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The Coal Resources of Great Britain.

TO all sections of the community, the state of the coal mining industry in Great Britain is a source of great anxiety. The real difficulties which the industry has to face depend upon causes which are very deeply rooted. We were the first nation to develop our coal resources extensively and, owing to the fact that we had originally magnificent coal seams lying at no great depths, and above all, that our coal-fields lay close to the seaboard and within easy access of excellent harbours, we built up the magnificent coal trade upon which we justly pride ourselves. Coal, our main national asset, is unfortunately a wasting asset; once extracted it can never be replaced. At the present moment we are practically producing 23 per cent. of the world's coal output, whilst we have only $2\frac{1}{2}$ per cent. of the world's coal resources; in other words, we are drawing upon our coal reserves nine times as fast as the rest of the world, and these reserves are therefore gradually approaching extinction.

At the present moment, however, what we have to fear is not the exhaustion of our coal supplies so much as the increased cost of our coal production, which makes it impossible for us to compete with other nations for the coal trade of the world. This increase in price is no doubt to some extent due to natural causes, but to a far greater extent has been brought about artificially. Unless we can produce coal as cheaply as the nations with whom we are brought into competition, our coal trade, and with it the whole nation, must decline. The cost of coal production is made up of many items, into all of which wages enter to a greater or lesser extent, but direct wages make up about two-thirds of that cost. It depends, therefore, entirely upon labour whether our coal trade is to prosper or to suffer gradual annihilation. It must be emphasised in the strongest possible terms that this insistent demand for cheap production does not by any means necessarily imply low wages per man employed; it does require a low wages cost per ton of coal produced; in other words, the key to the situation lies in the maximum production per worker engaged in the industry.

In the United States of America, the cost of coal production is roughly two-thirds of what it is in Great Britain (12s. 8 $d.$ per ton as against 19s. 0 $69d.$); nevertheless, the men engaged earn much better wages, simply because the output per man is so much higher (3.82 tons per shift as against 0.928 ton). This fact is due in part beyond doubt to natural causes, but is also due to the fact that the men themselves work hard and that the Trade Unions have always opposed anything like a "ca' canny" policy. These same reasons furthermore help American collieries to develop extensively mechanical methods of machine mining. It is often overlooked that a severe limitation of the hours of labour, such as we have in Britain, prevents the extensive adoption of coal-cutting machines; these can only be used to advantage if they are kept actively employed. A colliery cannot afford to put capital into such machines if they are only to be worked six hours out of the twenty-four, and this consideration doubly handicaps our coal industry.

When the future of the industry comes to be considered, it may well be found that neither American nor German competition will prove so formidable as competition from China, India, and South Africa. The price of coal at the pit's mouth in these countries is only about one-third of our own, and their immense coal resources necessarily bring them into prominence in discussing the future of the British coal industry. It is true that we have the advantage of a well-established coal trade, which has developed as a natural consequence of so many of the British coalfields being so well situated geographically, and it is true that trade is loth to leave the channels in which it has been accustomed to flow. Certain of our labour leaders, however, by their continuously repeated threats of strikes, are demolishing that confidence in Britain's ability to supply the goods as and when customers require them, which formed the real basis of Britain's supremacy in the coal trade, and without which the maintenance of that trade is impossible. Once that South Africa has developed and organised suitable transport facilities and has built up for itself the trade which our internal dissensions have turned from us, our chance of competing is gone. Even now it is going; for some years past Natal has been competing successfully in the Bombay markets with British and Indian coals.

It seems impossible to avoid the conclusion that we cannot hope to regain the position which we once held, that of the world's chief manufacturers, as this was based essentially upon the fact that we were able to produce coal in any desired quantity more cheaply than could any of our competitors, and the question which to-day is the most insistent is whether anything can be done, if not to restore our lost supremacy, at any rate to find some new method of utilising our coal to advantage, so as to save us from national extinction.

The situation is reviewed in an interesting article by Mr. Lancelot Lawton on "Coal and the Future" in the August issue of the *Fortnightly Review*. With most of the views therein expressed the majority of serious students of the economics of the coal industry will cordially agree, although there are several points to which exception may be taken. Thus the author commences with the statement that "the critical condition of the British coal-mining industry is due to the fact that to a large extent thicker seams at moderate depths are being exhausted"; the fact of this exhaustion is sufficiently well known, but working at moderate and even considerable depths is to-day no longer a serious problem. With modern methods of engineering, the increase in the working cost of winning coal from deep-lying seams is negligible, as witness the fact that the only collieries in Britain that are working to-day under anything like satisfactory conditions are the deep pits in the concealed Yorkshire coalfield. The real crux in the working of deep seams lies in the vastly greater initial outlay required, but, once capital can be assured that it will get an adequate return for its employment in such a relatively risky undertaking, depths of even of a thousand yards can no longer be considered a real obstacle to economic working. It may fairly be said that in spite of the wild talk of Socialists, one of the serious problems that

confronts the coal industry is how to inspire capitalists with this assurance; collieries inevitably become exhausted in the process of time, and if our coal trade is to be maintained, new pits must be sunk and new collieries opened out. Needless to say, this can only be done if the capitalist is assured that the investment involves only a fair business risk.

Like many others, Mr. Lawton pins his faith in the regeneration of the coal industry upon the general employment of low temperature carbonisation, with its attendant production of oil and other bye-products. Low temperature carbonisation is, however, by no means yet as assured of success as many seem to think, for they generally overlook not only the mechanical difficulties, but also the chemical difficulties which the process presents, such as are well indicated in the paper on the "Study of the Tars and Oils obtained from Coal," by Messrs. Sinnatt and King, read at Leeds at the recent meeting of the Chemical Engineering Group of the Society of Chemical Industry. Furthermore, there are other processes to be taken into account; it may fairly be said that for the production of oil from coal the Bergius process would seem to promise to rival, if not to surpass, low temperature carbonisation; the "Synthol process," based upon the interaction between carbonic oxide and hydrogen, also must not be left out of account, although this is not an industrial process to-day. Fischer, in his recent work on the conversion of coal into oil, translated by Lessing, says: "The Synthol Process, combined with primary tar production, likewise indicates the possibility of a total conversion, and indeed offers, in my opinion, the best promise for the future."

In view of these and many other possibilities which the scientific research of coal, now actively pursued in many quarters, is opening up, it is more than doubtful whether it would be a wise policy to-day to embark upon the construction of costly low-temperature carbonisation plants. A few years may well see this process relegated to the background and displaced by some more profitable method.

Capitalists are surely wise in waiting to see which process is likely to be the most advantageous before spending money on plants, which, for all we know to-day, in a few years may have only a scrap-iron value.

It is greatly to be feared that any remedy based upon the treatment of coal after it is won would not help the situation. As Mr. Lawton truly enough points out, any improvements in the utilisation of coal cannot possibly be confined to Britain, but will be universally adopted by other nations engaged in coal production, so that we necessarily come back to the economic proposition that the future of coal rests with those nations that can produce it cheaply. There is, in fact, only one remedy for the present critical position of the British coal industry, and that is the cheaper production of coal, which, as already said, means a greater output per man employed in the industry. A colliery that is unable to produce coal at a price less than the coal is worth in the world's markets is not a national asset but a national liability so long as it continues to work, and no method of treating the coal after it has been raised can possibly alter that cardinal fact.

HENRY LOUIS.