Like the rat and the bird, the human infant possesses the faculty of producing vitamin C. This faculty, markedly evidenced up to the age of 5 months, is afterwards diminished and disappears in infants of 14 months or above. It should be mentioned that the excretion of vitamin C in the urine often ceases in sick or dystrophic infants.

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[1] N. Bezssonoff and A. Delire, *C.R. Acad. Sci.*, **197**, 1774; 1933. N. Bezssonoff and H. Van Wien, *C.R. Soc. Biol.*, **115**, 1277; 1934.
[2] M. Van Eekelen, A. Emmeric, B. Josephy and L. Wolf, *Klin. Wochenschr.*, **13**, 564; 1934.

Isomerism of Sucrose and Iso-Sucrose

ALTHOUGH an adequate constitutional formula for sucrose has been developed, attempts to verify this structure by synthesis have led to no success, the only crystalline product isolated being an isomeric disaccharide termed *iso*-sucrose. Presumably the isomerism resides in the α or β configurations of the glucose and fructose residues present in this disaccharide; and, if so, both sucrose and *iso*-sucrose should behave in parallel fashion when subjected to the methylation process.

We have effected the complete methylation of *iso*-sucrose by the use of liquid ammonia as a solvent in the final stages of the process. The octamethyl *iso*-sucrose thus obtained was converted by hydrolysis into an equimolecular mixture of tetramethyl glucose and tetramethyl γ-fructose. The two sugars were separated by condensation with methyl alcohol under conditions in which the methylated fructose alone reacted and the resulting mixture was then benzoylated. In this way tetramethyl γ-methylfructoside and tetramethyl benzoylglucose were formed and were thereafter readily separated. In the one case, debenzoylation gave tetramethyl glucose and, in the other, mild hydrolysis yielded tetramethyl γ-fructose.

The result is conclusive and shows that *iso*-sucrose is a stereoisomeride of sucrose in the sense that it is a gluco-fructose containing a normal glucose residue coupled with a γ-fructose residue. The research is being extended.

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Mechanical Twinning in Bismuth Crystals

SINGLE crystals of bismuth are stated by many authors[1] to exhibit mechanical twinning on the planes of type (110). The twinned part has the form of a thin lamella parallel to the twinning plane. On the (111) cleavages they appear as narrow stripes along which the surface is slightly inclined to the (111) face. These inclined faces are of the (111) type. Therefore the atoms which formed the (111) plane before the twinning occurred, form after twinning—at least partially—the (111) plane.

In compression tests with bismuth crystals made by the Bridgman method, another kind of mechanical twin appeared. The most important features of it are: The change in shape and size of the crystal is much bigger than that due to a (110) twin. The twinned lamella is always comparatively thick, of the order of millimetres. The lamella lies along one of the $(7\bar{5}1)$ planes. If one cleaves a crystal which contains such a twinned lamella the (111) cleavage runs perfectly through the twinned part—of course, in a changed direction. This change in direction differs slightly from one crystal to another, owing to slip in the twinned part, as such twins only occur at comparatively high stresses. From its appearance, one can conclude that the cleavage through the twinned part is the (111) plane of the twinned structure. The atoms of the (111) planes therefore remain atoms of the (111) plane in the twin. Thus one is able to find the position of the twinning plane.

Measurements indicate $(7\bar{5}1)$ as the twinning plane, one individual being the mirror image of the other with respect to this plane. In a hexagonal system of axes, which is sometimes used for bismuth, it is the (2241) second order pyramidal plane. In this notation the usual twinning plane (110) in the rhombohedral system of axes becomes the $(10\bar{1}2)$ first order pyramidal plane.

It is remarkable that a plane of so low atomic density can be the twinning plane. However, a quite simple movement, which consists essentially of slip in the usual plane of slip (111), suffices to explain the formation of the twin.

Rather large specimens of the twins on the (110) planes were observed when a tensile test at higher temperature was applied to a bismuth crystal. I have already pointed out[2] that bismuth crystals slip in tensional tests at room temperature only if they contain gas. At higher temperatures (250° C.), however, even crystals without gas exhibit slip in tensional tests. An 'after elongation thread', such as occurs on zinc[3], of appreciable length was observed which was due to slip in a rather big twinned portion of the crystal. The twinning plane was the (110) plane. No other kind of twins was seen in these tests.

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June 15.

[1] Compare H. T. Gough and H. L. Cox, *J. Met. Inst.*, **48**, 227; 1932.
[2] NATURE, **133**, 831, June 2, 1934.
[3] H. Mark, M. Polanyi and E. Schmid, *Z. Phys.*, **12**, 58; 1922. Also C. H. Mathewson and A. J. Phillips, *Proc. Inst. Met. Div. Amer. Inst. Min. Eng.*, 143; 1927.

Wasting Disease of Eelgrass (*Zostera marina*)

IN NATURE of December 30, 1933, a letter appeared on the disease of the eelgrass (*Zostera marina*) in Danish waters based on investigations which I made in the summer of 1933. I am now able to give further details concerning this disease. The destruction of the leaves was continued during the winter, but young shoots formed in the early spring were generally without infection. Infection of the leaves reappears at the beginning of the summer.

At the same time also, a fructification, a formation of spores, in the rhizomes is nearly completed. During the winter and the spring the rhizomes are frequently found to be infected with mycelium referred to in my previous letter and now in June I have found, in the northern Kattegat, in the rhizomes *in situ*,