increasing positive numbers. At present we write 10^{-1}, 10^{-2}, 10^{-3}, . . . mm of mercury; or we use 10^{-3} mm, the micron, as the basic unit for measuring vacuum, and write 1, 0.1, 0.01, . . . , micron.

In Townsend's proposed system, the reciprocal of the negative power of 10, expressing pressure in millimeters of mercury, is multiplied by 10, thus resulting in positive, integral numbers of two figures. In this system, 10^{-1}, 10^{-2}, 10^{-3}, . . . , become 10, 20, 30, . . . vacuum units. This is similar to the method of expressing relative sound intensity levels, the reference level for vacuum being 1 mm. There is logic in using approximately 1 mm as the division point between pressure and vacuum. In its practical application, the range of values ordinarily used would lie between 10 and 70 vacuum units.

The suggestion appears practicable and logical. This note is written to bring it to the attention of American scientists and technologists who may not have access to *Nature*.

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THE OXIDATION OF BILIRUBIN BY PEROXIDASE

PEROXIDASE, in the presence of hydrogen peroxide, is known to oxidize phenols and aromatic amines and iodides. Milk peroxidase oxidizes nitrites and tryptophane.[1] Recently we have discovered that peroxidase oxidizes bilirubin to biliverdin. This reaction takes place in a narrow zone around pH 7.4.

It has been generally assumed that *in vivo* hemoglobin is broken down to biliverdin and that the biliverdin is then reduced more or less completely to bilirubin. However this may be, we wish to point out the possibility that bilirubin may be converted to biliverdin in the liver by action of peroxidase and peroxide. In 1934 Schreus and Carrie[2] observed that when liver brew was incubated with hemoglobin between pH 7 and 8, a blue-green pigment was formed. This was probably biliverdin. The formation of this substance was shown to be inhibited by catalase and favored when the digests were kept at 70°, at which temperature liver catalase was destroyed. We assume that the inhibitory effect of catalase was due to its destruction of hydrogen peroxide.

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[1] S. Thurlow, *Biochem. Jour.*, 19: 175, 1925.

[2] H. T. Schreus and C. Carrie, *Klin. Wochenschr.*, 13(2), 1670, 1934; *Med. Welt*, 9: 1135, 1935; quoted from *Chem. Abstracts*, 31, 6310, 1937.

THE IMPORTANCE OF DEGENERATIVE CHANGES IN LIVING ORGANISMS

VARIATIONS that reduce the amount and rate of growth in long-inbred lines of maize appear in the form of dwarf plants, narrow leaves, crooked stalks, reduced chlorophyll and plants that seem normal but are delayed in flowering and maturing. All the mutations so far observed are either neutral or disadvantageous to the organism. Unfavorable types such as these would be expected to be eliminated by natural competition, but when tested in hybrid combinations with the normal lines from which they originated, these degenerate individuals improve the performance of their offspring and definitely have advantage in survival. Increases over the normal, better parent range up to 104 per cent. in yield of grain, and up to 9 per cent. in height of stalk. This larger growth is made in less time.

Favorable mutations in plants and animals are extremely rare both under natural conditions and in the laboratory. The evidence indicates that they appear first in the heterozygous condition and segregate as unfavorable deviations from normal. Hereditary material is so highly developed and delicately balanced that changes of any kind usually result in a reduction of some kind. Ultimately these new alleles may be brought into equilibrium with the remaining gene complex in such a way as to promote better growth and survival. In this way evolution proceeds by first taking a step backward before going forward.

The fact that unfavorable characters appear so frequently and persist so long in many organisms indicates that they have survival value. These results, recently obtained and to be reported in detail, emphasize the need for caution before eliminating apparently degenerate individuals in plant and animal breeding practice as well as in any eugenic program.

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A REACTION OF ASCORBIC ACID WITH α-AMINO ACIDS

IN SCIENCE of May 25, 1945, Koppanyi, Vivino and Veitch described a red color reaction of ascorbic acid with various α-amino acids. Somewhat over a year ago we observed the development of a bright red color on and in surgical catgut (mainly collagen) when immersed in ascorbic acid solutions, and we believe the same reaction as described by those authors to be involved.

When raw or processed (heat sterilized) plain catgut strands were immersed in ascorbic acid solutions of 50 mg per cent. or more, and stored at room temperature, the strands were uniformly red in three