

ters discuss Herschel's contributions. These are arranged according to subject matter and include such topics as telescopes, studies on the moon, sun, planets, comets, variable stars, stellar magnitudes, the sun's motion through space, construction of the heavens, nebulous stars, and the evolution of the celestial systems. Each contribution is introduced with a short history of the problem and is followed by a look into Herschel's train of thought as he attempted to solve the problem. The author is careful to indicate that not all of Herschel's ideas were correct. For example, Herschel believed that there were people living on the sun, and the reason they were not consumed was that the sun's rays produced heat only when they entered an appropriate medium such as the earth's atmosphere. The reader, however, is bound to be impressed by the ability and perseverance of this amateur scholar. The reader will also feel sympathy and pity for Herschel's sister who seemingly forsook personal happiness to serve her entire life as her brother's assistant.

The last portion of Chapter 5 is *A Conspectus* in which the author summarizes Herschel's discoveries and ideas. Chapter 6, the *Epilogue*, covers advances in the field of astronomy since Herschel's day. This is confined to areas in which Herschel made contributions. The book is indexed and there is a bibliography. The book is well illustrated, containing 24 plates and 14 figures.

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JOSIAH W. GIBBS, AMERICAN THEORETICAL PHYSICIST. Benedict A. Leerburger, Jr., 118 pp., \$2.95, Franklin Watts, Inc., New York 22, 1963.

Benedict A. Leerburger, Jr., quotes a letter to Professor Gibbs from the president of Bowdoin College in Brunswick, Maine. It reads as follows:

My dear sir:

Would you entertain the offer of the Chair of Mathematics or of Physics at this college? Our salaries are just at this time low, but we expect to have them raised to about \$2,000; but perhaps it would be safe to estimate them at \$1,800, in considering the actual situation now.

This letter now seems actually ridiculous in view of the importance and status of physics and chemistry at the present time. If we could take the results of Gibbs's contributions back to his time, some eighty years ago, his salary offer should have been several billions of dollars.

Dr. Harold Urey, the discoverer of "heavy hydrogen," states:

It is probably true that very few scientists of the world have ever contributed as much endur-

ing material to physics or physical chemistry as Gibbs.

Gibbs, in his study of spatial mathematics was very, very close to the idea of Albert Einstein's Theory of Relativity. Without Gibbs's contribution of his Phase Rule, we would not have the rockets and space capsules of our Space Age. We would not have the steel and aluminum alloys so necessary to our modern society.

The author clearly explains in terms easily understood by the layman the most important of Gibbs's scientific works. He also shows Josiah Willard Gibbs in a most human manner. Throughout the book you live, teach and travel with this 19th century professor from New Haven, Connecticut.

The book is written so that a student in the sixth grade can understand and thoroughly enjoy it. It is a book that should be in every public library and also be part of the reading program in all junior high schools.

Science is soaring like a rocket. Gibbs was the "lox" and the fuel which started it on its fiery journey.

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Health

HEALTH IN ELEMENTARY SCHOOLS, Leslie W. Irwin, 440 pp., \$5.90, C. V. Mosby Company, St. Louis 3, 1962.

This should make an excellent contribution to all concerned with problems of educational organization, objectives, curriculum development, supervision, and teaching methods and materials as they relate to the elementary school health program. It not only makes available the essential information that teachers need but helps elementary teachers recognize more clearly their responsibilities and opportunities to improve their contribution to the protection and improvement of child health. It is designed primarily for use in teacher training institutions but should be of value to all elementary school personnel.

The book is divided into three parts; fundamental concepts, application of methods and techniques, and materials and their sources for improved health education. One of the outstanding features is a large section on health teaching techniques. Here a broad selection of activities is provided for those teachers with limited or extensive training and experience. One chapter is devoted to evaluation, including knowledge, attitudes, practices of children and of the total school health program.

The book is recommended very highly for all elementary school personnel.

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ADMINISTRATION OF SCHOOL HEALTH AND PHYSICAL EDUCATION PROGRAMS, Charles A. Bucher, 498 pp., \$6.25, C. V. Mosby Company, St. Louis, 1963.

As a general practice Health, Physical Education, and Recreation are organized as separate departments within a single school. The administrative problems associated with the areas of health, physical education, and recreation will differ. This particular edition treats each area and would serve the purposes of an introduction to the administrative problems as concerned by the beginning teacher, or student, of one of the areas under consideration. The book is very easy to read and understand. The greatest shortcoming is the brief coverage of problems in the aforementioned areas. The chapters pertaining to the administrative aspects of the total school health program present an excellent insight into the relevant topics. This book would serve well as a teacher reference and be of great value to one outside the realm of health, physical education, and recreation.

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Science Teaching Methods

COMPTON'S ILLUSTRATED SCIENCE DICTIONARY, Charles A. Ford, John S. Richardson, and Leo Charles Fay, Eds., 632 pp., \$13.25, F. E. Compton Co., Chicago 10, Illinois, 1963.

The editors of this new dictionary are to be congratulated for keeping their audience so clearly in mind. The audience is the junior and senior high school student who is probably not only mystified by all the terms which are used in science courses but has a great many terms thrown at him in the commercial news, radio, and television media. Each term which is used in the dictionary has a pronunciation guide, a category into which the term may be usually placed, a brief, simple definition with a clear eye to the readership, and a sentence using the word to be defined in an appropriate context. Small diagrams illustrate each page, but no effort is made to diagram each of the terms on the page.

Appendix items are quite rich in charts, diagrams, and informational tables on biological classification, prefixes and suffixes of scientific terms, astronomical data, abbreviation chart, periodic table, etc.

The dictionary meets a need about which all teachers know quite keenly. This need is for a simple, to-the-point explanation of terms with which students are confronted daily. The large well-known dictionaries use complicated terminology in the definitions, and appropriately so. This dictionary is aimed for the student, and as such, should enjoy a steady and rewarding use in schools, science classrooms, and for the study shelf at home. It should make a very fine gift for the junior and senior high school student, but teachers and librarians should inspect it very carefully for possible inclusion in their next order list.

BIOLOGICAL RESEARCH METHOD, AN INTRODUCTORY GUIDE, H. H. Holman, 262 pp., \$5.75, Hafner Publishing Company, New York 3, 1962.

An English book dealing with statistical methods, experimental design, data recording, etc., which all who deal in biological experimentation should know. While this book should prove to be a healthy, cold dash of water to the professional biological researcher, it does have a value also to the student attempting a biological research project. Far too often, research project reports, especially from the young and inexperienced, have internal and intrinsic faults in poor experimental design, poor use and collection of data, lack of statistical validity, and unwarranted conclusions. Since the above are often the criticisms leveled by the professional at amateur research in biology, the use of this book should go very far in eliminating the justification of these criticisms. As such, high school biology teachers will profit greatly by the use of this succinct treatment of research methodology in biology.

BIOLOGY CAN BE FUN, Sister Mary Stephanetta, C.S.S.F., \$3.00, J. Weston Walch, Publisher, Portland, Maine, 1958.

I do hope that today's teacher of high school biology has been provided with enough ammunition through NSF summer and academic institutes, BSCS, and the new frontiers of molecular biology, that they will replicate what the county sheriff did twenty years ago and outlaw "bingo" as a means of giving away prizes for nothing. The anticipated prize in this case is the effective teaching of biology. The game is not bingo but a packet of heavy, white, printed cards representing a series of three bingo-simulated games with enough materials to supply each game in a class of thirty-five. The teacher reads a statement taken from seventy-five biological facts on animal life, plant life, and man to the class, and the student fills in the section of his card representing the correct answer. The winning card has the completed