

must still ask, is the treatise by a single author the best method to review the vast subject of magnetism or would a better approach be a treatise by many authors sharply edited, or perhaps a continuing series like the Rado-Suhl series on magnetism? The gain in coherence and viewpoint make Vonsovskii's single-author approach a success. In this jet age of international meeting, big-science administration, teaching, committee responsibilities, it seems unlikely that a capable physicist will be able to "break away" and devote the energy, intelligence and time to write another treatise on magnetism. With Vonsovskii's book, however, I see no reason why another single-author treatise on magnetism should be undertaken in the near future.

I strongly recommend that libraries or other research institutions buy this book. The coherence of the approach, the inclusion of many historical Russian references and clarity of the presentation in the books are outstanding features. It would certainly be wise to use specific chapters in this book as one of the first references for any graduate student or researcher about to enter a specialized research area in magnetism. A suggestion to the publisher: It might be worthwhile to republish specific parts of the book in paperback, including only a few chapters. For example, chapters 20 and 21 on transition metals and magnetic alloys would make a convenient 200-page monograph in paperback for, say, less than \$10. Other chapters could also be regrouped into similar coherent subjects.

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Finite Groups and Quantum Theory

D. B. Chesnut

254 pp. Wiley, New York, 1974. \$14.95

Group Theory and Quantum Mechanics

B. L. van der Waerden

211 pp. Springer-Verlag, New York, 1974. \$23.00

An English version of *Group Theory and Quantum Mechanics*, a classic work on the subjects, is most welcome. The style and choice of subject matter are very much those of a prominent mathematician—as B. L. van der Waer-

den indeed is—who has studied and researched the field over its full span of development. D. B. Chesnut, the author of *Finite Groups and Quantum Theory*, is a physical chemist. He has written for students of physical chemistry at roughly the senior or beginning-graduate level. Judging from the treatment of Venn diagrams, sets and mappings, and matrices, he does not expect from these people the same mathematical background as would be appropriate to physics students at this level.

In van der Waerden's book, quantum mechanics is set within the framework of Hilbert-space theory, with careful distinctions between bounded and unbounded, symmetric and self-adjoint operators. The hydrogen atom, an electron in a central field, is worked out fully. The author also supplies a full exposition of group theory, group rings and finite-dimensional representation theory, and he applies this in detail to translations, the rotation and Lorentz groups, and the symmetric group.

Aiming at his less advanced audience, Chesnut covers standard ground from group theory to the theory of finite-dimensional representations. The coverage is distinctly introductory and a little sparse in places, with emphasis on elementary calculations. There is a good account of direct products of groups and the use of projection operators based upon the group-representation orthogonality relations, together with character tables for the deducing of irreducible components.

Van der Waerden considers physical applications in depth with accounts of angular momentum and spin from both the nonrelativistic and relativistic points of view. The symmetric group and the exclusion principle occupy a whole chapter, in which the Young operators are used to classify the irreducible representations of the symmetric group. Throughout, care is taken to derive the classification of quantum-mechanical states and their selection rules due to angular momentum and spin for many-electron atoms and diatomic molecules. Perturbation theory for the energy levels is sketched as well. All applications in *Finite Groups and Quantum Theory* are for point groups.

Later chapters of Chesnut's text deal with elementary applications to symmetry in quantum mechanics, the exclusion principle, molecular orbitals and chemical bonding. I would have enjoyed expansion of this later part to include some of the underlying physical chemistry that is frequently quoted as justification for a given remark or calculation. Surprisingly, notation used for the point groups, which first appears on page six, is never explained in the text proper, though many examples and exercises depend on it. Solutions to exercises close each chapter and are pre-

sented in detail; this is a good feature, which should prove useful for most of his readers.

Chesnut's volume is perhaps best used as a supplement to a course in physical chemistry, but the lack of any treatment of the rotation group and angular momentum precludes its usefulness in most physics classes. The charming little book by van der Waerden recalls the spirit of the golden age in quantum theory and takes a worthy place in the literature. Its economy of exposition allows surprising scope and depth in a few pages. Mathematicians should find *Group Theory and Quantum Mechanics* a good place to learn some quantum mechanics, as should physicists who can look elsewhere for calculations but who wish to see the subject on a firmer mathematical footing than in most physics texts.

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Objections to Astrology

B. J. Bok, L. E. Jerome

62 pp. Prometheus Books, Buffalo, N.Y., 1975. \$2.95

The survival of astrology in an age that we would like to regard as "scientific" has long been a source of embarrassment to astronomers and physicists.



Periodically, some of us become sufficiently alarmed at this evidence of rampant superstition that we decide the time has come to "do something about it." Such is the origin of this slim volume under discussion.

Objections to Astrology begins with a short manifesto—some 400 words or so—signed by 192 luminaries of science, primarily astronomers but representing nearly all disciplines. The body of the text consists of two articles. All three excerpts manage to avoid the obvious temptation to shrill polemic. Instead, they show some sensitivity to the psychological appeal and historical role of a system that has, for better or worse, outlived by millennia the cultures that gave it birth.

The first article is by the distinguished astronomer Bart J. Bok, who has trod this path many times since 1940. It might well bear the title "A Scientist's Primer of Astrology." In the spirit of the proverbial injunction to "know thine enemy," Bok briefly dem-