welcome is the tabulation of the nomenclature rules that have been adopted by the International Union of Pure and Applied Chemistry.

In succeeding chapters the power and brilliance of Werner's theory are developed. Once so controversial, it is now accepted in all important respects. Within its framework the inorganic (or is he organic?) chemist unravels the three-dimensional complexities of molecular structure with confidence. Deservedly, many of the monograph's chapters are concerned with the details of the architecture of coordination compounds: isomerism in its many forms, chelation and heterocyclic rings, bridge structures, and coordination numbers. There is another approach than the structural one—fully as important—which takes the attention of chemists, however. It is a concern for a deeper understanding of the nature of the forces that bind atoms together. The attempts to describe these interactions on electrostatic models are well presented, and good qualitative descriptions of the atomic orbital and molecular orbital theories of binding are given. A more detailed mathematical treatment of these approximations of quantum mechanics would have been welcome.

For the most part, the emphasis has been laid on the conclusions that have been drawn from measurements, although one chapter is devoted to physical methods: spectroscopic, electrometric, magnetic, x-ray and electron diffraction, isotopic tracer, and transport studies. The over-all integration is excellent, especially in view of the numerous contributors; such overlap as does exist is commendable. The book fairly bristles with literature references, and the indexing appears to be thorough.

NORMAN H. NACHTRIEB
Institute for the Study of Metals, University of Chicago

Agricultural Ecology. Girolama Azzi. Constable, London, 1956 (order from Essential Books, Fair Lawn, N.J.). 424 pp. Illus. $7.20.

The relatively new science of agricultural ecology attempts to correlate the physical features of environment, soil, and climate, with the quantitative, qualitative, and generative (characters of seed) development of agricultural plants. By this approach to a study of bio-environmental relationships, the action of each factor on the plant is carefully studied, and then the effect of each is measured as a function of all the other factors. Therefore, it may be possible to obtain the same yield with quite distinct groupings of factors, because it is possible for the factors to combine in many different ways, with the most unexpected compensating effect as the result. The methods could also contribute to studies in other fields such as forestry and animal husbandry.

Part I with 12 chapters deals with the concept of meteorologic equivalents and agricultural climatology (bio-atmospheric units) in relation to the growth and yield of crop and certain woody plants. An evaluation of the atmospheric environment is attained by determining the meteorologic equivalents for each plant, which make it possible to represent and summarize climate by the frequencies of normal and abnormal situations that result from an excess or deficiency of rainfall and temperature. Consideration is also given to certain factors such as diseases and photoperiodism. Isophane charts are given for sowing and harvesting of wheat throughout the world. The equivalents are determined for each of the subperiods of vegetative development, which in the case of chestnut are (i) leafing, (ii) flowering, (iii) fruit formation, (iv) maturity, and (v) dormancy. Equivalents are given for a number of crop and woody plants. An integration of the equivalents with an evaluation of losses through excess or deficiency will yield a "climatic formula" that summarizes positive and negative atmospheric values in the various zones for each single crop.

Part II with two chapters presents the method used for determining the relationship between the positive and negative values of soils in relation to growth of various crop plants. The study of soils is characterized by (i) the determination of soil-units, (ii) the conception of the repeated series of soils, and (iii) climate-soil units or the synthesis of the physical environment. Some of the soil characteristics used in the evaluation of the effects of soil on yields are chemical capacity, water balance, and workability. The climate-soil units offer a measured representation of the physical environment that is indispensable to the agronomist, economist, and geneticist.

Part III with nine chapters is largely a discussion of the quantitative, qualitative, and generative yield of cultivated plants. Of particular interest is the system of velocity-mass-structure. Small velocity with great expansion of mass is related to productivity, while great velocity with small mass is correlated with hardiness. With rust, for example, a higher degree of resistance may even be encountered with a small velocity of development.

Part IV with four chapters deals with a general discussion on factorial combinations, geographic trials with corn, and analysis of the components of yield.

This well-organized book includes numerous tables, figures, and charts as well as a glossary and an extensive bibliography. *Agricultural Ecology* should interest all teachers and scientists in agriculture, forestry, and animal husbandry.

L. W. R. JACKSON
University of Georgia

New Books

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A Space Traveler's Guide to Mars. I. M. Levitt. Holt, New York, 1956. 175 pp. $3.95.

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(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

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