

**STATE OF CONNECTICUT PUBLIC  
DOCUMENT NO. 47. STATE  
GEOLOGICAL AND NATURAL  
HISTORY SURVEY, BULLETIN NO. 11.  
THE BRYOPHYTES OF CONNECTICUT**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649405718

State of Connecticut Public Document No. 47. State Geological and Natural History Survey, Bulletin No. 11. The Bryophytes of Connecticut by Alexander William Evans & George Elwood Nichols

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**ALEXANDER WILLIAM EVANS & GEORGE ELWOOD NICHOLS**

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Printed for the State Geological and Natural History Survey

1908

T H E  
BRYOPHYTES OF CONNECTICUT

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## PREFACE

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The plants treated in the present report are largely neglected by collectors, partly on account of their small size and the difficulties encountered in their identification, partly on account of their slight value from an economic standpoint. To the student of botany, however, and especially to the morphologist and taxonomist, they are of exceptional interest. The morphologist finds among them all gradations between simple and more complex types of structure, and is thus enabled to gain some idea of the way in which the higher plants may have been derived from the lower; while the taxonomist obtains from them a series of distinct and attractive genera and species, which offer for his solution many complicated problems in variation and geographical distribution. In presenting to the botanists of Connecticut some account of the work which has been done on the Bryophytes within the state, it is hoped that more interest in this neglected group of plants may be aroused.

The report includes a general description of the Bryophytes as a whole and of the six subdivisions or orders into which it seems advisable to divide them. It also contains keys, more or less artificial, to aid in the identification of those species which have been detected in Connecticut. But it makes no attempt to describe or illustrate the genera and species represented, and is not intended as a substitute for the works in which such descriptions and illustrations are to be found. The student who makes a careful study of our Mosses and Hepatics will still find it necessary to use books of this character in order to confirm the determinations made by the keys, but the report should make the work of determination more decisive by indicating which species are to be expected in our region. The various books, articles, and scattered notes, which relate directly to Connecticut Bryophytes, are listed in

the bibliography at the close of the report. The following recent works (not included in the bibliography) may also be recommended:—

1. Braithwaite, R. The British Moss-Flora. Vol. I, pp. x + 315. 45 plates. Vol. II, pp. 268. Plates 46-84. Vol. III, pp. 274. Plates 85-128. Large 8vo. London, 1887-1905.
2. Howe, M. A. The Hepaticæ and Anthocerotæ of California. Mem. Torrey Club, 7: 1-208. Pl. 88-122. 1899.
3. Warnstorf, C. Kryptogamenflora der Mark Brandenburg. Band I. Leber- und Torfmoose. pp. xvi + 481. Band II. Laubmoose. pp. xii + 1160. Fully illustrated by text-figures. Leipzig, 1902-1906.
4. Dixon, H. N., and Jameson, H. G. The Student's Handbook of British Mosses. Second Edition, pp. xlix + 586. 65 plates. 8vo. Eastbourne and London, 1904.
5. Roth, G. Die europäischen Laubmoose. Band I. pp. xiii + 598. 52 plates. Band II, pp. xvi + 733. 62 plates. Large 8vo. Leipzig, 1904-1905.
6. Roth, G. Die europäischen Torfmoose. pp. viii + 80. 11 plates. Large 8vo. Leipzig, 1906.
7. Müller, C. Rabenhorst's Kryptogamen-Flora von Deutschland, Oesterreich und der Schweiz. 2. Auflage. Band VI. Die Lebermoose. Incomplete. Six fascicles, comprising 384 pp. and 225 text-figures, have already been published. Leipzig, 1906-1908.

In the study of certain critical families and genera the writers have received much assistance from Mrs. Elizabeth G. Britton, of the New York Botanical Garden, Mr. C. Warnstorf, of Berlin, Germany, and Mr. J. Cardot, of Charleville, France. Other correspondents, who will be mentioned particularly in the catalogue of species, have kindly furnished material of Connecticut Bryophytes for examination, and have thereby made the report much more complete than it would otherwise have been. To all of these the writers would express their sincere thanks.

BOTANICAL LABORATORY,  
SHEFFIELD SCIENTIFIC SCHOOL.



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## THE BRYOPHYTES OF CONNECTICUT

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### GENERAL CHARACTERISTICS OF THE BRYOPHYTES

The Bryophytes represent a very clearly defined Class in the Vegetable Kingdom, occupying a position just below the Pteridophytes, which include the Ferns and their allies. They comprise the plants which are properly known as Mosses and Liverworts. They must not be confused, however, with Algae and Lichens, both of which are sometimes called mosses, although simpler and less definite in organization, nor with the more highly developed Club Mosses, which belong to the Pteridophytes. The group is characterized by a clearly defined alternation of generations and by complex sexual organs, both antheridia and archegonia being multicellular, and showing a differentiation into sterile and fertile cells.

The *gametophyte*, or sexual individual, is a green plant, capable of absorption from the outside and therefore able to lead an independent life. It constitutes the plant-body of the Moss or Liverwort as ordinarily understood, and is usually much larger and more conspicuous than the *sporophyte*, or asexual individual. It consists of a dorsi-ventral thallus, usually closely appressed to the substratum, or else of a leafy shoot, the leaves being always destitute of stalks, and usually but a single cell thick throughout the greater part of their extent. Whatever its form the gametophyte exhibits an apical growth, frequently dying at one end while it advances at the other. It develops no true root, as do the higher plants, but clings to the substratum by means of filamentous organs called *rhizoids*, which often play no part in the process of absorption. The antheridia and archegonia are borne on the gametophyte; in monoicous species they arise on the same plant; in dioicous species, on different plants. The *antheridium* consists of a spheroidal or ovoid sac, sometimes stalkless and sometimes