

## THE BUSINESS OF MINING.

The work of the mining geologist in large part consists in demolition; in clearing away the rubbish of overthrown errors to obtain foundation room on which slowly to build a sound structure; in sifting and weighing a mass of speculations in the search for material. On the practical side, the progressive miner learns that the features of a single district or of a few localities may not be an unerring index to the characters of all other deposits; but he is at times hampered by established prejudices which have all the weight of precedents. Fortunately the spirit of modern investigation tends rather to the collection of facts than to speculation. It is now understood that, given sufficient data, the laws evolve themselves; and that the reversal of the logical sequence, putting the theory first, then searching for facts to fit it, tends only to hopeless perplexity.—Mining.

## THE CHEMIST IN IRON MANUFACTURE.

At the recent meeting of the New England Hardware Dealers' Association, Prof. W. P. Cohoe, of Harvard University, read a paper upon: "The Function of the Chemist in the Manufacture of Iron." The following is a synopsis of his remarks:

Now alchemy was not chemistry, but chemistry grew out of it. Its progress until to-day has been a steady one. To-day we are dependent upon it on every hand.

The truth of this last statement will be more forcibly seen when I have shown in a brief way—for time does not permit but a brief outline of the whole—what part the chemist plays in the history of an iron or steel product. Before there is a mine he is there. He examines the ore after it is mined, analyzes the pig after the furnace has done its work, and in large manufacturing establishments examines the finished products in company with the mechanical engineer.

Good iron was manufactured before such an article as the chemist existed. The chemist has obtained his knowledge in a reverse order in many cases, but to-day he has his knowledge fairly well in hand. Notice I do not say perfectly. The true scientist is modest. The function of the chemist in the iron industry then is two-fold. It is first to apply this knowledge so that the best product shall be obtained, and second to improve on present methods where possible.

What we call iron is not iron. It is a mixture of other elements with iron. The business of the chemist is to control this mixture, producing that which is best suited for the purpose intended. Probably none of you have ever seen pure iron. It is prepared chemically. Piano wire is 99.7 per cent. pure, the other 0.3 per cent. being carbon. Native iron occurs most frequently in the form of meteorites.

Now what are the principal forms in which we know iron?

One form is pig iron, or cast iron. It is very impure, containing principally carbon, phosphorus, sulphur and silicon. When cooled suddenly the carbon remains in chemical combination with the iron, and we have white cast iron; when cooled slowly the carbon settles out as graphite, and we have gray cast iron.

When the carbon, silicon and phosphorus are removed, the iron becomes tough and malleable, and its melting point is raised. Then we have wrought iron. Wrought iron generally contains less than 0.6 per cent. of carbon and melts at from 1,900 to 2,100 degrees.

Now what is steel? To-day we have so many kinds of steel that it is very hard to say just what steel is. Here is a definition, however. In its specific sense, steel is a compound of iron, possessing or capable of possessing decided hardness, simultaneously with a valuable degree of toughness when hot or when cold, or both. It includes, primarily, compounds of iron combined with, say, 0.30 to 2 per cent. of carbon, which can be rendered decidedly soft and tough, or intensely hard, by slow and rapid cooling respectively, and secondarily compounds of iron with chromium, tungsten, manganese, titanium, nickel and other elements, compounds which, like carbon steel, possess intense hardness with decided toughness.—Iron and Steel.

## THE AUTOMOBILE INDUSTRY IN GREAT BRITAIN.

Early in the century, before railroads were constructed, says Industries and Iron, the idea of conveying passengers and goods by means of steam power along the king's highway was attractive to many inventors. Highly ingenious were some of the results of their experiments, and the vehicles of Gurney, Hancock and Church, cumbersome though they were, when compared with modern designs, deserve some recognition, when the state of mechanism generally in their day, and the limited facilities which they had, are considered. The legislation, which allowed the Continent to proceed ahead of Great Britain in this matter, having been removed, great progress has been made within the last two years.

With the advent of any new industry there are always features that retard its progress—exalted notions of immediate success, undue anxiety to be the first in the field with new inventions, even though unfinished, and the attendant speculation almost inevitably cause disappointment to some. But while some of these causes have prejudiced a section of the public against the coming method of locomotion on ordinary roads, the initial errors have been overcome, and a motor vehicle is now recognized as a practical means of dealing with traffic problems. Far more convincing than the parades that have been made is the fact that several services of public motor cars have been successfully inaugurated in various centres of business and places of holiday resort, and hardly a town of any importance is without a firm enterprising enough to adopt the motor vehicle for ordinary business purposes. The number of these is growing, and only recently we heard of the establishment of a motor-car service in Sheffield.

In the present stage of the industry, exhibitions are not only useful, but absolutely necessary. They enable the public to see what is being done, and tend to give general confidence in the future of the industry, but they also enable manufacturers and others interested in the industry to compare notes and to keep themselves acquainted with the best notions of construction and design. Hence, while educating the public they educate those who cater for the public, and so do much to improve the general character of automobilism.

—The farmers along the Manitoba and North-Western Railway have finished their fall plowing, and are taking advantage of the good weather to deliver their grain at the elevators. Yesterday, says the Winnipeg Free Press, of 3rd inst., 15,000 bushels of wheat and 3,000 bushels of oats were marketed, the prices being from 51 to 60 cents, and 19 to 23, cents, respectively.

## PRESENT WHEAT SUPPLY.

Stocks of wheat in Canada continue on the increase, and estimates now place the quantity in store at around 7,300,000 bushels, compared with only 2,800,000 bushels this time a year ago, when stocks were abnormally small. According to a Western contemporary, the stocks of wheat are distributed, as follows:

	Bushels.
Montreal .....	229,000
Toronto .....	109,000
Kingston .....	60,000
Coteau, Que. ....	118,000
Depot Harbor, Ont. ....	.....
Prescott, Ont. ....	.....
Winnipeg .....	178,000
Manitoba elevators .....	4,750,000
Fort William, Port Arthur and Keewatin .....	1,930,000
Total, October 14th .....	7,374,000
Total a year ago .....	2,897,000

## GOVERNMENT ADVERTISING IN FRANCE.

France, whose national debt has been growing every day since it paid its milliard of redemption money to Germany, after exhausting apparently every conceivable means of taxation, has lately taken to advertising as a means of money making. This method had already been seized upon by numerous municipalities, which have sold the open spaces on certain public buildings to advertisers, as the panels of city railway cars are disposed of in the United States. As the railway stations, gendarmeries, custom-houses, entrepôts, barracks, and numerous other public buildings, as well as the packages in which several kinds of monopoly goods are sold, are entirely under the control of the Government, it is evident that it has advertising facilities at its command which entirely eclipse in extent and value anything that private advertisers can offer. The value of these may be greatly enhanced by legal restrictions upon the owners of private property, preventing the sale of space for similar purposes.

The latest device of this sort—or perhaps one should say the first Governmental enterprise in this field—is the "lettre annonces," or advertising post-paid letter sheet. One-half the sheet, of ordinary letter-size paper, and rather poor quality, is devoted to advertising, except a space about four and one-quarter by five and one-half inches reserved for the address, on which is printed a fifteen-centime postage stamp. The letter is written on the other half of the sheet, which is then ingeniously folded, and held by a gummed flap. The whole thing is sold for ten centimes; that is, two-thirds of the price of single-letter postage, or exactly the same as a postal card. By this means, the purchaser saves one-third the postage and gets his paper and envelope for nothing. Nominally, the scheme is worked by a corporation, "Societe Anonyme;" but as it sells postage stamps at one-third off, and has its wares for sale at the post offices and Government tobacco shops, it is practically a Government enterprise. The new system will evidently take the place of the postal card; it will decrease the sale of postage stamps, but the receipts from the advertising will enable the Government to make a substantial profit out of the project.—U.S. Consul, Albion W. Tourge.

—In honor of the four hundredth anniversary of the discovery of Brazil, in May, 1900, there will shortly be a special issue of stamps, as follows: Discovery of Brazil, 100 reis; independence, 200 reis; abolition, 500 reis; republic, 700 reis.