

duced by A. A. Noyes). It was the purpose of the experiments here reported to attempt a separation of the symmetric and antisymmetric types of iodine molecule by means of a photochemical reaction in which one of these molecular types is selectively activated. The selective activation was effected by irradiation with the green mercury line, 5461 Å, which is absorbed by only one of the molecular types, and the acceptor chosen for the activated molecules was gaseous hexene. If the photochemical reaction were of the simplest kind, namely the addition of the activated iodine molecules onto the hexene double bond, the reaction would proceed until half the iodine is used up, the molecules remaining being of the type which does not absorb the green mercury line. Experiments on mixtures with a partial pressure of iodine of about 0.17 mm and of hexene of about 6. mm show that the mechanism of the reaction is actually more complicated, and may possibly involve energy transfers between the two types of iodine, or the production of iodine atoms at some stage of the process. However, fluorescence experiments on mixtures in which half the iodine had reacted indicated a small but definite excess of the molecular type which does not absorb the 5461 Å line, over that found in the equilibrium iodine mixture. This excess does not disappear in several days when the gas mixture is kept in the dark.

*The ring structure of mannose:* HORACE S. ISBELL (introduced by George K. Burgess). The ring structure of the various forms of glucose and mannose has been the subject of considerable controversy. It has been claimed (Hudson, *Jour. Amer. Chem. Soc.*, 52: 1682, 1930) that a decision between the rival classifications of rings might be obtained from a comparison of the optical rotations of a pair of sugars which can exist only in one ring form. Two pairs of substances which fulfil these requirements, cellobiose and 4-glucosido-mannose, and lactose and 4-galactosido-mannose, were pointed out by C. S. Hudson. A comparison of the approximate rotations of these sugars as given in the literature shows that the difference between the molecular rotations of the first pair differs widely from the value obtained for the second pair. Thus it was necessary to obtain more accurate data upon the rotations of these substances. The preparation of 4-glucosido- $\alpha$ -mannose monohydrate has been repeated and the initial rotation as extrapolated to zero time was found to be  $[\alpha]_D^{20} = 14.6$ . A comparison of the molecular rotations of cellobiose and 4-glucosido- $\alpha$ -mannose gives an "epimeric" difference of 16,900. This is of the same order of magnitude as the values obtained from  $\alpha$ -mannose and  $\alpha$ -methyl mannoside, 14,900 and 15,300, respectively, but it differs markedly from the value 6,700 obtained from  $\beta$ -mannose. On the other hand, a comparison of the approximate rotations of 4-glucosido- $\beta$ -mannose and 4-galactosido- $\beta$ -mannose indicates that they agree with the value derived from  $\beta$ -mannose. These results are interpreted as indicating that 4-glucosido- $\alpha$ -mannose has a structure similar to  $\alpha$ -mannose, while 4-glucosido- $\beta$ -mannose and 4-galactosido- $\beta$ -mannose have structures similar to  $\beta$ -mannose.

Since the disaccharides just mentioned can not form a 1, 4 ring, probably neither  $\alpha$ - or  $\beta$ -mannose has a 1, 4 ring structure.

*Crystalline alpha and beta methyl-d-gulosides:* HORACE S. ISBELL (introduced by George K. Burgess). The reaction between reducing sugars and methyl alcohol in the presence of hydrogen chloride gives a mixture of isomeric methyl glycosides. Frequently amorphous products are obtained which can not be brought to crystallization by the usual methods. The separation of two isomeric methyl gulosides from such a mixture was accomplished by means of crystalline coordination compounds with calcium chloride. So far as known these compounds are the first compounds of this type to be prepared from the methyl glycosides. The calcium chloride was removed by means of silver oxalate, and crystalline  $\alpha$ -methyl-d-guloside (monohydrate) and  $\beta$ -methyl-d-guloside were obtained for the first time. The following new compounds are reported:

$\alpha$ -Methyl-d-guloside $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ ,	$[\alpha]_D^{20} = + 67.$
$(\alpha\text{-Methyl-d-guloside})_2 \text{CaCl}_2 \cdot 3\text{H}_2\text{O}$ ,	$[\alpha]_D^{20} = + 83.$
$\alpha$ -Methyl-d-guloside $\cdot \text{H}_2\text{O}$ ,	$[\alpha]_D^{20} = + 109.$
$\beta$ -Methyl-d-guloside $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ ,	$[\alpha]_D^{20} = - 46$
(approximately).	
$(\beta\text{-Methyl-d-guloside})_2 \text{CaCl}_2$ ,	$[\alpha]_D^{20} = - 65.$
$\beta$ -Methyl-d-guloside,	$[\alpha]_D^{20} = - 83.$

## BOOKS RECEIVED

- CASTLE, W. E. *Genetics and Eugenics*. Fourth edition, revised. Pp. x + 474. 170 figures. *The Genetics of Domestic Rabbits*. Pp. vi + 56. Illustrated. Harvard University Press.
- DRACHMAN, JULIAN M. *Studies in the Literature of Natural Science*. Pp. x + 487. Macmillan. \$4.00.
- HOLMES, HARRY N. *Laboratory Manual of General Chemistry*. Third edition. Pp. x + 163. 34 figures. Macmillan. \$1.60.
- HULBERT, ARCHER B. *Soil: Its Influence on the History of the United States*. Pp. x + 227. Illustrated. Yale University Press. \$2.50.
- LUCKIESH, M. *Artificial Sunlight: Combining Radiation for Health with Light for Vision*. Pp. 254. 65 figures. 8 plates. Van Nostrand. \$3.75.
- LIDDELL, DONALD M. *The Metallurgists' and Chemists' Handbook*. Third edition, revised. Pp. viii + 847. McGraw-Hill. \$5.00.
- MILLIKAN, ROBERT A., HENRY G. GALE and CHARLES W. EDWARDS. *A Manual of Experiments to Accompany "A First Course in Physics for Colleges."* Pp. vi + 221. 134 figures. Ginn. \$1.00.
- REYNOLDS, WALTER F. *First-Order Triangulation in Southeast Alaska*. Pp. vi + 157. 24 figures. Coast and Geodetic Survey, U. S. Department of Commerce.
- STANDLEY, PAUL C. *Flora of Yucatan*. Pp. 157-492. Field Museum of Natural History. \$2.00.
- STRONG, RICHARD P., Editor. *The African Republic of Liberia and the Belgian Congo: Based on the Observations Made and Material Collected during the Harvard African Expedition, 1926-1927. Volume II*. Pp. ix + 1064. Illustrated. Harvard University Press. \$15.00 for set of two volumes.