

has often been difficult to find the larvæ in healthy trees, although they were present in greatly increased numbers in the cankers. Thus this insect, which is undoubtedly of importance as a carrier of spores to healthy trees, would, as the infections grew old, become less so owing to its increasing tendency to breed in and frequent diseased trees to the exclusion of healthy ones. Other insects which come in this category are several species of moths of the genus *Sesia*, although, in the case of these, observations indicate that adaptation to a life in cankerous tissue has not developed to so great an extent.

Of more importance in providing for the spread of the chestnut bark disease are the fresh wounds made by certain insects through the outer bark of the tree to the cambium whereby spores disseminated in various ways can gain entrance. Of first rank among insects which work in this way are *Leptura nitens*, which, as stated, is found in 90 to 95 per cent. of the trees over 10 inches in diameter throughout the chestnut range, and the chestnut bast-miner *Ectoedemia phleophaga* Busck, which is found abundantly in 95 per cent. of the saplings and younger trees throughout the natural range of the chestnut. Less abundant, though also widely distributed, are three species of *Sesia*—*S. castanea* Busck, *S. scitula* Harris, and *S. pictipes* G. & R. All these insects attack perfectly healthy trees and make wounds at various situations over the entire bark surface of trees from those of sapling size to those which are matured. Furthermore, most of them are abundant and widely distributed. These wounds are all holes made by the larvæ either for the extrusion of frass—in which case they are present and used throughout the entire larval life—or for exit when the larvæ are preparing to leave the open to the cambium and surrounded by the moist dead tissue necessary³ for the growth of the spores. Thus practically all chestnut trees in their natural range have numerous open wounds whereby wind-blown and rain-washed spores can gain entrance. Young cankers

³ Rankin, W. H., "Phytopathology," Vol. 4, p. 242, 1914.

have been found starting in wounds of both types mentioned.

Wound makers of another class are the cicadas, tree crickets, tree-hoppers and aphides. These puncture the bark in ovipositing or feeding. In numerous cases the blight has been found starting in cicada and tree-hopper wounds. A possibility exists that these insects both carry the spores and directly inoculate the wound; but such a chance is slight from the fact that insects of this kind normally frequent healthy trees.

In conclusion it may be said that in view of the facts established, namely, that ascospores are carried about by the wind in great numbers and that the pycnosporos are washed down the trunks by the rain, the rôle played by insects in the transmission of this disease in merely transporting the spores is insignificant. On the other hand, owing to these same characteristics of the disease, the part played by insects in making wounds in the living cambium where such spores can gain entrance is far more important, and such wounds have been commonly found infected. Again, the fact that certain insects frequent diseased trees and eat the pustules, thereby preventing the dissemination of the spores, can certainly not be considered other than a benefit.

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CANCER AND HEREDITY

IN final reply to Dr. Little, of Harvard, there are three things to be said:

I

My results in cancer transmission are these:

1. The establishment of strains of mice which both in inbreeding and in hybridization transmit spontaneous cancer through as many generations as I please to carry it, and in a percentage which can be predicted with a surprising nicety. For example, certain strains of mice have been producing a fairly steady percentage of spontaneous cancer in this laboratory for five years without a break.

2. I have taken strains riddled with cancer and by the type of breeding tests described in my published work have eliminated the disease absolutely from the strain and its hybrids.

3. A mass of data still unpublished shows that these things can be done not only with cancer in general, but also with cancer of specific organs and of specific types.

The persistent criticism of my "unorthodox" results in *color transmission* in this hallowed cross between an albino and a house-mouse only serves to confuse the issue with regard to the question of cancer inheritance; and if Dr. Little wishes to criticize my cancer work further, in the interests of logic I ask him to do so on the lines of my cancer work and not on the basis of color transmission.

II

It is impossible to agree with Dr. Little that any reference to "the great laws of heredity" must necessarily refer only to Mendel's laws, since every student of genetics knows that there is a vast array of facts of heredity which by no possible compression can be forced within the limits of these laws. Especially does every worker with the coat colors of mice know this fact. Perhaps an amendment may in time be added to those theories now supposed by Dr. Little to be a closed issue like the Koran.

III

The publication of my results in color transmission will be attended to in due time. These data belong with a mass of facts collected in the study of the inheritability of coat pattern. It would be impossible to get this material in form for immediate publication without seriously neglecting experiments now under way in the study of cancer.

MAUD SLYE

THE OTTO S. A. SPRAGUE MEMORIAL INSTITUTE

A MOLLUSK INJURIOUS TO GARDEN VEGETABLES

DURING the past summer a small slug or *Limax* was noted to be injuring garden vegetables of several kinds. It seemed rather large for the common *Agriolimax agrestis* (Linné)

and specimens were submitted to Dr. H. A. Pilsbry for an opinion. They were found to be this species. Both underground vegetables and the leaves of the plants were attacked. In Canandaigua they were observed to attack potatoes, the mollusk frequently eating a hole in the tuber as large as its own body. As many as a dozen potatoes were observed to be thus eaten. In the same garden this slug attacked the string beans, eating into the full pods and consuming the beans. In Rochester, a garden was examined in which the potatoes were affected in the same manner as those at Canandaigua. In Syracuse, this slug was observed in cauliflower, in company with the smaller black slug, *Agriolimax campestris* (Binney). Some lettuce was also eaten by these mollusks. It is probable that this slug (*agrestis*) may become a pest in some localities.

Agriolimax agrestis is very abundant about Syracuse, in the east end, the hill portion, where one may see dozens of the slugs crawling on the sidewalk after a rain in a manner similar to the earthworms. This is particularly true on Euclid Avenue, where the morainic hills border the sidewalk on the south side. This brown slug as well as its smaller black relative is abundant in the woods and fields in and around Syracuse.

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SCIENTIFIC BOOKS

La Science Française. Librairie Larousse, Paris, 1915. 2 Vols. Pp. 396 and 403. Illustrated with portraits.

The dominance of German science during our generation seems to have been rather generally accepted, a principal cause of which is clearly seen in efficiency of organization essentially military in its nature. With attention now focused upon German efficiency, it is possible to discern certain elements of this success which before had been obscure. The systematic German mind, with its pertinacity and indefatigability of purpose, has found one of its expressions in the preparation of exhaus-