Part I, recording the proceedings of the meteorological section of the meeting, was also published in 1957 as a special supplement to the same journal as well as in the hard-cover edition.

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The College Influence on Student Character. An exploratory study in selected colleges and universities. Edward D. Eddy, Jr. American Council on Education, Washington, D.C., 1959. xii + 185 pp. $3.

In this study the provost of the University of New Hampshire and two recent college graduates (Mary L. Parkhurst and James S. Yakovakis) have contributed a most sensitive understanding of influences in college which have a lasting effect on students. The study was prepared for the American Council on Education because the council felt an "urgent necessity to develop in oncoming generations the strength of character to match the responsibilities that will be heaped upon the educated leader."

The purposeful search of the investigators for experiences inside and outside the formal educational process which touch the intangible phenomenon called "character" was conducted in a way which gives the findings unusual authenticity. Extended, on-the-spot observation at a diverse group of colleges, was coupled with incisive discussions with students, faculty, and counselors to produce fresh, lively, and strikingly candid testimony about what actually happens to students, in a personal sense, as they go through college.

The accent of the findings is impressively positive, but not complacent. Students respond when they are given responsibility, but it must be real, not fictitious, responsibility. They rise to a high level of performance, moral as well as intellectual, when a high level of expectancy on the part of the college community challenges them. They do build upon the insights of the teacher who has integrity and vision, but he must be a genuine article, for students quickly detect a "phony."

The central conclusion is that the dual goals of intellectual excellence and force of character are inextricably interwoven in the truly educated man. So the elements in the campus community which encourage character are those which also encourage learning. "The college," these observers believe, "finds its greatest contribution to the student in the Socratic theme that the unexamined life is not worth human living." Excellence of character will emerge as students are prodded to a more searching and strenuous intellectual development.

This vindication of the academic vocation in terms of its moral potential does not agree with the profile drawn of contemporary college experience in several other recent studies. Many students today can apparently refine their intellect without a corresponding enrichment of character. They seal off their moral control tower—the mechanism by which they reach value judgments—from the influx of intellectual communications. On many an American campus, a hiatus splits the educational process from the real life of students and the student's learning from the values he holds. An educated but morally *irresponsible* college graduate probably emerges far more frequently from the academic assembly line than does Eddy's intellectual of "Socratic-character."

What makes this inquiry so significant, however, is that it may have hit upon some of the vital influences which make the difference in the human outcome of the educational process. The Eddy report might well have been subtitled "A guidebook on how to avoid futility in liberal education." To educators concerned with the growth of the person as well as the mind of their students it will furnish encouragement and direction as they struggle against sweeping automation in the college industry.

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Free Radicals as Studied by Electron Spin Resonance. D. J. E. Ingram. Academic Press, New York; Butterworths, London, 1958. 274 pp. Illus. $9.50.

The development of paramagnetic resonance spectroscopy has opened new avenues in free radical research. Information and knowledge in this field have increased rapidly in recent years, and considerable future advances have to be anticipated. In this situation the monograph by Ingram fills an urgent need: it gives an excellent introduction to the field and a critical, systematic evaluation of the available experimental data.

The first four chapters of the book deal with the "unchangeable" facts: basic ideas, well-established experimental designs and methods, and basic molecular theory. The following five chapters discuss and summarize applications and achievements—physical, organic and biochemical, biological, and medical—in the physics of the field where many new facts have been discovered and existing theories could be confirmed. Of special interest are the applications of the method to radiobiological problems, where the existence of long-lived, radiation-produced radicals could be demonstrated and where the method is soon to be applied for the measurement of the life span of short-lived radicals produced in biological systems during irradiation.

Thus, the book will be more than a reliable source book of information and knowledge; it will also be a guide to further research in this steadily-growing important field. It is one of the standard works on free radical research which should be available in every laboratory.

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The Gulf Stream. A physical and dynamical description. Henry Stommel. University of California Press, Berkeley; Cambridge University Press, London, 1958. xiii + 202 pp. Illus. $6.

This well-written and stimulating book is a noteworthy contribution to the literature of oceanography and geophysics. The author summarizes the distribution in the northwestern Atlantic of temperature, salinity, other properties that characterize certain features of the Gulf Stream. However, he is careful to point out that although the name of this great ocean current is a familiar one, it is no easy matter to describe it accurately. The observational data can be interpreted in a variety of ways, depending upon the preconceived ideas of the compiler and the geographic pattern of the observations available to him. The computed values of current velocity and volume transport depend upon the selection of the level of no motion; even direct measurements of current are subject to these same uncertainties. In part these problems reflect the lack of adequate theories that should provide a model that could then be tested by properly planned field measurements. However, the theoretical oceanographer has been handicapped by the lack of an adequate description of the phenomenon he attempts to explain. This has led to what Stommel calls "the peculiar dreamlike qualities" that have characterized many of the descriptions and discussions of ocean currents. Stommel has made great contributions in recent years to a more rational attack on the problem of oceanic circulation.

The greater part of the book is devoted to a review of the theories of ocean currents. Stommel has broad theoretical interests, and he has also made many original observations on the Gulf Stream. Because of his background and interests he is uniquely qualified to write this book. Since its establishment in 1931,

the Woods Hole Oceanographic Institution has devoted a great deal of effort to the study of the Gulf Stream, and it is most fitting that this book should be written by a member of its staff.

For the oceanographer, the volume represents a valuable synthesis of information and theories; and for the worker in other fields, particularly those in the physical sciences, it will provide insight into some of the complex but poorly understood phenomena of the ocean. With this book at hand the future studies of the Gulf Stream and of oceanic circulation in general should move forward at an accelerated pace.

In an otherwise excellent work it is unfortunate that the author did not give more attention to the illustrations. This is particularly true in the descriptive sections where the illustrations have generally been copied from the original sources without regard to map projections, areas covered, scales, or units. Oceanographers are accustomed to this confusion, but other readers will have to examine the illustrations with caution.

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The Vertebrate Story. Alfred S. Romer. (a revised and enlarged edition of *Man and the Vertebrates*). University of Chicago Press, Chicago, Ill., 1959. vii + 437 pp. Illus. $7.

This is a fourth edition of the well-known book *Man and the Vertebrates*, with a new Hollywood title, more natural history, and less human anatomy. Though the changes are important ones, the purposes of the book remain the same. It is a taxonomic review of the vertebrates, including man, with enough anatomy and physiology to form a good picture of the kinds of lives led by the various groups and put together as an account of their evolution. The illustrations are clearer and more plentiful than they were in the last edition (1941), and the format of the book is considerably improved.

In the earlier book, man and the rest of the vertebrates were given about equal shares, but in the new one the division is about one to three. A large section on human anatomy has been omitted in favor of a more extensive treatment of the lower groups of vertebrates. The old 30-page chapter on frog anatomy remains, but there are now 15 more pages on teleosts, 36 more on reptiles, 12 more on birds, and one finds new or revised paragraphs all through the book. Human ancestry and human races take up the last hundred pages. The section on human origins has been slightly enlarged, and Piltdown man has been changed from a problem to a hoax, but this edition was apparently in the works too soon to permit the new Oreopithecus material to be included.

Other areas of great current interest seem to have been systematically avoided. Jaymoytius is not in the book, and the Ichthyostegalia are not discussed. The lungfishes are still "close to the ancestry of land animals," and are put in the same class with crossopterygian fishes, though Romer has changed his earlier name for this grouping from Choanichthyes to Sarcopterygii. *Latimeria* gets an extra paragraph in this edition, but, unfortunately it also picks up an extra lung. Vexing questions of the relationship of classes and subclasses of ancient fishes, and of the origins of amphibian groups, are bypassed.

This avoidance of technicality and controversy at least favors the maintenance of a storybook tone. Romer's genial, conversational style comes out best of all in the new sections. His animals, even his fossils, come alive. There are stimulating samples of his recent speculations on such subjects as the origin of vertebrates (probably from sessile filter-feeders related to echinoderms), the origin of the terrestrial habit (the amniote egg came ashore first), and "Gondwanaland" (who knows, why not?). This certainly remains a text to be preferred for an elementary course on the biology of vertebrates, or for painless self-education.

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New Books

Hunger and Food. Special edition of *Science and Mankind.* Josue de Castro, Ed. World Federation of Scientific Workers, London, 1959. 123 pp. 10s.

Industrial Fatty Acids and Their Applications. E. Scott Pattison. Reinhold, New York; Chapman & Hall, London, 1959. 236 pp. $7.

Introduction to Human Anatomy. Carl C. Francis. Mosby, St. Louis, ed. 3, 1959. 548 pp. $5.75.

The Journals of Daniel Noble Johnson (1822–1863). "Journal of a cruise on the Brazils on Board of the U.S. Ship *Delaware,* 1841–1842" and "Notes by the way while on board the U.S. Schooner *Enterprise.*" Misc. Collections, vol. 136, No. 2. Mendel L. Peterson, Ed. Smithsonian Institution, Washington, D.C., 1959. 268 pp.

Knowing Your Trees. 1955 edition. G. H. Collingwood and Warren D. Brush. American Forestry Assoc., Washington, D.C., 1955. Approximately 850 illustrations showing typical trees and their leaves, bark, flowers, and fruits.

Linguistic and Engineering Studies in the Automatic Translation of Scientific Russian into English. Technical report, prepared for the Intelligence Laboratory, Rome Air Development Center. ASTIA Document No. AD-148992. Erwin Reifler. Univ. of Washington Press, Seattle, 1959. $10. (not paged)

The Lost Divisions. Eli Ginzberg, James K. Anderson, Sol W. Ginsburg, John L. Herma. Columbia Univ. Press, New York, 1959. 245 pp. $6.

Magnetic Amplifier Engineering. George M. Attura. McGraw-Hill, New York, 1959. 234 pp. $7.50.

Méthodes mathématiques de la mécanique statistique. A. Blanc-Lapierre, P. Casal, A. Tortrat. Masson, Paris, 1959. 190 pp. F. 3800.

Modern Transistor Circuits. John M. Carroll. McGraw-Hill, New York, 1959. 280 pp. $8.50.

Natural Selection and Heredity. P. M. Sheppard. Philosophical Library, New York, 1959. 212 pp. $6.

The New World of Math. George A. W. Boehm and the editors of *Fortune.* Dial Press, New York, 1959. 128 pp. $2.50.

Nucleonics Fundamentals. David B. Hoisington. McGraw-Hill, New York, 1959. 422 pp. $9.50.

Our Atmosphere. Theo Loebsack. Translated from the German by E. L. and D. Rewald. Pantheon, New York, 1959. 256 pp. $5.

Patterns of Performance. Eli Ginzberg, James K. Anderson, Sol W. Ginsburg, John L. Herma. Columbia Univ. Press, New York, 1959. 359 pp. $6.

Plane Trigonometry. Raymond W. Brink. Appleton-Century-Crofts, New York, ed. 3, 1959. 350 pp. $4.

Plants and Environment. A textbook of plant autecology. R. F. Daubenmire. Wiley, New York; Chapman & Hall, London, ed. 2, 1959. 433 pp. $6.95.

Power Unlimited. The story of power —from windmill to nuclear energy. Abraham and Rebecca B. Marcus. Prentice-Hall, Englewood Cliffs, N.J., 1959. 160 pp. $3.50.

Principles of Self-Damage. Edmund Bergler. Philosophical Library, New York, 1959. 483 pp. $6.

Psychoanalysis, Scientific Method and Philosophy. A symposium. Sidney Hood, Ed. New York Univ. Press, New York, 1959. 383 pp. $5.

Radiation Biology and Cancer. Published for the University of Texas M. D. Anderson Hospital and Tumor Institute. Univ. of Texas Press, Austin, 1959. 501 pp. $8.50. This collection of papers, presented at the twelfth annual symposium on fundamental cancer research, is divided into the following sections: "Fundamental radiobiology"; "Radiological applications"; "Radiation effects on the hematopoietic system"; "Induction of neoplasia by ultraviolet light"; "Induction of neoplasia by ionizing radiations"; "Radiation biology and cancer"; and "Medical applications of radiation." The Bertner Foundation lecture, "Radiation neoplasia and endocrine systems" by Jacob Furth, is included in this volume.

Railroad Transportation and Public Policy. James C. Nelson. Brookings Institution, Washington, D.C., 1959. 520 pp. $7.50.

Researches in Geochemistry. Philip H. Abelson, Ed. Wiley, New York; Chapman & Hall, London, 1959. 521 pp. $11.