

Another very interesting fact brought out by the author's work on sweet potatoes is the apparent stability of cane sugar in relation to the respiratory processes in these roots, as cane sugar does not seem to be consumed by either anaërobic or normal respiration.—CHARLES O. APPLEMAN.

Analysis of quantitative variation.—BROTHERTON and BARTLETT¹² have presented the results of a very significant piece of research. The investigation as it stands belongs to the field of plant physiology, but probably it is most significant in the bearing upon certain problems of genetics. Plants of *Phaseolus multiflorus* grown in light and darkness were compared as to length and number of epidermal cells of a given internode. For the physiologist the results may be summarized in the following statement: "The effect of light is that it retards extension of the cells, and that as an indirect result there are fewer secondary divisions, since relatively fewer primary cells enter the range of length within which division takes place." For the geneticist we quote the following: "The mathematical formulation of the results of size inheritance according to the multiple factor hypothesis should be paralleled by a biological analysis, the object of which is the identification of the several factors concerned." Thus size differences may be resolved into number or size of constituent cells or both. "In the investigation of quantitative variations of a hereditary nature it seems likely that the study by the histological method of reactions to the environment and of the obscure reaction known as 'vigor of heterozygosis' will afford a means of correcting for these disturbing factors." It is probably true that heritable size differences express themselves directly in the cells of tissues deeper than the epidermis, and that the change in the epidermis amounts merely to a mechanical response to these forces within. It would probably be advisable, therefore, to carry the analysis to more significant tissues.—MERLE C. COULTER.

Root growth in cuttings.—CURTIS¹³ has published an important contribution to the physiology of root formation in cuttings. A number of forms were used, but *Ligustrum ovalifolium* furnished most of the experimental material. Nutrient solutions of the strengths used in culture work with seedlings were found to be distinctly injurious to woody cuttings. Treatments with potassium permanganate resulted in a very marked increase in root growth of various woody cuttings. After discussing several possible explanations for this stimulation, the author concludes that it is most probable that the potassium permanganate increases respiratory activity by catalytically hastening oxidation. It is known that when potassium permanganate comes in contact with organic matter manganese dioxide is precipitated and oxygen is liberated. There was

¹² BROTHERTON, WILBER, and BARTLETT, H. H., Cell measurement as an aid in the analysis of quantitative variation. *Amer. Jour. Bot.* 5:192-206. 1918.

¹³ CURTIS, OTIS F., Stimulation of root growth in cuttings by treatment with chemical compounds. *Cornell Univ. Agric. Exper. Sta. Memoir* 14:71-138. 1918.



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