

States. The first, culminating in late Archaic time at the beginning of the first millennium B.C., was marked by increasingly efficient adaptation to the forest conditions peculiar to the area. In the second, spanning the period from 1000 B.C. almost to A.D. 1000, "we find reared upon this economic foundation an era of regional differentiation and stylistic change." The third trend was towards closer relationships with Mesoamerica—"progressive drawing together with the Nuclear American civilization" (pages vii-viii). This seems a reasonable way to characterize what happened in the area.

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Elementary Practical Organic Chemistry. Part 1, *Small Scale Preparations*; part 2, *Qualitative Organic Analysis*; part 3, *Quantitative Organic Analysis*. Arthur I. Vogel. Longmans, Green, New York, 1958. xxviii + 890 pp. Illus. \$9.75.

This new edition of *Vogel* differs from the 1948 edition chiefly in three respects: (i) the material dealing with the reactions and characterization of organic compounds and the tables of physical constants of the various classes of compounds and of their derivatives have been removed from the portion of the text dealing with preparative methods and added to the section on qualitative organic analysis, which now occupies 296 pages; (ii) an entirely new section (196 pages) has been added, on the quantitative estimation of nitrogen, halogen, and sulfur, of the common functional groups, and of a few specific compounds; (iii) there is a marked decrease in the number of compounds for which preparative procedures are given.

In Part 1, "Small Scale Preparations," the number of preparations given (approximately 150) is about 35 percent of the number in the 1948 edition. This reduction results not only from the addition of the new section on quantitative analysis but also from the fact that there are now fewer pages in part 1 and that the page-size has been reduced, the amount of text being about 75 percent of that in the 1948 edition. However, 150 is still a much larger number of preparations than one finds in most texts published in the United States. Moreover, there is a broader coverage of the theory of physical methods and experimental techniques.

Numerous changes have been made in the procedures given for preparing certain compounds, and new types of reactions, such as reductions with lithium

aluminum hydride and sodium borohydride, have been added. On the other hand, the elimination of such a large number of preparations has necessarily meant a loss of useful types, and not everyone will be satisfied with the choice of those retained.

The author emphasizes the change to smaller-sized runs; the amounts used appear to be from one-fourth to one-tenth of those used in procedures given in the 1948 edition. However, the quantities of starting materials, which vary from a few grams to 25 grams and usually amount to around 15 grams, are comparable to the quantities usually used in laboratory courses in the United States. More sizes and types of glassware are used in the procedures given than are usually supplied for average-sized classes in the United States.

The organization of part 2, on qualitative analysis, is not the best possible. The familiar system developed at the University of Illinois is used, but the two chapters titled "Reactions of organic compounds" and "Class reactions" cover much the same material. Similar or identical procedures may be found in the two chapters, some tests are given in one chapter and some in the other, and directions for preparing derivatives are found in both, along with qualitative tests for functional groups. The inclusion of separate discussions for aliphatic functional groups and aromatic functional groups leads to much duplication and to many unnecessary cross references.

Part 3 describes, for the most part, standard procedures for the determination of functional groups. In fact, all three parts (which, incidentally, may be purchased separately) are very similar to texts published in the United States that cover the same areas.

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Dangerous Marine Animals. Bruce W. Halstead. Cornell Maritime Press, Cambridge, Md., 1959. vi + 146 pp. Illus. \$4.

Although this volume contains a remarkable amount of information about the kinds of marine animals that are dangerous to man (dangerous when touched or eaten or when overtly aggressive), we are assured that this book is the nonspecialist's version of a more exhaustive book still in preparation.

With the growing use of diving equipment, doctors especially will find this a valuable reference book, for the author (a physician) has taken pains to discuss the medical aspects of all sorts of ma-

rine accidents, ranging from jellyfish stings and poisoning from shellfish to sea-snake bites. An amazing variety of animals are in some way dangerous to man, but so little is known of many of them, or even of the nature of the injuries they cause, that many of the recommended treatments are empirical guesses. If one is bitten by a sea snake, it is essential that the snake be brought along to the hospital to make sure it is harmless. Much evidently remains to be learned, especially about the nature of fishes that are poisonous to eat, before the resources of the "silent world" can fulfill the expectations of some hopeful people. In the meantime, a book such as this is an essential beginning.

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The Perpetual Forest. W. B. Collins. Lippincott, Philadelphia, 1959. \$4.50.

W. B. Collins, who is deputy chief conservator of forests in Ghana, has managed to capture on paper much of the drama of life, death, and renewal in the African tropical forest. Any naturalist who has spent years of his life in the equatorial forest has felt the silent force, the rich complexity and ecological integration, of this most interesting of our terrestrial communities. Without saying so, Collins conveys by an array of facts the impression that the forest itself is a living, pulsating organism.

The author describes the conditions for the existence of a rain forest; he starts with the organisms in the soil, then discusses the succession from the relatively simple pioneer stage of the mangrove swamp to the complex, varied, climax forest. Today this self-sufficient world is being assaulted by man, and the destruction of the closed forest may be accomplished within the century. Collins describes the step-by-step process by which this occurs—the destruction of the forest cover and, finally, of the land, much as it occurred in North America. But water and wind act with cataclysmic force in the tropics.

The original shifting cultivation of the native garden was not destructive because these cultivated areas, abandoned after two years, were regenerated in another ten. But, as population increases, the rest periods become too short and new forest openings are burned out constantly. Once cleared of forest, the ground, laid bare to the searing sun, ceases to function as it did before it was denuded. First, the breakdown of humus is accelerated, then soil organisms are killed. Wind erosion follows. Rains may come, but there is no organic material

left for the soil microorganisms to work on. Destruction of the key organisms in the food chain destroys the community. Gully erosion on denuded land, when the rains come, completes the destruction. There is some reforestation, but this occurs at the expense of the closed forest, which includes too many species of no commercial value.

The first few chapters of *The Perpetual Forest* are strongly ecological in approach; the latter half of the book becomes almost anecdotal as group after group of animals is discussed to illuminate some part of the total picture. There is an interesting chapter on termites, driver ants, and other insects. There is a chapter on snakes and one on birds, and Collins understands and describes the dependence of animals on food niches.

He has a flair for vivid expression, but this is sometimes rendered less effective than it might have been through injudicious use of the comma. It was to have been expected that Collins, in studying the whole forest, would wander into fields in which he is not expert. His estimate of the age of the tropical forest as only a million years, when there is fossil evidence that it is 100 million years old, suggests a "blind spot." But these details do not seriously detract from the value of this book as a picture of the West African rain forest.

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Programming for an Automatic Digital Calculator. K. H. V. Booth. Academic Press, New York; Butterworths, London, 1958. 238 pp. \$7.50.

It is a good thing that this title reads "*Programming for an Automatic Digital Calculator*" rather than "*Programming for Digital Calculators*," for the reader will find the discussion limited to the APEXC, a computer at Birkbeck College, London.

The mathematical level of the exposition is fairly elementary. One can believe the author's statement, "the technique for programming can be acquired by anyone with a capacity for accurate detailed thinking, and a talent for solving puzzles. Moreover, it has been our experience that it is possible to train people to do useful programming in a matter of two weeks, although the acquiring of the more subtle tricks of the trade naturally takes longer." One can also say that the book will be invaluable to anyone faced with the problem of programming an APEXC computer. The relevant functional organization of the machine, detailed descriptions of various routines (such as division, square

root, matrix operations, and the solving of simultaneous linear equations), and fault-finding are discussed at length. Glimpses are also provided of more exotic topics, such as mechanical translation and automatic programming.

The book is not likely to have wide appeal for computer programmers or engineers for the following reasons: general problems of logical programming are not discussed; only the more elementary routines are considered; and much of the detailed discussion bears only on the Birkbeck machine. An experienced programmer, who can translate the discussion into a form applicable to his own machine, may find useful hints and kinks.

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New Books

Anatomy of the Human Body. R. D. Lockhart, G. F. Hamilton, F. W. Fyfe. Lippincott, Philadelphia, Pa., 1959. 704 pp. \$13.50.

The Annual of Czechoslovak Medical Literature, 1956. National Medical Library, Prague, Czechoslovakia, 1959. 423 pp.

Biographical Memoirs. vol. 33. Published for the National Academy of Sciences by Columbia Univ. Press, New York, 1959. 490 pp. \$5. Contents: "Albert F. Blakeslee," E. W. Sinnott; "Isaiah Bowman," J. K. Wright and G. F. Carter; "Everette L. DeGolyer," A. R. Denison; "Leland O. Howard," J. E. Graf and D. W. Graf; "Clark L. Hull," F. A. Beach; "Dunham Jackson," W. L. Hart; "Charles K. Leith," D. F. Hewett; "Warfield T. Longcope," W. S. Tillett; "Paul D. Merica," Z. Jeffries; "Robert A. Millikan," L. A. Du Bridge and P. A. Epstein; "Thomas H. Morgan," A. H. Sturtevant; "Frederick G. Novy," E. R. Long; "George W. Pierce," F. A. Saunders and F. V. Hunt; "Josiah Royce," R. S. Woodworth; "Lyndon F. Small," E. Mosettig; "Lewis M. Terman," E. G. Boring; "Horatio C. Wood, Jr.," G. B. Roth.

College Zoology. Robert W. Hegner, and Karl A. Stiles. Macmillan, New York, ed. 7, 1959. 736 pp. \$7.50.

Encyclopedia of Chemical Reactions. vol. 8. Compiled by C. A. Jacobson. Cliford A. Hampel, Ed. Reinhold, New York; Chapman & Hall, London, 1959. 533 pp. \$14.

High Altitude and Satellite Rockets. A symposium. Sponsored by the Royal Aeronautical Society, the British Interplanetary Society, and the College of Aeronautics. Philosophical Library, New York, 1959. 136 pp. \$15. Contents: "The scientific applications of rockets and satellites," H. S. W. Massey; "The satellite launching vehicle," M. W. Rosen; "British upper atmosphere sounding rocket," W. H. Stephens; "Some propulsion problems of high altitude rockets," A. D.

Baxter; "Design problems of large rockets," K. J. Bossart; "U.S.S.R. rocket and earth satellite programme for the I.G.Y.," "Recovery after re-entry by the use of aerodynamic lift," W. F. Hilton; "Dynamics of a dissociating gas: non-equilibrium theory," N. C. Freeman; "High temperature materials in relation to the satellite re-entry problem," P. Murray; "Some problems of instrumentation, telemetry and guidance," A. W. Lines; "Problems of respiratory metabolism in sealed cabins," Hans G. Clamann; "Psychophysiological hazards of satellite flight," J. P. Henry; "Future developments in rocket propulsion beyond the atmosphere," L. R. Shepherd.

Introductory Chemistry. Lillian H. Meyer. Macmillan, New York, ed. 2, 1959. 536 pp. \$6.

Let There Be Light. Lillian J. Bragdon. Lippincott, Philadelphia, Pa., 1959. 91 pp. \$2.75 (juvenile book).

Louis Pasteur, Fighting Hero of Science. Madeleine P. Grant. McGraw-Hill, New York, 1959. 220 pp. \$3.25 (juvenile book).

Microbiology. Louis P. Gebhardt and Dean A. Anderson. Mosby, St. Louis, ed. 2, 1959. 476 pp. \$5.75.

Plant Life. Lorus J. Milne and Margery Milne. Prentice-Hall, Englewood Cliffs, N.J., 1959. 296 pp. \$6.95.

Plant Propagation. Principles and practices. Hudson T. Hartmann and Dale E. Kester. Prentice-Hall, Englewood Cliffs, N.J., 1959. 568 pp. \$8.75.

Principles of Microbiology. Walter W. Krueger and Karl R. Johansson. Saunders, Philadelphia, Pa., ed. 2, 1959. 587 pp.

A Record of History and Evolution of Early American Bridges. Llewellyn N. Edwards. University Press, Orono, Maine, 1959. 216 pp.

Second Conference on Co-Ordination of Galactic Research. International Astronomical Union Symposium No. 7. A. Blaauw, G. Larsson-Leander, N. G. Roman, A. Sandage, H. F. Weaver, A. D. Thackeray, Eds. Cambridge Univ. Press, New York, 1959. 101 pp. \$3.

A Short Course of Organic Chemistry. John E. Leffler. Macmillan, New York, 1959. 208 pp. \$5.50.

The Sleep Walkers. A history of man's changing vision of the universe. Arthur Koestler. Macmillan, New York, 1959. 624 pp. \$6.50.

The Structure of Electrolytic Solutions. Walter J. Hamer, Ed. Wiley, New York; Chapman & Hall, London, 1959. 453 pp. \$18.50.

A Supplement to "Helium." E. M. Lifshits and E. L. Andronikashvili. Translated from Russian. Consultants Bureau, New York; Chapman & Hall, London, 1959. 172 pp. \$7.50.

Symbolic Logic and Intelligent Machines. Edmund C. Berkeley. Reinhold, New York; Chapman & Hall, London, 1959. 208 pp. \$6.50.

Thermodynamics. Gordon J. Van Wylen. Wiley, New York; Chapman & Hall, London, 1959. 578 pp. \$7.95.

The West in Crisis. James P. Warburg. Doubleday, Garden City, New York, 1959. 192 pp. \$3.50.