

ments are usually very much to the point and make it clear that this is not an uncritical compilation of published data.

The problem of devising a suitably flexible and rational system of classification for a work such as this is a formidable one. The task is made doubly difficult by the frequent failure of authors to ascertain the products of the reactions they study kinetically. On the whole, the present system is a reasonable one although it occasionally results in unusual juxtapositions and, conversely, sometimes separates reactions that belong together. One finds, for example, that "Ester Solvolysis" includes displacements effected by added reagents or by the conjugate base of the solvent. In contrast to this, the ethanolysis and acetolysis of sulfonate esters are tabulated separately under "Ester Solvolysis" and "Ester Exchange," respectively. The classification of alkyl halides as "esters" is somewhat distressing to an organic chemist. Indeed, the section on "Ester Solvolysis" could stand a considerable overhaul in organization, since in its present form it covers a very large and rapidly expanding field.

The above comments are intended mainly to warn the reader that he may not always find what he seeks where he expects to find it. Obviously, no conceivable system of classification would please everyone. Many possible objections could be met by an alphabetical index expanded to include extensive cross listings according to type of reaction, of reactant(s) and of product(s). One hesitates to suggest additional work to the authors, who are to be congratulated for their willingness to undertake the arduous task of compiling this work, but such an index should add greatly to the usefulness of the "Tables."

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**Rauwolfia: Botany, Pharmacognosy, Chemistry and Pharmacology.** By ROBERT E. WOODSON, JR., Ph.D., Professor of Botany, Washington University, Senior Taxonomist, Missouri Botanical Garden, HEBER W. YOUNGKEN, Ph.D., Sc.D., Ph.M.D., Research Professor of Pharmacognosy and Botany, Massachusetts College of Pharmacy, EMIL SCHLITTLER, Ph.D., Director of Research, CIBA Pharmaceutical Products Inc., Summit, New Jersey, and JURG A. SCHNEIDER, M.D., Director of Physiology Research, CIBA Pharmaceutical Products Inc., Summit, New Jersey. Little, Brown and Company, 34 Beacon Street, Boston 6, Massachusetts. 1957. xii + 149 pp. 16 × 24 cm. Price, \$5.50.

In the fourth edition (1949) of Henry's "The Plant Alkaloids" 5 pages and 49 references sufficed for presenting the chemistry and pharmacology of the seven rauwolfia alkaloids known at that time. Except for rauwolscine, which had been identified as a yohimbine isomer, their structure chemistry was as yet uncharted territory. Their pharmacology was on the whole unexciting and held little promise of therapeutic utility. While extracts of *Rauwolfia serpentina* were known to exert hypotensive and sedative effects, it was not clear whether these were due to an alkaloidal constituent. In the intervening 8 years, and particularly since the discovery of reserpine by Mueller, Schlittler and Bein (1952), this picture has changed radically. More than 40 alkaloids isolated from Rauwolfia species are now on record, and the structures of a great majority of these have been elucidated. Only last year we have seen these achievements culminate in Woodward's brilliantly conceived and executed synthesis of reserpine. There was a commensurate expansion of pharmacological research, most of it concerned with analyzing the unique combination of properties exhibited by reserpine, as well as revival of interest in the botany and pharmacognosy of the genus.

Obviously the time was ripe for reviewing the various aspects of the field anew in the light of these recent advances. The authors of "Rauwolfia," each of whom has in his area of competence made important contributions to the present state of knowledge, have succeeded admirably in imparting the new look on the topic. The four chapters of the little book are written in the manner of brief review articles. There is no attempt to bring in technical detail, except in the chapters on the botany (R. E. Woodson) and on the pharmacognosy (H. W. Youngken), where much of the space is naturally given over to the description and visualization of morphological subject matter. While the chemist interested in the Rauwolfia alkaloids will rarely have need for this kind of information, he will be well advised to read the initial sections in the botanical chapter which deal with the taxonomy, synonymy, geographical distribution of the species, and their culture and propagation. For instance, it may be new to him that *R. tetraphylla*, *canescens*, *heterophylla* and *hirsuta* are not, as he may have been led to believe by the chemical literature, different species, and that according to the nomenclature rules *tetraphylla* deserves preference. Likewise, he may be unaware of the fact that *R. canescens* is not indigenous in India, but was transplanted there a century ago from the West Indies.

The chemical chapter, by E. Schlittler, opens with a very useful set of tables listing the alkaloids so far isolated from the various species, together with their melting points, rotations and references to the papers reporting their discovery. In the following exposition of their structure chemistry some order is brought into the chaos of names by grouping the compounds according to certain structural criteria (anhydronium bases, indoline types, tertiary bases with heterocyclic, or alicyclic, ring E). The numerous more "conventional" representatives (yohimbine types) of the last-named group are treated somewhat cursorily, to allow fuller discussion in the following section of its most important members, reserpine and its two congeners, deserpidine and rescinnamine. That the proof of structure and the elucidation of the stereochemistry of these compounds should have received authoritative and lucid treatment by the originator of this whole line of research was only to be expected. In the stereochemical argument one could perhaps disagree with the author on one or two points in his evaluation of the evidence. Thus, this reviewer was a little surprised to find one of the early proofs for the *cis*-fusion of rings D and E, the formation of a quaternary N-4 tosylate from methyl reserpate 18-tosylate on treatment with collidine, discussed not in this context, but in connection with the configuration of C-17, on which this observation bears only indirectly. The chapter ends with a brief review of the synthetic studies so far on record, including the Woodward synthesis of reserpine, which is conveniently outlined in a flow sheet.

The present status of pharmacological knowledge is ably summarized by J. A. Schneider in the last chapter. It opens with an introductory section dealing with the historical aspects and the effects of crude extracts from various species. The pharmacodynamic properties of the individual alkaloids, grouped for this purpose as in the chemical chapter, are then reviewed. It is, of course, the subsection on reserpine which gives real substance to the chapter. Here the author could draw on a comparative wealth of recently published material which lent itself to classification according to pharmacological criteria and more detailed discussion in terms of specific effects.

In brief, the booklet provides all the essential information on Rauwolfia in highly condensed, yet readable form. It will be equally useful to the expert as a source of references and to the newcomer who needs orientation in one or the other aspect of the field.

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