approach to the subject, however. A general introduction on absorption and emission processes is followed by a description of the ammonia maser and other gas devices. The general principles of electron resonance in the solid state are then explained and this is followed by separate chapters on the two-level and three-level masers. A final chapter on traveling-wave masers together with a brief reference to parametric amplifiers in the appendix introduce the newest developments in this field.

It is a book which is well balanced and written in a logical way which is easy to follow, and can be strongly recommended to anyone entering this field whether as a solid-state physicist or as an engineer.

College Physics (3rd Revised Ed.). By Robert L. Weber, Marsh W. White, Kenneth V. Manning. 640 pp. McGraw-Hill Book Co., Inc., New York, 1959. $7.50. *Reviewed by Grant O. Gale, Grinnell College.*

THE third edition of a text as widely used as Weber, White, and Manning is almost perforce a finished piece of workmanship. The fact that the earlier editions were used in over a hundred colleges and transcribed on tape for the blind testifies to the general desirability of the text. For this reason this review will confine itself largely to the changes found or not found in the new third edition.

The size and format of the book were changed to an attractive double column page with smaller tabular arrangements and many illustrations reduced in size without loss of detail. The general appearance of the book is improved with the attractive etchings of the Nobel prize winners in physics kept at the chapter headings. The conventional compartments of mechanics, heat, etc. are maintained and each is introduced with an appropriate full-page picture with superimposed graphs, charts, etc. A rather unique feature is the treatment of the inside of the front and back covers with a series of sketches and brief statements portraying the history of physics from the Babylonians to nuclear energy.

The preface states that "this edition continues the inclusion of the topics needed for the conventional courses, together with selected material in atomic and nuclear phenomena, relativity, solid-state physics, and quantum-physics phenomena." The result of attempting to do so much has resulted in a book which is somewhat "encyclopedic in character" in spite of a disclaimer in the preface. The mathematical preparation expected from the students varies from an illustrative problem (page 207) showing how to change Fahrenheit temperatures to centigrade through to calculus used only in the appendix.

The many good features of earlier editions are kept, such as the careful use of significant figures and the algebraic manipulation of units as well as numbers. This, I found, made the students dimensionally alert and conscious. The earlier editions had a clarity of expression and an uncluttered style that the students found easy to read and understand. This has been kept and many a student finds it "easier to learn from Weber, White, and Manning". As expected, there are very few misstatements, knowing the meticulous care with which the authors avoid these. I would take exception to the first law of motion as stated on page 34: "There is no change of motion of a body unless a resultant force is acting upon it." I think it is better stated in the summary as an "unbalanced or net force". One can have the resultant of two or more forces be zero (see bottom of p. 18) and produce no acceleration. In the treatment of the Carnot cycle (p. 229) there has been some improvement and the notation has been changed from H to Q for the heat energy received and discharged, but the student is still confused between heat energy and work all represented by areas. To the student the area between an isotherm AB and the x-axis is meaningless because it may be any value. There are, however, few examples of this kind in the text.

From its appearance I was expecting an entirely new book with completely new emphasis oriented toward modern physics. I was disappointed in this respect in the third edition. It is essentially the old book with the deficiency of modern physics compensated for by a few appended chapters. For example, the whole treatment of heat and temperature does not give the student any feeling that heat is a statistical phenomenon. The statement "Heat is a form of energy that molecules of matter possess because of their motion" (p. 200) is true, but the concept that one or two moving molecules is *not* heat is certainly *not* clear. In much the same vein, the whole of the chapter (45) on spectra may be read and the questions discussed without any inkling that spectra have something to do with atomic structure and the Bohr theory. This is rather inadequately done in a separate single paragraph (50.4). The authors apparently recognize this deficiency, for in the preface they say "Material sometimes referred to as 'modern physics' has been included with conventional topics at various places throughout this edition. The contemporary physics section at the end of the book has been enlarged." And yet the section at the end of the book is labeled Modern Physics by a full-page illustration (569) rather than "contemporary"; the two are not quite the same. The Bohr atom was contemporary in 1926.

In spite of all these remarks the text is an excellent one. The problems are good, it is very teachable and the students like it. We all agree that a satisfactory first course in college physics cannot stretch all the way from the Babylonians to Nuclear Energy.

Recent Research in Molecular Beams. Edited by Immanuel Estermann. 190 pp. Academic Press Inc., New York, 1959. $6.50. *Reviewed by R. W. Hellwarth, Hughes Aircraft Company.*

FOR the purpose of commemorating the seventieth birthday of Otto Stern, his friend and collaborator Immanuel Estermann has collected a random sampling of the best of current molecular beam research into the