through" applies. This may be unfair; somehow I also read into the book the implicit statement that "if you think things are bad here, you should see the United States." If true, this assessment derives more from the contributions of the two Americans who participated in the symposium than from any British proclamation of superiority. I am not convinced that Britain is significantly closer than we to that hypothetical steady state which theoretical ecologists like to dream about.

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Chemistry of Natural Products

Only infrequently does one who reviews a volume the size of this one find that the task is not onerous but actually thrilling and immensely stimulating. R. H. F. Manske, who edited the volume, **The Indole Alkaloids** (Academic Press, New York, 1965. 877 pp., $32), is to be congratulated for having assembled an all-star cast of collaborators for the production of this latest volume of his definitive series, "The Alkaloids: Chemistry and Physiology."

In the entire field of the chemistry of natural products, the explosive advances made during recent years in the chemistry of the indole alkaloids probably have no parallel. In volume 7 of the series (1960), treatment of the subject comprised some 200 pages; the present volume runs to something like four times that number of pages, with most of the content being new. Material reported in previous volumes is summarized to the extent that the present volume is self-consistent but not repetitive.

The book contains 22 chapters written by such authorities in the alkaloid field as A. R. Battersby, E. Coxworth, B. Gilbert, J. E. Saxton, E. Schlittler, G. F. Smith, A. Stoll, W. I. Taylor, and Manske himself, with the assistance of coauthors in some instances. The impact of the development of new physical methods such as nuclear magnetic resonance (NMR), mass spectrometry, and x-ray analysis on the solution of the problem of structure assignment and stereo conformation is apparent throughout the volume. This is strikingly emphasized by the fact that in volume 7, which covers the literature through 1957, five pages were devoted to alkaloids of the *Aspidosperma* and the structure of no member of the group was known. In volume 8, 178 pages are devoted to this group. The extensive compilations of fragmentation patterns and NMR data will be of invaluable help to those who, in the future, engage in structural studies of natural products.

Classification of the alkaloids is becoming increasingly difficult, and for the most part a system based on botanical origin has been used in this volume. This necessarily involves some overlap, but repetition is avoided by judicious cross-referencing. The book's appeal to the taxonomist will be great.

The literature is covered through 1964, a feat not frequently encountered. In some chapters references to *Chemical Abstracts* are included in citing work published in obscure journals, a practice that merits commendation.

The typography is excellent. The relatively high cost of the book seems quite justified in view of the plethora of projection structures and tables. I noted only one minor error.

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Geobotany

The science of geobotany, or the use of plants as indicators of variations in the chemistry or water availability of the substrate, has not been adequately developed in the United States. Government agencies have made a few studies of the use of indicator plants in prospecting, and several bulletins describing phreatophytes that indicate groundwater have been published. University research in this field has not been significant, and that of private companies, of course, is not being published. The governmental organization and integration of environmental projects in Russia have advanced the science markedly in that country. A geobotanist is automatically included on all geological expeditions. Maps of plant distribution are first made from the air and later ground checked as additional environmental data are acquired. Fine maps of plant distribution are available for all of Russia, and detailed studies are being made continuously by a large staff of well-trained scientists.

This volume, **Plant Indicators of Soils, Rocks, and Subsurface Waters** (Consultants Bureau, New York, 1965. 222 pp., $27.50), edited by A. G. Chikishev, is a collection of papers given at a joint conference of the Geographical Section of the Moscow Society of Naturalists, the All-Union Research Institute of Hydrogeology and Engineering Geology, and the All-Union Aerogeological Trust by workers who have been studying the effectiveness of geobotanical indicators in solving a wide range of scientific and practical problems. According to the preface, plant indicators are being used "in the agricultural evaluation of territories, in engineering and geological surveys, for clarifying hydrogeological conditions in irrigated districts, for studies of swamps intended for industrial and agricultural uses, in prospecting for certain species of useful fossils, etc." The book includes fairly generalized review papers by the well-known geobotanists, Viktorov, Voronkova, Vostokova, Vyshivkin, Shvyryaeva, and Nesvetailova, and detailed accounts of specific projects by 44 new workers.

A half-dozen papers deal with the use of plants in determining the chemical composition of, and depth to, groundwater. This knowledge has aided greatly in the search for freshwater in southern deserts, and in areas of salt water north of the Caspian Sea. Other papers describe the use of plants in determining the structure of peat deposits, and the degree of decomposition, the humidity, ash content, and groundwater level in bogs.

Plant distribution is used in engineering geology to determine the extent of particular soil units, the mechanical composition of the subsoil, and general hydrogeological conditions. Indicator plants are also used to assess soil fertility, delineate alluvial plains, evaluate salinization, dryness, and so forth.

Indicator plants are being used as aids in mapping Quaternary deposits of various kinds, including fluvioglacial and morainic deposits, and in prospecting for salt domes and kimberlite dikes.

Shvyryaeva gives a fine discussion of the compilation of geobotanical maps. If data are collected on the soils, the age, genesis, and lithology of the underlying rocks, the salinity of the rocks, the depth and mineralization at the groundwater table, and the geomorphology at the time of plant map-