

PART II.
PAPERS.

12TH MARCH, 1903.

ADDRESS BY THE PRESIDENT.

MR. J. L. C. RAE.

THE honour you conferred on me at the closing meeting of last session, by electing me your President for the ensuing year, is one which carries with it duties and responsibilities of the weight of which I assure you I have a due regard.

To-night, in presiding at the opening meeting of the thirty-third Session of the Association, it is obviously my duty first to draw your attention to matters connected with the affairs of the Association during the past year, or, where it may be desirable for the purposes of comparison, during the past few years.

At the end of last session the membership of the Association numbered 116, as compared with 119 when it began. During the session 7 new members were elected, 2 were lost by death, and 8 were struck off the roll. The members lost by death were W. T. Poole and H. Broderick.

During our summer recess the death of Mr. George McCredie has further reduced our membership to 115.

By the decease of those gentlemen, the Association has lost three of its oldest and most respected members. Fitting reference was made at our meetings, at the time, to the loss of the two first-named, whilst of the late Mr. McCredie it may be said that no member was more widely known or highly respected than he.

The Annual Report of your Council, which was placed in your hands at our last meeting, shows that during last session eight meetings were held, at which there was an average attendance of 40 members.

Reference is also made in that report to the valuable and interesting papers read before you at those meetings, to the excursions made, to the annual dinner, and to the exchange of "Proceedings" with kindred societies.

So far as these matters are concerned, the work of the past session requires no further comment.

During the summer recess, through the kind invitation of Messrs. Burns, Philp & Co., Ltd., managing agents for the "Shell" Transport and Trading Co., Ltd., members were afforded an opportunity of inspecting the oil-fuel firing arrangements on that company's steamer "Clam" and their extensive installation of storage and settling tanks, pumping plant, &c., at Gore Bay.

Another outing which proved of interest was a visit to the Garbage Destructor at Moore Park, where members were very kindly received by Mr. Kenway, supervising engineer for Messrs. Goddard, Massey and Warner, who supplied and erected the plant

The annual dinner was held on 31st October, and a picnic at National Park on 22nd November, both proving very pleasant and successful functions. The kindness of the trustees of the National Park, in placing a steam-launch at our disposal on the day of the picnic was much appreciated.

Undoubtedly, those social gatherings have done good in promoting friendship amongst our members which could hardly have been possible by simple attendance at our formal monthly meetings. Besides, some of our older members can only attend on such occasions; and although they may have ceased to contribute papers, or to take part in our discussions, they are none the less subscribers to the funds of our Association, and we are glad to have opportunities of meeting them at our outings.

Referring to the meetings of your Council and to the deliberations thereat regarding matters of internal economy, the year has been one of steady work, and the financial position of the Association has been placed on a sounder basis by a continuance of the policy of removing from nominal membership

those who, after due and oft-repeated notice, failed to fulfil their obligations to us.

The following figures showing the fluctuations in numbers of members of the Association, together with the amount of unpaid subscriptions which have been written off during the past ten years, may be of interest:—

Year ending Sept. 30.	No. of Members.	Unpaid Subs.	Written off.		
			£	s.	d.
1893	... 160	...	9	9	0
1894	... 140	...	38	1	3
1895	... 145	...	14	14	0
1896	... 146	...	50	8	0
1897	... 153	...	31	8	6
1898	... 155	...	11	11	0
1899	... 136	...	143	5	9
1900	... 130	...	19	8	6
1901	... 119	...	60	5	0
1902	... 116	...	27	16	6
			£406 7 6		

These figures show that during the past decade there has been a drop of 44 members, and that the sum of £406 7s. 6d. has been written off the Association's books as unpaid subscriptions. The reduced number of members is more than accounted for by the number struck off the roll, your Council having found it necessary to remove no less than 59 names during the past six years.

It is much to be regretted that these and other financial losses so crippled the resources of the Association that the publication of the annual volume of "Proceedings" had to be put off for five years. You have, no doubt, noticed that the cost of Volume 11, published last session, was £82 14s. 2d., from which it may be seen that the amount of unpaid subscriptions would practically pay for the printing of the five behind-hand volumes.

Seeing that our present annual income is only a little over £230, and that £120 of that amount goes to cover rent and Secretary's salary, members will see the absolute necessity of paying their subscriptions regularly, if the publication of our "Proceedings" is to be again brought up to date. For this reason funds are much needed; and as it is an all-important matter in the interests of the Association, it is deserving of the most serious attention of all of us.

Apart altogether from ourselves, we have to consider those Societies with which we are now on terms of exchange, and by which the non-receipt of our volume may be resented or misunderstood, and might lead to a discontinuance of pleasant and profitable relationship.

I am well aware that other kindred societies have the same troubles as (and, in some cases, worse than) we have to contend with, but ours is the oldest established Engineering Society in the State, and its members must look to it that its status is maintained.

Much assistance will be given towards this end by members (especially those who have not already done so) coming forward with papers, and taking part in our discussions.

Your Council has now under consideration several matters, an adjustment of which, it is hoped, will tend to the welfare of the Association. They earnestly invite your co-operation towards making the Session a successful one, by a regular attendance at the meetings, thus showing that individual and collective interest in the progress of the Association which it deserves.

Turning from the affairs of the Association to our interests in general, it may safely be said that there is not a single industry or business in the State, or, for that matter, in the Commonwealth, the prosperity of which has not been seriously affected by the long-continued drought. The recently-published returns of live stock in the State show that, during 1902, there was a decrease of horses of 47,751, of cattle 314,000, and

of sheep 16,418,597. These figures tell, in unmistakeable language, of the losses caused to the pastoral industry, but they only partly convey an idea of the loss to the community. The railway returns have been seriously affected, business of all kinds and the employment of labour has been severely checked all over the country, and we daily hear tales of personal privation and suffering which we know are only too true, and which call for our warmest sympathy.

What affects the country is soon reflected in the city, and the present high prices of the necessaries of life, together with the depressed state of trade and commerce, are felt by all of us.

The drought also put a heavy strain on our system of water supply in Sydney, a system on which it is stated that over £4,500,000 has been spent. We all know how that strain affected us, and are glad that, on account of the rainfall on the catchment area at the end of last year, the wise restrictions which were placed on both public and domestic consumption of water have since been largely removed.

As a result of recent inquiry by a Royal Commission, extensive additions are now being made to the system, and it is to be hoped that these, and others which may be made as occasion demands, will be the means of preventing any recurrence of a scare of a water famine in the city.

Questions connected with pastoral and agricultural products are, doubtless, of much interest to engineers, for—when matters of road and railway construction, irrigation, manufacture of implements, and others, so all-important to the successful development of these industries, are taken into account—they find profitable employment for many of the branches of our profession.

Nevertheless, the search for, winning of, and turning into account the mineral wealth of the earth provides a vastly wider field of employment, and calls for all the skill and patience of the same and other branches of engineering science. Moreover, constructive work of all kinds is so dependent on the mineral industry that it is of paramount importance to the Engineer.

The mining industry has, undoubtedly, been one of the chief factors in the prosperity of our country, and will have an even greater influence thereon in the future than it has had in the past.

Statistics show that, after little more than 51 years' operations, the aggregate value of the metals and minerals produced in this State to the end of 1902 is £152,275,312; the value for the year 1902 being set down as £5,633,645. This shows a falling off of £372,991, as compared with the previous year, but the decrease was undoubtedly due to the low price of silver, lead and zinc, and to the fact that the industry was seriously affected by the drought. Notwithstanding the latter cause, it is very satisfactory to note an increase in the value of gold of £159,491 (although this is considered to be due to the gold won from ores from other States being treated at smelting works in this State), of coal £27,669 (this notwithstanding a decreased output of 26,415 tons), and of oil shale of £18,227.

For the whole of Australasia, the value of the gold yield for 1902 was recently stated as approximately £17,122,000, an increase on that of 1901 of £1,178,000. The exact returns from Tasmania and South Australia were not at the time available; but as the difference between them and those estimated could not materially affect the result, the figures quoted are very near the mark. The highest value previously recorded was in 1899, viz., £16,174,426.

These figures are very gratifying, for they show that, notwithstanding the effects of the drought in many localities, there has been a general increase.

West Australia with an output valued at £7,947,721 (an increase of £712,069 as compared with 1901) takes place of rank, and has during the past six years produced gold valued at over £35,000,000.

One can hardly mention the West Australian goldfields without making mention of the Coolgardie water scheme, the plant connected with which was opened, with great rejoicings,

some six weeks ago. It has been carried out at a cost, it is understood, of over £2,800,000, for the purpose of supplying the goldfields of Coolgardie and surrounding districts by pumping a daily supply of 5,000,000 gallons from a storage reservoir, situated on the Helena River, at a distance of 328 miles from Coolgardie. The working of this scheme will be watched by Engineers with special interest.

Regarding the coal resources of the Commonwealth, some remarkable and interesting figures were quoted by Mr. James Stirling, late Government Geologist of Victoria, in a lecture delivered by him before the members of the Australian Chamber of Commerce in London last May. Mr. Stirling is reported to have said that in the five coal-bearing States of the Commonwealth—i.e., New South Wales, Queensland, Victoria, Tasmania, and West Australia—there was an aggregate available quantity of 240,448,053,000 tons, which, valued at the rate of 8s. per ton at the pit's mouth, represented a total value of £96,179,221,200.

Let us compare Mr. Stirling's figures with those regarding the probable coal resources of the Mother Country at the present time.

The Royal Commission (1866-71) appointed to report on the probable duration of the coal-fields in Great Britain, estimated that the quantity then available in the United Kingdom was 146,480,000,000 tons. If we deduct the coal worked since that report was made (probably amounting to about 5,320,000,000 tons) there would be left, of the estimated quantity, a balance of 141,160,000,000 tons available in Great Britain, or nearly 100,000,000,000 tons less than the quantity estimated as the available tonnage in the Commonwealth.

I have not got all the figures relating to the production of coal in the Commonwealth in 1902, but in 1901 it was 6,880,501 tons, made up as follows:—

New South Wales	...	...	...	5,968,426 tons.
Queensland	...	...	...	539, 72 ,,
Victoria	...	...	...	209,329 ,,
West Australia	...	...	...	117,836 ,,
Tasmania	...	...	...	45,438 ,,

6,880,501 tons.

In 1902 it would, I think, be rather less, because all the figures I have got for that year show a decrease.

The production in 1901 was equal to fully $1\frac{1}{2}$ tons per head of population. In that year the production in New South Wales was equal to rather more, and in 1902 to rather less than $4\frac{1}{4}$ tons per head of the population of the State. I mention the ratio of output to population for the sake of comparison with some figures, which I recently saw in a home paper, having reference to the production of coal in some other countries in the year 1901. In that year, there were produced in the United Kingdom 219,047,000 tons, equal to $5\frac{1}{4}$ tons per head of population; in the United States, 260,929,000 tons, or just over $3\frac{1}{2}$ tons per head; in Germany, 108,417,000 tons, or rather less than 2 tons per head; in France, 31,613,000 tons, or about $\frac{2}{3}$ tons per head; and in Belgium the output was equal to about $3\frac{1}{2}$ tons per head.

It will be seen that, although the annual production in New South Wales is barely 6,000,000 tons, it ranks per head of population next to that of Great Britain, with an annual production of about 220,000,000 tons. It is evident that before we can look for much expansion we must have an increased home consumption, and that can only be brought about by the starting of manufacturing industries which will give profitable employment to a greatly increased population. This can only really be secured by the profitable investment of capital, and it is surely in the best interests of all classes that every reasonable facility should be offered to induce private enterprise. And what a field there is for it in this country!

With its abundant supplies of coal, iron, and other minerals, there is little room to doubt that New South Wales is destined to become the principal manufacturing State in the Commonwealth, with Sydney as its centre. To the north and south of Port Jackson, for a distance of about 100 miles in either direction, immense deposits of first-class coal extend along the coast, very favourably situated for export purposes. I may