Strawberries are grown commercially from regions having several weeks of continuous light in midsummer, such as Alaska, to regions of successively shorter daylight periods southward to Ecuador having 12 hours of daylight, and in winter, in Florida in days with less than 11 hours of daylight. Varieties that succeed in subtropical climates do not require a rest period, at least when grown under the day lengths in the subtropics. Although there is evidence that better growth may sometimes be obtained on such varieties after exposure to low temperatures for a time, they do not require a rest period under light conditions that prevail at Washington, D. C.

A study of the responses to light and rest periods seems to show that the strawberry varieties now grown in regions of short and of long days have actually though unconsciously been selected for adaptation to the light and rest period conditions of those regions. Varieties grown in subtropical regions are sufficiently adaptable to grow continuously under light periods of less than eleven to more than thirteen hours, and in these regions do not require a dormant period. Varieties adapted to Northern United States do not grow well under the short days of Southern states, and soon die out, while southern varieties make too vigorous a growth under the long days of summer in the North.

The strawberry is an evergreen, and upon exposure to suitable light periods some varieties after becoming dormant resume growth. In others apparently nutritional conditions have progressed to a point where light alone as we have used it is insufficient to cause renewal of growth. If the rest period in some other plants, especially in the deciduous ones, is due to similar causes, attempts to produce continued growth or to break the rest period by the use of lights should start before the leaves have fallen, or in some cases even as early as the end of June when the days are longest or even earlier to prove successful

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A "SCURVY-LIKE" DISEASE IN CHICKS

IN the course of nutritional studies we have observed the development of a scurvy-like disease in baby chicks. The first external symptoms are usually observed about the third week. They are nervousness and lameness, which is apparently due to stiffness of the hock joints. These symptoms are followed by bleeding from pin feathers on the neck, wings or thighs. About the same time blood clots appear beneath the skin and in the muscle of the thigh, around the hock joint and at the base of the wings. Closely following these abnormalities are frequent hemorrhages around the head, neck, back, ribs, breast and keel. Abdominal hemorrhages and small hemorrhagic spots in the muscle of the intestinal wall are common. The most frequent symptom is that of dark erosion spots on the gizzard lining[1] similar to the condition described by McFarlane, *et al.*[2] In these experiments approximately 95 per cent. of the chicks had erosions on the gizzard lining, while over 70 per cent. were affected with external or internal hemorrhages. In chicks suffering from the disease the bones were often brittle and the bone marrow dry and colorless. The blood showed an extremely low hemoglobin content (as low as one gram per hundred cubic centimeters of blood) and the blood picture microscopically resembled that described by Hess[3] for human scurvy. There further seemed to be an association between the symptoms described and growth in that the more rapid the growth the earlier the symptoms occurred and the more severe they were.

The symptoms described were produced by feeding a ration composed of fish meal, ground yellow corn, yeast, ground oyster shell and sardine oil or cod-liver oil to chicks confined in battery brooders. Rations in which the yeast was omitted produced the symptoms to a lesser extent. The substitution of 10 per cent. of dried skim-milk for the yeast and a portion of the fish meal produced about normal chicks. However, a few cases of eroded gizzard lining and small hemorrhages were observed, even when the milk was included in the diet. Five grams of cabbage per bird fed to affected individuals during the fifth and sixth weeks resulted in a complete recovery at the end of this period.

In view of the symptoms described, the diets used in order to produce the disease and the fact that cabbage in small quantities brought about a cure, we believe that, contrary to previous reports, growing chicks may suffer from scurvy due to an absence of vitamin C in the diet. We further believe that they are either unable to synthesize vitamin C or under certain conditions they are unable to synthesize this vitamin in sufficient amounts to meet their require ments.

A more detailed report of these investigations is being prepared for publication.

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[1] Similar gizzard affections have been observed in baby chicks as early as the seventeenth day of incubation.

[2] W. D. McFarlane, W. R. Graham, Jr., and G. E. Hall, *The Journal of Nutrition*, 1931, Vol. IV, 331.

[3] Alfred F. Hess, "Scurvy, Past and Present," Philadelphia, 1920.