

VANADIUM: ITS CHEMICAL AND METALLURGICAL TECHNOLOGY

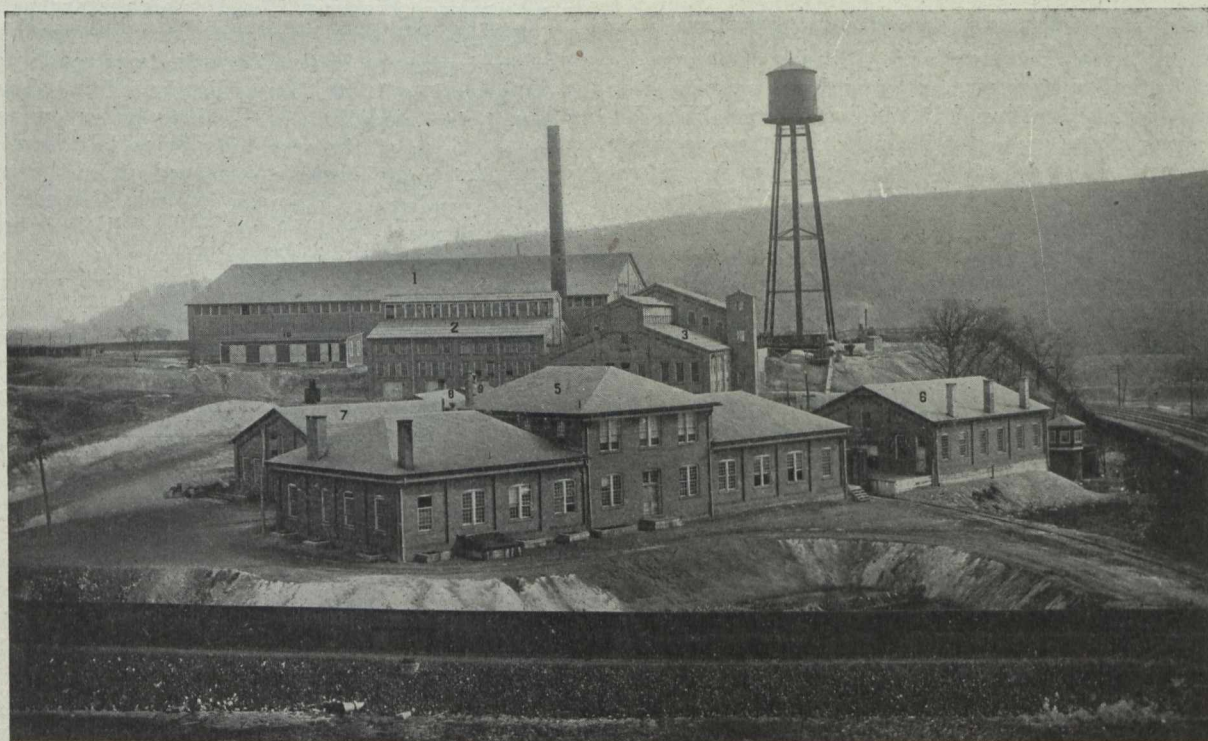
By F. M. Turner, Jr.

On account of its ever increasing use in the making of special steels for automobiles and railroad purposes vanadium alloys are now produced in such large quantities and the ores of the metal mined and sought for to such a degree that it can no longer be spoken of as a "rare element" as was the case even ten years ago. Hardly more than ten years ago vanadium compounds were known only to the dealer in chemicals who handled a few costly salts of the metal, for which there was a limited industrial application. When ferro-vanadium first began to be manufactured, after it was found that its addition improved the quality of steel, the limited sources of vanadium ores were soon exhausted, and the price asked for the alloy was so high as to make steels containing it of little more than academic interest. More-

other metals and to-day the user of ferro-vanadium does not have to rely altogether on empirical rules, but can know largely in advance the exact effect of the addition of the element to steel, and the most efficient manner to accomplish the desired result.

Historical sketch.—To a Mexican, Del Rio, belongs almost, but not quite, the honor of the discovery of this most useful element. Del Rio actually discovered it, but he was led by circumstances to renounce his own discovery.

For the following facts about Del Rio, the writer is indebted to an article in the Bulletin of the Pan American Union written by Mr. Wells of their staff, who by careful research in the archives of Mexico and Spain



AMERICAN VANADIUM COMPANY'S NEW PLANT

over, the impurities contained in the early ferro-vanadiums were so great that the results obtained on its addition were often far different from what was expected and it took some little time for the use of the element to rise into favor. To-day all has changed. A large American company has, after the expenditure of vast amounts of capital, rendered accessible enormous supplies of vanadium ore of high-grade quality in South America. By the maintenance of large and well-equipped research laboratories they have improved the methods of production so as to guarantee a uniform product to the user and have so standardized and improved their process as to make the price but a small fraction of what it was necessary to charge some years ago. Academic and industrial investigators in America, England, France and Germany have studied the properties of the alloys of the metal with iron, carbon, manganese and

found the details of Del Rio's career and his great discovery. Andres Manuel Del Rio, Professor of Mineralogy in the Royal School of Mines of the City of Mexico, was born in Madrid in 1764 and graduated from the University of Alcala de Henares in 1780. He was pensioned by the Spanish government and sent to study in England, France and Germany. There he spent about twelve years, studying mineralogy and mining, and worked with many great scientists—among others, Lavoisier. When he returned to Spain he was made one of a group of savants who were sent to Mexico to establish the Royal School of Mines in Mexico, and given the position of Professor of Chemistry. He later asked that the title be changed to Professor of Mineralogy. The school opened in 1795. Del Rio became interested in politics and was one of the advocates of Mexican independence. After the expulsion of the Spaniards from