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TASMANIA'S LIQUID OIL POSSIBILITIES

NOT WORTH INVESTIGATION

Lecture by Government Geologist

In view of the prevailing keen discussion as to the possibilities or otherwise of the discovery in Tasmania of supplies of liquid oil, special interest attached to Monday's meeting of members of the Royal Society, when the Director of the Geological Survey of Tasmania (Mr. Loftus Hills) delivered a lecture bearing on the question under the general title of "Oil". Mr. J.A. Johnson was in the chair and there was a good attendance.

Explaining that by the term petroleum implied either rock or crude oil, and included natural gas, bitumen, lubricating oils, kerosene, and benzine or petrol, the lecturer mentioned that it was mentioned historically, both in the Scriptures and the Classics. In the account of the building of the Tower of Babel, where the authorised version stated, "Slime had they for mortar", the Vulgate translation for "slime" substituted "bitumen". Herodotus in 450 B.C. referred to the pitch lake or spring in the Ionian Island of Zante, where the flow was as abundant today as it was then. Long before the Christian era, boring for gas by the Chinese was a recognised industry, and for centuries petroleum had been obtained by means of hand dug wells in Burma, Roumania, and Galicia. Natural gas was first turned to commercial use on a large scale in America, followed in 1859 by the discovery and use of oil found in surface flow or in the course of gas boring operations.

As regards the second division of oil shale, Mr. Hills indicated that this was essentially a clay laminated rock from which oil could be extracted by heating. Shales were of two distinct types, that impregnated with petroleum and that carrying as an essential constituent particles of "kerogen", the mother-substance of petroleum, which, on being heated, gave off liquid oils and gases. Of the two the latter was by far the most important, including as it did, the kerosene shales, Pelionite, Tasmanite, and the Ohio shales. Petroleum consisted of a series of compounds of carbon and hydrogen which might be solid, liquid, or gaseous. In all there were three main types of oils. First the paraffin base oils, such as Pennsylvania crude light oils, containing 50 per cent or more of gasoline and kerosene; secondly, the asphaltic base oils, such as the heavy crude oils of Texas and California, which, containing no gasoline or kerosene, were rich in lubricating oils; and lastly, the rich naphthene base oils of Russia (containing 80 per cent of naphthene) and of Roumania and Japan, each of which made excellent motor fuels and medicinal "paraffin". In all oils there was to be found an admixture of these dominating types, and the aim of industry was to break down the heavier oils into lighter oils by catalytic processes.

As regards the geographical distribution of oil, the lecturer said that liquid oil was found in large quantities in the United States of America, Canada, Mexico, Galicia, Persia, and Mesopotamia, Russia, Roumania, Burma, Japan, the Dutch East Indies, Italy, Germany, Trinidad, Peru, and the Argentine. Of the world's production, the United States

was responsible for 66 per cent, Russia for 17 per cent, Mexico 5 per cent, and Roumania, the Dutch East Indies, Burma, Galicia, and Japan, the remaining 12 per cent. Geologically, oil was met with in sands, sandstones, and dolomitic limestones, all of them containing pore spaces or fissures for storage purposes. The greater number of oil fields were found in Tertiary rocks aged from one million to thirty million years, and at that the youngest of all the rocks. All the world's fields (with the exception of those in America - The Californian and Gulf Coast fields excluded -) were in Tertiary rock, which contained 57 per cent of the known supply. The American oilfields were mostly in Devonian rock 350 million years old, whilst the Argentine fields were in 100 million year old Jurassic.

The origin of these oilfields, said Mr. Hills, was explained by a variety of theories. That they derived from meteorites in which hydro-carbons were found was as untenable as was that of Berthelot and Mendeljeff that their origin was inorganic. As regards the theory of organic origin, the contention that oil proceeded from vast accumulations of animal remains was to be discredited, on account of the entire absence of phosphates. Plant life was generally recognised as having given rise to both liquid oil and the kerogen of oil shales. Just as coal resulted from the compression of vegetable deposits and varied according as the bacteriological decomposition took place under marsh bogs or below the sea, so, too, sea water was apparently essential to the decomposition type which ultimately produced petroleum. Investigation had shown that in the coal series, ranging from peat through lignite and bituminous and semi-bituminous coals, to anthracite, which was practically pure carbon, a fixed carbon ratio could be arrived at, and further that in no rock series where more than 65 per cent of carbon obtained, could there be any expectation of finding oil.

Passing from a discussion as to the stage at which oil was formed, the lecturer dealt with its surface manifestations on land and at sea, and mentioned that the fact of there being instances of the existence of oil without such indications, gave company promoters the alleged justification for boring where there was no geological hope of striking oil. He proceeded to describe the methods of tapping oil and the immense yields and occasional fearful conflagrations which had resulted. Assuming the role of a typical company promoter, he made out a plausible case for the presumed existence of liquid oil in Tasmania. Rocks of suitable geological age were to be found, he said, in Tasmania. Vegetable deposits there were on an enormous scale, and, furthermore, the native coal contained less than 65 per cent of fixed carbon. Therefore, he dissemblingly asserted, oil must occur, and if there were no surface indications of it, such was the case with some of the biggest oil fields in the world, and only by boring could certainty be arrived at.

Reverting to his true role as unbiassed scientist, he then declared that, however unpalatable the truth might be, there was a big fly in the ointment. He had purposely left until that stage of his lecture, the dominating features as regards the occurrence of oil. The root of the matter was not so much how oil was formed as how it was stored, and this was a matter of geological formation, which applied to every oilfield the world over. In every instance the sand, sandstone, or dolomitic limestone containing the oil well must be and was underlaid and overlaid by impervious rock substance. In every case the oil was held in strata associated with rock horizons bent into broken or complete folds by geological compression,

and only by this compression could the oil be squeezed out of the mother kerogen, and its containing chamber be formed.

Mr. Hills then submitted the geological formation of Tasmania to the test of this essential requirement, and reminded his audience that the West Coast of Tasmania was originally a part of the great continent of Gondwanaland, which extended through South Africa to South America. The subsidence of the intervening land stretches resulted by way of compensation in the upward forcing of Tasmania, where, although the necessary accumulation of oil yielding sediment had taken place, the resulting forces were entirely tensional, and not compressive. The rocks carrying the potential mother substances were in consequence subjected neither to the folding essential to oil storage nor to the pressure from which the oil might have originated.

It might be objected, remarked the lecturer, that it was dogmatic to assert that the whole of Tasmania could not contain oil, but by blocking out the island as a potential field they were but doing on a small scale what had been done in large tracts of North America where it was recognised that under similar conditions oil was not to be thought of. "It is a pity", he concluded, "to waste time on liquid oil in Tasmania when there are so many wonderful resources awaiting capital for their development. Why chase a will o' the wisp, when, on all the scientific evidence it is quite hopeless?"

The chairman remarked that the lecture both historically and geologically had been an admirable one. As a specious company promoter the lecturer would have the power to considerably increase his income, but his devotion to truth left him no course open other than to tell the public that there was very little prospect of oil being found in Tasmania.

In reply to questions, Mr. Hills said that it was calculated that the known American reserves would be depleted in 1935 and that by 1950 the world's oil supply would be exhausted. The oil shales on the other hand contained reserves greater than all the oil already obtained, and it was the problem of economics to convert them into marketable products.

As regards the distribution of asphaltum on the Australian coast, it had to be remembered that its presence was never met with above high storm mark. The explanation offered by Sir Douglas Mawson was that its source was in the Antarctic, from where it was borne by travelling icebergs.

On the main topic of oil in Tasmania, the Government Geologist commented that the subject was one concerning which the public should have the full benefit of knowledge accumulated at the public expense. (The Geographical Survey was a national undertaking and the public expense.) The Geological Survey was a public expense and the public should have the exact information that they desired. (?) Misprint.

Contrary to the standing custom of the Society, a vote of thanks was carried by acclamation.