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IN THE SENATE OF THE UNITED STATES.

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APRIL 9, 1860.—Ordered to be printed.

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Mr. LANE made the following

REPORT.

[To accompany bill S. 149.]

The Committee on Public Lands, to whom was referred "A bill (S. 149) making appropriations to supply a deficiency in the appropriations for the completion of the geological survey of Oregon and Washington Territories," have had the same under consideration, and report the bill back, with the recommendation that it do pass, and submit the following documents in support of the appropriations made in the bill.

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GEOLOGICAL SURVEY OF OREGON AND WASHINGTON TERRITORIES.

*Instructions to Dr. John Evans, appointed to institute geological researches, &c., on the main lines of the public land surveys about to be commenced in Oregon.*

You have been appointed by the Department of the Interior, on the recommendation of Dr. David Dale Owen, United States geologist for Wisconsin and Iowa, (and other distinguished gentlemen,) to commence a geological and mineralogical survey west of the Cascade mountains, in Oregon Territory, beginning with the main lines of the public surveys, to wit: The principal meridian and base lines, to the immediate vicinity of which, it is apprehended, your researches will have to be confined in the *first* instance. Off those lines, to the extent *practicable*, you will endeavor to ascertain, barometrically, the elevation of the mountain ranges, peaks, and spurs of the points triangulated to, and when so doing you will have opportunity of also extending your mineralogical researches in the same direction.

The great object of your mission is to develop and make apprehensible whatever matters your professional skill shall deem to be most useful to the infant settlements of the Territory, whose people have sought to interest the government in the kind of scientific research required of you.

You will keep a detailed register of all your barometrical observations, and also a register of your geological and mineralogical re-

searches, and the inferences you may from time to time draw from them, ever taking special care to identify the localities of your observation points with surveying stations noted on line, or, as the case may be, with the points triangulated to from line stations, whereby the localities which you desire to identify may be shown on the map of the lines in connection with all the operations connected with the survey.

Those two main lines will run through the heart of the country, and *all the operations and observations* therewith connected, whether such be linear, triangulating, barometrical, geological, or mineralogical, &c., it is desired to be comprehended and exhibited, ultimately, on general maps of each line.

It is desired that you will observe the latitude and longitude of the point where the base line will intersect the principal meridian, and also the longitude and latitude of the mound to be erected on the summit of the Cascade mountains, at the point thereon where the base line will, by law, terminate. You are requested also to observe the barometrical elevation of the same point.

You propose traveling to Oregon, (under the protection of a party journeying thither which is shortly to start from St. Louis,) and to return by the Isthmus; but as your outward route will be one connected with the great geological field explored by Dr. Owen on its northwest, (and who is now elaborating his official report thereon,) you will do well to call on the Doctor, at New Harmony, Indiana, before joining your traveling party at St. Louis, and have an understanding with him whether anything can be accomplished by you on the route to meet his views, in time for his forthcoming report, which would not delay your seasonable arrival in western Oregon to join Surveyor General Preston's party; and would such, in your judgment, produce inadmissible delay, you must postpone such researches until the return trip by the overland route, instead of by way of the Isthmus.

It is deemed important that, either going or returning, (if possible, the former would be preferred,) you should proceed as you desire doing, to the Falls of the Missouri, and cross the mountains, as you suggest, "by what is called the *Flathead Trail*, because, if any pass practicable for wagons should there be found, it might [as you estimate] shorten the land travel to Oregon some eight or nine degrees of longitude." The Missouri river you state to be navigable for steamboats to that point, nearly 2,600 miles above St. Louis, and also state that you speak from personal knowledge as to 2,300 miles of that distance. Should such a wagon pass be found at the point alluded to, its discovery would be an interesting incident in your enterprise, and one that may prove of much utility to emigrants and to Oregon.

You will be allowed the same compensation heretofore allotted to other assistant geologists, viz: six dollars per day, and your necessary expenses en route, transportation of instruments, and a hired hand to take charge of them throughout the service, but keeping within the limits of the means which the department has the power to devote to the purpose in view, viz: thirty-five hundred dollars. While in the field of operations, it is expected you will pay your own personal

expenses. Your accounts will be rendered and adjusted in the usual mode, with which you are already familiar.

J. BUTTERFIELD,  
*Commissioner.*

GENERAL LAND OFFICE, *March 22, 1851.*

GENERAL LAND OFFICE,  
*February 9, 1853.*

SIR: I submit to your consideration the accompanying documents, confirmatory of the value of the geological reconnoissance of Oregon Territory, and of the adaptedness of Dr. John Evans for that particular service.

The documents submitted are as follows:

Documents A and B, being two resolutions of the legislature of Oregon, one passed in 1851 and the other in 1852, urging such work to be undertaken and continued by Dr. Evans.

Documents C and D, being resolutions of the *Academy of Science*, of Philadelphia, strongly recommending Dr. Evans as a geologist.

Document E. A memorial from some of the most distinguished citizens of Oregon, expressing their confidence in Dr. Evans, and desiring that the work may not be brought to a close for the want of a suitable appropriation.

Document F is a communication from the United States Surveyor General Preston, of Oregon City, representing the great value of Dr. Evans's labors and researches, developing the best *gold-bearing* region, the *coal-bearing* region, the *limestone* region; his discoveries of *iron* and *copper* ores, and the value of the geographical information imparted by him in advance of the public surveys; all of which go to establish the utility of the object for various *economical* considerations.

Document G is a succinct statement by Dr. Evans of his labors in Oregon. His unsettled account of expenditures to the 31st of December, 1852, amounts to \$11,984 25.

Document H is the proposed item to be inserted in the appropriation bill, should you and the committee concur in the desire herein set forth.

I beg leave to conclude by assuring yourself and the committee of my decided conviction that *there never has yet been* an amount of *equally valuable* information obtained by our government, under the circumstances, at so cheap a rate as that charged by Dr. Evans for his services rendered, and which includes the payment made to his colaborers; and I trust that the committee may be induced to accede to the urgent request from so many scientific and other sources, by favoring the appropriation as asked for in document marked H.

I have the honor to be, with great respect, your obedient servant,  
JOHN WILSON,  
*Commissioner.*

Hon. G. S. HOUSTON,  
*Chairman Com. Ways and Means, House Representatives.*

## GEOLOGICAL SURVEY OF

GENERAL LAND OFFICE,  
March 26, 1860.

I hereby certify that the within is a true copy as appears from the records and files of this office.

JOS. S. WILSON,  
*Commissioner.*

GENERAL LAND OFFICE,  
April 14, 1853.

SIR: Your letter of the 11th instant, with the proposition made to you by Governor Stevens, in his letter of the 11th instant, has received attentive consideration at this office, and obtained the sanction of the Secretary of the Interior. In your overland route to Oregon, therefore, in prosecuting to conclusion your geological reconnoissance of that Territory, you will coöperate with Governor Stevens in the mode proposed by him, making collections for his explorations, drawing up instructions for his guidance, furnishing him with all the geographical information you have collected in the service of this department, preparing the geological paper for his final report, and, according to his desire, "identifying yourself with the whole of that immense field upon which you have been engaged for so many years."

But such coöperation for the public benefit must, nevertheless, be made to consist with the main object of your appointment as geologist of Oregon, and to all due extent be made subservient thereto. It is therefore required that you make report to this department of the additional geological, topographical, and other valuable information obtained whilst coöperating in the mode suggested, to the extent that you may conceive such information to have a bearing on the purpose of your appointment as geologist for Oregon.

It is to be understood, however, that the expenses attendant on the desired coöperation here intended will not be made a charge against the limited amount recently appropriated by Congress for your duties, specified by the act of 3d March last, and concerning which you will be hereafter instructed.

Very respectfully, your obedient servant,

JOHN WILSON,  
*Commissioner.*

Dr. JOHN EVANS, *Geologist of Oregon,*  
*now at the seat of Government.*

JANUARY 1, 1855.

I hereby certify that the foregoing is a true copy of the "copy" sent by the Commissioner of the Land Office.

RICHARD EVANS.

GENERAL LAND OFFICE, *January 26, 1855.*

SIR: I have to acknowledge the receipt of your letters of the following dates, viz:

Of the 1st instant, submitting accounts and vouchers for expenditures on account of the geological reconnoissance, chargeable against the appropriation of \$5,000 per act of 3d March, 1853, and on account of the North Pacific railroad expedition, under the direction of Governor Stevens, together with diagrams representing your route in the explorations made by you from Nebraska to Washington Territory; also inclosing a communication from Governor Stevens, dated San Francisco, California, November 14, 1854, addressed to this office, on the subject of the importance of the geological researches, &c., and finally requesting the Department of the Interior to ask Congress for an appropriation to cover your expenditures incurred over and above the sum appropriated as aforesaid, besides to enable you to continue the explorations in Washington Territory and in vicinity of the Coose bay; and also to obtain the authority to publish your report of the geology of Oregon and Washington Territories.

Yours of the 5th instant, submitting a statement of the circumstances attending your connection with Governor Stevens's North Pacific railroad expedition, accompanied by a copy of the governor's letter to the Secretary of War, of the 14th November last, in support of your claim for expenditures made by you on account of that branch of the service; and

Yours of the 13th instant, inclosing a copy of a memorial from citizens of California residing at San Francisco, to their delegates in Congress, on the subject of your geological explorations in Washington Territory, &c.

In reply to the foregoing communications, I have to say that the subject-matter was examined into and reported to the Secretary of the Interior on the 15th instant, with a recommendation that an appropriation may be asked from Congress "for expenses incurred by Dr. John Evans, in geological explorations of Oregon, Washington, &c., and for the completion of those explorations in Washington Territory and on Coose bay, \$23,560, and the Department of the Interior is hereby authorized to have the report of Dr. Evans published under its direction, the expenses to be paid out of any money in the treasury not otherwise appropriated."\*

The above sum comprises the following items, viz :

Balance claimed by you for expenditures made over and above the appropriation of \$5,000, 3d March, 1853.....	\$5,694 25
Expenditures under Governor Stevens's North Pacific railroad service.....	4,867 50
To complete the reconnoissance in Washington Territory, as asked for by the legislature.....	10,000 00
Coose Bay exploration.....	3,000 00

Very respectfully, your obedient servant,

JOHN WILSON,  
*Commissioner.*

Dr. JOHN EVANS,  
*United States Geologist.*

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\* Authority to publish the report passed the House, but was stricken out by the Senate.

GENERAL LAND OFFICE, *January 23, 1858.*

SIR: I have the honor to acknowledge the receipt of your letter of the 18th instant, on the subject of the publication of the geological report of Oregon and Washington Territories, by Dr. John Evans, now before the Committee on Public Lands.

In compliance with your request, I would respectfully refer you to the inclosed copy of an extract from the annual report of this office to the Secretary of the Interior, dated November 30, 1857, giving an account of the institution and progress of the geological survey as above stated, by Dr. Evans, of the various appropriations made by Congress from time to time for that purpose, and of the estimate furnished by Mr. Evans of the probable cost of publishing the same, and which, it is believed, will be found to embrace all the information desired under the call made by your letter.

I have the honor to be, very respectfully, your obedient servant,  
 THOS. A. HENDRICKS,  
*Commissioner.*

Hon. JOHN G. DAVIS,  
*House of Representatives, Washington, D. C.*

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*Extract from the annual report of the Commissioner of the General Land Office to the Secretary of the Interior, dated November 30, 1857.*

GEOLOGICAL RECONNOISSANCE IN OREGON AND WASHINGTON TERRITORIES.

In March, 1851, it was determined by the Secretary of the Interior, under the third section of the act of 27th September, 1850, pointing out the manner of making surveys in Oregon, to connect with the land surveys in Oregon a geological reconnoissance and exploration. With this in view, a transfer from a fund for similar service in the northwest was ordered, of..... \$3,500 00

And Dr. John Evans was directed, on the 22d March, 1851, to proceed overland, to ascertain the general geology of the country west of the Missouri river towards the Rocky mountains; to reconnoiter for practicable wagon routes leading to Oregon over the Rocky mountains; and when there, to aid the surveyor general in obtaining the elevations of the country along the principal base and meridian lines, with the latitude and longitude at the intersection of those lines; and to keep his expenditures within the limits of the means placed by the department under his control.

On the 3d March, 1853, Congress made two separate appropriations: one of \$11,984 25, for expenses incurred in a geological reconnoissance in Oregon, undertaken in 1851; and another of \$5,000, for completing that geological reconnoissance. Whereupon, on the 19th April, 1853, the geologist was instructed to complete the service under the latter appropriation, and make his final report thereon; both of which appropriations amounted to..... 16,984 25

And on 3d March, 1855, Congress appropriated for this purpose the additional sum of.....\$23,560 00

Making an aggregate of..... 44,044 25

One item of the last appropriation was \$5,692 25, on account of excess of his expenditures over and above the \$5,000, per act 3d March, 1853; another item was \$13,000 25, for the completion of the geological explorations in Oregon and Washington Territories.

In placing the latter item under the control of the geologist, on March 20, 1855, he was instructed to complete the work, make final report, and not to exceed it in his disbursements.

The estimates on which the appropriation of \$23,560 was based, included a third item of..... 4,867 50

Which had been expended by Dr. Evans in cooperating with the expedition, under the authority of the War Department, for making the extreme northern railroad exploration from the Missouri to Washington Territory, thereby reducing to this extent the amount which has been appropriated for geological services in Oregon and Washington to..... 39,176 75

In the adjustment of Dr. Evans's accounts to the 4th March last, it is found that he has again exceeded the amount appropriated for the completion of the work, and incurred an additional liability of \$3,574 70, to the liquidation of which there are no means applicable under existing laws.

The geologist, in a communication of the 13th November, 1857, states as follows: That "rich deposits of semi-bituminous coal have been discovered cropping out at various points from the British possessions to near the boundary of California, and are almost inexhaustible in quantity, and accessible to sail and steam navigation."

"Ores of iron, lead, platinum, and copper have been discovered; also marbles, other limestones, and valuable rocks for building purposes. The analysis of the coals, limestones, and minerals, is complete; also many of the soils."

One hundred and five illustrations, and two hundred and seventy-seven pages of manuscript are completed, ready for the engraver and printer. "All the illustrations and analyses are in sufficient progress to keep the engraver constantly employed until the completion of the report."

The illustrations and manuscript referred to he has filed in this office; but the complete report which antecedent instructions required at his hands has not yet been made.

He further states that "the report will be about two thirds the size of Dr. Owen's report, and will cost, if published in the same style, \$26,526, including the cost of preparing all the maps and other illustrations." This sum, together with his claimed balance on account

of his expenditure over and above the last appropriation, he states, "will amount to \$30,000."

The facts in regard to the origin of this service, and the appropriation for its completion at different times, with the progress in it, as reported by the geologist, are respectfully submitted for the consideration of Congress.

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*Petition of the citizens of Saint Louis, Missouri, praying the immediate publication of Dr. Evans's final report of geological survey in Oregon and Washington Territories.*

Whereas the Academy of Science, of St. Louis, have learned, with much interest, that the general geological survey of Oregon and Washington Territories, conducted by Dr. John Evans, under the authority of the United States government, in the course of which valuable observations have been made upon the geography, the agricultural and mineral resources, and the natural history of these Territories, has been completed, and a final report prepared for publication when authorized by Congress: Therefore,

*Resolved*, That the Academy of Science, of St. Louis, fully appreciating the importance of Dr. Evans's explorations and labors, and believing that his discoveries promise to be of much value, when adequately made known, to commerce, the arts, agriculture, and science, would respectfully beg leave to urge upon Congress the immediate publication of Dr. Evans's final report, in the form and manner heretofore recommended by the Commissioner of the General Land Office, and under the personal supervision of the geologist.

*Resolved*, That a copy of the above preamble and resolution, signed by the president and secretary, be transmitted to the presiding officer of each house of Congress.

B. F. SHUMARD,  
*President Academy of Science, St. Louis.*

J. S. B. ALLEQUE,  
*Recording Secretary.*

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GENERAL LAND OFFICE, *May 22, 1858.*

SIR: I have the honor to inclose herewith a communication from John Evans, sent to this office, to-day, by the Hon. John G. Davis, of the Committee on Public Lands, asking the recommendation of the department for the publication of additional copies of the report of the geological survey of Oregon and Washington Territories.

The order of the House to publish the work is evidence to us of the estimate that that branch of Congress has of its merits, and as the subject is a scientific one, of great practical utility and interest to the country, the recommendation of 1,100 additional copies, to be distrib-



uted as follows, say 500 for the Department of the Interior, 500 for this office, and 100 for the use of Mr. Evans, the geologist, is respectfully suggested.

I am, very respectfully,  
 THOMAS A. HENDRICKS,  
*Commissioner.*

Hon. J. THOMPSON,  
*Secretary of the Department of the Interior.*

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GENERAL LAND OFFICE, *March 26, 1860.*

I hereby certify that the within is a true copy, as appears from the records and files of this office.

JOS. S. WILSON,  
*Commissioner.*

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WAR DEPARTMENT,  
*Washington, January 26, 1858.*

SIR: In reply to your request for my views respecting the publication of the report of Dr. John Evans, I have to state that the examinations of Dr. Evans extended over lines 24,000 miles in length, embracing the regions traversed by the route explored for a Pacific railroad near the parallel of 47° north latitude; that collections are made along all the lines passed over of the prevailing rocks, minerals, and soils which, in connection with other information gathered, exhibit the character and capabilities of the regions explored, their fitness for occupation and settlement, the facilities they afford for the construction of rail and common roads—all of which, I regard of very great value, not only in connection with the project of constructing a railroad to the Pacific, but with the military operations of the country.

The itineraries and topographical sketches of Dr. Evans likewise give useful information. For these reasons, I esteem the publication of this report to be important.

Very respectfully, your obedient servant,  
 JOHN B. FLOYD,  
*Secretary of War.*

Hon. JOHN G. DAVIS,  
*House of Representatives.*

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GENERAL LAND OFFICE, *January 26, 1855.*

SIR: I have to acknowledge the receipt of your letters of the following dates, viz:

Of the 1st instant, submitting accounts and vouchers for expenditures on account of the geological reconnoissance, chargeable against the appropriation of \$5,000, per act of 3d March, 1853, and on account

of the North Pacific railroad expedition under the direction of Governor Stevens, together with diagrams representing your route in the explorations made by you from Nebraska to Washington Territory; also inclosing a communication from Governor Stevens, dated San Francisco, California, November 14, 1854, addressed to this office on the subject of the importance of the geological researches, &c., and finally requesting the Department of the Interior to ask Congress for an appropriation to cover your expenditures incurred over and above the sum appropriated as aforesaid, besides to enable you to continue the explorations in Washington Territory and in vicinity of the Coose bay, and also to obtain the authority to publish your report of the geology of Oregon and Washington Territories.

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Yours of the 13th instant, inclosing a copy of a memorial from citizens of California residing at San Francisco, to their delegates in Congress on the subject of your geological explorations in Washington Territory, &c.

In reply to the foregoing communications, I have to say that the subject-matter was examined into and reported to the Secretary of the Interior on the 15th instant, with a recommendation that an appropriation may be asked from Congress, "For expenses incurred by Dr. John Evans in geological explorations of Oregon, Washington, &c., and for the completion of those explorations in Washington Territory and on Coose bay, \$23,560; and the Department of the Interior is hereby authorized to have the report of Dr. Evans published under its direction, the expenses to be paid out of any money in the treasury not otherwise appropriated."\* The above sum comprises the following items, viz:

Balance claimed by you for expenditures made over and above the appropriation of \$5,000, 3d March, 1853.....	\$5,694 25
Expenditures under Governor Stevens, North Pacific railroad service.....	4,867 50
To complete the reconnoissance in Washington Territory, as asked by the legislature. ....	10,000 00
Coose Bay exploration .....	3,000 00

Very respectfully, your obedient servant,

JOHN WILSON,  
*Commissioner.*

Dr. JOHN EVANS,  
*United States Geologist.*

\* This clause passed the House, but was lost in the Senate, where its necessity was not fully explained.

GENERAL LAND OFFICE, *March 26, 1860.*

I hereby certify that the within is a true copy, as appears from the records and files of this office.

JOSEPH S. WILSON,  
*Commissioner.*

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DEPARTMENT OF THE INTERIOR,  
*March 8, 1860.*

SIR: I have the honor to acknowledge the receipt, on the 24th ultimo, and also on the 6th instant, a copy of the following resolution of the Committee of Public Lands, adopted February 21, 1860, viz:

“*Resolved*, That the Secretary of the Interior be, and he is hereby, requested to furnish estimates of expenses incurred in the geological survey of Oregon and Washington Territories, not provided for by previous appropriations, for the analyses of soils, coals, and ores, and in the preparation of the final report for publication; and also for any information that may be in his possession, as to the results of these analyses, so far as they may serve to develop the agricultural and mineral resources of the country explored.”

In reply to the first branch of this resolution, calling for estimates, I would respectfully state that it will be perceived, from the inclosed copy of a communication of my predecessor of the 7th February, 1857, addressed to the Commissioner of the General Land Office, that in obedience to the requirements of the act of Congress of the 21st July, 1852, (Statutes, vol. 10, p. 12,) this department has not authorized any expenses for geological surveys in Oregon or Washington Territories beyond the amount appropriated therefor by Congress. The last appropriation was made by act of 3d March, 1855, (Statutes, vol 10, p. 651,) “for expenses incurred by Dr. John Evans in geological explorations in Oregon and Washington Territories, &c., and for the completion of those explorations in Washington Territory, and on Coose bay, \$23,560.”

Under date of the 20th March, 1855, the General Land Office informed Dr. Evans of this appropriation, and instructed him to complete his labors, and make his report.

On the 18th August following, he was again instructed to close his labors under the then existing appropriation, as no additional expenditure whatever was contemplated by this department in regard to geological reconnoissances in Oregon and Washington.

The geologist, however, afterwards rendered accounts of expenditures exceeding the sum appropriated; and in April, 1857, the General Land Office approved his accounts and vouchers, to an amount exceeding the appropriation by \$3,574 70. This course of action was taken without advice from this department, and was in contravention of established regulations, which inhibit the admission of an amount or balance due from the United States to any party where there is no appropriation out of which such balance can be paid.

Since that time Dr. Evans has informed the department that he has

incurred further liabilities to scientific gentlemen for making analyses of minerals, soils, ores, &c., &c., amounting to \$6,984 50.—(See copy of his letter of 14th November, 1859, to Commissioner of the General Land Office, and inclosures herewith.)

From all the papers inclosed, it will be perceived, first, that this department has not authorized any expenditures beyond the appropriations for geological surveys in Oregon and Washington, and is not in such a position as to report that there is any deficiency, to meet which it is under obligation to submit an estimate for a further appropriation. Second, That Dr. Evans urgently desires a further appropriation of both the amounts above mentioned. In regard to the propriety of making these appropriations, the committee and the House have the means of judging; and as the question is one peculiarly addressing itself to the discretion of the House, it is deemed proper, under all the circumstances, that this department should not submit any recommendation on the subject.

In reply to the other branch of the resolution, I have the honor to state that the information as to the results of analyses, as I believe, is contained in the papers which were transmitted to the House of Representatives by the President on the 13th May, 1858, and an abstract thereof, prepared by Dr. Evans, will be found among the copies herewith inclosed. I have never had occasion to investigate these results, with a view of forming a reliable opinion of their value. They were favorably mentioned by the General Land Office, in a letter of 17th June, 1857, addressed to Hon. J. Patton Anderson, (Thirty-fourth Congress, third session, House Reports, vol. 1, No. 171,) and in the annual report of that office in 1857, (Ex. Doc., first session, Thirty-fifth Congress, vol. 2, part 1, pages 95 and 96,) as also in a letter addressed by the Commissioner to this department, to which I replied on the 27th of the same month.

Copies of this correspondence are likewise inclosed for your information.

Very respectfully, your obedient servant,

J. THOMPSON,  
*Secretary.*

HON. ELI THAYER,

*Chairman Com. Public Lands, U. S. House of Representatives.*

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GENERAL LAND OFFICE, *May 22, 1858.*

SIR: I have the honor to inclose herewith a communication from John Evans, sent to this office to-day by the Hon. John G. Davis, of the Committee on Public Lands, asking the recommendation of the department for the publication of additional copies of the report of the geological survey of Oregon and Washington Territories.

The order of the House to publish the work is evidence to us of the estimate that that branch of Congress has of its merits; and, as the subject is a scientific one, of great practical utility and interest to the country, I respectfully suggest the recommendation of 1,100 additional copies, to be distributed as follows: Say 500 for the Department of the

Interior, 500 for this office, and 100 copies for Mr. Evans, the geologist.

I am, very respectfully,

THOS. A. HENDRICKS,  
*Commissioner.*

Hon. J. THOMPSON,  
*Secretary of the Department of the Interior.*

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DEPARTMENT OF THE INTERIOR,  
March 9, 1860.

SIR: I have the honor to acknowledge the receipt of your letter of the 20th ultimo, inclosing Senate bill No. 149, entitled "A bill making appropriations for the completion of the geological survey of Oregon and Washington Territories," and suggesting that the committee may be furnished with the views of this department thereon.

This bill proposes to make appropriations of two amounts, viz: \$3,574 70 and \$6,984 50. Total, \$10,559 20.

As furnishing the only expression of the views of the department which I deem proper, I have the honor herewith to inclose a copy of my letter of yesterday's date, addressed to the Hon. Eli Thayer, chairman of the Committee on Public Lands of the House of Representatives, in response to a resolution of that committee, of the 21st ultimo, calling for information as to the expenses incurred in the geological survey of Oregon and Washington Territories, and the results of analyses of soils, coals, and ores.

The bill and accompanying papers are herewith respectfully returned.

Very respectfully, your obedient servant,

J. THOMPSON, *Secretary.*

Hon. R. W. JOHNSON,  
*Chairman Committee on Public Lands, U. S. Senate.*

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WASHINGTON, January 21, 1858.

DEAR SIR: I understand that a question has been raised as to the propriety of the course pursued by Dr. John Evans in prosecuting his surveys of Oregon and Washington Territories after appropriations had been made, the apparent object of which was to bring that exploration to a close. On the inception of that enterprise the distinct understanding was, that appropriations would be made from year to year as the necessities of the service required. This understanding was not had from Congress or from any member, but from the uniform course pursued in all cases of surveys and for geological explorations; and when Dr. Evans started on his enterprise, the distinct understanding he had with me was that he should prosecute his *labors* with all diligence and economy to completion; he, however, taking the risk of the appropriations being made. No other course could have been

taken at that time by the office under my direction, for the reason that the field of his labors was almost unknown, was without mail routes or post offices at that time; and if the office had been disposed to put an entire stop to his operations, it could not have done so, at any time during the greater part of his services, for it would not have been able to communicate with him.

I make this statement to show that Dr. Evans was not guilty of disobedience of orders, or of disrespect to Congress or the department, but was carrying out in good faith what he supposed were the wishes of both.

Truly yours,

JOHN WILSON.

Hon. THOMAS A. HENDRICKS,

*Commissioner General Land Office, Washington.*

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GENERAL LAND OFFICE, *March 26, 1860.*

I hereby certify that the within is a true copy, as appears from the records and files of this office.

JOS. S. WILSON,  
*Commissioner.*

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WASHINGTON, *January 26, 1858.*

DEAR SIR: I understand that the report of Dr. Evans of the explorations and surveys made by him in the passes of the Rocky mountains, and in Oregon and Washington Territories, is now before Congress on the question of printing it, and that an objection has been raised because of supposed disobedience of orders by him. I was Commissioner of the General Land Office at the time this enterprise was undertaken, and the object sought was the establishing of the geographical position of certain important points, and the connection of the geology of those regions with the explorations reported by Dr. D. D. Owen. Congress at that time was particularly anxious to limit the appropriations of each year to the services performed during the year. It was well understood, when Dr. Evans started on this enterprise, that the fields of his labors were so remote, and almost wholly without mail routes and post offices, that but little communication could be had with him, and then only at rare intervals. He possessed, however, the entire confidence of the office, and we were perfectly sure that his duties would be faithfully and economically discharged. The result of his labors, in a most eminent degree, has proved that that confidence was well founded. As in the case of Dr. Owen, it was supposed that the work would go steadily on to completion, as the interests and honor of the country alike required. In pursuing his explorations, therefore, as he did, he supposed that he was carrying out the views of the office, which was the fact; and when the office would have recalled him, if I remember aright, we did not know where to find him. From every charge of disobedience or contumely I most heartily and entirely exonerate him.

The publication of Dr. Evans's work is eagerly looked for by the people of the northwest. The publication of Dr. Owens's work opened up to our citizens a new region, and the rapid settlement of Iowa, Wisconsin, and Minnesota was the consequence. The publication of Dr. Evans's report is pregnant with still more important results. Every patriot is anxiously looking for the means of connecting, by suitable means of transit, our Atlantic and Pacific possessions. However wisely a railroad scheme may be devised, it will fail, if there are not sufficient settlements to protect themselves and the road against the demonstrations of wandering Indians or unprincipled white men. Those settlements will not be made unless the people are satisfied that there are sufficient lands in different localities to justify them in doing so. The publication of Dr. Evans's report will furnish this information, and, when furnished, the energy and enterprise of the western people will soon people that vast region, and make the wilderness to bloom and blossom as the rose. I really do not know any object now before Congress of more vital interest to the country at large, and especially to the people of the great west, and I earnestly hope that Congress may at once order the publication of this report, in a manner commensurate with its importance and the dignity of the country.

Very truly, yours,

JOHN WILSON.

Hon. JOHN G. DAVIS,  
*House of Representatives.*

WASHINGTON, November 14, 1860.

SIR: Permit me to state most respectfully, that the cost of analyses of coals, soils, and minerals, and the preparation of maps and other illustrations for the report of the geological survey of Oregon and Washington Territories, ordered to be printed at the last session of Congress, amounts to \$6,984 50. This sum, together with the balance of \$3,574 70 due me on the adjustment of my accounts at the General Land Office, to 4th March, 1859, amounts to \$10,559 20.

The analysis of soils is very tedious and expensive. By reference to the Patent Office Report for 1858, page 29, you will perceive that Dr. Charles T. Jackson, chemist, of Boston, states "that the analysis of a single soil occupies from twenty to twenty-five days, and that no chemist can properly attend to more than one at a time."

In order to make the analysis perfectly reliable and most useful to the country, I have employed the most skillful and well-known chemists in the United States, Dr. Charles T. Jackson, of Boston; Professor A. Litton, St. Louis, Missouri; and Dr. D. D. Owen, of Indiana. Dr. Litton has been employed more than two years on this work.

Dr. Jackson has analyzed :

Soils.....	16
Coals.....	5
Iron ores.....	4
Copper.....	1

Lead and silver.....	2
Native sulphur.....	1
	—
	29
	==

Dr. Litton has analyzed :

Soils.....	23
Iron ores.....	2
Platinum.....	2
Limestones .....	5
Coals .....	6
Basaltic rock.....	1
	—
	38
	==

Dr. Owen has analyzed :

Coals and lignites.....	15
Iron ores.....	4
Soils.....	3
	—
	22
	==

Dr. Joseph Leidy, Academy of Sciences, Philadelphia, and Dr. Shumard, have made the drawings and descriptions of fossils, to determine the geological age of each formation. These analyses comprise all the prevailing soils and minerals from Kansas to the Pacific, and from the British possessions on the north to California on the south.

Agricultural chemistry is now attracting much attention, and our citizens engaged in such pursuits are now realizing the advantage of the adaptation of the crop to the constituents of the various soils, and the value of knowing what kind of fertilizers are needed to supply deficiencies where other crops are desired. Some of the results of the survey are very interesting, and are attracting much attention in the scientific world. In response to a verbal request from the late Acting Commissioner, I will, to-morrow or the next day, make a brief statement of some of the more important results to be used in your annual report to Congress, if you deem it expedient so to do.

In conclusion, I would most respectfully but urgently suggest the propriety that the General Land Office should recommend the printing of at least 5,000 extra copies of the *agricultural* portion of the report. If printed without the maps and other illustrations, the expense would be very trifling compared with the advantages that would be derived by all who may hereafter settle this vast region in the west.

I have the honor to be, very respectfully,

JOHN EVANS,

*Late Geologist for Oregon and Washington Territories.*

Hon. SAMUEL A. SMITH,

*Commissioner General Land Office.*



*Memorandum of the results of the Geological Survey of Oregon and Washington Territories, and the circumstances attending its institution and progress, from official sources.*

In March, 1851, it was determined by the Secretary of the Interior under the third section of act of 27th September, 1850, providing for the manner of making surveys in Oregon, to connect with the land surveys a geological reconnoissance and exploration. It was also deemed indispensable to the proper construction of maps of the country, that the latitude and longitude of the intersection of the base and meridian lines should be determined.

To accomplish this object a transfer was made from a fund for similar service in the northwest of \$3,500, and on the 22d March, 1851, Dr. John Evans was directed to proceed overland to the Pacific ocean, to ascertain the general geology of the country en route; to examine all the passes in the Rocky mountains for practicable wagon routes to Oregon; to obtain the elevations of the mountain ranges crossed, and along the base and meridian lines in that territory; and to determine the latitude and longitude of their intersection.

The sum placed at the disposal of the geologist for this purpose, \$3,500, was not sufficient to pay the necessary expenses of the overland journey to the Pacific. But in view of the importance of connecting our eastern country with the settlements on the Pacific by wagon or railroads as a great public measure of vital importance to the interests of the people, and as the practicability of establishing such communication depended very much upon the agricultural and mineral resources of the country en route, the Land Office having entire confidence in the geologist, that the duties confided to his charge would be performed in the most faithful and economical manner, and as the field of his labors was so remote, and at that time almost wholly without mail facilities, so that but little if any communication could be had with him, he was charged with their performance with the distinct understanding that the work would go on to completion, and that the necessary means would be supplied to meet the expenses incurred.

In December, 1852, the geologist returned to Washington, and reported to the General Land Office the results of the survey. On the 3d March, 1853, Congress, in answer to petitions from the legislature of Oregon for 1851 and 1852, made an appropriation of \$11,984 25 "for expenses incurred in a geological survey of Oregon, and \$5,000 to complete the reconnoissance." Whereupon, on the 19th of April, 1853, the geologist was instructed to return to the field of his labors and complete the survey. He was also instructed, at the same time, "to cooperate with Governor I. I. Stevens, as the geologist of his expedition and explorations for a railroad route to the Pacific near the forty-seventh parallel of north latitude, and to communicate all the geographical information obtained in former explorations in that region for the guidance of his several sub-corps." These duties were performed by the geologist, and he returned to Washington to prepare his final report. But Congress, in answer to petitions from the legislatures of Oregon and Washington, and citizens of California engaged in agri-

cultural, commercial, and mining pursuits, made a further appropriation of \$23,560. Of this amount \$4,692 25 was "for expenses incurred in the coöperation with Governor Stevens, under the War Department, and \$13,000 for more detailed examinations in the coal regions of Oregon and Washington Territories; the remainder, \$5,692 25 was for expenses incurred in the prosecution of the survey, in addition to the appropriation of \$5,000 made on the 19th April, 1853. To the clause in the general appropriation bill making this last appropriation of \$23,560 was added a proviso "for the publication of the report, payable out of any money in the treasury not otherwise appropriated." This clause passed the House, but was lost in the Senate, where the reason for its insertion had not been explained.

The object of the proviso was, that the analysis of the coals, ores, soils, and rocks, might be made at the east, during the progress of the survey, thus avoiding the long delay which has attended the publication of many scientific reports by Congress, so that the scientific as well as practical results of the survey might be ready for distribution in a few months after the completion of the field-work. The analysis of a single soil requires the undivided attention of the chemist from twenty to twenty-five days.

These results comprise a careful analysis of the prevailing soils, rocks, coals, and minerals along the entire overland route to the Pacific, and in Oregon and Washington Territories, from the boundary of California to the British possessions on the north, with lateral excursions both north and south of the Missouri and Nebraska, and along the eastern and western base of the Rocky mountains, including all the northern passes in that range, exhibiting the fitness of the country for settlement, and the practicability of wagon and railroads. Ores of lead, iron, copper, platinum, and gold have been discovered in various localities; also, marbles and other valuable limestones for building purposes.

The coals of Oregon and Washington Territories are inexhaustible in quantity, and accessible to sail and steam navigation.

The great lignite bed (tertiary coal) of the upper Missouri in Nebraska, extends over eight degrees of longitude and seven of latitude. This deposit is separated into seven seams, divided by, or interstratified with deposits of clays, sandstones, and grit. A careful analysis of specimens from various localities gives an average of thirty-eight per cent. of carbon in coke; fifty-three per cent. of volatile gasses and moisture, and nine per cent. of ashes, (white.) This deposit of legnite is situated in that portion of the country which is most destitute of timber, and the analysis shows it to be of value (by coking) for fuel and means of transportation.

The legislatures of Oregon and Washington Territories, have passed resolutions, strongly recommending the publication of the report, as containing "much valuable information as to the localities in the country explored, possessing mineral and agricultural wealth." These memorials and other papers substantiating all the facts alluded to in the foregoing statement, are on file with the Committee on Public Lands in the House or on the files of the Clerk's office.

The Academy of Sciences, St. Louis, and the Academy of Science,

Philadelphia, also earnestly desire the publication of the report, "as containing information valuable to commerce, the arts, and to science."

The Secretary of War also recommends the publication of the report "as of very great importance as exhibiting the character and capabilities of the country explored, its fitness for occupation, and settlement, the facilities afforded for the construction of rail and common roads, and in connection with the military operations of the country."

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*Memorial to Congress from the Academy of Sciences, Philadelphia.*

ACADEMY OF NATURAL SCIENCES,  
Philadelphia, February, 1860.

*To the Senate and House of Representatives of the United States of America in Congress assembled:*

The undersigned, a committee appointed by the Academy of Natural Sciences of Philadelphia, for the purpose of aiding the efforts of Dr. J. Evans to procure the meteorite now lying near Port Orford, Oregon, respectfully represent: That the discovery and preservation of meteorites is an object of great solicitude to scientific men, and that such specimens, besides the interest which attaches to them as the only objects we can reach foreign to the mass of our earth, are considered as possessing great value in scientific collections; and understanding that the one observed by Dr. Evans is so situated that it can be transported to the coast for shipment at a comparatively small cost, they would respectfully urge the great importance of securing it as soon as practicable, since, by the delay, it may become so covered with earth that the knowledge of its position may be lost.

JOHN L. LECONTE,  
SAMUEL POWEL,  
W. W. RUSHENBERGER.  
ISAAC LEE, *President.*  
ROBERT BRIDGES, M. D.,  
*First Vice-President.*  
JOHN LECONTE,  
*Second Vice-President.*  
THOMAS STEWARDSON,  
*Corresponding Secretary.*  
B. HOWARD RAND, M. D.,  
*Recording Secretary.*

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St. Louis, January 24, 1860.

SIR: In accordance with a resolution of the Academy of Science of St. Louis, the duty devolves upon me of addressing you, with a view of securing the influence of your institution in memorializing the Congress of the United States to have removed from Oregon to the city of Washington an immense meteorite, found by Dr. John Evans, United

States Geologist, in his geological reconnoissance of that territory, and also to procure geodetic measurement of the distance of its locality from Mount Pitt.

I enter upon this duty the more cheerfully as I feel that in doing so I am only conforming to the implied wishes of all true lovers of science, not only in this country, but in the Old World.

The question of the origin of these mysterious bodies is one of the deepest interest, the solution of which, perhaps, involves others of still higher moment. Are they of terrestrial origin? The secret powers of nature, which are at work in the deep and silent recesses of the earth, may become more fully comprehended, and the solution may afford important aid to the future development of chemical philosophy. Are they products from volcanoes existing in the moon? They become objects of even more than paramount value in assuring us that the constitution of the planetary spheres are almost certainly identical with that of our own earthly habitation.

We learn from the analysis of Professor Jackson, whose character as a chemist assures us of the accuracy of the determination, that this aerolite contains chrysolites, and is nearly identical in chemical constitution with that found by the celebrated Pallas on the frozen plains of Siberia. The latter was so highly prized by the government of Russia that it was transferred from this rigorous and inhospitable region to the imperial cabinet at St. Petersburg. Should our government feel less concern in treasuring up these great objects of natural curiosity and overweening interest among the scientific and learned, or should it be less munificent in advancing the great interests of human knowledge? The arts of modern civilization and refinement are based upon such knowledge, and that government which most efficiently promotes the advancement of science most effectually promotes its own interests, the interests of humanity, and the perpetuity of its own national glory.

Trusting that you will use every available means to secure the removal of this meteorite from Oregon to the cabinet of the Smithsonian Institution, and promising, if necessary, such aid as our infant academy may be able to afford, I have the honor to subscribe myself, your most obedient servant,

H. A. PROUT,

*President of the Academy of Science, St. Louis.*

Professor JOSEPH HENRY,

*Secretary of the Smithsonian Institution.*

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WASHINGTON, *November 21, 1859.*

SIR: In compliance with the verbal request alluded to in my letter of the 14th instant, I have the honor to present a few of the results of the geological survey of Oregon and Washington Territories, contained in the report ordered to be printed at the last special session of Congress.

Forty-two soils, twenty-six coals, ten iron ores, three of lead, two of platinum, five limestones, all from different localities, have been carefully analyzed by Professor A. Litton, of St. Louis, Dr. Charles T.

Jackson, of Boston, and Dr. D. D. Owen, of Indiana. Discoveries of native sulphur, salt springs in various localities, rock salt, marble, gypsum, ocher, and other valuable minerals have been discovered. The boundaries of the different gold regions have also been laid down on the geological map as far as ascertained. Three of the discoveries of iron ore are located in the Willamette Valley, and one near Astoria, mouth Columbia river, and two on the western slope Cascade range of mountains. Iron ore was also discovered in the Rogue River mountains. Our specimen from that region proves, on analysis by Dr. Jackson, to be meteoric, and is of great scientific interest. It is deemed advisable, by scientific men who have been made acquainted with the discovery, that the whole mass should be obtained by the government, and placed in the Smithsonian Institution.

On a large tributary of the Columbia, the Kooskooskie river, is a mountain of iron ore, more lofty than the celebrated iron mountain in Missouri, and fully equal in richness. The analysis of surface specimens by Dr. Owen, which probably for ages have been exposed to atmospheric influences, gives the following results :

Water .....	0.05	
Silica .....	1.90	
Peroxid of iron.....	89.95	Metallic iron.....62.993
Alumina.....	6.90	
Alkalies.....	0.10	
Loss.....	1.10	
	100.00	

In the main range of the Bitter Root mountains similar ore was discovered ; also, gold in quartz veins, in talcose slates, and platinum. Gold was also found in the same latitudes in the passes of the Rocky mountains.

Lead mines were discovered on the shores of Flat Bow lake and river, tributaries of the Columbia, in Washington Territory, and north of this river and lake in the British possessions ; also silver mines in the same locality. The gold fields of Rogue river are quite extensive, extending along the coast for a hundred miles, and from the ocean to the valleys east of the Coast range of mountains. Copper was also found in these mountains. Gold-bearing slates prevail in the Umpqua valley, near the head waters of its southeastern branch. The indications are that it will be found in sufficient quantities to justify mining. Copper was also found in quartz veins, but not sufficient to justify mining. Saliferous sandstone attains a great thickness in the valley of the Umpqua, and salt springs are numerous.

The Colville gold mines extend from a few miles north of the Spokane river far into the British possessions, connecting in a northwest direction with the Frazer's and Thompson's river gold-field. Eastward fifty miles from the Colville mines, the geology of the country changes, and the talcose slates give place to marbles, magnesian limestone, gypsum, &c., &c. The soil in these mountain regions is impregnated with fine gold, which, when the country becomes settled,

and suitable machinery and supplies can be obtained at reasonable cost, will prove very productive. Along the shores of the Pacific, in the neighborhood of Randolph and Port Orford, scales of platinum are mingled with gold in the black sand at the bottom of rivulets and along the sea-shore. Some sand collected in one of these rivulets, on analysis by Dr. Litton, of St. Louis, yielded 45 per cent. of platinum.

Sand from Cape Blanco, near Port Orford, Oregon, also yielded, by washing, 45 per cent. of platinum ore.

From the residue of the above sand left by washing, in Oregon Territory, for gold, by treating with nitromuriatic acid, was obtained a solution, out of which was obtained 44.35 per cent. of platinum.

The residue insoluble in nitromuriatic acid, consisted principally of particles of osmium, iridium, and sand, and amounted to 38.31 per cent.

Some of the soils of the Pacific coast and the Nez Percés country, between the Bitter Root and Cascade mountains, are very remarkable. They are similar in their constituents, and probably equal, to the celebrated soil near Olmutz, Moravia, which has been cropped for 160 years successively, without either manure or naked fallow, yielding every season abundant crops. This is owing, in a great measure, to the vicinity of mountain ranges, containing augite, hornblende, and serpentine, or talcose, chlorite, and magnesian schists, which prevail in the vicinity, the decomposition of which, and the vegetable matter brought down by abundant rains and the melting of snow in the spring, replenishes the exhaustion of the soil consequent upon the production of plentiful crops. In the Umpqua valley, near Winchester, the soil, over a considerable extent of country, yielded, on an average, 20 per cent. of iron, almost an iron ore; and yet the other constituents are of such a nature as to render it fine agricultural land. On a portion of the farm of General Lane, in this vicinity, the crop of wheat, the past season, was thirty bushels to the acre, on virgin soil, that had only been plowed once five years ago, and never manured.

The prairies abounding in the Rogue River mountains are exceedingly fertile. Native clover, and other grasses in season, reach the shoulders riding on horseback, and the woodlands surrounding them are frequently filled with fine grass and flowers, instead of brushy undergrowth. These prairies are of great importance, furnishing, as they do, means of subsistence in the neighborhood, for the miners engaged in the gold regions of Rogue river.

The following is the analysis of one of the prairie soils alluded to, made by Dr. Jackson :

1,000 grains of this soil separated mechanically into—	
Gravel .....	230
Sand .....	258
Fine brown loam.....	512

On analysis of the fine loam, it was found to consist of, in 100 grains—

Organic (vegetable) matter.....	29.400
Insoluble silicates.....	59.000
Peroxyd of iron and manganese.....	4.750
Alumina.....	5.250
Lime.....	0.185
Potash and soda.....	0.380
Magnesia.....	8.027
Phosphoric acid.....	0.500
Sulphuric acid.....	0.034
Chlorine.....	0.031
	<hr/>
	99.557
	<hr/> <hr/>

The following is an analysis of one of the soils referred to, made by Dr. D. D. Owen:

Nez Percés country:

Moisture expelled at 400° F.....	6.250
Organic matter.....	9.550
Insoluble silicates.....	7.2656
Lime.....	.320
Oxyd of iron.....	5.530
Alumina.....	3.800
Sulphuric acid.....	.090
Potash.....	2.280
Magnesia.....	1.080
Phosphoric acid.....	.220
Loss.....	.230
	<hr/>
	100.000
	<hr/> <hr/>

The coal fields of Oregon and Washington Territories are quite extensive, extending from near the boundary of California to the British possessions on the north, cropping out at various points throughout the entire region. These coals do not belong to the true coal measures, but are of the miocene tertiary formation. They are, however, of great thickness; and, in some localities, have been so altered and compressed by volcanic action, as that, in appearance and in their proximate constituents, they approach near to the composition of the coals of the western States.

The following analyses are from some of the most important localities:

Specimen from Fitzhugh's mine, Bellingham bay, analyzed by Dr. Owen:

Carbon.....	68.454
Hydrogen.....	6.666
Sulphur.....	1.000
Water expelled at 212 F.....	7.000
Ashes, (reddish brown).....	3.400
Oxygen, nitrogen, and loss.....	13.480

The same calculated for 100 parts of dry combustible matter:

Carbon .....	76.399
Hydrogen.....	7.439
Sulphur .....	1.116
Oxygen, nitrogen, and loss .....	15.046

Specimen from Bigelow's coal mines, Dwamish river, analyzed by Dr. Owen:

Specific gravity.....	1.495	
Total volatile matter	36.8	Moisture..... 12.00
		Volatile combustible gases..... 24.80
Coke.....	63.2	
		Fixed carbon in coke..... 52.80
		Ashes .....
		10.40
		<hr/>
		100.00
		<hr/> <hr/>

Specimen from Coose bay. Analyzed by Professor A. Litton.

Specific gravity.....	1.369
Carbon in coke .....	61.00
Volatile gases.....	27.00
Moisture .....	9.00
Ashes .....	3.00
	<hr/>
	100.00
	<hr/> <hr/>

All of which is respectfully submitted.

JOHN EVANS,  
*U. S. Geologist for Oregon and Washington Territories.*

Hon. SAMUEL A. SMITH,  
*Commissioner General Land Office.*

*Estimates of the cost of printing Dr. John Evans's Report on the Geology of Oregon and Washington Territories, 1,500 copies, in quarto, made by the Superintendent of Printing for the House of Representatives.*

For composition, 350 pages, small pica .....	\$775 50	
For press-work.....	300 50	
For dry-pressing 80 reams, at 50 cents.....	40 00	
For inserting plates .....	87 20	
	<hr/>	\$1,203 20
For 82½ reams, at \$7 84.....		646 80
For binding .....		1,562 20
For 3 colored maps, engraving, paper, printing, at \$400 each.....		1,200 00
For engraving 40 plates on steel, at \$45 each .....		1,800 00



For printing the same, at 65 cents per hundred.....	\$397 50	
Paper for the same.....	48 00	
	<hr/>	\$445 50
For 4 pages geological sections, 5 colored, at \$4 per hundred.....	\$244 80	
Paper for the same.....	38 40	
	<hr/>	283 20
Total cost of printing 1,500 copies .....		7,140 90
Total cost of printing 5,000 extra copies.....		13,886 80
		<hr/>
Total cost of printing the usual number and 5,000 extra copies.....		21,027 70
		<hr/> <hr/>

(For printing 1,500 extra copies, \$4,166 04, see detailed estimates.)

*Cost of printing 1,000 extra copies of Dr. John Evans's Geological Report.*

For press-work.....	\$208 00	
For dry-pressing 52 reams.....	26 00	
For inserting plates .....	60 00	
	<hr/>	\$294 00
For 54 reams of paper, at \$7 84.....		423 36
For 3 maps, at \$1 50 per hundred.....		450 00
For printing 40 steel plates, at 65 cents per hundred....		260 00
For paper for maps and plates.....		256 00
For 5 tinted pages, at \$2 60 per hundred.....	\$130 00	
Paper for the same.....	30 00	
	<hr/>	160 00
For 4 colored pages, at \$4 per hundred .....	\$160 00	
Paper for the same.....	24 00	
	<hr/>	184 00
For binding.....		750 00
		<hr/>
Cost for 1,000 extra copies.....		2,777 36
		5
		<hr/>
Cost of 5,000 extra copies.....		13,886 80
		<hr/> <hr/>