There are, even accepting the limits and approach defined by the author, a number of omissions of importance. It would be inappropriate to list these, but a few instances must be quoted to substantiate the statement. The fact that carvone hydrobromide gives eucarvone (p. 73) is stated without any mention of carenone and the work of van Tamelen. The biosynthesis of terpenoids is discussed with markedly undue stress on senecioic acid and no mention of the work of Lynen. One of the most impressive results accrued from triterpenoid studies is the discovery of the beautiful biogenetic relationship of all the triterpenoids. This earns nine words and the single representation, the cyclization of squalene to lanosterol (page 211), is misleading. The chemistry of caryophyllene is presented with no mention of the work of Barton. The migration of double bonds under the influence of ozone (pp. 16 and 29) is a dubious phenomenon in the extreme whilst the radical cyclization of large rings (p. 215) has little justification. Although some space is devoted (and rightly) to physical methods, the words nuclear magnetic resonance do not appear. The Auwers–Skita rules are given but not their conformational significance as expressed by Allinger and others.

The above and other flaws and lacunae, regrettable though they may be, might not detract seriously from the value of a book which, if it were in other respects, instructive and, most important for students, stimulating. However, herein lies in the Reviewer's opinion, the major deficiency in the book. The author in practically no place makes any attempt to increase the students understanding of how or why reactions take place, even in a very general sense. Indeed, although recent material is referred to, the style and approach of the book is that of some twenty years ago. This is a serious charge, but one, regrettably, justified.

Thus, one of the really important things forthcoming from terpenoid chemistry was the study of the Wagner-Meerwein change. This earns about two pages (the same, for instance, as does humulene) and little indication of its considerable generality is given. Starting materials and products are, in general, abruptly presented with no indication of the processes involved (the avoidance of the use of arrows appears studied). Time and time again the alert student must be troubled. How are the camphor sulfonic acids formed, how does lupene become converted into δ-amyrene, how does dihydrocarvone hydrobromide give carone, how does thujone give "isothujone" and caryophyllene give β-carophyllene alcohol or clovene? . . .

The avowed and specific purpose of this volume is to instruct students, but instruction is surely not the same as a bald statement of starting material and product. The student is entitled to some sort of explanation for it is these explanations which lead eventually to a general understanding of organic chemistry. Without such a basis terpenoid chemistry (and organic chemistry as a whole) becomes an undigested jumble and, rather worse, a bore.

Apart from some conformational diagrams the book is very well produced and appears free of errors. The price, since the book is intended for students, is high.

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NMR and EPR Spectroscopy. Papers presented at Varian's Third Annual Workshop on Nuclear Magnetic Resonance and Electron Paramagnetic Resonance, held at Palo Alto, California. By the NMR-EPR Staff of Varian Associates. Pergamon Press, Inc., 122 East 55th Street, New York 22, N.Y. 1960. viii + 288 pp. 16 × 23.5 cm. Price, $12.00.

The majority of research workers in chemistry who have applied magnetic resonance techniques to solve their problems have done so with some kind of Varian Spectrometer. The appearance of this collection of papers given at the annual workshop at Palo Alto will be of interest especially to those people who have recently obtained Varian Instruments. The book is of an introductory nature to the fields of n.m.r. and e.p.r. with a strong bias toward instrumentation.

Although I have not attended these summer schools presented by Varian Associates it is apparent that the material presented in the book differs very little from that given in the lectures. It is unfortunate that the authors did not take more care in modifying the presentation in book form. The introductory articles have several repetitious sections with duplication of figures and plates. The same photograph of a high resolution spectrometer appears twice in the first 57 pages of the book. There is in general a lack of adequate references as well as inconsistencies in the referencing system from chapter to chapter.

Many of the articles read like a spectrometer manual and neglect approaches to magnetic resonance spectroscopy that have been made by independent workers. There is little or no discussion, for instance, of high resolution spectrometers using proton resonance stabilized circuits. Another general criticism is that a book on magnetic resonance for the chemist should contain sections devoted to nuclear magnetic resonance in solids.

The introduction to analysis of high resolution n.m.r. spectra, although limited in scope by the space available, gives the essentials concisely. Rempel's chapters 18 and 22 on e.p.r. are correspondingly well presented in the space available. It is a pity that these quantitative aspects of the theory were not expanded at the expense of some introductory material.

The organic chemist will look for material on proofs of molecular structure. Some interesting examples of this will be found in Shoolery's chapter on "High resolution N.M.R. as a structure determining tool." The spectra of several large molecules are presented and the use of integrated intensities illustrated in structure proofs. The difficulties of working with such large molecules as $\Delta^{5,16}$-pregnadiene-20-one-3β-ol in dilute solution seem to have been satisfactorily mastered using standard Varian equipment. The following chapter, which describes the use of high resolution n.m.r. as a quantitative analytical tool, points out the high precision available. The illustration of the intensity ratio of the two toluene proton resonance signals as a function of r.f. power shows the striking influence of dissolved oxygen on quantitative work.

The title "N.M.R. for the physical chemist" which appears at the head of chapter 9 would indicate more than a study of chemical kinetics. The contribution of n.m.r. to our knowledge of intermolecular forces, a general account of nuclear shielding, and nuclear magnetic resonance in crystals would seem to fall into this division and in my opinion should have been included. The treatment of proton exchange and hindered internal rotation, however, is the most up to date which has appeared in book form.

Those people interested in modifying their Varian spectrometers to measure H_1 and relaxation times will find the instructions in two short chapters by Anderson.

The last third of the book is devoted entirely to e.p.r. spectroscopy. These chapters consist of descriptions of apparatus and the over-all scope of e.p.r. spectroscopy is presented. The sensitivity and specificity in identification of species associated with unpaired electron spins is illustrated.

It is apparent that what was probably very successful as a workshop has suffered considerably when reported without adequate change between the formal covers of a book. The lack of editing has allowed such phrases as "color centre magnetic resonance spectroscopy" to appear in the text.

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Wave Mechanics and Valency. By J. W. LINNETT, F.R.S., Fellow of the Queen's College, Oxford. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. xii + 184 pp. 12.5 × 19 cm. Price, $3.00.

This book is another in the Methuen monograph series. The author states in the Preface that his object is "to try to explain to the experimental chemist the processes and techniques that are involved in the application of wave mechanics to the electronic structures of atoms and molecules." The book is not intended for the professional worker in the field of molecular quantum mechanics, and he probably would find some of the discussion not suited to his taste. Examples are the mathematical limitations on ψ on page 4 (where incidentally the limitations are incorrect, *e.g.*, the δ-function), and the section on *normalisation* and *orthogonality* on pages 10–13.