

cause this allows an author to withdraw an article before publication should experiments performed subsequent to the completion of the article negate his former data or cause him to change his mind.

#### TEACHING TECHNIQUES

In addition to training in fundamental facts, principles, theories, laboratory techniques, and research, a prospective biology teacher needs training in biological teaching methods and techniques, methods of presentation of subject matter, construction of various types of tests, the evaluation and grading of student work, tricks dealing with the mechanics of class organization and order, seating, roll-taking, quiz conduction, handling of laboratory supplies (ordering, inventory, upkeep, storage), and

the handling of students.

Above all, the future teacher should be taught critical scientific methods of thinking—how to think for himself. This can not be accomplished in one course, but must permeate every science course which he takes.

Another sometimes neglected item is that of making the prospective teacher understand that he must give his very best efforts and interest to the job. It really does not matter a great deal whether one is preparing to teach in a high school, junior college, or a regular college, because for any one of these the prospective candidate needs as much preparation or information and as many techniques as he possibly can get, plenty of common sense, a willingness to work earnestly and hard in his chosen field and a desire to get ahead.

## Books

BUSH, GEORGE L., DICKIE, ALLAN, and RUNKLE, RONALD C. *A Biology of Familiar Things*. American Book Company. 695 pp. 1939. \$1.92.

This is a pioneer text. It is not a text with a prescribed syllabus, with an encyclopedia approach, or with a highly integrated organization. It contains much less technical material than is found in many of the accepted modern textbooks. The stress is on consumer biology. Its true value can only be judged by careful use of the text by teachers and supervisors.

*Mechanical Make-up*: It is a 6 × 9 inch sturdy book with a brown and light tan cover arrangement. It features photographs, using a superbly executed "bled" engraving as an introduction to each unit. Its photography is exceedingly sharp and distinctive. There is a

polychrome engraving as a frontispiece. Sufficient visual material, with effective introductory phrasing to legends, undoubtedly should stimulate closer examination of non-typographical matter. The typography is in a single column with well spaced composition. Especially effective is the composition of the overview to each unit. A unique development is the graphic illustration of laboratory techniques.

*Psychological Soundness*: In theory this book might be the essence of the psychological approach. It stems from central basic interests of the boy and the girl of our suburban communities. It appears to add to, supplement, and lead on from his or her everyday experiences. There is no evident seasonal arrangement. Paragraph headings are in the form of direct statements, viz., "It takes

little energy to sleep." "Sheep seldom have twins."

It is doubtful that there is a sufficient amount of worthy material present to make allowances for the brighter pupil. This is not a book for an academically minded student in high school.

*Literary Style:* Clarity of thought and expression is the keynote of the literary style of the text. The organization into levels where the simple style of presentation could be efficient is marked in many places. The approach, presentation, and statement of fact are decidedly above the average, and superior in many phases of the text's organization.

Sentence structure is in the main short and simple. The following is a selected example of a long sentence that is perfectly clear. "The microscope is also an aid to the proper treatment of cancer as it is possible to subject a small portion of abnormal tissue to high magnification by the use of the microscope, and in this manner to determine the rate of growth of the cancerous tissue and the effects of radium and x-rays used in the treatment."

The approach to a generalized subject such as "Plants for beauty and enjoyment" is further evidence of the mastery of the style of selection of facts in a really pleasing educational manner. In the unit on "Pets for pleasure and profit" the authors utilize every conventional pet to illustrate the laws and principles under consideration.

The literary style used by the authors is ably supported by visual aids of new and unusual selection. Their poignant appeal adds delight to the written discourse. A *Biology of Familiar Things*, has a pleasant, readable style with a minimum of "long words."

*Subject Matter:* The ten units emphasize five things: individual and community health; care of pets; cultivation

of flowers; control of pests and of useful organisms; conservation of natural resources.

The book is unconventional. Some 300 pages are devoted to subjects generally not included in secondary school volumes. It leaves out a glossary, key to pronunciation, the cell theory, recapitulation, evolution, phylum mollusca, and the human skeleton. It treats mitosis, photosynthesis, somatogenesis, metabolism, interdependence, taxonomy, worms, echinodermata, and coelenterata briefly; reproduction quite fully.

Most of the criticisms are on details. Pages 407-8 are not explicit enough on finding hydra; pages 53 on bile, 56 on the manufacture of red corpuscles, and 58 on the heartbeat treat these too briefly for complete accuracy; page 58 omits the coronary circulation; pages 75, 76, and 79 cling to the stimulus-response-synapse theory discredited by Lashley of Harvard; page 78 presents the human instincts theory; some ductless glands are left out; page 111 gives vaccination blanket approval.

The final "Biology of the Future" unit might be too technical to make pupils realize that they can, without special college training, make real contributions to biology, as many people with a hobby are doing.

Despite these criticisms, this book is a fine piece of work, although everybody may not agree on the selection and relative emphasis of topics. It is an effort to present young people with a meaningful biology, and might serve as the first year of the two-year sequence in biological science recommended by the Committee on the Teaching of Science of the National Society for the Study of Education in its Thirty-first Year-book in 1932.

*Learning Exercises and Teacher Helps:* If one is looking for a biology

text book with a minimum of technical material, no dissection, and few experiments involving the use of apparatus, this text is the answer. In this book the technical terms are defined at their point of use, as, "Plants such as tall peas . . . which have both the tall and dwarf characteristics are called hybrids." This learning device is of great value to the student.

There are activities at the end of each phase of a unit to assist the teacher. These are divided into two groups: One for general class discussion, and the other for independent assignment and research. The latter may be used largely for the more capable members of the class. Very little experimentation is included in these activities. The assignments are rather elementary as they involve chiefly the looking up of factual material, as for example: "What is the significance of the tuberculosis stamps which are seen in the United States mail every Christmas?" or "Determine the specific dates for spraying for codling moth in your locality." Typical of the research assignments is "Investigate the cost of guaranteed moth proof furniture as compared to the ordinary variety." However, the supplementary material treated under the heading "sidelights" contributes several experiments such as methods of collecting insects (page 346). Exercises of this type offer an opportunity for development in recreational activities and hobbies. The bibliography at the end of each unit would be more valuable to both teacher and pupil if each reference were applied to specific aspects of the unit.

Since the aim of the authors admittedly is to present in a simple and informal way biological principles suitable to the needs of the average student, the learning activities and teacher aids in-

cluded are sufficient.

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ZIM, HERBERT S. *Science Interests and Activities of Adolescents*. Ethical Culture Schools, New York. Litho-printed. vii + 256 pp. 1940.

*Science Interests and Activities of Adolescents* is the report of a study begun in 1934 in connection with a research program of the Commission on Secondary School Curriculum of the Progressive Education Association. It consists of three parts and the Appendices.

Part one, in addition to a brief summary of previous work in the field and the methods of attack of the present study, presents data gathered from over three thousand boys and girls representing five different schools. The data were obtained by several methods, namely, the science interest questionnaire; analysis of compositions from 1171 pupils in English classes of the participating schools; a technique involving interests displayed in a science exhibit; the selection of films listed in a fictitious list of films corresponding to the areas of science included in the science exhibits; "Wondering Questions"; and from exhibits offered at the "Science Fair."

Part two is concerned with science interests from a more individualistic point of view, giving many interesting autobiographies and case histories.

Part three offers suggestions for both a program of study and the formation of a science curriculum for adolescents which bring out the practical application of the study. The curricular set-up of the five schools engaged in the study and