

THE NATURAL WORLD: CHAOS AND CONSERVATION, ed. by Cecil E. Johnson. 1972. McGraw-Hill Book Co., New York. 269 p. (softback); price not given.

Cecil E. Johnson (who is not adequately identified in the book) divides his collection of 16 excerpts into two parts. In part 1 well-known scientists, journalists, and educators delve into the problems of our deteriorating environment. Paul Ehrlich, William Vogt, Barry Commoner, and William and Paul Paddock are among those who realistically and theoretically stimulate, here, an awareness of man's destiny in a polluted world. Naturalists dominate part 2: Konrad Lorenz, John Muir, and Rachel Carson, to name only three. Their viewpoint contrasts with that of part 1: their expert observation of the natural world, free from the influence of man, provides the reader with the beauty and, often, the mystery of the interrelationships of animals, plants, and protists. But although each division of this book is exceptionally worthy of its objective, no transition between parts is provided.

Like so many recent environmental paperbacks, Johnson's anthology leaves a sobering emptiness as to significant solutions. Still, the book can be recommended to high-school students and college freshmen who are embarking on the study of ecology.

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### Genetics

THE ORIGINS OF THEORETICAL POPULATION GENETICS, by William B. Provine. 1971. University of Chicago Press, Chicago. 212 p. \$7.75.

The notion of the scientist as the objective man, questing only after truth as it manifests itself by means of controlled experiment and painstaking observation, is fully exposed as myth in this book, which places the contrasting emergent theories of evolution and population genetics in a context of emotionalism and jealousy that impeded real intellectual progress in the field for decades.

This is a fascinating account of how ideas evolve from murky beginnings and then, at least partly because of the momentum of someone's personal commitment, achieve such status that they are defended as dogma instead of being investigated as propositions.

The conflict between the Mendelians and the biometricians was rooted in the latter's idea that evolution proceeded by natural selection acting on small, continuous variations, as opposed to the Mendelian view of discontinuous evolution. Each view had, among its champions, giants in the field of biology. This

struggle pitted Huxley and Galton against Darwin, and their respective followers contended fruitlessly until the lengthy and brilliant studies of Haldane, Fisher, and Wright, whose insights revealed that the chasm between the contrasting theories was essentially imaginary. Their studies convincingly demonstrated that each school had sound and crucial ideas that could comfortably dovetail into a coherent theory of evolution and a firm foundation for population genetics.

The mood of this book is controversy, which was manifest at scientific meetings, in the literature, in letters both public and private, and in various personal interactions. And not all of this controversy was purely scientific: there was, for example, the plea by Darbishire to Bateson not to expose the incorrectness of the former's published work because of the anticipated repercussions this would have on his developing career. There also are several curious examples of men entering the scientific jousts in fields in which they were peculiarly unqualified; neither Bateson nor Castle, for instance, was competent to deal with certain biometric tools in a convincing way, and when they made the attempt their scientific reputations suffered accordingly.

Now, of course, we know much more about genetics. Refined biochemical techniques enable us to consider population genetics in the light of protein polymorphism and neutral mutation. Perhaps it is because we have come so far that Provine's lively account of the early history of the field proves to be so fascinating.

Richard A. Levin  
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GENETICS: A SURVEY OF THE PRINCIPLES OF HEREDITY, by A. M. Winchester. 4th ed., 1972. Houghton Mifflin Co., Boston. 581 p. \$11.95.

This textbook of genetics is written for the undergraduate with a limited background in biology and with a major interest in human heredity. The concepts of traditional Mendelian genetics are treated logically, and are clearly and simply stated. The illustrations are well chosen to hold the interest of the general student.

The section on human blood groups is particularly good. It has been expanded from the previous edition to include the less-frequent blood antigens and the plasma proteins: haptoglobins, transferrins, and immunoglobulins. The explanation of Rh blood-group inheritance is quite clear.

The author mentions DNA in chapter 1, but not until chapter 17 does he give the evidence for DNA as the genetic material, and not until chapter 18 does he present the Watson-Crick model for the structure of DNA. The section on the genetic control of protein synthesis

is much expanded from the third edition.

For the women's libbers, let me quote from page 432: "Another Frenchman, Pierre Curie, and his wife Marie, isolated radium from uranium ore and demonstrated the value of radium in treating cancer." This attitude is not characteristic of the book as a whole.

This edition of the Winchester textbook has a more attractive format than the previous editions. Though I do not agree with the author's choice of arrangement of the material, the basic concepts of general genetics are interestingly presented. The book gives an adequate introduction to the study of genetics.

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THE SCIENCE OF GENETICS, by George W. Burns. 2nd ed., 1972. Macmillan Co., New York. 477 p. \$9.95.

The first edition of this genetics textbook appeared in 1969—only three years ago. Rapid progress in the science of genetics plus the acceptance of the book as a superior instructional tool have necessitated a new edition. This book is intended for undergraduates who have had college biology courses. It is competitive with Gardner's *Principles of Genetics* and Levine's *Biology of the Gene* but does not provide the advanced encyclopedic treatment found in Strickberger's *Genetics* nor the sophisticated presentation found in Srb, Owen, and Edgar's *General Genetics*.

Burns's book is readable, well organized, and well illustrated. It presents a chronologic account of genetics, beginning with Mendelism, the cytologic bases of transmission genetics, and the basic principles of classical genetics. Later chapters are devoted to the genetic material, protein synthesis, the genetic code, molecular structure of the gene, and regulation of gene action. Although some aspects of molecular genetics might have been introduced earlier, the organization of the book is generally good and its length is suitable for the usual one-quarter or one-semester course. Appropriate problems are provided at the end of each chapter and answers to all problems are found in an appendix. Other useful appendices include one dealing with life cycles of organisms frequently used in genetic research and one containing the structural formulas of biologically important amino acids.

Burns's chapters on molecular genetics have been largely rewritten from the previous edition, and I was impressed by his lucid and up-to-date account of this subject. In his introductory chapters on Mendelism, Burns uses traits in *Coleus* to illustrate the basic laws of heredity; this is a well-

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First in Water Analysis

come change from garden peas. The chapter on linkage, crossing-over, and gene-mapping precedes that on sex linkage. In my opinion it would be wiser to treat the special case of sex linkage first and then to deal with linkage in general, but this is not a serious fault.

Although he includes a discussion of the common human chromosome aberrations and describes the medicolegal applications of the ABO blood groups (including a brief discussion of states recognizing blood-group evidence in court), Burns's emphasis on human genetics may not be as great as some students would like. The book ends with a chapter in which problems of human genetics and genetic engineering are discussed.

*The Science of Genetics* includes a number of typographical errors; but one or two more serious problems should be noted. On pages 42, 220, and 221 Burns cites chromosome numbers for the saltmarsh grasses (*Spartina*) that have been demonstrated to be erroneous. *Spartina* spp. commonly are cited as a textbook example of speciation via interspecific hybridization followed by amphidiploidy. Many of the newer botany, genetics, and cytology books give the corrected counts. Burns's failure to do so may be regarded by many as a minor error, but such errors tend to shake one's confidence in what otherwise seems to be a fine book.

Two other problems should be noted: In the chapter on inheritance related to sex Burns cites pattern baldness in man as an example of sex-influenced inheritance. Although he is not alone in doing so, some writers would not agree with him; instead, they would cite pattern baldness as an example of sex-limited inheritance. Perhaps it would be best to present both alternatives, with supporting pedigrees. Also, in the same chapter Burns says that 50 sex-linked (X-linked) genes are known in man. Human geneticists now suggest that the the number of known X-linked genes in man is at least 70. Such matters do not negate the many fine qualities of this book. If *The Science of Genetics* proves to be the success that I anticipate it will be, the author surely will consider correcting the weaknesses mentioned when a third edition is prepared.

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**History and Philosophy**

**PUBLIC AFFAIRS**, by C. P. Snow. 1971. Charles Scribner's Sons, New York. 224 p. \$6.95.

C. P. Snow—novelist, physicist, civil servant—has long addressed himself to the relationship of science and society.

This book brings together his major statements: "The Two Cultures and the Scientific Revolution," "The Two Cultures: a Second Look," "The Case of Leavis and the Serious Case," "Science and Government," "Appendix to 'Science and Government,'" "The Moral Un-neutrality of Science," and "The State of Siege." A prologue and an epilogue give Snow's most recent thoughts on the major themes of this collection.

Readers who know Snow from his controversial "two cultures" statement will find the other essays equally thought-provoking. The volume will be especially valuable to seminars dealing with science and politics, but the engrossing account of the conflict of personalities and policy recommendations of two scientists, Sir Henry Tizard and Lord Cherwell, should be pondered by all who are concerned with the role of scientists in government. Snow provides a sound argument for the need to enlist scientists in the forming of public-policy decisions; and he asserts that their participation must be open rather than secret: "the euphoria of secrecy," he says, "goes to the head."

In "State of Siege" Snow discusses the related problems of world population growth and world food resources and of the growing gap between rich and poor nations. He has been joined by many since he first presented this argument, in 1968, but the actions he foresaw as necessary to solve these serious threats to the species have yet to be implemented.

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**REASON AND EXPERIENCE**, by James L. Larson. 1971. University of California Press, Berkeley. 186 p. \$7.50.

This book is an analysis of the conflict between practical and theoretic tendencies in the work of Linnaeus (Carl von Linné). Larson begins by rejecting the traditional scientific and philosophic approaches to the problem as inadequate and guilty of error, which has "for too long a time [stressed] the role of a single set of considerations in Linné's systematic work." He insists that the argument must be enlarged to include a thorough examination of the assumptions of 18th-century naturalists concerning the system, the elements, and the representation of natural order.

In his first, and longest, chapter Larson traces the history of the problem of order in nature as it developed and was interpreted by the herbalists during the 200 years before Linnaeus. Emphasis in this chapter is on the conflict between order as understood by reason alone and as understood in the light of observed affinities and practical considerations. The remainder of the book