to do, since the contents of this book are a curious mixture of rather elementary topics, treated in a straightforward way, side by side with quite advanced topics discussed in a very interesting way.

After a brief introduction, we find the following chapters: "The chemical bond," "The ionic bond," "Properties of ionic compounds," "Chemical reactions," "Complex compounds," "Polarization," "Water as a component of compounds and solutions," and "Non-electrostatic bonds." These chapters are full of useful tables of physical properties of numerous compounds. The author has a tendency to attempt to explain almost everything on the basis of purely electrostatic bonds and generally invokes homopolar bonds only where the former approach fails. In the final chapter, on nonelectrostatic bonds, the treatment of covalence is not very deep, when contrasted with the thorough discussions of ionic compounds that are found earlier in the book.

The use of such terms and concepts as *entropy, Madelung constants, free energy, enthalpy,* and *polarizability* and *dipole moment formulas* really makes the book unsuitable for use as a textbook in beginning chemistry courses in this country. On the other hand, the range of topics is not wide enough to justify its use as a textbook in an advanced course. It can be recommended as collateral reading, however, for junior and senior students and as a very good source of review material at the graduate level.

There are, unfortunately, more than the number of typographic errors that one would expect to find in a second edition.

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Biogeography. An ecological perspective. Pierre Dansereau. Ronald, New York, 1957. xiii + 394 pp. Illus. $7.50.

I owe to John Tukey, the mathematician, a distinction which is invaluable in discussing such a book as *Biogeography.* Tukey distinguishes between enterprises at the technologic and those at the scientific level. At the technologic (or engineering) level, work has got to be done, buildings have to be put up, and bridges have to be built, whether the fundamental information is at hand or not. The engineer has to use such facts as are available, make the best estimate he can, and go ahead. The scientist, on the other hand, must get down to the fundamentals of the problem. For a long time to come, any author who, like Dansereau, "embraces the entire field of the sciences of environment," who surveys "the origin, distribution, adaptation and association of plants and animals," must be as much an engineer as a scholar. The facts are fragmentary, the field of inquiry is so vast that information from various disciplines must be drawn together; there is little agreement on basic concepts.

Dansereau's book is one man's attempt to view the entire field, to produce a clear, logical presentation of just how plants and animals are distributed over the face of the earth and an analysis of the forces at work. It is divided into five parallel sections: "History of biota," "Bioclimatology," "Synecology," "Autecology," and "Man's impact on the landscape." Although it makes an ambitious attempt to consider animals as well as plants, it is obviously the work of a botanist. Over three-fourths of the cited works are purely botanical; the remainder are about equally divided between zoology and geography. There is nothing parochial, however, about the author's view of his subject. He has traveled widely and has worked and taught in many parts of the world. Of the five most frequently cited authors, only one, Stanley Cain, is an American. The other four are Europeans, each one from a different country.

The omissions are as remarkable as the vast field which has been so effectively surveyed. The author obviously does most of his thinking about the effects of plants that are big enough to be seen with the naked eye. The notion, developed so effectively at Rothamstead, of the ecological importance of a balance between the various kinds of microorganisms in the soil is nowhere presented. Antibiotics are not mentioned, neither is *Encylia farinosa* or any of the literature that demonstrates the lock-and-key relationship which natural selection may eventually force on species which have been associated with each other over long periods of time. The useful concept of the "ecological niche" does not even make the index, which is otherwise pretty inclusive.

The book is beautifully put together. It is lavishly illustrated; halftones, black and white diagrams, and tabular material make up well over one-third of its content. Ingenious and diverting diagrams illustrate the ways in which different kinds of plants of various aspect make up the vegetable cover of our globe. A 20-page appendix illustrates, in detail, the chief plant communities of the Saint Lawrence valley, as analyzed by the author's methods. There is a subject index, an author index, and an 18-page glossary, with clear definitions of the technical terms (some of them pretty fancy) which stud the text. *Tropophytia,* for instance, the "harmonious control of the habitat by a climate inducing alternation of leafing-out and leaf-fall" gets mentioned in at least eight places, and our old friend "short day" becomes "brevidiurn."

Dansereau's book grew out of courses given by him at São Paulo, the University of Michigan, and the University of Montreal. Its clarity, precision, and logical arrangement bear witness to his great skill as a teacher. Fortunate, indeed, are those young biologists who have had such a summary as this as a part of their scientific training.

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Modern Science and Human Values. A study in the history of ideas. Everett W. Hall. Van Nostrand, Princeton, N.J., 1956. 483 pp. $8.

Under the impact of the atomic bomb, many scientists today are troubled by the fact that their theoretical and technical achievements are not accompanied by a comparable progress in morality. How the destructive power of modern technology can be checked is undoubtedly a question of vital importance, and in this connection a well-established framework of values may seem to be highly desirable. Unfortunately, modern science is not able to build up such a framework; on the contrary, its startling success is exactly attributable to the sharp distinction between facts and values and to the rigorous exclusion of the latter from scientific theories.

The emergence of value-free natural and social sciences out of the evaluating Aristotelianism of the medieval schoolmen and the development of these sciences up to the present is the topic of Everett Hall's study. In spite of the modesty shown by the author in the preface, his book turns out to be one of the best semipopular expositions of these problems. It is based on a reliable knowledge of the rather complicated subject matter and avoids many of the widespread misinterpretations of the scope and the methods of modern scientific thinking—that is, of the Copernican, Newtonian, and Einsteinean theories. Furthermore, it shows a sound appreciation of European, and especially German, romanticism as the antagonist of the spirit of enlightenment. Dialectical materialism, selling itself under the label of a scientific world-view, is rightly unmasked as an offspring of romantic obscurantism.

But at the end of his book the author finds himself confronted with the embarrassing question mentioned previously. He has a keen awareness of the difficulties connected with these problems and denounces the metaphysical attempts to smuggle in the normative under the guise of descriptive clothes as