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F. Y. EDGEWORTH AND HENRY HIGGS

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## THE NEW COAL-BEDS IN BELGIUM<sup>1</sup>

IN no modern State has the soil been exploited for a greater number of years than that of Belgium. And its natural wealth shows signs of exhaustion. This is especially the case with metallic minerals, the

<sup>1</sup> Chief sources of information: Em. Harzé, Directeur Général des Mines: *Statistique Rétrospective des Mines, Minières, Carrières*, &c., published periodically; *Annales des Mines de Belgique*; *Revue Universelle des Mines*; *Tableau Général du Commerce de la Belgique*; *Annuaire Statistique de la Belgique*; industrial and commercial periodicals, especially *L'Organe Industriel*, Liège; parliamentary papers. Among those who have aided me in grouping the materials in this article I have to mention MM. Forir, Director of Geological Work at the University, Francken, Engineer to the State Railways, and Lecocq, Secretary to the Collieries Union, Director of *L'Organe Industriel* and of the School for Advanced Commercial and Consular Studies.

extraction of which does not give employment to more than one-tenth of the labour it absorbed thirty years ago.

Nevertheless, in the coal-mining industry no such shrinkage has been observed. On the contrary it is steadily progressing. Belgium, one of the smallest countries in the world, occupies the sixth place in the production of coal, that is to say, next after France. It even supplies a surplus for exportation, only  $\frac{1}{5}$  of its output being consumed within the country.

Were it not, however, for the newly acquired beds at the Campine, which are just about to be worked, the future would not present so favourable a prospect. In fact, although the coal-industry has gone on gaining in importance during the 19th century, it must be remembered that the advance in most other countries has been much more rapid, especially where the exploitation of coal strata was begun less long ago, notably in France, in Prussia, in the United Kingdom and, above all, in the United States. Again, the advance of production in Belgium is not equal to that of the consumption; hence she can only continue to export at a diminishing rate. And, finally, the best quality of coke for blast furnaces no longer suffices for her use and she has to import it from Westphalia.

The coal-beds do not possess all the attributes of combustible mineral, but only the intermediary qualities, to wit, thin coal, half-oily and oily (*maigres, demi-gras, gras*). No anthracite or lignite is found.

The coal district now being worked crosses the country from south-west to north-east, along the valleys of the Sambre and Maas. It extends over 140,000 hectares. The average production exceeds 21 million metric tons, which are the output of 132,000 men. The trade activity in coal, coke and briquettes for 1902, reckoned in thousands of tons, stands as follows:

	Imports.	Exports.	Surplus Exported.
Briquettes.....	33	671	638
Coke .....	230	824	594
Coal .....	3,232	5,078	1,846

France takes the greater part of these combustibles, Germany coming next.

The network of water-ways, which connect the country with its Continental neighbours, greatly facilitates the coal trade through its superior cheapness over railroad transport. Nevertheless, part of the coal traffic is effected by the railway. And the Government permits reduced rates in the case of railway export of coal.

Nature, in endowing Belgium with considerable reserve wealth in coal, has demanded of her greater sacrifices in labour and capital. Her coal beds are harder to work than those of other lands; they are less regular; they are of no thickness and they lie for the most part very deep.

As to wages, they are lower than in the United States and in

England, but not very different from those paid in France and Germany. This equality does not appear at all if the nominal rates of wages be alone considered. But if there be taken into account the cost of living, taxation and the indirect wages paid under the guise of proprietary institutions, it will be seen that the real wages of the Belgian miners are in no wise different from those of French or German miners.

The absence of thickness in the coal veins and their position would heavily handicap Belgium as compared with other nations were it not that these disadvantages have been counterbalanced by good organisation of labour and the employment of superior workmanship. The coal-owners have by mutual arrangement instituted piece-work generally, and reduced the number of auxiliary hands (*demi-ouvriers*) engaged at low pay. They have found it more profitable to engage only good men at good wages. The suppression of female labour within the mines has also reduced the cost of labour. The economy effected by their lower rate of wages was more than cancelled by their lower rate of production and by the distraction caused in the mine by their presence. Thus the experience of Brassey has been again confirmed by the experience of Belgian coal-owners.

How far the *personal* productivity of the labourer has in this way been raised it is impossible to measure exactly. It must always remain unsolved.<sup>1</sup> Anyway statistics teach us that the number of tons annually put out per labourer is greatly increased—from 121 in 1850 to 177 in 1900. This advance is the more remarkable when we consider that the mines in question have been worked for centuries and that the difficulties of working them are ever increasing.

In spite of these difficulties the coal-owners have succeeded in reducing the number of fatal accidents to a rate lower than that in the most productive countries, if we are to believe in a chart published by the Central Committee of French Collieries.

Nor have the many drawbacks prevented them from supplying coal at a relatively low price. Discounting the year 1900, when the price was for Belgium exceptionally high, and taking into account only the four preceding years, we find that, of all the adjacent coal-producing centres, Westphalia alone was able to supply coal at a cheaper rate.

The situation of the Belgian market would in itself prevent the coal-owners from keeping an inflated price for any length of time. The contiguity of the sea and of the port of Antwerp, the number and cheapness of the means of the inland transport, as well as the absence of custom dues, place them in direct competition with foreign producers. In this respect they are less favoured than the coal-owners of La Sarre in Germany; here the fact that the district is less accessible and the French market near, where prices are usually high, gives greater latitude to the producers in settling the rate.

The question has been raised in Belgium whether American coal

<sup>1</sup> Cf. my *Productivité du travail et les salaires*, Paris: Larose, 1899. Pp. 64, with 14 diagrams.

which has already put in an appearance in Denmark, in England, and in the basin of the Mediterranean, was not also about to invade the country and compromise the prosperity of the collieries. It is admitted that the competition of these coals, which has not for that matter been felt as yet in the country, may become a fact in certain exceptional cases, without being ruinous at the outset. The fact is that although American coal commands a lower price at the pit's mouth the cost of transport is too heavy. The problem is thus reduced to a question of freight.

The conclusion is that, up to the present, the commercial situation in Belgium has been more favourable to the industrial consumers than to the coal producers.

Notwithstanding this, the situation would have had to undergo modification had it not been for the discovery of coal-beds in the Campine. We have seen that the difference between export and import of coal is tending to diminish, and that Belgium had to obtain certain qualities of coal from abroad. It must be added that, in 1900, the price of coal reached a much higher level than in adjacent countries. The industries of the country found this unwonted rise the harder to bear in that they were just then passing through a period of crisis.

This rise in prices is attributed in part to changes that had intervened in the conditions of internal competition, namely, to the diminishing number of producers and the formation of syndicates. But it may also be accounted for by the want of elasticity in the national production, rendering it incapable of meeting promptly a strong increase in demand. M. Trasenster remarks judiciously, on this point, that, from 1895 to 1900 or 1901, the rise was especially felt in those countries where the increase in production has been least, to wit, in England and Belgium.

Not only is there a falling-off tendency in home competition, but the political trend in adjacent countries enables us to foresee that, in the not distant future, the influence of foreign competition on the Belgian markets will also fall off. For while England has put a duty on the export of coal, it is being sought elsewhere to ensure the plenishing of the national market by entrusting to the State the working of coal-mines.

Here, however, a new factor comes to light which is capable of considerably increasing the supply of combustibles on the Belgian markets. I speak of the recently inspected coal-beds. These beds are situated in the poor and sandy region known as Campine, lying in the north-east between the Scheldt and the Maas. They cover a vast acreage, estimated by M. Forir, from the official reports of recent soundings, at 160,000 hectares. This superficies is thus 20,000 hectares greater than the coal district under exploitation. It is bounded approximately by an elongated triangle having its angles at the town of Lierre near Antwerp in the west and, in the east, at Maaseyck and Maastricht on the Maas.

Although the brothers Castiau have drawn the attention of speculators

ever since the beginning of the nineteenth century to the probable existence of these beds, it is only during the last few years that they have been made the subject of serious study by the members of the Geological Society of Belgium.

MM. Lohest, Habets and Forir succeeded in determining a rational line for soundings, and financial support from the chief coal-owners of the country enabled the work to be carried out.

Basing his conclusions on the results of 57 soundings, M. Forir has committed his conclusions on the composition of the new coal-field to the following notes, which he has been good enough to communicate to me.

He divides the field, according to the nature of the carboniferous contents, into four strips of unequal magnitude but nearly parallel, starting from the Maas and moving west-north-west. Beginning with the southernmost, these consist in :

(1) a zone of anthracite, containing up to 10 per cent. of volatile matter. The breadth of this zone is 12 kilometers. It is assumed, in the absence of adequate soundings, that this district contains only shallow veins.

(2) A zone of "thin" coal, containing 10 to 20 per cent. of volatile matter. These are house coals. The veins are, as a rule, shallow and lie at a distance from each other. The zone has a mean breadth of  $2\frac{1}{2}$  kilometers.

(3) A zone of "fat" coal, or coke-coal, containing 20 to 30 per cent. of volatile matter. Its breadth is also  $2\frac{1}{2}$  kilometers. When worked it will make up that deficiency in coke for industrial purposes which is now remedied in part by Westphalian coal. Unfortunately, this zone has a relatively small area.

(4) A zone of coals containing 30 to 40 per cent. of gas. This is most abundantly represented in the new district. Their present value is high, but it is likely to fall in consequence of the discovery of important coal-beds in Westphalia and in Belgium itself. On the other hand it is possible that this abundance may bring about a modification of mechanical processes, by stimulating the substitution of heating at a distance by the aid of gasogenes, supplying gas at a very high temperature, for the system of direct heating by contact. This zone is  $3\frac{1}{4}$  kilometers broad.

(5) A zone of dry coals burning in long flames, containing over 40 per cent. of gas and suitable for making gas for lighting purposes. It has no great area, its breadth being only  $5\frac{1}{2}$ , and its length 30 kilometers.

In conclusion, writes M. Forir, the Campine Coalfield contains a smaller quantity of coal, proportionately to its size, than that of Liège. Moreover, the new district promises to be difficult to work. Not only are there thick layers of barren soil to penetrate, but the coal itself lies often at a great depth, near crumbling or aqueous sands. In these tracts the sinking of wells at such depths has not yet been worked

successfully by means as yet known. No doubt, however, one can set over against such obstacles the inventive spirit of the engineer. The fact remains that, in Campine, technical problems will have to be solved which have not presented themselves elsewhere.

Under these conditions can the exploitation of the strata become, from an economic point of view, a productive undertaking? Given the price of coal, is there sufficient profit in it to reward adequately the capital invested? Such is the question.

Relying on various estimates we may assign, for the working of the district as a whole, a fresh staff of 150,000 labourers, and a capital of 500,000,000 francs (£20,000,000), as yielding, at a net profit of one franc a ton, an interest of 5 per cent. Judging by this it does not seem impossible to make it pay from the commercial point of view. There is no doubt that the interest which it promises is not considerable, but it is a reasonable one and capable of tempting capitalists without further delay. Such, moreover, seems the opinion among Belgian capitalists, for the Government is already in possession of 30 to 40 applications for concessions, and these, at 15 millions of capital per concession, represent a total capital of about 500,000,000 francs. This amount will probably be raised without great trouble. Witness how Belgium by herself negotiated stocks and bonds in Russia in a few years at the nominal value of 1,000,000,000 francs.<sup>1</sup>

There remains the question of the staff of labourers. No doubt the 150,000 hands necessary for an annual output of 25 million tons will not be found or trained in a day. It will be of importance to have recourse as little as possible to strangers, and to turn first to the resident population, even if it takes time to initiate them into mine-labour. A comparison between the history of the Westphalian collieries and those of La Sarre actually shows the social advantages of this method of procedure. The Campine might even furnish a large proportion of the necessary *personnel*, for the region contains a very poor agricultural population, who would be easily attracted by the high wages at the mines. The remainder will be found plentifully scattered about the country. Is not Belgium the most densely populated of all countries, and by a very industrious people, and one potentially very mobile, thanks to advanced means of transport and reduced tariffs? As to technical experts there will be no lack of these, seeing that there are enough to go forth every year to seek employment in Europe.

We may now discern the important results that may be involved in the exploitation of the Campine Coalfields. But there is one problem that must be solved before any others, and that is the legislation concerning mines.

The principles of property in mines at present obtaining in Belgium date from the Act of the 21st April, 1810. According to these principles, a mine is a property of a different character from that on

<sup>1</sup> See my "Mercantilisme des pays neufs et la crise des industries russes." *Revue d'Economie Politique*, 1903.

the surface of the soil. It takes its origin in the right yielded, not by the proprietor of the soil, but by the Government. All mines actually existing in Belgium belong to individual grantees. The concessions have been granted by the Government in perpetuity. Exploitation is subject to special regulations, and is liable to the discharge of certain quit-rents both to the State and to the owner of the surface soil.

For some years past the question has been raised of revising this mining legislation, in which there are certain *lacunæ*. Thus the State is completely powerless as against grantees who might be working mines in a manner adverse to the general good. The right of confiscating a grant in such cases was sanctioned by a law passed in 1791, but was repealed by the Act of 1810, by which grants are declared perpetual and irrevocable. And the law does not require a grantee who wishes to sell a mine to seek any authorisation for the transaction.

Hence some changes seem called for in the direction of a greater intervention of the State on behalf of the public interest. But how far should one go? There is a great variety in the kind of changes desired, according to the varieties of social opinion.

Naturally, it is the Socialists who demand the widest changes. MM. Denis and Vandervelde have proposed purely and simply to grant no new concessions to private individuals, but to bring all new mines under State management. They are wrapt up in the interests of the consumer, who, they say, would in this way obtain their combustibles cheaper, in the interest of the labourers, who would have their condition improved, and in the interest of the State, which would reap the profits now engrossed by the capitalists.

Can the State manage an industry as well as private enterprise, or can it not? The controversy has re-opened in Belgium with all the amplitude conferred on it by an impending application of the highest importance. Is it really desirable, as Socialists maintain, in the interests of consumers, of the workers and of finance? This has been keenly contested, notably by M. Trasenster in his pamphlet on *L'Exploitation des Mines par l'État*.

To those who assert that it was the profit-mongering spirit in private mine-owning firms which recently forced up prices in Belgium higher than elsewhere, he replies that the real reason is the great difficulty of increasing the production of coal in the country. According to him the argument drawn from the Prussian State-management of mines recoils on its advocates. He thinks that "the only effective method of arresting the rising price of coal due to the exhaustion of our ancient coal-fields is to cope with the scarcity, the sole cause of dearness, by developing production. . . ." Again, would the condition of miners be bettered if they were handed over to the State as employer? No, answer the partisans of private enterprise, the wages paid at the private collieries of La Ruhr are higher than those paid at the public collieries of La Sarre. Besides, the labourers would have their liberty restricted, and on this point the criticisms of



Paul Weiss are quoted, contained in his recent work on the revenue mines of Prussia. In Prussia, he writes, the State "has shown itself to be the hardest, least indulgent of masters. . . . as to wages, they have remained over than what are paid in Westphalia. . . . The German Socialists, who know by experience what is to be expected from revenue undertakings, never demand the nationalisation of mines like their French or Belgian comrades."

To this the Socialists reply that the public administration of industries ought to be placed on a very different footing from the methods obtaining at present in society generally. It should be given an independent control and financial organisation. It is necessary, say MM. Denis and Vandervelde, "to put a stop to the baneful confusion of the machinery for political control with the machinery for carrying out economic services rendered by the State, by giving to the latter all the relative independence that is necessary to the perfection of their functioning, and compatible, at the same time, with the permanent predominance of a more enlightened public interest."

It is not, however, probable that the Government will pronounce in favour of the incorporation, pure and simple, of the new mines into the State domain. Other less radical proposals have been put forward.

According to that of Senator Finet, it would be best to entrust the ownership only of the mines to the State, and not their exploitation. This should be handed over to private enterprise for a term of 30 years. To this it is replied that a grant of 30 years is insufficient; it could not incite in the manager the spirit of prevision, preservation, or progressive improvement.

The scheme adopted by the Council of Mines introduces still less change into the present *régime*. It preserves intact the proprietary system now in use, and is confined to a regulation of accessory points such as the sale of mines, location, and the delimitation of grants.

Between these divergent views comes that of the Director-General of Mines, M. Harzé, which deserves special attention. Without adopting the system of the nationalisation of mines, he nevertheless admits that the State ought to acquire certain collieries to ensure the coal-supply of its railways. It would then best be seen if there were occasion to extend the productive activity of the State so as to compete with the grantees in the industrial market. Moreover, the State might hand over the working of the collieries it had founded to companies, or even to labour syndicates. One ought, he thinks, to profit by actual conditions in experimenting in State-management. "If it did not succeed, it would always be easy for the State to alienate subsequently its own estate, and one would have gained definite conclusions on certain ideas."

Such are the schemes and such the controversies to which the Belgian law on mining has given rise.

The discovery therefore of these new coal-beds in the Campine

amounts to an event of considerable importance. When turned to profit it will double the importance of the Belgian coal-industry. The national industries will be assured of a supply of combustibles for a long period of time. We may predict that the great increase in the quantity of coal annually put into the market and the greater elasticity given by a production thus so much enlarged, will compensate for the probable restriction of foreign competition by the growth of home competition, and will tend to arrest any excessive rise in prices. The sources of national wealth will be considerably augmented, an item of value to a small and densely populated country, and to a soil exploited for so many years. The new mines will afford the accumulated national savings a source for important investments, which may be reckoned at 500,000,000 francs, and for the employment of some 150,000 labourers, without counting engineers and middlemen. At the same time there will be an increase in the influence brought to bear on the peace of society by the material and moral condition of the working classes. Their welfare must be more and more watched over, if serious disturbances in times of crisis are to be avoided. The Campine itself will undergo changes through the opening up of its coal-beds. In the midst of its plains, dunes, swamps, and sparse growths there will arise the smoking pillars of chimneys and the dark outlines of elevators. The artists and the townfolk who go there to-day, seeking inspiration, pure air and quiet, will no doubt regret the transformation. But when all is said, the country will have gained in wealth, in well-being and, let us hope, in light and happiness.

LAURENT DECHESNE,

*Professor at the Ecole des Hautes Etudes commerciales et consulaires, at Liège.*

THE ROYAL ECONOMIC SOCIETY (incorporated by Royal Charter, 1902) was founded, under the name of the BRITISH ECONOMIC ASSOCIATION, at a meeting held at University College, London, on November 20th, 1890, the Right Hon. G. J. Goschen, M.P. (now Viscount Goschen), in the Chair. The object of the Society is the advancement of economic knowledge by the issue of a Journal and other printed publications, and by such other means as the Society may from time to time agree to adopt.

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