

man's earlier investigations. He concludes that the conjugations by means of which the cells of the rusts change from a uninucleated to a binucleated condition are not to be regarded as simple fusions for nutritive purposes as is common in many fungi, but as marking the beginning of the sporophyte generation.

In a paper entitled "Infection Experiments with *Erysiphe cichoracearum*" (*Bull. Univ. Wis.*, Science Series, vol. 3, pp. 337-416) Dr. G. M. Reed takes up the question of "physiological species," and after making a great many infections concludes that his work "throws considerable doubt upon the existence of distinct biological forms" in mildews as well as in certain species of rust. The paper is so largely made up of tables that it can not be summarized.

C. H. Kauffman's "Unreported Michigan Fungi for 1907, with an Outline of the Gasteromycetes of the State" (in Tenth Ann. Report Mich. Academy of Science, pp. 63-84) adds many hitherto unreported species to the Michigan flora and includes a useful arrangement of the Gasteromycetes. The same author's paper on the Physiology of the Saprolegniaceae (in *Ann. Bot.*, Vol. XXII., pp. 361-387) adds to our knowledge of the structure and development of these interesting fungi, and is especially valuable as suggesting methods of culture. The author modestly says that his paper "adds something more of evidence towards the doctrine that sex in plants is determinable by external conditions," distinctly disclaiming however that it is yet conclusive.

CONNECTICUT MOSSWORTS

UNDER the title "The Bryophytes of Connecticut" Professor Doctor Evans and Mr. G. E. Nichols publish (in *State Geol. and Nat. Survey, Bull.*, No. 11) an important contribution to our knowledge of the mosses and liverworts of that state. It opens with a well-written introductory chapter of 16 pages on the general structure of these plants, followed by a 5-page history of bryology in Connecticut (from which we learn that the first systematic work on these plants was undertaken by D. C. Eaton about half a century ago), half a dozen

pages of ecology, and two, on the economic values of bryophytes. Then follows the Catalogue of 387 species, distributed as follows: *Marchantiales*, 12; *Jungermanniales*, 92; *Anthocerotales*, 3; *Sphagnales*, 31; *Andreaeales*, 2; *Bryales*, 247. Under each species are given habitat, localities in the state, general distribution, exsiccata and references to descriptive or other papers. The bibliography includes 81 papers, beginning with Sullivant's "Anophytes" in the second edition of Gray's "Manual," in 1856, and coming down to the present. An excellent index closes this useful work.

CHARLES E. BESSEY

UNIVERSITY OF NEBRASKA

ANTHROPOLOGY AT THE BRITISH ASSOCIATION

THE Anthropological Section (H) of the British Association, held at Belfast last September, was notable for the number and excellence of the papers, many of which were fully illustrated with lantern slides. A précis of the proceedings will be found in *Nature*, but readers of SCIENCE may like to hear how America was represented. In his presidential address on "Totemism" Mr. A. C. Haddon criticized the terminology employed by most American students. He held a confusion had been made between totemism proper and the cult of a guardian spirit; doubtless American anthropologists will have something to say on this subject. Mr. W. J. Knowles, a local archeologist, described some stone axe factories that he had discovered near Cushendall in Co. Antrim, which recall in a small way, as was pointed out at the time, the bowlder quarries described by Dr. W. H. Holmes in the Fifteenth Annual Report of the Bureau of Ethnology. Mr. Knowles also exhibited some leaf-shaped flint objects which were probably an intermediate stage in the manufacture of arrow- and spear-heads and he alluded to the analogous leaf-shaped blades found by Mr. Holmes in the Piny branch quarry sites. Dr. W. H. Furness, third, of Philadelphia, read a very interesting and important paper on the "Ethnography of the Nagas of Eastern Assam," which was illustrated by a fine series

of colored photographs that often elicited applause from the audience. This paper will be printed in full in the *Journal of the Anthropological Institute*. Dr. Furness has traveled a great deal in the far east and his comparisons of the Nagas with the interior tribes of Borneo will prove of value—as he knows them all so well, as is proved by his recently published magnificent volume on “The Home-life of Borneo Head-hunters” (Lippincott Co.) and by the very valuable collection he has given to the Free Science and Art Museum of Philadelphia. Dr. Furness does not find a very close resemblance between the Nagas and Borneans which some have expected should occur. The Report of the Students Ethnological Survey of Canada Committee is practically nothing more than a memoir by Mr. C. Hill-Tout on the Mainland Halkōmē’lem, a division of the Salish of British Columbia, but more especially with the Teil’qē’uk and Kwa’ntlen tribes of the Lower Fraser River. These ethnological studies run to over ninety pages, the greater number of which are devoted to linguistics. The Royal Society of Canada has at least awakened to the importance of recording the rapidly vanishing lore of the Canadian aborigines and it is to be hoped that some action will now result and that the Canadian government will assist in this important national work. The reading by Mr. J. L. Myres of a suggestive paper written by Dr. W. H. Holmes, entitled “The Classification and Arrangement of the Exhibits in an Anthropological Museum” led to a very interesting discussion in which Dr. W. E. Hoyle, Professor Boyd Dawkins, both of the Manchester Museum, Mr. H. Balfour, of the Pitt Rivers Museum, Oxford; Mr. G. Coffey, of the Royal Irish Academy Museum, Dublin; Mr. E. Lovett, and Dr. A. C. Haddon took part. Several speakers referred to characteristic features of American museums and pointed out some of the ways in which the English museums could be rendered more instructive and popular. It is beginning to be realized that a museum should be the educational center of a town, but in order to be that it must itself first be educational in its scope.

H.

SPECIAL ARTICLES

THE PRESENCE OF WATER VAPOR IN THE ATMOSPHERE OF MARS DEMONSTRATED BY QUANTITATIVE MEASUREMENTS

IN 1867, Huggins first announced his detection of a slight intensification of the bands of aqueous absorption in the spectrum of Mars. The observation was an exceedingly delicate one, and resting, as it did, solely on eye-estimates of the relative intensities of weak lines which certainly do not differ very much in appearance, it is not remarkable that other observers, with even more powerful instruments, have declined to endorse the supposed intensification of aqueous bands, and have even denied its existence. Vogel, indeed, came to the aid of Huggins in 1873, and the opinion of two such accomplished observers was worth something. The question, however, up to the present time, has remained a matter of opinion only, with the honors about equally divided, the Lick observers declaring positively that no intensification was visible.

Under these circumstances, Professor Lowell’s announcement that Mr. V. M. Slipher had succeeded in photographing the little α band in the spectrum of Mars under conditions which left no doubt of its relatively greater strength, may have passed with some as no more than a fresh subject for incredulity, and one to be relegated to the same limbo of “matter of opinion.” I therefore resolved to try to place these observations on a more solid basis, and with material aid from Professor Lowell, who has generously placed at my disposal the means for testing my ideas, I am now able not only to confirm Mr. Slipher’s discovery, but to give numerical values for the amount of intensification of the α band. Besides this, it now becomes possible to give an approximate estimate of the amount of water vapor which is present in the air of Mars.

The instrument with which the examination of the spectrograms is made, I call a spectral band-comparator. It can be used for comparing the intensities of either lines or bands in two different spectra, but was more especially intended for the examination of