ART. XXXV.—*A Sketch of the Life and Scientific Services of John Evans, M.D., U. S. Geologist for Oregon and Washington Territories, and of the U. S. Chiriqui Exploring Expedition; by CHARLES T. JACKSON, M.D., of Boston.*

THE labors of pioneer geological surveyors, who visit the unbroken wilderness and scale mountains never before trod by civilized man, thread the mazes of cañons amid the Rocky Mountains, or navigate in frail bark canoes unfrequented rivers with unknown rapids and tangled with fallen trees, are of such an arduous and dangerous nature that only the boldest and most adventurous are willing to undertake or are able to accomplish them.

We look with the same interest on one who has successfully accomplished such feats in behalf of science, as we regard the war-worn veteran who has returned from a successful campaign against the enemies of his country. We know and feel what hardships he has endured, and sympathize with him in his triumphs over difficulties and dangers, while we enjoy with him the fruits of his researches, knowing how dearly they have been acquired. The enthusiastic geologist, thousands of miles away from home, throwing away much needed bread in order to preserve specimens to illustrate the mineralogy, geology, and natural history of the country he explores, kindles in us a profound respect for his self-sacrificing spirit and desire to serve, to the extent of his ability, the cause of science. Scientific explorations, in a

country infested by hostile savages, require the wisdom, coolness, and intrepidity of an old border warrior to ensure success. To accomplish such feats, and return in safety, was the fortune of the subject of the present sketch, and though, unhappily for his country, he died before his valuable reports had been published, we doubt not the Government will duly make public record of his labors.

Dr. EVANS was born in Portsmouth, New Hampshire, on the 14th of February, 1812, and was son of Hon. Richard Evans, a Judge of the Supreme Court of New Hampshire. He was educated at Andover, Massachusetts, and was in his early manhood employed for a while as a mercantile clerk. In 1831 he removed to Washington, and was employed as a clerk in the general Post Office Department for eight years. He afterwards removed to St. Louis, studied medicine, and received the degree of M.D. at the Medical College of that city. In 1835 he married Miss Sarah Z., daughter of the distinguished architect, Robert Mills, formerly of Charleston, South Carolina, but for many years a resident at Washington. By this marriage he had three sons and one daughter.

In 1847 he was appointed, by Dr. David Dale Owen, to be one of his assistants in his geological survey of the western portion of the Chippewa land district, and accomplished his duties to the entire satisfaction of his employer and the public.

In March, 1851, he was appointed, by the Secretary of the Interior, "to institute geological researches on the main lines of the public land surveys about to be commenced in Oregon," and entered zealously on that laborious duty, exploring the falls of the Missouri to the Flat Head pass, in the Rocky Mountains, and through that pass from the forty-sixth to the forty-ninth degrees of north latitude, and to the Columbia River. The valleys of the Flat Head Lake and Bitter Root rivers were also explored, and he crossed the Bitter Root range of mountains, which are one hundred and twenty miles wide, and explored the country to the Spokane, Clear Water, Snake, Walla Walla, Utillah, John Days, and Falls rivers to the Columbia, and thence to Oregon City.

He collected specimens of all the rocks, minerals, fossils, and soils of those wide spread regions, and forwarded them for description and analysis to some of the most skillful mineralogists, palæontologists, botanists, and chemists of the United States, among whom we may name Dr. Owen, Professors Litton, Leidy, Shumard, and Lesquereux, all of whom were supplied with ample materials for their scientific examination and description. To the author of this paper he sent specimens of rocks for description, and of coals, ores of iron, lead and copper, and a large number of selected soils, and a piece of very remarkable meteoric iron, for analysis.

Dr. Leidy, he informs us, has furnished no less than ninety figures of mammalian fossils, and the other scientific gentlemen have worked out the problems given them to solve, so that a magnificent foundation is laid for a most interesting and valuable report, embracing the labors of some of the most able naturalists and chemists in this country.

Dr. Evans worked steadily on his report, presented it to Congress, and having had an opportunity to re-visit Oregon and Washington Territories, by consent of Congress withdrew his report for the purpose of adding to it his last researches, and thus making it more perfect. We understand that this labor was performed, and that the revised and completed report is now in the general land office at Washington, awaiting publication, which it is earnestly hoped may not long be delayed.

One of the most interesting scientific discoveries made by Dr. Evans, during his explorations in Oregon, was that of an enormous mass of meteoric iron containing an abundance of chrysolite or olivine imbedded in it. During the Indian war in that region, Dr. Evans ascended Bald Mountain, one of the Rogue River range, which is situated from thirty-five to forty miles from Port Orford, a village and port of entry on the Pacific coast, and obtained some pieces of metallic iron, which he broke off from a mass projecting from the grass-covered soil on the slope of the mountain. He was not aware of its meteoric nature until the chemical analysis was made, but the singularity of its appearance caused him to observe very closely its situation, so that when his attention was called to the subject he readily remembered the position, form, appearance, and magnitude of the mass and manifested the most lively interest in procuring it for the government collection in the Smithsonian Institution at Washington, a duty I doubt not he would have been commissioned to perform had his life been spared.

By the aid of information contained in his letters to me, perhaps some traveler in those regions may be able to find this very interesting meteorite, and I shall therefore transcribe what he says of it. In reply to my inquiry, whether he felt confident he could again find this mass of meteoric iron, he says in his letter of May 1st, 1860:

"There cannot be the least difficulty in my finding the meteorite. The western face of Bald Mountain, where it is situated, is, as its name indicates, bare of timber, a grassy slope, without projecting rocks in the immediate vicinity of the meteorite. This mountain is a prominent landmark, seen for a long distance on the ocean, as it is higher than any of the surrounding mountains. It would doubtless be best and most economical to make a preliminary visit to the locality, accompanied only by the two voyageurs alluded to in my last letter." (Two of the Canadian Frenchmen in employ of the Hudson Bay Company.)

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"Arrangements might then be made with the Indians for its purchase, and the best plan selected for its removal. It would be expedient to procure the men and animals necessary in the Umpqua valley, east of the Coast Range of mountains, as Port Orford at present is quite a small settlement, although a 'port of entry.' The meteorite might be shipped in the California steamer to San Francisco, and from that port in a sail vessel round the Horn to Boston."

Dr. Evans estimates the appropriation required at from two to three thousand dollars.

At the General Land Office and Indian Bureau in Washington, Dr. Evans ascertained that the right to this meteorite "vests in the Indians," the land not yet having been ceded to the United States, and any agreement made with them would be binding, and the United States government could lay no claim to it. Dr. Evans then adds:

"There would not be the slightest difficulty in making an arrangement with the Indians, for I am personally acquainted with their chiefs. The principal chief, 'Old John,' spent several days in my camp of two men, during the height of the war, when it would have been dangerous for less than three or four companies of U. S. soldiers to have passed the same mountains. It would require only ten or a dozen blankets, tobacco, &c., as presents."

"As to the cost of transportation of the meteorite to Port Orford, it is difficult to make an accurate estimate. It is situated in a mountainous region, thirty to thirty-five miles from the coast, and the only access to it is by mountain trails. It might be removed in pieces of from one hundred to one hundred and fifty pounds in weight on pack mules; and accurate measurements made of the whole mass without great expense, say from \$1,200 to \$1,500. But to remove it entire would either be impracticable or involve great expense, unless indeed a river which passes the base of the mountain (Sixe's River), and empties into the Pacific, should prove navigable for a raft of sufficient size for its transportation. There is water enough, but it is no doubt much obstructed by fallen timber, and may have rapids, which it would be difficult to pass over with such a heavy load. In either mode of transportation my first duty would be to explore this river."

In another letter Dr. Evans says: "As to the dimensions of the meteorite I cannot speak with certainty, as no measurements were made at the time. But my recollection is, that four or five feet projected from the surface of the mountain, that it was about the same number of feet in width, and perhaps three or four feet in thickness; but it is no doubt deeply buried in the earth, as the country is very mountainous, generally heavily timbered, and subject to washings from rains and melting of snow in the spring, so that in a few years these causes might cover up a large portion of it. The mass exposed was quite irregular in shape. * * * *

In another letter Dr. Evans states concerning the meteoric iron:

"The locality is about forty miles from Port Orford, in the mountains which rise almost directly from the coast, only accessible by pack mules. But each mule might carry three hundred pounds weight, and if required

make several trips, to secure the whole mass. It would, however, be necessary to take along suitable tools, to separate the mass, which might if desirable be adjusted together afterwards. But I should suppose that each institution, which might furnish the funds, would desire a portion of the mass."

The latter remark refers to his proposal to raise the funds from several scientific Societies, in case that Congress should fail to appropriate money for the purpose of procuring the meteorite. The legal proprietorship in it was also inquired about expressly with this view in case Congress should fail to grant funds for procuring this very interesting object of science.*

Every possible exertion was making in Congress, and with the departments at Washington, to induce the government to take measures for procuring this very valuable meteorite, and to cause it to be placed in the museum of the Smithsonian Institution, where it could readily be examined by scientific men, but Dr. Evans death, and the present unhappy state of the country, seem to prevent the realization, for the present, of this enterprize.

Dr. Evans in one of his letters to me writes also:—"Did I ever mention to you the discovery made by me (in 1853) of platinum on the Pacific coast?—A portion of the black sand, collected from the bed of a small creek, yielded 47 per cent, as analyzed and separated by Dr. Litton."

Dr. Evans also states that "on the Western slope of Bitter Root Mts., bordering on the Rooskooski River, a large tributary of the Columbia, I discovered a mountain of iron ore, a surface specimen of which yielded, on analysis, 67 per cent of metallic iron. It is fully equal in richness and, greater in altitude, than the celebrated Iron Mountain of Missouri."

Without anticipating more of the matters, in Dr. Evans' Report, which we hope may soon be published by Government, I may say that, from the specimens examined by me, it is evident that there are vast regions of volcanic origin in Oregon, that trachytes, basalt, lavas, native sulphur, and other materials of igneous origin, were among those sent to me for description or analysis, and there were also specimens of pure rock salt, which the note accompanying the specimen stated was "in great abundance," as also was the native sulphur.

Argentiferous lead ores, and specimens of yellow copper pyrites, were also discovered, besides numerous ores of iron and many tertiary dry coals, before mentioned.

Dr. Evans adds: "Is it not worthy of note in the history of nations, and is it not a great honor to our national Legislature, and the Officers of the

* If the Bald Mountain meteoric iron is like in tenacity and hardness to that of most known masses of similar origin, the dissection of it would prove a task of far more difficulty than seems to have been supposed by Dr. Evans: so great indeed that in our judgment it would be impracticable, to the extent suggested. If its dimensions—which appear to be quite conjectural—are not something excessive (like those of the great Columbia and Brazilian irons) the cost of transporting it entire the moderate distance of thirty or forty miles would certainly be less than that of its dissection. It would not be difficult, with the aid of a good mechanic, to contrive a vehicle which would both raise it from its bed and effect its transport.—Eds

General Government, that they should have instituted and completed, a Geological reconnaissance of the vast regions between the Western States and the Pacific Ocean, and from the British possessions to the boundary of California? This survey, exhibiting as it does by careful analyses the constituents of all the prevailing soils, coals, and minerals: and that too whilst the country for the most part is still inhabited by savages!

"Extensive beds of semi-anthracite (or perhaps more properly semi-bituminous) coals, ores of iron, lead, copper platinum, gold, sulphur, rock salt, &c. &c. have been discovered, in various localities, which will prove of great commercial advantage in view of the important trade between China and the islands of the Pacific and western coast."

In the prosecution of his surveys, Dr. Evans was assisted by Dr. B. F. Shumard, of St. Louis, who has kindly placed in my hands a large amount of information, concerning the discoveries made on his surveys, and also an account of Dr. Evans' discoveries in the *Mauvaises Terres*, of a vast number of bones representing the ancient and extinct fauna of Nebraska, a region explored by Dr. Evans, while in the employ of Dr. D. D. Owen, researches from which Dr. Leidy derived those interesting materials, for his very valuable memoir. The attention of scientific men was first called to the *Mauvaises Terres*, as a charnel house of fossil remains, by Dr. Hiram A. Prout, (see this Journal, [2], vol. ii, page 248).

To Dr. Evans is also due the discovery of the Pass of the Rocky Mountains, named after Cadotte, who is not its original discoverer, as we are assured by Dr. Shumard, as well as by Dr. Evans himself.

We omit the very interesting descriptions, which, both Dr. Evans and Dr. Shumard have given of their wilderness adventures, trials and perils; but before closing this paper, I would say that Dr. Evans, in his journey across the Rocky Mountains, met with the usual misfortunes which attended all early travellers in that desolate region:—that he was reduced to the necessity of killing and eating his pet dog after having, in his own words, "thrown away bread to preserve stones:"—that his mules gave way under labor and privations, amid these fastnesses, and were left to die, while our geologist, braving all dangers and fatigues, forced his way over the mountains and reached his destination in safety.

Dr. Evans, fortunately for himself, acquired a high renown among the Indians, for his supposed power of curing the cholera, and his Indian name means, the medicine man who kills the cholera, he having been fortunate in his treatment of the cases, which came under his care. On one occasion, a delegation of chiefs waited upon him, and besought him to "make medicine," (perform some mysterious rite), so that the Great Spirit would send them plenty of Buffaloes, protect their corn from frost, and give them a moderate winter." They fully believed in his great

influence with the celestial powers, and to this superstition, undoubtedly, he owed his life in his adventurous travels, amid the war paths of hostile Indians. He was informed that all the chiefs of the tribes west of the Rocky Mountains knew him; for they have a way of telegraphing intelligence to great distances, without the aid of electricity. Dr. Evans's sextant, on one occasion, certainly saved his life from predatory Indians, who came to kill him and his party, but were awed by his bringing down the sun at his will, and they went away and reported that they dared not kill him; for some great misfortune would be sure to fall upon the tribe if they injured so great a medicine man. Large parties of miners have been killed when endeavoring to follow the paths which Dr. Evans passed in safety, and a party of a dozen of them were killed soon after Dr. Evans left Rogue River Mountains when they endeavored to visit the spots he had explored.

Dr. Evans went to Central America last year as geologist to the Chiriqui Exploring Expedition. He there discovered, in the lagoon districts of the Gulf of Chiriqui, an abundance of excellent bituminous coals of the Eocene Tertiary age, the aggregate thickness of the beds being $73\frac{1}{2}$ feet, while their mean thickness was not far from four or five feet. Six of the beds, he states, are so contiguous one over the other as to be mined together in a thickness of clear coal of thirty feet.

Such a deposit, of good coals, was of vast importance to the enterprise then in contemplation, of opening a new route across the Isthmus to the Pacific Ocean—a project which we trust will be revived, when the unhappy war in which the country is now engaged shall be brought to an end.

These coals, analyzed by the writer, were found to be of excellent quality, and suitable for all the uses to which good bituminous coals are applied. These Tertiary coals undoubtedly contain succinic acid, for they give out the fragrant odor of burning amber when heated. They differ from the lignites of northern Tertiary beds entirely, and seem to point to a condition of things such as must have existed during the older and regular Coal formation.

The gorgeous scenery of the tropical forests, and luxuriance of vegetation in Central America, seem to have strongly impressed Dr. Evans, and he expressed in his letters to the General Land Office an intention of removing with his family to Chiriqui. A dangerous delusion! for the destructive effects of that seductive climate have proved fatal to nearly all the northern explorers who have labored there, and we have no doubt that Dr. Evans' constitution was enfeebled by his exposure in that region during the summer months and the rainy season, so as to render him incapable of resisting the very mild attack of pneumonia, which ended his career by death, in Washington, April 13th, 1861.

He died in the midst of his labors, and before they had been made public; but his work had reached a state to ensure it from being lost to the world. A simple resolution of Congress is now all that is needed to bring forth from the government press his report containing, as we believe, matter of value in this country alike to science and the general public.

Boston, September 1, 1861.