suffers most noticeably from a lack of descriptive material. The uninformed reader will be little impressed by the utility and power of the ligand field theory without specific illustrations of some of the many well established examples of the use of the theory in predicting and correlating electronic properties and structures.

In this time of rapidly multiplying knowledge, a current text in nearly any field will be equally distinguished by what it omits as by what it includes. The authors state in the preface that "we have treated those [topics] which seemed to us most relevant to the modern inorganic chemists," and acknowledge that "there will be disagreement concerning the emphasis placed on various topics as well as the omission of others." The reviewer strongly concurs with the latter statement and feels that the most serious deficiency of this otherwise essentially sound text lies in the choice of some topics and the complete omission of others. Amongst those topics which could be considered "theoretical" in the sense of this book, no mention whatever is made of bonding and structure in electron deficient compounds or in organometallics—metal cyclopentadienyl, arene and olefin complexes. Further, there is no discussion of the use of physical methods, such as nuclear and electron resonance and infrared spectroscopy, in establishing structures and elucidating chemical bonding. Included are chapters on acids and bases, electromotive force, and non-aqueous solvents which, while capably presented, are perhaps best placed in a source bearing a different title. The chapter on the theory of the nucleus appears too brief and introductory compared to other textual sources to be very useful, and a subject development of the type attempted here (including α and β decay theories) seems out of place in a chemistry text, however theoretical. These views are admittedly personal ones and undoubtedly some readers will find the choice of topics completely satisfactory.

On the whole the book is quite clearly written and the subject matter rather well developed. It is a welcome change from nearly all current inorganic texts which too often consist of encyclopedic recitations of chemical facts with little attempt to interweave principles. Development of topical subjects from a mathematical or semi-quantitative quantum mechanical point of view is long overdue in an inorganic text and this book represents a healthy stride in that direction.

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Determination of Organic Structures by Physical Methods. Volume 2. BY F. C. NACHOD, Sterling-Winthrop Research Institute, Rensselaer, New York, and W. D. PHILLIPS, Central Research Department, E. I. du Pont de Nemours and Co., Wilmington, Delaware. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1962. xiii + 771 pp. 16 × 23.5 cm. Price, $16.00.

The second volume of the "Determination of Organic Structures by Physical Methods" devotes nearly half its pages to resonance spectroscopy, in an expansion of this subject consistent with the major advances of the period since 1955, when the first volume was published. The well-referenced chapter on Optical Rotatory Dispersion, covering 92 pages and the research contributions of the last seven years, provides a striking contrast to the two-page mention of this subject in the first volume. The examples of rotatory dispersion are prudently selected and the principles clearly stated; moreover, the number of curves has been kept to a useful minimum. The chapter on Mass Spectrometry is fairly comprehensive. It presents the general possibilities and difficulties of using mass spectrometers for structure determination, along with a qualitative view of what goes on inside the instrument and inside a molecule which has been hit by an electron. The sections on rearrangements, functional group effects and special techniques provide information sufficient to excite the imagination. One can easily foresee that this subject will be greatly expanded in a third volume of the series.

Infrared and Raman Spectroscopy are combined in a chapter concentrating on the theoretical background of vibrational spectra and introducing the subject of absolute intensities. The treatment of Electronic Spectra of Polyatomic Molecules and the Configurations of Molecules in Excited Electronic States is highly theoretical. It will stimulate those who seek information concerning the geometry of excited states but will completely satisfy only those who are willing to classify ethylene among the "larger molecules." The chapter entitled Far and Vacuum Ultraviolet Spectroscopy may be regarded in part as a continuation of the chapter on Ultraviolet and Visible Light Absorption in Volume I. Ionization potentials are tabulated for aliphatic, alicylic, unsaturated and aromatic hydrocarbons. Solution spectra run under special conditions and data culled from technical reports and private communications as well as the normal journal references have been used to assemble the N → V transitions in olefins, the absorption maxima of aromatic compounds in the region 1720-2000 Å., and the short wave-length maxima for ketones, amides and imides.

The second portion of the volume is devoted to resonance spectroscopy, starting with a chapter on High Resolution H^1 and F^{19} Magnetic Resonance Spectra of Organic Molecules which is a good review of theory and types of applications. It moves too fast to be considered as an introduction for a reader not familiar with quantum mechanics and it is not a guide for empirical application of n.m.r., but it is complementary to the excellent books on the subject. Particular attention is paid to applications of n.m.r. in kinetic studies of fast reactions including isomeric and conformational equilibration. The review on Nuclear Magnetic Resonance Spectra of Elements Other than Hydrogen and Fluorine serves to inform the reader of the progress which has been made in a very valuable but, in many cases, experimentally more difficult form of n.m.r. Chemical shift tables are included for C^{13}, B^{11}, N^{14}, O^{17}, Si^{29}, P^{31}, Sn^{119} and other nuclei, which give an indication of the value of the technique in analysis and in structure determination. The brief treatment of Nuclear Magnetic Resonance Spectra of Organic Solids shows how the F^{19} and H^1 spectra can be used to determine structure in a limited number of cases and to derive information concerning free or hindered molecular motion.

The contributor of the Chapter on Electron Paramagnetic Resonance of Organic Molecules gives a lucid introduction to the qualitative theory of e.p.r. and illustrates the theoretical considerations with a review of selected problems in which e.p.r. spectroscopy has produced evidence concerning structure and bonding in organic free radicals. The chapter on Electron Paramagnetic Resonance of the Organometallics is more mathematical and perhaps of less general interest. The final chapter provides a satisfactory coverage of Nuclear Quadrupole Resonance Spectroscopy.

In criticism of the book as a whole, this reviewer finds that the individual chapters are aimed at different kinds of readers, so that it becomes more a collection of monographs. The experts who have contributed these monographs are: Gloria G. and Robert E. Lyle, F. W. McLafferty, M. Kent Wilson, D. A. Ramsay, D. W. Turner, W. D. Phillips, Paul C. Lauterbur, R. E. Richards, Richard Bersohn, Richard E. Robertson and Chester T. O'Konski.

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Cours de Cristallographie. Livre III. Première Partie. Radiocristallographie Théorique. Deuxième Partie. Methodes de Cristal Tournant. Determination des Structures Cristallines. Troisième Partie. Methodes de Poudres. By R. GAY, Professeur à la Faculté des Sciences de Bordeaux. Gauthiers-Villars et Cie., 55, Quai des Grands-Augustins, Paris 6, France. 1961. 278 pp. 16 × 25 cm. Price, 38 NF.

This is the third of a series of three volumes giving an account of a course in crystallography taught by the author. The first two volumes, on geometrical crystallography and physicochemical crystallography, provide the background for the volume under review; but the latter is easily readable by those familiar, from other sources, with the material contained in the first two volumes.

The third volume is divided into three parts. The first part treats of two subjects. In the first two chapters a very brief but readable account is given of the nature of X-rays and the means by which they are produced. The