

(2) That sugar produced by our Allies be granted preferential treatment to the extent of $12\frac{1}{2}$ per cent. on the tariff in force. This corresponds with a reduction of the duty by $\frac{1}{4}d.$ per lb.

(3) That sugar produced by neutral countries should pay the full tariff without any reduction.

As regards home-grown sugar the Organisation recognises that some degree of protection will be absolutely necessary if capital is to be attracted to the new industry, and it suggests that "the difference between excise on home-grown beet-sugar and the duty on Empire-grown cane-sugar shall be *2l. 6s. 8d.* per ton until the crop of home-grown sugar reaches 50,000 tons per annum, after which such advantage would cease."

These proposals will doubtless be fiercely opposed by all to whom the word "Protection" is anathema. But the events of the time, and the chastening influence of the conditions which have been forced upon us by the Central Powers in the effort by the most powerful of them to secure the domination of the world, have profoundly modified our views on many matters. The Government has now agreed to the principles of Imperial preference, and the policy of preferential treatment of our Allies has been embodied in the resolutions of the Paris Economic Conference.

In regard to tariffs the matter now resolves itself into a question of details, and if the nation is determined, as it no doubt is, that the disadvantage under which it has suffered shall never again arise, but that the machinations of our arch-enemy shall be effectually checkmated, once and for ever, there should be little or no difficulty in arriving at a satisfactory adjustment. T. E. THORPE.

THE MINERAL WEALTH OF GERMANY.

THE *Fortnightly Review* for June contains an interesting article by "Politicus" on "The Natural Wealth of Germany," in which particular stress is laid upon the immense value of the asset represented by that country's mineral possessions. These are tolerably accurately known, because in Germany the State owns the minerals and has therefore taken good care to have a complete and scientific inventory made of its mineral resources. The facts as to Germany's mineral riches are thus readily accessible, and ample statistical information is available on the subject. Taking the three undoubtedly most important of Germany's mineral products, namely, coal, iron-ore, and potash salts, the author of the article in question arrives at the startling conclusion that the value of these is close upon 240,000 millions sterling, out of which coal alone represents 89 per cent. A German poet has long ago warned the world that no prudent fighter underrates his foe, but it is perhaps almost as grave a blunder to overestimate his powers, and there is no difficulty in showing that this is what "Politicus" has done to an enormous extent.

It will be easiest to commence with coal, this being, as stated, by far the most important factor, whilst abundant statistics are available for discuss-

ing the question. "Politicus" takes the report submitted to the International Geological Congress in 1913, which gave the coal resources of Germany at about 400,000 million tons. He says simply that "at the very low average price of 10s. per ton at the pit's mouth" this coal is worth more than 200,000 millions sterling. He forgets, apparently, that this coal is not at the pit's mouth—it is deep within the bowels of the earth. The value of 10s. per ton at the pit's mouth may be readily accepted as a fair figure, but this is assuredly not the value of the coal in its unsevered condition. In a recent paper on the subject the writer of the present article showed that the value of coal at the pit's mouth in Great Britain amounted to about 10s. per ton in 1913, and that this price was made up of:—Royalty 5'35 per cent., wages 62'55 per cent., materials 16'45 per cent., administration 7 per cent., and interest and profit 8'65 per cent. It is surely obvious that it is only the first item which represents the value of the coal as it lies in the ground, and that out of the value of 10s. at the pit's mouth 9s. 6d. represents the cost of getting and raising it, so that its real value is only the balance of 6d. Certain American figures also quoted by the author of the article show that the royalty value of the coal—that is, the value of the coal as it lies in the seam—is less than 4 per cent. of its cost at the pit's mouth in the United States, so that the figure of 5 per cent. of the value at the surface here adopted may be considered to represent very closely the general value and can be applied to the German conditions without much risk of error. Hence, so far, the figure given by "Politicus" would appear to be twenty times too great, and his 200,000 millions would be reduced to 10,000 millions.

Even this latter figure is, however, a great overestimate, and that for a reason that "Politicus" has also overlooked. It has been seen that coal in the unsevered condition is worth 6d. per ton, but this 6d. is realisable only as and when the coal is won. A ton of coal that is to be won a century from now is worth to-day, not 6d., but only 0'0456d., or less than the twentieth part of a penny, allowing interest at 5 per cent. This quite obvious consideration, that a sum of money, receivable at a distant date, is worth to-day only the amount which, if allowed to accumulate at interest, would produce the sum in question, must profoundly influence the present value of coal to be won at a remote date, but it has been entirely omitted from the calculation. It is true that it is only possible to compute the present value of Germany's coal reserves by making a series of assumptions, yet by means of these we are able to determine, at any rate, the order of magnitude of the figures involved. In 1913, the coal production of Germany was about 150 million tons; if it be assumed that this increases by 50 million tons annually, the production in a century would be at the rate of 5150 million tons per year, and the total quantity worked during the century would be 265,000 million tons, or more than half the known coal resources of the country. No one can pos-

sibly predict what the coal production of any country will be a century hence, but, so far as anyone can see, this rate of increase of production is much greater than what the actual increase can reasonably be expected to be; it follows that the present value of the coal resources is greater on this hypothesis than it is in reality, even though the value of all the production after the first century be neglected. The value of the coal produced during the century at 6*d.* per ton, allowing money to earn interest at the rate of 5 per cent., is only about 550 millions sterling to-day, and though it is impossible to assert that the coal resources of Germany are really worth this amount, it is tolerably evident that they cannot be worth more. In other words, the estimate of "Politicus" is nearly 400 times too great.

Turning next to the iron-ores, the author puts the quantity at 4000 million tons, and he values these at 5*s.* per ton, apparently also at the mouth of the mine, and thus gets at a value of 1000 millions sterling. Fully 80 per cent. of Germany's iron-ore production comes from the minette ore-field of Lorraine and Luxemburg, and as this field is tolerably well known and much information has been published about it, it will suffice to confine the discussion to this field alone. "Politicus" has taken his figures from those published at the International Geological Congress in 1910, but these are now out of date, and more accurate data are to-day available. According to the most recent estimates by the leading German authority, the available minette ore in the Luxemburg-Lorraine ore-field amounts to about 2090 million tons. In 1913, the output was approximately twenty million tons, and it has been increasing at the rate of about two million tons per annum. Assuming a uniform rate of increase up to the exhaustion of the field, which, though technically impossible, is a convenient hypothesis for the purposes of calculation, and will assign to the ore-field a value in excess of the facts, the field would be worked out in about thirty-seven years, the output in the last of these years being calculated at ninety-two million tons. The estimate of value given by "Politicus" is certainly wrong; these ores cost at the mine about 2*s.* 6*d.* to 3*s.*, 3*s.* 6*d.* being considered a high figure. The value of the ore *in situ* must accordingly be low, though there are no data at hand for accurately determining this; a valuation based on English conditions would assign to it a value of 3*d.* to 4*d.* Taking the higher figure, and again capitalising at 5 per cent., the present value of this iron-ore field on the above assumptions comes to rather more than 12½ million pounds. If the discount on the value of the ore to be won in later years had not been taken into account, an erroneous value of close upon thirty-five million pounds would have been arrived at. Taking 3½ millions sterling as the value of the other iron-ores of Germany, a total of sixteen million pounds is arrived at, and the figure given by "Politicus" is thus sixty times too great; the error is less in this case than in that of coal, because the period of exhaustion has

been assumed to be much shorter, and the present value, corresponding with the production at the end of the term, is correspondingly higher.

The third material discussed as a source of mineral wealth is the series of potassium salts derived from the vast deposits of which Germany owns the practical monopoly. Here there are no safe data available for determining the value. The writer in the *Fortnightly Review* assumes that the supplies amount to 50,000 million tons and that they are worth 10*s.* per ton; as before, he has confused value at the mouth of the mine with value *in situ*, and has made no allowance for discounting the sums realisable only at a distant date. It is therefore probable that his figures are several hundred—say, at least 200—times too high, and that 125 million pounds is a more probable estimate of the true present value than the figure given by him.

Thus a correct method of appraising mineral values shows that the figure of nearly 240,000 million pounds sterling, given by "Politicus" as the actual value of the three most important items of the mineral wealth of Germany, must be reduced to under 700 millions, so that the former figure is roughly 300 times too great. It need scarcely be repeated that the numbers here arrived at make no pretence to accuracy, but they do probably indicate the correct order of magnitude of the present value of these minerals, and, in any case, they serve to show the correct method of valuing minerals in their unsevered condition.

H. LOUIS.

ANTHRAX AND ITS PREVENTION.¹

ANTHRAX is an acute, infective disease of man and animals and is caused by the anthrax bacillus, which becomes disseminated throughout the body so that every part is infectious. The many animal products used in commerce may thus be a grave source of danger if they emanate from animals which have succumbed to the disease. Although in this country anthrax is not to be regarded as a frequent cause of death, it is nevertheless of great importance on account of the increase which has taken place, and especially in virtue of the very large amount of material imported from countries where anthrax is rife. In order to prevent the disease in dangerous trades working with possibly infected animal material it would, at first sight, appear to be a simple thing to disinfect the infected material. In practice, however, this is found to be exceedingly difficult on account of the truly enormous powers of resistance of the spore of the anthrax bacillus, which is among the most remarkable of living things. A method to be efficient and practicable (1) must aim at the complete destruction of the infectivity of the material; (2) must not damage the material; (3) must be practicable on a large commercial scale; and (4) its cost must be reasonable.

¹ Report of the Departmental Committee Appointed to Inquire as to the Precautions for Preventing Danger of Infection by Anthrax in the Manipulation of Wool, Goat Hair, and Camel Hair. Vol. 1., Report of the Disinfection Sub-committee. (London: Published by His Majesty's Stationery Office, 1918.) Price 1*s.* net.