wealth of detailed experimental data has left little speculative ground on which the theorist may gain a secure footing. From now on, auroral theories may have to be correct.

The book closes with a short summary, by Anders Omholt, of a few particular points of interest.

As I mentioned at the beginning of this review, this book is a brief progress report (with the exceptions of the more complete review papers by Anderson and Leadabrand). The papers will be of limited value to those who are not already familiar with auroral phenomena. This book would make a good companion to *Physics of the Aurora and Airglow*, by Joseph Chamberlain, along with the 1962 symposium "Theoretical Interpretation of Upper Atmosphere Emissions" which was published as volume 10 of the journal *Planetary and Space Science* (1963). My only negative comment is a mild one directed at the publisher: the cost of the book exceeds four cents per page, which seems too high in view of the quality of the printing and the format. Surely a way could be found to publish conference proceedings in less time and at a lower price.

A. J. DESSLER
Space Science Department,
Rice University,
Houston, Texas

Organic Chemistry: A Reference Book

The Acyclic Aliphatic Tertiary Amines. Leonard Spialter and Joseph A. Pappalardo. Macmillan, New York, 1965. xvi + 512 pp. Illus. $18.

This is not a book that anyone will read, or will intend to read, from cover to cover; it is a one-volume reference work, primarily a tabulation of 710 compounds, each one acyclic, aliphatic, and tertiary, ranging from C_3H_9N to $C_{87}H_{177}N$, as defined by the title. Entries are further limited to those that contain only carbon, hydrogen, and nitrogen, although both monoamines and polyamines up to $C_{21}H_{50}N_6$ are listed (with saturated and unsaturated hydrocarbon groups). The literature survey included *Chemical Abstracts* through mid-1961, so that all examples covered by the title and described through 1960 are likely to be included. There are approximately 1600 unduplicated references (pp. 451–501). The indexing is nicely handled by means of a formula index (pp. 511–512) so that entries are quickly located.

The first 93 pages will interest most organic chemists and advanced students, for those pages are devoted to historical background, nomenclature, general properties, and general preparative methods. The review of preparative methods (pp. 14–93) is complete and includes discussion of the scope and limitations of the many methods recited.

The first specific entry, obviously, is trimethylamine (p. 100), which occupies 13 pages that cover all physical properties, natural occurrence, methods of preparation, and derivatives; each item of information is supported by literature references. It appears that any worthwhile, published item about trimethylamine is cited here, either per se or by way of references. Most of the subsequent entries are very much shorter, of course; ethynyldimethylamine rates only a few lines (two derivatives, one reference).

I made a number of sample checks to locate assorted bits of published information with which I was already familiar; in each instance I was able to locate the item quickly. I noted only a very few misspelled words and typographical errors.

Clearly this book will be extremely useful (even indispensable) to those actively engaged in research in aliphatic amine chemistry. We will appreciate having it in the office and laboratory, within instant reach. Others will consider the price high and will forego the convenience of owning a personal copy, knowing that every good chemical research library will have the volume in its collection.

All those who use the volume will certainly hope that this is the first of a multivolume set which will provide similar coverage of all of amine chemistry. But this is unlikely; amine chemistry *in toto* is much too vast, and the job much too formidable, for any two-man team. The authors chose to cover a very small corner of this very large field, and they have done a painstaking and thorough job.

G. F. HENNION
Department of Chemistry,
University of Notre Dame

Prigogine School Techniques

Statistical Mechanics of Charged Particles. R. Balescu. Interscience (Wiley), New York, 1963. xiv + 477 pp. Illus. $15.

Statistical Mechanics of Charged Particles, by R. Balescu, volume 4 of the series Monographs in Statistical Physics and Thermodynamics, edited by I. Prigogine, is based on nonequilibrium statistical mechanics as developed by I. Prigogine and his coworkers at the Université Libre de Bruxelles. Balescu has contributed greatly to this new approach to statistical mechanics and is, therefore, in a position to give an accurate account of the subject. Indeed, he does this in a masterful and rigorous fashion.

The theory is not easy since it deals with the foundations of the subject. However, Balescu's book can be read profitably by serious, second-year, graduate students in this country. The book is largely self-contained and is very clear and readable. Many complex details and much additional material are relegated to appendices.

Much of the customary work in plasmas is based upon equations that are "derived" by intuitive arguments. The newer approaches in statistical mechanics seek to derive phenomenological equations rigorously, starting with the basic dynamical description of the entire system. The dynamical equations describing the system involve interactions among all the particles that comprise the system and in general are quite intractable. However, the perturbation methods of modern quantum theory provide a tool that enables one to solve the dynamical equations in a *formal* manner. The "solution" consists of infinitely many terms in a series whose convergence is quite doubtful. Nevertheless, in some real sense the series represents the solution to the equations. Very briefly, the method of the Prigogine school consists, first, in identifying terms in the perturbative expansion for the time evolution of various Fourier coefficients of the phase-space distribution function (Wigner distribution function for quantum systems). The terms in this expansion are identified and classified with the aid of a systematic diagram technique. A study of the properties of classes of diagrams then leads to a judicious choice of terms (usually infinite in number), which yield the largest contributions to a given type of physical