Physics and Chemistry

Introduction to General Science with Experiments. By Percy E. Rowell. Macmillan. 75 cents.
General Science. By Bertha M. Clark. American Book. 80 cents.
Laboratory Manual in General Science. By Bertha M. Clark. American Book. 40 cents.
First Principles of Physics. By Henry S. Carhart and Horatio N. Chute. Boston: Allyn & Bacon. $1.25.
Applied Physics for Secondary Schools. By V. D. Hawkins. Longmans, Green. $1.
Chemistry, An Elementary Text-Book. By William Conger Morgan and James A. Lyman. Macmillan. $1.25.
Principles of Human Nutrition. By Whitman H. Jordan. Macmillan. $1.75.

The introduction of textbooks on "general science" has two pedagogical advantages; first, it breaks down the arbitrary and fictitious barriers that custom has erected between the several sciences, and second, it substitutes a practical grouping for a theoretical system. This idea has been carried to an extreme in Rowell's *Introduction to General Science,* where successive lessons treat of the construction of the siphon, the fixation of nitrogen, the testing of paints, the action of carbon dioxid, the nature of lightning, the cause of winds and the making of a kite, all because these topics have some connection with the atmosphere. This makes almost as scrappy reading as a daily paper, tho doubtless a good teacher could bring out the necessary continuity. The volume contains 212 lessons, covering, as may be inferred, a wide range of subjects, from the material of comets to the conduct of life. They are illustrated so far as possible by simple experiments and provided with reading references, in which chief use is made of the publications of the United States Department of Agriculture, for the purpose of encouraging the "bulletin habit." Clark's *General Science* is less ambitious in its scope and more logical, or, at least, more conventional in its arrangement. It is mostly confined to physics, tho with brief excursions into such subjects as bacteria and headache powders. It differs, however, from older textbooks in physics in being less mathematical and abstract. The accompanying *Laboratory Manual*

contains ninety-two experiments adapted to second-year high school students.

The names of Carhart and Chute have been known long enough to be generally received as a guarantee of excellence. Their *First Principles of Physics,* bearing the date of 1912, is a thoroly teachable textbook, with a good grasp of theory on the one hand and of every day applications on the other. Problems are abundant and the illustrations really illustrate. Twenty portraits of eminent physicists serve to introduce the student to the history of the science. A radical departure in the customary order is made by placing the mechanics of fluids before the mechanics of solids.

Hawkins's *Applied Physics* is something quite out of the ordinary and lives up to its title, for it deals with the real problems of our modern civilization, tho treating them in a thoroly scientific style. The chapter on electricity, for example, begins not with the properties of the ether or the peculiarities of amber, but with the dynamo, the most familiar of electrical instruments to the boy of today, and the author assures us that "it is no more difficult for the pupil to understand a three-phase alternator than to master the influence machine." Certainly the pupil who had mastered these 200 compact pages would have a grasp of the subject that few of them get from volumes five times the size. But it would take a teacher who knows more than most of them about shopwork and machinery to handle such a textbook. The problems are numerous and ingeniously practical, but there are no directions for the experiments of students or instructor.

Chemistry has suffered in the past even more than physics from a remoteness from life. Not a few pupils are "passed" in it without suspecting that it concerns much of anything outside the drugstore and laboratory. The effort to remedy this gives to the pages of Morgan and Lyman's new elementary textbook an unusual appearance. The illustration of rapid acidation is not a line sketch of phosphorus burning in a flask of oxygen, but a photograph of San Francisco on fire. The process of making nitrates from the air is pictured by a thunderstorm, as well as by the arc apparatus. Portraits of great chemists (mostly pretty poor) give the personal side. Arrows are used instead of the sign of equality to indicate the course of reactions. We are glad to see that the simplified spellings recommended some twenty years ago by the chemical section of the American Association—chlorin, oxid and sulfur, for example—are used thruout. Questions and problems are included, but not laboratory directions.

Jordan's *Principles of Human Nutrition* is intended for the use of the home reader and "short course" student as well as for college classes, so it is less technical and more practical than such books as Sherman's "Chemistry of Food and Nutrition," for example. Professor Jordan is one of the foremost authorities in the country on the feeding of animals, and here shows himself equally at home in the matter of feeding human beings. His discussion of such vexed questions as vegetarianism, raw food and the protein needs of the body is careful and just, and his advice in regard to dietetics, the selection of food and its preservation is practical and reliable. A hundred pages of the volume are taken up with tables of the analyses of American food materials. Professor Jordan also uses the spellings "oxid" and "sulfur," but not "chlorid."