what like it. It is well known and is fully described from various localities in Quebec and Ontario on pages 18-19 of Mr. Hoffman's report on Minerals of Canada, Vol. IV., New Series Geological Report, 1888-89. It is known as anthraxolite, a name given it by Professor Chapman. It is of no commercial value and has no relation to carboniferous or other more recent coal formations. The discovery in the Township of Balfour, Range 1, lot 10 (Sudbury sheet of the Geological Survey map), though of no commercial value, is of considerable scientific interest, because it occurs there in the same black Cambrian slates of the Sillery formation as it does throughout the Province of Quebec from Lotbinière to Gaspé, and again on the north shore of Lake Superior upper copper-bearing rocks of Logan, now known as Cambrian, and probably about the same age as those of Sillery and Quebec, where also, on strength of it, much useless expenditure was incurred searching for coal.

Our next issue will contain an interesting descriptive article on the silver-mining industry of British Columbia, from the pen of Mr. J. C. Gwillim.

The unprofitable condition of the coal trade of late has frequently raised the question as to how far it is possible to introduce further economies in the working of coal mines. The substitution of steam power for hand labor has done much during the past half century to reduce the cost of working. But now there are rival systems of the application of power to colliery working. There are those who advocate the use of compressed air; others electricity. Certain experts go so far as to declare that electrical power costs only about half that of steam—not only so, but that the cost of a steam plant for a given output is almost twice the cost of an electrical plant. In this comparison it is well to bear in mind that the steam plant used at collieries is generally of a rough and uneconomical character. Fuel is held of so little account at a colliery that economy in its consumption is too often regarded as of little consequence. This is a mistake which is beginning to be discovered. The *Iron and Coal Trades Review* avers that the probable consumption of coal in colliery engines, on the average, is not less than 6 lbs. per horse power per hour. This is a moderate estimate, and taking it to refer to indicated horse-power, it is possible to produce the same power with 1½ tons of coal, or even less; hence it may be fairly said that there is a possible saving to be effected of seventy-five per cent., worth on the annual output of the United Kingdom, nearly £900,000. It would probably be well within the mark to say that the saving to be effected in labor of handling, and in the maintenance of boilers and appliances for consuming this, would be worth say 65 per cent. of the above sum, showing a possible economy of say £1,500,000 per annum, a sum equal to over 2 per cent. on the total value of the coal raised, or about 3¾ per cent. of the whole wages annually paid in the mining industries. And if the coal were raised unbroken, so that its value was equal to the average value of the coal sold, these figures would rise to 3 per cent. of the value of the total coal raised, or 6 per cent. of the wages paid. It may be stated at once that, to realise these economies, the power required must be produced by compound or triple-expansion condensing engines—appliances almost unknown in colliery work. Not many colliery proprietors, however, are enterprising enough at the present time to incur a large outlay for new steam plant. It may be that many are waiting to see the issue of new developments with the other agencies now coming into favor.

M. de Regaurd, a French metallurgist, claims to have discovered a new method of treating gold ores. A brief summary of the process is as follows:—The ore or tailings are treated with tetra-chloride of sulphur, which coming in contact with water is at once decomposed, forming sulphurous hydrochloric acid as well as a little sulphuric acid and free sulphur, but when auriferous mineral is present other reactions ensue with the ultimate result that chlorine is rapidly freed. The inventor expects to contract all of the gold contained in the tailings, slimes or whatever he may be treating. His estimate of cost of treatment is at present drawn up upon the expectation of handling such tailings as are still plentiful in South Africa and many other places, and on the scale of 100 tons a day he figures that the delivery to the tanks will cost 67 centimes (13½ cents) per ton; the cost of labor will be 1.50 centimes per ton, chemicals and supplies 50 centimes, general expenses 1 franc 30 centimes, making total cost of 3 francs 97 centimes, to which must be added the cost of the purchase of the tailings. In his own estimate, basing the cost of the tailings at 3 francs per ton, and adding 2 francs per ton for sinking fund, he arrives at a total cost of nearly 9 francs, or in round figures $1.80 per ton.

The bursting of a fly-wheel is almost unheard of in England, says the London *Engineer*, notwithstanding the high-speed engines we now have running, yet in the United States the fly-wheel casualties have become a matter of weekly report. In England we have many thousands of high-speed cast-iron fly-wheels and very large wheels up to 60 tons weight, running with very high periphery speed, and they all run safely, and yet in the States they say: "The sudden advent of electrical apparatus and its high speeds found people making fly-wheels of cast-iron, with a narrow factor of safety, or, indeed, no factor of safety at all, if we consider the impossibility of detecting inherent strains and imperfections in this material. No one can know the value of material molded into form at a temperature of 2,000 degrees and then cooled down to a fortieth of this temperature, nor can they judge internal structure by surface indications. The fact is that cast-iron is not suitable material for fly-wheels that are to be driven at high speed, nor is it necessary to make them of this material. There is not even the claim of cheapness in their favor, if the methods of making such wheels of wrought iron and steel were once worked out. Twenty years ago a Scotch firm, who had to make a large fly-wheel for a spinning mill, riveted up a box rim, made from rolled plates, and filled it with cemented masonry or 'grout,' and did a very sensible thing."

In a paper read before the Society of Arts on "The Use of Compressed Air in Tunnelling," Mr. E. W. Moir, M.I.C.E., states that at one time on the Hudson river tunnel, out of the forty or fifty men employed there was one death a month. By treating the bad cases homœopathically this enormous death-rate was reduced to only two deaths in fifteen months out of 120 men employed. When attacked, the men were placed in a special air chamber and the pressure raised to one-half that in the tunnel. The pressure was then gradually lowered at the rate of about 1 lb. per minute. Even in severe cases the men left the chamber quite cured. Mr. Moir also states that it is important to have pure air in the tunnel, an increase of sickness occuring when the proportion of carbonic acid exceeds one part per thousand. It is also advisable to give every man a cup of hot coffee before he comes out of the compressed air; a warm room should be provided to dress in, as well as extra clothing to wear inside the lock.

More than 1,250,000 tons of coal are consumed yearly by the famous Krupp works at Essen, Westphalia, commenced in 1810 by Peter Fredrich Krupp, and now in the possession of Herr Friedrich Krupp, member of the Reichstag. The establishment consists, according to the *Eisen Zeitung*, of two steel works with fifteen Bessemer converters; four steel works with Siemens-Martin open hearth furnaces; iron, steel and brass foundries; puddling, melting, reheating and annealing furnaces; draw benches; a hardening and tempering department; file manufactory; rolling mills for plates, rails and tires; railway spring and wheel manufactory; steam hammers, forges, axle-turning shop, boiler shop, engineering and repair shops. Besides the above and many other departments, at Essen, connected with the making of canons, there are steel works at Annen, in Westphalia, three collieries in Westphalia, besides participation in several others; 547 iron mines in Germany; various iron mines at Bilbao, in Spain; four iron works, including one at Duisburg, one at