determination of the reducing power of both diabetic and normal urins. It has been found applicable to the determination of the reducing power of these materials with ease of technic and with very concordant results without the necessity of any preliminary preparation of the urin. From 1–10 cc. of urin have been used in a determination, the usual amount being 2 cc. in the case of the urin of diabetes. An advantage of the method is the use of small volumes of urin consistently with accuracy. A quantity of 50–100 mg. of pure dextrose when added to diabetic urin was always found determinable either exactly or to within a fraction of 1% of the total amount present. It should be noted that reduction methods show reducing power only, which is not always an exact index of the sugar present, especially in urin. In order to guard against erroneous conclusions the power of normal urin, and to a less extent that of diabetic urin, to hold curpous oxide in solution with or without oxidation must be remembered.

V. Summary of Results.

In consequence of the need for the greatest rapidity compatible with the highest accuracy a procedure for the determination of sugar has been developed from the results of a study of the conditions of reduction and of the accurate measurement of copper in sugar analysis. The procedure is characterized primarily by the quantitative standardization in detail of the conditions of reduction, and of the volumetric estimation by the iodide method of the copper in alkalin tartrate solutions. A set of tabular values has been presented with the data of the original determinations by means of which the probable limits of error can be ascertained. This method has been applied with good results to the determination of the reducing power of urine and of other physiological materials.

I am under much obligation to Professor F. G. Benedict for helpful suggestion and criticism throughout this work. For able and patient assistance in obtaining the experimental data I owe much to Miss Elizabeth B. Babcock, Mr. R. I. Carney, Miss Alice Johnson and Mr. W. F. O'Hara of the staff of this laboratory.

NOTE.

Determination of Melting Points with the Aid of the Microscope.—In toxicological investigations it sometimes happens that a method of determining an approximate melting point under the microscope is of service where the amount of available material is too small to be introduced into a capillary tube. The apparatus described below does not make possible the determination of melting points accurately, but it is of service where an approximation within a few degrees or so is helpful.

The compound microscope used is fitted with a $^2/_3$-in. objective, magnifying 100 diameters. The diaphragm is removed and beneath the table is clamped a section of brass tube, fitted with glass windows at the ends, and wound with a heating coil of nichrome wire, through which can be passed an electric current. The diameter of the tube is 3.1 cm., the length 2.4 cm. Soldered to each end is a collar of sheet brass about 0.5 mm. thick extending 1.2 cm. beyond the inner tube. The lower collar projects inside the tube for about 2 mm. to serve as a support for a round glass plate which is cemented to it with bakelite. Upon this glass plate rest three brass rods cemented to the side of the tube which extend on the inside of the tube to a distance of 6 mm. from the top, and which serve as a support for the top cover glass which has to be removed when the substance is introduced. The top cover glass is round, fitting the inside of the tube, and is cemented to the bottom of a brass ring which fits the inside of the tube and rests upon the three brass rods, just referred to. It is necessary to have the top cover glass below the upper surface of the coil in order to get the objective of the microscope sufficiently near the substance.

The thermometer is introduced through a side tube, the center of which is 8 mm. above the bottom of the main tube. The thermometer extends horizontally to one side, the bulb being entirely within the center of the coil. The thermometer can be cemented in the side tube with asbestos padding and bakelite, or if it is desired to have it removable, it can be fitted with a collar which is threaded to fit the end of the side tube. Care must be taken if the thermometer is removed that it is returned to exactly the same position after the instrument is once calibrated. Above the bulb of the thermometer is a wire bridge upon which the microscope slide which is to hold the substance is placed. Care must be taken that the slide is always put in the same position. Round cover glasses, 2 cm. in diameter, are best adapted to hold the substance.

The heating wire is wound around the outside and impregnated with bakelite. For this purpose Bakelite Varnish No. 2 was used. Four yards of asbestos covered 0.020 nichrome wire were used, and the outside was wrapped with four layers of asbestos paper. The wire can be obtained from the Driver-Harris Wire Co., Harrison, N. J. Squares of asbestos board, with a hole in the center, are placed above and below the heating coil, to prevent loss of heat at the bottom, and undue heating of the microscope table at the top.

The temperature of the thermometer of course is not that of the substance on the slide, but by noting the thermometer reading at which an unknown substance melts, the true melting point can be found by comparison with substances of known melting point. The highest reading on the thermometer obtainable with a current of 0.6 amp. was 64°, with

a current of 0.95 amp. 153°, while with a current of 1.25 amp. the temperature rose above the 200° mark. MARSHALL P. CRAM.

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NEW BOOKS.

Notions Fondamentales d'analyse Qualitative. By V. THOMAS and D. GAUTHIER. 327 pp. and 91 Figs. Gauthier-Villars. Paris, 1912. Price not stated.

This text book differs essentially from those printed in this country in recent years. In the first place, it contains no theory; electrolytic dissociation, equilibrium and the mass law are nowhere mentioned. Analytical tables too are conspicuously absent. The preface states that the book is for *learners*, not for those who seek to pass examinations, and the thoroughness which this statement implies is everywhere evident. It contains more of the chemistry of the elements than most books on the subject. The matter regarding the limitations of the various separations is especially full and illuminating. Several methods are commonly given, and the exact path to be followed is left to the student or perhaps partly to individual instruction. Judged as a laboratory text it should serve well, with proper guidance, to develop real independence as well as careful and painstaking methods in the student, but the course here mapped out would doubtless require more time than American students usually get for qualitative analysis. "Notions fondamentales" is avowedly addressed to beginners, yet it is almost extended enough for a reference book, containing as it does considerable material on all but the very rarest elements, and it seems to the reviewer rather a pity that a reference book was not made of it, for such a book could be used by beginners as well as this one, and there is more need of such a book than of a teaching manual of qualitative analysis—at least in the English language. Many reactions apparently new are given here, though some very valuable ones, like the test for platinum with potassium iodide, the test for cobalt with α-nitroso-β-naphthol and the test for nickel with dimethylglyoxime—all very delicate and characteristic—are not included. The book also lacks, as most text books on qualitative analysis do, a systematic treatment of methods of procedure in detecting very small quantities of the elements and the limits of accuracy of the most delicate tests. This book contains short sections on the use of the microscope and the spectroscope, both of which are practically applied.

E. T. ALLEN.

Soil Bacteriology. By JACOB G. LIPMAN and PERCY E. BROWN. Published by the authors, 1911. pp. 87.

Soil bacteriology has needed definit laboratory methods to exploit it satisfactorily for student purposes. In this little volume an attempt