

Noted Geologist, Without Price, After Year's Study, Says

Oil Field Is Here

CLEMENT L. WEBSTER, M. S.; Geologist, Minerologist, Paleontologist and Scientist,

who is endorsed by the Department of the Interior through the Geological Survey, through J. W. McGee, assistant chief and acting chief at all times for J. W. Powell, who was chief of the Geological Survey; endorsed by the Smithsonian Institution and the Bureau of Ethnology, who appears as an authority in "American Men of Science," second edition, and in the publication of the world known as "Who Is Who;" whose works published on paleontology are used as textbooks in Yale college and are referred to and accepted by all workers in this line of science; who is the author of 200 published titles, including books, maps, geological charts (mainly scientific), covering the principal gas and oil fields of the United States, portions of Canada and Old Mexico; who conducted work in engineering for the Iowa State University as a specialist in geology and paleontology; who is a member of many of the highest scientific societies of the world, with over 30 years of technical and practical experience in the leading oil fields of the world, tells the world what he knows about the Guaranty Oil Company's properties here and at Eugene.

This wonderful man has spent over one year in making a careful survey of the oil structures in and near Lane county, Oregon, including the drilling block and the two oil wells now being drilled by the Guaranty Oil Company of Oregon. Without solicitation, of his own free will and accord has signed and submitted the following favorable report upon the Guaranty Oil Company's properties.

Only one motive can be found or ascribed to him for so doing and that is that he naturally wishes to be on record so that in the future he can tell the world, "I told you so."

MR. WEBSTER'S REPORT

Doctor D. E. Olson,
President The Guaranty Oil Company,
Eugene, Oregon.

Dear Sir:

I herewith submit to you my report upon the conditions found existing in the oil bearing regions of western Oregon and the Eugene quadrangle, and other territory embraced within this great oil area, which in this report I have provisionally designated as the Pacific Coast Oil Area.

GENERAL STATEMENTS

It may be sufficient for the purpose of this report to state that: Herein are presented facts as to conditions found and known to exist in the oil area here considered, and on which conditions the conclusions here presented are based, these conclusions resting upon well developed geological principles recognized by leading oil geologists and oil development companies.

EXTENT OF THE OIL AREA INVESTIGATED AND TIME CONSUMED IN INVESTIGATION.

The extent of this Pacific Coast Oil Area investigated by me extends from the southern state line of California to the south to and beyond the southern state line of Washington on the north, and comprises much of the western half of the states of California and Oregon especially; and the time consumed in these investigations began about the first of December, 1923, and extended to the last of December, 1924. The presentation of interesting details encountered and investigated in this research work would be too voluminous for this report and here serve no essential purpose.

The great and now famous oil and gas area of California is too well known to the oil world to warrant discussion here. Suffice it to say that this is now recognized as one of the greatest and finest productive oil areas existing within the United States; and it is well known to oil experts that this great area is very far from exhaustion today. This area in California presents some features of special interest, one of them being the adequate porosity of many of the oil sands, which permits of the accumulation of large bodies or pools of oil; and another being the richness of the several great general oil horizons, down to the depth of 4000 feet and more.

The geology age of the strata of this great oil area varies somewhat, the lowest California oil being as now recognized, in the topmost Cretaceous, and extends upwards into the Tertiary, including the following great subdivision: Tefon, Sespe, Vaqueros, Monterey and Fernando.

THE PACIFIC COAST OIL AREA OF OREGON.

This area in Oregon is a continuation of the same great oil area of California with, of course, some lithological variations from the general characters there, the geological age being practically the same as two main divisions. In the Oregon area there exists a slight question as to the geology age of one or more of the subdivision, but as this question is not one vital as to the occurrence of commercial oil in the state, this matter will be passed over in the report.

In the southern central and southeastern portions of Oregon the oil structures and lithological characters of some of the oil strata varies somewhat from that of the same area in this state as it extends to the state line of Washington, and presents some phases of especial interest and importance, but as this report is especially concerned with the Eugene Quadrangle, a discussion here of these questions will be deferred.

GEOLOGICAL FORMATIONS, CONDITIONS AND OIL STRUCTURES OF THE EUGENE QUADRANGLE.

Special and extended study and investigation of this quadrangle has been conducted by me during a part of the period previously mentioned in this report, and these same investigations continued over wide areas in northern Oregon, and extended into Washington.

In all my many years of labor and experience in geology and oil field investigations in the United States, I have nowhere seen finer or more numerous typical geological oil structures (including domes, anticlines, synclines, monoclines, closures, confining beds, etc.) than are shown in the Eugene quadrangle and certain regions contiguous to it in Oregon. It is true that at times a wildcat well may be drilled on a good geological structure, but this is not the rule. This fact is well illustrated by drillings conducted in a certain Wyoming oil field, as well as elsewhere.

In the Eugene Quadrangle is presented facts and geological conditions of great economic interest and importance as bearing on the question of this finally proving a productive oil field. Here is shown to be present the great beds of fossils and marine life of the same geological age as the great oil producing fields of California, and this usually shows evidence of a large source of oil supply; there here exists large numbers of oil structures of the most perfect type and generally they are found with perfect or nearly perfect closures, all of which means very much in favor of the accumulation of oil; splendid confining beds above and below. It has an important closure on the east side of the area formed by a great dike of basalt of special geological interest and importance. This dike is known to me to extend northward for more than 125 miles and to have large and important branches. This is indeed a remarkable and rare feature in the known oil fields. A rare and remarkable feature relating to the dike is the fact that nowhere have I observed much if any evidence of metamorphism of the marine sediments, although in many places there exists a perfect contact between them. A very important fact is also noted, and that is this great dike is geologically very young, having been formed at a period long after all the marine sediments of this quadrangle had been laid down. This may have some bearing upon the question of early accumulation of oil here. After its appearance, this dike had the effect of closing this oil field on the east, and also aided in forming, together with other mountain-making forces at work here, the important oil structure here and there of the monocline of this quadrangle.

The oil well at Eugene is being drilled on the apex of a splendid oil dome or anticline not far from from the dike. Comparatively few as perfect oil domes exist in most other oil fields. The oil well now being drilled at Cottage Grove is so nearly analogous to the one at Eugene in all respects that the statements herein made relating to the Eugene well can apply equally well to this.

The geological series at and near Eugene in which the oil wells of this quadrangle are being drilled belong to two great geology ages: the upper part of the Cretaceous, and the Tertiary. The latter perhaps included the Eocene, Oligocene and Miocene. There may be some doubt expressed as to the exact of at least one of the above formations, but as this question is not of material importance as to the occurrence of oil in the Eugene Quadrangle, this question, like some others herein referred to, will not here be discussed.

Oil and gas seepages exist at various points at and near the two above wells now being drilled, showing, of course, that they originate from the rocks below. In a few cases, I am convinced, marsh gas has been mistaken by a few for petroleum gas.

The depth to which the boring of the well at Eugene has reached, I am informed, is approximately 2500 feet; and the drill has already passed through several oil sands yielding the officials of the company state, from one to seven or more barrels of oil. This was cased off, the drill continuing greater depth. This oil occurs at about the central portion of the Tertiary as here represented. The borer, at the present depth, is now bringing up considerable quantities of gas and some oil, as reported by officials of the company and by all the drillers; and both oil and gas from the well at Cottage Grove, which is down around 1500 feet at the present time.

OIL HORIZONS OF THE EUGENE QUADRANGLE.

In the quadrangle there exists at least two distinct general oil and gas horizons: one at or near the center of the Tertiary series as here represented, and a second horizon in the Cretaceous immediately underlapping the Tertiary here, the same being the equivalent of the very productive oil sands of southern California.

The drill at the well at Eugene has already passed through this first oil horizon of the Tertiary, as previously stated, and will reach the Cretaceous horizon below at the depth of 3400 to 4000 feet (and there is a possibility of oil and gas being reached even before the depth of 3400 feet is attained); and there appears from the evidence a possibility of oil being reached here at even a somewhat greater depth. The drill alone can definitely determine that question at the present time.

EQUIPMENT, DRILLERS AND DEPTH TO WHICH DRILLING MAY BE CONDUCTED.

The drilling equipment at these two wells I believe to be among the very best for the purpose and work undertaken, and can attain any required depth that may reasonably be desired, and the same is being handled with great efficiency.

GEOLOGICAL AND TOPOGRAPHICAL LOCATION OF THE EUGENE QUADRANGLE.

This quadrangle could not well be better located either geologically or topographically. Geologically it presents features splendidly adapted to the accumulation of large bodies or pools of oil and gas; and topographically it is splendidly situated in a most desirable region between the Coast Range and Cascades, and in these respects duplicates some of the largest and best oil fields of the world.

DRILLING SITES.

In some places in this quadrangle it will be safer in boring for oil to locate the drilling on the slope of the structure rather than on its apex, for the reason, among possibly others, that the porosity of the oil sands is so reduced the oil will not accumulate at the apex but on the flank of the dome. In other cases, however, the boring may safely be begun on the apex of the anticline. These facts are well illustrated by Plate I and Plate II of this report, which represent actual and common conditions in oil fields.

PREPARATION FOR THE BRINGING IN OF THE WELLS.

Adequate preparations should be made for the bringing in of the two wells of the Eugene Quadrangle, and so be prepared for whatever events may take place at such bringing in.

GENERAL OPINIONS OF GEOLOGISTS AS TO POSSIBILITIES OF THE OCCURRENCE OF OIL IN OREGON AND THE EUGENE QUADRANGLE.

Many of the leading and experienced geologists of the country are convinced that the oil area of Oregon considered in this report will prove a productive oil field when properly developed; and I personally share in the opinion, this opinion on my part being based upon the long and continued personal investigations and study of the region herein considered, as well as on extensive knowledge of all the principal oil and gas fields of the United States and portions of Canada and Old Mexico.

METAMORPHISM.

I find that in the Eugene Quadrangle as well as in many other oil areas in Oregon here considered, metamorphism has played a much less important part than has generally been supposed, and that there is much less evidence existing as to metamorphism here than has been thought possible.

PHYSICAL CONDITIONS OF THE OIL SANDS OF THE PACIFIC COAST OIL AREA OF OREGON.

From my investigations I have found that the oil bearing sands and limestones of southern California gradually become less porous (contains less voids) as they extend northward and enter Oregon and continue to its northern boundary, this being chiefly noticeable in the upper parts of the Tertiary throughout the entire area here considered.

This lessening of porosity of the oil sands of the Tertiary of Oregon becomes a most important matter at times and one which cannot be overlooked without grave danger to the development of this area as a profitable oil field. But very few even of the oil experts have recognized this important condition, and those who have have kept it to themselves or the oil companies employing them.

This lessening of the adequate porosity of the oil bearing strata, in places of this region, is responsible mainly for the lessening of the size and importance of the oil pools here.

The truth of these statements becomes apparent to the expert who carries out an extensive and protracted research investigation throughout this extensive area, as I have done, and in no other way can these facts be adequately ascertained. The Cretaceous rocks below do not appear to lack this porosity, as do the upper portions of the Tertiary oil rocks above.

The high oil structures or domes on the eastern border of the Eugene Quadrangle are the first to peel or show the bad effect of this lessened porosity and the consequent lessened accumulation of oil into pools here, while the smaller oil structures of the monocline below generally offers the greater inducement for the accumulation of oil into pools. In the area here considered this lessened porosity of the oil strata is rarely ever due to metamorphism, but to a condition existing at a time when the constituent elements of this strata were originally laid down in the ancient seas. This lessened porosity of oil strata is not uniform by any means throughout the entire area here treated of, but is more or less spotted with this condition. As stated, this condition should be fully understood, that all elements of risk may be eliminated so far as possible in the exploration for oil in this area. This condition as above set out has proven a stumbling block to many geologists who have not had the time or opportunity for adequate study and investigation of the oil strata of this entire Pacific Coast Oil Area.

THE GUARANTY OIL COMPANY OF OREGON.

From my personal acquaintance with the personnel of the Guaranty Oil Company of Oregon, I am much pleased to say that during my long and extensive acquaintance with corporations I have at no time found a more honorable, square dealing, conscientious group of men belonging to a body corporate; and such are certainly entitled to the hearty support and encouragement of every loyal citizen at all interested in the development of the natural resources of a region or state.

Respectfully submitted,

(Signed) CLEMENT L. WEBSTER,

Geologist and Mining Engineer.

Eugene, Oregon, December 30, 1924.