and significant work; therefore it is to be taken as Heavens' own Olympus of thin films. But the book is both a satisfying and provocative purchase.

Heavens' book will be satisfying to the reader because a new science can be contacted in or through his book. It will be satisfying because of the uniformity and clarity of style and the coherence of the author's re-presentation and epitome of the original literature.

The book will be provocative to the original mind, as are all such competent surveys written by authors who are themselves intimate with their subjects. It is provocative in the sense that hardly a page fails to evoke an idea for an experiment or investigation that is worth while or needs to be done. We may expect Heavens' work to be very stimulating to and important for the growth of the art he treats.

I not only recommend this book to those already interested in thin films, but also to those who have a problem-solving competence that is currently unemployed. For the theoreticians, the optical theory presented is certainly more complex and less useful than it will be in the future; and for experimentalists, the techniques described (thermal evaporation of films) have great power for study of the solid state. For example, to appreciate the opportunities, we only need to imagine the study of thin films developed to the point where a similar work on their mechanical properties could be prepared; but first the experiments need to be made and theory needs to be formulated. The attraction of such optical or mechanical research lies in the relatively modest equipments required for it.

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Beta- and Gamma-Ray Spectroscopy. Kai Siegbahn, Ed. Interscience, New York; North-Holland, Amsterdam, 1955. xiv + 959 pp. Illus. $20.

The object of this volume, as stated by the editor, who is a well-known expert on beta- and gamma-ray spectroscopy, is to facilitate the entry of the newcomer into this field of nuclear research. Actually, the book offers considerably more than this statement implies. The experimentalist who is actively engaged in nuclear research will find this volume, in most parts at least, an extremely useful and well-documented reference and handbook.

The large amount of material is distributed in 26 chapters, each of which was prepared by one or more specialists in the particular field.

The first two chapters give a good survey of the interaction of electrons and gamma rays with matter. A comprehensive and up-to-date discussion of theory and design of beta-ray spectrometers follows; high-resolution spectroscopy is included. Gamma-ray spectroscopy by crystal diffraction is discussed by the most competent worker in this field. An excellent survey of the scintillation method, full of useful information and practical details, is presented in the next chapter. Particular detection methods, including proportional-counter spectrometry and special methods in gamma-ray spectroscopy, are discussed in the sixth chapter.

Unfortunately, the discussion of the important coincidence method in the next chapter, although it is informative, is somewhat out-of-date, for it is based mostly on the use of Geiger-Müller counters; very little is said about the use of scintillation detectors in coincidence arrangements. Special problems of beta-spectrometer measurements, including details of source and window techniques, are treated in the next chapter, which is followed by three clearly written articles on (i) theory of allowed beta decay, (ii) theory of forbidden beta decay, and (iii) experiments on the shapes of beta spectra with emphasis on the choice of the interaction of beta decay. Intimately related to the problems of beta decay are the neutrino recoil experiments that are competently discussed in the next chapter. The theories of multipole radiation and internal conversion are then presented in the 13th and 14th chapters, respectively.

After two excellent chapters that describe the present status of the interpretation of experimental nuclear data on the basis of the shell model and the unified model, the measurement of short lifetimes of nuclear excited states by the delayed coincidence method, on the one hand, and by the method of resonant scattering of gamma radiation, on the other hand, is described. Three well-organized articles follow. They form the 19th chapter, which is devoted to theory and experiments on the angular distribution of nuclear radiation. In the chapter that follows this rather theoretical discussion, some internal effects involved in nuclear decay processes, such as the emission of Auger electrons, the formation of internal pairs, and internal *bremsstrahlung* are treated.

In the remaining six chapters, particular problems that are more or less related to beta- and gamma-ray spectroscopy are considered—including ordinary and double Compton effect, double beta decay, annihilation of positrons in various substances and the formation of positronium, some illustrative disintegration studies, gamma radiation emitted during charged particle reactions, neutron-capture gamma rays, and the measurement of disintegration rates. The appendix of the book deserves mention because it gives extremely valuable tables containing numerical data useful for the evaluation and interpretation of experimental results.

As a whole, the book is well edited. In the discussion of such a great variety of problems by a number of different authors, it is inevitable that some aspects are neglected, on the one hand, and that the same subject is considered by several of the contributors, on the other hand. Some overlapping does occur and some omissions and minor errors were noticed, but they are hardly worthy of mention. However, I would have liked to see one chapter of this book devoted to a general discussion of the many electronic devices used in modern nuclear spectroscopy.

The book should be of great interest and value to all nuclear physicists. Those, in particular, who are working in the field of nuclear spectroscopy must have this excellent work at hand.

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Quantum Theory of Solids. Intern. Ser. of Monogr. on Physics. R. E. Peierls. Oxford Univ. Press, New York–London, 1955. vii + 229 pp. Illus. $4.80.

As the title implies, the problems dealt with in this book are those that require the use of quantum theory. Consequently, there is no discussion of various lattice imperfections. The book is short and thus it does not pretend to be complete. It is good in that it gives a concise, clear picture of the theoretical methods used to treat some, but not all, problems in the field. The author often treats a simple case and then gives a short derivation of the general theorems. Very few experimental data are given; and in many instances once the general relationships are obtained, no numerical estimates of orders of magnitude are stated. The author is, however, careful to point out the experimental physical facts that allow a solution to be obtained by the particular method or approximation employed.

In the first two chapters the normal vibrations of a solid are treated. The discussion is unusual, because it includes the influence of anharmonic terms on the specific heat, the thermal expansion, and the thermal conductivity. The discusison of the thermal conductivity is excellent, although it is evident that the subject is complicated. The next chapter deals with the scattering of electromagnetic radiation by crystals. The discussion is limited to the case in which the initial and final electronic states of the crystal are the same. The influence of lattice vibration