A NEW GUINEA EEL-FAIR

THE ascent of fresh-water streams by vast swarms of elvers or young eels, long known as "eel-fairs" in England, is a phenomenon of great interest. The migrations of the Atlantic eels are now well known, thanks to the studies of a long line of naturalists, culminating in the epochal researches of Johannes Schmidt.

As yet little is known of the life histories of the numerous species of Anguilla found in the Indo-Pacific waters. It is therefore of interest to note that on May 24, 1928, we found an incredible number of young eels ascending the great Sepik River at Marienberg, New Guinea, which is about forty miles inland from the north coast. This is in former German New Guinea.

I measured 262 specimens, varying from 104 to 210 mm in length. Most of the eels observed were from 125 to 150 mm long, and quite slender. A moderate increase in length was accompanied by a very great increase in bulk.

The eels occurred in such numbers that the natives, men, women and children, scooped them up out of the river by basketsfull on both sides of the river. The Sepik at Marienberg is half a mile wide and fifteen to twenty-five feet deep at the bank; our ship, drawing thirteen feet of water, tied up to the shore.

Two days later only a few individuals were found in seining the tributary brooks where the young eels had occurred in myriads before.

This is the second eel-fair observed in New Guinea, the first seen being on February 22, 1922, in the Mamberamo River, Dutch New Guinea. This was inland a considerable distance from the north coast.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

MORE ABOUT LACTOPHENOL

IN two late numbers of SCIENCE[1] two contributors have called attention to lactophenol and its use. Lactophenol and lactophenol gum have been used for nearly eight years by the writer, his coworkers and students in the department of botany. This solution has been found an excellent medium for killing, staining and mounting microscopic materials, for these three processes may be accomplished in one process with green lactophenol.

However, for staining nuclei and differentiating hyphae in plant tissues, as wood and parenchyma, the sections were first submerged for ten minutes in lactophenol to which two parts of distilled water had been added; after this liquid was drained or blotted from the sections they were covered with deep acid green lactophenol and stored overnight in the open air. The liquid was again removed, the sections washed by floating clear lactophenol over them and then mounted in clear lactophenol or lactophenol gum. Hyphae in cells of fruit, wood and from germinating conidia were nicely differentiated by this method.

As investigators continue to employ this solution in zoological and botanical work, greater possibilities for a more extensive use may be forthcoming. If such be the case, they should be published for the benefit of all.

Details for the preparation of lactophenol and lactophenol gum together with references may be found in an article by W. H. Davis, "Lactophenol."[2]

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SPECIAL ARTICLES

A NEMATODE PARASITE OF THE JAPANESE BEETLE (POPILLIA JAPONICA NEWM.)

ON May 29, 1929, at the Tavistock Golf Course, Haddonfield, New Jersey, in a plot of ground two feet square the writers found fourteen dead, fully grown Japanese beetle grubs. These grubs were flaccid and of an ocherous brown tint. On dissecting the cadavers each one was found infected with numerous nematodes. Among these nematodes ovoviviparous females, males and larval forms were observed. On May 31, in the identical locality, nine more dead Japanese beetle grubs were found. These grubs had the same external appearance as the previous ones and were also heavily infested with the parasite.

On each of the two days following this observation eight fully grown Japanese beetle grubs from healthy stock were experimentally infected with worms derived from the parasitized grubs. One grub was placed in each of eight sterile tin salve cans containing soil which had been previously baked. The surface of the soil in each can was dampened with five drops of a heavy salt solution suspension of the nemas. An equal number of uninfected controls were held. Within five to seven days fifteen of the sixteen infected grubs

[1] SCIENCE, 70: 430, November 1, 1929; 70: 455, November 8, 1929.

[2] *Botanical Gazette*, 77: 343–344, 1924.

died. They were flaccid, of an ocherous brown color and were filled with the introduced nematodes. One infected grub and the sixteen controls pupated and transformed. This experiment was repeated towards the last of June with approximately identical results.

During the course of the first experiments some of the worms derived from the May 29 and 31 field collections were fixed and sent, on June 4, to Dr. G. Steiner, of the U. S. Department of Agriculture, for identification. Dr. Steiner informed us that the nematode was undoubtedly a parasite and not a saprozoic free-living form. It belongs to the family *Oxyuridae,* and has been described by Dr. Steiner as a new genus and species under the name of *Neoaplectana glaseri.*[1] Whether *Neoaplectana* accompanied the Japanese beetle to this country or is a usual parasite of some native insect, from which it has reached *Popillia japonica,* is not yet clear.

During the summer and early fall frequent examinations of living and dead grubs were made. Some of these were obtained from the original locality as well as from other sources in New Jersey and Pennsylvania. However, *Neoaplectana* was found in only one place, namely Tavistock, near Haddonfield. On June 15, one pupa from this station was found parasitized with *Neoaplectana.* On June 21, a reexamination of the small plot of ground where the nematodes were first found yielded three Japanese beetle grubs, two pupae and two adults, all parasitized. The adults seemed to have been in the process of emerging from the soil when stricken. The June 21 collection was the last *Neoaplectana*-parasitized material obtained. After this date the adults emerged and the next generation of grubs were too small and scarce for satisfactory work until about the last of August.

One dead second-stage larva obtained from Pitman, New Jersey, August 24, and three from Haddonfield September 17, were heavily infested with several species of nematodes that appeared smaller than the spring parasite. These nematodes were undoubtedly saprophytes which multiplied within the bodies of the grubs after they succumbed from other causes. We were able to cultivate several generations of these worms on hay infusion agar to which a small amount of coagulated horse serum had been added. The females of these worms laid eggs very freely on the medium. Healthy Japanese beetle grubs infected with these nematodes did not die, although they acquired the worms, probably per os, and maintained from one to six of them within their alimentary tracts for about two weeks. The saprophytic species were the only ones found throughout the early autumn, and they also apparently disappeared from the field after the middle of October.

[1] *J. Wash. Acad. Sci.,* 19: 436, 1929.

Neoaplectana appears to be ideally adapted as a parasite for the Japanese beetle, for the reason that the host spends most of its long life cycle in the ground, which is undoubtedly also the natural environment of the nematode during at least a portion of its existence. According to present indications the parasite still occurs locally. However, it possesses great reproductive and lethal capacities, and therefore might prove a valuable adjunct if distributed throughout the territory infested with the Japanese beetle.

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REVERSAL OF THE STIMULATING ACTION OF HYDROSTATIC PRESSURE ON STRIATED MUSCLE

THE application of hydrostatic pressure to striated muscle commonly results in a marked augmentation of the tension developed during a single twitch.[1] Pressures of the order of 1,000 pounds per square inch in our previous study caused an increase of about 30 per cent. in tension and heat production. Most of our work, however, has been carried out on cardiac muscle in which tissue the effects of pressure are greater and the results may be predicted with considerable confidence.[2] Certain observations made in the interim on striated muscle failed to show as great a stimulation as was reported earlier, and occasional preparations were entirely uninfluenced by pressure. A further study has therefore been undertaken on striated muscle in which the effects of various environmental factors have been investigated in relation to the magnitude of the response under pressure. The results, a preliminary report of which is here published, are of interest in relation to the theories of pressure action and to the general problem of muscular contraction.

All observations have been made on sciatic-gastrocnemius preparations from the frog by a technique previously described.[1]

When the muscle was immersed in an oxygen free Ringer's solution or in one in which the acidity had been increased to about a pH 6.8 by the addition of hydrochloric acid, a characteristic change was noted. At first pressure resulted in the usual augmentation

[1] McKeen Cattell and D. J. Edwards, *Am. Jour. Physiol.,* 86: 371, 1928.
[2] D. J. Edwards and McKeen Cattell, *Am. Jour. Physiol.,* 84: 472, 1928.