PURPLE BACTERIA AS SYMBIONTS OF A LICHEN

THUS far lichens have been considered as being fungi with which are associated certain algae, and it is supposed that at least in certain species both may live to common advantage.

It seems, however, another symbiosis is possible, which I have observed on a lichen thus far known as *Chiodecton sanguineum* (Sw.) Waino. It is a very conspicuous and attractive species, which I have found abundantly in Florida and in some parts of the island of Cuba. One encounters it especially in the damp hummocks growing against stems of *Quercus virginiana, Magnolia grandiflora* and of some other trees.

It is a crustlike lichen which is nearly round or irregular in shape and may develop a diameter of from half a centimeter to about two decimeters. Its characteristic is its center of a grayish to bluish gray color surrounded by a deep red margin, which is as far as I am aware never absent. On the grayish parts of the upper side of the lichen some red-colored blotches may appear in streaks or in small spots. Whereas the upper surface is thus almost gray, the lower one is deep red.

When this lichen is observed under high power of the microscope it is at once evident that the red color is caused by small organisms, which surround the hyphae of the fungus.

It is generally accepted that the algal symbiont of *Chiodecton* is a species of *Trentepohlia.* This is, however, not the case with this species of lichen. The red organisms have not a single characteristic in common with the *Trentepohlia.* In fact, they are not green algae nor blue-green algae; but these are purple bacteria.

They are oval and vary from 1.5 to 2 microns in length; they possess no flagella but show a vivid Brownian movement, as the same is present when they are dead. The bacterial cells contain the well-known bacteriopurpurin.

Cultures and subcultures and various other investigations with these bacteria have been made by the writer, which have proved that they belong to the genus *Rhodobacterium.* The name of the lichen has consequently been changed into *Rhodobacteriophora sanguinea,* and this new species of purple bacteria has been given the name of *Rhodobacterium lichenophora.*

An extensive account of my research of this interesting lichen will appear soon in one of the botanical periodicals.

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LIBRARIANS AND SCIENTIFIC RESEARCH

THE following statement was accidentally gleaned from the "Report of the Librarian of Congress," Washington, Government Printing Press, 1923, Page 205. (On reclassification of Library Service).

9. To hold the staff permanent, a maximum of less than $6,000 is unsafe, and in a library, permanence in the staff positions is essential. A scientist engaged in intensive research can readily pass over his work to his successor, who will take it up where he leaves off. The specialist leaving a library takes with him an accumulated knowledge of the particular collections and the apparatus, and an acquired experience in interpretation, which can not be replaced.

The librarian of Congress would be a better librarian if he understood better the conditions of scientific research.

B.

SCIENTIFIC BOOKS

The Fauna of British India, including Ceylon and Burma. Oligochaeta. By J. STEPHENSON. London: Taylor and Francis. 1923.

ABOUT seventeen years ago Col. Stephenson began to devote himself to the study of Indian earthworms. Laboring with extraordinary zeal, he published thirty-five papers, and described 126 new species and a number of varieties. He has now gathered all his results, combined with those of other workers, into a volume of 518 pages, treating the subject as exhaustively as the present state of our knowledge permits. This book is something more than a collection of descriptions of families, genera and species; it includes many reflections on the general aspects of the subject, on such topics as evolution and geographical distribution. It readily appears from a study of the tables and descriptions that specific (and even generic) characters have arisen by meristic variation in many instances. This variation is going on at the present time, as Beddard has well shown in the case of a common Indian species, *Perionyx excavatus* of E. Perrier. There is no reason why changes of this type should not occur independently in a number of places, and consequently doubts arise as to the phylogenetic integrity of some of the genera. The probable lines of descent have been worked out with some apparent accuracy, but the author has been led to suggest that of the large genus *Megascolex,* some species are derived from *Notoscolex,* others from *Perionyx,* and others probably from *Spenceriella.* Moreover, those derived from *Notoscolex* have had their origin "at different times and places." From such considerations one may be led, according to his bias, to either propose a series of new genera or lump those already recognized. By referring all these worms to a single