The Treatment of Conservation in Some Representative General College Texts of the Past Two Decades

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What has been the trend in emphasis on the important topic of biological resource use and husbandry in college teaching of the immediate past? What is the outlook for the future? These are questions worth considering in a day when considerable effort is being made to make our nation more aware of its conservation problems. The following examination shows how certain authors of college texts have treated the matter from 1930 to date.

Animal Biologies of the Thirties

1931. *Animal Biology.* Guyer, M. F., Harper, 744 pp.

Biological conservation [1] and Ecology, a related topic, are both indexed, the latter word being in the glossary. Chapter 1, *The World of Life,* 14 pp., has two paragraphs entitled "Conservation, Public Support of Economic Measures" with other portions bearing on the topic. Page 659 of chapter 28, *Zoology Today,* has a paragraph on "Ecology."

1933. *Animal Biology.* Wolcott, R. H., McGraw-Hill, 615 pp.

Conservation is not indexed but ecology is. Chapter 67, pp. 477–486, *Animal Organisms in Relation to Their Environment,* has the sub-title *Ecology.* Chapter 69, pp. 493–498, treats animal associations. Chapter 70 is on health. The glossary defines neither term. Broadly ecology implies the living organism in relation to all factors impinging upon and influencing it, conservation the intelligent use of living resources, looking especially toward their perpetuation. Humans and their welfare enter into this picture. Many divisions of biology combine their contributions, therefore, into the interrelated whole that converges upon conservation.

1939. *An Introduction to Animal Biology.* Parker, J. B. & J. J. Clarke, C. V. Mosby, 503 pp.

This is primarily a "types" text. Ecology is defined on p. 17. Conservation is not in the table of contents, index, nor glossary.

Plant Biologies of the Forties

1943. *Plant Biology.* Weatherwax, P., W. B. Saunders, 455 pp.

Ecology is in both glossary and index, conservation in neither. The table of contents gives no indication of treating resources and their use.

1947. *The Essentials of Plant Biology.* Kern, F. D., Harper, 440 pp.

Ecology is defined, p. 5, and discussed under *Plant Associations,* pp. 267–276. There are three fine photographs from the U. S. Forest Service, one from the National Park Service. There is a good chapter, 12, of 20 pages, on plant improvement and breeding. Conservation of plant life is not listed.

General Biologies of the Thirties

1930. *Foundations of Biology.* Woodruff, L. L., Macmillan, 4th ed., 501 pp. (recently completely revised).

Ecology is indexed, conservation not. Likewise for Glossary. Chapter 23, on adaptation, has 28 pages. Chapter 25, *Biology and Human Welfare,* pp. 372–405, has a section 2½ pages long on *Conservation of Natural Resources,* with one figure on soil erosion from U. S. Forest Service. Section D, *Constructive Biology,* pp. 405–410, discusses biological research problems.

[1] Hereafter when used "conservation" will signify its biological meaning.

1937. *Biology, the Story of Living Things.* HUNTER, WALTER & HUNTER, American Book Co., 670 pp.

Chapter 25, *Conservation and Its Meaning,* pp. 589–607, is excellent. Four fine references, two by Hornaday, one each by Pack and Rowan, are listed. Both conservation and ecology have several citations in the index. The first section of the book, *Natural History,* has three fine chapters entitled, *The Stage Setting, The Biological Conquest of the World,* and *The Interdependence of Living Things—The Web of Life,* all related to conservation and ecology. The final section, *Man as a Conqueror,* of which the conservation chapter is the second, also has *Man's Conquest of Nature, Man's Fight for Survival,* and *The Next Million Years,* all bearing upon the topic. In the latter about a page deals with *Human Betterment.* This text sems to be a revision of the authors' earlier *College Biology.* Is it possible that it reflects the influence of Dr. V. E. Shelford, one of our leading ecologists?

1937. *General Biology.* KENOYER, L. A. & H. N. GODDARD, Harper, 630 pp.

Conservation is discussed in a paragraph on p. 525, *Ecological Influence of Man.* This is the concluding section of chapter 26, pp. 502–525, *The Organism and the Environment.* The appendix lists 13 very good references on adaptation, ecology, and the environment as it affects animals and plants. Chapter 27, pp. 526–542, treats *The Biology of Man.* Ecology is defined in the glossary, conservation is not. Both terms are indexed.

1939. *Fundamentals of Biology, Animal and Plant.* BEAVER, W. C., C. V. Mosby, 896 pp.

There are six listings indexed for ecology, none for conservation. Chapter 32, pp. 622–636, *Plant Ecology and Plant Geography,* is a very good summary with 14 excellent references. Ecology is in the glossary. Chapter 21, pp. 436–467, with 31 titles, covers the ecology of animals very acceptably. A revision of this text is appearing.

GENERAL BIOLOGIES OF THE FORTIES

1943. *Biology: The Science of Life.* MACDOUGALL, MARY S. & R. W. HEGNER, McGraw-Hill, 963 pp.

Chapter 49, pp. 834–854, is in two sections: *Conservation of Our Natural Resources,* pp. 834–846; *Conservation of Man,* pp. 846–854. In the former are 31 photo-reprints, 4 from the U. S. Forest Service, 3 from the Wild Flower Preservation Society. In the second part there is one reprint from *The Atlanta Journal.* The content here relates largely to communicable disease and public health.

Chapter 46, pp. 756–779, covers adaptations. Chapter 48, pp. 805–833, deals with *Biology and Human Welfare.* One section discusses the *Relation of Plants to Man,* the other, animals to man. Chapter 6, 18 pages, treats interdependence and environments, is therefore ecological. Conservation and ecology are indexed, the latter only being in the glossary.

1944. *College Biology.* WELLHOUSE, W. H. & G. O. HENDRICKSON, F. S. Crofts, 391 pp.

Chapter 30, *Conservation,* pp. 350–360, has a reference list of 6 titles. Conservation is indexed, ecology is not, a rather uncommon reversal of customary procedure. *Natural Resources* is an indexed topic, also unusual, with the text material included in the conservation chapter.

1946. *Life Science.* DELAUBENFELS, M. W., Prentice-Hall, 340 pp.

Soil conservation is indexed and briefly discussed. *Ecology,* chapter U, of this text which strives to be different, pp. 244–254, has four references.

1944. *Elements of Biology,* 461 pp.

1947. *General Biology,* 718 pp., both by STRAUSBAUGH, P. D. & B. R. WEIMER, John Wiley.

Both index ecology and conservation. In the earlier book *Conservation* is part of chapter 15, *Plants and Animals in Their Environment,* pp. 381–408. Chapter 14, pp. 362–380, is on economic relations of man, plants and other animals. Chapter 13, pp. 327–361, discusses *Biology and Human Health* very well.

Chapter 17, pp. 581–621, *How Are Living Organisms Related to Their Environment? Ecology,* of the later text, is especially good. There are photo-reprints here from the

National Zoological Park, Soil Conservation Service, Fish & Wildlife Service, American Museum of Natural History. The texts duplicate to some extent.

1947. *General Biology.* MAVOR, J. W., Macmillan, 986 pp.

Ecology, indexed, is defined on p. 11. *Conservation of Natural Resources,* topic B, a paragraph of 13 lines, is found under *Biology in the Service of Man.* Remaining parts are *Agriculture, Fisheries, Medicine, Public Health and Society,* all brief. These four pages form part of Chapter one, *The Scientific Method and Its Application.*

Chapter 17, pp. 353–366, deals with the economic importance of plants. Chapter 9, on bacteria, pp. 220–252, is excellent and has much material on transmission of infectious diseases. Chapter 39, *Animals and Plants in Relation to Their Environment,* pp. 750–808, also good, deals with ecology. It comes under the broader title of *The Organic World and Its Evolution.*

A Brief Biology, by the same author and publisher, 1949, of 427 pages, follows much the same treatment on a reduced scale, having 15 pages on ecology.

1949. *The World of Life.* PAULI, W. F., Houghton Mifflin, 653 pp.

This striking text has material on soil conservation, pp. 242–245. Ecology is indexed and defined in the glossary.

1949. *Biology and Its Relation to Mankind.* WINCHESTER, A. M., D. Van Nostrand, 777 pp.

The index reference is to ecology which is defined on p. 10. The glossary also defines it but conservation does not appear. Disease and the importance of microbiology are well done. The topic, therefore, relates to human resources.

1950

This year saw a number of new productions of worth and interest, also some thorough revisions.

College Biology. ETKIN, W., Thomas Y. Crowell, 806 pp.

The glossary-index defines ecology and mentions "conservation of the topsoil." Chapter 19, *The Organic Community,* pp. 423–446, is ecological and nicely done. Chapter 20 is on *Parasitism and Disease.* All the illustrations and photographs seem to be original. Functional principles stand out.

Biology, Its Human Implications. HARDIN, G., W. H. Freeman, 635 pp.

Ecology and conservation are both indexed. Chapter 34 is devoted to *The Conservation of Natural Resources,* pp. 537–559. There are 11 photo-reproductions from the U. S. Soil Conservation Service, one from U. S. Forest Service. *Ecology,* with its index reference to pp. 528–621, is here broadened to include chapter 33, *The Significance of Decay,* the conservation chapter above, and 6 succeeding ones on aspects of evolution to the end of the book, very interesting material. The author is unconventional in this treatment. Ecology is usually not so general in scope.

General Biology. MOMENT, G. B., Appleton-Century-Crofts, 680 pp.

Both ecology and conservation are indexed, with the former defined in a glossary. Chapter 10 is in two sections, *The Web of Life—Ecology,* pp. 201–217, and *Bacteria and Diseases,* pp. 217–230. Some of the fine references, often included in such lists, are: Gabrielson's *Wildlife Conservation; Principles of Animal Ecology,* by Allee *et al.;* Darwin's *Vegetable Mould;* Malthus on *Population; Deserts on the March* by Sears. Two photo half-page reprints from the Soil Conservation Service are included in this very attractive modernized version.

Biology, The Human Approach. VILLEE, C., W. B. Saunders, 580 pp.

This text continues the fashion of the era with its stress on man. *Ecology,* chapter 30, pp. 547–555, is largely evolution and adaptation. One short section of three paragraphs is on ecology as such, with a like number given to *Biologic Interactions.* There are 5 references on ecology and adaptation. Chapter 22, pp. 385–410, is titled *Micro-organisms and Infectious Disease.*

1934. *Elements of Modern Biology.* PLUNKETT, C. R., Henry Holt, 540 pp.

1951. *Principles of Modern Biology.* MARSLAND, D., a revision of the preceding.

The earlier book does not index either term but "ecological" is defined in its glossary. The later one indexes ecology and defines it in the glosary but omits conservation. *Ecology and Evolution,* chapter 28, has 23 pages with 4 references.

This survey shows, in summary, that although authors of college texts recognize the demand for a discussion of the interrelations of organisms to each other and their response to environmental factors with their dependence on the same they do not put into their books very much that is strictly conservation teaching. The emphasis is more on theoretical aspects than on what is often termed applied biology.

It has frequently been true that the institution of higher learning has had a powerful effect on what is taught in the lower preparatory levels. This seeming lack of consciousness of the need for presenting conservation of natural biological resources to large segments of our future citizens who would benefit much by it is regrettable. Only the exceptional college textbook author is regardful of the importance of conservation. Morphology continues to occupy a large share of attention.

BOOK REVIEWS

CORRELL, DONOVAN STEWART. *Native Orchids of North America.* The Chronica Botanica Co., Waltham, Mass.; Stechert-Hafner, Inc., New York City. xv + 399 pp. illus. 1950. $7.50.

This volume is the only comprehensive flora of the orchids of all of North America north of Mexico. It has the twofold value of being technical and of being sufficiently clear to be popular. The illustrations are characterized by artistic excellence, and still they show the exactness of detail that is necessary for identification.

The arrangement of the text is uniform throughout. There is a key to the genera. Following the description of each genus is a key to the species. The keys, each arranged with pairs of contrasting statements, are artificial; i.e., they are "constructed for utility and not for the purpose of showing relationship." The meanings of the technical names of the orchids are given to encourage the wide use of more exact terms, as has become the custom with such names as *Rhododendron* and *Chrysanthemum.* Following the description of each genus and species there are general remarks that deal with the history of its collection, the nature of the habitat, the time of flowering of the orchids, and the general observations by which one learns to know the plants in the field. Within the United States the locations of the orchids are given in terms of counties as well as states. The "method of culture" for each species is a definite contribution to horticulture; this information also discourages the removal of orchids that are seldom transplanted successfully.

The author points out that, of nearly two hundred species and variants in the orchid flora, the greatest number occurs in the mesophytic area of eastern United States and Canada and that nearly one hundred ten are found in southeastern United States. The smallest number of species are found in the prairies and great plains of the Mississippi basin. Field study of the orchids should be encouraged by this excellent book. It is a book that one may enjoy browsing through, but more important is the fact that it is destined to become the standard manual of the orchids for the United States.

The orchid flora was written by Dr. Donovan S. Correll, the cultural notes were written by Dr. Edgar T. Wherry and John V. Watkins, and the illustrations were drawn by Mrs. Oakes Ames and Gordon W. Dillon.

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GARDNER, VICTOR R. *Basic Horticulture.* 2nd ed. The Macmillan Co., New York. x + 465 pp. illus. 1951. $4.75.

It has been nine years since the appear-