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THE RELATION OF THE BEET SUGAR FARM TO THE FACTORY.

In view of the widespread attention which is now certain to be given to the cultivation of the sugar beet, it is well to sound a note of warning with reference to one or two elementary facts, the neglect of which may bring much loss and disappointment to the well-meaning but misguided husbandman.

As there are only a few localities in the United States where beet sugar factories exist, it will be necessary to erect factories to receive and work up the crops, and it is in making the selection of sites that the greatest forethought and care must be exercised. The factory must be centrally located with regard to the beet-growing district, and at the same time it must, if possible, be situated upon a railroad or have connection through its own private side tracks.

When it has been proved that the soil is suitable, that the materials of manufacture are near at hand, and that a market can be depended upon, any agricultural district may lay out its beet farms and build its own factory with a certain assurance that it will prove a profitable, and, what is better, a permanently profitable, investment both for capital and labor.

REPAIRS TO DRY DOCK NO. 3 AT THE BROOKLYN NAVY YARD.

Great interest attaches to the repairs which are being carried out on the new dry dock, known as No. 3, at the Brooklyn Navy Yard. Judged from the engineering standpoint, the problem is an entirely new one, and as there is no case just like it on record, the engineers will have to act entirely on their own initiative.

Dry dock No. 3, it will be remembered, is the one which subsequently to its opening developed a serious leak along one side near the entrance, which an examination by a diver showed to result from injury to the outside apron. The floor and sheet piling at the edge of the apron were found to be broken, and it was supposed that the dredge which was used in opening the entrance from the East River had struck the apron and injured it sufficiently to allow the entrance of water within the sheet piling.

The cofferdam consists of three lines of heavy sheet piling, which extend in a curved form clear across the entrance from wall to wall. The inner wall will be about 90 feet from the caisson; 13 feet in front of this will be another wall, and 13 feet beyond this a third wall. The curve will, of course, be convex to the thrust of the water, to which it will present an arch effect,

though not much reliance will be placed upon the latter in estimating the strength of the dam. The three walls will be strongly braced in the direction of the thrust of the water, and the whole interior space will be filled to above the water line with carefully rammed puddled clay.

The dam will possess considerable strength on account of its arched form and the interior trussing, and it will be further reinforced and rendered watertight by two embankments of clay and gravel, which will start at the water line and slope away to the bed of the river on the river side of the entrance, and on the inner side will finish against a fourth wall of sheet piling, which will be driven across the entrance about 30 feet from the toe of the apron.

From the above general description, it will be seen that in cross section the proposed cofferdam is not unlike the familiar earth dam used in reservoir construction. When it is completed and the water has been pumped out of the dock, a full examination can be made of the origin and extent of the leak.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY MARCUS BENJAMIN, PH.D.

The forty-sixth meeting of the American Association for the Advancement of Science was held in Detroit, Mich., during the week beginning with August 9. The sessions were held in the beautiful building of the Central High School, which occupies an entire square, facing Cass Avenue, between Hancock and Warren Avenues, and it is safe to say that at no recent meeting of the association have any such commodious and delightful quarters been assigned to it.

To these words of welcome Mr. McGee made a pleasing rejoinder, after which formal announcements of important matters were presented by the permanent secretary and the local secretary. The general session then adjourned and the sections assembled for organization. This effected, the members separated for luncheon, but later in the afternoon gathered again to hear the vice-presidential addresses.

The presiding officer of the section on mathematics and astronomy was Prof. Wooster W. Beman, of the University of Michigan, Ann Arbor, who spoke on "A Chapter in the History of Mathematics." This address was a sketch of the development of the geometric treatment of the imaginary, particularly in the latter part of the eighteenth and the first part of the nineteenth centuries.

Section B, on physics, was ably presided over by Prof. Carl Barus, of Brown University, Providence, R. I., whose address was on "Long Range Temperature and Pressure Variables in Physics." The first part of his address contained a history of the various attempts to provide suitable apparatus for high temperature measurement. He then considered the applications of pyrometry, referring at great length to the variation of metallic ebullition with pressure. Results already attained show an effect of pressure regularly more marked as the normal boiling point is higher. Igneous fusion was considered in its relation to pressure and with regard to the solidity of the earth. The question of heat conduction was taken up, and the results deduced by various writers as to the age of the earth discussed. High pressure measurement was dealt with. Passing from this subject, the entropy of liquids was considered. This subject of the heat produced by sudden compression of liquids is in its infancy, and only a year ago were any results of a satisfactory nature obtained. The paper ended with a reference to isothermals and several kindred subjects, all of them slightly dwelt on. The section on chemistry was presided over by Prof.