that, whereas in the former case no appreciable interaction took place between the two dissimilar inoculations, in the latter the two like inoculations did so interact, and in view of the fact that the rust of the first inoculation was in every case completely destroyed by the curative treatment, this interaction was most probably due to the production of some specific humour by the first inoculated rust.

A full account of this work is to be published elsewhere in due course.

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Heterosis in Lycopersicum Crosses in Relation to Seed Weight

In a recent communication Ashby[1] has criticized certain conclusions which I have drawn from an experiment[2] dealing with the problem of heterosis in Lycopersicum crosses. It was shown in this experiment that, in general, there is little correspondence between the presence of heterosis, measured as increase in fresh weight, in the seed and in the mature hybrid 145 days after sowing, and various possible reasons for this were discussed. Ashby suggests that there is another possible explanation which has been overlooked, namely, that correlations between seed weight and 'final weight' had been destroyed by the process of transplantation which took place in the 47th day after sowing, and he produces evidence to support this possibility. This evidence is in itself of great interest, but I consider that it in no way invalidates my conclusions, for the following reasons:

(1) My published data show that any correlations which might have existed between seed weight and weight of plant had already disappeared before transplantation took place (r between seed weight and dry weight of plant on 29th day $= -0{\cdot}160 \pm 0{\cdot}236$). Evidently this lack of correlation must be due to causes other than transplantation.

(2) In spite of marked differences in growth-rate between certain lines there is still a significant correlation ($r = 0{\cdot}488 \pm 0{\cdot}160$) between the dry weight of the plants before transplanting (29th day) and fresh weight after transplanting (145th day), so that, in this experiment, correlations were not destroyed by the process of moving the plants from pots in the greenhouse to a bed in the garden.

The problem of the relationship between seed or embryo weight and the size of the plant after a given period of growth is evidently a complex one, the full elucidation of which must await the accumulation of further experimental evidence. Investigations along these lines are at present in progress.

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A Light-sensitive Strain of *Pseudomonas aeruginosa*

A strain of *Pseudomonas aeruginosa* (*Bact. pyocyaneum*), isolated from a milk factory effluent, was found to be affected by daylight in two different ways. In the first place, the formation of pyocyanin in young cultures was diminished in daylight. Cultures on a glycerol-peptone agar[1], grown at room temperature in the dark, developed an intense blue colour in two weeks (Ridgway's Dark Delft Blue[2]), while parallel cultures in a north window showed a transient green colour (Russian Green) one week after inoculation but had faded to a dirty green-brown by the second week. Growth was apparently equally good in both sets of cultures.

The second effect of light was to cause a marked acceleration in the appearance of a red-brown colour in old cultures. *Ps. aeruginosa* cultures kept continuously in the dark undergo an almost imperceptible and very slow colour change from dark blue through plum colour to dark brown, which takes about eight weeks to complete at 20° C. But dark-grown fortnight-old blue cultures changed to dull brown in a week, and to bright red-brown (Russet) in a fortnight, when kept in a north window. This rapid change of colour in daylight was also observed in cultures killed with formalin.

The view that the red-brown pigment in old cultures of *Ps. aeruginosa* is an oxidation product of pyocyanin[3] is supported by the fact that, when blue cultures were exposed to daylight inside an anaerobic chamber, fading was seen, but no change to red-brown was visible in two weeks.

The red-brown pigment is therefore an oxidation product of pyocyanin; its formation is accelerated by daylight, and is independent of the presence of living bacteria.

Jane Meiklejohn.

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Influence of Age upon the Requirement of Vitamin A

During the course of experiments in which rats were given graded amounts of vitamin A, it was noticed that by 50 days the incisor teeth of animals on daily doses of from ½ to 1 I.U. had lost the deep orange pigment in the enamel, the teeth of animals receiving larger doses being at this stage normal. But, if these latter rats were allowed to live longer, it was found that daily doses of 2–3 I.U. of vitamin A, which were adequate to produce normal teeth at 50 days, appeared insufficient when the animals were older, since later their teeth also gradually lost their pigment. It was therefore decided to investigate this point more closely and to examine the teeth histologically.

The changes in the rat's incisor tooth in vitamin A deficiency have been already described by Wolbach and Howe[1]. The earliest effect is upon the odontoblasts, which show irregular downgrowths into the dentin, leading ultimately to the complete disappearance of predentin. In advanced cases the odontoblasts show marked atrophic changes or disappear completely. This is particularly marked on the lingual side of the tooth, where in extreme cases the formation of dentin completely ceases and the odontoblasts are entirely lacking. As a result of the continued growth of dentin on the labial side, the pulp cavity is pushed