DISCUSSION

A PROPOSED COMPENDIUM OF CULTURE METHODS FOR THE LESSER INVERTEBRATE ANIMALS

AT the Syracuse meeting of the Association in June I suggested cooperation among zoologists in the preparation of a compendium of methods of rearing and maintaining cultures of the lesser invertebrate animals. These animals are needed for experimental purposes and for laboratory use. Many such animals have been kept in dwindling cultures for a time, but I fear that very few have been reared successfully through repeated generations. The methods for these few have cost much time and labor and are not very widely known. They are hidden away in scattered papers whose titles usually give no hint of their presence. It seemed to me that future workers would be greatly aided by making the knowledge of successful cultural practices more available.

The idea was favorably discussed in the opening meeting of Section F. I now invite the consideration of the wider circle of zoologists who are readers of SCIENCE. What I have in mind is a compendium of the best knowledge available concerning the collecting, feeding, sheltering, breeding, etc., of the lesser invertebrates: in short, everything that has to do with maintaining cultures of them. Perhaps there is not much known, aside from a few classic forms, such as Drosophila, Daphnia, Paramoecium, etc.; but perhaps there is more known than we suspect (the discussion at the Syracuse meeting would indicate this); and perhaps if what is known were brought together and studied there might appear some general rules of management of great value.

My thought was, and is, that if a small committee of interested zoologists were commissioned by their colleagues to gather and sift such material, and publish it in a book, the job might be done through cooperation without too great expenditure of time. I have thought that such a book would have for me the help that Lee's "Microtomists' Vade Mecum" had when I began to work alone on animal tissues. I have in mind a small book that any one could afford to own, that would avoid on the one hand anecdotes and freak plans, and on the other hand such futilities as mathematics prematurely applied to inadequate data. In these days of emphasis on the use of living animals is not such a book much needed?

If the question that I here raise elicits sufficient response from the zoologists who may chance to read this, I will at the Atlantic City meeting of Section F propose such a committee, together with cooperative arrangements to facilitate its functioning.

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PHYCOMYCETES, ASCOMYCETES AND FUNGI IMPERFECTI IN OKLAHOMA SOIL

ACCORDING to Waksman,[1] work on soil fungi has been done in Europe, Japan, and in the United States in New York, Michigan, New Jersey, Idaho, and other of the northern and eastern states. However, no counts heretofore have been reported from Oklahoma. This study was made by the plating method, and included the fungi in typical Cleveland County, Oklahoma, soils. Only the noteworthy results and explanations follow.

In general, the counts of Phycomycetes, Ascomycetes and *Fungi imperfecti* made in Oklahoma are higher than those made in northern states. The samples were taken at four different depths in the soil: Sample A, 2 cm below the surface; sample B, 8 cm; sample C, 20 cm; sample D, 40 cm. The work extended over a year. The averages were: Sample A, 313,000 per gram of soil; sample B, 423,000; sample C, 134,000; sample D, 195,000. Waksman gives the average numbers of fungi in soils farther north as follows: At a depth of 2 inches, from 30,000 to 120,000; at a depth of 6 inches, from about 15,000 to 90,000; at a depth of 10 inches, 10,000 to 35,000. Averages for only our very loose sandy soils were: Sample A, 537,000; sample B, 1,277,000; sample C, 224,000; sample D, 216,000. The averages for the finest, most closely packed soils were: Sample A, 230,000; sample B, 217,000; sample C, 129,000; sample D, 365,000.

A notable fact was the large percentages of *Aspergillus niger* present. Of the total number of Phycomycetes, Ascomycetes and *Fungi imperfecti* found at the two cm depth, 43.7 per cent. were *Aspergillus niger;* at the eight cm depth, 38.9 per cent.; at the twenty cm depth, 26.6 per cent.; and at the forty cm depth, 25.2 per cent. A factor here may have been that *Aspergillus niger,* like all other members of this genus, is strictly aerobic.[2]

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MITOCHONDRIA AS CENTROSOMES

IN the papers presented at the New Orleans meeting of the American Association for the Advancement of science on the alveolar structure of the mitotic spindle and the self-repulsion of chromosomes, I did not include the evidence corroborative of those observations as given by the variant locations of the mitochondria during mitosis. The *Amblystoma punctatum* material with which I have been working

[1] S. A. Waksman, "Principles of Soil Microbiology," 1927.

[2] Charles Thom and Margaret B. Church, "The Aspergilli," p. 49. 1926.