
5. For surveying the public lands in Kansas, at rates not exceeding \$10 per mile for standard lines, \$6 for township, and \$5 for section lines.	62,663 00	40,000 00	.....	15,000 00
6. For surveying the public lands in Colorado Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	86,051 00	40,000 00	.....	15,000 00
7. For surveying the public lands in Nevada, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	50,000 00	50,000 00	.....	20,000 00
8. For surveying the public lands in Idaho Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	35,660 00	25,000 00	.....	15,000 00
9. For surveying the public lands in New Mexico Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	25,000 00	5,000 00	.....	.....
10. For surveying the public lands in Arizona Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	.....	5,000 00	.....	10,000 00
11. For surveying the public lands in California, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	100,000 00	50,000 00	.....	30,000 00
12. For surveying the public lands in Oregon, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	55,450 00	25,000 00	.....	20,000 00
13. For surveying the public lands in Washington Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	34,240 00	15,000 00	.....	10,000 00
14. For surveying the public lands in Utah Territory, at rates not exceeding \$15 per mile for standard lines, \$12 for township, and \$10 for section lines.	25,000 00	5,000 00	.....	.....
15. For the survey of the northern boundary of Colorado Territory, estimated 367 miles, at not exceeding \$60 per mile.	.....	22,020 00	.....	.....
16. For the survey of the eastern boundary of Colorado Territory, estimated 280 miles, at not exceeding \$20 per mile.	.....	5,600 00	.....	.....
17. For the survey of the northern boundary of Nevada, estimated 310 miles, at not exceeding \$30 per mile.	.....	9,300 00	.....	.....
18. For the survey of the eastern boundary of Nevada, estimated 435 miles, at not exceeding \$25 per mile.	.....	10,625 00	.....	.....
Total	.....	417,545 00	.....	.....

## EXPLANATION OF THE FOREGOING ESTIMATES.

1. \$20,000 here estimated is to be applied to the survey of pine lands on the Upper Mississippi river, and other public lands, in the western and southwestern portions of the State, required for immediate settlements.
  2. \$15,000 is estimated for the extension of the lines of public surveys north of Yanceton Indian reservation, lying between Dakota and Missouri rivers, and other localities required for actual settlements.
  3. \$25,000 is estimated for the survey of standard and township lines in the mineral regions, and for the subdivision of agricultural lands to meet the actual demand of settlers.
  4. \$50,000 is estimated for surveys along the Platte river, in view of the obligations on the part of the government along the line of the Union Pacific railroad from Omaha to the Pacific ocean, and for the survey of other parts of the State needed for settlement.
  5. \$40,000 is estimated for the survey of public surveys, along and contiguous to the Union Pacific railroad, and such other portions of the State already settled upon and awaiting the extension of the lines of public extension.
  6. \$40,000 herein estimated is to be applied to the extension of the standard lines to the Parks within the Rocky mountains, for surveying township and section lines therein, and for the subdivision of townships falling within the railroad grant along the northern boundary of Colorado.
  7. \$50,000 is estimated for the survey of Ruby Valley guide meridian, extension of the fourth standard parallel north, township and subdivision of the public lands embraced within the limits of the Central Pacific railroad grant, and sundry other valleys containing actual settlements.
  8. \$25,000 is estimated for the extension of the lines of public surveys to the mineral districts, and for running township and subdivisional lines in different valleys affording agricultural lands, and in great demand for actual settlements.
  9. \$5,000 is estimated for continuing the survey of base, meridian, township and section lines in such portions of the Territory as will be found demanding public lands for actual settlements.
  10. \$5,000 is estimated for the extension of the base, meridian and standard parallels to the mineral districts, and for the survey of township and section lines in localities comprising agricultural lands.
  11. \$50,000 is estimated for the survey of the public lands situated within the limits of the Central Pacific railroad grant, and other grants for similar purposes in the State, and to meet demands of settlers in different portions thereof.
  12. \$25,000 is estimated for the extension of the lines of public surveys along the railroad routes from Eugene City to the eastern boundary of the State; Corvallis to the Acquia bay, on the Pacific, and from Albany to Canon City, and for the survey of other parts of the State requiring the surveys.
  13. \$15,000 is estimated for the survey of guide meridian and standard parallels through the Colville valley, and for the survey of township and section lines in said valley, as well as in the vicinity of Columbia river, below Priest's rapids, on the Upper Yakama, and on Puget's sound.
  14. \$5,000 is estimated for additional surveys in the mineral regions of Utah Territory, and for retracing and re-establishing obliterated lines of former surveys, and thereby enable the surveys of cities and towns out boundaries to be adjusted with the lines of public surveys.
- 15, 16, 17, 18. These respective sums are estimated for surveying and determining the boundaries of States and Territories involving astronomical work, and marking the same conspicuously on the face of the earth, in order to afford the necessary and certain limits of the several jurisdictions, and to close on those boundaries the lines of public surveys now rapidly approaching them. Mining interests and their adjudication by the respective courts of law, as well as political and civil jurisdictions, imperatively demand the ascertainment and perpetuation of those boundaries.

NOTE.—By the act of Congress approved May 30, 1862, the power of fixing the rates per mile for surveys is expressly delegated to the Commissioner, but "in no case to exceed the maximum established by law." It is hence his duty to reduce the rates under the maximum stipulated in the estimates, according as circumstances may allow, and therefore the maximum, in said estimates, are by no means to be considered as the controlling rates.

REMARK.—No estimates are here submitted for the survey of *Indian* and other reservations contemplated by the sixth section of the act of Congress approved April 8, 1864, (Statutes, vol. 13, page 41,) as such estimates should more appropriately emanate from the Office of Indian Affairs, whose province it is to determine the localities and extent of such reservations, as the Indian office was advised by letter of the 31st August last from the Commissioner of the General Land Office.

JOS. S. WILSON, *Commissioner*.

DEPARTMENT OF THE INTERIOR, *General Land Office*, September 2, 1867.

No. 18 A.

SURVEYOR GENERAL'S OFFICE,  
*St. Paul Minn., September 9, 1867.*

SIR : In accordance with your instructions, I have the honor to submit the following report of the progress of the public surveys in this district, and also of the office-work performed since the date of my last annual report, accompanied by the usual tabular statements relating thereto.

Of the field-work undertaken and uncompleted at the date of my last report the whole was completed within the time fixed in the contracts, the notes approved, and the plats and transcripts of the same transmitted.

During the months of September and October, 1866, after notice was received of the appropriation of July 28, of same year, small contracts were made with Messrs. O. E. Garrison, George E. Stuntz, and Charles W. Christmas, deputy surveyors. Mr. Garrison completed his contract, but, owing to the lateness of the season and other causes, the other two deputies were unable to fully complete their work, and, with the consent of the Commissioner, a portion of their contracts was cancelled.

On the 22d of September, 1866, George B. Wright, deputy surveyor, was instructed to subdivide township 130 north, of ranges 38 and 39 west, which surveys were completed by him, notes returned, approved, and transmitted.

The deputies sent into the field this season were considerably retarded in their operations in consequence of continued rains and high water during the first of the season, but are now making good progress, and it is believed they all will be able to complete their work within the time to which they are limited by their contracts. The tables herewith transmitted will show the progress made by them to this date, as far as known at this office.

The usual annual examinations of trespasses on the public lands were made early in the spring, and a thorough exploration of all the logging districts shows that the depredations were not very extensive, and it is believed that all are discovered. Collections will be made as fast as possible, and I expect to be able to collect nearly the whole amount during the next two months.

Immigration to this State during the past and present season has been very large, consisting to a great extent of a farming population, many of whom are crowding beyond the surveyed portion of the State; and I take the liberty of urging the fact that the estimate for the surveying service in this district, herewith submitted, is the least amount that could be asked for consistent with the public interest. In addition to the information furnished by the several tabular statements herewith transmitted, the following summary of the office-work performed since the date of the last annual report is given :

The original notes of three thousand (3,000) miles of subdivisional surveys have been examined and platted, and the contents of the fractional lots calculated and placed on the maps and copies.

One hundred and forty-six (146) township plats have been made, including the originals, the Commissioner's, and the registers'.

The original notes of four hundred and twenty-eight (428) miles of standard and township lines have been examined and approved, diagrams of the same constructed, and transmitted with transcript of field-notes.

Three thousand three hundred and fifty (3,350) pages of transcripts for the department and for record in this office have been made, the same compared and indexed, with full title page to each township.

One hundred and four (104) townships of descriptive notes, giving the establishment of the exterior and interior corner boundaries, with description of soil, timber, &c., have been prepared, compared with the originals, and transmitted to the local land offices or filed in this office.



The usual and necessary amount of office-work, such as preparing contracts, notes, and diagrams, for the use of deputies, the correspondence and recording of same, making out deputies' and other accounts, has been performed. A considerable amount of time is necessarily required in clerical duties connected with the timber trespasses, and much time has been consumed in preparing a map of this surveying district, as directed by the Commissioner. This map will not be ready to forward with this report, but will be transmitted during the present month.

The several statements, estimates, and map accompanying this report are as follows :

A.—Amount, character, locality, and present condition of the surveys in the field.

B.—Original, Commissioner's, and registers' plats made and copied, with date of transmission.

C.—Estimate of appropriation for surveys for the fiscal year ending June 30, 1869.

D.—Estimate of appropriation for salaries for the fiscal year ending June 30, 1869.

E.—Abstract account of the incidental expenses of the office from July 1, 1866, to June 30, 1867.

G.—Statement showing the number of townships surveyed and acres of land therein.

I am, very respectfully, your obedient servant,

L. NUTTING, *Surveyor General.*

Hon. JOSEPH S. WILSON,

*Commissioner General Land Office, Washington, D. C.*

*A.—Statement showing the amount, character, locality, and present condition of the surveys in Minnesota uncompleted at and under-taken since the date of the last annual report.*

Name of deputy.	Date of contract.	Character of work.	Amount and locality.	Present condition.
Messrs. Jewett and Howe...	May 19, 1866	Subdivisions.....	Townships 115 and 116, range 36; townships 115 and 116, range 37; township 116, range 38; townships 117, 118, 119, and 120, range 39; townships 118, 119, and 120, range 40; townships 119 and 120, range 41 west; and that part of township 114, range 37; townships 114 and 115, range 38; townships 115 and 116, range 39; townships 116 and 117, range 40; and townships 117 and 118 north, range 41 west, lying north of the Minnesota river.	Surveys completed, notes returned and approved, and plats and notes transmitted.
George B. Wright.....	May 22, 1866	.....do.....	Townships 125, 126, and 127, range 40; and townships 125, 126, and 127, range 41.	Do. do. do.
Judson W. Bishop .....	May 26, 1866	Township lines and subdivisions.	Township lines between townships 109 and 110, 110 and 111, 111 and 112 north, ranges 39, 40, 41, 42, 43, 44, 45, and 46; and that part of range 47 west, lying in the State of Minnesota; range lines between ranges 39 and 40, 40 and 41, 41 and 42, 42 and 43, 43 and 44, 44 and 45, 45 and 46 and 47 west, in townships 109, 110, 111, and 112 north; subdivisions of township 106 north, range 42 and townships 105, 106, 107, and 108 north, range 43 west.	Do. do. do.
George E. Stuntz .....	Sept. 15, 1866	Subdivisions.....	Townships 43, 44, and 45 north, range 18 west; and township 45 north, range 19 west of 4th principal meridian.	Survey of townships 43 and 44 north, range 18 west, and township 45, range 19 west, completed, notes returned and approved, and plats and notes transmitted. Balance of contract cancelled.
George B. Wright, (instructions.) Charles W. Christmas.....	Sept. 22, 1866 Oct. 3, 1866	.....do..... .....do.....	Township 130 north, ranges 38 and 39 west of 5th principal meridian. Townships 131 and 132 north, of ranges 40 and 41 west of 5th principal meridian.	Surveys completed, notes returned and approved, and plats and notes transmitted. Townships 131 and 132 north, range 40 west, surveyed, notes returned and approved, and plats and notes transmitted. Balance of contract cancelled.
George R. and George E. Stuntz.	Mar. 12, 1867	Standard & township lines.	The 3d guide meridian, from the intersection of the 10th standard parallel therewith, due north 48 miles; the 6th and 7th correction lines from the independent meridian to the 3d guide meridian; township lines between townships 54 and 55, 55 and 56 north, ranges 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, and 27 west of 4th principal meridian; range lines between 16 and 17, 17 and 18, 18 and 19, 19 and 20, 20 and 21, 21 and 22, 22 and 27 west, in townships 54, 55, and 56 north.	Notes of 3d guide meridian and of 6th correction line returned, approved, and transmitted.
Messrs. Jewett and Howe...	Apr. 6, 1867	Subdivisions.....	Townships 109, 110, 111, and 112 north, ranges 39, 40, 41, 42, and 43 west of 5th principal meridian.	Notes of townships 109, 110, and 111, range 39, returned, approved, and transmitted. Township 112, range 39, and townships 109, 110, 111, range 40, returned.
George B. Wright.....	Apr. 6, 1867	.....do.....	Townships 121, 122, 123, and 124 north, ranges 39 and 40 west; townships 123 and 124 north, range 41 west.	Notes of township 124, ranges 39 and 40, returned, approved, and transmitted. Townships 123 and 124, range 41, returned.

David Watson.....	Apr. 8, 1867	.....do.....	Township 114 north, range 41 west; township 114 north, range 42 west; and townships 113, 114, and 115 north, range 43 west.	Notes of township 114, range 41, returned, approved, and transmitted.
Oscar E. Garrison.....	Apr. 8, 1867	.....do.....	Township 137 north, ranges 33 and 34 west.	Notes returned.
Thomas B. Walker.....	Apr. 17, 1867	Subdivisions and township lines.	Township lines between townships 101 and 102, 102 and 103, 103 and 104 north, of ranges 39, 40, 41, 42, 43, 44, 45, 46, and 47 west; range lines between ranges 39 and 40, 40 and 41, 41 and 42, 42 and 43, 43 and 44, 44 and 45, 46 and 47 west, in townships 101, 102, 103, and 104 north; subdivisions of townships 105, 106, 107, and 108 north, range 44 west; and township 105 north, range 45 west.	Notes of township lines between the 5th and 6th guide meridians, from the State boundary to the 1st standard parallel, returned.
George R. and George E. Stuntz, (instructions.)	Aug. 1, 1867	Subdivisions.....	Township 54, of ranges 24, 25, and 26; township 55, of ranges 25 and 26 west, of 4th meridian.	No returns.
Oscar E. Garrison.....	Aug. 5, 1867	Township lines and subdivisions.	Township lines between townships 49 and 50 north, ranges 26 and 27 west; range lines between ranges 25 and 26, 26 and 27, in township 49 north; subdivision of township 49 north, ranges 26 and 27 west, of 4th meridian; and township 140 north, of range 25 west, of 5th meridian.	Do.
Do.....	Oct. 4, 1866	Subdivisions.....	Townships 135 and 136 north, ranges 32 and 33 west, of 5th principal meridian.	Surveys completed, approved, and transmitted.

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, St. Paul, September 9, 1867.



B.—*Statement of original, Commissioner's and registers' plats made and copied, with date of transmission to the General Land Office and the local land offices.*

Description.	Land office.	Original.	Commissioner's.	When trans- mitted.	Registers'.	When trans- mitted.	Total.
Townships 125 and 126, range 39.....	St. Cloud.....	1	1	—, 1866	2	July 12, 1867	2
Township 127, range 37.....	do.....	1	1	May 10, 1867	1	July 12, 1867	3
Township 130, range 38.....	do.....	1	1	June 6, 1867	1	July 12, 1867	3
Township 127, range 39.....	do.....	1	1	May 10, 1867	1	July 12, 1867	3
Township 130, range 39.....	do.....	1	1	June 6, 1867	1	July 12, 1867	3
Township 125, range 40.....	do.....	1	1	Sept. 15, 1867	1	July 12, 1867	3
Townships 121 and 127, range 40.....	do.....	2	2	Dec. 22, 1866	2	July 12, 1867	6
Townships 125 and 126, range 41.....	do.....	2	2	Sept. 15, 1866	2	July 12, 1867	6
Township 127, range 41.....	do.....	1	1	Dec. 22, 1866	1	July 12, 1867	3
Township 115, range 36.....	St. Peter.....	1	1	Aug. 23, 1866	1	July 31, 1867	3
Township 116, range 36.....	Greenleaf.....	1	1	Aug. 23, 1866	1	July 31, 1867	3
Townships 114 and 115, range 37.....	St. Peter.....	2	2	Aug. 23, 1866	2	July 31, 1867	6
Township 116, range 37.....	Greenleaf.....	1	1	Sept. 19, 1866	1	July 31, 1867	3
Township 114, range 38.....	St. Peter.....	1	1	Jan. 9, 1867	1	July 31, 1867	3
Township 115, range 38.....	do.....	1	1	Apr. 19, 1867	1	July 31, 1867	3
Township 116, range 38.....	Greenleaf.....	1	1	Sept. 19, 1866	1	July 31, 1867	3
Township 115, range 39.....	St. Peter.....	1	1	Apr. 5, 1867	1	July 31, 1867	3
Township 116, range 39.....	Greenleaf.....	1	1	Apr. 5, 1867	1	July 31, 1867	3
Townships 117, 118, and 119, range 39.....	do.....	3	3	Nov. 1, 1866	3	July 31, 1867	9
Township 120, range 39.....	do.....	1	1	Nov. 30, 1866	1	July 31, 1867	3
Township 116, range 40.....	do.....	1	1	Apr. 5, 1867	1	July 31, 1867	3
Township 117, range 40.....	do.....	1	1	Jan. 9, 1867	1	July 31, 1867	3
Township 118, range 40.....	do.....	1	1	Nov. 1, 1866	1	July 31, 1867	3
Townships 119 and 120, range 40.....	do.....	2	2	Nov. 30, 1866	2	July 31, 1867	6
Township 117, range 41.....	do.....	1	1	Apr. 5, 1867	1	July 31, 1867	3
Township 118, range 41.....	do.....	1	1	Jan. 9, 1867	1	July 31, 1867	3
Townships 119 and 120, range 41.....	do.....	2	2	Nov. 30, 1866	2	July 31, 1867	6
Township 106, range 42.....	St. Peter.....	1	1	Oct. 24, 1866	1	July 31, 1867	3
Township 105, range 43.....	Winnebago City.....	1	1	Oct. 24, 1866	1	.....	3
Townships 105, 106, and 108, range 43.....	St. Peter.....	3	3	Oct. 24, 1866	3	July 31, 1867	9
Townships 135 and 136, range 32.....	St. Cloud.....	2	2	Feb. 14, 1867	.....	.....	4
Townships 135 and 136, range 33.....	do.....	2	2	Mar. 12, 1867	.....	.....	4
Townships 131 and 132, range 40.....	do.....	2	2	June 15, 1867	.....	.....	4
Townships 43 and 44, range 18.....	Taylor's Falls.....	2	2	Feb. 1, 1867	.....	.....	4
Township 45, range 19.....	do.....	1	1	Feb. 14, 1867	.....	.....	2
Township 114, range 41.....	St. Peter.....	1	1	Aug. 1, 1867	.....	.....	2
Townships 109, 110, and 111, range 39.....	do.....	3	3	Aug. 21, 1867	.....	.....	6
Township 124 north, ranges 39 and 40.....	St. Cloud.....	2	2	Aug. 30, 1867	.....	.....	4
Total.....	.....	.....	.....	.....	.....	.....	146

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, *St. Paul, September 9, 1867.*

C.—*Estimates of appropriation required for continuing the public surveys in Minnesota for the fiscal year ending June 30, 1869.*

For the establishment of 700 miles of township lines between the fifth and sixth correction lines from the independent meridian to the 3d guide meridian.....	\$4,900
For the subdivision of eighteen (18) townships between the independent meridian and the third guide meridian.....	8,100
For the subdivision of thirty (30) townships in the western and southwestern part of the State.....	12,000
	25,000
For the incidental expenses of surveyor general's office, including office rent, messenger, fuel, stationery, &c.....	2,000
	27,000

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, *St. Paul, September 9, 1867.*

*D.—Estimate of appropriations required for the salaries of the surveyor general and the regular clerks in his office for the fiscal year ending June 30, 1869.*

For the salary of surveyor general .....	\$2,000
For the salary of chief clerk .....	1,500
For the salary of chief draughtsman .....	1,300
For the salary of assistant draughtsman .....	1,200
For the salary of transcribing clerk .....	1,200
For the salary of transcribing clerk .....	1,100
	<hr/>
	8,300
	<hr/>

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, *St. Paul, September 9, 1867.*

*E.—Abstract statement of the incidental expenses of the surveyor general's office from June 30, 1866, to June 30, 1867.*

For quarter ending September 30, 1866 .....	\$535 80
For quarter ending December 31, 1866 .....	337 35
For quarter ending March 31, 1867 .....	320 85
For quarter ending June 30, 1867 .....	308 63
	<hr/>
	1,502 63
	<hr/>

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, *St. Paul, September 9, 1867.*

*G.—Statement of townships surveyed from the 1st day of July, 1866, to the 30th day of June, 1867.*

	<i>Acres.</i>
1. Township 126, range 39 .....	22,414.80
2. Township 127, range 37 .....	21,475.72
3. Township 130, range 38 .....	21,207.45
4. Township 127, range 39 .....	18,534.72
5. Township 130, range 39 .....	19,947.93
6. Township 125, range 40 .....	22,772.28
7. Township 126, range 40 .....	21,601.04
8. Township 127, range 40 .....	21,886.19
9. Township 125, range 41 .....	20,958.28
10. Township 126, range 41 .....	21,308.98
11. Township 127, range 41 .....	22,915.84
12. Township 115, range 36 .....	22,712.14
13. Township 116, range 36 .....	22,858.19
Fractional township 114, range 37 .....	10,358.07
14. Township 115, range 37 .....	22,893.32
15. Township 116, range 37 .....	22,931.65
Fractional township 114, range 38 .....	778.50
Fractional township 115, range 38 .....	18,305.49
16. Township 116, range 38 .....	22,875.22
Fractional township 115, range 39 .....	2,595.05
Fractional township 116, range 39 .....	18,391.35
17. Township 117, range 39 .....	22,766.47
18. Township 118, range 39 .....	22,789.17
19. Township 119, range 39 .....	22,774.25
20. Township 120, range 39 .....	22,850.88
Fractional township 116, range 40 .....	2,331.76
Fractional township 117, range 40 .....	19,853.35
21. Township 118, range 40 .....	22,769.80
22. Township 119, range 40 .....	22,645.78
23. Township 120, range 40 .....	22,814.53
Fractional township 117, range 41 .....	5,632.45
Fractional township 118, range 41 .....	21,205.70
24. Township 119, range 41 .....	22,752.70

	<i>Acres.</i>
25. Township 120, range 41 .....	22,973.75
26. Township 106, range 42 .....	22,831.01
27. Township 105, range 43 .....	22,975.57
28. Township 106, range 43 .....	23,006.21
29. Township 107, range 43 .....	23,023.75
30. Township 108, range 43 .....	22,431.56
31. Township 135, range 32 .....	22,707.34
32. Township 136, range 32 .....	22,798.83
33. Township 135, range 33 .....	22,469.89
34. Township 136, range 33 .....	22,424.45
35. Township 131, range 40 .....	21,886.67
36. Township 132, range 40 .....	19,569.60
37. Township 43, range 18 .....	22,976.12
38. Township 44, range 18 .....	23,041.42
39. Township 45, range 19 .....	19,818.95
1, 118 previously reported .....	21,923,872.38
Total acres surveyed.....	21,879,715.70

L. NUTTING, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE, *St. Paul, September 9, 1867.*

### No. 18 A—(Supplement.)

SURVEYOR GENERAL'S OFFICE,

*St. Paul, Minn., October 8, 1867.*

SIR: In compliance with the request contained in your letter of September 14, I have the honor to submit the following supplemental report, "presenting results as to the material interests of the State, her resources, agricultural, mineral," &c.

#### AGRICULTURAL CAPACITY.

Many persons in the eastern and middle States regard Minnesota as too cold a region for successful agricultural purposes, but it is believed that there are few districts in this country that can equal this State in that respect. The prevailing soil is a dark sandy loam, with a clay subsoil or underlaid with limestone. The depth of this dark rich loam varies from two to four feet, and this fact enables it to support vegetation during droughts that, in less favored localities, prove disastrous to crops, and also prevent injury during wet seasons on account of the facility with which it drains. Another important feature of the soil of Minnesota is that its earthy materials are finely pulverized and the soil is light and mellow, existing *naturally* in the condition reached by soils less favorably constituted by expensive under-drainage.

The following table will show about the average yield, per acre, of a few of the staple products of Minnesota:

Wheat, bushels per acre .....	22.05
Rye, bushels per acre .....	21.56
Barley, bushels per acre .....	33.23
Oats, bushels per acre .....	43.00
Corn .....	35.67
Potatoes, bushels per acre .....	208.00
Sorghum, gallons of sirup per acre .....	100.00
Hay, tons per acre .....	2.12

The above is collated from the census of 1860, and gives only the *average* yield of the crops mentioned for the whole State, and may be taken as a fair sample of the average, one year with another. With thorough cultivation the yield is often much greater than the above figures. In 1865, from 400,000



acres of wheat there was harvested 10,000,000 bushels, an average of 25 bushels to the acre.

Wheat is, and no doubt will continue to be, the leading agricultural staple of this State, owing to the large yield, superior quality, and comparative exemption from the dangers to which it is exposed in other States, by drought, rust, insects, &c.

The largest known growth of other States, as compared with the *average* of Minnesota, is as follows:

Minnesota, 1860, bushels per acre .....	22.00
Ohio, 1850, bushels per acre .....	17.03
Michigan, 1848, bushels per acre .....	19.00

The average corn yield in Minnesota in 1859 (a bad year) was 26 bushels; 1860, 35½ bushels; 1865, 43½ bushels; average about 35 bushels; a larger average than in Ohio, Illinois, Iowa, or Kentucky, for the three years taken together.

It seems to be established beyond question that Minnesota is far ahead of any State east of the Rocky mountains in its capacity for wheat production, and equal to most as a corn producing State.

Oats, rye, barley, and buckwheat all do remarkably well; and no better potatoes are grown anywhere, and a large market is found for them in all the States below.

#### MANUFACTURING FACILITIES.

Minnesota possesses a more ample and effective water-power than any other State in the Union. The falls and rapids of St. Anthony, with a total descent of sixty-four feet afford an available hydraulic capacity greater, it is believed, than any single water-power in the world.

The St. Croix falls, at the head of navigation on the St. Croix river, and the falls of the St. Louis river, at a point intersected by the Lake Superior and Mississippi railroad, are only second in power to the falls of St. Anthony. The Mississippi, in its descent from Itasca lake to the mouth of the Minnesota, has a fall of 836 feet, characterized by long stretches of slack water, and then broken by falls and rapids available for hydraulic works. The principal of these, aside from St. Anthony falls, are Pokegama falls, Little falls, and Sauk rapids.

In addition to these, there are a great number of streams, such as Elk, Rum, Sauk, Crow, Vermillion, Zumbro, Cannon, Root, Cedar, Blue Earth, Chippewa, &c., which afford an abundance of available water-power to nearly every county in the State. Manufactories are springing up all over the State. In 1860 there were 511 establishments, producing four and a half millions' worth of manufactures. Now the number of establishments is estimated at 2,000, producing from sixteen to eighteen million dollars' worth of manufactures. Such a combination of agriculture and manufacture as is found in Minnesota is very unusual; generally, where one feature is present the other is absent; but here both exist with all their advantages.

#### MINERAL RESOURCES.

The mineral deposits of Minnesota, although but little developed, it is believed, will prove another important source of wealth. In the northern part of the State copper and iron ores of superior quality are found. The copper mines on the north shore of Lake Superior are rich and extensive, and fine specimens of this ore have been obtained on Stuart and Knife rivers. Thick deposits of iron ore are found in various localities in the northeastern part of the State and on the Upper Mississippi, near Pokegama lake, said to be equal to the famous Swedish and Russian iron.

A geological survey, made under the auspices of the State in 1865, disclosed the existence of the precious metals on the shores of Vermillion lake. Scientific analysis attested the presence of gold and silver in the quartz surface rock in sufficient quantities to induce the employment of capital and labor in their extraction, and a number of stock companies have been formed and repaired to that place in search of gold. Whether the search will prove as successful as anticipated time will determine.

Slate in immense quantities is known to exist on the St. Louis river, equal in quality to any in this country for roofing and other purposes.

Unlimited quantities of pipe-stone are found in the southwestern part of the State, and also on the St. Louis river. This is a kind of stone that is very soft and easily worked when first quarried, becoming hard on exposure to the air for a short time, and capable of receiving a high polish, and will, no doubt, be extensively used for mantels, table-tops, vases, &c.

But the richest mines of wealth a State can have or wish for are a productive soil and healthy climate; and in these respects Minnesota is not excelled by any.

#### FORESTS.

The impression seems to prevail among many not acquainted with the State that Minnesota is a prairie country, nearly destitute of timber. This is a great mistake. There is no western State better supplied with forests. To say nothing now of the pine region, there is what is known here as the "Big Woods," about one hundred miles in length and from thirty to forty in width, running nearly north and south through the central part of the State; and nearly all the lakes and streams are fringed with woodland, and groves of timber are scattered throughout the State at short intervals. Oak, ash, maple, hickory, basswood, elm, butternut, and cottonwood are the prevailing varieties.

#### PINERIES.

The vast pine forests in the northern part of the State extend from Lake Superior to Red lake, and as far south as latitude 46°. The principal pineries where lumber is at present obtained are on the head-waters of the Mississippi and the St. Croix and their tributaries, viz., Kettle, Snake, Rum, Crow, Wing, &c.

These pine forests, being almost inexhaustible, will constitute a vast source of wealth for generations to come. In 1866 the amount of logs and lumber cut and manufactured was about 175,000,000 feet; this year the amount will be still greater. When it is considered that no pine is found west of these vast forests in Minnesota until the Black Hills in the western part of Dakota Territory are reached, their value and importance cannot be overestimated.

#### FACILITIES FOR EXTERNAL AND INTERNAL COMMUNICATION.

The steamboat business of Minnesota is, as yet, confined to the Mississippi, the Minnesota, and St. Croix rivers. The Northwestern Union Packet Company own eleven first-class packets, twenty stern-wheel steamers, and from one hundred and thirty to one hundred and forty barges, and employ over two thousand men. Their boats ply between Dubuque and St. Paul, and between La Crosse and St. Paul. This company has also regular lines on the St. Croix and Minnesota rivers for passengers and freight. The Northern Line, plying between St. Louis and St. Paul, consists of nine or ten first-class side-wheel packets, eight stern-wheel steamers, and sixty or more barges. A boat leaves St. Louis and St. Paul daily.

#### RAILROAD SYSTEM.

In 1857 Congress made a land grant of four and a half million acres to Minnesota for railroad purposes. In 1864 an additional grant was made. These

acts grant ten sections (6,400 acres) of land for each mile of road to be built in compliance therewith. These lines are as follows :

*First division of St. Paul and Pacific railroad*—from Stillwater, via St. Paul and St. Anthony, to the western boundary of the State, near Big Stone lake, 220 miles. This road is completed and in operation from St. Paul to Lake Minnetonka, (fifteen miles west of Minneapolis,) twenty-five miles. A branch line of this road is completed, and cars running thereon to St. Cloud, seventy miles from St. Anthony and eighty miles from St. Paul.

*Minnesota Valley railroad*—from St. Paul up the valley of the Minnesota river to Mankato ; thence in a southwesterly direction to the Iowa line, in range 42 west ; distance to State line 170 miles. Completed and in operation from St. Paul, 60 miles, and is being rapidly pushed forward.

*The Minnesota Central railroad*—a line from St. Paul and Minneapolis (junction at Mendota) running nearly due south, via Faribault and Owatonna, to the Iowa line ; completed and in operation to Austin, 105 miles, where a junction is formed with the McGregor Western railway, giving all rail connection with the east and south via Prairie du Chien.

*The Winona and St. Peter railroad*—a line from Winona, via St. Peter, to the western boundary of the State, completed and cars running from Winona west 100 miles or more. The line when completed will be 250 miles long. It intersects the Minnesota Central at Owatonna.

*The Southern Minnesota railroad*—a line from La Crescent, through the southern tier of counties of the State, to the western boundary, completed and operated to Rushford, 30 miles ; whole length of line, 250 miles.

*Lake Superior and Mississippi railroad*—a line from St. Paul to the head of Lake Superior, in Minnesota. The distance is about 150 miles. Thirty miles have been graded, starting at St. Paul, and work is now being vigorously prosecuted on the line.

*Northern Pacific railroad*—a line crossing the State from Lake Superior to the Red river. Engineers are now making a survey of the two trial lines for this road.

*Hastings and Red River railroad*—a line from Hastings through the counties of Dakota, Scott, Carver, McLeod, &c., to the western boundary of the State. The land grant to this road being of recent date, no portion of it is completed. Some twenty miles are graded, and no doubt several miles of iron will be laid the present season.

*Winona Branch of St. Paul and Pacific railroad*—from St. Paul to Winona along the valley of the Mississippi river. This line has been surveyed, ten miles of the grading completed, and the company propose to build and equip the road at an early day. It is impossible to estimate the importance of this system of railroads to the present and future population of the State. These lines, amounting to over 2,000 miles, wholly within this State, are rapidly opening up some of the best lands to be found anywhere, by bringing them within reach of good markets. The railroad companies are pursuing a liberal policy towards immigrants, by offering liberal terms as to price and time of payments, their own prosperity being identical with that of the State. The facility which Minnesota has of sending her products to market is one, and not the least, of her many advantages. The vast region to the northwest of Minnesota, the Saskatchewan district, estimated to comprise 368,000 square miles, must eventually find an outlet across this State to St. Paul or Lake Superior. A large proportion of this immense region, notwithstanding its high latitude, is capable of cultivation, and it is demonstrated that as far as the production of the cereals is concerned, it is unsurpassed by any portion of the world. The settlement of this region



cannot longer be postponed, and the importance to the State of its connection with the public thoroughfares of Minnesota cannot well be estimated too highly.

I am, very respectfully, your obedient servant,

L. NUTTING,  
*Surveyor General.*

Hon. JOSEPH S. WILSON,  
*Commissioner General Land Office, Washington, D. C.*

### No. 18 B.

SURVEYOR GENERAL'S OFFICE,  
*Yancton, Dakota Territory, August 19, 1867.*

SIR: I have the honor to submit the following report of the field and office work performed in this surveying district since the date of my last annual report, together with the usual statements relating thereto and marked A, B, and C.

### SURVEYS.

1. The correction or line of  $43^{\circ} 30'$  north latitude has been extended west from Dakota river, in range 58, to the Missouri river in range 71, amounting to seventy-five miles, fifty-one chains and twenty links.

2. All the proper township and range lines north of the south boundary of township No. 95 to 101, north and west of the line between ranges 57 and 58 west to the Missouri river, amounting to four hundred and eighty miles, twenty-eight chains and seventeen links.

3. The following named 55 townships and fractional townships have been subdivided into sections, viz: Townships 101, 102, 103, and 104 north, of range 51; townships 96, 97, 98, 99, 100, 101, 102, 103, and 104, of range 52; townships 96, 97, 98, 99, and 100, of ranges 53, 54, 55, 56, and 57; township 100, of range 66; townships 98, 99, and 100, of range 67; townships 97, 98, 99, and 100, of range 68; townships 97, 98, 99 and 100, of range 69; townships 98, 99, and 100, of range 70; township No. 100, of range 71; and township 100, of range 72, all west of the fifth principal meridian, in the Territory of Dakota, amounting to three thousand and six miles, thirty-three chains and twenty-eight links.

### OFFICE WORK.

1. The field-notes of all the above described surveys have been carefully examined and approved.

2. A diagram has been made and the field-notes transcribed of the survey of the above described township lines and transmitted to the General Land Office.

3. The field-notes of the following named 55 townships have been protracted, triplicate maps of each one thereof constructed, and the maps filed and transmitted, as required by law, viz: Townships 101, 102, 103, and 104, of range 51; townships 96, 97, 98, 99, 100, 101, 102, 103, and 104, of range 52; townships 96, 97, 98, 99 and 100, of ranges 53, 54, 55, 56, and 57; township 100, of range 66; townships 98, 99, and 100, of range 67; townships 97, 98, 99, and 100, of range 68; townships 97, 98, 99, and 100, of range 69; townships 98, 99, and 100, of range 70; township 100, of range 71, and township 100, of range 72, all west of the fifth principal meridian, in the Territory of Dakota.

4. Transcripts have been prepared and transmitted of the entire field-notes of each of the fifty-five townships last above named, all of which have been carefully compared with the original, and each has been prefaced with an index diagram.

5. Lists descriptive of the land and all the corners of the above named townships have been made, carefully compared with the original field-notes, certified, and transmitted to the local office at Vermillion.

6. A map of the Territory of Dakota has been constructed on a scale of sixteen miles to an inch and transmitted to the General Land Office.

7. The usual amount of miscellaneous business has been performed, such as preparing contracts and bonds, (in quadruplicate,) with instructions, and diagrams of the exterior boundaries of their surveys for the use of deputies, making out and recording their accounts and the accounts with the government; the general correspondence of the office and recording the same, together with other work, all of which occupies a large amount of time, but of which no regular or detailed statement can well be given.

#### MISCELLANEOUS.

Out of the appropriation for surveys in the Territory of Dakota for the fiscal year ending June 30, 1868, I have contracted for surveys as follows:

1. With Horace J. Austin for subdividing six townships; he has completed his surveys and returned his field-notes to this office, which have been approved, platte<sup>d</sup>, and transcribed.

2. With George N. Proppro for subdividing eight townships; he has completed his surveys, but has not returned his field-notes to this office.

3. With Moses K. Armstrong for survey of standard townships and subdivisionallines in the vicinity of the Red River of the North, to the amount of five thousand dollars. He is in the field.

In ny annual report of last year is set forth the wants of the Territory in relation to the surveys of public lands. What was then stated may be restated with additional force as applicable to the present fiscal year. I am clearly of the opinin that during this year the population of Dakota will be increased ten thousand by emigration. This opinion is based upon information already received fromthe Red River of the North, from that part of Dakota lying along the Platte river and south of the Black Hills, and statement of the local land officers in regad to the amount of land already taken by homestead and pre-emption this seasn in the valley of the Missouri river.

This amount of population, in connection with that already here, unlike the population of the mining Territories, which is transient and fluctuating, is permanent and abiding, composed almost entirely of people devoted to nothing but agriculture and mechanical pursuits, all of whom at once, upon entering the Territory, provide themselves with land sufficient for themselves and children, and mke valuable improvements, for here they expect to make their homes and their gaves.

No mining has yet been done in the Territory, consequently no floating or drifting population are invited to come; hence a greater quantity of surveyed lands are required for our population than for that above referred to in many other localities. Again, the want of timber in some parts of the Territory, and its abundance along the lakes and streams where prairie fires could not destroy its growth, seem to render it necessary that surveys should be kept further in advance of the population, that the first settlers may make good selections, than under other circumstances would be required.

The five thousand dollars appropriated by the last Congress for surveys at and along the Red River of the North, is being expended by Mr. Moses K. Armstrong, deputy surveyor, pursuant to your instructions of the 19th of April last. I am reliably informed that about five thousand dollars more will be required to extend the surveys in that locality sufficiently to meet the present wants of settlers in that vicinity, and this is rendered eminently so from the fact that the treaty of 1863, by which the United States became possessed of those lands,

gives to a large amount of the population of that distant region a quarter section of land, which they have the right to select in preference to other settlers. Hence it becomes necessary both for the half-breed and other settlers that these lands, at least so far as they are occupied, be surveyed at the earliest possible day, and the five thousand dollars asked for will do no more than to accomplish the desired object.

Again, the settlements are far in advance of the surveys along the valley of the Missouri river from Fort Randall to Fort Sully, and such will be the fact when the ten thousand dollars of this fiscal year for surveys in the Missouri valley shall be exhausted.

Again, it is an established fact that in and around the Black Hills of Dakota there is a vast amount of pine timber of excellent quality, which is now so much needed for building material all over Dakota elsewhere, and this timber is not over two hundred miles from surveys already made. I would recommend that five thousand dollars be appropriated for the purpose of extending the surveys to the Black Hills, and, as far as that sum would reach, make survey of said timbered lands.

In view of the well-established fact that there is a vast mine of mineral wealth in and around the Black Hills of Dakota, gold, silver, copper, and coal, which would have been opened and worked this season but for military orders to the contrary, it would seem to be of the first importance to the government to make a liberal appropriation for surveys in this locality.

I am informed that around Fort Laramie and all along the vicinity of the Union and Pacific railroad, where it is located on the soil of this Territory, there are now three thousand inhabitants, and by the commencement of the next fiscal year, at the present ratio, will have reached five thousand who now are and will continue asking for surveys in that locality.

For the reasons already stated in connection with the productive soil and salubrious climate of this Territory, containing an area of 256,900 square miles, with nearly as much arable land as the other seven Territories combined, I was induced to ask the amount of appropriation named in my annual estimate, which I have no doubt your judgment will approve, and Congress pass by your recommendation.

Papers accompanying and forming a part of this report:

A.—Estimates for the surveying service in this district.

B.—Abstract account of the incidental expenses of the surveyor general's office for the year ending June 30, 1867.

C.—Statement showing the number of townships surveyed in Dakota and area of land therein.

I am, very respectfully, your obedient servant,

WILLIAM TRIPP,  
Surveyor General.

Hon. JOS. S. WILSON,

Commissioner General Land Office, Washington, D. C.

*A.—Estimate of appropriations required for continuing the public surveys in the Territory of Dakota, for salaries of the surveyor general and the clerks in his office, (as per act of March 2, 1861,) and for the incidental expenses of the office, for the fiscal year ending June 30, 1869.*

For survey of standard lines.....	\$2,000 00
For survey of township lines.....	5,000 00
For subdividing forty townships.....	15,000 00
Total for surveys.....	22,000 00
For incidental expenses of office.....	2,000 00



For salary of surveyor general.....	\$2,000 00
For salary of chief clerk.....	1,600 00
For salary of principal draughtsman.....	1,300 00
For salary of assistant draughtsman.....	1,200 00
For salary of two clerks.....	2,200 00
Total for surveyor general and clerks.....	8,300 00

WILLIAM TRIPP, *Surveyor General*.

SURVEYOR GENERAL'S OFFICE, Yankton, D. T., August 19, 1867.

*B.—Abstract statement of the incidental expenses of the surveyor general's office for the fiscal year ending June 30, 1867.*

For the quarter ending September 30, 1866.....	\$366 05
For the quarter ending December 31, 1866.....	378 55
For the quarter ending March 31, 1867.....	337 25
For the quarter ending June 30, 1867.....	352 20
	1,434 05

WILLIAM TRIPP, *Surveyor General*.

SURVEYOR GENERAL'S OFFICE, Yankton, D. T., August 19, 1867.

*C.—List of townships surveyed in the Territory of Dakota from July 1, 1866, to June 30, 1867.*

Number.	Township.	Range.	Area.
1	101 north .....	51 west .....	22,835.10
2	96 north .....	52 west .....	22,973.06
3	97 north .....	52 west .....	22,939.98
4	98 north .....	52 west .....	22,886.90
5	99 north .....	52 west .....	22,849.97
6	100 north .....	52 west .....	17,919.15
7	101 north .....	52 west .....	23,071.98
8	96 north .....	53 west .....	23,025.66
9	97 north .....	53 west .....	22,870.67
10	98 north .....	53 west .....	23,002.98
11	99 north .....	53 west .....	23,003.53
12	100 north .....	53 west .....	18,246.51
13	96 north .....	54 west .....	23,014.75
14	97 north .....	54 west .....	23,013.53
15	98 north .....	54 west .....	22,992.48
16	99 north .....	54 west .....	23,007.32
17	100 north .....	54 west .....	18,392.40
18	96 north .....	55 west .....	23,400.16
19	97 north .....	55 west .....	23,298.86
20	98 north .....	55 west .....	23,389.59
21	99 north .....	55 west .....	23,353.54
22	100 north .....	55 west .....	18,787.32
23	96 north .....	56 west .....	22,849.15
24	97 north .....	56 west .....	23,139.70
25	98 north .....	56 west .....	23,098.10
26	99 north .....	56 west .....	23,061.80
27	100 north .....	56 west .....	18,201.12
28	96 north .....	57 west .....	22,869.34
29	97 north .....	57 west .....	23,219.47
30	98 north .....	57 west .....	22,814.48
31	99 north .....	57 west .....	82,959.72

C.—*List of townships surveyed, &c.*—Continued.

Number.	Township.	Range.	Area.
32	100 north .....	57 west .....	18,534.42
33	100 north .....	66 west .....	18,903.26
34	98 north .....	67 west .....	23,062.79
35	99 north .....	67 west .....	23,009.43
36	100 north .....	67 west .....	18,960.26
37	97 north .....	68 west .....	9,259.66
38	98 north .....	68 west .....	23,073.77
39	99 north .....	68 west .....	23,203.95
40	100 north .....	68 west .....	19,078.82
41	97 north .....	69 west .....	9.00
42	98 north .....	69 west .....	16,308.64
43	99 north .....	69 west .....	23,122.39
44	100 north .....	69 west .....	19,169.97
45	98 north .....	70 west .....	35.44
46	99 north .....	70 west .....	10,188.00
47	100 north .....	70 west .....	18,911.56
48	100 north .....	71 west .....	14,272.67
49	100 north .....	72 west .....	73.59
129 townships previously reported .....			969,666.24
Total acres surveyed .....			860,108.05
			2,829,774.29

WILLIAM TRIPP, *Surveyor General.*SURVEYOR GENERAL'S OFFICE, *Yancton, D. T., August 19, 1867.*

No. 18 C.

SURVEYOR GENERAL'S OFFICE,  
*Plattsmouth, Nebraska, August 27, 1867.*

SIR: Complying with your instructions I have the honor to submit my report of the organization and official action, thus far, of this office.

In obedience to the provisions of an act of Congress entitled "An act to remove the office of surveyor general of Wisconsin and Iowa to Plattsmouth, Nebraska," and in accordance with your instructions of April last, I proceeded, after having secured a building at Plattsmouth suitable for the office purposes, to Dubuque, Iowa, and there obtained, from the custodian of the surveying archives of the State of Iowa, such furniture belonging to the office of the late surveyor general of Wisconsin and Iowa as I deemed advisable and necessary to transport to this place for the use of this office.

As soon as the plats, field-notes, records, and other papers connected with the surveys in Nebraska, on file in the office of the surveyor general at Leavenworth, Kansas, were separated from those of Kansas, and the necessary copies prepared, I brought them also to this place, and, when properly arranged, notice was given, as directed by you, that the surveyor general's office for the district of Iowa and Nebraska was open and ready for business.

All surveys in Nebraska contracted for by the surveyor general of Kansas and Nebraska have been completed in the field and office; and transcripts of the field-notes, plats, diagrams, and descriptive lists have been transmitted to the proper offices.

The Indian troubles, which for a long time past have disturbed the peace of

our frontier country, increased to such an extent at the opening of this season that it soon became evident that no surveys could safely be prosecuted in the field in this district without the protection of a military escort. I therefore, in June last, made formal application to General Augur, commanding this department, for such protection. This, I regret to say, he was unable to give me until about the first of August, and then only to the extent of forty men—sufficient, as was thought, for three surveying parties.

I have contracted for the extension of the following standard lines, viz: the second guide meridian west, from the third standard parallel north to the fourth standard parallel north; the third, fourth, and fifth guide meridians west, from the second standard parallel north to the fourth standard parallel north; the second standard parallel north, through ranges twenty-five to forty, inclusive; third standard parallel north, through ranges seventeen to forty, inclusive; and the fourth standard parallel north, through ranges nine to forty, inclusive, all west of the sixth principal meridian.

I have also under contract, and being subdivided, townships five and six of ranges twelve, thirteen, fourteen, fifteen, and sixteen; townships five, six, seven, and eight of ranges seventeen and eighteen; township eight of range nineteen; and fractional townships eight, of ranges fifteen and sixteen, all west of the sixth principal meridian.

Other deputy surveyors are ready to take the field if proper escorts can be obtained. These General Augur has kindly promised me at the earliest possible moment; but the lateness of the season, combined with the fact that the Indian attacks seem increasing in number and ferocity, forbid the hope that more than one other party can be maintained in the field at present. I am reconciled to this fact by the belief that a speedy adjustment and settlement of the Indian question seems probable.

It is hoped that the Indian commission, now on the frontier and making the final effort for peaceful solution, will succeed. If they fail, the military power of the nation will, doubtless, at once be evoked, the savage obstacles to American progress be thrust aside or destroyed, and civilization, having gathered momentum from the delay, will once more resume its peaceful march across the continent.

In the further extension of the surveys, that of first importance is the establishment of the western boundary of this State, and so much of the southern as forms the northern boundry of Colorado. Settlements of considerable importance and thriving towns have sprung up with great rapidity along portions of this line, which is also near the line of the Union Pacific railroad. In many instances it is impossible, without this survey, to determine whether these towns are within the limits of the State of Nebraska or the Territory of Colorado; hence civil organizations, and the establishment of law and order, are delayed.

The wonderfully rapid progress of the Union Pacific railroad, now stretching across the State from east to west, also demands increased and increasing energy in the extension of the public surveys along its line. The cabin of the pioneer farmer and the shop of the pioneer tradesman are already thickly scattered along its route, and the interests of the settlers, the railroad and the country alike demand the speedy survey of the lands adjacent.

The usual statements and estimates accompanying this report are as follows:

A.—Schedule showing the condition of the surveys under the appropriation for the fiscal year ending June 30, 1868.

B.—Statement showing the salary and incidental expense account for the fiscal year ending June 30, 1868.

C.—Estimates of sums required for the extension of surveys in the State of Nebraska for fiscal year ending June 30, 1869.



D.—Estimates of sums required for office expenses for fiscal year ending June 30, 1869.

All of which is respectfully submitted :

P. W. HITCHCOCK,  
*Surveyor General.*

A.—Schedule showing the condition of the surveys under the appropriation for the fiscal year ending June 30, 1868.

Name of deputy.	Date of contract.	Character of the work.	Amount and locality.	Present condition.
Josiah B. Park and Henry C. Campbell.	July 2, 1867.	Standard lines.	The 2d guide meridian west, from 3d to 4th standard parallels north; the 3d, 4th, and 5th guide meridians west, from 2d to 4th standard parallels north, all west of 6th principal meridian; the 2d standard parallel north through ranges 25 to 40 inclusive west of the 6th principal meridian; the 3d standard parallel north through ranges 17 to 40 inclusive, west of the 6th principal meridian, and the 4th standard parallel north through ranges 9 to 40 inclusive, west of the 6th principal meridian, Nebraska.	Parties in the field.
William Hardin.....	July 12, 1867.	Subdivisions.	Townships 5 and 6 north, ranges 12, 13, 14, 15, and 16 west, of the 6th principal meridian, Nebraska.	Parties in the field.
James McBride.....	July 31, 1867.	Subdivisions and township line.	Townships 5, 6, 7, and 8 north, ranges 17 and 18 west, of the 6th principal meridian; township 8 north, range 19 west, of the 6th principal meridian; and fractional township 8 north, ranges 15 and 16 west, of the 6th principal meridian; also the line between ranges 15 and 16 west, of the 6th principal meridian; of township 8 north, State of Nebraska.	Parties in the field.

P. W. HITCHCOCK, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE,  
Plattsmouth, Nebraska, August 27, 1867.

B.—The United States in account with the office of the surveyor general of Iowa and Nebraska, on account of salaries and incidental expenses for the fiscal year ending June 30, 1867.

SALARY ACCOUNT.

DR.

For expenditures during second quarter, 1867 ..... \$703 10

Cr.

By appropriation approved March 2, 1867, for compensation of surveyor general and clerks .....	\$7,000 00
Unexpended June 30, 1867 .....	6,296 90

## INCIDENTAL EXPENSE ACCOUNT.

Dr.

For expenditures during second quarter, 1867 .....	625 54
--	--------

Cr.

By appropriation approved March 2, 1867, for office rent, fuel, books, stationery, &c. ....	2,000 00
Unexpended June 30, 1867 .....	1,374 46

P. W. HITCHCOCK, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE,

Plattsmouth, Nebraska, August 27, 1867.

C.—*Estimates of sums required for the extension of surveys in the State of Nebraska for the fiscal year ending June 30, 1868.*

Surveys estimated.	Miles.	Rate.	Cost.
For running the second guide meridian west from the fourth standard parallel to the seventh standard parallel north. The fifth and sixth standard parallels from the first to the second guide meridian west. The fourth and fifth guide meridians west, from the base line to the second standard parallel. The first standard parallel from the third to the fifth guide meridians west. The sixth and seventh guide meridians west, from the third standard parallel to the fourth standard parallel. The third and fourth standard parallels, from the fifth to the seventh guide meridians west .....	600	\$10	\$6,000
For running the exterior township lines of townships 13 to 16 inclusive, of ranges 9 to 16 west, inclusive; township 13 to 16, inclusive, of ranges 17 to 24, inclusive; townships 9 to 16, inclusive, of ranges 25 to 40 west, inclusive .....	1,872	6	11,232
For the section lines of township 5 of ranges 22 to 24, inclusive; townships 1 to 4, inclusive, of ranges 17 to 24, inclusive; townships 9 to 16, inclusive, of ranges 25 to 40, inclusive; townships 13 to 16, inclusive, of ranges 9 to 24, inclusive .....	13,620	5	68,100
Total .....			85,332

P. W. HITCHCOCK, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE,

Plattsmouth, Nebraska, August 27, 1867.

D.—*Estimate of sums required for office expenses for the fiscal year ending June 30, 1869.*

Salary of surveyor general .....	\$2,000
Salary of chief clerk .....	1,600
Salary of principal draughtsman .....	1,300
Salary of assistant draughtsman .....	1,200
Salary of accountant .....	1,200
Salary of two copyists, at \$1,100 each .....	2,200
Salary of one messenger .....	600
Office rent, fuel, and other incidental expenses .....	2,000
Total .....	12,100

P. W. HITCHCOCK, *Surveyor General.*

SURVEYOR GENERAL'S OFFICE,

Plattsmouth, Nebraska, August 27, 1867.

No. 18 D.

SURVEYOR GENERAL'S OFFICE,  
Leavenworth, Kansas, August 24, 1867.

SIR: In accordance with your instructions of March 26, 1867, I herewith submit my annual report, in duplicate, showing the condition of surveys and the operation of the office in the district of Kansas and Nebraska during the year ending June 30, 1867:

1. Names, duties, and salaries of persons employed in the office of the surveyor general during the year ending June 30, 1867.

2. Sums expended for salaries of surveyor general and clerks during the year ending June 30, 1867.

3. Expenditures of the office during the year ending June 30, 1867.

4. Amount of revenue tax paid by the surveyor general and clerks during the year ending June 30, 1867.

5. The extent and cost of surveys executed in Kansas during the year ending June 30, 1867.

6. The same in Nebraska.

7. Number and area of townships of which plats and descriptive lists have been transmitted to the department and local land offices during the year ending June 30, 1867, in Kansas.

8 and 9. The same in Nebraska.

10. Estimated expense, number of miles, and character of work for which contracts have been entered into for surveys in Kansas, and chargeable to appropriations approved July 28, 1866, and March 2, 1867.

11. Estimate of sums required for the extension of surveys in the State of Kansas for the fiscal year ending June 30, 1869.

12. Estimate of sums required for office expenses for the fiscal year ending June 30, 1869.

#### CONDITION OF PUBLIC SURVEYS.

All surveys contracted for out of appropriation of April 7, 1866, have been completed. Six contracts have been entered into out of appropriations approved July 28, 1866, and March 2, 1867, for surveys in Kansas. In letting these contracts I have followed the instructions as set forth in your letters of September 6, 1866, and March 30, 1867. The appropriations under which the present surveys are being prosecuted having been reported to this office at an earlier day than usual, it was thought that deputies would have little or no trouble in completing their contracts within the time specified. The causes that will prevent this desired result are much the same as have been referred to in my annual reports heretofore, but in a more aggravated form. The deputies, as usual for the past few years, upon starting for the field were furnished with an order for an escort of soldiers, to be procured at the military post nearest the locality of their surveys. These orders have been of little or no avail, as the demand for troops on the plains is so great that it is almost impossible for the military authorities to furnish escorts to all parties in need of them.

Messrs. Diefendorf and Smith are the only deputies who have been able to procure an escort sufficient in numbers to prosecute their work without molestation. These deputies, when last heard from, were still in the field; but, as a portion of their work is so remote from military posts, it was thought if more escort were not furnished they would have to abandon it for the present.

Messrs. Armstrong and McClure are the only deputies who have been attacked by Indians, an account of which has been furnished you. Since the loss reported, these deputies have procured a new outfit, hired new assistants, and, with commendable energy, have again started for the field.



The remaining deputies have had to contend with almost insurmountable difficulties in the shape of desertion of assistants and that of procuring escorts; but, notwithstanding the many detentions and grievances that beset the deputies on every side, they are all using their utmost endeavors towards completing their respective contracts.

## OFFICE WORK.

Diagrams and transcripts of field-notes of 309 miles 2 chains and 95 links of standard lines have been made and transmitted to the department.

Diagrams and transcripts of field-notes of 1,950 miles 21 chains and 66 links of exterior lines have been made and transmitted to the department.

Transcript of field-notes and township plats of 140 townships of subdivisional lines have been made and transmitted to the department and proper local land offices.

One hundred and forty descriptive lists have been made and transmitted to the proper local land offices.

One new map of Kansas, in colors, has been made and transmitted to the department.

Diagrams and transcripts of field-notes of the base line through 59 ranges have been made and furnished to the surveyor general's office of Iowa and Nebraska.

## EXTENSION OF PUBLIC SURVEYS.

Under this head I have but little to say. The constant inquiry for public lands, and the rapidity with which the recent surveys are being located upon, are facts sufficient to prove to the government that a further extension of the public surveys is necessary. The future progress of the Union Pacific railroad, eastern division, is also another incentive in that direction, as the grading parties on said road are already at work beyond the lines of the present surveys.

Commerce on the plains has been seriously retarded this year, on account of Indian hostilities, and travel thereon has only been safe when under the protection of a heavy escort of soldiers.

Very respectfully, your obedient servant,

H. S. SLEEPER,  
*Surveyor General of Kansas.*

Hon. JOSEPH S. WILSON,  
*Commissioner General Land Office, Washington, D. C.*

No. 1.—Statement showing the names, duties, nativity, whence appointed, and rate of compensation per annum of persons employed in the surveyor general's office of Kansas and Nebraska during the year ending June 30, 1867.

Names.	Duty.	Nativity.	Whence appointed.	Term of service.	Salary per annum.
H. S. Sleeper.....	Surveyor general.....	New York.....	Kansas.....	Entire year.....	\$2,000
Henry C. Fields.....	Chief clerk.....	Virginia.....	Kansas.....	Entire year.....	1,600
William B. Covel.....	Principal draughtsman.....	New York.....	Kansas.....	Entire year.....	1,300
John P. Sleeper.....	Assistant draughtsman.....	New York.....	Kansas.....	October 1, 1866, to April 25, 1867.....	1,200
James F. Taylor.....	Assistant draughtsman.....	New York.....	Kansas.....	July 1 to September 30, 1866.....	1,200
Burr Noble.....	Temporary draughtsman.....	New York.....	Kansas.....	November 1, 1866, to January 31, 1867.....	1,200
Henry S. Burr.....	Accountant.....	Ohio.....	Kansas.....	Entire year.....	1,200
James F. Taylor.....	Copyist.....	New York.....	Kansas.....	October 1, 1866, to June 30, 1867.....	1,100
Edward C. Wright.....	Copyist.....	New York.....	Kansas.....	July 1 to August 14, 1866.....	1,100
William T. Schooley.....	Copyist.....	Illinois.....	Kansas.....	August 15 to September 30, 1866.....	1,100
James B. C. Covel.....	Temporary copyist.....	New York.....	Kansas.....	November 1, 1866, to January 31, 1867.....	1,100
James Bicknell.....	Messenger.....	England.....	Kansas.....	Entire year.....	600

No. 2.—*Statement showing the amount expended for salaries of surveyor general and clerks during the year ending June 30, 1867.*

Quarter ending September 30, 1866.....	\$2,100 00
Quarter ending December 31, 1866.....	2,481 27
Quarter ending March 31, 1867.....	2,298 05
Quarter ending June 30, 1867.....	1,882 41
Total.....	<u>8,761 73</u>

No. 3.—*Statement showing the amount expended for rent of office and incidental expenses during the year ending June 30, 1867.*

Quarter ending September 30, 1866.....	\$544 49
Quarter ending December 31, 1866.....	426 96
Quarter ending March 31, 1867.....	431 21
Quarter ending June 30, 1867.....	415 39
Total.....	<u>1,818 05</u>

NOTE.—The quarter ending June 30, 1867, includes \$37 50 chargeable to binding appropriation.

RECAPITULATION.

Salaries of surveyor general and clerks during the year.....	\$8,761 73
Rent of office and incidental expenses during the year.....	1,818 05
Total.....	<u>10,579 78</u>

No. 4.—*Statement showing the amount of revenue tax paid by the surveyor general and clerks during the year ending June 30, 1867.*

Quarter ending September 30, 1866.....	\$59 82
Quarter ending December 31, 1866.....	68 87
Quarter ending March 31, 1867.....	54 41
Quarter ending June 30, 1867.....	28 19
Total.....	<u>211 29</u>

No. 5.—*Statement showing the extent and cost of surveys executed in Kansas during the year ending June 30, 1867.*

No. of contract.	Name of deputy.	Standard lines.	Township lines.	Section lines.	Date of appropriation.	Date of contract.	Rate.	Am't for mileage.
316	Angell and Beverage .....	236 41 33	.....	.....	1866. April 7	1866. May 16	\$10 6	\$2,365 16
	Do..... do.....	.....	617 67 01	.....	April 7	May 16		3,702 52
								<u>6,067 68</u>
317	Diefendorf and Cosgray .....	.....	590 14 76	.....	April 7	May 16	6 5	3,541 10
	Do..... do.....	.....	.....	430 25 25	April 7	May 16		2,401 57
								<u>5,942 67</u>
318	Furrow and Sleeper .....	.....	.....	1,262 61 74	April 7	May 17	5	6,313 85
321	Manning and Ballard .....	.....	.....	1,202 77 41	April 7	May 31	5	6,014 83
		236 41 33	1,207 21 76	2,946 04 40				<u>21,339 03</u>



No. 6.—*Statement showing the extent and cost of surveys executed in Nebraska during the year ending June 30, 1867.*

No. of contract.	Name of deputy.	Standard lines.	Township lines.	Section lines.	Date of appropriation.	Date of contract.	Rate.	Am't for mileage.
314	Hackbusch and Farnsworth.	72 41 62			1866. April 7	1866. May 15	\$10	\$725 20
	Do.....do.....		269 29 53		April 7	May 15	6	1,616 21
	Do.....do.....			1,057 78 95	April 7	May 15	5	2,289 93
								7,631 34
315	Armstrong and Wright		127 63 66		April 7	May 15	6	766 77
	Do.....do.....			1,021 41 06	April 7	May 15	5	5,107 57
								5,874 24
319	George T. McClure			621 23 62	April 7	May 25	5	3,106 47
322	Paul and Paul		312 06 02		April 7	July 16	6	1,872 45
	Do.....do.....			780 04 68	April 7	July 16	5	3,900 29
								5,772 74
323	Davis and Wiltse		33 60 68		April 7	July 25	6	202 55
	Do.....do.....			382 12 60	April 7	July 25	5	1,910 78
	Do.....do.....			719 52 29	April 7	July 25	5	3,598 26
								5,711 59
		72 41 62	742 79 90	4,582 53 20				28,096 38

No. 7.—*Statement showing description of land and area of same for which township plats and descriptive lists have been furnished to the western land district, Junction City, Kansas, during the year ending June 30, 1867.*

Township.	Range.	Area.	Triplicate plats; date when transmitted.	Descriptive lists; date when transmitted.
20 south	4 west	23,036.23	October 29, 1866	November 16, 1866.
16 south	5 west	22,945.82	do	Do.
17 south	5 west	22,971.03	do	Do.
18 south	5 west	22,950.89	do	Do.
19 south	5 west	22,974.55	do	Do.
20 south	5 west	23,004.90	do	Do.
16 south	6 west	22,951.44	do	Do.
17 south	6 west	22,951.04	do	Do.
18 south	6 west	22,968.24	do	Do.
19 south	6 west	22,965.05	do	Do.
20 south	6 west	23,000.08	do	Do.
16 south	7 west	22,866.82	do	Do.
17 south	7 west	22,983.72	do	Do.
18 south	7 west	23,032.85	do	Do.
19 south	7 west	23,075.98	do	Do.
20 south	7 west	23,051.94	do	Do.
16 south	8 west	22,973.55	do	Do.
17 south	8 west	22,996.08	do	Do.
18 south	8 west	23,030.19	do	Do.
19 south	8 west	23,030.34	do	Do.
20 south	8 west	23,020.55	do	Do.
6 south	9 west	23,062.19	February 20, 1867	February 20, 1867.
7 south	9 west	23,012.77	do	Do.
8 south	9 west	23,011.73	do	Do.
9 south	9 west	23,057.40	do	Do.
10 south	9 west	23,141.96	do	Do.
6 south	10 west	22,817.70	do	Do.
7 south	10 west	22,960.77	do	Do.

*Statement showing description of land, &c.—Continued.*

Township.	Range.	Area.	Triplicate plats; date when transmitted.	Descriptive lists; date when transmitted.
8 south ....	10 west....	23, 059. 86	February 20, 1867 ...	February 20, 1867.
9 south ....	10 west....	23, 075. 14	..... do.....	Do.
10 south ....	10 west....	23, 096. 76	..... do.....	Do.
6 south ....	11 west....	22, 887. 07	..... do.....	Do.
7 south ....	11 west....	22, 988. 81	..... do.....	Do.
8 south ....	11 west....	23, 034. 19	..... do.....	Do.
9 south ....	11 west....	23, 020. 31	..... do.....	Do.
10 south ....	11 west....	23, 022. 09	..... do.....	Do.
6 south ....	12 west....	22, 982. 63	..... do.....	Do.
7 south ....	12 west....	22, 995. 09	..... do.....	Do.
8 south ....	12 west....	23, 043. 69	..... do.....	Do.
9 south ....	12 west....	23, 052. 72	..... do.....	Do.
10 south ....	12 west....	23, 033. 10	..... do.....	Do.
14 south ....	9 west....	23, 169. 97	March 27, 1867.....	March 27, 1867.
15 south ....	9 west....	23, 209. 20	..... do.....	Do.
14 south ....	10 west....	23, 039. 02	..... do.....	Do.
15 south ....	10 west....	23, 020. 17	..... do.....	Do.
14 south ....	11 west....	23, 009. 97	..... do.....	Do.
15 south ....	11 west....	23, 030. 50	..... do.....	Do.
14 south ....	12 west....	23, 043. 03	..... do.....	Do.
15 south ....	12 west....	23, 036. 56	..... do.....	Do.
Total...		1, 127, 695. 61		

No. 8.—*Statement showing description of land and area of same for which township plats and descriptive lists have been furnished to the North Platte district, Omaha, Nebraska, during the year ending June 30, 1867.*

Township.	Range.	Area.	Triplicate plats; date when transmitted.	Descriptive lists; date when transmitted.
21 north....	1 west....	23, 035. 06	April 19, 1867.....	April 19, 1867.
22 north....	1 west....	23, 064. 82	..... do.....	Do.
23 north....	1 west....	23, 997. 33	..... do.....	Do.
21 north....	2 west....	23, 052. 06	..... do.....	Do.
22 north....	2 west....	23, 014. 11	..... do.....	Do.
23 north....	2 west....	23, 021. 52	..... do.....	Do.
21 north....	3 west....	23, 030. 47	..... do.....	Do.
22 north....	3 west....	23, 024. 60	..... do.....	Do.
23 north....	3 west....	23, 052. 49	..... do.....	Do.
18 north....	4 west....	11, 182. 93	December 5, 1866....	January 17, 1867.
19 north....	4 west....	23, 053. 46	..... do.....	Do.
20 north....	4 west....	22, 771. 24	..... do.....	Do.
21 north....	4 west....	23, 005. 29	March 18, 1867.....	March 18, 1867.
22 north....	4 west....	22, 973. 95	..... do.....	Do.
23 north....	4 west....	22, 967. 22	..... do.....	Do.
18 north....	5 west....	13, 256. 60	December 5, 1866....	January 17, 1867.
19 north....	5 west....	22, 931. 86	..... do.....	Do.
20 north....	5 west....	22, 830. 07	..... do.....	Do.
21 north....	5 west....	23, 066. 72	March 18, 1867.....	March 18, 1867.
22 north....	5 west....	23, 108. 11	..... do.....	Do.
23 north....	5 west....	23, 014. 99	..... do.....	Do.
12 north....	6 west....	34. 50	May 18, 1867.....	May 22, 1867.
18 north....	6 west....	15, 826. 10	December 5, 1866....	January 17, 1867.
19 north....	6 west....	22, 938. 82	..... do.....	Do.
20 north....	6 west....	23, 005. 31	..... do.....	Do.
21 north....	6 west....	23, 034. 94	March 18, 1867.....	March 18, 1867.
22 north....	6 west....	22, 947. 97	..... do.....	Do.
23 north....	6 west....	22, 858. 91	..... do.....	Do.
12 north....	7 west....	7, 594. 46	January 14, 1867....	January 17, 1867.

*Statement showing description of land, &c.—Continued.*

Township.	Range.	Area.	Triplicate plats; date when transmitted.	Descriptive lists; date when transmitted.
12 north ....	7 west....	971.93	May 18, 1867.....	May 22, 1867.
15 north ....	7 west....	13,042.44	December 5, 1866....	January 17, 1867.
18 north ....	7 west....	22,911.13	..... do.....	Do.
19 north ....	7 west....	22,967.41	..... do.....	Do.
20 north ....	7 west....	23,139.86	..... do.....	Do.
11 north ....	8 west....	1,967.00	January 14, 1867 ....	Do.
11 north ....	8 west....	6,715.55	May 18, 1867.....	May 22, 1867.
12 north ....	8 west....	21,107.47	January 14, 1867 ....	January 17, 1867.
12 north ....	8 west....	1,643.15	May 18, 1867 ....	May 22, 1867.
13 north ....	8 west....	22,786.32	December 5, 1866....	January 17, 1867.
14 north ....	8 west....	22,591.07	..... do.....	Do.
15 north ....	8 west....	12,443.24	..... do.....	Do.
16 north ....	8 west....	2,446.55	..... do.....	Do.
17 north ....	8 west....	3,529.40	..... do.....	Do.
18 north ....	8 west....	22,976.33	..... do.....	Do.
19 north ....	8 west....	22,966.01	..... do.....	Do.
20 north ....	8 west....	22,997.29	..... do.....	Do.
10 north ....	9 west....	8,456.47	May 18, 1867 ....	May 22, 1867.
11 north ....	9 west....	12,505.14	January 14, 1867 ....	January 17, 1867.
11 north ....	9 west....	6,699.40	May 18, 1867.....	May 22, 1867.
12 north ....	9 west....	19,205.17	January 14, 1867 ....	January 17, 1867.
9 north ....	10 west....	590.28	May 18, 1867.....	May 22, 1867.
10 north ....	10 west....	5,721.49	January 14, 1867....	January 17, 1867.
10 north ....	10 west....	14,932.48	May 18, 1867.....	May 22, 1867.
11 north ....	10 west....	22,925.79	January 14, 1867 ....	January 17, 1867.
11 north ....	10 west....	77.75	May 18, 1867.....	May 22, 1867.
12 north ....	10 west....	22,857.48	January 14, 1867....	January 17, 1867.
9 north ....	11 west....	647.34	..... do.....	Do.
9 north ....	11 west....	7,245.46	May 18, 1867.....	May 22, 1867.
10 north ....	11 west....	18,109.35	January 14, 1867 ....	January 17, 1867.
10 north ....	11 west....	4,831.00	May 28, 1867.....	May 22, 1867.
11 north ....	11 west....	23,055.56	January 14, 1867 ....	January 17, 1867.
12 north ....	11 west....	22,873.64	December 5, 1866....	Do.
8 north ....	12 west....	339.95	May 18, 1867.....	May 22, 1867.
9 north ....	12 west....	7,382.87	January 14, 1867 ....	January 17, 1867.
9 north ....	12 west....	10,564.37	May 18, 1867.....	May 22, 1867.
10 north ....	12 west....	22,957.62	January 14, 1867 ....	January 17, 1867.
11 north ....	12 west....	22,929.06	..... do.....	Do.
12 north ....	12 west....	22,896.48	December 15, 1866....	Do.
9 north ....	13 west....	16,868.16	January 14, 1867 ....	Do.
10 north ....	13 west....	23,042.43	..... do.....	Do.
11 north ....	13 west....	22,934.19	December 15, 1866....	Do.
12 north ....	13 west....	22,981.89	..... do.....	Do.
9 north ....	14 west....	18,980.87	January 14, 1867 ....	Do.
10 north ....	14 west....	23,026.81	..... do.....	Do.
11 north ....	14 west....	22,979.43	December 15, 1866....	Do.
12 north ....	14 west....	23,014.99	..... do.....	Do.
9 north ....	15 west....	19,339.81	January 14, 1867 ....	Do.
10 north ....	15 west....	23,059.56	..... do.....	Do.
11 north ....	15 west....	23,039.13	December 15, 1866....	Do.
12 north ....	15 west....	23,017.08	..... do.....	Do.
..... north ....	16 west....	26,834.25	January 14, 1867 ....	Do.
10 north ....	16 west....	26,789.06	..... do.....	Do.
11 north ....	16 west....	26,928.81	December 15, 1866....	Do.
12 north ....	16 west....	26,859.85	..... do.....	Do.
Total.....	.....	1,495,398.59		



No. 9.—*Statement showing description of land and area of same for which township plats and descriptive lists have been furnished to the Dakota land district, Dakota, Nebraska, during the year ending June 30, 1867.*

Township.	Range.	Area.	Triplicate plats; date when transmitted.	Descriptive lists; date when transmitted.
24 north .....	1 west...	23,014.86	April 19, 1867 .....	April 19, 1867.
24 north .....	2 west...	23,050.55	.....do.....	do.
24 north .....	3 west...	22,979.81	.....do.....	do.
24 north .....	4 west...	22,963.73	March 18, 1867.....	March 18, 1867.
24 north .....	5 west...	22,866.96	.....do.....	do.
24 north .....	6 west...	22,940.10	.....do.....	do.
24 north .....	7 west...	22,969.77	.....do.....	do.
Total.....	.....	160,785.78		

No. 10.—*Statement showing the expense, (estimated,) number of miles, and character of work for which contracts have been entered into for surveying in Kansas, and chargeable to appropriations of July 28, 1866, and March 2, 1867.*

No. of contract.	Name of deputy.	Standard lines.	Township lines.	Section lines.	Rate.	Estimated cost.
324	Armstrong and McClure .....	.....	.....	1,200	\$5	\$6,000 00
325	Diefendorf & Smith .....	234	.....	.....	10	2,340 00
325	.....do.....	.....	612	.....	6	3,672 00
						6,012 00
326	James W. Thomas .....	.....	.....	600	5	3,000 00
328	Sleeper & Taylor .....	.....	.....	1,200	5	6,000 00
329	Angell & Armstrong .....	.....	192	.....	6	1,152 00
329	.....do.....	.....	.....	960	5	4,800 00
						5,952 00
330	George W. Goodrich .....	.....	.....	600	5	3,000 00
	Total.....	.....	.....	.....	.....	29,964 00

No. 11.—*Estimate of sums required for the extension of surveys in the State of Kansas during the year ending June 30, 1869.*

Surveys estimated.	Miles.	Rate.	Cost.
For running the fourth guide meridian west, from the base line to the fourth standard parallel south; the first, second, third, and fourth standard parallels south, from the third to the fourth guide meridian west.....	312	\$10	\$3,120 00
For running the exterior lines as shown on diagram furnished department July 22, 1867 .....	1,608	6	9,648 00
For running the subdivisonal lines as shown on diagram furnished department July 22, 1867.....	7,980	5	39,900 00
Total.....	.....	.....	52,668 00

No. 12.—*Estimate of sums required for office expenses for the fiscal year ending June 30, 1869.*

Salary of surveyor general.....	\$2,000
Salary of chief clerk.....	1,600
Salary of principal draughtsman.....	1,300
Salary of assistant draughtsman.....	1,200
Salary of one accountant.....	1,200
Salary of two copyists, at \$1,100 each.....	2,200
Messenger, rent, and other incidental expenses.....	2,000
Total.....	<u>11,500</u>

No. 18 D.—(Supplement.)

SURVEYOR GENERAL'S OFFICE,  
Leavenworth, Kansas, September 24, 1867.

SIR: In accordance with your instructions of August 29, 1867, I submit the following as a supplement to my annual report, dated August 24, 1867, showing the resources of this district, "agricultural and mineral; existing and increasing facilities of internal and external communication, by railway and otherwise."

AGRICULTURAL.

I am pleased to be able to state, as a premise to my remarks on this subject, that never during the history of Kansas has there been a season wherein all products of the soil common to this latitude have yielded more bountifully than the one now closing.

Upon the receipt of your instructions to prepare this report I endeavored to procure from official sources the statistical information required, but the officers of the different counties, to whom this duty belongs, have failed to comply with the law regulating such matters. In the absence of these facts, I have obtained from reliable sources some general ideas and figures, which are given below:

Estimated population of Kansas.....	300,000
Estimated number of acres improved.....	<u>2,000,000</u>

Live stock.	Number of head.	Price per head.	Total amount.
Cattle.....	1,000,000	\$25	\$25,000,000
Horses.....	150,000	60	9,000,000
Mules.....	10,000	100	1,000,000
Hogs.....	1,000,000	5	5,000,000
Sheep.....	100,000	3	305,000

Total value of live stock.....	<u>40,300,000</u>
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Grain, &c.	No. of bushels.	Price per bushel.	Total amount.
Corn.....	40,000,000	\$0 50	\$20,000,000
Wheat.....	2,500,000	1 75	4,375,000
Potatoes.....	1,000,000	1 00	1,000,000
All other products.....			<u>10,000,000</u>

Total value of crops for 1867.....	35,375,000
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Total value of improved farms and agricultural implements.....	<u>40,000,000</u>
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The facts from which the foregoing figures are produced have been taken from the most trustworthy sources, and are deemed as reliable as can be furnished from unofficial data.

Heretofore the fruit crop has been comparatively light, owing to the newness of the country, and it has been a question whether all kinds of fruit could be profitably raised in this State; but from all parts of the State we hear that fruit of every variety common to this climate has yielded profusely this year. During the early part of this season the grasshoppers appeared in such numbers as to destroy the most of early vegetation, and reduced this wheat crop to about one-half.

#### MINERALS.

In an annual report heretofore furnished the department, a brief allusion was made to the mineral resources of this district. No extended scientific investigation has been made since that date, but, from discoveries already made, sufficient facts are gleaned to warrant the statement that Kansas is not deficient in mineral productions. The coal measures underlie fully seventeen thousand square miles of the eastern portion of the State, extending to an irregular line crossing the State from north to south, near Fort Riley. The upper strata crops out in nearly every county in the eastern and middle portions of the State. At present the coal veins have not been worked to any great extent, except in Leavenworth, Osage, and Bourbon counties, where it is found in inexhaustible quantity and of superior quality. Our geological researches develop, west of the line of the coal measures, an irregular belt, running from north to south, of an extent from fifty to seventy miles in width, belonging to the permian system, in which are found many salt springs, inexhaustible beds of gypsum, and iron ore of an inferior quality. In one locality platina is also found. From recent reports of surveys in the vicinity of Fort Hays and the west, I am of the opinion that from that point west coal will be found to increase in quantity and quality. Sand rock, suitable for building purposes, underlies the whole State of Kansas, and crops out in many localities. Lime rock, also, is found in numerous varieties, and appears in nearly every ravine and hillside. On the Kansas river, near Fort Riley, is found inexhaustible quarries of magnesian limestone, of beautiful color, which is now being used in the erection of public buildings.

There is no locality in this district, yet surveyed, where the surveyors have been unable to find rock of one of the before-mentioned varieties, which leads to the belief that there is sufficient rock to be found in nearly every locality to supply all demands for building and fencing purposes.

A quarry of black marble, full of light yellow veins, has been discovered in Bourbon county. This marble receives a fine polish and is considered valuable for ornamental purposes. White marble of various varieties is found south of the Cottonwood river, in the counties of Butler and Sedgwick.

#### SALT.

Under the act admitting Kansas into the Union as a State, twelve salt springs were granted, which have been located upon the tributaries of the Kansas river. Four of these springs are situated on Salt creek, in the valley of the Solomon river; four, in an extensive salt marsh of three thousand acres in the valley of the Republican river; two on a small tributary of the Republican river, still further east, in a small marsh of three hundred acres, which, like the first-mentioned marsh, is wholly void of vegetation. Of the exact location of the remaining two this office is not advised. These springs are all leased by the State and will soon be in operation. The brine arising from these springs has been scientifically investigated and found to yield a large percentage of salt.

Many other springs have been discovered on the Saline river, and, doubtless, when surveys are extended westward along that stream, very extensive salines will be found. The water of the Saline river during a great portion of the year is found to be so brackish as to be unfit for culinary purposes.

On Fall river, a branch of the Verdigris river, is found a salt spring which



has been worked for many years, supplying a local demand with an excellent quality of salt. The most extensive salines, however, are found in the extreme southwestern part of the district, (*vide* report of Colonel Johnson, topographical engineer of the United States army survey of southern boundary of Kansas,) which are considered by competent judges to be capable of supplying several million bushels of salt per annum, equal, at least, to supply (when transportation facilities are furnished) Missouri, Kansas, and Territories west. Whenever the Pacific railroad and the southwestern branch towards Santa Fé shall have been completed, thus opening up a ready market and furnishing speedy means of transportation, it is fair to presume that Kansas will become one of the great salt-producing States of the Union.

#### MANUFACTURES.

Considerable attention has been paid during the last few years to the development of our manufacturing interests. Of the different branches that are now in operation, or nearly so, the following are the most prominent :

Two woollen factories are located at Lawrence, one at Fort Scott, and one at Burlington. A paper mill is about completed at Manhattan, for the manufacturing of all kinds of paper. Numerous flouring and saw mills are conveniently located throughout the State. In this city a large foundry has been in successful operation for a number of years, manufacturing stoves, quartz mills, and castings for all kinds of machinery. Also, mills for the manufacturing of farm, garden, and household implements, woollen goods, flour, carriages, and wagons, and all kinds of building material, are extensively carried on.

#### RAILROADS.

During the past year rapid advancement has been made towards completing the already established roads, and also in forming and surveying routes for proposed roads. The liberal grants of lands that the several roads possess, together with the material aid offered by counties through which the lines pass, and the well-known ability of parties interested in them, are favorable to their completion at an early day. And with the completion of the roads established and proposed, Kansas will have as complete a system of railways as most of the western States. As a brief description of the railroad system to this date will, no doubt, be of interest to those looking westward, the following is submitted :

#### UNION PACIFIC RAILROAD, EASTERN DIVISION.

The year 1863 dates the commencement of the main line of this road, beginning at the State line at the junction of the Kansas river with the Missouri river. In the year 1864 forty miles were completed. In the year 1865 the war prevented further progress, but in July of the same year a new company was organized, and, during the year following, completed seventy-nine miles of the main line, together with the branch road from Leavenworth to Lawrence, a distance of thirty-one miles. At this period there is completed three hundred miles of said line, including the branch from Leavenworth to Lawrence, with a prospect of reaching the three hundred and thirtieth mile-post by January 1, 1868, which will make a total of miles completed up to that date of three hundred and sixty-one.

The number of passenger cars now used is.....	17
The number of baggage and mail cars now used is.....	7
The number of freight cars now used is.....	600
The number of locomotives now used is.....	25
Total number of cars and locomotives.....	649
Average earnings of road monthly.....	\$200, 000
Number of employés.....	1,500

The foregoing facts were kindly furnished by General A. Anderson, superintendent of road.

The Pacific railroad, central branch, starting from Atchison and running west, has completed and in operation sixty miles.

The Missouri River railroad, commencing at Leavenworth and connecting with the Union Pacific railroad, eastern division, and the Pacific railroad of Missouri at Wyandotte, has thirty-three miles completed and in operation.

The Leavenworth, Lawrence and Galveston railroad, commencing at Lawrence, is graded to the south line of Douglas county, with iron arriving for the laying of the track to that point; distance twenty miles. Grading on this line will be completed to the town of Ottawa, Franklin county, by the first of January, 1868, making a total of thirty miles graded to that date.

The St. Joseph and Denver railroad, running through the northern tier of counties, has fifteen miles about ready for the cars.

A contract for building and equipping the Union Pacific, southern branch, railroad was entered into on the twenty-third of August last; the contracting parties to build the line from its junction with the Union Pacific railroad, eastern division, at Junction City, to the northern boundary of the Osage (Indian) reservation, near Humboldt, Kansas. Work on the line to commence on the 15th of October next, and the road completed and equipped on or before the 1st day of January, 1870, with a proviso extending the time of completion to 1872, in case the State fails to guarantee interest on certain bonds. From the terms of the contract, and the known ability of the capitalists who have undertaken the work, there is little doubt that the commencement and completion of this line will be in conformity with the time as expressed in the contract.

The Missouri River, Fort Scott and Galveston railroad, from Wyandotte south, have about twenty miles graded. The franchises of this road are of a local nature.

The Lawrence and Emporia and Atchison, Topeka and Southwestern railroads have each liberal franchises of land.

The St. Louis and Santa Fé railroad, from Holden, Missouri, through the counties of Miami, Franklin, Osage, and Lyon, Kansas, to Emporia, thence to Santa Fé, has been much discussed by people along said line, with a view of commencing operations at an early day. This road has no franchises as yet.

A preliminary survey of a road commencing at a point in the vicinity of Pond creek, near western boundary of Kansas, and running south to Santa Fé, is being made.

In offering the foregoing statements, in obedience to the requests of the department, it is with full knowledge of the fact that many important points relating to the advantages presented by Kansas for immigration have been but lightly referred to, in consequence of my inability to procure authentic statistical information of a late date, and the slow progress made in scientific investigations.

In the absence of these requirements, I deem it a duty to give in general terms some of the leading features that constitute this district. The act organizing the Territory of Kansas is dated in May, 1854, up to which time the rolling prairies and fertile valleys were free from cultivation, excepting a few localities, where Indians (then the chief inhabitants) had commenced a system of farming in a small way. The troubles that soon followed this event are too well known to need repeating here, and are referred to only to mark the unfavorable position occupied as relates to immigration. But, notwithstanding these drawbacks, the rich soil and boundless pasturage facilities presented such strong inducements for settlement, that during the year 1861, her population having reached the required numbers, she was admitted into the Union as a State.

Since that period the growth of Kansas has been marked by a steady and rapid increase, and, with the exception of one year, bountiful returns have been made to all tillers of the soil. The year referred to is the one which is generally termed

the "drought year." But that Kansas is subject to droughts, or will ever be visited by another season where rain in sufficient quantities does not fall to insure the raising of good crops, is contradicted by the experience of citizens whose residence dates previous to the territorial organization, and by records of the Agricultural Bureau at Washington, which show that in twenty-six States the average depth of rain per month, for the months of June, July, and August, (said to be the dry months,) during the period of eight years was one-fourth of an inch per month in favor of Kansas. Experience has also taught that the soil of Kansas is better adapted to withstand dry seasons than the soils of most of the western States; and the fact alone that never before nor since the period referred to has there been a failure of crops from this source, is sufficient proof against the assertion that Kansas is liable to droughts.

The estimated area of Kansas is eighty-seven thousand square miles, or fifty-five million six hundred and eighty thousand acres. Of this about twenty-five million acres are surveyed, being less than one-half of the whole area of the State.

The general appearance of this vast body of land has been briefly referred to in one of my former reports, but as some of the leading features may be of interest in this connection, I append a short summary:

The general surface of Kansas is a gently undulating prairie having no marked features unlike those of other prairie States, excepting, perhaps, the diversity presented by a more rolling surface. The division of land is of two classes. First to mention is the timber and rich alluvial bottom lands bordering rivers and creeks, the estimated area of which is ten million acres, being fully five times the amount of all improved lands in the State at the present time. To the second class belongs the upland or rolling prairie, the soil of which averages from two to three feet in depth, with a subsoil of fertilizing qualities which will by careful cultivation prove inexhaustible. This class of land is considered preferable for the raising of grains and fruit, while the bottom land is selected for corn, hemp, vegetables, and grasses. But such is the uniform character of the general surface of Kansas that nearly every quarter section within its limits is capable of cultivation.

Timber is confined mainly to the borders of rivers and creeks, and is not superabundant; yet its scarcity is compensated for in a great measure by the very general distribution of rock throughout the State, which is of easy access and furnishes the best of building and fencing material.

No mountain ranges, swamps, sloughs, or lakes exist in this State, except in some instances where rivers have changed their beds, leaving small lakes. Water-courses are well distributed throughout the State. Their usual course is south of east. Among the most important streams may be mentioned the Arkansas and Neosho on the south, the Kansas river and its tributaries in the northern part, and the Missouri river forming the eastern boundary. The descent of the Kansas river may be regarded as showing the average rapidity of water-courses in the State. From its mouth west one hundred miles the fall is a little over two feet to the mile, for the second and third hundred miles about six feet to the mile, and for the last one hundred miles about seven feet to the mile, making a total rise of over two thousand feet in four hundred miles. Water-powers are not abundant, but several are being improved on the Neosho river and other smaller streams.

Such streams as rise in the mountains west have quicksand bottoms, but local streams that rise within the boundaries of the State have clear water and gravelly beds, but are not as enduring as the mountain streams. Unfailing springs of pure, cold water are found in nearly every locality, and good wells of water can be obtained by digging to the depth of from twenty to forty feet.

In support of the advantages of Kansas as regards climate and health, I can offer nothing more adaptable and comprehensive than to quote from Professor G.



C. Swallow's geological report of 1865: "Situated between the thirty-seventh and fortieth degrees of north latitude, and half way up the slope of the eastern Cordilleras, the climate of Kansas is temperate and healthful. As indicated by our position, and clearly proved by a long series of meteorological observations at our military posts, the summers are long and temperate and the winters short, mild, and dry, variegated by a few cold days. But few countries have climates better adapted to health and a luxuriant growth of the staple products of the temperate zone."

In concluding my report of the resources of this district, I am gratified to state that by the first day of January, 1868, there will be completed and in operation about five hundred miles of railway. Of this number the Union Pacific railroad, eastern division, will have the greater portion. The line of this road has been extended during the present year under the embarrassing circumstances of an Indian war of unparalleled ferocity.

The extending of the Pacific railroads through the country heretofore occupied as their undisturbed hunting grounds has been, no doubt, the primary cause of the hostile attitude of the different Indian tribes on the plains, and it undoubtedly will be the last effort of barbarism to beat back the advancing tide of civilization. But notwithstanding these difficulties, settlements have kept pace with the progress of the road, and points where hardly six months ago not a house marked the spot, are now occupied by flourishing towns. It is impossible to overestimate the advantages that the completion of this road will afford to the western part of this district. Already thousands of head of cattle are being shipped over this road to eastern markets, which were driven up from Texas in the early summer months and herded and fattened on the nutritious grasses peculiar to western Kansas. Whenever the present Indian difficulties shall terminate, and a false and pernicious philanthropy cease to encourage idleness and vagrancy in the wandering nomads of the plains, then, within an incredibly short space of time, what was once designated by geographers as the "Great American Desert" will become the home of hardy, enterprising settlers, with their railways, cities, and towns, and countless herds of stock grazing upon the finest pasturage of the world.

Very respectfully, your obedient servant,

H. S. SLEEPER,  
*Surveyor General of Kansas.*

Hon. JOSEPH S. WILSON,  
*Commissioner General Land Office, Washington, D. C.*

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No. 18 E.

SURVEYOR GENERAL'S OFFICE,  
*Santa Fé, New Mexico, July 19, 1867.*

SIR: I have the honor to submit herewith my annual report, with statements marked from A to F inclusive, showing the condition and wants of the surveying service in this district:

#### SURVEYS.

Statement marked A shows the public surveys made during the year ending June 30, 1867. Statement B shows the surveys of private land claims made during the same period. Statement C exhibits the surveys contracted for, to be executed during the fiscal year ending June 30, 1868.

In addition to the surveys under contract to be executed during the current year, it is proposed to contract for the survey of the exterior boundaries of townships 5, 6, 7, and 8 north, of ranges 20, 21, and 22 east, and for the subdivision of four or five of said townships, to include the settlements on the river Pecos.

These, with the surveys now under contract, will consume nearly all of the unexpended appropriations for surveys in this district.

A contract was entered into with Deputy Surveyor William H. Pierce, on the 15th day of December, 1866, for the survey in Arizona of ninety-six miles of the Gila and Salt River meridian, thirty-six miles of the base line and standard and exterior township boundary lines, to amount in the aggregate to a sum not exceeding seven thousand five hundred dollars. Mr. Pierce completed the survey of the meridian from the initial corner north twenty-four miles, the base line from the same corner east thirty-six miles, and the first standard parallel north along the south boundary of township 5 north, east forty-two miles and west forty-two miles, when the military protection which had been furnished him was withdrawn, and he was compelled to quit the field, the Indians infesting the country rendering it unsafe and impracticable to continue the work without a military escort. At his request and by your direction Mr. Pierce has been released from further obligation to prosecute the work under his contract.

By the fourth section of the act of Congress entitled "An act to create the office of surveyor general in the Territory of Montana, and establish a land office in the Territories of Montana and Arizona," approved March 2, 1867, the Territory of Arizona was attached to the surveying district of California. In accordance with your instructions, dated March 29, 1867, I have transmitted to the surveyor general of California all of the original archives in this office relating to the surveying service in Arizona, receipts for which when received will be forwarded to your office.

#### PROPOSED SURVEYS.

The lands watered by the San Juan river, in the northwestern part of this district, are attracting the attention of miners and settlers, and it is proposed to extend the lines of the public surveys in that direction during the next fiscal year. By reference to the map of this district, made to accompany this report, the extent and location of the proposed surveys in the San Juan country, as also those proposed in other sections, may be seen.

#### INDIAN RESERVATIONS.

To prevent a conflict between the white settlers on the Pecos river and the Navajo Indians, it is important that the exterior boundaries, at least, of the Navajo and Apache reservation be surveyed at an early day. For the plan and estimated cost of survey I respectfully refer you to my letter of November 21, 1866.

The tract of land fifteen miles square selected by the agent of the Gila Apaches on the Gila river, to be set apart as a reservation or home for that band of Indians, is not now, nor (except for a short period) was it ever, occupied by the Indians as a home. For the past six years they have been at war with our people, and have evinced no desire to settle upon this or any other reservation. I believe the selection was never approved by the President or by any officer of the government but the Commissioner of Indian Affairs. If this is true, I submit whether, under the circumstances, it should not be formally vacated and opened to settlement. I am informed that a settlement would be made upon these lands at once if they were known to be public lands.

The Indians of the pueblo of Santa Ana are anxious that their grant should be confirmed by Congress. In my letter of January 5, 1867, accompanying some proofs concerning their title and the extent of their claim, I recommended its confirmation. The boundaries of the lands of this pueblo, as also those of the pueblos of Laguna and Acoma, should be surveyed and marked to prevent controversies which are constantly arising between the Indians and their white neighbors, and which can only be permanently settled by a survey under authority of the government.

## PRIVATE LAND CLAIMS.

The questions relating to Spanish and Mexican titles in this Territory having been discussed and well nigh exhausted in the annual reports of the Commissioner of the General Land Office and of this office for the years 1862 to 1866, inclusive, and in my official correspondence with your office during the same period, it would seem to be unnecessary to add anything in this report upon the subject; but it is of such vital importance to the future welfare and prosperity of New Mexico that these titles should be settled, and the valid claims segregated from the public domain, I again call the attention of your office to it.

The questions touching the validity of these claims are such that to decide them intelligently involves the necessity of a thorough knowledge of the land laws of Spain and Mexico, and of the civil law of descents, administration, &c., and should not be submitted to any but a judicial tribunal.

If it is objected that a court appointed for this purpose alone will involve too great expense, I suggest that jurisdiction be conferred by law upon the United States district courts of the Territory, where all parties could be heard, with the right to any party in interest to appeal to the Supreme Court; and in all cases that it should be made the duty of the United States district attorney to appear and defend the interests of the government. I can see no reason why New Mexico should be made an exception to the otherwise uniform practice of the government in ascertaining and adjusting the rights of citizens claiming lands under titles derived from foreign governments. The law now in force, requiring the surveyor general "to ascertain the origin, nature, character, and extent of all claims to land under the laws, usages, and customs of Spain and Mexico," and to report "his decision as to the validity or invalidity of each of the same" for the action of Congress, after thirteen years' experience, has failed utterly to accomplish the purposes intended by it. Great injustice is liable to be done, as well to claimants as to the government, by this anomalous manner of determining the rights of parties. The surveyor general is not permitted to incur any expense in calling witnesses, no notice is required to be given to any party in interest by publication or otherwise, and, as a consequence, almost all investigations have been *ex parte*. I believe that in but two cases investigated by this office and reported for the action of Congress prior to October 9, 1861, was there any evidence taken except that which was offered by the claimants, and but one in which there was any appearance in behalf of the government. Claims thus investigated, approved, and reported, containing hundreds of thousands of acres, have been confirmed by Congress, without any proof—so far as appears from the record—as to their area or extent. The government in these confirmations may not have done any injustice to individuals, or parted with the title to any lands which properly belonged to it, but its liability to do so under the circumstances is manifest. I have, therefore, again to urge that Congress will make provision for the better security of the rights of individuals and of government in the settlement of these claims.

## MINES AND MINING.

*Gold.*—Since my last annual report gold has been discovered in the mountains, about twenty miles northeasterly from the town of Taos, in this Territory. At last advices it was estimated there were four hundred men engaged in gold-washing in a district five by fifteen miles in extent. I have no reliable information as to the actual production.

The New Mexico Mining Company is increasing and perfecting its machinery and increasing the working force at the old placer, twenty-eight miles southeasterly from Santa Fé, and promises largely to increase the production of gold from those mines during the next year. Dr. Michael Steck, the present superintendent, gives the result of the reduction of sixty-three tons of quartz from the



mines of this company at seventeen hundred and seven dollars and sixty-four cents, or an average of twenty-seven dollars and ten cents per ton, and says that the ore is abundant, cheaply mined, and convenient to the works. Many lodes rich in gold have been discovered in that vicinity, but no other mill has been erected, and they remain undeveloped.

But little has been done since my last report in working the gold placers near Fort Stanton.

The developments at Pinos Altos during the year fully justify all I have heretofore reported concerning the mineral wealth of that region. It is estimated that there are now more than one thousand persons engaged in gold-washing and in working the rich veins of gold-bearing quartz in that immediate vicinity.

I am indebted for the following information concerning these mines to Brevet Major General James H. Carleton, United States army, who lately visited them:

The Pinos Altos Mining Company has a quartz-crushing mill of fifteen stamps now in operation at the town of Pinos Altos. The quartz worked by it is taken from the Pacific lode, and yields from eighty to one hundred and fifty dollars of gold per ton. The cost of mining and delivering the ore at the mill is estimated at eight dollars and fifty cents per ton, and of reducing it and separating the gold at three dollars. The mill has the capacity of reducing twenty tons of ore in twenty-four hours. General Carleton was informed by good authority that within a radius of six miles from the town of Pinos Altos there had been discovered at the time of his visit six hundred lodes of gold and silver ore, many of them prospecting as rich as the Pacific lode above mentioned. There is a scarcity of water for washing; but in the rainy season, in many of the ravines or gulches in the vicinity, there will be water, so that miners can wash five to six dollars per diem to the hand.

*Silver.*—Numerous veins of silver ore are reported to have been discovered during the year in the Sandia, Manzano, San Andros, Mimbres, and Organ mountains, but none have been worked sufficiently to prove their value or extent. The greater part of the gold-bearing quartz in New Mexico yields also more or less silver; and, as a rule, I believe the percentage of silver increases as the veins descend. Silver, therefore, promises ultimately to be the leading mining interest in this section of the Rocky mountains. There are no works in operation for the reduction of the silver ores.

*Copper.*—Copper seems to be a universal accompaniment of the precious metals in this section; traces of it are found in most of the veins of gold and silver ore. Lodes and deposits of copper ore are reported to have been discovered in the Taos, Jemez, Sandia, and Mimbres mountains. The copper mines near Pinos Altos have been noticed in former reports from this office. When, by the construction of railroads, cheap transportation shall be furnished to the people, copper mining will become an important branch of the industry of this Territory. The silver and gold in much of the ore will more than pay for its transportation and reduction.

*Coal.*—Veins of bituminous coal have been found in the Raton, Sandia, and Jemez mountains, near the Puerco river, west of Albuquerque, and in the vicinity of Forts Craig, Stanton, Selden, and Bayard. Anthracite coal of a superior quality is also found near the Galisteo creek, about twenty miles south from Santa Fé. I have no doubt but that this valuable mineral exists in abundance throughout the Territory, and can be made available to furnish cheap fuel for the operation of railroads, and for manufacturing and domestic uses.

*Lead and iron.*—Lead and iron are very common minerals throughout the Territory. Much of the lead has sufficient percentage of silver to pay for its separation; but as yet there is little domestic demand for lead, and the cost of transportation to a foreign market would consume it; there is, therefore, none mined or smelted. For the same reasons the mountains of iron ore remain

untouched by the manufacturer, and the iron to supply the home demand is brought in wagons from the States.

*Salt*.—Almost the entire amount of salt used in New Mexico is obtained from salt lakes on the plain, fifty to sixty miles east of the Rio Grande. The salt, crystallized by the evaporation of the water by the sun, is deposited upon the bottom of the lake, forming a crust several inches thick, and is shovelled thence directly into the wagons and dried by the sun. There are some impurities mixed with it, which give it a dark appearance, but when leached or washed it becomes white as snow. The supply seems inexhaustible. There are similar lakes, or deposits, south of the Canadian river, near the east boundary of the Territory, and also west of the Rio Grande.

*Other minerals*—In addition to those above enumerated, zinc, antimony, kaolin, and other minerals are known to exist, which, when the railroads shall reach this region and the current of immigration turns in this direction, with its capital and industry, to develop and work the mines, will contribute largely to the general wealth.

#### MINERAL CLAIMS.

I have received no application as yet for the survey of mineral claims in this district, and have, therefore, made no appointment of a deputy to make the surveys contemplated under the act of July 26, 1866.

#### ESTIMATES, EXPENDITURES, ETC.

Exhibit D, hereto annexed, is a statement of expenditures on account of salaries during the fiscal year ending June 30, 1867.

Exhibit E shows the expenditures for incidental expenses during the same period.

The paper marked F contains the estimates of appropriations required for the surveying service in this district, for the fiscal year ending June 30, 1869.

The map drawn to accompany this report, showing the surveys executed prior to and including June 30, 1867, and the proposed surveys, was transmitted with my letter of 9th instant.

I am, respectfully, your obedient servant,

JOHN A. CLARK,  
*Surveyor General of New Mexico.*

Hon. JOSEPH S. WILSON,

*Commissioner of the General Land Office, Washington, D. C.*

A.—Statement of surveys of public land made during the fiscal year ending June 30, 1867, under acts of Congress approved April 7 and July 28, 1866.

Contract.		Deputy.	Character of work.	Miles.	Chains.	Links.	Cost.
No.	Date.						
26	October 9, 1866	Hiram G. Fellows	Second correction line south Third correction line south Exterior boundaries of township 11 south, ranges 13 and 14 east; townships 14 and 15 south, ranges 9 and 10 east; township 11 south, ranges 13 and 14 east; townships 11, 12, 13, 14, and 15 south, range 14 east; townships 9 and 10 south, range 16 east; townships 11, 12, 13, 14, and 15 south, range 15 east.	130 60	40 00	00 00	\$1,957 50 846 00
27	December 15, 1866	William H. Pierce	Arizona base line Arizona, Gila, and Salt river meridian. Arizona first correction line north.	258 36 24	63 00 00	34 00 00	3,086 40 540 00 360 00
28	December 20, 1866	Isaac C. Stueck	Third correction line south Fourth correction line south Exterior boundaries of townships 16, 17, 18, 19, and 20 south, ranges 11, 12, and 13 west.	84 72 192	00 00 00	00 00 47	1,260 00 272 81 1,080 00 2,304 06
				874	58	81	11,716 77

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.

B.—Statement of surveys of private land claims made during the fiscal year ending June 30 1867.

Claim.		Confirinee.	Contract.		Deputy.	Miles.	Chains.	Links.	Cost.	Area in acres.	Survey approved.
Name.	No.		No.	Date.							
San Pedro	14	José Serafin Ramirez	25	August 9, 1866	W. W. Griffin	37	38	31	\$562 11	35,911.63	September 17, 1866. Do.
Cañon del Agua	70	do	25	do	do	8	49	13	129 30	3,501.21	
						1	32	00	12 60		
						47	39	44	703 91	39,412 84	

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.



Contract.		Deputy.	Character of work.	Estimated number of miles.	Rate per mile.		Estimated cost.
No.	Date.				Exteriors.	Subdivisions.	
29	June 3, 1867...	Robert B. Willson...	Subdivision of townships 14 and 15 south, ranges 9 and 10 east; township 11 south, ranges 13 and 14 east; townships 9 and 10 south, range 16 east..... Exterior boundaries of township 11 south, ranges 17, 18, 19, 20, 21, 22, 23, and 24 east; township 10 south, ranges 17 and 24 east; and subdivision of township 10 south, ranges 17 and 24 east; township 11 south, ranges 17, 22, 23, and 24 east..... Exterior boundaries of townships 18, 19, and 20 south, range 10 west; and subdivision of townships 16 and 17 south, range 13 west; township 17 south, range 12 west; townships 18, 19, and 20 south, range 10 west; township 20 south, range 11 west; township 15 south, range 5 west.....	480	.....	\$10	\$4,800
30	June 3, 1867...	Hiram C. Fellows....		486	\$12	10	5,112
31	June 11, 1867..	Isaac C. Stuck.....		516	12	10	5,232
				1,482	.....	.....	15,144

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.

## D.—Statement of expenditures for salaries for the fiscal year ending June 30, 1867.

Name.	Duty.	Rate of salary.	Time employed.		Amount.	Remarks.
			From— inclusive—	To— inclusive—		
John A. Clark.....	Surveyor general.....	\$3,000	July 1	June 30	\$3,000 00	Back pay for 1860.
David J. Miller.....	Clerk.....	1,330	July 1	August 29	216 25	
David J. Miller.....	Translator.....	2,000	July 1	June 30	2,000 00	
Robert B. Willson.....	Translator.....	1,500	October 5	June 30	48 91	
Robert B. Willson.....	Draftsman.....	1,500	February 13	February 27	62 50	
Thomas A. Smith.....	do.....	1,500	November 12	February 17	24 45	
Isaac C. Stuck.....	do.....	1,500	December 8	November 26	77 44	
Isaac C. Stuck.....	do.....	1,500	April 2	June 30	370 87	
					5,801 02	

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.

## E.—Statement showing the incidental expenditures during the fiscal year ending June 30, 1867.

Fiscal quarter.	Name.	Consideration.	Time.		Amount.	Remarks.
			From— inclusive—	To— inclusive—		
First.....	John A. Clark.....	Sundries.....	July.....	July.....	\$74 60	Per vouchers accompanying account.
First.....	Mary Vincent.....	Office rent.....	August.....	September 30.....	15 00	
First.....	do.....	do.....	October.....	December 31.....	44 00	
Second.....	do.....	do.....	.....	.....	66 00	
Second.....	John A. Clark.....	Sundries.....	.....	.....	241 45	Do.
Third.....	do.....	do.....	.....	.....	105 37	Do.
Third.....	Mary Vincent.....	Office rent.....	January.....	March.....	66 00	Do.
Fourth.....	do.....	do.....	April.....	June.....	66 00	
Fourth.....	John A. Clark.....	Sundries.....	.....	.....	56 61	
					735 03	

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.

## F.—Estimate of appropriations required for the fiscal year ending June 30, 1869.

Object of appropriation.	Amount.
For salary of the surveyor general.....	\$3,000 00
For salary of the translator.....	2,000 00
For public surveys—continuing the survey of base, meridian, township, and subdivision lines.....	25,000 00
	30,000 00

JOHN A. CLARK, Surveyor General.

SURVEYOR GENERAL'S OFFICE, Santa Fé, New Mexico, July 19, 1867.

## No. 18 F.

SURVEYOR GENERAL'S OFFICE,  
*Denver, Colorado Territory, July 10, 1867.*

SIR: I have the honor to submit the following report of the official transactions of this office for the year ending June 30, 1867, together with an estimate for surveys for the year ending June 30, 1869, and such other information as, in the short time I have held the position of surveyor general of Colorado and Utah, has come under my notice.

Statement marked A shows the surveys made during the year ending June 30, 1867.

Statement marked B contains the surveys made under the 10th section of the act of May 30, 1862.

Statement marked C contains the surveys now under contract and in progress under the appropriation for the fiscal year ending June 30, 1868.

Statement marked D contains the amount of salaries paid the surveyor general and clerks for the year ending June 30, 1867, and incidental expenses of the office for the same period.

Statement marked E contains the number of townships surveyed during the year ending June 30, 1867, and area of public land contained in the same.

*Estimates for surveys for the year ending June 30, 1867.*

Estimate for surveys in mountains:

398 miles of standard lines, at \$25 per mile .....	\$9,950 00
844 miles of township lines, at \$20 per mile .....	16,880 00
1,200 miles of subdivisinal lines, at \$18 per mile ..	21,600 00

Total for surveys in mountains .....	\$47,630 00
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Estimate for surveys on plains:

624 miles of standard lines, at \$10 per mile .....	6,240 00
1,398 miles of township lines, at \$8 per mile .....	11,184 00
3,000 miles of subdivisinal lines, at \$7 per mile ....	21,000 00

Total for surveys on plains .....	38,424 00
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Total for surveys in Colorado .....	86,054 00
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Estimate for surveys in Utah .....	20,000 00
For retracing the lines of survey .....	5,000 00

Total for surveys in Utah .....	25,000 00
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Estimate for office expenses:

Salary of surveyor general .....	3,000 00
Salary of chief clerk .....	2,000 00
Salary of principal draughtsman .....	1,800 00
Salary of transcribing clerk .....	1,500 00
Salary for messenger .....	600 00

Total for salaries .....	8,900 00
Incidental expenses .....	2,000 00

Total expenses .....	10,900 00
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Total estimate for the year ending June 30, 1867 .....	121,954 00
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The amount of the above estimates will appear large, but they are called for by the rapid completion of two lines of railroads, one of which is now running to a point in this Territory.

In relation to the surveys in the mountains the price allowed by law per mile is entirely inadequate to have the work done in a country so broken and mountainous, and presenting so many difficulties to be overcome by the surveyor as this. The price of the standard lines in the mountains should be at least twenty-five dollars per mile; exterior township lines twenty, and subdivisional lines eighteen dollars per mile. This would be only sufficient to have the work completed in a proper manner.

I cannot too strongly urge the necessity of having the surveys extended over the mountains to the parks and mining claims, to enable the mining claims to be properly located. The timber lands in the mountains should be subdivided, as they are being rapidly depleted of their timber for the mines and building purposes. They could be readily sold, while, if depleted of their timber, they would be of little or no value.

During the year ending June 30, 1869, it will be found necessary to extend the surveys along the line of the Union Pacific railroad, eastern division, and that alone will require an increased appropriation to enable the work to be done. The Union Pacific railroad is now completed and in running order to Julesburg, in this Territory, one hundred and eighty miles northeast of Denver, which point they expect to reach during the summer of 1868.

The Union Pacific railroad, eastern division, is completed and in running order to Fort Ellsworth, about three hundred miles east of Denver, which point they also expect to reach during July, 1868.

This will give to this Territory two routes eastward, and will open the country and induce immigration to the fine lands of Colorado.

*Gold and silver.*—Of the gold and silver one can form no idea of the wealth of the deposits in this Territory, and as soon as a method of separating the different metals in a less expensive manner is adopted, large results will follow.

I have had too little time to make a full report on this important subject. But my predecessor in his last able report has entered so fully into the subject, that I have nothing to add.

The mines have not fully recovered from the effects of the late depression, owing in a great measure to reckless speculation. But I am convinced that when fully developed the mines of Colorado will be found second to none in riches.

*Coal.*—Coal exists in large quantities and has been traced and opened along the base of the mountains, and the indications are that an extensive basin exists underlying a large extent of territory eastward from the mountains. The quality is good. It makes an excellent gas and steam coal, and some of it could be used for smelting iron.

I consider the coal deposit one invaluable to this country, and time will so prove it.

*Iron.*—Iron is found in abundance along the base of the mountains and at some distance from them, and, with abundance of coal found near to it, will prove in time invaluable. As yet no effort has been made to any extent to work it, owing to the high price of labor.

#### GENERAL REMARKS ON THE AGRICULTURE OF THE COUNTRY.

My predecessor in his last report estimated the number of acres of land capable of cultivation in the Territory at 4,000,000 of acres. It is a fact that all the land that can be irrigated is susceptible of cultivation and produces well.

The mountain streams fall very rapidly, and thus can be carried by irrigating ditches to cover immense quantities of land, and I am led to believe that at least 10,000,000 of acres of land can be cultivated. The crops last year were good. It was the first year, I am told, that sufficient produce had been raised to supply the demands of the Territory. The present year farming is being carried on with success, the grasshoppers, the great dread of the farmer, having done but little damage to the crops. Wheat, oats, barley, corn, potatoes, &c., all look well and promise an abundant yield, and I predict that it will be but a few years until this Territory will produce more than enough to supply her wants.

## UTAH.

No appropriation for surveys in this Territory was made by Congress for the year ending June 30, 1867. This Territory is being rapidly settled, and I deem it to be the best interest of the government to have the land surveyed and a land office established in the Territory, as a large amount of land is under cultivation and settlers are anxious to obtain title to the lands. It would also encourage immigration, which is the best method of doing away with the peculiar institutions of the country. The rapid settlement of the country should urge the necessity of making an appropriation for surveys in this Territory.

My predecessor, in his last annual report for the year ending June 30, 1866, recommended a small appropriation for retracing the lines of public survey. I would also recommend an appropriation of five thousand dollars to have the lines retraced and to enable the surveyor general to superintend it in person, and also an appropriation of twenty thousand dollars for surveys in this Territory.

The northern and eastern boundary line of the Territory of Colorado should be established by survey, as it is difficult to determine what portion of the lands along the line of the Union Pacific railroad are in this Territory.

Hoping this may meet with your approval, I am, very respectfully, your obedient servant,

W. H. LESSIG,

*Surveyor General Colorado and Utah.*

HON. JOSEPH S. WILSON.

*Commissioner of the General Land Office, Washington, D. C.*

*A.—Statement of surveys made under the appropriation for the fiscal year ending June 30, 1867.*

No. of contract.	Names of deputies.	Miles.	Chains.	Links.	Cost.	Remarks.
27	W. H. Pierce .....	54	17	52	.....	Standard lines.
		162	16	96	\$5,631 86	Exterior township lines.
28	William Ashley .....	39	76	27	.....	Do.
		660	46	3	4,943 65	Subdivisional.
29	George E. Pierce .....	583	54	69	4,085 70	Do.
30	William Ashley .....	542	59	59	3,800 29	Do.
		95	75	6	767 50	Exterior township lines.
31	W. H. Pierce .....	96	01	13	960 14	Standard lines.
		125	68	22	1,006 82	Exterior township lines.
		419	34	93	2,936 15	Subdivisional.
32	George E. Pierce .....	54	41	68	436 17	Exterior township lines.
		599	22	56	4,194 96	Subdivisional.
33	George E. Pierce .....	25	78	61	181 88	Do.

B.—*Statement of surveys made under the act of Congress approved May 30, 1862.*

No. of contract.	Names of deputies.	Miles.	Chains.	Links.	Cost.	Remarks.
34	Cecil A. Deane .....	45	49	13	\$319 28	Subdivisional.
35	William Ashley .....	6	47	64	52 76	Exterior township.
		10	41	3	73 58	Subdivisional.

C.—*Statement showing surveys contracted for under the appropriation for the fiscal year ending June 30, 1868.*

No. of contract.	Names of deputies.	Style of work.	Estimated No. of miles.	Estimated cost.	Remarks.
37	Cecil A Deane .....	Standard .....	24	.....	Returned.
		Township .....	108	\$1,000	
38	William Ashley .....	Standard .....	54	.....	In progress. Do.
		Township .....	312	.....	
		Subdivisional.....	420	8,000	
39	George H. Hill.....	Standard .....	210	3,000	

D.—*Statement showing the amount of salaries paid surveyor general and clerks for the fiscal year ending June 30, 1867; also incidental expenses for same period.*

Name.	Occupation.	Nativity.	Whence appointed.	Time of service.	Amount paid.
John Pierce ...	Surveyor general	Connecticut ..	Col. ....	11 months, 3 days.	\$2,777 47
W. H. Lessig...	.....do.....	Pennsylvania.	Penn. ....	27 days.....	222 57
E. M. Ashley..	Chief clerk.....	Ohio .....	Col. ....	Entire year.....	1,800 00
R. Fisher .....	Draughtsman ..	Rhode Island..	do.....	.....do.....	1,500 00
C. R. Pierce...	Transfer clerk...	Ohio.....	do.....	11 months, 3 days.	1,388 74
T. W. Russell..	.....do.....	Pennsylvania..	do.....	27 days.....	111 26
Total .....	.....	.....	.....	.....	7,800 00

## INCIDENTAL EXPENSES.

Expended for 1st quarter, 1866.....	\$494 36
Expended for 2d quarter, 1866.....	348 39
Expended for 3d quarter, 1866 .....	417 75
Expended for 4th quarter, 1866.....	496 24
Total incidental expenses .....	1,756 74



E.—Statement showing the number of townships surveyed during the year ending June 30, 1867, and the area of public land contained in the same.

Description.		Area.	Remarks.
Township.	Range.		
6...south	65...west	23,322.40	Surveyed by W. H. Pierce, contract No. 27.
7...do	do	23,038.91	Do. do.
8...do	do	22,951.35	Do. do.
9...do	do	22,941.48	Do. do.
10...do	do	23,022.43	Do. do.
11...do	do	23,284.98	Do. do.
9...do	66...do	22,941.88	Do. do.
10...do	do	23,099.09	Do. do.
11...do	do	23,111.08	Do. do.
18...do	64...do	22,941.82	Surveyed by Wm. Ashley, contract No. 28.
19...do	do	23,062.13	Do. do.
12...do	65...do	23,158.48	Do. do.
14...do	do	23,125.69	Do. do.
15...do	do	23,069.41	Do. do.
18...do	do	23,035.91	Do. do.
19...do	do	23,044.44	Do. do.
12...do	66...do	23,076.11	Do. do.
13...do	do	23,045.70	Do. do.
20...do	68...do	23,098.99	Do. do.
20...do	62...do	23,120.53	Do. do.
10...do	64...do	22,972.12	Surveyed by Geo. E. Pierce, contract No. 2.
6...do	67...do	23,132.90	Do. do.
7...do	do	23,022.18	Do. do.
8...do	do	23,013.95	Do. do.
9...do	do	23,033.61	Do. do.
1...do	68...do	22,816.19	Do. do.
6...do	do	23,145.08	Do. do.
7...do	do	22,068.79	Do. do.
8...do	do	15,365.35	Do. do.
2...do	69...do	23,009.22	Do. do.
6...do	61...do	22,628.43	Surveyed by Wm. Ashley, contract No. 30.
7...do	do	23,300.32	Do. do.
8...do	do	23,240.99	Do. do.
6...do	62...do	23,088.29	Do. do.
7...do	do	23,055.30	Do. do.
8...do	do	23,130.85	Do. do.
9...do	do	23,086.06	Do. do.
9...do	63...do	23,040.47	Do. do.
10...do	do	23,035.50	Do. do.
4...do	61...do	22,947.09	Surveyed by W. H. Pierce, contract No. 31.
5...do	do	22,999.84	Do. do.
4...do	62...do	22,952.25	Do. do.
4...do	63...do	22,982.92	Do. do.
4...do	64...do	23,154.32	Do. do.
5...north	do	22,961.27	Do. do.
6...do	do	22,873.20	Do. do.
5...south	63...do	23,038.47	Surveyed by Geo. E. Pierce, contract No. 32.
6...do	63...do	22,778.64	Do. do.
7...do	do	22,851.56	Do. do.
8...do	do	22,947.71	Do. do.
5...do	64...do	23,039.22	Do. do.
6...do	do	22,821.40	Do. do.
7...do	do	22,781.11	Do. do.
8...do	do	22,800.27	Do. do.
9...do	do	22,856.93	Do. do.
5...do	65...do	23,022.82	Do. do.
9...do	68...do	10,319.61	Do. do. contract No. 33.

E.—*Statement showing the number of townships surveyed, &c.*—Continued.

Description.		Area.	Remarks.
Township.	Range.		
4...south....	70...west....	12,611.11	Surveyed by C. A. Deane, contract No. 34.
3...do.....	.....do.....	4,730.00	Surveyed by Wm. Ashley, contract No. 35.
75 townships previously reported.....		1,310,115.44	acres surveyed in 1867.
		1 469,894.12	
Making a total of.....		2,807,009.56	acres surveyed in Colorado.

No. 18 G.

*Annual report of the surveyor general of Nevada, 1866-'67.*

UNITED STATES SURVEYOR GENERAL'S OFFICE,  
Virginia City, Nevada, August 5, 1867.

SIR: In compliance with instructions from the department, I herewith submit my annual report, in duplicate, in reference to the surveys executed in the State of Nevada, and other operations of this office, during the year ending June 30, 1867. I also forward statements of the business appertaining to this surveying department, to accompany the report, as follows, to wit:

A.—Statement of contracts entered into during the year 1866-'67.

B.—Statement of account of appropriation for the survey of public lands in the State of Nevada to June 30, 1867.

C.—Statement of account of appropriation for compensation of the United States surveyor general, and the employés in his office, during the fiscal year 1866-'67.

D.—Statement of account of appropriation for rent of office, fuel, books, stationery, and other incidental expenses, including pay of messenger, for the fiscal year 1866-'67.

E.—Statement of plats made in the office of the United States surveyor general of Nevada for the fiscal year 1866-'67.

F.—List of lands surveyed in Nevada during the fiscal year 1866-'67.

G.—Estimates for the surveying service in the district of Nevada for the fiscal year ending June 30, 1869.

In addition to the office work, as set forth in the foregoing statement, the employés, consisting of a chief clerk, draughtsman, and messenger, have been engaged in the following duties, viz:

1. Making a new map of the State of Nevada.
2. Copying correspondence of this office.
3. Making out contracts in triplicate.
4. Making sketches to accompany contracts of public surveys.
5. Keeping in order the records, plats, and field-notes of public surveys.
6. Making out quarterly accounts and certificates to vouchers.
7. Posting the books of accounts and records appertaining to the business of the office.

The State of Nevada was formerly connected with and under the jurisdiction of the surveyor general of the State of California, but a separate department having been formed, the office of surveyor general for Nevada was filled by my predecessor, William B. Thornburg, esq., he having taken possession of the office on the 27th day of November, 1866, and held the same until I assumed

the duties of the office on the 17th day of May, 1867. During my predecessor's administration very little business had been transacted, and on entering upon the duties of my office I found it expedient to rent suitable rooms and furnish the same for the transaction of business.

In order to be able to act from personal knowledge in reference to future surveying operations, I have recently travelled extensively throughout the State, and find the localities most needing an extension of the public surveys to be embraced within the Humboldt, Paradise, and Quin's River valleys, comprising the richest agricultural districts of the State.

Paradise valley contains about 40,000 acres of excellent land, producing of wheat from thirty to sixty bushels, and of barley from forty to eighty bushels per acre. It is connected with the main Humboldt river by a small stream called the Little Humboldt, and extends north from the main river about fifty miles. It contains quite a large settlement, and is rapidly increasing in population. To accommodate this section of the country I have let a contract to William Epler to survey the Humboldt river guide meridian, commencing at the fourth standard parallel north, running north between ranges 35 and 36 east to the Oregon line. From this meridian, township, and subdivision lines can be extended over the best portion of the agricultural and mineral lands of that part of the district which commands immediate attention. Extending up the Humboldt river, on either side, are many other productive valleys, but settlements have thus far been retarded on account of the hostility of the Indians.

I deem it advisable to run a guide meridian as soon as possible from the fourth standard parallel north, commencing on the Reese River valley and running south to the first standard parallel north. From this meridian township lines can be run over the agricultural lands of Reese river, Smoky and Monitor valleys, also over the rich mineral lands of Lander and Nye counties.

There is urgent necessity for the survey of Carson River valley; it will be embraced in one tier of townships until the river reaches the region of Carson lake, when the country spreads out into a level plain 20 to 25 miles in length and from 18 to 25 miles in width, all of which can be made very productive by irrigation, the river affording an abundance of water for this purpose at a convenient distance. There are many settlers upon these lands, all of whom are very desirous of obtaining titles from the government.

I consider it important to extend the first, second, and third standard parallels and township lines over Walker river and other valleys in Douglas and Esmeralda counties, and subdivide the same.

I have recently contracted with R. R. W. Norris to complete the unfinished exterior and subdivision lines of townships 16, 17 and 18 north, range 21 east. The great Comstock lode and the cities of Virginia and Gold Hill are included in these townships, and I deemed it of the utmost importance to extend these surveys as speedily as possible, in order to connect the mining with the public surveys.

There are a succession of small and productive valleys embraced between the fourth standard, Pyramid lake, and the California State line; and in view of the early completion of the Central Pacific railroad to this point, the rapid increase in population, and a general desire on the part of the settlers to obtain titles to their lands, I consider it necessary for the public good to prosecute this survey to its completion at the earliest date.

Regarding the rapid progress towards completion of the Central Pacific railroad through the State, it is important that the lines of surveys should be extended over the Humboldt and adjacent valleys, from the Humboldt guide meridian to the Utah line; these valleys embrace from fifty to sixty townships of land, most of which, by irrigation, is susceptible of the highest order of cultivation.

It will be necessary to extend the fourth standard parallel to the Utah line,



and most economical and advantageous to run a guide meridian from a point in Ruby valley north to the Idaho line and south to the Colorado river. In explanation of the establishing of these several proposed guide meridians, I will state that large portions of the State of Nevada are a barren waste, and by running these guide meridians the useful lands will be speedily surveyed and a large expense saved in running the standard parallels over localities that will never be used.

I have received several communications from officers and prominent citizens of Lincoln county representing that there are many families and considerable wealth in that portion of Nevada formerly belonging to the Territories of Utah and Arizona, but since ceded by act of Congress to this State, and that said citizens refuse to pay taxes to the officers of this State, claiming still to be citizens of Utah.

I consider it important that an appropriation should be made, and that the boundary line should be established between Nevada and Utah as soon as practicable.

I have divided the State into eight mineral districts, but have not yet completed their organization by the appointment of deputies. There seems to be a general disposition on the part of the mining claimants to obtain patents as soon as the means of the applicant and condition of the mines will allow. There will, doubtless, appear many adverse claims on mines of established value; few mines in this State having ever become valuable that have not been entangled in expensive litigation, and in nearly every instance the party in occupation would have been allowed to obtain at the first a government title had the law been in force before the value of the mine had been established.

The law seems to give general satisfaction, and will result in substantial benefit to the mining interest. It will prevent litigation, and thus give confidence and security to this class of property, and will be not only a great assistance in enlisting capital for the development of this vast mineral region, the extent of which is yet unknown, but will be the means of adding largely to the metallic currency of the country.

I would mention the difficulty that is found in obtaining the services of competent and scientific men to act as deputies in the mining districts; the pay established being less by one-half than that paid by private parties for similar services. Applicants also find it difficult to obtain the publication in the newspapers of their notices of intention without prepayment being made. I would, therefore, respectfully recommend that the per diem of deputies be increased, and that applicants be allowed to make their own terms with newspapers, and be relieved from depositing the same with a United States depository.

Considering the vital importance to the welfare of the State of the introduction of railroads, it may not be irrelevant in closing my report to treat briefly on this subject, particularly in regard to the progress of our great national enterprise, the Pacific railroad.

The Central Pacific Railroad Company have at this date completed their road to the town of Cisco, California, a point in the Sierra Nevada mountains, thirteen miles west from the crest, fifty miles west of the Nevada State line, and 216 miles east of San Francisco. Work on the road is rapidly progressing, the grading being nearly completed to the summit. Considerable material, with locomotive and cars, have been hauled by teams across the summit, and the track is now being laid down on the eastern slope of the mountain, and rapidly approaching the valley of the Truckee. This point once gained, no further difficulties will be encountered till the road reaches the vicinity of Salt lake. It is the intention of the company to have the road completed and in running order to the Nevada State line by the first day of December, 1867, a distance of 266 miles from San Francisco. From this point the road passes down the

valley of the Truckee river to the Big bend; thence, across the Humboldt and Truckee desert, to the Humboldt lake, following up the valley of the Humboldt river to its source at the Humboldt hills, a distance of 370 miles from the Nevada State line and 636 miles east from San Francisco. As the grading will be light through the valley of the Humboldt, the road will, in all probability, be completed and in running order to the Utah line within the next eighteen months. Should the eastern end of the line continue to advance with the same vigor that is now being manifested, by that time a small gap of but a few hundred miles will be left remaining to connect the Atlantic and Pacific oceans by iron bands.

There is a succession of valleys extending from the line of the Central Pacific railroad, on the Humboldt river, to the southern extremity of the State, and connecting the above railroad with the navigable waters of the Colorado river. The expense of grading would be light, and the building of a road through this portion of the State would accommodate the rich silver districts of Lander, Nye, and Lincoln counties, and be the means of causing hundreds of mines to be worked at profit that are now lying idle, besides enhancing the profits tenfold of those already in successful operation.

A road called the Virginia and Truckee railroad has already been surveyed, connecting the cities of Virginia and Gold Hill with the Central Pacific railroad. It is the intention of the company to commence grading the road at once, and have the same completed and in running order within fourteen months' time from its commencement. It will be twenty-two miles in length, and is estimated to cost in the neighborhood of \$1,100,000.

To show the effect these roads will have upon the State, I have compiled the following statements, the estimates having been carefully made, and will be found substantially correct; they relate only to business connected with the Comstock lode:

At the present time about 30,000 tons of general merchandise are brought to Nevada from California, annually, for consumption in this district, at a cost of transportation of about \$1,800,000. Through railroad communication with Sacramento a saving will be made of upwards of \$900,000 per annum.

The daily consumption of wood by mills is.....			223 cords.
Do	do.,	mines.....	72 "
Do.	do.	domestic use.....	60 "
Total.....			<u>355</u> "

In the summer time the average price is \$16 per cord; in the winter from \$25 to \$30; and has reached as high as \$50. On the completion of the railroads it can be furnished at profit for \$10, making a daily saving on wood of at least \$3,000.

There is used in the Comstock mine annually, of lumber and timber, about 18,000,000 feet, and in the mills and for domestic use there is consumed about 1,400,000 feet, the average cost of which is \$29 per thousand. By a railroad connection with the forests of the Sierra Nevada mountains it can be furnished at a profit for \$21 per thousand.

It is thought by competent judges that one thousand tons of low-grade ore can be raised from the Comstock lode daily, that will pay from twelve to fifteen dollars per ton, that cannot now be worked at profit; and it is estimated that by the erection of water mills upon the Truckee river (which has great capacity for propelling machinery) this class of ore can be worked profitably at a cost of \$10 to \$12 per ton. This estimate being correct, a grade of ores can be worked at profit that are now of no value; and, estimating the yield of 1,000 tons to be \$15 per ton, there will be brought into circulation from this mine alone, annually, an income of bullion amounting to over \$5,000,000. The effect

of railroad communication will be even greater upon the more remote portions of the State, for the reason that lumber, machinery, and merchandise has to be drawn much further, and at an expense of nearly or quite double the price of freights to Virginia.

Hoping the above will meet with your approval, I am, very respectfully, your obedient servant,

A. P. K. SAFFORD,

*United States Surveyor General for Nevada.*

Hon. JOS. S. WILSON,

*Commissioner General Land Office, Washington, D. C.*

A.—*Statement of contracts entered into by the United States surveyor general of Nevada with deputy surveyors during the fiscal year 1866-'67.*

Contract.		Name of deputy.	Work embraced in contract.	Amount.	Remarks.
No.	Date.				
	1867.				
	Feb. 14	J. S. Henning..	Humboldt Canal Com-	-----	Special deposit.
			pany grant.		(Closed.)
	Mar. 23	D. B. Scott....	N. $\frac{1}{2}$ section 2, township	-----	Special deposit.
			17 W., range 20 E.,		(Closed.)
			Mount Diablo base.		
1	June 12	Wm. Epler.....	Humboldt river guide	\$2,430 00	Not closed.
			meridian.		
2	June 25	R. R. W. Norris.	Exterior and subdivis-	1,736 00	Not closed.
			ion lines of townships		
			16, 17, and 18 N.,		
			range 21 E., Mount		
			Diablo base.		



## B.—Statement of account of appropriation for survey of public lands in Nevada during the fiscal year 1866-'67.

Dr.		Cr.	
1866-'67.			
July 1.....	No surveys yet returned.	1866-'67.	By balance of appropriation, March 1, 1862. \$1,913 74
			By balance of appropriation, July 2, 1864 .. 5,137 81
			By appropriation of April 7, 1866..... 15,000 00
			By appropriation of July 28, 1866..... 15,000 00
			By appropriation of March 2, 1867..... 20,000 00
			57,051 55
			57,051 55
		1867.	By balance .....
		July 1.....	57,051 55

## C.—Statement of account of appropriation for compensation of the United States surveyor general and the employes in his office during the year 1866-'67.

Dr.		Cr.	
1866-'67.			
To amount paid surveyor general, second quarter .....	\$250 00	1866-'67.	By appropriation of July 28, 1866, ("compensation surveyor general") ..
To amount paid surveyor general and clerks, third quarter .....	1,200 00		By appropriation of July 28, 1866, ("compensation of clerks") ..
To amount paid surveyor general and clerks, fourth quarter .....	599 99		By appropriation of March 2, 1867 .....
Balance .....	2,049 99	1867.	By balance.....
	12,950 01	July 1.....	12,950 01
	15,000 00		

In the report for the quarter ending June 30, 1867, the messenger's account (\$23 32) was charged to the account of "appropriation for compensation surveyor general," &c. In the accompanying annual report it will be found charged to "appropriation for rent of office, incidental expense," &c.

*D.—Statement of account of appropriation for rent of office, fuel, books, stationery, and other expenses, including pay of messenger, for the fiscal year 1866-'67.*

1866-'67.	DR.
To amount paid in second quarter.....	\$53 00
To amount paid in third quarter.....	75 00
To amount paid in fourth quarter.....	1,371 35
	<hr/>
	1,499 35
Balance .....	3,500 00
	<hr/>
	5,000 00

1866-'67.	CR.
By appropriation of July 28, 1866.....	\$3,000 00
By appropriation of March 2, 1867 .....	2,000 00
	<hr/>
	5,000 00
	<hr/>
July 1, 1867.	
By balance .....	3,500 65

NOTE.—Messenger's account included in the fourth quarter.

*E—Statement of plats made in the office of the United States surveyor general of Nevada for the fiscal year 1866-'67.*

	Original.	Department.	Register.	Sketches for deputies.	Total.
Plat of township subdivisions.....			17		17
Plat of Humboldt canal grant.....	1	1			2
Map of the State of Nevada.....	1	1			2
				2	2
					23

*F.—List of lands surveyed in Nevada during the fiscal year 1866-'67.*

	Description.	Acres.
Grant of the Humboldt Canal Company under act of Congress granting certain lands to said company.	West $\frac{1}{2}$ section 36, township 33 N., range 34 E.; section 31, township 33 W., range 35 E.; south $\frac{1}{2}$ section 30, township 33 N., range 35 E.; southwest $\frac{1}{4}$ section 29, township 33 N., range 35 E.; southwest $\frac{1}{4}$ section 29, township 33 N., range 35 E.; northwest $\frac{1}{4}$ section 32, township 33 N., range 35 E.; section 16, township 35 N., range 34 E.; southwest $\frac{1}{4}$ section 25, township 36 N., range 38 E.; southeast $\frac{1}{4}$ section 26, township 36 N., range 38 E.; northeast $\frac{1}{4}$ section 35, township 36 N., range 38 E.; northwest $\frac{1}{4}$ section 36, township 36 N., range 38 E.; section 22, township 34 N., range 35 E.; Mount Diablo base and meridian and land embraced in canal.....	4,093.75
Surveyed by special deposit.	North $\frac{1}{2}$ section 2, township 17 N., range 20 E.; Mount Diablo base and meridian .....	318.29
Total .....		4,412.04

G.—*Estimate for the surveying service in the district of Nevada for the fiscal year ending June 30, 1869.*

For surveying subdivision lines in Paradise valley, and on the Humboldt river adjoining .....	\$9,000 00
For surveying township exteriors and subdivisions near Walker river .....	9,000 00
For surveying standards, exteriors, and subdivisions on the Humboldt river, on the line of the Central Pacific railroad.....	20,000 00
For surveying subdivisions in the Reese River district.....	7,000 00
For surveying standards, exteriors, and subdivisions in Ruby valley .....	5,000 00
Rent of office, stationery, and incidental expenses, including messenger.....	4,700 00
For compensation of surveyor general .....	3,000 00
For compensation of clerks .....	8,400 00
Total .....	<u>66,100 00</u>

No. 18 H.

SURVEYOR GENERAL'S OFFICE,  
*Boise City, Idaho Territory, August 1, 1867.*

SIR: In accordance with your instructions, under date of March 26, 1867, I herewith submit the following report, in duplicate, of the surveying service in this district, for the fiscal year ending June 30, 1867, together with the following statements appertaining to the office and field work:

A.—Estimate of expenses incident to the survey of the public lands in the Territory of Idaho, for the fiscal year ending June 30, 1867

B.—Statement showing the condition of surveying contracts, entered into since the office was opened.

C.—Statement of expenditure of appropriation for compensation of surveyor general, and clerk in his office, for the fractional fiscal year ending June 30, 1867.

D.—Statement of the office expenditure for the fractional fiscal year ending June 30, 1867.

E.—Statement of original plats or diagrams of standard lines.

F.—Account of appropriation for extension of public surveys for the fractional fiscal year ending June 30, 1867.

G.—Diagram of Idaho, compiled from the best information at our command, and showing the lines actually run prior to 30th June, 1867.

The office was opened on the seventh day of November last, but as your instructions governing the office and field-work were not received until January 18, 1867, I did not think proper to let any contracts for surveying, or to make any arrangement for a permanent office, and as we had a very severe winter and late spring, it was impossible for surveying parties to take the field until April.

The initial point of surveys for this surveying district was fixed upon the summit of a rocky butte, standing isolated upon the plain, between Snake and Boise rivers, bearing south  $29\frac{1}{2}^{\circ}$  west, and distant nineteen miles from Boise City, and the initial, as given by solar compass, is in latitude  $43^{\circ} 26'$  north. Having no instruments with which to make observations for longitude, it was not determined.

The extension of the base line, Boise meridian, and standard parallels has demonstrated that the initial was well selected, as all these lines are where they should be to meet the present and future agricultural interests of the country, as well as the basis of the survey of the mineral lands, when the same may be required.

Two contracts were let on the 8th April, one to P. W. Bell, to survey the base line east one hundred miles, and west thirty-six miles; also, the Boise meridian south to the southern boundary of the district, and the first standard



south and west thirty-six miles, to form the base of surveys in the Owyhee gold and silver mines.

The work has been completed, and diagrams, with transcript of field-notes, transmitted to your office, except, however, about twelve miles of the meridian, near the south boundary of the district, which, owing to high water, it was utterly impossible to complete at the time.

The other contract, to A. M. Thompson, was for the extension of the Boise meridian north forty-eight miles, and the first standard northwest to Snake river, and east forty-two miles.

The standard west will be the base for the work in the Payette valley, and the same line east, for the survey of the mineral lands in Boise basin.

The contract has been completed, and diagrams, with transcript of field-notes, transmitted to the General Land Office.

The same deputy will extend the meridian into the northern part of the Territory, where there are large tracts of good agricultural lands, which are being located by actual settlers. The returns of the field-notes of the contract have not been made, but are expected in three or four days, as the deputy has just returned from the field.

In making the estimates for the office expenditures for the fiscal year ending June 30, 1869, I have only asked for a sum sufficient to meet the actual wants of the office.

The estimates for the field-work for the same time are much less than might be judiciously expended, and will not enable this office to contract for the survey of more than one-fourth of the lands now in occupation of actual settlers; but if this amount can be made available at an early day the ensuing season, it will meet the wants of the settlements, and I trust you will ask for this amount, which I propose to expend in running exterior and subdivision lines in the Payette, Weiser, Boise, Clearwater, and Salmon River valleys, where the most urgent demands for the surveys exist, and where the soil is usually good and productive.

Exterior lines, sufficient to cover the most prominent quartz ledges in Owyhee, Alturas, Boise, and Nez Percés counties, should be run next season to enable this office to give a just showing of the extensive quartz and placer mines of these counties, as well as to enable the owners of quartz ledges to avail themselves of the benefit of the act of Congress, approved July 26, 1866, "granting the right of way to ditch and canal owners on the public lands and for other purposes."

#### CLIMATE.

The altitude of Idaho Territory, with its mountains and table lands, renders the winters cold compared with the country lying west, but dry and healthy.

The Boise, Payette, and Weiser valleys are sheltered and mild.

#### SOIL.

The soil of the valleys is highly favorable to the growth of cereals and vegetation. Extensive crops are raised where irrigation is practicable. The alkali land, mostly covered with sage bush, has proved well adapted to the raising of grain. The soil, reported second rate, being decomposed granite, yields the heaviest crops.

#### TABLE LANDS.

The extensive table lands are covered with wild grasses and wild rye, and are valuable for grazing.

## TIMBER.

The mountains are clothed with pine and fir timber. The valleys are destitute of timber except a species of cottonwood growing along the banks of the rivers. The valleys are depending upon the mountains at a heavy cost for lumber and fuel.

## MINERALS.

Gold is found on the head-waters of all the rivers. Rich placer mines have been profitably worked for years on the Clearwater and Salmon rivers. Extensive placer and quartz mines are found on the Boise river and its branches, embracing several districts. Many rich quartz lodes of gold and silver have been discovered and partially worked; their future development depending upon the reduced cost of transportation and other expenses, which thus far have retarded the growth and prosperity of the country.

The quartz and placer mines of Owyhee county, situated in the southwest part of the Territory, have proved to be eminently rich so far as developed. Some of the ledges are being worked with valuable machinery, repaying the capital invested, though at an enormous outlay. The quantity and quality of the ore already abstracted are favorable indications of their future wealth.

Several thousands of gold and silver quartz claims have been taken up and recorded, more or less prospected, but the heavy expenses under which the miners of this Territory have labored has, in general, prevented their successful development. The near approach of the Pacific railroad to the southern borders of the Territory will materially reduce the cost of working the mines, when the resources of the country will be more favorably brought into notice.

## POPULATION.

From the most reliable sources of information the population is estimated at twenty thousand. This does not include the floating portion of miners, which this year has been comparatively small.

## IMPROVEMENTS, ETC.

The farmers in general have erected substantial dwellings, barns, and fences, and are extensively engaged in planting fruit trees. Many thousands of apple, plum, pear, peach, and cherry trees have been planted, some of which are already bearing. These were obtained at a distance, under the customary disadvantages, but will, in another year, repay the risk and outlay.

By the 1st of December next the full amount of the appropriation at the disposal of this office will have been consumed, and unless another is made at the next session of Congress, there will be no funds to prosecute the surveys the coming season.

All of which is respectfully submitted.

LA FAYETTE CARTÉE,  
*Surveyor General, Idaho.*

Hon. JOS. S. WILSON,  
*Commissioner General Land Office.*

*A.—Estimate for surveying and office expenses in the district of Idaho for the fiscal year ending June 30, 1869.*

Office expenses :	
For compensation of surveyor general.....	\$3,000 00
For compensation of chief clerk.....	1,800 00
For compensation of draughtsman.....	1,500 00
For rent of office, fuel, books, stationery, and other incidental expenses.....	3,000 00
	<hr/>
	\$9,300 00

## Surveying service:

For surveying 400 miles standard lines, at \$15 per mile.....	\$6,000 00	
For surveying exterior boundaries of 40 townships, 480 miles, at \$12 per mile.....	5,760 00	
For surveying 2,400 miles of subdivisional lines, at \$10 per mile..	24,000 00	
		<u>\$35,760 00</u>
Total estimates.....		<u>45,060 00</u>

## B.—Statement showing the condition of surveying contracts entered into since office was opened.

No. of contract.	Name of deputy.	Date of contract.	Character, amount, and locality of work.	Remarks.
1	Peter W. Bell .....	1867. April 8	Boise meridian south from the initial point to the 42d parallel of latitude; base line west from initial point to a point due south of the Owyhee river, and east from the same point 100 miles, and the first standard parallel south (west) 36 miles.	Surveys completed, notes returned and approved and plats and transcript transmitted.
2	Allen M. Thompson.	April 8	Boise meridian north of initial point 48 miles, and first standard parallel north (west) to Snake river, and east 42 miles.	Surveys com'd, notes ret'd and ap'vd, and plats and transcripts transmitted.
3	Allen M. Thompson.	May 27	Boise meridian north, continued 180 miles, and two standard lines 140 miles.	Surveys completed, notes not yet returned.
4	Peter W. Bell.....	June 26	Exterior and subdivisional lines of townships 1, 2, 3, 4, and 5 north, ranges 1, 2, 3, and 4 east of Boise meridian.	Party in the field.

## C.—Statement of account of appropriation for compensation of surveyor general of Idaho and clerks in his office for the fractional fiscal year ending June 30, 1867.

DR.		CR.	
To amount paid surveyor general third quarter, (fractional,) 1866.	\$260 87	By amount of approbriation approved June 25, 1864, as advised by letter from the department, of December 20, 1866 .....	\$6,500 00
To amount paid surveyor general fourth quarter, 1866.....	750 00		
To amount paid surveyor general and chief clerk first quarter, 1867	1,200 00		
To amount paid surveyor general and chief clerk second quarter, 1867 .....	1,200 00		
To balance .....	3,089 13		
	<u>6,500 00</u>		<u>6,500 00</u>
		By balance .....	3,089 13



D.—*Statement of appropriation for rent of office, fuel, books, stationery, and other incidental expenses for the fractional fiscal year ending June 30, 1867.*

Dr.		Cr.	
To amount expended fourth quarter, 1866.....	\$502 35	By amount of appropriation approved June 25, 1864, as advised by letter from the department, of December 20, 1866 .....	\$3,000 00
To amount expended first quarter, 1867 .....	491 10		
To amount expended second quarter, 1867.....	536 92		
To balance .....	1,469 63		
	3,000 00		3,000 00
		By balance .....	1,469 63

E.—*Statement of original plats or diagrams of standard lines, and copies transmitted to the General Land Office.*

Contract.		Date of voucher.	Name of deputy.	Description of plats.	Plats made.	
No.	Date.				Original.	Sent to Com'r.
1	1867. April 8	1867. July 8	Peter W. Bell .....	Boise meridian south from the initial point, 72 miles and 63 chains. Base line west from initial point, 36 miles. Base line east from initial point, 102 miles. First standard parallel south, (west,) 36 miles.	1	1
2	April 8	June 5	Allen M. Thompson.	Boise meridian north from initial point, 48 miles. First standard parallel north, (east,) 39 miles and 20 chains. First standard parallel north, (west,) 30 miles 18 chains and 50 links.	1	1

F.—*Account of appropriation for extension of public surveys for the fractional fiscal year ending June 30, 1867.*

To amount reported for payment on contract No. 1, Peter W. Bell .....	\$3,701 81	By appropriation approved July 2, 1864.....	\$10,000 00
To amount reported for payment on contract No. 2, Allen M. Thompson.....	1,762 21		
To expenses incurred in selecting and locating the initial point of surveys.....	94 00		
Estimated:			
To amount due on contract No. 3, Allen M. Thompson, finished, but notes not yet returned to office.....	3,575 00		
Estimated balance.....	866 98		
	10,000 00		10,000 00

No. 18 I.

*Annual report of the United States surveyor general for California for the year 1866-'67.*

OFFICE OF THE U. S. SURVEYOR GENERAL FOR CALIFORNIA,

*San Francisco, July 31, 1867.*

SIR: In accordance with instructions from the department, I have the honor to herewith submit, in duplicate, my annual report in reference to surveys executed in the State of California during the fiscal year ending June 30, 1867.

I also forward statements of the business appertaining to this surveying department, to accompany the report, as follows:

A.—Statement of contracts entered into with deputy surveyor during the year 1866-'67.

B.—Statement showing the number of miles surveyed in California to June 30, 1867.

C.—Statement of account of appropriation for surveys of public lands in the State of California to June 30, 1867.

D.—Statement of account of appropriation for compensation of surveyor general and clerks for 1866-'67.

E.—Statement of account of appropriation for rent of office and other incidental expenses for 1866-'67.

F.—Statement of field-notes of public surveys sent to the department during the year ending June 30, 1867.

G.—Statement of descriptive notes, decrees of courts, &c., relative to private land claims, to accompany plats for patent, compiled for transmission to the department at Washington in 1866-'67.

H.—Statement of plats made in this office in 1866-'67.

I.—Statement of examinations and reports made to the department for patent, of all subdivisional surveys heretofore pre-empted or selected under acts of Congress relating thereto.

K.—Statement showing the number and present condition of surveys of private land claims under instructions from this office in 1866-'67.

L.—List of lands surveyed in California during 1866-'67.

M.—Estimates for surveying service in California for the fiscal year ending June 30, 1869.

In addition to the office work, as set forth in the foregoing statements, the employés have been engaged in the following duties, viz :

1. Making out contracts for surveys of public lands in triplicate.
2. Examination of the field-notes of public surveys returned by the deputy surveyors.
3. Copying the correspondence of this office.
4. Making out instructions for surveys of private land claims, in triplicate.
5. Examination of field-notes of surveys of private land claims returned by deputy surveyors as executed under instructions from this office.
6. Keeping in proper order and condition the Spanish and Mexican archives and records of the late board of land commissioners.
7. Keeping in order the records, plats and field-notes of public surveys and of surveys of private land claims.
8. Examination of locations of surveys of private land claims.
9. Making sketches to accompany contracts of public surveys and of surveys of private land claims.
10. Making out bonds and accounts of deputy surveyors for work executed under contracts.
11. Making out bonds and instructions of deputy surveyors for surveys of mineral lands under the special act of Congress relating thereto.
12. Making out quarterly accounts and certificates to vouchers.
13. Posting the books of accounts and records appertaining to the business of the office.
14. Exhibiting the Spanish and Mexican archives, and land commission papers, records, and plats, to parties interested, and making the necessary explanations.
15. Making out in triplicate the annual report with accompanying statements.

The estimate for the year ending June 30, 1869, in relation to surveys in California is for the following purposes, viz :

1. For running and establishing the lines necessary for the subdivision of such townships as lie within the congressional grants to the Central Pacific and Western Pacific railroad companies, and in such other portions of the State as may be deemed necessary and expedient.

2. For extending the township and subdivision lines over confirmed private land claims, for the survey of which no application has been or shall have been made within the time specified by the act of Congress approved July 23, 1866.

These unsurveyed private land claims in California number above three hundred, the titles to which are either finally adjudicated or yet pending in the courts. They lie principally in the southern part of the State, and embrace within their claimed boundaries lands well adapted for tillage and grazing, as well as the growth of most of the semi-tropical and many of the tropical fruits and vegetables.

The prosperity of that part of the State embracing most of this class of claims has, without a doubt, been very greatly retarded by reason of the non-establishment of the boundaries of these claims, which has prevented the segregation of the ranchos from the public domain, and thus delayed the extension of the lines of public surveys over adjacent territory, clearly public land, which ought as speedily as possible to be opened for entry and settlement by the immigrant.

3. For extending the township and subdivision lines over such portions of the mineral districts as may be found necessary to connect the lines of the mining claims recognized by law with the lines of the public surveys.

As the act of Congress, approved July 26, 1866, authorizing and directing surveys of mining claims, prescribes a mode of entry and purchase of all public lands within these mineral districts, and as this class of claims is steadily grow-



ing in importance and value from the increase of mining knowledge and improvement in mining machinery, it is a point of great interest, not only to the public treasury, but to the saving of future litigation as to the established boundaries of claims, that definite connections with established lines and corners of public surveys should be had at the earliest practicable day, and therefore this item of the estimates has been included as yielding to none other in its relative importance.

4. For pay of clerks and draughtsmen in the surveyor general's office.

The entire amount named in the estimate for this service will, in my opinion, be required. The increasing population of the State, and the demand for lands for entry and settlement, not only by immigrants, but by citizens successful in commercial and mining pursuits, who seek homesteads, are daily adding to the labor and complication of the work of this office. In addition to this the natural effects of the act of Congress, approved July 3, 1866, relating to swamp and overflowed lands in this State, are imposing on the present force of the employés in this office much additional labor, and that, too, of a kind not heretofore reckoned part of the duties of this office.

For these reasons the force employed in office work during the past year has been insufficient for as prompt a performance of all the duties devolving upon it as was desirable; and, however unwillingly, I have been thereby unable to furnish the registers of the several land offices with the necessary plats of township subdivisions with the same alacrity (after completion of the field-work by the deputy surveyors) that I would have wished and the public interest demanded.

In this connection it will be noticed that no estimate is made for the surveying service in Arizona, which Territory is now, for public survey service, under the control of this office. But, as this office is not in possession of any official information as to the amount of unexpended balances to the credit of the service in that Territory from appropriations heretofore made, nor of the amount and character of the work necessary to be done there, the consideration of the amount of appropriations necessary, and the classes of estimates under such appropriation, is respectfully referred to the better information of the department.

The surveys of the past fiscal year, executed under the appropriations for the public work, have been principally confined to the northern and eastern portions of the State, embracing Long valley, Surprise valley, part of the country lying between Surprise valley and Honey lake, the eastern portion of Honey Lake valley, a tract north of Marysville and east of the Sacramento river, including twenty-two townships lying partly in Sacramento valley and partly in the low foot-hills of the Sierra Nevada, and a tract of twelve townships (including the Big Meadows) situated in the vicinity of the head-waters of Susan river and of the north fork of Feather river.

Through the portions surveyed, as above described, run the great high roads from Red Bluff and Chico, in California, to the Territories of Montana and Idaho, with their lateral branches.

Under the act of Congress approved May 30, 1862, permitting settlers on public lands to deposit the necessary funds to the credit of the appropriation for work petitioned for by them, subdivision work has been executed to the amount of nearly \$15,000. Of this amount there were deposited by the Central Pacific Railroad Company about \$5,000, and by the Western Pacific Railroad Company \$1,000.

Under the act of Congress approved July 23, 1866, the lines of the public surveys have been extended over the Aguas Nieves or Hensley rancho, situated in Butte county, the title to which rancho had been rejected by the Supreme Court of the United States. The various tracts upon this rancho which each settler had reduced to possession will be protracted upon the township subdivi-

sion plats, in order to enable coterminous proprietors to make joint entries, in accordance with the subdivision lines.

Under the act of Congress approved July 1, 1864, the expenses for surveys of private land claims, during the present year, have been defrayed from funds deposited by the owners of the respective claims, as required by said act.

Under the act of Congress approved July 26, 1866, and the instructions from the department dated January 14, 1867, relating to the survey of mineral lands in California, I have deemed it proper to establish nine surveying districts, known as "mineral districts" upon the records of this office, within which are embraced the principal mining counties of the State. These districts are as follows :

Mineral district No. 1 : The counties of Del Norte, Klamath, and Humboldt.

Mineral district No. 2 : The counties of Siskiyou, Shasta, and Trinity.

Mineral district No. 3 : The counties of Plumas, Butte, and Sierra.

Mineral district No. 4 : The counties of Yuba and Nevada.

Mineral district No. 5 : The counties of Placer, El Dorado, and Sacramento.

Mineral district No. 6 : The counties of Amador and Calaveras.

Mineral district No. 7 : The counties of Alpiné, Mono, and Inyo.

Mineral district No. 8 : The counties of Tuolumne, Mariposa, Merced, Stanislaus, and Fresno.

Mineral district No. 9 : The counties of Los Angeles, San Bernardino, San Diego, Kern, and Tulare.

Deputy surveyors have been commissioned by me for districts numbers three, four, five, six, seven, eight, and nine, and a system of work and returns in accordance with the act of Congress and the instructions from the department relating to mining surveys above referred to has been established under instructions to deputy surveyors in charge of mineral districts, issued from this office, of date July 17, 1867.

The surveys of mineral lands thus far returned to this office under the above act are embraced within districts numbers three, four, five, and eight.

From the accompanying statements enumerated in the first part of this report, the department will be enabled to judge the amount, value, and character of the work executed in the field and the office by the deputies and employés under my charge.

I am, very respectfully, your obedient servant,

L. UPSON,

*United States Surveyor General for California.*

Hon. JOSEPH S. WILSON,

*Commissioner of General Land Office, Washington, D. C.*

## A.—Statement of contracts entered into by the United States surveyor general for California during the fiscal year of 1866-'67.

Name of deputy.	Date of contract.	Location of work.		Amount of contract.	Remarks.
		Meridian and base.	Direction.		
S. Millington.....	July 6, 1866	Mount Diablo.....	N. and W.....	\$600 00	Special deposit; closed.
Ephraim Dyer.....	July 7, 1866	do.....	N. and E.....	7,500 00	Charged to appropriation; closed.
W. H. Carlton.....	July 11, 1866	do.....	N. and W.....	2,000 00	Do.
S. W. Foreman.....	July 30, 1866	do.....	S. and W.....	1,000 00	Do.
W. H. Norway.....	Aug. 17, 1866	San Bernardino.....	do.....	200 00	Do.
L. N. Chapman.....	Sept. 6, 1866	Mount Diablo.....	N. and W.....	2,000 00	Do.
W. F. Ingalls.....	Sept. 24, 1866	do.....	N. and E.....	7,500 00	Do.
J. M. Ingalls.....	Sept. 24, 1866	do.....	do.....	7,500 00	Charged to appropriation.
Ephraim Dyer.....	Sept. 24, 1866	do.....	do.....	7,500 00	Do.
J. T. Stratton.....	Oct. 16, 1866	do.....	S. and E.....	250 00	Special deposit; closed.
Do.....	Oct. 26, 1866	do.....	S. and W.....	50 00	Do.
W. Magree.....	Oct. 27, 1866	do.....	N. and W.....	270 00	Do.
G. H. Thompson.....	Nov. 7, 1866	do.....	do.....	85 00	Do.
S. W. Foreman.....	Nov. 12, 1866	do.....	S. and E.....	70 00	Do.
C. C. Tracy.....	Nov. 24, 1866	do.....	N. and W.....	313 00	Do.
J. T. Stratton.....	Nov. 30, 1866	do.....	S. and E.....	200 00	Do.
G. H. Thompson.....	Dec. 1, 1866	do.....	S. & E. and S. & W.....	1,000 00	Charged to appropriation; closed.
G. P. Ingalls.....	Dec. 6, 1866	do.....	do.....	7,500 00	Charged to appropriation.
E. H. Dyer.....	Dec. 6, 1866	do.....	N. and E.....	7,500 00	Do.
H. Hancock.....	Dec. 10, 1866	do.....	do.....	903 00	Special deposit; closed.
C. C. Tracy.....	Dec. 17, 1866	do.....	N. and W.....	500 00	Charged to appropriation; closed.
S. W. Foreman.....	Dec. 17, 1866	do.....	S. and E.....	1,250 00	Do.
J. Reed.....	Jan. 10, 1867	do.....	S. and W.....	440 00	Special deposit; closed.
H. Hancock.....	Jan. 10, 1867	do.....	N. and E.....	770 00	Do.
Do.....	Jan. 10, 1867	do.....	do.....	100 00	Do.
I. N. Chapman.....	Feb. 4, 1867	do.....	N. and W.....	250 00	Charged to appropriation; closed.
Do.....	Feb. 25, 1867	do.....	do.....	175 00	Special deposit; closed.
J. Reed.....	Feb. 25, 1867	do.....	S. and E.....	488 00	Do.
Ephraim Dyer.....	March 1, 1867	do.....	N. and E.....	7,500 00	Charged to appropriation.
W. F. Ingalls.....	March 1, 1867	do.....	do.....	5,000 00	Do.
L. Ranson.....	March 15, 1867	do.....	N. and W.....	70 00	Special deposit; closed.
A. W. McPherson.....	March 16, 1867	do.....	S. and W.....	700 00	Do.
S. W. Foreman.....	March 20, 1867	do.....	do.....	1,000 00	Charged to appropriation; closed.
J. E. Foreman.....	March 25, 1867	do.....	N. and W.....	1,594 00	Special deposit; closed.
T. J. Dewdney.....	March 27, 1867	do.....	do.....	1,324 00	Special deposit.
C. Duerr.....	April 4, 1867	do.....	S. and E.....	60 00	Special deposit; closed.
J. Reed.....	April 7, 1867	do.....	do.....	200 00	Do.
I. N. Chapman.....	April 10, 1867	do.....	N. and W.....	1,500 00	Charged to appropriation.
J. Balsdon.....	May 15, 1867	do.....	do.....	580 00	Special deposit.
H. Hancock.....	June 19, 1867	San Bernardino.....	S. and W.....	132 00	Do.
J. J. Cloud.....	* July 9, 1866	Mount Diablo.....	N. and W.....	138 75	Charged to appropriation; closed.

\* Special instructions.



B.—Statement of number of miles surveyed in California to June 30, 1867.

Name of surveyor.	Date of contract.	Base.	Meridian.	Standard.	Traverse.	Meander.	Township.	Section.
		<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>	<i>Miles, chs. lts.</i>
S. Millington .....	July 6, 1866			13 61 72			3 00 00	31 51 52
Ephraim Dyer .....	July 7, 1866			9 30 00			131 07 70	308 05 96
Joseph J. Cloud .....	July 9, 1866							
W. H. Carlton .....	July 11, 1866			3 22 70			51 21 46	82 74 57
S. W. Foreman .....	July 30, 1866						16 39 46	4 05 46
W. H. Norway .....	Aug. 17, 1866							
I. N. Chapman .....	Sept. 6, 1866					39 65 24	8 00 00	130 45 21
W. F. Ingalls .....	Sept. 24, 1866			7 84		41 79 90	117 63 49	534 51 24
J. M. Ingalls .....	Sept. 24, 1866			18 40 00			137 77 90	558 64 21
Ephraim Dyer .....	Sept. 24, 1866			15 24 60		27 16 50	111 04 37	394 49 36
J. T. Stratton .....	Oct. 16, 1866							11 52 07
J. T. Stratton .....	Oct. 26, 1866					1 19 22		1 37 37
William Magee .....	Oct. 27, 1866					1 13 56	7 31 75	11 68 70
G. H. Thompson .....	Nov. 7, 1866						9 50 45	7 53 49
C. C. Tracy .....	Nov. 24, 1866					7 52 98	8 45 11	14 10 64
G. H. Thompson .....	Dec. 1, 1866						1 40 00	10 41 61
G. P. Ingalls .....	Dec. 6, 1866						63 02 45	175 52 61
H. Hancock .....	Dec. 10, 1866					2 30 99	25 00 52	37 33 75
S. W. Foreman .....	Dec. 17, 1866					18 10 80	7 19 56	37 08 38
H. Hancock .....	Jan. 30, 1867						11 78 69	34 19 86
I. N. Chapman .....	Feb. 4, 1867					1 71 28		12 18 64
L. Ransom .....	Mar. 15, 1867					6 39 86		5 18 17
A. McPherson .....	Mar. 16, 1867						14 62	17 55
S. W. Foreman .....	Mar. 20, 1867					3 73 74	17 40 00	55 55 01
J. Reed .....	Apr. 7, 1867						5 79 89	31 22 43
G. W. Colby .....	Apr. 30, 1864						2 41 80	4 56 14
A. McPherson .....	Sept. 1, 1864						5 00 01	39 35 52
II. B. Martin .....	Nov. 15, 1864						17 23 79	59 18 28
T. J. Dewoody .....	Nov. 22, 1865					3 64 53	14 47 63	51 63 67
J. Cloud .....	Apr. 18, 1865							2 00 08
S. W. Foreman .....	Sept. 23, 1865						59 13 27	7 10 06
S. Millington .....	Sept. 23, 1865							63 43 32
S. Millington .....	Nov. 9, 1865						19 51 51	19 51 51
H. H. Harmon .....	Dec. 6, 1865						4 21 00	10 60 00
S. Millington .....	Dec. 6, 1865						5 40 94	5 40 94
A. McPherson .....	Dec. 12, 1865						7 16 70	17 30 99
A. W. Von Schmidt .....	Apr. 5, 1866					43 31	5 79 50	27 20 48
John Reed .....	Apr. 24, 1866						6 00 03	15 51 09
S. Millington .....	Apr. 17, 1866							14 08 76
Charles Durr .....	May 26, 1866		2 00 00				2 40 87	43 39 67
J. T. Stratton .....	June 16, 1866						8 69 45	44 73 22
J. E. Freeman .....	June 21, 1866					6 57 29	82 59 43	278 75 96
Miles surveyed in 1866-67			2 00 00	63 12 86				3 255 58 10
Miles surveyed to June 30, 1866, as per last report		330 60 57	696 39 49	4 200 66 15	2 737 43 30	334 18 90	944 05 81	78 469 73 78
Total miles surveyed to June 30, 1867		330 60 57	698 39 49	4 263 79 01	2 737 43 30	398 49 90	21 713 44 19	81 725 51 88

## C.—Statement of account of appropriation for the survey of public lands in California during the fiscal year of 1866-'67.

DR.

CR.

Date of account.	In favor of—	Founded upon—	Amount.	Date.	On account of—	Amount.
1866.				1866.		
July 9	A. W. Von Schmidt.....	Contract of April 5, 1866.....	\$410 98	July 1	By balance.....	\$25,728 93
Aug. 29	G. W. Colby.....	September 30, 1864.....	543 35		By deficiency appropriation, as per letter from department of June 14, 1866.....	30,000 00
29	H. B. Martin.....	November 15, 1864.....	873 98		By appropriation, as per letter from department of September 14, 1866.....	25,000 00
29	S. W. Foreman.....	September 23, 1865.....	1,590 82		By amount of certificates of deposit with the United States assistant treasurer at San Francisco, California.....	14,536 20
Sept. 29	J. H. Stuart.....	Excess of deposit, township 5 S., range 1 E.....	350 16			
10	Central Pacific Railroad Company.....	Excess of deposit for surveys in list No. 1.....	339 29			
11	C. T. Healy.....	Contract of November 29, 1864.....	169 31			
Nov. 17	S. Millington.....	May 7, 1866.....	230 33			
8	do.....	November 9, 1865.....	136 65			
8	do.....	December 6, 1865.....	421 77			
8	do.....	July 6, 1866.....	12 00			
Oct. 25	R. M. Wilson.....	December 6, 1865.....	88 00			
25	do.....	Excess of deposit, township 1 S., range 31 E.....	7,176 49			
Nov. 8	E. Dyer.....	Contract of July 7, 1866.....	1,004 49			
19	S. W. Foreman.....	July 30, 1866.....	1,915 17			
Dec. 6	J. E. Freeman.....	November 20, 1865.....	1,255 00			
18	G. H. Thompson.....	"Sobrante de San Jacinto".....	1,384 53			
18	B. B. Barker.....	Contract of June 4, 1866.....	31 95			
28	J. T. Stratton.....	October 26, 1866.....	1,562 26			
29	E. Dyer.....	September 24, 1866.....	1,921 18			
29	J. M. Ingalls.....	September 24, 1866.....				
1867.						
Jan. 26	A. McPherson.....	November 1, 1864.....	952 90			
29	J. T. Stratton.....	June 6, 1866.....	790 19			
Feb. 8	C. Duerr.....	May 26, 1866.....	606 00			
8	J. Reed.....	April 24, 1866.....	352 73			
16	W. H. Carlton.....	July 11, 1866.....	587 47			
16	J. J. Cloud.....	Instructions of July 9, 1866.....	138 75			
16	A. McPherson.....	Contract of December 12, 1865.....	309 57			
16	J. M. Ingalls.....	September 24, 1866.....	5,518 03			
7	H. H. Harmon.....	December 6, 1865.....	1,130 00			
Mar. 29	I. N. Chapman.....	September 6, 1866.....	1,609 51			
29	W. F. Ingalls.....	September 24, 1866.....	7,435 10			
17	J. E. Freeman.....	June 21, 1866.....	4,606 39			
29	G. H. Thompson.....	November 7, 1866.....	20 88			
29	J. T. Stratton.....	October 16, 1866.....	116 59			
29	G. P. Ingalls.....	December 6, 1866.....	2,535 34			
28	I. N. Chapman.....	September 6, 1866.....	389 39			
28	J. J. Cloud.....	December 12, 1865.....	275 30			
	Total.....		47,069 88			
	Add balance.....		48,195 25			
	Grand total.....		95,265 13		Total.....	95,265 13
					By balance.....	48,195 25

D.—Statement of account of appropriation for compensation of United States surveyor general of California and the employes in his office during the fiscal year of 1866-'67.

Dr.		Cr.	
1866-'67.		1866.	
To amount paid surveyor general and clerks, first quarter .....	\$4,200 00	July 1	By balance .....
To amount paid surveyor general and clerks, second quarter .....	4,233 69		By appropriation as advised by letter from the department of September 14, 1866 .....
To amount paid surveyor general and clerks, third quarter .....	4,200 00		By deposits with United States assistant treasurer at San Francisco, California .....
To amount paid surveyor general and clerks, fourth quarter .....	4,919 78		
Total .....	17,553 47		
To balance .....	2 98		
Grand total .....	17,556 45		
		1867.	Total .....
		July 1	By balance .....
			17,556 45
			2 98

E.—Statement of account of appropriation for rent of office, for fuel, stationery, and other incidental expenses, including the pay of messenger, for the fiscal year of 1866-'67.

Dr.		Cr.	
1866-'67.		1866.	
To amount paid for July, August, September, 1866.	\$1,127 16	July 1	By balance .....
To amount paid for October, November, December, 1866.	950 00		By appropriation as per letter from department of September 14, 1866. ....
To amount paid for January, February, March, 1867. ....	830 32		
To amount paid for April, May, June, 1867. ....	896 24		
Total .....	3,803 72		
To balance .....	809 44		
Grand total .....	4,613 16		
		1867.	Total .....
		July 1	By balance .....
			4,613 16
			809 46



*F.—Statement of transcripts of field-notes of public surveys sent to the department at Washington, from the United States surveyor general's office for California, during the fiscal year of 1866-'67.*

Meridian of Mount Diablo.

Name of deputy.	When sent.	Character of work.	Remarks.
A. W. Von Schmidt.	July 9, 1866	Township 5 S., range 1 E..	Township and section lines.
S. W. Foreman.	Aug. 29, 1866	Township 19 N., range 21 E..	Do. do.
Do.	Aug. 29, 1866	Township 20 N., range 21 E..	Do. do.
Do.	Aug. 29, 1866	Township 20 N., range 22 E..	Do. do.
Do.	Aug. 29, 1866	Township 20 N., range 23 E..	Do. do.
Do.	Aug. 29, 1866	Township 22 N., range 23 E..	Do. do.
G. W. Colby	Aug. 29, 1866	Township 22 N., range 1 E..	Do. do.
Do.	Aug. 29, 1866	Township 23 N., range 1 E..	Do. do.
H. B. Martin	Aug. 29, 1866	Township 8 N., range 8 W..	Do. do.
S. Millington	Sept. 17, 1866	Township 7 N., range 6 W..	Section lines.
C. T. Healy	Sept. 17, 1866	Township 7 S., range 3 W..	Do.
S. Millington	Nov. 8, 1866	Township 8 N., range 10 W..	Township and section lines.
Do.	Nov. 8, 1866	Township 6 N., range 9 W..	Section lines.
Do.	Nov. 8, 1866	Township 6 N., range 10 W..	Township and section lines.
R. M. Wilson.	Nov. 8, 1866	Township 1 S., range 31 E..	Section lines.
Ephraim Dyer	Nov. 8, 1866	Township 12 N., range 18 E..	Township, section, standard and meander lines.
Do	Nov. 8, 1866	Township 15 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 29 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 30 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 31 N., range 15 E..	Do. do.
Do	Nov. 8, 1866	Township 31 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 31 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 32 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 33 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 34 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 35 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 36 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 37 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 38 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 39 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 40 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 41 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 42 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 43 N., range 16 E..	Do. do.
Do	Nov. 8, 1866	Township 43 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 42 N., range 17 E..	Do. do.
Do	Nov. 8, 1866	Township 43 N., range 15 E..	Do. do.
Do	Nov. 8, 1866	Township 43 N., range 16 E..	Do. do.
S. W. Foreman.	Nov. 28, 1866	Township 8 S., range 4 W..	Township and section lines.
Do	Nov. 28, 1866	Township 9 S., range 3 W..	Section lines.
Do	Nov. 28, 1866	Township 9 S., range 4 W..	Township and section lines.
B. B. Barker	Dec. 17, 1866	Township 18 S., range 11 E..	Do. do.
Do	Dec. 17, 1866	Township 18 S., range 12 E..	Do. do.
J. P. Stratton	Dec. 28, 1866	Township 3 S., range 5 W..	Section and meander lines.
J. M. Ingalls	Jan. 18, 1867	Township 27 N., range 7 E..	Township, standard, and section lines.
Do	Jan. 18, 1867	Township 27 N., range 8 E..	Do. do.
Do	Jan. 18, 1867	Township 28 N., range 7 E..	Do. do.
Do	Jan. 18, 1867	Township 28 N., range 9 E..	Do. do.
Do	Jan. 18, 1867	Township 29 N., range 7 E..	Do. do.
Do	Jan. 18, 1867	Township 29 N., range 8 E..	Do. do.
Do	Jan. 18, 1867	Township 29 N., range 10 E..	Do. do.
Do	Jan. 18, 1867	Township 30 N., range 9 E..	Do. do.
Do	Jan. 18, 1867	Township 30 N., range 11 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 8 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 9 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 10 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 11 E..	Do. do.
Ephraim Dyer	Jan. 18, 1867	Township 30 N., range 16 E..	Standard and township lines.
Do	Jan. 18, 1867	Township 31 N., range 14 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 15 E..	Do. do.
Do	Jan. 18, 1867	Township 31 N., range 16 E..	Do. do.
Do	Jan. 18, 1867	Township 34 N., range 17 E..	Do. do.
Do	Jan. 18, 1867	Township 44 N., range 16 E..	Do. do.
Do	Jan. 18, 1867	Township 45 N., range 15 E..	Do. do.
Do	Jan. 18, 1867	Township 46 N., range 15 E..	Do. do.
Do	Jan. 18, 1867	Township 46 N., range 16 E..	Do. do.
J. T. Stratton.	Jan. 29, 1867	Township 7 S., range 1 W..	Section, township, and rancho lines, (resurveyed.)
Do	Jan. 29, 1867	Township 8 S., range 1 W..	Do. do.
C. Duerr	Feb. 8, 1867	Township 3 S., range 1 W..	Do. do.
J. Reed	Feb. 8, 1867	Township 6 S., range 1 W..	Section, township, and meander lines.
J. M. Ingalls.	Feb. 16, 1867	Township 27 N., range 7 E..	Section lines.

## F.—Statement of transcripts of field-notes, &amp;c —Continued.

Meridian of Mount Diablo.

Name of deputy.	When sent.	Character of work.	Remarks.
J. M. Ingalls.....	Feb. 16, 1867	Township 27 N., range 8 E...	Section lines.
Do.....	Feb. 16, 1867	Township 28 N., range 7 E...	Do.
Do.....	Feb. 16, 1867	Township 28 N., range 8 E...	Do.
Do.....	Feb. 16, 1867	Township 28 N., range 9 E...	Do.
Do.....	Feb. 16, 1867	Township 29 N., range 7 E...	Do.
Do.....	Feb. 16, 1867	Township 29 N., range 8 E...	Do.
Do.....	Feb. 16, 1867	Township 29 N., range 9 E...	Do.
Do.....	Feb. 16, 1867	Township 30 N., range 9 E...	Do.
Do.....	Feb. 16, 1867	Township 30 N., range 10 E...	Do.
Do.....	Feb. 16, 1867	Township 30 N., range 11 E...	Do.
A. McPherson.....	Feb. 16, 1867	Township 10 S., range 1 E...	Township and section lines.
Do.....	Feb. 16, 1867	Township 10 S., range 2 E...	Do. do.
Do.....	Feb. 16, 1867	Township 11 S., range 1 E...	Do. do.
William H. Carlton ..	Feb. 16, 1867	Township 16 N., range 17 W...	Township lines.
Do.....	Feb. 16, 1867	Township 17 N., range 17 W...	Do.
Do.....	Feb. 16, 1867	Township 18 N., range 17 W...	Do.
Do.....	Feb. 16, 1867	Township 19 N., range 17 W...	Do.
Do.....	Feb. 16, 1867	Township 17 N., range 18 W...	Do.
H. H. Harmon.....	Mar. 7, 1867	Township 6 N., range 8 W...	Section lines.
W. F. Ingalls.....	Mar. 29, 1867	Township 21 N., range 17 E...	Township, section, and meander lines.
Do.....	Mar. 29, 1867	Township 22 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 23 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 24 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 25 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 26 N., range 15 E...	Do. do.
Do.....	Mar. 29, 1867	Township 26 N., range 16 E...	Do. do.
Do.....	Mar. 29, 1867	Township 26 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 27 N., range 15 E...	Do. do.
Do.....	Mar. 29, 1867	Township 27 N., range 16 E...	Do. do.
Do.....	Mar. 29, 1867	Township 27 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 28 N., range 16 E...	Do. do.
Do.....	Mar. 29, 1867	Township 28 N., range 17 E...	Do. do.
Do.....	Mar. 29, 1867	Township 29 N., range 16 E...	Do. do.
I. N. Chapman.....	Mar. 28, 1867	Township 17 N., range 16 W...	Do. do.
Do.....	Mar. 28, 1867	Township 17 N., range 17 W...	Do. do.
Do.....	Mar. 28, 1867	Township 18 N., range 17 W...	Do. do.
Do.....	Mar. 28, 1867	Township 19 N., range 17 W...	Do. do.
Do.....	Mar. 28, 1867	Township 16 N., range 17 W...	Do. do.
Do.....	Mar. 28, 1867	Township 17 N., range 18 W...	Do. do.
Do.....	Mar. 28, 1867	Township 18 N., range 18 W...	Do. do.
R. S. Lammot.....	Apr. 17, 1867	Township 3 N., range 6 W...	Meander lines.
J. E. Freeman.....	May 17, 1867	Township 17 N., range 11 E...	Township, section, and meander lines.
Do.....	May 17, 1867	Township 17 N., range 12 E...	Do. do.
Do.....	May 17, 1867	Township 17 N., range 13 E...	Do. do.
Do.....	May 17, 1867	Township 17 N., range 14 E...	Do. do.
Do.....	May 17, 1867	Township 17 N., range 15 E...	Do. do.
G. P. Ingalls.....	May 29, 1867	Township 1 S., range 13 E...	Standard, township, and section lines.
Do.....	May 29, 1867	Township 1 S., range 14 E...	Do. do.
Do.....	May 29, 1867	Township 1 S., range 15 E...	Do. do.
Do.....	May 29, 1867	Township 2 S., range 14 E...	Do. do.
Do.....	May 29, 1867	Township 3 S., range 14 E...	Do. do.
Do.....	May 29, 1867	Township 3 S., range 15 E...	Do. do.
Do.....	May 29, 1867	Township 4 S., range 14 E...	Do. do.
Do.....	May 29, 1867	Township 4 S., range 15 E...	Do. do.
G. H. Thompson.....	May 29, 1867	Township 4 N., range 7 W...	Section lines.
J. T. Stratton.....	May 29, 1867	Township 12 S., range 6 E...	Do.
I. N. Chapman.....	June 28, 1867	Township 15 N., range 16 W...	Township and section lines.
Do.....	June 28, 1867	Township 15 N., range 17 W...	Do. do.
J. J. Cloud.....	June 28, 1867	Township 6 S., range 4 W...	Do. do.

G.—Statement of descriptive notes, decrees of court, &c., of private land claims to accompany plats for patent compiled for transmission to the department at Washington during the fiscal year of 1866-'67.

Nature of work.	Name of claim.	To whom confirmed.	Original.	For Wash- ington.	When sent.
Descriptive notes and decrees	El Pinole.....	M. A. M. de Richardson <i>et al.</i>	1	1	July 18, 1866
Do.....	Salinas.....	Heirs G. Espinoza <i>et al.</i>	1	1	Aug. 8, 1866
Do.....	Santa Teresa.....	Augustin Bernal.....	1	1	Aug. 8, 1866
Do.....	Pala.....	Ellen E. White <i>et al.</i>	1	1	Aug. 8, 1866
Do.....	Arroyo Grande.....	Francisco Branch.....	1	1	Aug. 29, 1866
Do.....	Bolsa de Chamisal.....	L. T. Burton.....	1	1	Aug. 29, 1866
Do.....	Pismo.....	Isaac J. Sparks.....	1	1	Aug. 29, 1866
Do.....	Corral de Piedra.....	J. M. Villavicencio.....	1	1	Aug. 29, 1866
Do.....	El Pascadero.....	David Jacks.....	1	1	Sept. 8, 1866
Do.....	Sau Francisquito.....	M. C. V. de Rodriguez.....	1	1	Sept. 8, 1866
Do.....	Tract in Monterey Co.....	Heirs Simeon Castro.....	1	1	Sept. 8, 1866
Do.....	El Tucho.....	David Jacks.....	1	1	Sept. 8, 1866
Do.....	Agua Puerca y las Francas.	R. Rodriguez & F. Alviso.	1	1	Sept. 28, 1866
Do.....	Yokaya.....	C. Juarez.....	1	1	Oct. 9, 1866
Do.....	Cañada del Hambre y las Bolsas.	Teodora Soto.....	1	1	Oct. 9, 1866
Do.....	Posolmi.....	L. Ynigo <i>et al.</i>	1	1	Nov. 8, 1866
Do.....	Panoche de San Juan.....	J. Ursua and P. Romo.....	1	1	Dec. 18, 1866
Do.....	Island Santa Catalina.....	J. M. Covarrubias.....	1	1	Dec. 18, 1866
Do.....	Los Meganos.....	Alice Marsh.....	1	1	Dec. 18, 1866
Do.....	Lomas de Santiago.....	T. Yorba.....	1	1	Jan. 18, 1867
Do.....	Los Cerritos.....	Juan Temple.....	1	1	Jan. 18, 1867
Do.....	San Ysidro.....	Q. Ortega <i>et al.</i>	1	1	Jan. 29, 1867
Do.....	San Joaquin.....	J. Sepulveda.....	1	1	Jan. 29, 1867
Do.....	Chualar.....	M. Malarin.....	1	1	Feb. 7, 1867
Do.....	Las Positas.....	J. Noriega <i>et al.</i>	1	1	Feb. 8, 1867
Do.....	Las Milpitas.....	Ygnacio Pastor.....	1	1	Mar. 27, 1867
Do.....	Buena Vista.....	M. Malarin.....	1	1	April 29, 1867
Do.....	San Vicente.....	Blas A. Escarillo.....	1	1	May 4, 1867
Do.....	Aguajito.....	G. Tapia.....	1	1	May 4, 1867
Do.....	Tolenas.....	J. F. Armijo <i>et al.</i>	1	1	May 29, 1867

H.—Statement of plats made in the office of the United States surveyor general for California during the fiscal year of 1866-'67.

	Plats of township work.	Plats of township subdivisions.	Plats of ranches.	General maps.	Grand total.
Original.....	16	.....	.....	.....	.....
Department.....	16	.....	.....	.....	.....
Original.....	.....	112	.....	.....	.....
Department.....	.....	118	.....	.....	.....
Register.....	.....	69	.....	.....	.....
Original.....	.....	.....	23	.....	.....
Department.....	.....	.....	41	.....	.....
Traced copies.....	.....	.....	6	.....	.....
For courts.....	.....	.....	5	.....	.....
Skeleton plats.....	159	.....	.....	.....	.....
General maps.....	.....	.....	.....	5	.....
Sketches for deputies.....	33	.....	.....	.....	.....
Total.....	224	299	75	5	603



**I.—Statement of examinations and reports made to the department for patent of all subdivisional surveys pre-empted or selected under the acts of Congress relating thereto during the fiscal year of 1866-'67.**

Month.	San Francisco.	Stockton.	Marysville.	Humboldt.	Visalia.	Grand total.
<i>Report of land offices in 1865.</i>						
January .....	3	2	2	2	2	-----
February .....	4	2	2	2	2	-----
March .....	4	2	2	2	2	-----
April .....	5	2	2	2	1	-----
May .....	3	2	2	2	-----	-----
June .....	2	-----	-----	-----	-----	-----
July .....	5	4	2	1	-----	-----
August .....	-----	4	4	-----	1	-----
September .....	3	-----	-----	2	1	-----
October .....	-----	3	3	1	-----	-----
November .....	9	-----	-----	4	3	-----
December .....	3	4	2	1	1	-----
<i>Report of land offices in 1866.</i>						
January .....	7	2	4	-----	1	-----
February .....	-----	-----	-----	-----	-----	-----
March .....	3	-----	2	10	4	-----
April .....	7	3	2	-----	1	-----
May .....	5	3	-----	-----	3	-----
June .....	2	4	2	5	2	-----
July .....	3	1	2	-----	2	-----
August .....	4	-----	2	-----	3	-----
September .....	6	-----	-----	-----	-----	-----
October .....	3	-----	-----	-----	-----	-----
November .....	4	-----	-----	-----	-----	-----
December .....	3	-----	-----	-----	-----	-----
<i>Report of land offices in 1867.</i>						
January .....	5	-----	-----	-----	-----	-----
February .....	5	-----	-----	-----	-----	-----
March .....	5	-----	-----	-----	-----	-----
April .....	-----	-----	-----	-----	-----	-----
May .....	-----	-----	-----	-----	-----	-----
June .....	-----	-----	-----	-----	-----	-----
Total .....	103	38	37	33	29	240

**K.—Statement showing the numbers and present condition of surveys of private land claims in California under instructions from this office during the fiscal year of 1866-'67.**

No. of survey.	No. in land commission.	Name of rancho.	County.	Name of confirmees.
643	58	Mallacomes .....	Sonoma .....	J. S. Berreyesa.*
644	239	Santa Ysabel .....	San Diego .....	J. J. Ortega <i>et al.</i>
645	286	Pueblo lands of San José .....	Santa Clara .....	Mayor and common council of San José.
646	61	San Geronimo .....	San Louis Obispo .....	R. Villavicencio.
647	188	Island San Diego .....	San Diego .....	F. Billings <i>et al.</i>
648	543	Pueblo lands of Santa Barbara .....	Santa Barbara .....	Mayor and common council of Santa Barbara.
649	483	Topangu Malibu .....	Los Angeles .....	M. Keller, substitute for L. V. Prudhomme.
650	700	Santa Margarita .....	San Diego .....	Pio Pico <i>et al.</i>
651	297	Tract near San Juan Bautista .....	Monterey .....	M. Larios.
652	521	Temascal .....	Santa Barbara .....	R. de la Cuesta <i>et al.</i> , substitute for M Anguesola.
653	747	Lands near Santa Cruz .....	Santa Cruz .....	Thomas Russell.*

\* Resurvey.



32	99 N., range 9 E.	21, 807.30			1, 120.00		22, 927.20
33	98 N., range 16 E.	18, 083.99			5, 102.00		23, 185.99
34	98 N., range 17 E.	15, 092.92					24, 308.92
35	20 N., range 7 E.	15, 208.82			560.00		25, 963.22
36	20 N., range 8 E.	16, 721.08					26, 953.08
37	20 N., range 9 E.	22, 729.15					27, 929.15
38	20 N., range 16 E.	5, 768.09			69.00		28, 557.09
39	30 N., range 9 E.	22, 874.72					29, 874.72
40	30 N., range 10 E.	22, 927.60					30, 927.60
41	30 N., range 11 E.	22, 930.93					31, 930.93
42	30 N., range 16 E.	22, 987.72					32, 987.72
43	31 N., range 15 E.	23, 017.24					33, 017.24
44	31 N., range 16 E.	22, 999.81					34, 999.81
45	34 N., range 17 E.	18, 351.33					35, 351.33
46	38 N., range 17 E.	8, 249.17					36, 130.17
47	38 N., range 17 E.	7, 846.15					37, 144.80
48	40 N., range 16 E.	7, 241.64					38, 040.00
49	41 N., range 16 E.	13, 374.35					39, 040.00
50	41 N., range 17 E.	75.12					40, 832.64
51	42 N., range 16 E.	13, 994.31					41, 737.52
52	42 N., range 9 E.	4, 549.15					42, 904.69
53	42 N., range 17 E.	1, 920.00					43, 832.64
54	43 N., range 15 E.	18, 631.89					44, 040.00
55	43 N., range 16 E.	13, 764.28					45, 056.45
56	43 N., range 17 E.	5, 758.40					46, 764.28
57	44 N., range 15 E.	8, 883.01					47, 073.01
58	44 N., range 16 E.	4, 611.33					48, 038.40
59	45 N., range 16 E.	20, 636.68					49, 073.01
60	46 N., range 16 E.	1 N., range 4 W.					50, 043.33
61	4 N., range 4 W.	6, 339.96					51, 049.78
62	4 N., range 7 W.	10, 601.22					52, 040.00
63	6 N., range 8 W.	4, 027.70					53, 136.10
64	6 N., range 9 W.	6, 448.15					54, 065.18
65	6 N., range 10 W.	2, 506.07					55, 082.00
66	7 N., range 2 W.	9, 671.95					56, 004.72
67	8 N., range 8 W.	20, 483.04					57, 976.16
68	8 N., range 10 W.	11, 313.29					58, 042.24
69	11 N., range 7 W.	2, 294.81					59, 093.59
70	13 N., range 7 W.	4, 568.16					60, 349.38
71	14 N., range 17 W.	2, 634.39					61, 864.00
72	15 N., range 17 W.	4, 117.64					62, 848.16
73	15 N., range 17 W.	10, 546.52					63, 634.39
74	16 N., range 17 W.	3, 009.40					64, 920.00
75	16 N., range 16 W.	10, 240.00					65, 1081.06
76	17 N., range 17 W.	13, 337.42					66, 17, 529.40
77	17 N., range 18 W.	1, 239.80					67, 23, 040.00
78	18 N., range 17 W.	4, 912.69					68, 2, 560.00
79	18 N., range 18 W.	1, 715.35					69, 1, 280.00
80	19 N., range 17 W.	1, 600.00					70, 22, 137.42
							71, 1, 239.80
							72, 23, 026.99
							73, 1, 715.35
							74, 22, 400.00
							75, 2, 400.00
							76, 2, 560.00
							77, 1, 280.00
							78, 22, 137.42
							79, 1, 239.80
							80, 23, 026.99
							81, 1, 715.35
							82, 22, 400.00
							83, 2, 400.00
							84, 2, 560.00
							85, 1, 280.00
							86, 22, 137.42
							87, 1, 239.80
							88, 23, 026.99
							89, 1, 715.35
							90, 22, 400.00
							91, 2, 400.00
							92, 2, 560.00
							93, 1, 280.00
							94, 22, 137.42
							95, 1, 239.80
							96, 23, 026.99
							97, 1, 715.35
							98, 22, 400.00
							99, 2, 400.00
							100, 2, 560.00
							101, 1, 280.00
							102, 22, 137.42
							103, 1, 239.80
							104, 23, 026.99
							105, 1, 715.35
							106, 22, 400.00
							107, 2, 400.00
							108, 2, 560.00
							109, 1, 280.00
							110, 22, 137.42
							111, 1, 239.80
							112, 23, 026.99
							113, 1, 715.35
							114, 22, 400.00
							115, 2, 400.00
							116, 2, 560.00
							117, 1, 280.00
							118, 22, 137.42
							119, 1, 239.80
							120, 23, 026.99
							121, 1, 715.35
							122, 22, 400.00
							123, 2, 400.00
							124, 2, 560.00
							125, 1, 280.00
							126, 22, 137.42
							127, 1, 239.80
							128, 23, 026.99
							129, 1, 715.35
							130, 22, 400.00
							131, 2, 400.00
							132, 2, 560.00
							133, 1, 280.00
							134, 22, 137.42
							135, 1, 239.80
							136, 23, 026.99
							137, 1, 715.35
							138, 22, 400.00
							139, 2, 400.00
							140, 2, 560.00
							141, 1, 280.00
							142, 22, 137.42
							143, 1, 239.80
							144, 23, 026.99
							145, 1, 715.35
							146, 22, 400.00
							147, 2, 400.00
							148, 2, 560.00
							149, 1, 280.00
							150, 22, 137.42
							151, 1, 239.80
							152, 23, 026.99
							153, 1, 715.35
							154, 22, 400.00
							155, 2, 400.00
							156, 2, 560.00
							157, 1, 280.00
							158, 22, 137.42
							159, 1, 239.80
							160, 23, 026.99
							161, 1, 715.35
							162, 22, 400.00
							163, 2, 400.00
							164, 2, 560.00
							165, 1, 280.00
							166, 22, 137.42
							167, 1, 239.80
							168, 23, 026.99
							169, 1, 715.35
							170, 22, 400.00
							171, 2, 400.00
							172, 2, 560.00
							173, 1, 280.00
							174, 22, 137.42
							175, 1, 239.80
							176, 23, 026.99
							177, 1, 715.35
							178, 22, 400.00
							179, 2, 400.00
							180, 2, 560.00
							181, 1, 280.00
							182, 22, 137.42
							183, 1, 239.80
							184, 23, 026.99
							185, 1, 715.35
							186, 22, 400.00
							187, 2, 400.00
							188, 2, 560.00
							189, 1, 280.00
							190, 22, 137.42
							191, 1, 239.80
							192, 23, 026.99
							193, 1, 715.35
							194, 22, 400.00
							195, 2, 400.00
							196, 2, 560.00
							197, 1, 280.00
							198, 22, 137.42
							199, 1, 239.80
							200, 23, 026.99
							201, 1, 715.35
							202, 22, 400.00
							203, 2, 400.00
							204, 2, 560.00
							205, 1, 280.00
							206, 22, 137.42
							207, 1, 239.80
							208, 23, 026.99
							209, 1, 715.35
							210, 22, 400.00
							211, 2, 400.00
							212, 2, 560.00
							213, 1, 280.00
							214, 22, 137.42
							215, 1, 239.80
							216, 23, 026.99
							217, 1, 715.35
							218, 22, 400.00
							219, 2, 400.00
							220, 2, 560.00
							221, 1, 280.00
							222, 22, 137.42
							223, 1, 239.80
							224, 23, 026.99
							225, 1, 715.35
							226, 22, 400.00
							227, 2, 400.00
							228, 2, 560.00
							229, 1, 280.00
							230, 22, 137.42
							231, 1, 239.80
							232, 23, 026.99
							233, 1, 715.35
							234, 22, 400.00
							235, 2, 400.00
							236, 2, 560.00
							237, 1, 280.00
							238, 22, 137



## List of lands surveyed in California, &amp;c.—Continued.

No. of townships surveyed.	Description.	Public land.						Confirmed private land claims.		Military reservation.		Indian reservation.		Unsurveyed mound land.		River, swamp, and overflowed land.		Unsurveyed public land.		Remarks.	Total.	
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.			Acres.
Mount Diablo meridian—Continued.																						
81	Township 32 N., range 5 W.	4,371.60																				
82	32 N., range 6 W.	1,280.00																				
83	32 N., range 14 E.	7,272.98																				
84	3 S., range 14 E.	23,145.80																				
85	4 S., range 14 E.	23,150.22																				
86	4 S., range 15 E.	11,627.71																				
87	5 S., range 1 E.	12,584.81																				
88	5 S., range 2 E.	2,086.80																				
89	6 S., range 7 E.	12,955.32																				
90	7 S., range 1 E.	91.10																				
91	12 S., range 4 E.	3,263.76																				
92	12 S., range 6 E.	4,820.55																				
93	13 S., range 2 E.	1,995.03																				
94	13 S., range 4 E.	6,902.95																				
95	18 S., range 11 E.	16,738.87																				
96	18 S., range 12 E.	11,550.79																				
97	19 S., range 12 E.	1,122.40																				
98	3 S., range 1 W.	16,784.77																				
99	3 S., range 5 W.	4,544.82																				
100	4 S., range 1 W.	124.01																				
101	4 S., range 4 W.	4,544.82																				
102	5 S., range 1 W.	672.60																				
103	7 S., range 1 W.	9,025.12																				
104	7 S., range 3 W.	19,118.99																				
105	8 S., range 1 W.	9,930.93																				
106	8 S., range 3 W.	23,020.68																				
107	8 S., range 4 W.	19,531.67																				
108	9 S., range 1 W.	12,484.99																				
109	9 S., range 3 W.	6,127.53																				
110	9 S., range 4 W.	5,973.33																				
111	10 S., range 1 W.	13,397.66																				

111	<i>San Bernardino meridian.</i>	Township 4 N., range 25 W.....	68.95	A.			D.			A + D	21, 731.05	21, 800.00
		7 N., range 31 W.....	2, 248.00	20, 840.00			399, 385.43	68, 340.77	13, 989.09		411, 950.45	23, 088.00
112	<i>Mount Diablo meridian.</i>		1,331,921.04	201, 541.92								2, 427, 128.70
		Township 1 N., range 1 E.....	11, 597.08				11, 408.00					23, 005.08
		22 N., range 1 E.....	5, 578.88	17, 440.00						A + E	16, 367.30	23, 018.88
		4 N., range 4 W.....	6, 768.80	A.				E.		A + E	13, 834.26	23, 136.10
		4 N., range 7 W.....	9, 230.92	A.			13, 360.00					23, 065.18
		7 N., range 2 W.....	8, 706.51	975.73								23, 042.24
		7 N., range 8 W.....	19, 400.04	A.			D.			A + D	3, 693.55	23, 093.59
		8 N., range 5 W.....	1, 749.92	A.			D.			A + D + E	21, 290.08	23, 040.00
		32 N., range 5 W.....	7, 676.86				15, 347.84					23, 024.70
		6 S., range 7 E.....	1, 467.87	A.						A + D	21, 572.13	23, 040.00
		10 S., range 1 W.....										
	<i>San Bernardino meridian.</i>	Township 7 N., range 31 W.....	2, 816.61	20, 319.49								23, 136.10
		Returned in previous reports.....	74, 993.49	38, 735.22			40, 115.84				76, 757.32	230, 601.87
		Returned in previous reports.....	1,331,921.04	201, 541.92			399, 385.43	68, 340.77	13, 989.09		411, 950.45	2, 427, 128.70
		Aggregate surveyed during the year.....	74, 993.49	38, 735.22			40, 115.84				76, 757.32	230, 601.87
			1,256,927.55	162, 806.70			359, 269.59	68, 340.77	13, 989.09		335, 193.13	2, 196, 526.83

*M.—Estimate for the surveying service in the district of California for the fiscal year ending June 30, 1869.*

Class of expenses:

For surveying extensions of standard parallels, township, exterior, and subdivisional lines in the State of California .....	\$100,000 00
For rent of office, stationery, instruments, and other incidental expenses, including wages of messenger.....	6,000 00
For compensation of surveyor general.....	3,000 00
For compensation of clerks in the office of the surveyor general .....	17,000 00
Total.....	<u>126,000 00</u>

No. 18 J.

SURVEYOR GENERAL'S OFFICE, EUGENE CITY,  
*Oregon, July 1, 1867.*

SIR: In pursuance of your instructions of March 26, 1867, I herewith submit my annual report, showing the condition of surveys and the operations of the office in this district during the past year.

A.—Statement of surveying contracts made since June 30, 1866.

B.—Statement of original plats of public surveys, copies transmitted to the general and local land offices since June 30, 1866.

C.—Statement showing the number of townships surveyed since June 30, 1866, with the area of public land contained therein.

D.—Statement of amount of salaries paid the surveyor general and clerks for the fiscal year ending June 30, 1867.

E.—Statement of the incidental expenses of this office for the year ending June 30, 1867.

F.—Estimate for surveying and office expenses for the fiscal year ending June 30, 1869.

During the year I succeeded in extending the surveys in southeastern Oregon, in anticipation of a rapid advance of settlements to that quarter, and also in view of my attention being called to the wants of the Oregon Central Military Road Company, both by the officers of the company and your letter dated May 16, 1866. But Indian hostilities have continued beyond expectation, and it is now dangerous, on that account, to survey in those valleys except in the immediate vicinity of the military establishments in Klamath Lake and Surprise valleys. In the latter valley there are quite heavy settlements, estimated at three hundred voters, and, as you will perceive by the accompanying diagram, there is not a foot of government survey in that country, nor can there be without an extension of the seventh standard parallel beyond the Goose Lake valley.

As the amount of surveys I could be able to secure in these parts, under present difficulties and with the limited amount of funds, would be immaterial so far as accomplishing the important purposes of those immediately interested in their extension is concerned, I concluded it would be the best—or could be made to be the best—for those citizens interested, and for the public service, not to attempt those surveys under the present appropriation; but promising that, if possible, the present neglect shall be made up under the next appropriation, which should be more ample, and when the dangers from the savages, as we shall hope, are removed.

The almost impossibility of extending the work by small contracts, as they must be, around the borders of the Willamette, Umpqua, and Rogue river valleys, has already been intimated to you. For the extension of such surveys



the present price per mile is inadequate; particularly at the present rate of gold, which, it must be borne in mind, is the basis of business in this State. These surveys are also of a difficult and expensive character, as they will encroach upon uneven ground, and heavily timbered and exceedingly brushy districts. Much of this is the running or vine maple, a most stubborn enemy of operations in the field. Another difficult class of brush is the fir, and there will be extensive tracts of this to contend with. Where growing from six to ten feet high it is often almost as thick as hemp. Much of these surveys cannot be done without cutting out a path. In fact, it is almost useless to think about extending these surveys at present rates, unless the government should reach specie payments, a thing for some time to come scarcely hoped for.

Since making our diagram of last year, we have received more ample information in regard to the John Day river and its tributaries, and our present diagram, therefore, may be regarded as the closest approximation to the correct that may be had short of an actual survey.

I have for some time contemplated running a standard line from the Deschutes meridian east far enough to reach the settlements along the valley of the middle fork of the John Day river, below and in the vicinity of Canyon City, but am now satisfied that the most economical and practicable method to accomplish that purpose will be to run a new guide meridian from the base line south into those valleys and establish upon that the necessary standard lines upon which to base those surveys; and they are much needed to be made, as has been before reported. To this important necessity I would respectfully call your attention in making your recommendation for appropriation to extend the work in the field.

I have contracted for the continuation of the base line east to the intersection of Snake river, and do not doubt but that it will be completed during the summer. This has been attended to in view of the perfection of the diagram of the district, and out of respect to your suggestions of March 16, 1866.

We have made it a point to be as economical and prudent in the expenses of the office as possible. The heavy financial burdens of the government are not forgotten, and nothing is purchased unless positively needed and cannot be dispensed with. Our furniture is old and plain, and, with the exception of a few articles, has served since the establishment of the office. It has been our aim to keep our official conduct in all these things above censure, and are glad to be able truthfully to say, with success. In this manner we hope to do our part in sustaining the honor and reputation of this important branch of the public service.

Very respectfully, your obedient servant,

E. Z. APPLGATE,  
*Surveyor General of Oregon.*

Hon. JOSEPH S. WILSON,  
*Commissioner of General Land Office.*

## A.—Statement of surveying contracts made since June 30, 1867.

Contract.	No.	Date.	Name of deputies.	Location and description of lines.	Amount surveyed.				Gross amount.	Remarks.
					Base line, \$15 per mile.	Standard parallel, \$15 per mile.	Exteriors, \$12 per mile.	Subdivisions, \$10 per mile.		
113	July 2, 1866		George Mercer .....	Second standard parallel south from the southwest corner of township 10 south, range 8 west, west to the Pacific ocean. Exterior lines of township 4 north, range 34 east, townships 3 and 4 north, ranges 35, 36, and 37 east, townships 5 and 6 north, range 37 east; also, subdivisional lines of township 4 north, ranges 31, 34, 35, 36, and 37 east, townships 5 and 6 north, range 37 east, township 3 north, ranges 36 and 37 east, township 3 north, ranges 34 and 35 east; also, the base line east from the northeast corner of township 1 south, range 40 east, to the left bank of Snake river.	.....	17 00 00	.....	.....	\$255 00	Contract closed; reported for payment.
114	July 2, 1866		William H. Odell .....		40 20 65	.....	67 60 87	286 09 22	4, 279 05	Contract closed; reported for payment.
115	July 23, 1866		D. P. Thompson, B. J. Pengra, J. W. Meldrum.	Seventh standard parallel south, between townships 35 and 36 south, through ranges 10, 11, 12, 13, 14, and 15 east; also, the exterior lines of township 28 south, range 7 east, township 29 south, ranges 7 and 8 east, township 30 south, range 8 east, township 31 south, ranges 8 and 9 east, township 32 south, range 9 east, township 33 south, range 10 east, township 34 south, ranges 10 and 11 east, township 35 south, ranges 11 and 12 east, townships 35 and 36 south, ranges 13, 14, and 15 east; also, the subdivisional lines of township 28 south, range 7 east, township 29 south, ranges 7 and 8 east, township 30 south, range 8 east, township 31 south, ranges 8 and 9 east, township 32 south, range 9 east, township 33 south, range 10 east, township 34 south, ranges 10 and 11 east, township 35 south, ranges 11 and 12 east, townships 35 and 36 south, ranges 13, 14, and 15 east.	.....	34 00 00	155 21 62	846 23 34	10, 836 15	Contract closed; reported for payment.
116	Dec. 12, 1866		J. W. Meldrum .....	Subdivisional lines of townships 27 and 28 south, range 13 west, townships 26 and 28 south, range 14 west, townships 21, 29, 30, and 31 south, range 11 west, township 29 south, range 12 west, townships 20 and 30 south, range 10 west, and so much exterior lines as are necessary to base aforesaid subdivisions upon.	.....	.....	.....	.....	.....	Deputy now in the field.
117	Jan. 5, 1867		George Mercer .....	Exterior lines of township 10 south, ranges 9 and 10 west, township 11 south, ranges 9, 10, and 11 west; also, subdivisional lines of township 10 south, ranges 8, 9, and 10 west, township 11 south, ranges 9, 10, and 11 west.	.....	.....	.....	.....	.....	Deputy now in the field.
118	Jan. 29, 1867		T. W. Davenport .....	South and east exterior lines, and subdivisional lines of township 7 south, range 2 east.	.....	.....	.....	.....	.....	Cancelled.
119	Feb. 15, 1867		D. P. Thompson, A. M. Thompson, B.	Exterior and subdivisional lines of townships 1 and 2 north, range 19 east, township 2 north, ranges 20 and 21 east, townships 1	.....	.....	.....	.....	.....	Deputies now in the field.

					Deputies now in the field.
120	May 27, 1867	J. Pengra. Wm. H. Odell, Jos. G. Gray.	and 2 north, ranges 22, 23, and 24 east, townships 1 and 2 south, ranges 24, 25, and 26 east. Exterior and subdivisonal lines of township 1 north, ranges 38, 40, 43, 44, 45, and 46 east, township 1 south, ranges 43, 44, 45, and 46 east, townships 3 and 4 south, range 37 east, and subdivisonal lines of township 1 north, range 39 east; also, the base line from established post in south boundary of section 35, township 1 north, range 47 east, to intersect the left bank of Snake river; also, the guide meridian between ranges 39 and 40 east, from the southeast corner of township 25 south, range 39 east, to southeast corner of township 35 south, range 39 east; also, the seventh standard parallel south, between townships 35 and 36 south, from southeast corner of township 35 south, range 39 east, to southeast corner of township 35 south, range 46 east, Willamette meridian.		
121	May 27, 1867	J. J. Henderson.....	Exterior and subdivisonal lines of township 1 north, range 10 east, township 1 south, ranges 18, 19, and 20 east, township 2 south, range 18 east. Exterior and subdivisonal lines of townships 1 and 2 north, range 25 east, township 1 south, range 27 east, township 2 south, ranges 20, 21, 22, and 23 east, township 3 south, ranges 21, 22, 23, 24, and 25 east.		Deputy now in the field.
122	June 10, 1867	D. P. Thompson, B. J. Pengra.			Deputy now in the field.



## B.—Statement of original plats of public surveys, copies transmitted to the General and local land offices, since June 30, 1866.

Contract.	Date.	Date of voucher.	Name of deputies.	Lines.	Townships.	Ranges.	Plats made.				Remarks.	
							Original.	Sent to Commissioner.	Sent to register.	Total.		
1113	July 2, 1866	Oct. 11, 1866	Geo. Mercer.	Standard parallel.....	Between 10 and 11 S...	Through 9, 10, and 11 W.....	1	1	.....	2	Commr.'s copies accompanied by transcript of field notes.	
1114	July 2, 1866	Jan. 19, 1867	Wm. H. Odell.	Base line.....	.....	Through 41 to 47 E.....	1	1	.....	2		
				Exteriors.....	3 N.....	35 and 36 E.....	}	1	1	.....		2
				do.....	4 N.....	34, 35, 36, and 37 E.....		3	3	3		9
				Subdivisions.....	3 N.....	34, 35, and 37 E.....	5	5	5	15		
				do.....	4 N.....	31, 34, 35, 36, and 37 E.....	1	1	.....	2		
1115	July 23, 1866	Dec. 31, 1866	Thompson, Pengra, & Meldrum.	Standard parallel.....	Between 35 and 36 S...	Through 9 to 14 E.....	}	1	1	.....	2	
				Exteriors.....	29 and 30 S.....	8 E.....		1	1	.....	2	
				do.....	35 S.....	9, 10, 11, 12, 13, and 14.....		2	2	.....	6	
				do.....	36 S.....	10, 11, 12, 13, 14, and 15 E.....		6	6	6	18	
				Subdivisions.....	37 S.....	14 and 15 E.....		5	5	5	15	
				do.....	29 and 30 S.....	8 E.....		2	2	.....	6	
				do.....	35 S.....	9, 10, 11, 12, 13, and 14 E.....	6	6	6	18		
				do.....	36 S.....	10, 11, 12, 13, and 14 E.....	5	5	5	15		
				do.....	37 S.....	14 and 15 E.....	2	2	.....	6		
Total plats made.....										79		

C.—*Statement showing the number of townships surveyed since June 30, 1866, with the area of public land contained therein.*

Number.	Description.		Area in acres.	Remarks.
	Township.	Range.		
1	4 north....	31 east .	22, 943. 64	Surveyed by William H. Odell; contract 114.
2	3 north....	34 east .	6, 081. 30	
3	4 north....	34 east .	22, 557. 26	
4	3 north....	35 east .	4, 794. 39	
5	4 north....	35 east .	22, 306. 23	
6	4 north....	36 east .	22, 348. 02	
7	3 north....	37 east .	960. 84	
8	4 north....	37 east .	4, 170. 58	
9	29 south....	8 east .	7, 678. 62	Surveyed by Thompson Pengra, and Meldrum, under contract 115.
10	30 south....	8 east .	13, 933. 37	
11	35 south....	9 east .	11, 393. 03	
12	35 south....	10 east .	17, 303. 94	
13	35 south....	11 east .	23, 014. 33	
14	35 south....	12 east .	19, 221. 12	
15	35 south....	13 east .	22, 389. 11	
16	35 south....	14 east .	22, 989. 77	
17	36 south....	10 east .	23, 043. 60	
18	36 south....	11 east .	20, 912. 01	
19	36 south....	12 east .	23, 119. 48	
20	36 south....	13 east .	20, 487. 01	
21	36 south....	14 east .	22, 981. 60	
22	36 south....	15 east .	16, 639. 20	
23	37 south....	14 east .	23, 047. 93	
24	37 south....	15 east .	21, 134. 06	
Total acres .		.....	405, 450. 44	

D.—*Statement of amount of salaries paid the surveyor general and clerks for the fiscal year ending June 30, 1867.*

Name.	Occupation.	Nativity.	Time of service.	Amount paid.
Elisha L. Applegate..	Surveyor general .	Missouri ...	Entire year .....	\$2, 500 00
Joel Ware.....	Chief clerk.....	Ohio.....	Entire year .....	1, 600 00
John T. Bloomfield....	Draughtsman.....	Indiana.....	Entire year .....	1, 400 00
A. A. Skinner .....	Transcribing clerk.	Ohio .....	3 months 15 days..	350 00
J. J. Henderson .....	Transcribing clerk.	Missouri...	4 months 16 days..	453 26
William H. Haley....	Transcribing clerk.	Kentucky..	7 months 16 days..	753 26
Total.....	.....	.....	.....	7, 056 52

*E.—Statement of the incidental expenses of the surveyor general's office for the year ending June 30, 1867.*

Date of voucher.	For what expended.	Amount.
1866.		
August 15	Printing blanks--instructions to deputies .....	\$20 00
September 30	Rent of office, 3d quarter, 1866 .....	75 00
September 30	Messenger, 3d quarter, 1866 .....	150 00
October 6	Fire-wood .....	60 00
November 15	Postage. ....	10 63
November 15	Tin map cases .....	12 00
December 31	Rent of office, 4th quarter, 1866 .....	75 00
December 31	Messenger, fractional 4th quarter, 1866 .....	119 02
1867.		
March 31	Rent of office, 1st quarter, 1867 .....	75 00
March 31	Messenger, 1st quarter, 1867 .....	150 00
March 31	Office table .....	17 00
June 30	Rent of office, 2d quarter, 1867 .....	75 00
June 30	Messenger, 2d quarter, 1867 .....	150 00
June 30	Stationery—bill of A. V. Peters & Co. ....	243 33
June 30	Printing blank vouchers .....	20 00
June 30	Tin map cases .....	5 00
June 30	Postage and box rent .....	9 00
	Total incidental expenses .....	1,266 03

*F.—Estimate for surveying and office expenses for the fiscal year ending June 30, 1869.*

OFFICE EXPENSES.

For compensation of surveyor general .....	\$2,500	
chief clerk .....	1,600	
draughtsman .....	1,400	
two clerks, at \$1,200 .....	2,400	
For office rent, pay of messenger, and incidentals .....	2,000	
		\$9,900

SURVEYING SERVICE.

For surveying 90 miles guide meridian, at \$15 .....	1,350	
300 miles standard parallel, at \$15 .....	4,500	
800 miles exteriors, at \$12 .....	9,600	
4,000 miles subdivisions, at \$10 .....	40,000	
		55,450
Total estimate .....		65,350

No. 18 K.

SURVEYOR GENERAL'S OFFICE, OLYMPIA,  
Washington Territory, July 12, 1867.

SIR: I have the honor to submit the following report, in duplicate, of the progress of the public surveys in this district since my last annual report:

Nothing new having been developed in this surveying district, since my last annual report, affecting its resources, either agricultural, mineral, manufacturing, or commercial, I beg to refer to that document rather than to re-write the same matter in substance, although in different words. In regard also to the work in contemplation for the ensuing fiscal year, I beg to refer to my last annual report, and respectfully repeat the recommendations therein contained.



Herewith I forward the usual statements of the business pertaining to this surveying district to accompany the report, as follows, to wit:

A.—Statement showing the condition of contracts not closed at the date of my last annual report.

B.—Statement showing the amount, character, and condition of the public surveys contracted for since the date of my last annual report.

C.—Statement showing the original plats made and copies transmitted to the General Land Office, and to the district offices, since the date of the last annual report.

D.—Statement showing the number of acres of land surveyed in Washington Territory from June 30, 1866, to June 30, 1867.

E.—Estimate of expenses incident to the survey of the public lands in the Territory of Washington, for the fiscal year ending June 30, 1869.

*A.—Statement showing the condition of contracts which were not closed at the date of the last annual report.*

Contract.		Name of deputy.	Work embraced in contract.	Remarks.
No.	Date.			
72	May 5, 1863	D. G. Major .....	Exteriors of subdivisions of fractional townships Nos. 6 north, ranges 32, 33, 34, 35, 36, and 37 east.	Closed. Plats all transmitted to department and local land office, except 32, reserved under instructions.
84	June 1, 1866	E. Richardson .....	Subdivisions of townships 8 and 9 north, range 30 east; 9 and 10 north, range 22 east; 8 north, range 31 east; 28 north, range 6 east; exteriors of townships 28 north, range 6 east; 8 north, range 30 east; 6 and 7 north, range 30 east.	Closed. Plats, &c., transmitted to General Land Office and local land offices.
85	June 23, 1866	H. J. Stevenson ...	Exteriors of townships 14, 15, and 16 north, ranges 19, 20, and 21 east; fourth standard parallel, 72 miles.	Contract abandoned.
86	June 23, 1866	L. P. Beach .....	Exteriors of township No. 17 north, ranges 19 and 20 east; subdivisions of townships Nos. 14, 15, and 16 north, ranges 19 and 20 east.	Time extended and deputy now in the field.

*B.—Statement showing the amount, character, and condition of the public surveys contracted for since the date of the last annual report.*

Contract.		Name of deputy.	Surveys embraced in contract.	Estimated number of miles.	Rate per mile.	Am't of contract.	Remarks.
No.	Date.						
87	Aug. 20, 1866	H. N. Stearns.....	Exteriors of townships 33 and 34 north, 3 east.	25	\$12	\$1,300	Closed. Plats, &c., transmitted to the Gen. Land Office.
88	Sept. 24, 1866	Jesse Richardson...	Subdivisions of townships 33 and 34 north, 3 east.	100	10		
			3d standard parallel.....	12	15	3,948	Deputy now in field.
			Exteriors of townships 12 north, ranges 16, 17, 18 east; 12 north, 28, 29, 30 east; 11 north, 28, 29, 30 east; 9 north, 23, 24 east.	114	12	.....	
			Subdivisions of townships 6 and 7 north, range 30 east; 9 north, 23, 24 east.	240	10	.....	
89	Sept. 22, 1866	J. V. & E. M. Meeker.	Subdivisions of townships 20 and 21 north, range 3 east.	40	10	400	Closed. Plats trans'd to the G. L. Office.

## B.—Statement showing the amount, character, &amp;c.—Continued.

Contract.		Name of deputy.	Surveys embraced in contract.	Estimated number of miles.	Rate per mile.	Am't of contract.	Remarks.
No.	Date.						
90	Dec. 27, 1866	Ed. Giddings. ....	Exteriors of townships 14, 15, and 16 north, ranges 19, 20, and 21 east; 18 north, 19, 20 east; 5 north, 24, 25, 26, 27 east; 5 and 6 north, 28, 29 east; 4 north, 20, 21, 22, 23, 24 east; 14 north, 18 east. Subdivisions of townships 4 north, range 21, 22, 23, 24 east; 5 and 6 north, 28, 29 east.	344	\$12	\$5, 848	Deputy now in field.
91	Jan. 2, 1867	Edwin Richardson .	4th standard parallel. .... Subdivisions of townships 14 north, range 18 east; 17 north, 18, 19, 20 east; 18 north, 17, 18, 19, 20 east.	72 480	15 10	5, 880	Deputy now in field
92	Jan. 5, 1867	J. V. & E. M. Meeker .	Subdivisions of township 22 north, range 5 east.	60	10	600	Closed. Plats trans'd to the G. L. Office.
93	Feb. 13, 1867	Alfred H. Simmons .	Exteriors of townships 13, 14, 15, 16 north, ranges 24, 25, 26, 27 east; 13 north, 28 east.	200	12	2, 400	Deputy now in field.
94	May 4, 1867	Albert J. Treadway	Exteriors of townships 13, 14, 15, 16 north, ranges 22, 23 east. Subdivisions of townships 13, 14 north, range 27 east; 13 north, 28 east.	60 180	12 10	2, 520	Deputy now in field.
	*Nov. 20, 1866	E. Richardson. ....	Exteriors and subdivisions of township 23 north, range 8 east.	16	....	162	Closed. Plats transmitted to General Land Office.
	*Jan. 14, 1867	A. J. Tredway ....	Section 26, township 16 north, range 4 west.	2	10	20	Closed. Diagram tr'd to the G. L. Office.
	*Feb. 22, 1867	E. Richardson. ....	To verify work of D. G. Major; establish correct range line between townships 7 north, ranges 31 and 32 east, and retrace south boundary same.	....	....	....	Closed. Plat transmitted to General Land Office and local land office.

## C.—Statement showing original plats made, and copies transmitted to the General Land Office and to the district offices, since the date of the last annual report.

Description of plats.	Original.	General Land Office.	District office.	Total.	When transmitted.
Township No. 28 N., R. 6 E., ex. and sub. ....	1	1	1	3	Sept. 22, 1866.
Townships No. 6 and 7 N., R. 30 E., ex. ....	1	1	....	2	Oct. 30, 1866.
Township No. 8 N., R. 31 E., sub. ....	1	1	1	3	Nov. 2, 1866.
Township No. 8 N., R. 30 E., ex. and sub. ....	1	1	1	3	Nov. 2, 1866.
Township No. 9 N., R. 30 E., sub. ....	1	1	1	3	Dec. 1, 1866.
Township No. 9 N., R. 22 E., sub. ....	1	1	1	3	Dec. 1, 1866.
Township No. 10 N., R. 22 E., sub. ....	1	1	1	3	Dec. 1, 1866.
Township No. 23 N., R. 8 E., ex. and sub. ....	1	1	1	3	Jan. 11, 1867.
Township No. 9 N., R. 23 E., ex. and sub. ....	1	1	....	2	Jan. 11, 1867.
Third standard parallel through R. 17 E. ....	1	1	....	2	Jan. 11, 1867.
Township No. 33 N., R. 3 E., ex. and sub. ....	1	1	1	3	Mar. 2, 1867.
Township No. 34 N., R. 3 E., ex. and sub. ....	1	1	1	3	Mar. 2, 1867.
Township No. 9 N., R. 23 E., sub. ....	1	1	1	3	May 11, 1867.

\* Special instructions.

## C.—Statement showing original plats made, &amp;c.—Continued.

Description of plats.	Original.	General Land Office.	District office.	Total.	When transmitted.
Township No. 9 N., R. 24 E., ex. and sub.	1	1	1	3	Jan. 11, 1867.
Township No. 6 N., R. 30 E., sub.	1	1	1	3	May 21, 1867.
Township No. 7 N., R. 30 E., sub.	1	1	1	3	May 21, 1867.
Township No. 20 N., R. 3 E., sub.	1	1	1	3	Feb. 12, 1867.
Township No. 21 N., R. 3 E., sub.	1	1	1	3	Feb. 12, 1867.
Township No. 6 N., R. 32 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 6 N., R. 33 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 6 N., R. 34 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 6 N., R. 35 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 6 N., R. 36 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 6 N., R. 37 E., ex. and sub.	1	1	1	3	Jan. 30, 1867.
Township No. 5 N., R. 28 E., ex. and sub.	1	1	1	3	May 31, 1867.
Township No. 5 N., R. 29 E., ex. and sub.	1	1	1	3	May 31, 1867.
Township No. 6 N., R. 28 E., ex. and sub.	1	1	1	3	May 31, 1867.
Township No. 6 N., R. 29 E., ex. and sub.	1	1	1	3	May 31, 1867.
Section 26, township 16 N., R. 4 W., sec line	1	1	1	3	Apr. 12, 1867.
Township No. 7 N., ranges 31 and 32 E., ex.	1	1	.....	2	July 3, 1867.
Territorial maps	1	2	.....	3	June 26, 1867.
Total	31	32	26	89	

## D.—Statement showing list of lands surveyed in Washington Territory since June 30, 1866, and up to June 30, 1867.

No. surveyed.	Designation of townships.	Public lands.	Donation claims.	Military reservations.	Indian reservations.	Add error in computation.	Total.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
1	Township 28 north, range 6 east.	22,611.43	.....	.....	.....	.....	.....
2	Township 8 north, range 30 east.	19,849.28	.....	.....	.....	.....	.....
3	Township 8 north, range 31 east.	21,631.23	.....	.....	.....	.....	.....
4	Township 9 north, range 22 east.	12,602.06	.....	.....	.....	.....	.....
5	Township 9 north, range 30 east.	22,062.60	.....	.....	.....	.....	.....
6	Township 10 north, range 22 east.	23,134.58	.....	.....	.....	.....	.....
7	Township 23 north, range 8 east.	4,730.86	.....	.....	.....	.....	.....
8	Township 33 north, range 3 east.	8,660.94	.....	.....	.....	.....	.....
9	Township 34 north, range 3 east.	5,318.59	.....	.....	.....	.....	.....
10	Township 9 north, range 23 east.	22,731.49	.....	.....	.....	.....	.....
11	Township 9 north, range 24 east.	23,077.49	.....	.....	.....	.....	.....
12	Township 6 north, range 30 east.	18,184.18	.....	.....	.....	.....	.....
13	Township 7 north, range 30 east.	18,210.66	.....	.....	.....	.....	.....
14	Township 20 north, range 3 east.	15,467.21	.....	.....	.....	.....	.....
15	Township 21 north, range 3 east.	1,491.82	.....	.....	.....	.....	.....
16	Township 6 north, range 32 east.	9,682.00	.....	.....	.....	.....	.....
17	Township 6 north, range 33 east.	9,217.38	.....	.....	.....	.....	.....
18	Township 6 north, range 34 east.	8,981.14	.....	.....	.....	.....	.....
19	Township 6 north, range 35 east.	8,923.79	.....	.....	.....	.....	.....
20	Township 6 north, range 36 east.	9,019.56	.....	.....	.....	.....	.....
21	Township 6 north, range 37 east.	9,019.39	.....	.....	.....	.....	.....
22	Township 5 north, range 28 east.	3,690.60	.....	.....	.....	.....	.....
23	Township 5 north, range 29 east.	4,763.04	.....	.....	.....	.....	.....
24	Township 6 north, range 28 east.	22,984.81	.....	.....	.....	.....	.....
25	Township 6 north, range 29 east.	23,140.17	.....	.....	.....	.....	.....
26	Section 26, township 16 north, range 4 west.	640.00	.....	.....	.....	.....	.....
	Total	350,026.30	.....	.....	.....	.....	.....



## E.

*Estimate of expenses incident to the survey of the public lands in Washington Territory for the fiscal year ending June 30, 1869.*

For salary of surveyor general .....	\$2,500 00
For salary of chief clerk .....	1,800 00
For salary of draughtsman .....	1,500 00
For salary of assistant draughtsman .....	1,400 00
For salary of clerk .....	1,200 00
For rent of office, wages of messenger, fuel, books, stationery, and other incidentals .....	2,000 00
For 216 miles meridian and standard parallel lines, at \$15 .....	3,240 00
For 500 miles township exterior lines, at \$12 .....	6,000 00
For 2,500 miles township section lines, at \$10 .....	25,000 00
	<hr/>
	44,640 00
	<hr/>

The estimate for 216 miles meridian and standard parallel lines includes 90 miles of guide meridian through the Colville valley, and the sixth standard parallel 54 miles east from the Columbia guide meridian.

The 7th standard parallel, 12 miles E. and 12 miles W., through new guide meridian, (24m.)

The 8th standard parallel, 12 miles E. and 12 miles W., through new guide meridian, (24 m.)

The 9th standard parallel 12 miles E. and 12 miles W., through new guide meridian, (24 m.)

The estimates for 500 miles exterior lines and 2,500 miles of section and meander lines include 16 townships in the Colville valley, 10 townships on the Columbia river, in the vicinity of and below Priest's rapids, 6 townships on the Upper Yakama, and 4 townships on Puget sound.

The extension of the sixth standard parallel 54 miles east from the Columbia guide meridian, and the projection therefrom of a guide meridian, to run north through the Colville valley, is deemed preferable to the extension of the Columbia guide meridian north through an uninhabited and almost uninhabitable country, remote from the settlements, intended to be accommodated by the proposed surveys at Colville.

Very respectfully,

S. GARFIELD,

*Surveyor General Washington Territory.*

Hon. JOSEPH S. WILSON,

*Commissioner General Land Office.*

No. 18 L.

SURVEYOR GENERAL'S OFFICE,

*Helena, Montana Territory, October 26, 1867.*

SIR : I have the honor to submit the following report of the surveys of Montana, together with the result of my observations and inquiries as to the agricultural and mineral portions of this Territory, agreeably to your instructions of May 9, 1867.

In July last I proceeded to examine Beaver Head Rock, the point suggested by you as a suitable one for the initial point of the surveys. I took with me Professor B. F. Marsh, whom I have known for years as a scientific and skilful civil engineer, and Major W. W. De Lacy, who is a practical surveyor and engineer, thoroughly conversant with the topography of this country.

Having superior instruments for the purpose, we were enabled to make accurate observations.

North from Beaver Head Rock a meridian would pass, in a short distance, over the cañon of the Big Hole river, and thence, in a very few miles, over a number of very deep gulches, with precipitous sides, finally culminating about fifteen miles distant in the main range of the Rocky mountains, whose sides are broken by deep and almost impassable ravines ; thence the line would continue, for about one hundred miles, over mountains wholly impracticable.

South from Beaver Head Rock, for about ten miles, the land is rolling, unfit for any purpose except grazing; thence south the line would ascend a mass of rugged mountains and continue thereon beyond the limits of the Territory.

On the west, a base line, for twelve miles, would run over land rolling, sometimes broken, thence ascending the dividing range between the Big Hole and Beaver Head, and crossing westward over some of the highest and most rugged mountains in the Territory.

East, the line would pass over two ranges of mountains before reaching the Madison Ford, a distance of about thirty-five miles; thence over a succession of mountain ranges separating the Gallatin and Yellowstone rivers and their tributaries, and therefore wholly impracticable.

The point selected, after a thorough reconnoissance and many trials, is on the summit of a limestone hill about 800 feet high, about twelve miles southwest of the junction of the three forks of the Missouri river. Willow creek flows at its base on the east, and the hill projects boldly northward into the valley of Jefferson Fork. It is a prominent landmark for miles around, and the base and meridian lines from it will run through the principal valleys east of the mountains, where the public surveys are required to be extended as soon as possible.

The base line east crosses the Gallatin valley, twenty five miles wide, and can be extended into the valley of the Yellowstone through the Boseman Pass.

West from the initial point the line passes through the valley of Jefferson Fork, thirty-four miles, to the base of the main range of mountains; thence it would cross them at a feasible point and at the heads of the Deer Lodge and Bitter Root valleys on the Pacific slope.

South, the principal meridian runs through a rich mineral region, enters the Madison valley at the head of a cañon twenty-three miles distant, thence up this valley to the territorial line.

North, the meridian line accommodates the Missouri valley and its tributaries, facilitating the connection of the surveys of the farming lands and the mineral region in the vicinity of Helena with the principal lines. In fact, the base and meridian lines are so located that the survey of the agricultural and mineral lands east of the Rocky mountains can be made with immediate reference to these lines, and by extending the base line west, the most important valleys and mines will be connected with this system of surveys; advantages which can be secured by no other lines. In view of these facts, developed by careful observation and exploration of the country, I have deemed it best to locate the principal lines as stated. The surveys since made demonstrate the fitness of the choice, which may be further seen by reference to the accompanying map, and I trust it will secure your approval.

With the appropriation of \$25,000 for surveying the public lands of Montana, 166 miles of base and principal meridian lines have been run, at a cost of \$2,490. These surveys, together with those now under contract and in progress, are exhibited in statement marked A, hereto appended.

No salaries were paid for the fiscal year ending June 30, 1867, except that of surveyor general, which was \$516 67. This is shown in statement marked B.

A map, accompanying this report, has been prepared, as requested in your communication of July 27, 1867. This map has been drawn by W. W. De Lacy, draughtsman, and it is due him to say that, for the purpose of publishing a map, he has been engaged for five years in surveys and explorations, often at great hazard, the result of which, together with all the information he has obtained, is placed for the use of the department. I deem this valuable and worthy of mention.

The statement marked C contains the estimate for surveying and office expenses for the fiscal year ending June 30, 1869, which amounts to \$119,600. In making this estimate I have been governed by what are unquestionably the wants of the people, as ascertained by my personal observation, the general

desire of the settlers for surveys in all the principal valleys, and the actual extension of the settlements.

The salary of surveyor general, \$3,000 per year, I find wholly insufficient for my personal expenses, owing to the discounts of twenty-five per cent. on currency, high price of living, &c. Experience has proven that the amount now fixed by law is absorbed in six months. I earnestly request that it be increased to \$6,000.

The estimates of salaries for clerks, draughtsmen, &c., I have made, from what has been my experience in employing competent persons, and the money already expended privately in securing their services. Prices of all kinds of labor are extremely high, and especially do I find it difficult to obtain such as I would employ, at the salaries named in your instructions. I respectfully ask that the appropriations named be made.

Competent deputies cannot be procured to extend the principal lines over the rugged hills and mountains for the prices named in your instructions. The base and meridian lines, now surveyed, run for many miles over these mountains, and Deputy Marsh, who is an experienced and skilful surveyor, has completed his contract at a loss of over \$1,000, which he will make the subject of a special communication. I therefore respectfully ask that the price for surveying the base, meridian, and standard lines over the mountains and broken foot-hills be increased to \$20 per mile, and if a survey of the timber lands is ordered, the price for exterior township lines be increased to \$15 per mile, and subdivision lines to \$12 per mile.

The price for surveying lodes and mining claims (\$10 per day) is wholly inadequate to pay surveyors for their time. It will be with great difficulty that competent men can be procured at present prices. I beg leave to recommend that this per diem be raised to at least \$25.

#### AGRICULTURE.

I have made diligent inquiries as to the resources of Montana, now being developed in those portions which demand earliest attention. I find the land in the valleys, suitable for cultivation, to be first-rate and unusually fertile, almost every variety of the cereals yielding abundantly. A mountain stream of good size generally courses rapidly through the valley, increasing in volume from many springs and clear sparkling brooks from the adjacent hills and mountains. A sufficient supply of water for irrigation is generally afforded, and the table lands, situated below the sources of the streams, can be watered with facility, thus adding a large percentage of fertile lands, which, until recently, were supposed to be confined to the bottoms alone. The soil of these table lands is of fine quality, and it has been ascertained that the crops in such localities are more certain and quite as abundant as those produced on the low lands of the valleys. I believe fully one-third of the entire area of the Territory is susceptible of profitable cultivation.

The more important valleys, requiring immediate survey, are the Bitter Root, Deer Lodge, Hell Gate, Round, Big Hole, Beaver Head, Stinking Water, Jefferson, Madison, Gallatin, Boulder, Prickly Pear, including Helena and the Missouri, from the Three Forks to Cañon Ferry, east of Helena, in all of which there are settlements.

The arable lands in these valleys, from a careful estimate, amount to 9,000 square miles, and contracts will be let as soon as possible to experienced deputies for the survey of portions amounting to the present appropriation. Natural roads lead from the different valleys to the cities, towns, and mining camps, many of which are equalled only by the best improved roads in the State.

A ready home market is found for the produce of the ranches and dairies, and the supply of the different kinds of grain is, no doubt, sufficient for the



wants of the population, until another crop is produced. Potatoes are selling at two cents per pound, and, together with other root crops, are in great abundance. The yield of potatoes has been so great that I believe fully one million bushels could be exported, and still leave enough for home consumption.

The wheat raised in Gallatin valley is carefully estimated at 8,000 acres; and other small grains, such as oats, barley, rye, &c., are placed at 6,000 acres. From that already threshed, the yield will be at least an average of thirty bushels to the acre, making, as a low calculation of all the grain in that valley, 420,000 bushels. Several of the other valleys have large crops this season, but I have no data of them.

Through the kindness of J. H. Ming, esq., territorial auditor, I have been furnished with a partial list of the returns received at his office up to this time. The list shows 166,140 acres of land under cultivation, and the total valuation of property assessed \$5,708,118. Although the returns are not full, some idea can be had of the immense resources of Montana.

There are a number of flouring mills in the agricultural portions of the country, all doing a good business. There are three large ones in the Gallatin valley, and more are being erected in other places. From this time no profitable shipments of flour can be expected into Montana.

#### GRAZING LANDS.

The grazing lands are of great extent, and of the best quality; there can be none finer in the world. The most nutritious grasses cover all the valleys, hills, and mountains, except on the very highest ranges. Cattle and stock of all kinds can be kept in good condition all winter on these lands, generally without even hay.

Beeves are taken from among the different herds at all seasons of the year, and found to be the fattest and sweetest, making delicious food. The nutritious grasses make them more tender and of a finer quality than the grain-fed stock of the States. Many large herds of cattle are now being grazed in the Territory, their number being estimated at 40,000. There are also numerous bands of horses and mules herded throughout the country, which, together with the oxen, are largely used for the transportation of goods between the different commercial points.

#### POPULATION.

The population is not definitely known. The vote at the recent election was near 12,000. On account of the fewness of precincts, a full vote was not polled. I may be safe in estimating the entire number of people at 40,000, and it is confidently believed that it will reach 60,000 in 1868, should there be no Indian troubles along the overland routes.

#### IMMIGRATION.

Owing to the Indian troubles on the plains this season, the great thoroughfares to this Territory were partially cut off, except the Missouri river, which was the only route free from molestation. Many availed themselves of this route, and a large number of boats landed at Fort Benton, loaded with freight and many passengers. The overland coach carried quite a number of immigrants through, but the dangers were so great that but few emigrant trains would encounter them. The northern overland route from Minnesota has been traversed with interruptions by the Indians in some cases, and the mails are sometimes obstructed. The class of citizens who are generally coming into the Territory are those who intend making their homes here. Hence many families are coming and settling up the different valleys. The farming population is fast increasing, and a great number of miners find it profitable to devote their time to agriculture.

## TIMBER.

Timber is generally found on the mountains and foot-hills and along the water courses. Pine, fir, and cedar predominate. Pine differs in size, according to its locality; on the slopes of the mountains, especially on the Pacific side, it is large; on the highest points it is short and scant. Firs (the balsam and spruce) abound on the northern slopes and colder regions of the mountains, often attaining great size. Cedar is usually stunted and scrubby, growing on rocky, sterile soil, and used only for firewood. Timber for building, fencing, and fuel, as well as for mining purposes, is found in abundance to supply the wants of the settlers, and there is but little land that may be said to be without these necessary materials close at hand.

Numerous saw-mills are running constantly, to supply the demand for lumber, which sells readily at from \$30 to \$50 per thousand feet.

Thoughtless and malicious persons frequently set fire to the timber, and during the past two years the destruction has been very great. I therefore respectfully and earnestly recommend that the timber lands adjacent to the valleys and mines be surveyed as soon as practicable, to insure their protection, as they will be readily purchased by the settlers, and measures taken for their preservation.

## BUILDING MATERIALS.

Building-stone of granite, limestone, and slate is found in all portions of the country, together with the materials for brick, slate for roofing, &c. Superior fire clay has also recently been discovered in great abundance, the want of which has been felt heretofore in building furnaces. Many fire-proof business buildings have been erected in Virginia City, Helena, and Sterling.

## MOUNTAIN PASSES.

There are several passes over the mountains, some of which are doubtless feasible for the construction of railroads. The lowest of those now known are the Deer Lodge and Mullan's passes, requiring no tunnels, the former 5,000 feet and the latter 6,000 feet above the level of the sea.

## HOT SPRINGS.

These are numerous in the Territory. There is one near Helena which is quite a place of resort; another in the Deer Lodge valley, first visited and discovered by Lieutenant Mullan. These hot springs are found in almost every valley and along the large rivers. The greatest number is on the head-waters of the Madison river, on the southeast branch, on or near the confines of the Territory. This stream, on account of the great number of hot springs, was called the "Fire Hole" river. On one branch there are several hundred springs, some of which are geysers or spouting springs. These springs are of a very high temperature, some of them probably adapted to medicinal purposes. On the head of the Stinking Water is a large spring of sulphuretted hydrogen, from which that stream derives its name.

## COAL

Has been found on the Big Hole river, about sixty miles from Bannock City; in Jackass gulch, on the east side of the Madison river; and at Summit district, near Virginia City. These are all bituminous, and the seams do not exceed three or four feet in width, as far as known. Coal also exists on the head of the Yellowstone river. Brown coal, or lignite, is found in great quantities on the banks of the Missouri and Yellowstone rivers, valuable as common fuel, but of no great value for manufacturing purposes. It is also found on the head-waters of the Teton and Marias rivers, branches of the Missouri.

## IRON.

A deposit of iron ore has been discovered on Jackass creek, a tributary of the Madison river, but its extent is unknown. It is supposed to be valuable.

## COPPER.

There is a group of copper leads along the Muscleshell river, believed to be valuable. The lodes generally run east and west, and assayers have detected gold, in small quantities, in specimens examined. The width of vein is from three to four feet. As yet no arrangements have been made for working these mines, nor have any shipments of ore been made to any place for that purpose, so far as known. Some recent discoveries of placer copper have been made on Beaver creek, near Jefferson City, which show some splendid specimens. But freights are so high that nothing can be made at copper mining until the rates are reduced.

## SILVER MINES.

The first discovery of silver mines in the Territory was made by Professor Eaton, of New York, on Rattlesnake creek, opposite the town of Argenta. The mineral was argentiferous galena. About the same time silver was discovered on the head of Prickly Pear creek, above Beavertown. Subsequently lodes containing both gold and silver were discovered at and near Virginia City, in the Madison range of mountains, on the Jefferson, Prickly Pear, Ten Mile, and Boulder creeks, and also in the vicinity of Helena. The most recent discovery is on Flint creek, a branch of Hell Gate river. On the head of this stream a district has been found abounding in silver lodes, the assays of which have been of astonishing richness. Great activity is exhibited there at present in prospecting, developing the lodes and building mills and furnaces. Many furnaces are being put up in different parts of the Territory. The best results obtained have been at Argenta, where, under the superintendence of gentlemen of skill and experience, the smelting works have been very successful, and several shipments of silver have been made this season.

## PLACER MINES.

The first placer mines worked in this Territory were found on the Hell Gate river in 1862. In the fall the mines at Bannock were discovered. In May, 1863, the mines on Alder gulch, where Virginia City now stands, were discovered and an immense impetus given to prospecting, and about \$20,000,000 have been taken from there since that time. About a year afterwards mines were discovered on Prickly Pear, where Helena now stands.

Valuable mines were discovered on the eastern side of the Missouri, and immense sums have been taken from Confederate gulch and Montana bar. Diggings were struck on the Big Blackfoot in 1865, which have produced largely.

All the gulches are on the head-waters of the Missouri, Columbia, and Yellowstone rivers, and are generally contained within the parallels of  $45^{\circ}$  and  $47^{\circ} 30'$  and the meridians  $110^{\circ}$  and  $114^{\circ}$  west longitude. The number amounts to hundreds, and almost every day increases it.

At the present time there is great excitement in the western portion of the Territory about mines said to exist on the Big Bend of the Kootenay, which are probably within the limits of the Territory.

Gulch mining is attended with many difficulties in this country. The season is short, and the gold generally found on the bed rock, often fifty or sixty feet from the surface. When provisions and labor become cheaper many gulches will be worked that at present are untouched. They are known to contain gold, but prices at present are too high to yield a profit on them.



Large amounts of money have been expended, this season, in ditches and preparations for gulch mining next year, and fully fifty per cent. more gold will be taken out than has been the present season. I estimate this year's work at \$20,000,000. To conclude, not a tenth part of the Territory has been prospected.

#### GOLD-BEARING LODES.

The first gold-bearing lode of this Territory was discovered at Bannock, in 1862, and called the Dakota. The surface indications were extraordinarily good, and gave a stimulus to prospecting which resulted in the discovery of many valuable leads in that part of the country. The results from these leads proving satisfactory, several mills were erected, and are now at work upon rock taken from them. Some of the largest and finest lodes of this section have been discovered this season, and the hope is entertained that quartz mining may prove successful in this the pioneer mining camp of Montana.

Several thousand lodes have been discovered in Madison county, many of which are in the vicinity of Virginia City.

There are a large number of mills in this county, either in successful operation or in process of erection, and the results thus far have been generally satisfactory. Much capital has been embarked in mining enterprises, and the work has been prosecuted with an energy that attests the confidence of the operators and gives assurance of success. At Summit City, eight miles above Virginia City, near the head of Alder gulch, gold quartz mining is extensively carried on. The lodes are numerous and rich; several mills are in operation and others being built. From this point there is a succession of auriferous lodes to the foot of Alder gulch, a distance of ten or twelve miles. Fine ledges are also found on the west side of the Madison range, in Ramshorn, California, and Beran's gulches, while Mill creek and Wisconsin gulches afford good prospects. Some of the gold-bearing lodes of this region contain large quantities of argenterous galena.

There is a valuable quartz district between Hot Springs creek and Meadow creek, on the east side of the Madison range, and still another to the north of it, on Norwegian gulch. At the Sterling mining district, in this section, there are many valuable lodes, and five mills in operation. In some other of these places mills are at work, generally with fine success.

There are also mining districts on the waters of the Jefferson river, known as the Silver Star, Highland, and Rochester, in which lodes have been found of immense value, some of which in their present undeveloped state have sold for large sums. One, the Green Campbell, was bought by a New York company for \$80,000.

There are several districts on the Boulder, Prickly Pear, and Flint creeks and Deer Lodge river, which have shown fine indications and are being worked to a considerable extent. One lode, the Atlantic Cable, situated on Little Moose creek, a tributary of the Deer Lodge, gives extraordinary promise. Though little work has been done upon it, the sum of \$180,000 has been offered for it and refused.

The Bailey lode, in the Dead Wood district, on the head-waters of the Little Blackfoot, also deserves particular mention. Parties who have been prospecting for it for the two past years claim to have recently struck the vein or crevice, and are taking out rock of remarkable richness.

To the east of the Missouri river, near Diamond City, is a large and promising quartz region, which is attracting much attention. Two mills are already in operation, and several companies have been organized, one of them with a capital of \$1,000,000 and a working capital of \$300,000, for the purpose of developing and working some of the leading mines. Large quantities of machin-

ery, and all the necessary appliances for the successful working of the leads and extracting the precious metals, have been ordered from the east, and large results are expected next season.

The district of gold mining now receiving a considerable portion of public attention is that around Helena, a great many of the lodes being situated on the Oro Firio and Grizzly gulches, to the southwest of the city, stretching along to the northward toward Ten Mile, connecting with that district and Blue Cloud.

The Union Lode, No. 2, is situated near Grizzly gulch, in the Owyhee Park district, and is partly owned by James W. Whittutch, being considered one of the richest and best developed in the Territory. It is being worked in several places, and promises all that could be wished. Recent crushings of ore have yielded seventy-two dollars to the ton. Another, the Park lode, is also doing well, while on the neighboring gulches there are many fine lodes which only need labor and capital to make them rival anything yet found in any mining country.

On Ten Mile creek, a stream that flows from a source near the summit of the Rocky mountains, in a northeasterly direction, there is a fine lot of lodes, some of which have assayed a large percentage of gold, while there is an intermingling of silver. Careful assays prove these lodes to contain from \$25 to \$300 per ton of ore, and by the "working test" made in St. Louis, \$240 per ton has been obtained from rock taken from within seven feet of the surface. The veins are generally firm and solid within a few feet of the surface; the ledges from five to thirty feet high.

Blue Cloud, a new district, about ten miles from Helena, on Ten Mile, is opening out well. Machinery is being erected, and developments rapidly made.

In addition to the many mills, there are scattered over the different portions of the country, wherever there are any promising lodes, a large number of arastras. They are a rude mill, constructed for the purpose of working quartz, and generally driven by water-power. Most of them do well, and yield handsome wages to their owners. Some are erected for the purpose of developing mines, rather than going to the expense of bringing machinery on to the premises too early, deeming it best to prove the value of one good lode rather than own many with no knowledge of their intrinsic wealth. The owners of lodes are generally anxious to procure government patents for their claims, and already there have been several applications filed. Next season I have no doubt but a large proportion of the owners of quartz will take advantage of the mineral law to get titles to their mines.

There have been more valuable discoveries of leads this season than ever before, and capital is being carefully used in developing them. By the use of an arastra, and a small amount of money, each lead can be tested economically and sufficiently. Five hundred thousand dollars judiciously expended this season would open out enough mines to insure the success of one thousand mills next year. This seems to be the general theory on which miners are working, and can consequently offer inducements to capitalists in another season.

The leads in Montana are generally better defined than in any other mining country in the world, and the singular freaks sometimes taken by them in other regions are less frequent here. The simplicity of the ores is a theme of general remark, and although sulphurets are often found, they are taken as an indication of richness, and their appearance looked upon as a promise of ultimate success.

On the whole, the gold lodes of Montana look in every way encouraging; in every quarter the highest hopes are expressed, and all look forward to great wealth for the Territory from this source.

## MISCELLANEOUS.

The principal shipments of merchandise to this Territory are made by steam-boats via the Missouri river, from St. Louis to Fort Benton, at a cost of about eight cents per pound. From this place transportation is had by means of ox, mule and horse trains, to the towns and mining camps, at from three to five cents per pound. Fifty boats landed at Fort Benton during the last season, with freight to the amount of from one hundred to three hundred tons each, and were it not for the rapids above the mouth of the Muscleshell many boats of larger capacity would engage in this service. Hence, a wagon road built by the government from Helena to the most feasible point below those rapids would be of immense benefit to the Territory. Quite an amount of freight is also brought from California and Oregon through Washington Territory, over the mountains on pack animals. Large trains of them are arriving now, but the mode of transportation is primitive and expensive, and a wagon road is much needed in that direction. The people here are looking with great solicitude for the action of Congress on this subject.

Our productions are such as to make us self-sustaining. Butter can be had at seventy-five cents, and potatoes and other vegetables at from two to five cents per pound; flour is worth ten cents; grain, such as rye, oats, and barley, seven cents; beef and wild game fifteen to twenty-five cents per pound. In a word, all the necessities of life are in the reach of any one, and in proportion to the prices paid for labor, cheaper than in the States, offering to the industrious laborer inducements furnished by no other portion of the Union.

The climate is healthful, and with an atmosphere devoid of humidity, is admirably calculated for those afflicted with diseases of the lungs, or any manner of rheumatic affections. The purity of the water, and the entire absence of all malarious influences, also render it well adapted to the invalid suffering from any cause whatever.

But not alone in a practical view does Montana offer superior inducements to the people of the over-crowded States. Here, side by side, they find the grandest of the Creator's handiwork and the magnificent enterprises of man. Above tower the lofty peaks of the Rocky mountains, covered with a luxurious growth of evergreens and capped with everlasting snow, while below is the sturdy miner with pick and shovel extracting the precious metal that is to sustain the national credit and honor, and the valleys covered with herds of cattle, stacks of grain, and all the evidences of increasing wealth.

With such advantages, who can doubt the brilliant future of Montana Territory, and the important position she must one day take in the great sisterhood of States?

In conclusion I beg leave to present a letter from Professor G. C. Swallow, a gentleman of science and talent, who has given several months to investigations of the various resources of Montana:

"HELENA, MONTANA, *October 4, 1867.*

"MY DEAR SIR: In compliance with your request I can only give you a very general statement of my impressions of Montana as a mineral and agricultural region, as previous engagements will occupy nearly all of the five days between this and the time when your report must be completed. I have spent the last four months in as complete and careful an examination of the mining and agricultural capacities of the Territory as the time would permit. The results already obtained in cultivating the soils of our valleys are such that there can be no reasonable doubt of the entire success of agricultural pursuits in the Territory. It certainly is one of the finest stock countries on the continent. All the more important domestic animals and fowls do remarkably well; horses, mules and neat cattle are more hardy, and keep in better condition on the native



grasses than they do in the States on hay and grain. As a general rule they winter well on the grass of the valleys and foot-hills without hay or grain. The valleys furnish a large area of natural meadows, whose products are equal to those of the cultivated meadows of the middle States. Beef fattened on the native pastures is equal to the best produced in the country.

"The small grains, wheat, rye, barley, and oats, produce as large an average yield as in the most favored grain-producing States; fifty and sixty bushels to the acre are not uncommon yields for Montana. Of the native fruits we have strawberries, raspberries, blueberries, serviceberries, choke cherries, haws, currants, and gooseberries, and there is every reason to believe that apples, pears, cherries, plums, quinces, blackberries, raspberries, strawberries, currants, and gooseberries can be cultivated in our broad valleys as successfully as in any of the mother States.

"All the more important root crops, such as potatoes, rutabagas, beets, carrots, turnips, radishes, and onions, and all the more important garden vegetables, are cultivated with great success.

"Timber is abundant on the mountain slopes and in some of the valleys. Five varieties of pine, two of fir, one of spruce, two of cedar, grow on the mountains and in the mountain valleys and cañons; balsam, poplars, aspens, alders, and willows on the streams. The pines, firs, spruce, and cedars furnish an abundance of good timber for building, mining, and farming purposes.

"The purest waters abound everywhere, in cool springs, mountain streams, meadow brooks, and clear, rapid rivers. Hot and mineral springs also occur. Beautiful lakes and magnificent waterfalls and cascades are numerous in the mountains.

Veins of gold, silver, copper, lead, and iron are found in great numbers in nearly all the mountainous portions of the Territory. So far as discovered, they usually come to the surface on the foot-hills and sides of the valleys and cañons. A large portion of these lodes are *true veins*, cutting through granite, syenitic, porphyry, trap, gneiss, mica slate, hornblende slate, talcose slate, argillaceous slates, sandstone, and limestone. These veins vary in thickness from a few inches to fifty or sixty feet. The gangue or vein rock, called *quartz* by the miners here, is very variable in character. In the gold-bearing veins it is usually a whitish quartz, more or less ferruginous—often nearly all iron. In some veins it resembles a stratified quartzite; in others it is syenitic; pyrites, hornblende, calc-spar, arsenic, antimony, copper, and tellurium are found in these veins. In the silver veins the iron so abundant in the gold veins is usually replaced by oxide of manganese. This mineral is sometimes so abundant as to constitute the larger portion of the gangue. The gangue in many of the copper mines is usually quartz, heavy spar, calc-spar, and brown spar, more or less commingled.

"Many thousand lodes of gold, silver, and copper have already been discovered and recorded, and a large number of them somewhat developed. It is true, as well as in all other mining regions, that a large part of the lodes discovered cannot be worked with profit by the method usually adopted in new mining countries; but many of those which cannot now be profitably worked will become valuable when experience has shown the best methods, and when labor and materials can be had at ordinary prices. But there is a very large number of large and rich lodes, which will yield large profits even at the present prices of labor and material; and there is quite a number of lodes of both gold and silver already discovered which will rank among the largest and richest in the annals of mining.

"This, like all new mining districts, presents serious obstacles and difficulties in the way of immediate success. These are obvious to all experienced men, and are expected in all such undertakings. But all this and other hindrances to the full success of our quartz-mining operations will soon be removed. They

are evils which will naturally cure themselves. Better mills are now going into operation, better lodes are bought in larger quantities, good men are employed to manage, and owners of quartz property are offering better facilities for developing their lodes; capital is turned towards this source of wealth, and our best financiers are operating in Montana mining property.

"The placer mines, though very extensive, and in some instances vastly rich, have not yielded so much as in former years. But many new and rich discoveries have been made and large sums of money spent in conducting water to favorite localities, and we have every reason to believe that the placers will yield as many millions as in former years to those hardy toilers who have labored so faithfully and successfully in securing this 'golden harvest.'

"In conclusion, it may be stated with safety that Montana has the agricultural capacity for sustaining any population which her mines, salubrious climate, and glorious scenery may attract to her fair land. Her mines are more numerous and more diffused than any other equal area on the globe, and they will prove as rich and yield as large profits as the most productive in this or any other country.

"Very truly yours,

"G. C. SWALLOW.

"General SOL. MEREDITH."

I am, very respectfully, your obedient servant,

S. MEREDITH,  
*Surveyor General.*

Hon. JOS. S. WILSON,

*Commissioner General Land Office, Washington, D. C.*

*A.—Statement showing the condition of the surveys contracted under the appropriations of twenty-five thousand dollars.*

Contract.		Name of deputy.	Surveys embraced in contract.	Number of miles.	Rate per mile.	Amount of contract.
No.	Date.					
1	Aug. 1, 1867	B. F. Marsh...	*Base line east 30 miles, and west 34 of initial point.	64	\$15	\$960
			Principal meridian south 7 townships, and north 10 townships from the initial point.	102	15	1,530
2	Oct. 23, 1867	B. F. Marsh...	†First standard parallel north, through ranges 1, 2, and 3 east, and ranges 1, 2, and 3 west; second standard parallel north, through ranges 1, 2, and 3 east, and ranges 1, 2, 3, and 4 west.	78	15	1,170
			Exteriors of townships 1, 2, 3, 4, 5, 6, 7, and 8 north, range 1 east; exteriors of townships 9 and 10 north, ranges 1, 2, 3, and 4 west.	180	12	2,160
			Subdivisions of townships 9 and 10 north, ranges 2 and 3 west.	240	10	2,400

\* Completed; plats, &c., transmitted to General Land Office.

† Deputy now in the field.

SURVEYOR GENERAL'S OFFICE,  
*Helena, Montana, October 26, 1867.*

S. MEREDITH, *Surveyor General.*

B.—*Statement of salary for the fiscal year ending June 30, 1867.*

For the salary of surveyor general from April 28 to June 30, 1867.....	\$516 67
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SURVEYOR GENERAL'S OFFICE,  
Helena, Montana, October 26, 1867.

S. MEREDITH, *Surveyor General.*

C.—*Estimated surveying and office expenses for the fiscal year ending June 30, 1869.*

## SURVEYING SERVICE.

For the extension of the base, principal meridian, and standard parallels, 702 miles, at \$15 per mile .....	\$10,530
For exterior township lines, at \$12 per mile, and subdivisional lines, at \$10 per mile .....	89,470

## OFFICE EXPENSES.

Compensation of surveyor general.....	6,000
chief clerk.....	2,500
draughtsman .....	2,500
assistant draughtsman.....	2,000
two transcribing clerks, each \$1,800.....	3,600
For office rent, fuel, messenger, books, stationery, furniture, and other incidental expenses.....	3,000
Total .....	119,600

SURVEYOR GENERAL'S OFFICE,  
Helena, Montana, October 26, 1867.

S. MEREDITH, *Surveyor General.*



No. 19.—*Statement of confirmed Indian pueblo grants and private land claims in New Mexico.*

## PUEBLO GRANTS.

Designation.	Name.	Confirnee.	Under act of—	Area in acres.
A	Jemez.....	Indians of the Pueblo.....	Dec. 22, 1858, Statutes, v. 11, p. 374.	17,510.45
B	Acoma.....	do.....	do.....	Not surveyed.
C	San Juan.....	do.....	do.....	17,544.77
D	Picuris.....	do.....	do.....	17,460.69
E	San Felipe.....	do.....	do.....	34,766.86
F	Pecos.....	do.....	do.....	18,763.33
G	Cochiti.....	do.....	do.....	24,256.50
H	Santo Domingo.....	do.....	do.....	74,743.11
I	Taos.....	do.....	do.....	17,360.55
K	Santa Clara.....	do.....	do.....	17,368.52
L	Tesuque.....	do.....	do.....	17,471.12
M	San Ildefonso.....	do.....	do.....	17,292.64
N	Pojoaque.....	do.....	do.....	13,520.38
O	Zia.....	do.....	do.....	17,514.63
P	Sandia.....	do.....	do.....	24,187.29
Q	Isleta.....	do.....	do.....	110,080.31
R	Nambe.....	do.....	do.....	13,586.33
	Laguna*.....	do.....	June 21, 1860	Not surveyed.

\* Confirmed by 3d section act of 21st June, 1860, Statutes, vol. 12, p. 71, in connection with private claim No. 30.

## PRIVATE LAND CLAIMS.

1	San Juan Bautista del Ojito del Río de las Gallinas.	Preston Beck, jr.....	June 21, 1860	318,699.72
2	Town of Tomé.....	Inhabitants of the town.....	Dec. 22, 1858	121,594.53
5*	Tierra Amarilla.....	Francisco Martinez <i>et al</i> .....	June 21, 1860	Not surveyed.
6	Town of Casa Colorado.	Inhabitants of the town.....	Dec. 22, 1858	do.....
7	Brazito.....	Legal representatives of Juan Antonio Garcia.....	June 21, 1860	do.....
8	Town of Tecolote.....	Inhabitants of the town.....	Dec. 22, 1858	21,636.83
	Las Frigos.....	Legal representatives of Francisco Trajillo, Diego Padilla, and Bartolome Marquez.	June 21, 1860	12,545.66
9	Junta de las Rios.....	John Scolly, Guillermo Smith, Gregorio Trajillo, Augustin Duran, Santiago Giddings, and Francisco Romero.	do.....	Not surveyed.
10	Nuestra Señora de la Luz	John Lamy, bishop of New Mexico.....	do.....	16,546.85
11	Town of Chillili.....	Inhabitants of the town.....	Dec. 22, 1858	38,435.14
12	Agua Negra.....	Antonio Sandoval.....	June 21, 1860	Not surveyed.
13	Town of Belen.....	Inhabitants of the town.....	Dec. 22, 1858	194,663.75
14	San Pedro.....	José Serafin Ramirez.....	June 21, 1860	35,911.63
15	.....	Charles Beaubien and Guadalupe Miranda.....	do.....	Not surveyed.
16†	.....	José Leandro Perea.....	do.....	do.....
18	Cañon de Pecos.....	Legal representatives of Juan Estevan and legal representatives of Francisco Ortiz, jr., and Juan de Aguilar.	do.....	do.....
16	Rancho of the pueblo of San Cristoval.	E. W. Eaton, assignee and legal representative of Domingo Fernandez and others.	do.....	27,854.06
20	Town of Las Vegas.....	Inhabitants of the town.....	do.....	496,446.96
†	Location number 1.....	Heirs of Luis Maria Cabeza de Baca, in lieu of "Las Vegas Grandes."	do.....	Not surveyed.
+	Location number 2.....	do.....	do.....	99,289.39
21	Town of Tajique.....	Inhabitants of the town.....	do.....	Not surveyed.
22	Town of Torreon.....	do.....	do.....	do.....
23	Town of Manzano.....	do.....	do.....	do.....
24	San Isidro.....	Legal representatives of Antonio Armenta and Salvador Sandoval.	do.....	do.....
25	Town of Cañon de San Diego.	Inhabitants of the town.....	do.....	do.....
27	Town of Las Trampas.	do.....	do.....	do.....
28	.....	Legal representatives of Sebastian Martin.....	do.....	do.....

\* The claim of Casa Colorado is numbered 29 in the act of confirmation, but in the corrected list of private claims (see letter of surveyor general of January 12, 1858) is numbered as above.

† The claim of E. W. Eaton is numbered 16 in the act of confirmation, but should have been numbered 19. It seems to have been accidentally omitted in the corrected list.

‡ The heirs of Luis Maria Cabeza de Baca, by the act of June 21, 1860, were granted, in lieu of "Las Vegas Grandes," which they claimed, the same amount of land contained in the Las Vegas town grant, to be located by them in square bodies, not exceeding five in number. The heirs of Baca have located said grant in five square bodies, viz: Nos. 1 and 2 in New Mexico, Nos. 3 and 5 in Arizona, and No. 4 in Colorado.

No. 19.—*Statement of confirmed Indian pueblo grants, &c.*—Continued.

Designation.	Name.	Confirmer.	Under act of—	Area in acres.
29	Town of Anton Chico.	Inhabitants of the town.	June 21, 1860	389,662.72
30	Rancho of Pagnate, rancho of El Rito, Gigante cañon, and rancho of San Juan and Santa Ana.	Indians of the pueblo of Laguna	.....do.....	Not surveyed.
31	.....	Legal representatives of Vicente Duran y Ar- mijo.	.....do.....	.....do.....
32	Town of Mora.	Inhabitants of the town.	.....do.....	.....do.....
33	Valverde and Fray Cristoval.	Heirs of Pedro Armendaris	.....do.....	.....do.....
34	.....	.....do.....	.....do.....	.....do.....
35	Bosque del Apache	Antonio Sandoval	.....do.....	.....do.....
36	Town of Chamito.	Inhabitants of the town.	.....do.....	.....do.....
37	Town of Tejou.	.....do.....	.....do.....	.....do.....
38	.....	Legal representatives of Pedro Sanchez.	.....do.....	.....do.....
43	Ortiz Mine.	Elisha Whittlesey, Abraham Rencher, Ferdi- nand W. Risque, Nathaniel M. Miller, Joseph F. Walker's representatives, Charles E. Sherman, and Andrew J. O'Bannon.	Mar. 1, 1861	69,458.33
70	Cañon del Agua	José Serafin Ramirez.	June 12, 1866	3,501.21

JOS. S. WILSON, *Commissioner.*DEPARTMENT OF THE INTERIOR,  
*General Land Office, October 15, 1867.*

No. 20.—*Statement showing the area of the several States and Territories con-  
each up to the 30th June, 1867, and the quantity of land which remained*

No. 1.	No. 2.		No. 3.	No. 4.	No. 5.
States and Territories containing public land.	Areas of States and Terri- tories containing public land.		Quantity sold.	Entered under the homestead law of May 20, 1862, and its supplements of 1864 and 1866.	Granted for mil- itary services.
	Sq. miles.	Acres.	Acres.	Acres.	Acres.
Ohio.....	39,964	25,576,960	12,806,249.64	5,410.12	1,817,425.99
Indiana.....	33,809	21,637,760	16,122,244.78	.....	1,311,956.65
Illinois.....	55,410	35,462,400	19,878,915.99	272.03	9,533,133.00
Missouri.....	65,350	41,824,000	22,849,196.76	625,800.03	6,796,322.89
Alabama.....	50,722	32,462,080	17,788,665.12	47,859.09	1,158,611.17
Mississippi.....	47,156	30,179,840	12,201,037.03	18,855.70	384,697.73
Louisiana.....	41,346	26,461,440	5,720,309.75	4,659.52	1,156,442.50
Michigan.....	56,451	36,128,640	12,160,834.06	968,166.59	3,328,246.78
Arkansas.....	52,198	33,406,720	8,235,659.03	53,213.84	2,258,146.92
Florida.....	59,268	37,931,520	1,832,431.49	112,192.86	464,782.04
Iowa.....	55,045	35,238,800	11,571,722.64	291,038.65	13,946,005.77
Wisconsin.....	53,924	34,511,360	9,717,660.10	624,384.84	6,053,119.40
California.....	188,981	120,947,840	734,469.18	279,523.36	455,492.00
Minnesota.....	83,531	53,459,840	2,081,523.14	2,101,231.51	5,740,039.00
Oregon.....	95,274	60,975,360	200,959.13	228,340.11	57,069.14
Kansas.....	81,318	52,043,520	236,145.52	622,477.07	4,040,805.95
Nevada.....	112,090	71,737,741	56,964.86	10,546.53	7,580.00
Nebraska.....	75,995	48,636,800	205,475.62	708,545.37	1,428,758.05
Washington.....	69,994	44,796,160	154,681.27	220,313.74	39,813.63
New Mexico.....	121,201	77,568,640	.....	.....	.....
Utah.....	88,056	56,355,635	.....	.....	.....
Dakota.....	240,597	153,982,080	8,527.97	94,587.06	20,240.00
Colorado.....	104,500	66,880,000	58,455.38	119,003.79	116,240.00
Montana.....	143,776	92,016,640	.....	.....	.....
Arizona.....	113,916	72,906,304	.....	.....	.....
Idaho.....	90,932	58,196,480	.....	.....	.....
Indian.....	68,991	44,154,240	.....	.....	.....
American purchase from Russia.....	577,390	369,529,600	.....	.....	.....
Total.....	2,867,185	1,834,998,400	154,622,128.46	7,136,511.81	60,114,928.61

Column No. 5 shows the quantity returned as actually located, and does not, of course, include the outstand  
Column No. 6 shows the quantity selected within their own limits by States containing public lands, under  
act to non-public land-holding States which had been located by the State assignees up to June 30, 1867, and  
cable to all the States.

Column No. 7 shows the quantity actually certified under grants for railroads, and not the whole quantity  
to the railroad grants by act of Congress will be equal to 184,813,994.67 acres. (See table No. 15.)

Column No. 8 shows the quantity embraced in *approved* swamp selections under the acts of 1849, 1850, and  
Column No. 9 shows the quantity granted for internal improvements, under the act of September 4, 1841,  
grants to each State for internal improvements. In the case of Ohio and Indiana, the prior grants covered  
act of 1841. In the case of Illinois, Iowa, and Wisconsin, the quantities given in this column include the  
granted to Iowa for the improvement of the Des Moines river, under the acts of 1846, and 1862, and joint reso  
act of 1846, and therefore exceed the quantity of 500,000 acres.

Column No. 10 shows the quantity granted for university purposes, and the estimated quantity granted to  
Indian territory nor American purchase from Russia being included.



*taining public lands, the quantity of land disposed of by sale or otherwise in unsold and unappropriated at that date in the several States and Territories.*

No. 6.		No. 7.	No. 8.	No. 9.	No. 10.	
Granted for agricultural colleges—act of July 2, 1862.		Approved under grants in aid of railroads.	Approved swamp selections.	Quantity granted for internal improvements.	Donations and grants for schools and universities.	
Selected in place.	Located with scrip.				Schools.	Universities.
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
			25,640.71	1,243,001.77	704,488	69,120
			1,263,653.28	1,609,861.61	650,317	46,080
		2,595,053.00	1,488,265.02	533,382.73	985,066	46,080
244,384.51	147,797.25	1,715,435.00	4,314,590.47	500,000.00	1,199,139	46,080
		2,288,138.50	2,595.51	500,000.00	902,774	46,080
		908,680.29	3,068,642.31	500,000.00	837,584	46,080
		1,072,405.45	8,430,254.73	500,000.00	786,044	46,080
225,253.88	960,807.59	2,718,413.49	5,691,518.66	500,000.00	1,067,397	46,080
		1,793,167.10	7,283,763.13	500,000.00	886,460	46,080
		1,760,468.39	10,901,007.76	500,000.00	908,503	92,160
240,000.96	1,760.00	2,770,762.26	838,418.30	1,333,079.90	905,144	46,080
240,007.73	702,425.07	1,379,545.35	3,019,461.20	1,183,728.42	958,619	92,160
		89,819.93	324,678.62	500,000.00	6,719,321	46,080
119,852.17	488,803.03	1,644,602.64	725,034.13	500,000.00	2,969,990	46,080
	1,920.00			500,000.00	3,329,705	46,080
90,000.40	411,959.70	2,908.92		500,000.00	2,891,306	46,080
				500,000.00	3,985,430	46,080
	475,989.58			500,000.00	2,702,044	46,080
	1,120.00				2,488,675	46,080
					4,309,368	46,080
					3,130,869	46,080
					8,554,560	
					3,715,555	
					5,112,035	
					4,050,356	
					3,233,137	
1,159,499.65	3,192,582.22	20,739,340.32	47,377,523.23	12,403,054.43	67,983,914	1,082,880

ing warrants and scrip not returned as located up to June 30, 1867.

the agricultural college act of July 2, 1862, and its supplements; also the quantity of scrip issued under said act, which would be 9,600,000 acres, should said act be made appli-

which will inure under the grants, it being estimated that the aggregate which will be transferred pursuant

1860, and not the quantity *selected*, the latter being in excess of the approvals. (See swamp tables Nos. 6 and 7.) and specific grants prior thereto. The act of 1841 granted 500,000 acres less the quantity embraced in prior the quantity given in column 9, exceeding 500,000 acres; and therefore those States received no land under the additional selections by Illinois for the Illinois and Michigan canal, under the acts of 1842 and 1854, the quantity lution of 1861; also the grant to Wisconsin for the improvement of the Fox and Wisconsin rivers, under the

the States and reserved in the organized Territories, respectively, for the support of schools, neither the

No. 20.—*Statement showing the area of the*

	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.
States and Territories containing public land.	Located with Indian scrip.	Located with float scrip, under act of March 17, 1862.	Estimated quantity granted for wagon roads.	Quantity granted for ship canal.	Salines.
	Acres.	Acres.	Acres.	Acres.	Acres.
Ohio.....					24,216
Indiana.....					23,040
Illinois.....					121,620
Missouri.....		80.00			46,080
Alabama.....	7,918.83				23,040
Mississippi.....	16,402.00				
Louisiana.....	78,563.24				
Michigan.....	400.00	12,896.24	1,718,613	1,250,000.00	46,080
Arkansas.....	275,972.64				46,680
Florida.....					
Iowa.....	2,200.00	80.00			46,080
Wisconsin.....	22,851.21	1,680.00	250,000	200,000.00	
California.....	25,626.39	80.00			
Minnesota.....	213,633.49	400.00			46,080
Oregon.....			1,256,800		46,080
Kansas.....	480.00				46,080
Nevada.....	15,156.99				
Nebraska.....	1,400.00	80.00			
Washington.....					
New Mexico.....					
Utah.....					
Dakota.....	8,880.00				
Colorado.....	80.00				
Montana.....					
Arizona.....					
Idaho.....					
Indian.....					
American purchase from Russia.....					
Total.....	669,564.79	15,296.24	3,235,413	1,450,000.00	514,485

Column No. 12 shows the quantity located with scrip issued under the act of March 17, 1862, (Statutes, vol. Nana grants, in Louisiana.

Column No. 15 showing the quantity granted for salines, does not include the selections by the State of Column No. 21 shows the quantity embraced in confirmed private claims, so far as returns of surveys have

DEPARTMENT OF THE INTERIOR, *General Land Office, October 15, 1867.*

\* Donations to actual settlers under the act of September 27, 1850, and supplemental acts.

*several States and Territories, &c.—Continued.*

No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Seats of government and public buildings.	Granted to individuals and companies.	Granted for deaf and dumb asylums.	Reserved for benefits of Indians.	Reserved for companies, individuals, and corporations.	Confirmed private land claims.	Remaining unsold and unappropriated June 30, 1867.
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
.....	32, 141. 24	.....	16, 330. 73	8, 805, 976. 00	26, 459. 80	500. 00
2, 560	843. 44	.....	126, 220. 71	149, 102. 00	329, 880. 00	2, 000. 00
2, 560	954. 64	.....	41, 754. 59	.....	233, 334. 00	2, 000. 00
2, 560	.....	.....	22, 587. 61	.....	1, 477, 993. 77	1, 835, 892. 71
1, 620	1, 981. 53	21, 949. 46	2, 542, 378. 82	.....	213, 386. 65	6, 915, 081. 32
1, 280	15, 965. 31	.....	16, 561, 608. 82	.....	688, 083. 25	4, 930, 893. 56
.....	8, 412. 98	.....	.....	.....	2, 075, 426. 29	6, 582, 841. 54
13, 200	4, 080. 00	.....	109, 300. 83	.....	126, 711. 25	5, 180, 640. 63
10, 600	139, 366. 25	2, 097. 43	.....	.....	118, 451. 12	11, 757, 662. 54
6, 240	52, 114. 00	20, 924. 22	227. 49	305. 75	3, 739, 789. 00	17, 540, 374. 00
3, 840	.....	.....	119, 183. 34	.....	.....	3, 113, 464. 18
6, 400	5, 705. 82	.....	.....	.....	36, 880. 99	10, 016, 700. 87
6, 400	.....	.....	.....	.....	5, 703, 954. 99	106, 062, 392. 13
6, 400	.....	.....	.....	.....	.....	36, 776, 170. 89
6, 400	*1, 519, 286. 66	.....	1, 040, 640. 00	.....	.....	52, 742, 078. 96
6, 400	.....	.....	.....	.....	.....	43, 148, 876. 44
25, 600	.....	.....	.....	.....	.....	67, 090, 382. 62
44, 800	.....	.....	.....	.....	.....	42, 523, 627. 38
.....	*218, 011. 97	.....	.....	.....	.....	41, 627, 464. 39
.....	.....	.....	208, 000. 00	.....	.....	73, 005, 192. 00
.....	.....	.....	2, 039, 040. 00	.....	.....	51, 139, 646. 00
.....	.....	.....	.....	.....	.....	145, 295, 284. 97
.....	.....	.....	.....	.....	.....	62, 870, 665. 83
.....	.....	.....	.....	.....	.....	86, 904, 605. 00
.....	.....	.....	.....	.....	.....	68, 855, 954. 00
.....	.....	.....	.....	.....	.....	54, 963, 343. 00
.....	.....	.....	.....	.....	.....	44, 154, 240. 00
.....	.....	.....	.....	.....	.....	369, 529, 600. 00
146, 860	1, 998, 863. 84	44, 971. 11	12, 827, 272. 94	8, 955, 383. 75	* 14, 770, 351. 64	1, 414, 567, 574. 96

12, page 371,) in satisfaction of claims against the United States for lands sold within the Las Ormigas and La

Nebraska under the act of April 19, 1864, (Statutes, vol. 13, page 49.)  
been received, not embracing claims confirmed and not yet reported as surveyed.

JOS. S. WILSON, *Commissioner.*

†Including Chickasaw cession.



No. 21.—*Historical and statistical table of the United States of North America.*

[NOTE.—The whole area of the United States, including water surface of lakes and rivers, is nearly equal to four million square miles, embracing the Russian purchase.]

The thirteen original States.	Area in square miles.	*Population—1860.
New Hampshire .....	9,280	326,073
Massachusetts .....	7,800	1,231,066
Rhode Island .....	1,306	174,620
Connecticut .....	4,750	460,147
New York .....	47,000	3,880,735
New Jersey .....	8,320	672,035
Pennsylvania .....	46,009	2,906,115
Delaware .....	2,120	112,216
Maryland .....	11,124	687,049
Virginia—East and West .....	61,352	1,596,318
North Carolina .....	50,704	992,622
South Carolina .....	34,000	703,768
Georgia .....	58,000	1,057,286

States admitted.	Act organizing Territory.	United States Statutes.		Act admitting State.	United States Statutes.		Area in square miles.	*Population—1860.
		Vol.	Page.		Vol.	Page.		
Kentucky .....				Feb. 4, 1791	1	189	37,680	1,155,684
Vermont .....				Feb. 18, 1791	1	191	*10,212	315,098
Tennessee .....				June 1, 1796	1	491	45,600	1,109,801
Ohio .....	Ord'n'ce of 1787			Apr. 30, 1802	2	173	39,964	2,339,562
Louisiana .....	Mar. 3, 1805	2	331	Apr. 8, 1812	2	701	*41,346	708,002
Indiana .....	May 7, 1800	2	58	Dec. 11, 1816	3	399	33,809	1,350,428
Mississippi .....	Apr. 7, 1798	1	549	Dec. 10, 1817	3	472	47,156	791,305
Illinois .....	Feb. 3, 1809	2	514	Dec. 3, 1818	3	536	*55,410	1,711,951
Alabama .....	Mar. 3, 1817	3	371	Dec. 14, 1819	3	608	50,722	964,201
Maine .....				Mar. 3, 1820	3	544	*35,000	628,279
Missouri .....	June 4, 1812	2	743	Mar. 2, 1821	3	645	*65,350	1,182,012
Arkansas .....	Mar. 2, 1819	2	493	June 15, 1836	5	50	52,198	435,450
Michigan .....	Jan. 11, 1805	2	309	Jan. 26, 1837	5	144	*56,451	749,113
Florida .....	Mar. 30, 1822	3	654	Mar. 3, 1845	5	742	59,268	140,425
Iowa .....	June 12, 1838	5	235	do .....	5	742	55,045	674,948
Texas .....				Dec. 29, 1845	9	108	*274,356	604,215
Wisconsin .....	Apr. 20, 1836	5	10	Mar. 3, 1847	9	178	53,924	775,881
California .....				Sept. 9, 1850	9	452	*188,981	305,439
Minnesota .....	Mar. 3, 1849	9	403	Feb. 26, 1857	11	166	83,531	173,855
Oregon .....	Aug. 14, 1848	9	323	Feb. 14, 1859	11	383	95,274	52,465
Kansas .....	May 30, 1854	10	277	Jan. 29, 1861	12	126	81,318	107,206
West Virginia .....				Dec. 31, 1862	12	633	23,000	.....
Nevada .....	Mar. 2, 1861	12	209	Mar. 21, 1864	13	30	†112,090	\$6,857
Colorado .....	Feb. 28, 1861	12	172	.....	13	32	*104,500	†10,507
Nebraska .....	May 30, 1854	10	277	Mar. 1, 1867	13	47	75,995	\$34,277
								†2,261
								28,841

Territories.	Acts organizing Territories.	United States Statutes.		Area in square miles.	*Population.
		Vol.	Page.		
New Mexico .....	Sept. 9, 1850	9	446	121,201	The estimated population of these Territories on January 1, 1865, as above indicated, was 360,000.
Utah .....	Sept. 9, 1850	9	453	†88,056	
Washington .....	Mar. 2, 1853	10	172	69,994	
Dakota .....	Mar. 2, 1861	12	239	240,597	
Arizona .....	Feb. 24, 1863	12	664	**113,916	
Idaho .....	Mar. 3, 1863	12	808	90,932	
Montana .....	May 26, 1864	13	85	143,776	
Indian .....				68,991	
District of Columbia .....	July 16, 1790	1	130	} 10 miles sq.	
	Mar. 3, 1791	1	214		
***Northwestern America, purchased by treaty of May 28, 1867 .....				577,390	70,000

\*The total population of the United States in 1860 was, in round numbers, 31,500,000. In 1865 it is estimated that the population was 35,500,000, including the inhabitants of the Territories, estimated at 360,000 persons on January 1, 1865. At the present time, November 1, 1867, according to the most satisfactory estimate, it is about 38,500,000. In 1870, according to existing ratios, the population of this country will be over 42,250,000.

†The area of those States marked with a star are derived from geographical authorities, the public surveys not having been completely extended over them.

‡The present area of Nevada is 112,090 square miles, enlarged by adding one degree of longitude lying between the 37th and 42d degrees of north latitude, which was detached from the west part of Utah, and also northwestern part of Arizona Territory, per act of Congress approved May 5, 1866, U. S. Laws 1865 and 1866, page 43, and as assented to by the legislature of the State of Nevada, January 18, 1867.

§ White persons.

¶ Indians.

‡ The present area of Utah is 88,056 square miles, reduced from the former area of 106,382 square miles by incorporating one degree of longitude on the west side, between the 37th and 42d degrees of north latitude, with the State of Nevada, per act of Congress approved May 5, 1866, and as accepted by the legislature of Nevada, January 18, 1867.

\*\* The present area of Arizona is 113,916 square miles, reduced from the former area of 126,141 square miles by an act of Congress, approved May 5, 1866, detaching from the northwestern part of Arizona a tract of land equal to 12,225 square miles, and adding it to the State of Nevada. U. S. Laws 1865 and 1866, page 43.

NEVADA.—Enabling act approved March 24, 1864; Statutes, volume 13, page 30. Duly admitted into the Union; President's proclamation No. 22, dated October 31, 1864; Statutes, volume 13, page 749.

COLORADO.—Enabling act approved March 21, 1863; Statutes, volume 13, page 32. Not yet admitted.

NEBRASKA.—Enabling act approved April 19, 1864; Statutes, volume 13, page 47. Duly admitted into the Union; see President's proclamation No. 9, dated March 1, 1867; U. S. Laws 1866 and 1867, page 4.

That portion of the District of Columbia south of the Potomac river was retroceded to Virginia July 9, 1846 Statutes, volume 9, page 35.

\*\*\* BOUNDARIES.—Commencing at 54° 40' north latitude, ascending Portland channel to the mountains, following their summits to the 141° west longitude; thence north on this line to the Arctic ocean, forming the eastern boundary. Starting from the Arctic ocean west, the line descends Behring's strait between the two islands of Krusenstern and Ratmanoff to the parallel of 65° 30', and proceeds due north without limitation into the same Arctic ocean. Beginning again at the same initial point on the parallel of 65° 30', thence in a course southwest through Behring's strait, between the island of St. Lawrence and Cape Choukotski, to the 172° west longitude; and thence southwesterly through Behring's sea, between the islands of Atton and Copper, to the meridian of 193° west longitude; leaving the prolonged group of the Aleutian islands in the possessions now transferred to the United States, and making the western boundary of our country the dividing line between Asia and America.

JOS. S. WILSON, *Commissioner*.

DEPARTMENT OF INTERIOR, *General Land Office*, October 15, 1867.

No. 22.—*Statement showing the area and population of the British possessions north of United States boundary line.*

Localities.	Area in sq. miles.	Population.
Labrador.....	170,000	-----
Rupert river.....	185,000	-----
* Canada East.....	200,000	1,111,566
† Canada West.....	140,000	1,396,091
Nova Scotia.....	18,725	330,857
New Brunswick.....	27,700	252,047
Prince Edward Island.....*	2,134	80,856
Newfoundland.....	36,000	120,000
Abbittbe.....	29,655	-----
Moose.....	30,345	-----
Albany.....	65,000	-----
Severn.....	32,500	-----
Rainy lake.....	29,000	-----
Red river.....	16,200	-----
Swan river.....	69,000	-----
Island.....	27,000	-----
Norway.....	17,000	-----
Cumberland.....	30,000	-----
Nelson.....	31,000	-----
York.....	26,000	-----
English river.....	70,000	-----
Lesser Slave lake.....	47,000	-----

\*The report of the commissioner of crown lands for 1856 gives the area of Canada East at 210,000 square miles, and Canada West at 121,260 square miles. The census of 1861 gives Canada East a population of 1,110,664.

†On the 1st of July, 1867, the provinces of Canada East, Canada West, (hereafter to be known as "Quebec" and "Ontario," Nova Scotia, and New Brunswick, were united in a common government under the name of the "Dominion of Canada." The government consists of a governor general and his cabinet, a senate and house of commons, while each of the provinces has its provincial legislature.

*British possessions, &c.—Continued.*

Localities.	Area in sq. miles.	Population.
Saskatchewan .....	93,000	.....
British Columbia .....	225,000	} 64,000
Vancouver island .....	12,756	
Athabaska .....	75,000	.....
Peace river .....	85,000	.....
Columbia .....	350,000	.....
Mackenzie river .....	225,000	.....
Great Slave lake .....	195,000	.....
Churchill .....	345,465	.....
Southampton island .....	27,325	.....
Island south of Baffin's bay .....	184,575	.....
Victoria Land .....	95,000	.....
Baring's island .....	28,000	.....
Prince Patrick island .....	10,000	.....
Mellville island .....	24,000	.....
North Devan island .....	25,000	.....
North Somerset island .....	7,000	.....
Total .....	3,306,380	.....
Territory around Smith's Sound and Small islands .....	124,165	.....
	3,430,545	.....

No. 23.—*Statement showing the area and population of the West Indies, Mexican States, Central America, and New Granada.*

## WEST INDIES.

Government.	States and colonies.	Area in sq. miles.	Populat'n.
Spanish colonies .....	Cuba .....	47,278	1,024,004
	Porto Rico .....	3,865	474,058
	Dominica, San Domingo .....	17,609	136,760
Republic .....	Hayti, San Domingo .....	10,081	572,000
British colonies .....	Jamaica .....	6,250	441,264
	Bahamas .....	5,094	31,402
	Virgin islands .....	92	6,689
	Barbuda .....	72	1,707
	St. Christopher's .....	68	23,177
	Antigua .....	108	37,757
	Montserrat .....	47	7,653
	Dominica .....	274	25,230
	St. Lucia .....	296	6,471
	St. Vincent .....	132	30,128
	Barbadoes .....	166	161,201
	Granada .....	125	35,517
	Tobago .....	144	16,363
	Trinidad .....	2,020	78,845
French colonies .....	Guadaloupe and dependencies .....	631	154,863
	Martinique .....	382	136,574
Dutch colonies .....	Curacoa and dependencies .....	369	31,741
Danish colonies .....	Santa Cruz .....	78	23,729
	St. John's .....	22	2,228
	St. Thomas .....	27	13,666
Swedish colonies .....	St. Bartholomew's .....	25	9,000



## MEXICAN STATES.

States.	Area in sq. miles.	Population.
Aguas Calientes .....	11,000	86,329
Chiapa .....	19,036	167,472
Chihuahua .....	102,646	164,073
Colima .....	3,305	144,331
Durango .....	49,360	62,109
Guanajuato .....	12,419	729,103
Guerrero .....	29,122	270,000
Jalisco .....	50,192	804,058
Mexico .....	15,965	1,299,163
Michoacan .....	26,172	554,585
Nueva Leon and Coahuila .....	81,015	213,369
Ojaca .....	33,123	525,938
Puebla .....	14,017	658,609
Queretaro .....	2,431	165,155
San Luis Potosi .....	31,905	397,189
Sinaloa .....	34,049	160,000
Sonora .....	131,117	139,374
Tobasco .....	16,852	70,628
Tamaulipas .....	30,384	109,673
Trascala .....	1,833	90,158
Vera Cruz .....	25,536	349,125
Yucatan .....	45,822	668,623
Zacatecas .....	21,915	296,789
California .....	56,384	12,000

## CENTRAL AMERICA AND NEW GRANADA.

Countries.	Area in sq. miles.	Population.
Guatemala .....	40,700	850,000
San Salvador .....	9,600	394,000
Honduras .....	47,000	350,000
Nicaragua .....	58,000	264,000
Costa Rica .....	19,500	100,174
New Granada .....	521,948	2,363,054

