

of growth-gradients, which are of varying shape and steepness, and apparently interact with one another as illustrated by the fact (*loc. cit.* p. 910) that an active

of the two distinct crinkles, namely, crinkle *A* and paracrinkle, they are to be distinguished by their varietal reactions.

The variety Di Vernon is only with some difficulty to be obtained free from all external signs of virus disease. Two out of three such apparently healthy and very vigorous stocks in my possession, when grafted to healthy Arran Victory plants, produced in them but a mild mosaic, but when grafted to healthy President plants, a violent and lethal streak. Further, if the mosaic-affected Arran Victory be grafted to President, the latter succumbs to acute streak in the same way as did those grafted directly from the Di Vernon.

Uptodate has long been known to carry a latent streak, though it itself may appear to be in the best of health. I have tested out a great many units of Uptodate from the very best stocks obtainable in Scotland and Ireland, and have, with one doubtful exception, found them all to be carriers of virus disease. Now the streak which Uptodate may carry reacts differently from that carried by Di Vernon: here both healthy test plants, Arran Victory and President, develop a moderate and generally non-lethal streak. However, the Arran Victory usually suffers more severely than does the President—the reverse of what was found with Di Vernon streak.

To the Uptodate class of streak reaction belongs that found in two more carriers, namely, Kerr's Pink and Majestic. In the latter variety, streak carriers seem rather rare; in the former the matter is complicated by the fact that whilst all Kerr's Pink stocks (in my opinion) are carriers, the virus they carry is clearly depressed in virulence by its sojourn in Kerr's Pink, and it is only rarely that its reaction on grafting to other varieties is in terms of streak.

A corresponding difference of reaction is found when *Datura* are inoculated with the two types of streak. The Di Vernon carriers produce no reaction in *Datura*; the Uptodate and Kerr's Pink carriers, on the other hand, cause a reaction identical with that following inoculation with crinkle *A*.

As it seems wisest to discriminate between the viruses of the potato by their reaction in standard healthy varieties rather than by their clinical appearance in any one variety, I would suggest that the virus which produces streak in both healthy Arran Victory and President and may be latent in Uptodate, Kerr's Pink, and Majestic, be termed streak *A*; and that which may be latent in Di Vernon, produces a streak in healthy President but fails to do so in healthy Arran Victory, be called streak *B*. Such a system of nomenclature leaves room for the identification of other streaks, evidence for which is now accumulating in our Institute.

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Cambridge, July 30.

¹ "Crinkle 'A': an Infectious Disease of the Potato," and "Paracrinkle: a Potato Disease of the Virus Group." *Proc. Roy. Soc. B*, vol. 106, 1930.

Transmission of Potato Leaf Roll.

IN his letter in NATURE of July 19, p. 96, Dr. Kenneth Smith appears to be under the impression that I 'deplore' the importance attached by virus workers to *Myzus persicae* as a vector of potato leaf roll. The importance of this insect in this respect was not called into question in my letter in NATURE of June 28, but rather "the growing tendency . . . to regard the relation of *M. persicae* to leaf roll transmission as specific and unique". Dr. Smith reminds me that in May 1929 he expressed the opinion that *M. persicae* is probably not the only carrier of leaf roll.

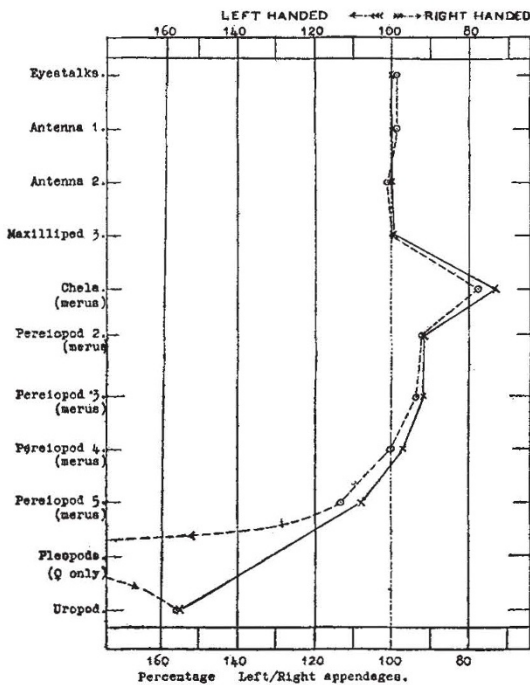


FIG. 2.—x—x, male; o---o, female.

growth-centre in one appendage is correlated with increased growth-activity in limbs immediately posterior to it, decreased growth-activity in those immediately anterior.

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J. S. HUXLEY.

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July 28.

¹ Huxley and Tazelaar, NATURE, June 15, 1929, p. 910; Huxley, *ib.* April 13, 1929, p. 583.

Virus Disease of the Potato: Streak.

THE term 'streak' has been applied to a diseased condition of the potato in which the leaf and stem tissues become to a greater or lesser extent involved in a necrotic process. The condition was first described as a separate disease by Atanasoff under the name of 'stipple streak', and has since received considerable attention from the clinical point of view from Quanjer and others. In this Institute I have shown how 'streak' may be but an alternative symptom of another disease, namely, crinkle *A*; and my colleague, Dr. Kenneth Smith, that it may assume a somewhat similar relation to ringspot disease of tobacco. In the former, the change from crinkle to streak is induced by varietal susceptibility; in the latter, by *passage* of an original potato mosaic virus through tobacco before being used as an inoculum to reinfest the healthy potato. Streak is clearly a clinical picture which may be reproduced by different agents.

In pursuance of the task of obtaining virus-free stocks, I have frequently been brought up against the problem of the apparently healthy virus carrier, and have dealt with the question in some detail in two recent papers.¹ This year's work has given me good reason to believe that there may be at least two distinct viruses which produce streak, and, as in the case