

The Museum News of the Brooklyn Institute notices the installation of an exhibit illustrating Mr. Abbott H. Thayer's principles of obliterative shading, of a group of timber wolves and of a large painting showing the appearance of a coral reef. The main article in the Children's Museum section describes coffee culture in Guatemala.

SPECIAL ARTICLES

THE DETERMINATION OF THE CLAY CONTENT OF SOILS¹

IN the method of mechanical analysis of soils originally devised and used in the Bureau of Soils of the United States Department of Agriculture,² the amount of clay was determined—after the coarser particles had been separated by centrifuging—by evaporating the clay-water to small bulk in enameled-ware sauce pans, transferring it to platinum, carrying completely to dryness, and weighing the residue. This method was found undesirable on account of the excessive time required for the evaporation, because many dust particles and fragments cracked from the lining of the sauce pans got into the clay and were weighed with it, and because the transfer from sauce pans to platinum required much time and trouble and offered possibilities of loss. To avoid these difficulties, and especially to increase the rapidity of the work, it was therefore decided to abandon the final transfer to platinum, and to complete the evaporation in the enameled-ware dishes and weigh the clay in them without transfer. For convenience in weighing and to decrease the likelihood of entry of dust, the enameled-ware sauce pans were discarded and there were adopted instead much smaller enameled-ware cups, having a capacity of about 300 c.c. and weighing about 180 grams. This method has the disadvantage of requiring a much heavier balance, but the determinations seem none the less accurate, and a great saving of time has been effected.

It is now thought that the method may be

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²See Bulletin No. 24, Bureau of Soils, U. S. Department of Agriculture (1904).

still further shortened in the case of routine analyses by abandoning altogether the direct determination of clay and obtaining its percentage by difference. The error thus introduced will probably be far less than that involved in the centrifugal (or other) separation of the clay from the silt, and both errors are almost certainly within the limits of variation which may be expected between different samples of the same soil. In one hundred consecutive analyses taken at random from the recent files of the Bureau of Soils the variations between the percentage of clay as directly determined and that found by difference ranged between 0 and 2.28 per cent. In two cases the variation was over 2.00 per cent.; in three cases, between 2.00 per cent. and 1.50 per cent.; and in six cases between 1.50 per cent. and 1.00 per cent. In all other cases the variations were 1.00 per cent. or less.

It is indeed not improbable that in many cases the determination by difference is the more accurate, as all errors due to access of dust or to loss of clay water are thus avoided. Errors due to a not impossible change in the state of hydration of the clay are also eliminated. It is believed that in the vast majority of cases the difference method in clay determination will be accurate within 1.00 per cent., and no greater accuracy is necessary or even desirable for purposes of soil classification. The saving in time is at least 30 per cent., and is believed to be well worth while in routine laboratories making a large number of analyses. The direct determination must, of course, be retained for cases of especial importance, or where a check is necessary and is probably also advisable for students' use, and for use in small laboratories.

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NOTES ON THE ATROPHY OF THE EYE OF *RAJA* *ERINACEA*

IN the skate, *Raja erinacea*, a clearly defined case of complete atrophy of the left eyeball was observed in our course this fall.

The brownish integument continued without