note that credit for the voltage multiplier is given to the Swiss Greinacher.

This is a very intriguing and easily understandable book mainly teaching the experimentalist (relatively little theory is given). The fact that it is written in French is not a serious detriment if one has a fair understanding of physics and just a vague idea of French.

The MKS system is used throughout, and some sensible abbreviations are used. The cps is replaced by the Hz (after Hertz, and long in use in Europe) and the weber/m^2 (= 10 000 gauss) is called a tesla, which should satisfy many an otherwise ardent fan of cgs units. A word of caution: the French word "rayon" has the two meanings "ray" and "radius" and caused me no little confusion (Section 5-10 "rayons ioniques" means "ionic radii", while in Chapter 10 "rayons cosmiques" means "cosmic rays").

While the book on the whole is an admirable creation, there are many small faults. First of all, the whole quality of materials and typography is seriously inferior to American books, at a superior price (about $14). Next there are very many misprints, omissions, and other errors to be found. While this may not be very serious for a person thoroughly familiar with physics *and* the language, it will make the reading more difficult for others. The discovery of the neutron is placed in 1939 on page 33; on page 25 the atomic number of the last of the actinides is not given; the curie is defined as 3.71×10^{-10} decays per second. Nevertheless, I would recommend this book highly to any student of physics who wants to get a different point of view.

Contemporary Models of the Atomic Nucleus. By P. E. Nemirovskii. Translated from Russian by S. and M. Nikolic. Transl. edited by Bernard T. Feld. 332 pp. (Pergamon, Oxford) Macmillan, New York, 1963. $15.00.
Reviewed by Ernest M. Henley, University of Washington.

This book, translated from the Russian into rather nonfluent English, is a curious combination of material. It consists, in part, of a relatively up-to-date survey of nuclear models, and, in part, of an advanced treatise on special topics. The text begins with a short description of static nuclear properties, followed by a longer survey of the shell and collective models. In these chapters explanations are often totally absent, assertions are made without justification (e.g., that certain terms in an equation may be disregarded), and material is used without being introduced (e.g., the density matrix).

In Chapters 4 and 5, the author presents discussions, based in large part on his own work, of the optical and shell models. In contrast to the first few chapters, complicated details and lengthy derivations are introduced. However, even in these chapters, judgments are made without adequate reason. For example, on page 241 it is stated that, in the Born approximation treatment of the stripping reaction, "It is *logical* to assume the potential of the neutron-proton interaction to be of the form $V_0\delta(|\mathbf{r}_p - \mathbf{r}_n|)$." (Italics are the reviewer's.)

It is not clear to this reviewer whether the book is aimed at the student who is beginning to learn nuclear physics, or at the more advanced student and research physicist. It is difficult to recommend the book to either group because of the lack of explanations in the first part, and the one-sided presentation in the latter part. The value of the book is not enhanced by the lack of an index, by common misspelling of references, and by its exorbitant price.

Mathematical Theory of Elastic Equilibrium. Recent Results. By Giuseppe Grioli. 168 pp. (Springer-Verlag, Berlin) Academic Press, New York, 1962. Paper $7.25.
Reviewed by E. H. Dill, University of Washington.

This is a brief monograph of interest only to the advanced scholar specializing in the theory of elasticity. Some thermodynamic potentials of the exact theory are reviewed. Successive approximations to the exact equations, uniqueness, and existence of solutions to the linear theory are studied by regarding the solution as depending on a single parameter. Methods of determining upper and lower bounds on the stress and displacement at a point are presented for the linear theory. Plane stress, plane strain, and hypoelasticity are reviewed. Lastly, the equations of elasticity with nonsymmetric stress tensor are considered.

Renewed interest in the theory of elasticity in the last twenty years has resulted in several well-written books. This is not one of them. The presentation of the fundamental relations is poorly written and can best be studied elsewhere. Nevertheless, the author seems to be quite capable and all results are correct.

Once the reader has overcome the natural annoyance incurred by the frustration of trying to comprehend the author's nonexplanations, several interesting new results will be noticed. The chapters on inequalities for the linear theory and on integration of the basic equations of the linear theory, which comprise thirty per cent of the book, are well worth the effort required to study them.

Perhaps one of the most important virtues of this monograph is that it makes available the recent work written in Italian. About half of the 160 references are to the Italian literature and over half of the references have been published since 1950.

Theoretical Electromagnetism. By R. H. Atkin. 260 pp. Wiley, New York, 1962. $9.00.
Reviewed by Harold Mendlowitz, National Bureau of Standards, Washington, D.C.

Nowadays many intermediate texts in physics are basically geared toward the goal of preparing the student for a course in quantum mechanics. When this happens, the subjects taught at the intermediate level are used as examples of the various techniques to be mastered before one is able to handle the mathematical tools necessary for a course in quantum mechanics. Of course, one can sometimes gain a great deal of insight into the subject matter of the intermediate-level course although the choice of topics to be treated depends somewhat upon the needs of another course.

Theoretical electromagnetism is treated by the present author as an end in itself. The treatment follows

the old-line English philosophy of giving the student a great variety of problems, both in the text and in the exercises. By this method the student is expected to master the subject. Most of the book is devoted to electrostatics, magnetostatics, and steady-state circuitry. About 25% of the material treats Maxwell's equations and the special theory of relativity. The vector and tensor methods which are utilized are sufficiently elementary so that even a student whose background is weak in these subjects would probably not experience too much difficulty. One may expect that juniors would probably be able to use this book with a little help from the instructor in vector and tensor manipulations.

Because of the way the subject matter is now channeled in the American universities, one can only recommend this book as a text for those being exposed to this subject for the first time after the initial general physics course. However, it would make a useful supplement in a course where the major text emphasizes methods of solutions of Maxwell's equations for the electromagnetic field and treats electro- and magnetostatics very lightly.

Basic Mathematics for the Physical Sciences. By Haym Kruglak and John T. Moore. 354 pp. McGraw-Hill, New York, 1963. Paper $3.95.
Reviewed by Robert L. Weber, The Pennsylvania State University.

With complementary skills, authors and publisher have succeeded in displaying in an especially attractive and useful form basic mathematics needed by high-school students taking a college preparatory curriculum or, for review, by college students in typical freshman courses in physical science. The scope is indicated by this listing of chapter titles: Arithmetic, Algebra, Geometry, Trigonometry, Intuitive calculus, Graphical analysis of experimental data. Mathematical tables, physical constants, and conversion factors are given in an Appendix.

Each of the first four chapters is introduced by a diagnostic pretest several pages in length. By working out the exercises in a pretest, the student can ascertain his weaknesses. The answer key tells him on what pages he will find relevant help. He can check the success of his study by answering the post-test at the end of the chapter. Such tests are not used in the last three chapters, but they, too, contain an adequate number of exercises.

I should be inclined to make the 32 pages of the chapter on measurement required reading for students in any introductory college-level laboratory course in physics. The meanings of measurement, types of errors, expression of accuracy, and proper use of significant figures are presented in conventional manner. The treatment of simple error analysis, including both algebraic and calculus methods and the normal curve, is the best I have seen for beginning students. The final chapter on graphical analysis of experimental data includes helpful exercises on empirical equations and the use of logarithmic papers.

This is a good book to recommend to your students; several copies should be available to them in the physics laboratory.

Multilinear Analysis for Students in Engineering and Science. By G. A. Hawkins. 219 pp. Wiley, New York, 1963. Paper $2.95, cloth $6.50.
Reviewed by Peter L. Balise, University of Washington.

Vector, tensor, and matrix analysis were encountered mostly at the graduate level until quite recently, but now the availability of digital computers has led scientists and engineers commonly to use matrix techniques for the efficient and systematic solution of problems. Vector representation is becoming standard in undergraduate courses, rather than being a special approach. And the appropriateness of the mathematicians' view of vectors as ordered n-tuples, rather than as arrows, is increasingly recognized.

Many recent books reflect this progress, but the circumstances of the present volume particularly emphasize the change in engineering education. It was written by a dean of engineering who had previously written thermodynamics texts. As Dean Hawkins describes in the preface, in order to continue his work in applying the theory of the continuum to heat and mass transfer problems he found it necessary to reinforce his knowledge of vector and tensor analysis; so he wrote this book to assist students in self-study of the subject.

These circumstances, and Dean Hawkins' proven writing ability, would lead one to expect an outstandingly lucid presentation for beginners. That the volume did not fully meet my expectations probably is more an indication of my own opinion of how best to present the subject than it is a measure of Dean Hawkins' success in his latest writing venture. I prefer at first to emphasize physical interpretation, with less initial attention to analytical or manipulative techniques than is given by Dean Hawkins and many other teachers. For example, I like to consider transformations of the inertia tensor in matrix form before presenting the summation convention, although of course index notation is essential to tensor analysis.

The book is logical, beginning with a review of vectors, determinants, and matrices, then considering the summation convention and transformations, and presenting the major aspects of tensor analysis. The last chapter outlines vector quantities in tensor form, which should help the student appreciate what he has learned. An example of the coherence of the work is that **i**, **j**, and **k** are never used for Cartesian unit vectors: instead the use of $\mathbf{i}_1$, $\mathbf{i}_2$, and $\mathbf{i}_3$ anticipates the idea of n-dimensional space.

The work is well illustrated (with some good shaded drawings), and problems are included. It is not intended as a text, apparently, because rigor is not emphasized. Nevertheless, it could well be considered as a text or supplementary reading for engineering courses in tensor analysis.

Physique générale. By Jean Rossel. 480 pp. Editions du Griffon, Neuchatel, Switzerland, 1963. Fr. Suisses 48.
Reviewed by Jacques Romain, Centre de Recherches Routières, Sterrebeek, Brussels, Belgium.

Prof. Rossel's purpose in preparing this book was to write an intermediate book, midway between rather qualitative elementary books and highly technical advanced books. To achieve this goal in less than 500 pages without