

1900; \$50,000 within the next eighteen months, and \$100,000 within the next three years. Of these sums it is provided that \$3,000 shall be spent on experiments looking toward the production of aluminum from the rock in these locations, and a minimum of \$25,000 on a plant for the manufacture of abrasive goods from corundum.

A number of practical tests are carried out each year by the staff of the Department of Mining and Metallurgy and the students of the mining course in their 4th year, in the metallurgical and ore dressing laboratories of McGill University. These consist of the milling and smelting of sample lots of ore, and are intended to apply as much as possible to the advancement of the mineral industries of Canada. At the present moment tests in concentration of low grade titaniferous and chromite iron ores, from the province of Quebec, are in progress, the success of which will have an important economic bearing. Different lots of the ore have been crushed in the various crushing machines of the laboratory, including the fine rolls, stampmill and Huntington mill. Experiments are now being conducted on these, with different sets of concentrating apparatus to determine the most suitable treatment for the ore. In connection with this work, a Browne hydrometric classifier, one of the latest additions to the ore dressing plant, is being made use of.

Personal

A. E. Lewis, of the Atlantic Refining Co., left Toronto on the 29th ult. for Winnipeg and the Northwest in the interests of his company.

N. Hanson Greene, C.E., returned to Montreal recently from an extended trip through Central Ontario, where he has been engaged in reporting on proposed water power and harbor development works.

At the opening of the present session at McGill University the position of McDonald lecturer in Metallurgy and Assaying was left vacant by the resignation of John W. Bell, he having gone to California to take an important part in connection with a mining enterprise there. This vacancy has recently been filled by the appointment of F. W. Draper, M.Sc. Mr. Draper is a graduate of the Massachusetts Institute of Technology, having obtained his degree with high honors in the year '95. Since then he has been constantly engaged in metallurgical work, having been in the employ of a large lead and copper smelting company, for the greater part of the period, while for the last year he has held an educational appointment as Professor of Metallurgy in the University of Missouri. He gave up his position there to accept the lectureship at McGill. His attainments and experience clearly justify his selection, and it is evident that the appointment is a fortunate one for McGill, and that Dr. Porter has secured an able second of his efforts in the Department of Mining and Metallurgy.

METAL IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the imports from Great Britain of interest to the metal trades for the month of October and the ten months ending October, 1898-99.

	Month of Oct.		Ten months ending October.	
	1898.	1899.	1898.	1899.
Hardware	£1,412	£1,848	£18,842	£17,036
Cutlery	4,948	4,043	44,493	43,347
Pig iron	1,474	11,385	9,860	25,992
Bar, etc.	1,491	7,977	8,167	22,234
Railroad	—	38,979	9,119	152,881
Hoops, sheets, etc.	7,350	8,449	51,531	92,959
Galvanized sheets	10,938	8,520	54,650	57,589
Tin plates	19,578	46,925	121,015	188,565
Cast, wrought, etc., iron	2,537	10,500	22,387	50,250
Old (for re-manufacture)	—	883	3,574	5,073
Steel	3,644	40,663	43,032	110,340
Lead	3,172	7,691	31,090	41,788
Tin, unwrought	1,727	1,130	14,019	19,563
Alkali	10,339	7,891	42,048	33,196
Cement	5,825	7,894	23,518	39,537

SOME EXPERIENCES WITH PORTLAND CEMENT.*

BY W. K. ELDRIDGE, CITY ENGINEER, OF LAFAYETTE, IND.

The demand for Portland cements in all classes of work having been greater than the supply for several years past, has almost irresistibly tempted manufacturers to make premature shipments, adulterations and otherwise to issue defective goods, thereby placing an added burden and anxiety on the conscientious engineer in his endeavors to prevent the use of unseasoned and otherwise unsuitable cements, particularly in the construction of cement sidewalks. This he attempts by subjecting the cement before using to the usual tests now universally prescribed in all satisfactory specifications; but my experience of the past two seasons has indicated that the present method of conducting cement tests does not afford the engineer all the information he should obtain before an acceptance of the cement. Even if he takes the ill-spared time from his other duties to make a determination of the relative proportions of lime, silica and alumina, he would probably get no information of other possible ingredients of an injurious nature, and be left as helpless as before. Our tests as heretofore made are the usual ones for fineness, time of setting, constancy of volume and tensile strength; but it is easy to reason from a comparison of a number of results, including the action of the work after construction, that such tests may be and I believe are at times more or less deceptive and insufficient for perfect safety.

For instance, it is becoming customary for manufacturers to give artificial age to their cements by adding certain quantities of sulphate of lime. It has long been known that an excess of the sulphate is injurious to the cement, besides concealing certain actions that a test should be permitted to develop if it is to be reliable; but the temptation to go to excess in order to send out a product that will pass the usual tests without waiting for the proper age or requiring the extreme care necessary in its manufacture is evidently yielded to in many cases, our experience having fully shown that an honestly made cement not sufficiently aged will fail under the steam or boiling water test, thus betraying its immaturity, while a reinforced cement, though equally green, will pass all the tests that so far are customary. Any cement containing more hydrate of lime than is necessary for combination with the silica to form the tri-silicate of lime, runs the danger, in proportion to the excess, of the conversion of the free lime into the carbonate of lime, which action causes the cracking and seaming so common in cement walks. The boiling water test is intended to show this in a few hours, while it would require a long period of time otherwise. But since the presence of sulphate of lime will enable the cement to "boil" safely (and the greater the amount the surer it will "boil"), and further retards the action of the free lime in the work, sometimes to a late day, all value in this test is wholly lost when applied to "doctored" cements. Another inducement for the manufacturer to use sulphate of lime in dangerous quantities comes from the present demand for very finely ground, slow-setting cements; and as fine grinding hastens setting, a corrective must be applied, and if carried to excess, future disintegration is sure to occur, and the usual tests afford no warning. A demand for high initial strength is also called for in connection with slowness of setting, and those two qualities are also hostile; but since the immediate damaging effects of an excess of lime necessary to produce this high initial strength are concealed by the addition of sulphate of lime, we have a cement, finely ground, slow setting, of high tensile strength, but very dangerous to use. Having drawn a sample of a certain cement which failed under the boiling water test, I had the experiment made of ageing the cement artificially, using different proportions of sulphate of lime in regular proportions until the cement would not endure the test. No tests were made to determine whether the cement was over-limed or simply too new; nor was any demonstration made of any sulphate that might have been in the cement before making our additions. When more time permits we expect to go into this part of the matter more deeply.

It was noticed that the cement required more water for gauging as the per cent. of sulphate was greater. Summarizing the results of the experiment, it shows that the time of setting is retarded quite uniformly with the progressive increase of sul-

*From a paper read before the American Society of Municipal Improvements at the Toronto meeting.