case more often, argues some defect in the college training of young engineers. It is due to narrowness somewhere; probably to an over-specialization before a suitable groundwork has been laid. Our schools, (and this applies to those of the United States and Europe as well) are graduating more and more a class of men who stand intermediate between the true engineer and the master mechanic. Their talents are in demand, and they step readily from college into lucrative positions. Meantime the young man in the office goes forward from post to post until at last he stands above and directs them.

The complaints in the commercial world against the technical graduate are generally that he lacks ability to manage men, and that he is deplorably ignorant of accounts and business methods. A man deficient in these important qualifications cannot, of course, control a great industrial establishment. The school cannot train students in the art of managing men. This comes only through contact with workmen, through working with them until their limitations, their needs, and their capabilities are understood. No one can acquire this by merely looking on. The young engineer who is willing to accept positions as a workman among workmen, rising thus to places of gradually increasing responsibility, can remove this deficiency at least. It is a common fault with young graduates to aspire too soon to positions where technical training is required. The other lack is one which to a considerable extent the college can make good. If the aim of the technical school is to fit men for the industrial application of science, it should then make practical men of them as well as practical scientists. If a knowledge of book-keeping and business forms is necessary for the success of the practical man, then the least that the college can do is to give its students a course in these subjects. It certainly should not leave them at a disadvantage with the graduates of the so-called business college. Where is the technical school that gives such a course?

This is not all. The technical course may cultivate brain power, but it does not give breadth. The business man is acquiring knowledge of men, of the great movements of the world, of economic conditions. The circumstances that make for success or against it in the great concerns of the world's industrial life, he learns by rude experience. His knowledge may be partial and narrow, but so far as it goes it is usually sound, and eminently practical. It is real knowledge, and it gives power. This is a sort of knowledge which in a different, and doubtless a better way, a broad college training can afford. It is an argument for the broadly educated, cultured engineer, who knows something more than his technology. We believe that one so equipped has a better chance in the world than he who specializes before receiving such an education. The subject is one which deserves the serious thought of our University authorities. If the chances for technical graduates, as a result of their training, to become something more than superior skilled artisans (save in exceptional cases), do not improve, it will become a reproach to the schools that send them out.

EN PASSANT.

The output of pig-iron from Canadian furnaces during the first half of 1900 was 45,234 gross tons. This indicates no increase in the rate of production over 1899, the total output for that year being 94,077 tons. Of the pig-iron turned out in the current year about one-sixth was with charcoal as fuel. One-third of the product was Bessemer pig.

The Canada Iron Furnace Co. will soon have its new works at Midland in operation, smelting ore from the Helen mine at Michipicoten, with small quantities of Calabogie magnetite. This will be the first instance of an Ontario furnace running entirely on Canadian ores. The Helen ores contain about 58.7 per cent. of iron, with 0.114 per cent. of phosphorus, and 0.046 per cent. of sulphur. The new furnace is 64 feet high, 13 feet in diameter at the boshes, and 8 feet in diameter at the crucible. The regenerative plant consists of three Gordon stoves, 60 ft. by 16 ft. The blast will be supplied by two blowing engines of 400 h.p. each. It was originally intended to use charcoal as fuel, and plans had been drawn for a large by-product plant. But it has been decided, for the present at least, to employ Cornellsville coke, which can be cheaply laid down at Midland from Lake Erie ports.

Considerable difficulty having been experienced by millmen using built-up mortar blocks in stamp-mills from the loosening of the anchor bolts which hold the mortar upon the blocks, it will be of interest to note how this tendency has been overcome by Mr. D. G. Kerr, of the Belmont mine, near Marmora, Ont. The bolt holes are bored to a distance of 5 feet, inclining from the top toward the bottom, the distance from the edge of the block to the centre of the bore-hole at the top being 3 inches, and at the bottom only 1 inch. At this point the sides of the block are recessed to receive horizontal blocks 6 inches high and 4 inches wide, one on each side, inset 1½ to 2 inches. These small blocks are bolted on by bolts passing through the mortar block. The anchor bolts pass down through these small blocks, the nuts being tightened against washers below them. By this arrangement the bore-holes are prevented from being worn larger through the jarring of the bolts.

There has lately arisen a discussion over the efficiency of the Bryan mill as an amalgamator and crusher, compared with the stamp-mill, which brings up the old question of high crushing capacity in gold milling operations. The desire to secure at once a high crushing capacity with good extractive work, perennially leads to a crop of errors. The desire is natural, but not easy to satisfy. The Bryan mill is undoubtedly a good crusher, admirably adapted to ores containing much argillaceous material. The Huntington mill is adapted to similar ores, though perhaps the Bryan will render better service on somewhat harder material. But neither of them can really be compared as amalgamators with the stamp mill, and for the same reason, viz., the high centrifugal velocity imparted to the pulp causes too rapid a discharge. Moreover, the rollers ploughing through the material on the dies, keep it too thoroughly stirred up. The ideal condition for amalgamation, so easily obtained in the stamp mill, is that of a suspended pulp, never too violently disturbed, and yet never fully at rest. That this condition is not always maintained in stamp milling is the fault of the millman, who does not attend to the economical adjustment of his mill as carefully as he should. Furthermore, the importance of the time factor in amalgamation cannot be too strenuously insisted upon. This, again, is under complete control in the stamp mill, but is not capable of regulation in any mills of the rotary type now on the market.

Ontario promises soon to show a large increase in its copper production. In addition to the old works at Copper Cliff, the Victoria mine, owned by Dr. Ludwig Mond, will soon be producing ore which will be smelted and blown in converters to high grade copper-nickel matte for exportation to England. Large mining operations are also projected at Massey, where a promising deposit of ore carrying over 4 per cent. of copper is now being developed. The future of the Parry Sound mines is still uncertain, though development is being actively prosecuted. The copper district at Bruce mines, however, is soon to be energetically exploited. A concentrator of 400 tons daily capacity, with a smelting and converting plant, is being erected at Bruce Mines, where the old workings are being equipped with a modern plant, contemplating deep mining. The Rock Lake copper mines have also been extensively developed, showing a large vein of good ore, and a 200 ton concentrator is nearly finished, which will produce high-grade concentrates for shipment.