

9th December, 1921

The Honourable,
The Minister for Mines,
HOBART

Dear Sir,

SEARCH FOR OIL IN TASMANIA

In accordance with your instructuins I beg to submit the following comments on the proposal made by Mr. J. T. Moate on behalf of the Adelaide Oil Exploration Company to search for oil and oil-producing substances in Tasmania, which proposal requests (inter alia) the exclusive right to search for oil and oil-producing substances in Tasmania for five years.

The suggested scheme purports to be designed to bring about the development of some of the natural resources of Tasmania and as the development of our natural resources is the great objective of the Geological Survey of Tasmania, any proposal bearing thereon would naturally receive our very earnest consideration. Accordingly I have considered the proposal made on behalf of the Adelaide Oil Exploration Company in great detail and have met Mr. J. T. Moate and heard his views in connection with it.

There are many different view-points from which the proposal may be considered and I will deal with the matter under several headings which summarise these view-points.

There are two phases of the proposal which are clearly separable. These are the mention of:

- (1) Liquid oil; and
- (2) Oil-producing substances.

The questions involved in these are distinctly different, and I will therefore deal with them separately.

(1) LIQUID OIL

The proposal requests the exclusive right to search for liquid oil in Tasmania for five years.

In dealing with this request I wish first to discuss the question as to whether in the light of certain knowledge we possess any expenditure in this direction is justifiable. I shall then deal with the merits or demerits of the proposal if such search were justifiable. I will then demonstrate what effect the adoption of the proposal would have on the reputation and future of the mining industry in Tasmania.

- (a) Justification or Otherwise for Expenditure on the Search for Liquid Oil in Tasmania in view of Results of the Work of the Geological Survey for the past Thirty Years

The expressed intention of the Adelaide Oil Exploration Company, if granted the concessions asked for in the proposal, is to carry out geological surveys in Tasmania in their endeavour to locate liquid oil in this State. In considering this contention it is essential to ascertain what geological surveys have been carried out in Tasmania up to the present time. I would therefore beg to draw attention to the fact

that up to the present date the sum of approximately £65,000 has been expended in the carrying out of geological surveys in Tasmania. In addition to that, we have the results, which are very considerable and valuable indeed, of the work carried out through a long period by the late Messrs. R.M. Johnston, I.S.O. and Thos. Stephens M.A. The whole of the information thus acquired is in the possession of the Geological Survey of Tasmania, and I desire to specially emphasise at this stage the fact that the one great authority in the world concerning the geology of Tasmania is the Geological Survey of Tasmania. A great part of the information in our possession has been issued and is available in printed form, but a very appreciable has not been published but is in our possession in acquired knowledge and records in the office. That the whole of our knowledge has not appeared in published form is due to the influence of those individuals who have demanded the publication of commercial reports with the elimination of scientific matter. The Geological Survey has repeatedly pointed out the desirability of publishing such matter, and through the efforts of various Ministers some of it has been written up and published, but a considerable part which would be of value at the present moment is in existence in our minds alone. Such information is constantly used by us in making our recommendations and reports, and it is therefore clear that the one source of detailed information with regard to the geology of Tasmania is the Geological Survey. One cannot expect new arrivals in Tasmania or those residents in other parts of the world to possess this knowledge, but it is always available when asked for.

Now in considering the proposal, it is clear therefore that new arrivals in Tasmania and those paying attention to the State residing in other parts of the world are at a disadvantage in not possessing this information. If, however, the published reports of the Geological Survey are studied a considerable knowledge of the geology of Tasmania could be acquired, but of course it is essential that these reports should be read in their entirety and the statements contained therein considered in proper relation to the whole. It has come under our notice that many of these publications have been misread and false conclusions drawn therefrom. As an example in this connection I beg to draw attention to a mistake made in quoting from Bulletin No. 30, page 37. As will be explained later, anticlinal structures are amongst those which are essential to the storage of oil in nature. In bringing forth evidence that the Pelion district is favourable for the occurrence of liquid oil, a passage from Bulletin 30 which deals with this area has been quoted as follows:- "The strata are faulted in a series of long, roughly parallel anticlines and synclines". This statement is certainly made on page 37 of Bulletin 30, but the whole point of the matter is that it is made in connection with the Algonkian system, and definitely not in regard to the Permo-carboniferous system. The significance of this lies in the fact that if the folding occurred in the Permo-Carboniferous system the district may be favourable for oil, but folding in the Algonkians is no indication of oil whatsoever. The full quotation bearing on this point in Bulletin 30 is as follows:- "Occupying the greater part of the surface are the Algonkian formations which underlie all other sediments occurring here. An examination of the structure of these formations shows that the strata are folded in a series of long, roughly parallel anticlines and synclines which have been

truncated by Pre-Carboniferous erosion, and also by the action of Pleistocene glaciers". It is regrettable therefore that our publications are not read and interpreted correctly as nothing could be in plainer English than the above.

Examining now the proposal itself, it is perfectly clear to me that it is the result of a very incomplete appreciation of the geology and geological history of Tasmania, and in considering the desirability of the carrying out of the geological surveys suggested in the proposal and in the manner indicated therein, it is essential to bear this in mind. It is obviously going to serve no useful purpose to repeat work which has already been carried out at considerable expense, and it is therefore my duty as Director of the Geological Survey of Tasmania to point out where this expenditure is going to be a duplication.

At this stage I desire to point out the fact that geological structure and geological history are the same whether they are considered in relation to a deposit of copper ore or a deposit of liquid oil. A geological survey is a geological survey no matter for what purpose it may have been carried out. There is the tendency at the present moment of referring to "oil men" and "oil geologists" as quite apart from "geologists". Certainly there exist men whose experience has been largely confined to geological surveys in connection with oil deposits, but there is no ignoring the fact that the elucidation of geological structure, which is the main question to be determined in considering the possibilities of any region for liquid oil, is the work of a trained geologist whether he calls himself an "oil geologist" or anything else.

It may be as well here to draw a parallel between the geological and medical professions. Just as a properly trained medical man practising in a temperate climate may encounter the presence of a disease generally characteristic of a tropical climate, and could diagnose and treat it successfully, so a thoroughly trained geologist working on geologic structures could answer any question in regard to the possibility of oil in those structures, which may suddenly arise; and so it seems to me necessary to emphasise at this point that the thoroughly trained officers of the Geological Survey are as competent as any geologists from any part of the world to express an opinion in regard to oil possibilities in Tasmania; and further than this, that their possession of a knowledge of facts in regard to the geology and geological history of Tasmania, possessed by no others in addition to their thorough training, gives them authority to speak with greater certainty than anybody else of the possibility of oil in Tasmania.

In considering the proposal therefore to carry out geological surveys in Tasmania in connection with the attempt to locate liquid oil, it must be remembered that we already possess very definite knowledge in regard to the salient geologic features in Tasmanian controlling the occurrence of oil. We possess this to such an extent that it can be definitely stated, and is now so stated by me, that 21,000 square miles of Tasmania has no possibility of containing liquid oil. Of the remaining 5,000 square miles which is country of which we know very little, the greater part, we have evidence to believe, is most unlikely from the point of view of the occurrence of oil.

If these salient geologic features were not so definitely indicative of the absence of oil, but on the contrary gave even the slightest hope, then the detailed geologic survey and mapping suggested in the proposal would be desirable. Under the circumstances, however, those proposing to spend the money on this work would be well advised not to so waste their capital as the work could never give them any financial return although it would of course have a value, under certain circumstances, to the Geological Survey.

To propose, therefore, to spend £10,000 a year for the next 5 years in carrying out geological surveys searching for liquid oil is to repeat work which has already been done. It is of course necessary that in the years before us the detailed geologic mapping of Tasmania should be continued in those areas as there will be objectives to attain by so doing which are very desirable but which are quite apart from the question of the occurrence of liquid oil. The position concisely therefore is that the Geological Survey of Tasmania as the result of the geological investigations carried out by it and by other qualified geologists at a cost exceeding £65,000 is able to definitely state that there is no necessity for the proposed expenditure by the Adelaide Exploration Company in carrying out geological surveys as this work would be merely repetition. Tasmania, as a matter of fact, should regard itself fortunate, in possessing this information and being able to give advice which will prevent the useless expenditure of that money which, if available, could be advantageously utilised in the development of some of our actual natural resources.

The idea prevalent in certain quarters that there is a possibility of liquid oil in Tasmania is due to many misconceptions and a lack of knowledge both on the general question of oil occurrence and on the question of the geology and geological history of Tasmania. A great deal of this misconception is due to the fact that individuals with no training in the fundamental principles of geology refer to books on the occurrence of oil, and read them without that knowledge of general principles which is necessary to properly assimilate the information and to correlate its various parts properly with the co-ordinated whole. Again I would refer to a parallel in the medical profession. A layman obtaining possession of a popular medical work of the type common in many households, will, after reading several pages of it, imagine that he has several diseases. The trouble arises from his limited knowledge. There are many individual symptoms which are common to many diseases, but the existence of any symptom must be regarded in its proper relation to all the other symptoms and conditions before a successful diagnosis is possible. The lack of knowledge of these other general conditions and symptoms results in the layman deducing that because he has certain individual symptoms he has the disease. And so a layman reading a work on the occurrence of oil reads of certain features as indicating the existence of oil, and in his ignorance of the other general conditions essential to the occurrence of oil, he makes very serious mistakes and, in many cases, after reading the work can see the existence of oil almost anywhere.

It seems desirable at the present time to indicate several of the mistaken and unbalanced conclusions which are typical of the statements which accompany the expression of opinion that oil exists in certain parts of Tasmania.

- (i) It has been stated that as it is well known that Permo-Carboniferous or Tertiary strata in certain parts of the world contain oil pools, and as Permo-Carboniferous and Tertiary strata occur in Tasmania, so Tasmania should contain oil deposits.

This is a totally erroneous idea as the determining factor as to whether these rock series carry oil or not is not that they are of Permo-Carboniferous or Tertiary age, but because of what has happened to them since they were first laid down as sediments. The fact indisputably established by the Geological Survey is that these strata in Tasmania have had a totally different experience since their formation than those of other parts of the world where oil occurs and that they have not been subjected to those conditions which would result in the formation of oil pools.

- (ii) The conclusion has been drawn that because the chemical composition of a substance called "Pelionite" is practically identical with that of a substance called "Albertite" that the two substances are identical in character and origin. This results in the further inference that because Albertite has been determined as inspissated petroleum, therefore Pelionite is inspissated petroleum. This conclusion is again in error, and is due to a lack of knowledge of chemistry.

It is well known to any trained chemist that the same chemical composition may characterise substances of totally different general character and origin. For instance, starch and sugar have the same chemical composition, but nobody would attempt to say that they were of the same general character and had the same mode of origin. In the same way a diamond and black lead have the same chemical composition, but it would be ridiculous to say that they are the same substance and have the same mode of origin. And so, although Pelionite and Albertite have the same ultimate chemical composition, the other chemical, physical and microscopical properties definitely show, as they do in the two cases cited above, that the two substances have a totally different origin and are in no way related.

- (iii) It has been stated that the geological features of the Barn Bluff-Pelion area resemble those of certain oilfields in Mexico. This again is not a fact as there is a very definite and marked difference in geologic structure.

- (iv) The reason given, in one instance, for the belief that the Barn Bluff-Pelion area contains liquid oil, namely, that igneous intrusions have distilled the oil from certain substances, is to say the least very highly improbable as it assumes conditions for the formation of oil which are known to occur in no oilfield in the world.
- (v) Reference has been made to the "Catalogue of the Minerals of Tasmania" by W.F. Petterd, which contains a reference to the occurrence of asphaltum on the River Mersey. This occurrence, it is well known to us, was never seen by Mr. Petterd and is at least doubtful.
- (b) The Objections to the Proposed Scheme in Itself if Search for Liquid Oil were Warranted

Although I have shown above that the expenditure by the Adelaide Oil Exploration Company on the search for Liquid Oil has no hope of any valuable result, yet it will serve some useful purpose if attention is drawn to several aspects which would arise if the general principle of the proposal itself were worthy of adoption.

- (i) The undertaking to spend £10,000 per year would not be sufficient in itself and some more definite indication would have to be given as to what proportion of that £10,000 would be spent on actual work in Tasmania. Unless some such provision is made, it would be quite possible to spend a considerable portion in Directors' fees and other expenses outside of Tasmania. The spirit in which the proposal is made indicates the general intention of spending the £10,000 in Tasmania on field work, but I beg to submit that something more definite in the agreement would be desirable than this.
- (ii) It is proposed to hand over to the Government the results of the Geological surveys if made. As a matter of fact this is no more than is required under the Mining Act in regard to licences to search, and I would, at this stage, point out that the information supplied under this provision of the Act, up to the present, by any licensees is not only very meagre, but also totally misleading and of no value whatever in scientific research in Tasmania. This brings up the point in connection with the proposal of the employment of, as stated in the formal letter, "competent geologists experienced in oil finding". The inducement held out is that the result of these men's work being handed to the Government will be of value in connection with the geological surveying of Tasmania. If this information is to be relied upon and used by us, the work must be carried out by geologists whose capacity and capability are definitely proved and established. Just as the Surveyor General of Tasmania cannot accept the work of any but fully qualified and registered surveyors so the Geological Survey of Tasmania cannot accept the work of any but fully qualified

geologists whose qualifications and experience they are quite satisfied with. It would, I therefore beg to submit, be essential that in any agreement in regard to the proposal provision be made that no geologist should be appointed by the Adelaide Oil Exploration Company to carry out geological surveying in Tasmania without the approval and concurrence of the Geological Survey. If there were any value in the proposal it would lose the whole of it if the results obtained were found to be unreliable owing to the incapacity of the officials employed.

(c) The Result which would follow the
Adoption of the Proposal under
Existing Circumstances

With the knowledge of the facts I have presented above, before us, it is now possible to look forward and see what would be the ultimate result to Tasmania if the proposal were adopted. The prominent fact is that the Geological Survey of Tasmania has definitely arrived at the conclusion that the expenditure of money on the search for liquid oil in Tasmania is not justified. If holding this opinion they associated themselves with a scheme for such search for petroleum, they automatically and naturally would be regarded by the public as sharing the belief that there was some chance of locating liquid oil. This would induce the public to subscribe their capital which is the very thing the Geological Survey wish to prevent as they know definitely that the money so subscribed and spent will be a dead loss to the subscriber. After the inevitable denouement happened and the people realised their money had gone, any future recommendations made by the Geological Survey would not be heeded by the investing public, and we would have lost that reputation for reliability and bona fide independent expressions of opinion as to the value of mineral and other deposits which is our most precious qualification and which we must protect at all costs.

I would desire to stress the aspect of the case that we should think not of the interests of the present generation but of the interests of an indefinite number of generations ahead. It would not be in the national interest in order to obtain a temporary circulation of money if by so doing we were creating a handicap which would be a very serious hindrance to the next generation in the development of our natural resources. The introduction of capital in Tasmania is desirable and urgently needed, but what the Geological Survey desires to specially point out is that in the proposal we are considering the introduction of capital for the carrying out of work which could not possibly give any results. The capital which is available should be spent on one of the many natural resources of Tasmania which by such expenditure would show appreciable monetary returns.

The inducement held out in the statement of the proposal in regard to the possibility of discovering mineral deposits during the search for oil has no real basis for justification. It is my duty to point out in this connection that in the search for oil and oil producing substances in Tasmania attention would naturally be confined to the Permo-Carboniferous rocks and those of younger age. The fact that our mineral deposits are

confined to rock series older than these demonstrates that their discovery would not be hastened by the search it is proposed to make, because the two groups of rock series have a totally different geographical distribution.

(2) OIL PRODUCING SUBSTANCES

Dealing now with the portion of the proposal which mentions oil-producing substances as distinct from liquid oil, the position is very clear and obvious. In the first place, in view of the knowledge possessed by the Geological Survey of Tasmania, there is no necessity for the carrying out by the Adelaide Oil Exploration Company or anybody else of the geological survey proposed. We are in the position of being able to give anybody intending to search for oil-producing substances full information as to exactly where to search and how to search. This search will be confined to one horizon in the Permo-Carboniferous rock series, and the work will be of the nature of systematic surface prospecting and trenching within these narrow zones. It is such work that an individual prospector or party of prospectors can very appropriately undertake, and I beg to submit it would be a great pity to lock up the whole of those portions of Tasmania in the hands of one Company and shut out the highly valuable work of individual prospectors. Such prospectors wishing to carry out such work and coming to us for the information would have it in their power to make valuable discoveries of these oil-producing substances. The elimination of such individual effort would, I beg to submit, be disadvantageous to the State.

The Adelaide Oil Exploration Company will have, without any such concessions being granted to them as they have asked for, immense scope to spend their capital in the search for these oil-producing substances. This search is, in fact, very desirable and the operations of any Company in Tasmania having that object in view would be very welcome.

The Geological Survey is convinced that in this oil-shale industry Tasmania has a very valuable national asset, and it has been our endeavour for some time past to have them fully developed. With this object in view, such investigation has been included in the programme of work of the Geological Survey of Tasmania for the next twelve months, and it is proposed to carry out geological surveys of the oil shale fields including the putting down of a series of bores in a systematic manner. As a co-ordinate part of this investigation the sum of £ has been made available to carry out systematic investigations of the best method of retorting the various types of oil-producing substances occurring in Tasmania.

Under these circumstances it seems to us very undesirable indeed to hand over the exclusive rights for investigating the resources of Tasmania in this connection to one particular Company. That Company, as stated above, will have infinite scope by availing itself of the provisions under the present Mining Act whereby they can take up an indefinite number of 3,200 acre blocks under licences to search.

SUMMARY AND CONCLUSION

In conclusion, therefore, I beg to state that the Geological Survey is definitely of the opinion that it would not be to the advantage of Tasmania to adopt the proposal submitted by the Adelaide Oil Exploration

Company, the following being the main reasons as somewhat fully indicated above:-

- (i) The State having expended £65,000 in geological surveys of Tasmania is in a position to state that there is no justification for the expenditure by the Adelaide Oil Exploration Company of any money in intensive geological mapping as the salient geologic features indicate that no possibility of liquid oil exists.
- (ii) The belief that liquid oil may exist is due to an incomplete knowledge of the geology and geological history of Tasmania.
- (iii) It is not desirable that the Geological Survey should associate itself with an undertaking which they know is foredoomed to failure as it is essential that the public can look to us for unbiassed and bona fide information as to the justification for the expenditure of capital in connection with the mineral resources of Tasmania. Knowing that the proposal has no hope of success we definitely say so, and it would be inadvisable therefore for us to even acquiesce in the proposal.
- (iv) The Geological Survey of Tasmania can give definite and exact information as to where and how to search for oil-producing substances such as Tasmanite, Pelionite, Kerosene Shale &c. This search can be carried out by individual prospectors as well as by Companies and Syndicates. It is clearly undesirable therefore to take away from the individual prospector the right to carry out such work in Tasmania. Under licences to search the Adelaide Oil Exploration Company can carry out as much work as they desire in the search for oil-producing substances, and the covering by them of unnecessary ground could be avoided by their accepting the help and advice which the Geological Survey is only too willing to give them.

Finally, I therefore beg to advise that there is nothing in the proposal which, under all the circumstances would warrant its acceptance.

I have the honor to be, Sir,
Your obedient servant,

L. Hills
DIRECTOR