Metallurgical Comment

T. R. LOUDON, B.A. Sc.

Correspondence and Discussion Invited

CAST IRON FOUNDRY PRACTICE.

The fight for the adoption of scientific metallurgical management in the cast iron foundry is one that still continues. Large strides have been made toward better conditions. Foundry superintendents are gradually discarding the old unscientific methods of judging the grades of pig iron. Greater reliance is being placed upon chemical analysis. Apathy, on the other hand, still contests the field with a stubbornness that brands it as having its source in ignorance.

Without the aid of chemical analysis, the great accuracy attainable in the making of given grades of steel wherein the carbon content, for instance, may be regulated down to hundredths of one per cent., could not exist. Metallography, a science that may be termed as comparatively new, has been readily and quickly adopted by the steel maker. In fact, history shows that the manufacturer of steel has been quick to reach out and call to his aid any scientific development that could be reasonably called practical. In this respect, the steel maker is far in advance of the cast iron manufacturer. That this is practically due to the fact that cast iron foundries are usually very small in comparison with the huge steel plants, has to be acknowledged; but, nevertheless, there undoubtedly has been and still is to a certain extent, an apathy on the part of the cast iron founder that is difficult to explain.

To take the case of chemical analysis: The wide-awake foundries not only buy their pig iron by analysis, but they also check the product when received. Now and again, though, one finds examples of foundries that are making a commodity, the specifications for which do not call for any particular analysis of iron, perhaps, merely specifying a certain limit of strength. In cases such as these very little attention is paid to the analysis of the pig iron used. To suggest to the foundry manager that it woud pay to check up the analysis even under such circumstances, is, in most cases, superfluous. Yet it would not be difficult to find cases where one-quarter of a day's output could often have been saved had more attention been paid to the iron being used. The fact that **metallurgical supervision pays always** does not seem to be grasped.

There is another factor besides the involved cost to the manufacturer that tends to perpetuate these conditions. If engineers would insist upon being furnished with chemical analyses as well as physical tests for cast iron **in all cases,** a large step forward would be made. In reality, as far as cast iron is concerned, physical tests on bars generally mean very little, as no attention is paid to the rate of the cooling of the bar, a point of extreme importance in determining the ultimate nature of the iron.

As with the making of steel products, so with the manufacture of cast iron; the man who does not recognize the advantages of scientific metallurgical supervision, is being gradually placed at a disadvantage, and the engineer who has to do with cast iron can help materially to bring about such a desired state of affairs by following the course as suggested above.

IMPROVEMENTS AT NOVA SCOTIA STEEL AND COAL COMPANY'S PLANT.

During the year 1911 many important improvements and betterments were effected at the various plants of the Nova Scotia Steel and Coal Company. Processes of manufacture absolutely unique in Canada were adopted, important departments brought to a point where they stand second to none in the world and generally the company maintained its position as the pioneer of the Canadian steel and coal trade.

The most important additions during the year were the installation of a fluid steel compression plant at the open hearth department, Sydney Mines, Cape Breton, and the substitution of hydraulic presses for steam hammers in the forging department at New Glasgow. In taking this step, "Scotia" has again been the first to bring the latest European methods of steel making to Canada and in consequence is prepared to handle a class of profitable business which no other Canadian company will be able to deal with until they adopt similar machinery.

The increased tonnage of finished product arising from recent additions to the rolling mill equipment necessitated the substitution of a 34-inch blooming mill for the old 26-inch mill which was no longer able to furnish the billet tonnage required by the various finishing departments. Many other improvements, but of a somewhat minor nature, designed to effect working economies in the various departments were also installed and the plant generally kept in a very high state of efficiency.

The fluid steel compression plant is designed to improve the quality of the ingots by expelling the gases generated during conversion and pouring, thus eliminating blow holes and other similar flaws. The process, which is fully patented in all the principal countries of the world, will be worked under arrangements with the inventor, M. Harmet, of St. Etienne, France, whose experience and advice are at the disposal of the company. The plant consists of a group of four hydraulic presses capable of dealing with ingots weighing both three and five tons and a mammoth single press capable of compressing ingots of twenty tons and upfards. The machinery is exceedingly massive, several single pieces weighing 80,000 lbs. each and both presses are capable of exerting a pressure of 4,000 tons on the steel while still in the fluid state.

An entirely new ingot car casting and electric stripping plant has also been installed in the open hearth department which it is expected will effect considerable reduction in costs.

During the last two or three years the New Glasgow works have been practically reconstructed and are now perhaps the most efficient in their particular lines of manufacture in the Dominion. The process of modernization was greatly enhanced this year by the erection of the hydraulic forge and new engineering shops. These cover an area of 40,000 sq. feet and are of steel, brick and concrete construction. The hydraulic forge plant contracted for in Europe some nine months ago consists of two presses, the smaller of 600 tons, the larger of 4,000 tons capacity. The latter will be able to deal with ingots weighing up to sixty tons. The presses are operated on the steam hydraulic principle, all the accessories being electrically driven.

To handle the ingots while being heated and forged in this department, two electric cranes, one of 60 tons and the other of 30 tons capacity have been installed. A 30-ton electric crane is installed in the engineering shop and a similar one in the ingot assembly yard.

The completion of this plant will place the Scotia Company abreast of any forge shops in Europe, probably in ad-