Forest Ecology: Sukachev's Concept of "Biogeocoenoses"

Fundamentals of Forest Biogeocoenology. V. N. Sukachev and N. V. Dylis, Eds. Botanical Institute and Laboratory of Forest Science, Academy of Sciences of the U.S.S.R., Moscow, 1964. 574 pp. Illus.

Fundamentals of Forest Biogeocoenology was written by 16 men and women who are connected with the Botanical Institute or the Laboratory of Forest Science of the Academy of Sciences of the U.S.S.R. The senior editor Vladimir Nikolaevich Sukachev, who is a member of the Academy, has guided the field of forest ecology in Russia since the beginning of this century and has developed the concept of "biogeocoenology." The other editor, N. V. Dylis, is a forest ecologist and geobotanist.

Although the book is entitled *Forest Biogeocoenology*, its scope is much broader for it is concerned with the general, complicated phenomenon of interplay between the environment and the plant community (the Greek word *Koinos* means common), as well as with the interplay between the components of such a community. In the Western world the closest term perhaps is "an ecosystem."

Chapter 1, by Sukachev, is concerned with the fundamentals of biogeocoenology, its relation to ecosystems, geographical landscapes, facies, and the like, and with its place among the other branches of science.

The different components of forest biogeocoenoses are considered in chapters 2 through 6. In chapter 2, "Atmosphere as a component of biogeocoenosis" (41 pp.), A. A. Molchanov (director, Laboratory of Forest Science, Academy of Sciences, U.S.S.R.) discusses light, heat, rainfall, dust, and noxious gases and their effect on forest vegetation. Chapter 3, "Phytocoenosis" (125 pp.), by N. V. Dylis, J. L. Zelniker, and V. G. Karpov, is concerned with plant physiology and plant ecology. Animals, both vertebrates and invertebrates, as a component of biogeocoenosis are dealt with in chapter 4 (84 pp.) by P. M. Rafes, L. G. Dinesman, and T. S. Perel. Chapter 5 (70 pp.), prepared by S. E. Egorova, M. G. Enikeeva, and B. S. Bol'shakova, treats microorganisms and their part in a biogeocoenosis. Inevitably the chapter is largely on soil microorganisms, although some space is devoted to the relation of the microorganisms to the plants, the animals, and the atmosphere. Chapter 6 (85 pp.), by S. B. Zonn, is chiefly concerned with the physical properties of soil, its structure, and its dynamics, in both young plantations and well-established forests.

In chapter 7 (29 pp.), on the dynamics of forest biogeocoenoses, Sukachev treats the following topics: plant succession, evolution of the biogeocoenological cover of the earth, and changes in forest biogeocoenoses caused by exogenous influences—changing geomorphology, glaciation, and human activities. The principles of classification of forest biogeocoenosis are considered by N. V. Dylis (chapter 8, 15 pp.). V. D. Alexandrova deals with the possible relevance of cybernetics in forest biogeocoenology (chapter 9, 10 pp.). In the concluding, unnumbered chapter (7 pp.), Sukachev discusses the theoretical and practical importance of the field.

The Fundamentals of Forest Biogeocoenology is written in Russian, and there is no English summary. This means that only a few in America will be able to read this interesting and informative book.

Those who know the Russian language will note that the book provides a complete account of the development of the ecological (if I may use an obsolete term) concept in Russia. The bibliography of more than 1000 Russian publications (up to 1964 and with a few titles in Ukrainian) will make the volume invaluable for reference purposes. The list of literature in Western languages includes some 500 titles (up to 1962).

For those who do not read Russian, I offer the following suggestions: (i) The concept of Sukachev's biogeocoenology and its practical applications is treated in Blanckmeister and Kienitz's *Der Wald und die Forstwirtschaft* (Berlin, 1963); (ii) Sukachev himself outlined his concept of "biogeocoenoses" and compared it with Tansley's "ecosystems" in a paper presented at the Symposium on Forest Types and Ecosystems, held at the Ninth Botanical Congress, Montreal, 1959 [*Silva Fennica* **105**, 94 (1960)]; (iii) V. J. Krajina of the University of British Columbia, who "outlined the areas of agreements [and disagreements] of the eighteen papers read at the [Montreal] Symposium" analyzed Sukachev's concept of the new discipline and seemed to prefer the term "biogeocoenose" to the term "ecosystem" [*Silva Fennica* **105**, pp. 53, 107 (1960)]. It appears then that Sukachev's ideas have found a response among Western ecologists. Perusing Krajina's comments, a reader may gain a sufficient understanding of Sukachev's theses to appreciate the importance of his book.

Incidentally, there is a publisher's note at the end of the book which indicates that only 2300 copies were printed. This means that the whole edition will be sold out immediately and that the book will be out of print even before it has reached the bookstores.

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Chemical Data

Chemotaxonomie der Pflanzen. vol. 3, Dicotyledoneae: Acanthaceae-Cyrillaceae. R. Hegnauer. Birkhäuser, Basel, Switzerland, 1964. 743 pp. Illus. F. 123.

This volume, third in a projected series of five, covers the Dicotyledoneae (in which families are listed alphabetically) through the family Cyrillaceae. My review of volume 2 [*Science* **145**, 259 (1964)] was concerned in large part with what the book did not do (and which no book could do at the present time); in this review I wish to emphasize the content of the series.

The nature of the work is encyclopedic and its coverage of the literature comprehensive. Although the title may suggest an effort to utilize chemical data to develop a taxonomic system, this is not the case. Actually, the purpose of the author seems to be to organize all available chemical data within an arbitrary taxonomic framework for the convenience of biologists. When it is pertinent to call attention to interesting and suggestive chemical correlations, this is done, but little phylogeny is included, and the highly speculative nature of that which is included is made clear by the author.

The first 41 pages of volume 3 represent a somewhat disjunct discussion of (in order) taxonomic systems of