

The Chamber's Letter to the Prime Minister.

UR 1861-1920/104-114

Chamber of Mines of Victoria,  
Melbourne,

11th June, 1910.

Sir,

I have the honour, by direction of my Council, to request that early consideration be given by your Government to the desirability of establishing a Federal Department for the Geodetic, Topographic, and Geological Survey of the Territories of the Commonwealth.

As a representative of mining interests, the Chamber is concerned in the collection and systematising of all information likely to assist actual mining operations in the Commonwealth, and to be helpful to the investor both here and abroad. A geological survey on broad lines such as that of the Federal Government of the United States of America, of Canada, and the Dominion of New Zealand - is the means whereby these ends may be most completely attained. In as much as systematic geological surveys must be based on systematic topographic maps, and the latter, in turn, on systematic geodetic surveys, my Council consider it within their legitimate province to urge on you the importance of all three branches of work.

The Chamber recognises the good work being done by the several Geological Survey Departments of the various States. Differences of policy, however, multiplications of systems of publication of literature, differences in scale, scope, area, geological nomenclature, and colouring of maps and lack of united effort generally, combine to give a result that lacks simplicity, essential in these times to any business system, that must be confusing to persons seeking mining or geological information in several States, and that is unworthy of Australia, because information concerning its greatest asset - its territorial wealth - is disseminated not by and at the discretion of Australia, but by and at the discretion of its individual States, whose authority cannot make the same impression upon the senses of the world.

-2-

My Council does not suggest that the present State geological surveys would be unnecessary in the event of the proposed Federal Department being established; there will always be plenty of scope for individual State work to supplement all that could be achieved by the most comprehensive federal service. At present, however, there is not, so far as my Council is aware, a systematic geodetic or topographic survey in any State. Expensive surveys for public engineering purposes are, after affecting their particular purposes are, pigeon-holed and practically lost for ever, instead of forming part of a system published for the use of all Government departments and the public generally, and there is no doubt that economy to all the States would ultimately result were effect given to the suggestions herein.

The proposed Federal Mining Bureau, to which public attention was recently directed by your predecessor, would in all probability eventually find its most important source of information in the work of the suggested department.

It is perhaps necessary to point out, also, that in addition to supplying the basis for all States' schemes of domestic water supply, irrigation, road and railway location and other purposes, topographic surveys would be of the highest importance in connection with the national defence.

This communication does not pretend to cover all the consideration involved in my Council's proposal, and they respectfully suggest that valuable information and opinions on the question may be obtainable from the Public Works, Water Supply, Railways, Geological, and Lands Departments of the various Departments as well as from the Federal Defence Department.

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

D.L. STIRLING.  
SECRETARY.

The Hon. Andrew Fisher, M.H.R.,  
Prime Minister of the Commonwealth.  
MELBOURNE.

EXTRACT from the Monthly Mining Report of the Chamber of Mines Victoria for the month of June, 1910.

In continuation of discussion in connection with the establishment of a federal geological survey, adjourned from meeting of Council of the 14th April. Mr H. Herman presented a draft report on the matter in which was urged the necessity of the Commonwealth Government taking of hand the complete geodetic, topographic, and geologic survey of the whole of the Australian States, and pointed out the great advantage which would accrue from the work being done. The report went on to state that in the United States a most elaborate geological survey has been proceeding for years, with incalculably good results to the mining, quarrying, and allied industries.

This very detailed topographical maps of subdivisions of the republic were first of all made, and to these maps were affixed the geological and mining detail. Experts having the highest technical and practical training in the various phases of the mineral industry were employed to undertake work on the coal fields, oil lands, sulphide deposits, iron ores, &c. The numerous excellent and highly systematic maps and reports which were issued from time to time in the several "quadrangles" had done much to prevent the flotation of commercially unprofitable properties (thus saving vast sums of money), and to exploit in a very practical manner the wealth of the great republic. Canada had also a large and well-equipped federal geological survey staff in addition to the various provincial surveys. Nearer at hand, New Zealand had recently established a survey on American lines, though naturally on a more modest scale.

That not only would a similar survey carried out by the Commonwealth Government be of great benefit to the mining industry, in which the Chamber was chiefly interested, but it would be of inestimable value to the Commonwealth as a whole in matters of national defence. The proposed survey would be of great value to all the States in their schemes for water supply, irrigation, road and railway location, and many other purposes.

Dr. J. Macintosh Bell, Director of Geological Survey of New Zealand, who was present by invitation, addressed the Council

on the subject. He stated that a complete survey on the lines indicated survey on the lines indicated in Mr. Herman's report has been initiated about six years ago in New Zealand by the Seddon Government, and has been carried on continuously since. The results already obtained had more than justified the outlay, and had proved of great benefit. Looking on the mining side of the question, most valuable and reliable information was constantly available, and had resulted in the investment of large amounts of capital in districts which had been shown to be likely to give good results, whilst on the other hand it had prevented the useless waste of money in places where there was no likelihood of success.

A discussion ensued, after which Dr. Bell was warmly thanked by members for the valuable information imparted to the meeting. The following resolution was unanimously agreed to on the motion of Mr. Herman, viz:-

"That the Council of the Chamber of Mines of Victoria considers it highly desirable that the Commonwealth Government should undertake a systematic geodetic, topographic, and geological survey of the Commonwealth."

It was further resolved that the Secretary write to the Prime Minister, enclosing the resolution, and giving the council's reasons in support; also to communicate with kindred societies throughout Australia, soliciting them to co-operate in the matter.

#### PROPOSED FEDERAL GEOLOGICAL SURVEY.

The Correlation of the Commonwealth Strata.

THE PROJECT RECEIVES THE HEARTY INDORSATION OF THE LEADING AUSTRALASIAN MINING AND SCIENTIFIC BODIES.

On another page will be found the full text of the letter forwarded by this Chamber to the Prime Minister of the Commonwealth (Mr. Fisher), suggesting a systematic and scientific geological and petrological survey of the whole continent, based upon a definite Commonwealth combined topographic and geodetic survey. It is noteworthy that the Commonwealth Government has

already seen the wisdom of establishing a special cartographic branch, attached to the Home Affairs Department, charged upon the duty of preparing and publishing a new map of Australia on the polyconic projection. The projection adopted involves the least distortion among the many known methods of mapping. It is one in which the central meridian is taken, and each parallel of latitude is computed on a separate basis - that is, on its own value. This ensures that each degree of longitude will be of correct value, whereby the projection on the map of our coast-line will be practically correct. This work is now going forward at a cost of about £5000 a year.

Of the principal map projections, viz, orthomorphic, equal area, perspective, zenithal, conical, cylindrical, and convential, it is almost safe to assume that the professional authorities at the Home Affairs Department judiciously selected a projection the most suitable for field work, enabling the contours to be correctly plotted and such features as are usually shown on topographical maps, viz:-

1. Hydrography, or water features, as ponds, streams, lakes, swamps, &c.
2. Hypsography, or relief of surface, as hills, valleys, and plains.
3. Culture, or features constructed by man, as towns, roads, villages, bridges, railways, &c.

A good topographic map renders unnecessary a special survey for each new need. The maps of the United States Geological Survey represent besides the natural features mentioned, such artificial features as are of a public or more enduring nature, as State, county, township, and city boundary lines; reservation, land grant, and public land township lines; railways, streets, roads and paths; bridges ferries, dams, locks, and wharves; the location of permanent bench marks and trig stations, and the positions of lightships and lighthouses, mines, shafts, and tunnels. The only private features shown are houses, factories, stores, &c.: no outbuildings being represented. Naturally, the original intention in the construction of the United States topographic map was only to show such features required as a base for geological maps, but in time its scope became so extended as to cover everything incident to educational, practical, political, administrative and military,

-4-

statistical, and economic relations.

An admirable work on the subject has been written by H.M. Wilson, of the United States Geological Survey. This author makes it clear that no amount of compiling and building up of the patchwork of local cadastral mapping will ever produce a topographical whole - that "mother map", as Wilson calls it, from which all other maps should spring. And, again, this same authority indorses the remarks of Professor Agassiz, who, in speaking of the inadequate means placed at the disposal of geologists, says:- "Topographical surveys to be satisfactory should be founded upon astronomical operations. Mining operations bear to geology the same relations that geodetic operations bear to astronomy. All that may be fairly expected of a geologist is to prepare a geological map of the district he surveys, and thus obtain the information, without which the mineral resources of a country cannot be satisfactorily ascertained. Therefore, to make a geological map three preliminaries were requisite - first, a topographical survey on a geodetic basis or 'control', second, the work reduced to exact topography by the hands of skilled topographical artists in mapping; and third, such general knowledge of the rock formation adapted to the whole area. There was no radical distinction of method required for a geographic, geologic, or military map. To all of them the same system of surveying was applicable - the general work of topographical delineation based on triangulation."

Practically the procedure recommended by H.M. Wilson and Professor Agassiz is embodied in the Chamber's letter to the Prime Minister. The Federal Government, as already stated, has taken the initiative to construct a "mother map" of the continent. The first operation, the measurement of a base-line intersecting the proposed observatory at the Federal capital site, has been undertaken, and in future this will be the meridian from which all surveys in Australia will have their starting point. The spot chosen is about six miles south-west from where the federal city will be. It is suggested by the Chamber and those mining engineering and scientific bodies supporting the movement, that the geological

survey should proceed pari passu with the topographical and geodetic survey. The preliminaries for an Ordnance survey are now sufficiently well advanced to enable a staff of geological surveyors to commence field work. As long as the geological area to be mapped can be controlled by a triangulation connected with the federal base, the geological survey could proceed simultaneously with other surveys. The plotting would be made on reconnaissances constructed on small scales, and the final sheets prepared as fast as the topographical maps are completed.

The geological survey should not be held back waiting on the topographical work. If the topographer is able to locate precisely on a sketch sheet, which has the trigonometric positions marked, the definite or principal points over the area under survey - that is say, an area in which the main divides, leading spurs, river flats, and water courses have been traversed - there is nothing to hinder the geological work of the section from proceeding, the features of which can be filled in afterwards.

The general plan adopted in Canada, the United States and New Zealand, consists in dividing the country into quadrilateral areas (called "quadrangles"), bounded by parallels and meridians of latitude and longitude. These "quadrangles" are bounded by proper north and south and east and west lines. In the United States no less than four maps of the area are constructed - one showing the topography of the area; another showing accurately the geology of the area and the position of mineral deposits within it if these exist; while a third is so coloured as to emphasise the mineral deposits or any bands of an occurrence of rock which are likely to contain them, thus serving as an excellent basis for the work of prospectors. A fourth map shows the structure of the area by presenting a series of transverse sections through it. These four maps are bound together in a stout paper cover. and constitute what is known as a "folio."

The New Zealand survey, under the direction of Dr. J. Mackintosh Bell, is being carried out on a slight modification of the American system. The Commonwealth has before it the wonderful results from federal work in the United States and Canada geological surveys,

and, to come nearer to home, the work now being carried on under Dr. Bell's direction in New Zealand.

Successive Commonwealth Governments have each in their turn indorsed by liberal grants the action of the first Ministry, which federalised the six States' meteorological departments into one Commonwealth bureau. Politicians of all shades of opinion have agreed that meteorology affected all Australia, and not one State, and the same process of reasoning which centralised meteorological work might be used with much stronger force in favour of federalising geological survey work. Political and inter-state boundary lines made no difference, except as pointed out in the Chamber's letter to the Prime Minister, to encumber continental geology with a multiplicity of terms, colouring schemes, and local classifications, which have been a burden and a confusion. But even these must sooner or later disappear under a definite federal system embracing the whole continent. The Commonwealth Meteorological Bureau has been established at a cost of £20,000 a year, of which Victoria's share of this expenditure is about £6000. Surely the correlation of the Commonwealth strata is of more importance than co-ordinating weather observations.

If a federal bureau was created it would have a class of specialists who would deal with the tin or copper or other minerals deposits of all Australia. Now the field geologists working in one State only could not gain the knowledge necessary to give a proper value to their work. Let us take, for instance, any of the industrial metalliferous deposits. What can a Victorian geologist, who only knows Victoria, know by practical experience about the occurrence of these metals except from reading? With a federal bureau there would be a higher state of specialisation among members of the survey staff. To those who may argue against the project on the ground that the new mapping branch attached to the Home Affairs Department has not been long enough established to have grafted on to it geological survey work, i.e., that it has not yet produced the new map it was originated to do, it may be urged in reply that not one-third of Victoria had been topographically surveyed, and yet withal there was a good deal of duplication of work still going on by the different State

-7-

departments in different survey work. The Lands, Public Works, Railways, State Rivers and Water Supply, and Mines Departments have each a survey staff all doing more or less mapping in the way of filling in features, whereas under a federal survey system there would be a "mother map" to work upon for all such special cadastric surveys.

It is not proposed by the Chamber's scheme for the Federal Government to control mining affairs. It will always be the business of the State departments to look after the interests of their mines, and for the State Parliaments to make laws governing the relations between the Crown, as owner of the minerals, and mining tenants. A Federal Geological Survey Bureau would have no more right to interfere in the conduct of mining or in the granting of leases or mining rights than the Federal Customs Department would have in controlling the shops and factories whose goods pass through the hands of the Customs officials. Except in regard to mining within the Federal capital area, the mining administration must always rest with the States concerned.

The Chamber of Mines in putting forward the scheme does not by any means lay claim to being the first in the field as the originator of the movement. It frankly recognises the effort made by the Australasian Institute of Mining Engineers, when, in May, 1905, Mr. James Stirling, ex-Government Geologist of Victoria, and a member of the executive of the Institute of Mining Engineers, addressed that body on this very question, covering practically the same ground set forth in the Chamber's Letter to the Prime Minister. And so recent as the Mount Morgan session of the Institute held last month, the subject was again renewed by that body, when the following resolution was passed:-

"That it be a recommendation to the Council (Australasian Institute of Mining Engineers) that a committee be formed for the purpose of further discussing the whole question of Government aid to mining, and particularly the question of obtaining a complete geological survey, also to take the necessary steps in connection with both subjects."

The president, Captain G.A. Richard, general manager of the Mount Morgan Gold Mining Company, in putting the resolution, said that

the Commonwealth industry could do a number of things in the matter that the States could not do. The idea was that a qualified director should be appointed in charge of the federal survey work. A man must be got for the position who had the requisite previous experience, and would know how to organise such a survey. The Chambers of Mines of Melbourne and Kalgoorlie had taken action on the subject, and their co-operation should be sought. A geological survey by the Federal Government would have to come sooner or later, and the sooner it was brought about the better. Dr. MacIntosh Bell also spoke on the subject, and on passing through Melbourne on route to New Zealand via Tasmania, gave a lengthy address to the Council of this Chamber on the question, dealing generally with the systems carried on in the United States and Canada, and that under his own direction in New Zealand. It is gratifying to learn that the Council of the Institute of Mining Engineers has taken prompt action in appointing the committee recommended by the Mount Morgan Convention.

The names of those appointed on the Mining Engineers' Committee are as follows:-

F.W. Skeats, Professor of Geology &c.,  
at the Melbourne University;

G.D. Delprat, general manager of the  
Broken Hill Proprietary Company  
Limited (N.S.W.).

F. DANvers Power, Lecturer in Mining  
at the Sydney University.

R.W. Chapman, Professor of Engineering  
at the Adelaide University.

G.A. Richard, general manager of the  
Mount Morgan Gold Mining Company,  
Queensland, and President of the  
Institute.

Richard Hamilton, general manager of the  
Great Boulder Proprietary Company,  
W.A., and President of the Chamber  
of Mines of Western Australia,  
Kalgoorlie.

Robert C. Sticht, general manager of the  
Mount Lyell Mining and Railway  
Company, Tasmania.

Dr. J. Mackintosh Bell, director of the  
Geological Survey of New Zealand,  
Wellington.

-9-

and those members of the executive of the Institute resident at Melbourne, viz., Messrs. H.H. Schlapp, C.F. Courtney, H. Herman, A.S. Kenyon, A.H. Merrin, and S.B. Hunter.

As showing the perfect harmony between the Institute of Mining Engineers and this Chamber on the board principles of the scheme, Mr. H. Herman, who is a member of the executive of both bodies, has taken the lead in formulating the movement in the Chamber. It is anticipated that when all the replies have been received to the Chamber's circular letter sent to kindred associations inviting their co-operation in furtherance of the work, there will be a confederation of representatives of all professional and scientific societies whose assistance has been invoked, to elaborate a method essential to the success of the work and for the purpose of commending the survey to the attention of the Federal Government and to those interested in the organisation of a proper topographical and geological survey.

The Prime Minister (Mr. Fisher) has already expressed himself generally favourable to the project. He has suggested that the various bodies concerned in the movement should seek the co-operation of the various State Geological Survey Departments. While he and his colleague in the Ministry thought it would be highly advantageous for the Commonwealth to have control of the geological survey as in the United States and Canada, it was just possible some legislative action would be necessary before the Commonwealth could obtain control of the work. It is perfectly understood that the good work already done in the several States will be utilised in correlating the survey, and the States departments will remain as before for the purpose of rapid isolated surveys in connection with existing mines and new finds. It is probable that a sum of from £15,000 to £20,000 a year will be ample for many years to come to carry on the work of the Federal Bureau in the construction of base maps for the field geologists to record their work upon, and with the co-operation of all the States - in fact, this is an essential to the success of the whole scheme - there should be no obstacle placed in the way by local or professional jealousy to the work being taken in hand at once by the Commonwealth authorities.