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**Lichens of Ohio. Part 2. Fruticose and Cladoniform Lichens.** *Conan J. Taylor O.F.M.*  
Ohio Biological Survey, Biological Notes No. 4. Obtainable from Publications Office,  
The Ohio State University, 2500 Kenny Road, Columbus, Ohio 43210, pp. 153-227,  
A1-A22. \$3.00.

The lichens considered in this second of three parts of Father Conan Taylor's manual of Ohio lichens includes many of the most conspicuous and widespread species. Originally there were to have been two parts, with the second containing the fruticose and crustose lichens. Fortunately it was decided to publish the fruticose volume now, without waiting the several years required for the crustose forms to be more completely studied.

The format follows that of the first volume, that on foliose lichens, and the pagination continues from that volume. Each species is illustrated with a photograph, as well as with detailed enlargements of structures and lichen substances. These are even finer than the excellent illustrations of the first volume. Appendices of lichen acids and a glossary are also included. These appendices were prepared especially for this volume with the result that, when the same acids or terms found in the previous part are repeated, the photographs are new and apply to species treated in this part.

Only a few minor errors were noted; *Ephebe lanata* is much more widespread in Ohio, as indicated by specimens in The Ohio State University Herbarium, than the distribution map suggests; and in the glossary, "ascocarp" precedes "areolate." All students of lichens, in Ohio and elsewhere, who have access to this new Biological Survey publication, are the beneficiaries of a valuable contribution to aid them in identifying lichens and in learning about their distributions.

EMANUEL D. RUDOLPH

**Lewis and Clark: Pioneering Naturalists.** *Paul Russell Cutright.* University of Illinois Press, Urbana, 1969. xiii+506 p. \$12.50.

Congressman Thomas Jefferson first attempted in 1783 to organize an exploration of the territory west of the United States, whose boundary was then the Mississippi River. A few years later, when Minister to France, he encouraged John Ledyard in his abortive attempt to explore the western country by travelling from Russia to the west coast and thence to the Mississippi. As Vice-president, Jefferson hoped that Andre Michaux would explore part of the western region. As President, Jefferson at last could take more effective measures.

Jefferson set his plans in motion in 1801 by appointing Captain Meriwether Lewis (1774-1809) to be his private secretary and arranging for him to be thoroughly instructed in determination of latitude and longitude; in elementary medicine; in botany, zoology, and mineralogy; and in preservation of specimens. Early in 1803, Lewis was secretly ordered to begin planning the expedition he was to lead. He immediately asked Captain William Clark (1770-1833) to join him in leading the project. By the time of the purchase of the Louisiana Territory for \$15,000,000, later that year, secrecy was no longer necessary. The thorough and careful preparation of the two young captains, supported in their work by the President, and their careful recruitment of personnel were the keys to the success of the project.

After five months in camp near St. Louis, during the winter of 1803-1804, the expedition set out May 18, 1804, and made its way in 166 days up the Missouri River to the Mandan villages (60 miles above the present city of Bismark, North Dakota), where they went into winter quarters. On April 7, 1805, they set out again up the Missouri, following it to Three Forks and thence across the mountains and down the Columbia River to the Pacific, where they went into winter quarters near Astoria, Washington. On March 22, 1806, they started the return journey up the Columbia River, over the mountains, and down the Missouri, reaching St. Louis on September 23. It was to be 1969 before another expedition supported by the American government would be as successful, as well led, and as fruitful in discovery and in scientific importance.

The reports by Lewis and Clark (edited by others) and by several other members of this "most journal keeping group" are now rare; the journals and other books were published much later. Professor Cutright, a biologist, has set out "to provide greater emphasis and depth to the more neglected technical aspects of the Expedition (especially botanical, zoological, and medical)" and to demonstrate that Lewis and Clark were "important pioneering naturalists."

The author has provided a swiftly paced and most readable account of the journey, written from the standpoint of the plants seen and collected; the animals seen, collected for science, and hunted for indispensable food; the general "aspect of the land;" the geography, especially in terms of streams; the medical events and triumphs (only one death on the whole expedition); and the ethnology of the Indian tribes. Each chapter has a "Summary of Discoveries," listing the plants and animals "New to Science," the Indian tribes encountered, and the "Topographical Features named and/or discussed." An excellent summary chapter emphasizes the most important discoveries. Extensive appendices list the hitherto-undescribed plants and animals discovered and the present location of these explorers' journals, maps, and related materials. The Bibliography and Index are extensive.

Professor Cutright has written the definitive book on the natural history of the Lewis and Clark expedition. He has, however, not included mineralogy and geology in his natural history, and there is almost no mention of the fossils, rocks, minerals, and "volcanic scoria" that were observed and collected. It is to be hoped that some geologist will be as faithful as the biologist Cutright in again following the route of Lewis and Clark with the journals in hand, in writing a running account of the journey from the geological viewpoint, and in following up the fate of the mineral specimens as Cutright has that of the plants and animals. If the writer of a book on the geology of the expedition follows the method used by Cutright, another important Lewis and Clark book could result.

GEORGE W. WHITE

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