

THE Key REPORTER

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Senate Establishes Award for Book on Science

*Companion to Christian Gauss Prize for Literary Criticism
Will Honor Interpretation of Sciences and Mathematics*

AS a reminder that "the search for wisdom is still a single enterprise," the Phi Beta Kappa Senate has established an annual prize of \$1,000 for an outstanding contribution to the literature of science. This action was taken by the Senate at its annual meeting on December 6, by recommendation of the Committee on Policy. The first award will be made next December to the author of the best book on science or the interpretation of science published between July 1, 1958 and June 30, 1959.

The purpose of the award is to stress the need for literate and scholarly interpretations of the physical and biological sciences and mathematics, and to symbolize the importance of science as a part of humanistic studies. Such books as

Deserts on the March, by Paul B. Sears, *The Immense Journey*, by Loren Eiseley, *Of Stars and Men*, by Harlow Shapley, and *Mathematics: Queen and Servant of Science*, by Eric Bell, are examples of the kind of scientific scholarship the award is to cover. It will go to a scientist, rather than to a science writer, and the book will be one written for the intelligent general public, not for other scientists.

The conditions of the Phi Beta Kappa Award in Science are similar to those of the Christian Gauss Award, which is given each year to an outstanding book of literary criticism. Entries must be original publications, a provision that does not exclude works of which chapters have appeared earlier as articles.

They must be the work of a single author, unless by a highly integrated team of writers ("if there be such," the stipulations add). If an entry has been published abroad before appearing in the United States, it is ineligible unless its foreign publication was arranged by the American publisher. Finally, entries shall not be of a technical character; reports on research as such are ineligible.

The prize-winning book will be selected by a committee of six, which in this first year will be appointed by President Laurence M. Gould, and in future years will be elected by the Senate. Publishers will be required to submit seven copies of each book: one for each of the judges, and one for the use of the national office.

At the Senate's annual dinner, the 1958 Christian Gauss Award, also of \$1,000, was presented to Cedric H. Whitman, associate professor of Greek and Latin at



Cedric H. Whitman

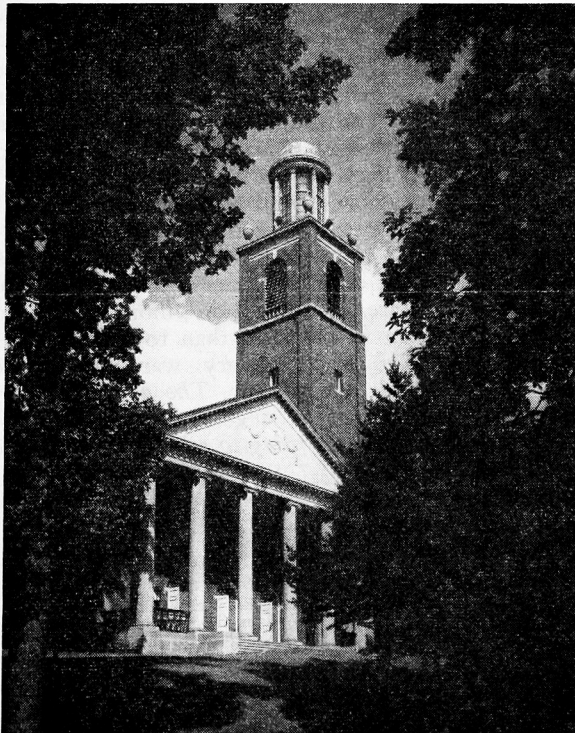
Recipient of the 1958 Christian Gauss Prize for his book *Homer and the Heroic Tradition*

Harvard University, for *Homer and the Heroic Tradition*, which was published by the Harvard University Press.

A graduate of Harvard and a member of its faculty since 1947, Mr. Whitman began his book as a search for the answer to the question whether the *Iliad* is the creation of one person or of many. A member of the award committee described it as "a brilliant and largely original analysis of Homer's poetic accomplishment." Mr. Whitman's book also received honorable mention last year for the Faculty Prize sponsored by the Harvard University Press.

This was the first year in which the competition for the Christian Gauss Award was open to books from any press in the United States; eligibility was formerly restricted to books published by a university press. The committee had anticipated that the number of entries would double, and it did; but this was partly a coincidence, since sixty-five per cent of the entries came from the university presses.

The check for \$1,000 was presented to Professor Whitman by Professor Wylie Sypher of Simmons College, chairman of the committee of judges. It was the second to be given for a book published by the Harvard University Press since 1952, when it went to Jerome Hamilton Buckley for *The Victorian Temper*.



Stetson Chapel, Kalamazoo College

At ceremonies in this chapel on December 9, President Gould of the United Chapters installed the Delta chapter of Michigan in Kalamazoo College. Story on page 4.

THE STEADY STATE:

Physical Law and Moral Choice

By Paul B. Sears

THE dream of universal harmony is an ancient one. Often it has taken the nostalgic form of a Golden Age, long past. Again it appears as future promise. The dreamer who looks ahead often sees it all very simply. Let him and all who think alike with him have their way. Never has this been better set forth than by Dr. Rabelais.

"Then, ah then!" continued Homenas, ". . . then plenty of all earthly goods here below. Then uninterrupted and eternal peace through the universe, an end of all wars, plunderings, drudgeries, robbings, assassinations, unless it be to destroy these cursed rebels, the heretics."

In an earlier chapter Rabelais had given us a glimpse of a far nobler harmony—that of the Abbey of Thélème. Peopled by the generous and enlightened who could trust each other and tolerate differences, its motto was *Do What Thou Wilt*. But in the Prophetic Riddle just following he pictures a world disordered, too much like the present for comfort. It is here that one may see, if so minded, a brief, graphic, uncannily prescient forecast of the revolution that was to come less than three centuries later.

There are today four times as many human beings in the world as when those words were written. Old and stable social orders have broken up. New powers, through new knowledge, are at man's disposal. He has, in truth, become a geological force. The dream of ultimate harmony still persists, but the old cleavage remains. There are those who think the blessed state must come by eliminating all who do not think as they do. There are others who hope for a condition of mutual tolerance and restraint, founded upon some measure of common understanding.

These are moral problems, using that term in its broad and classic sense. But morality today involves a responsible relationship toward the laws of the natural world of which we are inescapably a part. Violence toward nature, as the Tao has it, is no less an evil than violence toward fellow-man. There can be no ultimate harmony among our own species in defiance of this principle. But more than that, we can find in certain concepts of natural science an invaluable guide as we struggle to attain a better order in our own affairs.

Mr. Sears is chairman of the Yale University Conservation Program and author of *Deserts on the March*. This article is taken from his address to the 1958 Council.

A disturbing paradox of this scientific age is the fact that its most profound implications have not sunk into our minds and become manifest in our behavior. Commonly—too commonly—we hear such glib phrases as "man's control of nature," "the necessity of an expanding economy," and "the conquest of space." As Ortega y Gasset has said, the effect of the industrial revolution has been to create an illusion of limitless abundance and ease, obscuring the ancient doctrine that effort and struggle are the price of human survival.

Thus in one sweep are brushed away the lessons of history, the wisdom so painfully gained through disciplined thought and intuition in the fields of ethics and aesthetics, as well as those aspects of natural science that could afford us perspective, rather than immediate convenience. A subtle and dangerous symptom of this last is the recurring objection to physical and biological analysis of man's estate.

Whatever else he may be, a human being is a physical object and a living organism. He is by no means an inert particle, nor is he exempt from physiological limitations. Enough of us have been caught, afoot or on wheels, in traffic jams, have been hungry and thirsty, and are sufficiently familiar with birth and death to appreciate these facts. To mention them is not to say that human beings are mere particles or mere animals. Yet certainly one must be free to weigh any consequences that may result from a particular quality of property of mankind, without being condemned for applying physical or biological analogy to the demi-god, man.

There is precisely here a most delicate and important job of identification and discrimination. Could we clarify it, it might help lower the costly barriers that hamper free intercourse between scholars in the humanities and those in science—indeed, among scientists themselves.

An initial difficulty comes from confusing analogy with proof. Yet no matter how much the role of analogy may be abused, its importance as an aid to scientific investigation is very great indeed. Wisely selected parallels, or analogies, are the source of models that science can then test. A new situation, structure, or process suggests a familiar one, and we go on from there. The brown discoloration of a peeled apple suggests oxidation, and so it proves to be.

We can also isolate certain qualities in a system and study them profitably

on their own merits. A notable instance is afforded with respect to mere increase in human numbers within a finite space. Obviously we cannot apply the laws that govern the dynamics of gas molecules strictly unless we are all playing blindman's buff with motion at random. This we are not doing, for eyesight and judgment enable human beings to pick open pathways, which molecules cannot do. Yet the general principle that freedom tends to diminish (or stress to increase) as numbers multiply not only applies in theory, but in historical fact.

The application may be pressed still further. When energy is introduced into a system, the stress increases. This obviously applies to the molecules in a kettle of heated water. I am unable to see why it does not apply with equal rigor to modern man who, through the internal combustion engine, is drawing upon the fossil energy of oil deposits, now being consumed at an estimated rate one million times faster than they have accumulated. By virtue of this process the average American moves, I should judge, some ten times faster than he did in 1900, and if so, covers one hundred times more territory. The evidence of stress as a function of numbers and energy is manifold. Yet we have reassuring voices telling us not to be disturbed, because the earth can support an indefinitely increased population.

Perhaps, with so much at stake, it is time to make certain we understand what science is, and what is its role in human affairs.

Science is the discovery and formulation of the laws of nature. In our enthusiasm we may forget that a law not only tells you what you can do, but what you cannot do. When we use our knowledge of natural law for specific problems we are practicing technology, not science. And because scientific technology has placed an estimated minimum equivalent of three dozen servants at the disposal of the average American, we are, quite naturally, more inclined to listen to promises than to warnings.

Yet the necessary warning can be stated quite simply. *The applications of science must be guided, managed, controlled, according to ethical and aesthetic*

THE KEY REPORTER

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principles and in the light of our most profound understanding. Unfortunately we cannot set up an equation to show that because a thing is possible, it is necessarily wise and proper. If we could, it might simplify matters.

Certainly the application of science has been selective. An astute student of cultural processes, examining the western world, would note that science has been applied in spectacular fashion to the elaboration of consumers' goods, the reduction of mortality rates, and the tapping of fossil energy. He would also note certain consequences of this situation. Among them would be an explosion of human population without known precedent in the biological world, a lessening of the need for muscular effort, increased leisure, a startling multiplication of the rate of individual movement, dissipation of non-renewable resources, and disruption of natural cycles in the landscape. Nor would he be likely to overlook the signs of increasing tension upon the individual and the disintegration of value systems, which, whatever their limitations, have always exerted a stabilizing effect on human societies.

Our observer would find the question of man's relation to environment relegated to the fringes of serious scientific inquiry. He would uncover a widespread belief in the possibility of and necessity for a perpetually expanding economy. He would find economists well pleased if they could look ahead twenty-five years while a few scientists try honestly to peer much farther into the future. He would see that a great deal of effort is being given by the latter group to estimating the maximum number of human beings that could possibly be kept alive on earth, such estimates ranging from three to ten more times the present population. Concerning the quality of existence possible under such conditions he would discover a strange silence broken only by such bold prophets as Orwell, Huxley, and Sir Charles Darwin, the physicist.

Persisting, he would recognize other interesting conditions. Although the devising of means of human destruction continues uninhibited, frontal attack on the control of population pressure—difficult enough for technical reasons—is largely taboo. So are suggestions that human happiness might well be possible under a far less wasteful and consumptive economy. And while analysts are beginning to demonstrate that, beyond a certain limit, the expansion of any urban center means economic loss, not gain, their warnings carry little weight.

Modern society seems incalculably rich in means, impoverished in ends. The dazzling success of science in placing facilities at our disposal has left us all, including the scientist, a bit confused. Yet wisely enough the editor of a recent collection of studies on population points out that while the scientist possesses no special magic or superior methods for reaching policy decisions, he can offer sound knowledge, highly relevant to the making of value judgments.

THERE appears to be some consensus on one point: that an improved level of living for mankind is desirable. Such a blanket statement covers a multitude of possibilities, of course, although it clearly implies adequate nutrition, a better distribution of benefits, and relief from unnecessary hardship and suffering. But on the means of attaining this objective, we find ourselves in a bipolar atmosphere of world politics. One doctrine holds the individual generally competent to take part in decisions and provides elaborate safeguards to ensure him this privilege. The other sets up a monolithic structure in which the individual is submerged, ostensibly for his own good.

It would clarify, if not resolve, matters if we were to admit frankly that our Cold War is the third great religious

in my judgment, risen to the full opportunities that are his.

One cannot generalize about either humanists or scientists with any assurance, good manners aside. But this restriction does not apply so strictly to the fields they represent. A safe proposition is that neither of these vital activities should be carried on in isolation from the other.

Complicating the situation is the prevailing conviction that science holds the key to man's future. Julian Huxley has described this mood as "the airy assumption that 'science' will surely find a way out," a mood intensified by recent developments in the exploration of outer space. Yet it is clear enough that the fundamental problems of mankind are no longer technological, if they ever were, but rather cultural.

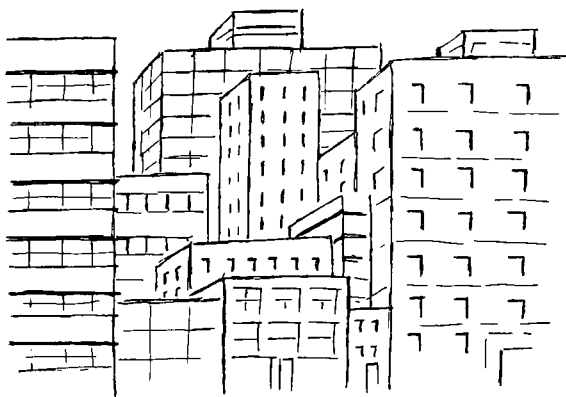
The need, in this neo-technical world, for the best that the humanities can offer is well-nigh desperate. It is the business of science to minimize the areas of uncertainty in human affairs. They remain large enough when this is accomplished. At this point we must begin to draw on the accumulated experience and wisdom of mankind to formulate, refine, and dramatize the ethical and aesthetic values that will guide us.

Values are the business of the humanities, and values clearly determine the direction of human effort. With incalculable powers at the disposal of mankind, the need for responsible control is correspondingly great. People shape their values in accordance with their notions of the kind of universe they believe themselves to be living in. The basic function of science is to illuminate our understanding of that universe—what it may contribute to human ease and convenience is strictly secondary.

Personally I am far less interested in guessing how thickly mankind can be amassed on this planet and still survive than I am in the optimum quality of existence for those who do. It is on this issue that the humanist must not desert us. We need his tempered judgment, his knowledge of great human achievement, his sensitive awareness of the creative human spirit to help us understand what, indeed, constitutes the good life. Doubtless this is an issue that can never be completely settled, but with each step that clarifies it, we shall have more guidance in our quest for a worthy goal.

Yet this goal must be sought with a realistic understanding of the natural world of which we are a part. We must know its possibilities and respect its limitations. We must scan it for hints and models, remembering that the organized system of life and environment has been operating more than a thousand times as long as the experience of our

(Continued on back cover)



conflict of the western world. The two previous ones were abated, not simply by military means, but more basically by concession to the idea of survival through dynamic equilibrium. Hope today lies in arriving at some similar agreement in principle, powerful enough to carry conviction, broad enough to tolerate the inevitable diversity that should enrich rather than impoverish human culture.

This brings us inescapably to a well-worn topic—the need for a better entente between the sciences and the humanities. Granting freely that science has frightfully disturbed the orderly world of the humanist, the latter has not,



The Kalamazoo College Quadrangle

Phi Beta Kappa Extends Jurisdiction by Three Different Methods

Kalamazoo College Receives New Chapter; Rutgers Installs Section at Newark; Western Reserve Extends Eligibility

THE initiation of five foundation members and two members in course concluded the installation ceremonies of the Delta chapter of Michigan in Kalamazoo College, where United Chapters President Laurence M. Gould installed the 164th chapter of Phi Beta Kappa on December 9.

Kalamazoo College is a liberal-arts institution with an enrollment of about 650 students, and is affiliated with the Baptist Church. The college has operated since 1955 under a charter that acknowledges the non-sectarian character of the curriculum and of the extra-curricular program.

Although each year a considerable number of graduating seniors continue their studies on the postgraduate level in all fields, Kalamazoo has a particularly distinguished record in the production of scientists. It has been listed in fourth place among American colleges and universities for the number of successful Ph.D. candidates in science per thousand students graduated. The doctorates earned in science follow the national pattern in their distribution among the various scientific fields, evidence that the college has not achieved its record by narrow specialization.

A petition to grant a charter to Kalamazoo College was first brought before the Council of 1952, but failed to receive the necessary vote of two-thirds of the chapters represented. At that time Greek and Latin were not offered at Kalamazoo. Although course offerings in the classics are not a formal requirement for a chapter of Phi Beta Kappa, the Council had discussed the omission, which the Senate had believed offset by the high quality of the institution as a whole and its remarkable strength in science. Since 1952, however, course offerings in both

languages have been established, and the 1958 Council granted the petition without hesitation.

Chartered as Michigan and Huron Institute, Kalamazoo opened its doors in Bronson, Michigan, in 1836. In that year the town changed its name to Kalamazoo, and in 1837 the Institute followed suit. Its charter was amended in 1855 to grant the power to confer degrees, and since that time it has been called Kalamazoo College.

Kalamazoo City takes its name—thought to mean “a pot of boiling water”—from the river on which it is situated. The Indians, in naming the river, presumably had in mind certain stretches where the water moves so rapidly that it looks as if it were boiling.

Newark College

Also installed in early December was a new section of the Alpha of New Jersey at Rutgers, in the Newark College of Arts and Sciences. Newark College became part of Rutgers University in 1946, by act of the State Legislature, incorporating the former University of Newark into the State University of New Jersey. Before the merger the University of Newark had been a private institution.

Rutgers has sheltered a chapter of Phi Beta Kappa since 1869. A section of the chapter was organized in 1921 in the coordinate undergraduate college for women founded at New Brunswick in



Newark College of Arts and Sciences



1918, now known as Douglass College. The acquisition of a third liberal-arts division at Newark raised the question of Phi Beta Kappa eligibility for Newark students. In 1947 the chapter received permission from the Senate to consider qualified Newark students for a five-year trial period, in accordance with a plan worked out by the chapter for keeping elections under the control of the sections in New Brunswick. At the end of the trial period the Committee on Qualifications and the Senate were satisfied that elections of Newark students by the Rutgers chapter were fully in line with standards, but they recommended that the experiment be discontinued, because of the disadvantages and the dangers, from the standpoint of long-range policy, inherent in the election of students on a campus some twenty-five miles distant from the electing group.

The 1952 Council agreed with this conclusion and adopted a general policy for the extension of chapter jurisdiction, which is now incorporated in the By-Laws of the United Chapters. The extension of such jurisdiction may be done in one of three ways, depending on the degree of integration of the colleges concerned. If they are closely integrated in administration, faculty, and educational facilities, the chapter may either allow direct election of qualified students in both colleges, or may establish a new section. If the administration is integrated, but faculty and educational facilities are not, either a new section or a new chapter may be established. Finally, if the degree of integration be-

tween the colleges is slight, application may be made for a separate chapter. All these methods of extension are subject to the approval of the Senate and the Council.

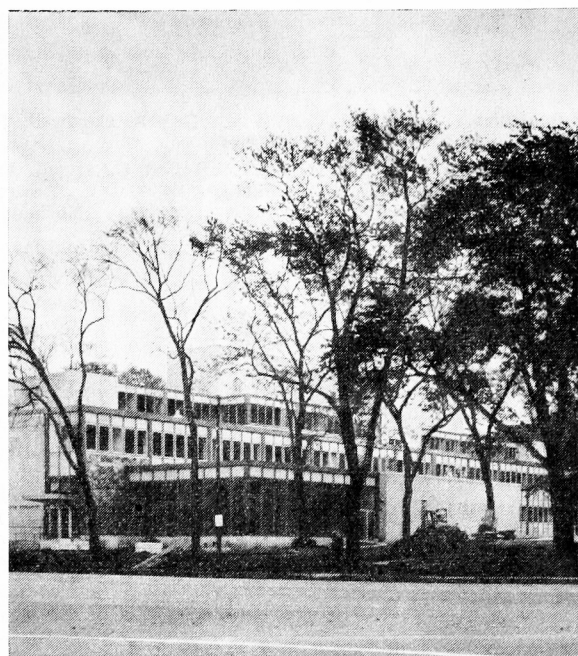
Newark College, although under the centralized control of Rutgers, has its own campus and staff, and the 1958 Council voted favorably on the Senate's recommendation that a section be established.

Western Reserve

The simplest way of extending Phi Beta Kappa was approved by the Council for Western Reserve University, where students enrolled in Cleveland College may now be elected to the Society.

Western Reserve has three undergraduate colleges: Adelbert, for young men attending full time, Flora Stone Mather, for young women attending full time, and Cleveland, which is for both men and women, largely adults, most of whom attend part time. Students in any of the colleges may enroll for day or evening classes. Cleveland College sponsors a program of non-credit adult education, with a very large enrollment, but more than two thousand students are enrolled for credit, of which about ten per cent work toward the A.B. degree.

Since 1952 entrance and degree requirements for matriculated students at Cleveland College have been the same as



Cleveland College Headquarters at Western Reserve

those in effect at the other two colleges. The members of Phi Beta Kappa who teach students in the three colleges are members of the same faculty, and all three colleges are located on the same campus. The Western Reserve chapter did not, therefore, petition for the establishment of a separate section in Cleveland College, but merely requested that the Council authorize the direct election of qualified students, the men to be elected by the section in Adelbert College, and the women by the section in Flora Stone Mather College.

Winter 1958-1959:

The Reshaping of Privacy • *August Heckscher*

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The New England Conscience • *Perry Miller*

The Existentialists and William James • *Julius Seelye Bixler*

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(History, Economics, Government, Lawrence A. Cremin, Louis C. Hunter,
Sociology, Education) Norman J. Padelford, C. Vann Woodward
Natural Sciences.....Kirtley F. Mather

Frederick B. Artz

JUDGMENTS ON HISTORY AND HISTORIANS. By Jacob Burckhardt. Beacon. \$7.50.

This collection of lecture notes, written between 1865 and 1885 by one of the great philosophical historians of the nineteenth century, offers penetrating comments on the main currents of cultural, political, and religious history from the Greeks to Napoleon.

THE LOOM OF HISTORY. By H. J. Muller. Harper. \$7.50.

The history of the Near East from before the Greeks to the reforms of Kemal Ataturk. The author makes no attempt to write a continuous history, but instead presents studies of periods and leaders.

ONCE TO SINAI. By Hilda F. M. Prescott. Macmillan. \$5.

Based on a German friar's diary of 1483, this account covers a fantastic journey to the Holy Land and beyond. A fascinating addition to any library of books on the Middle Ages.

MISSIONARIES, CHINESE, AND DIPLOMATS: The American Protestant Missionary Movement in China, 1890-1952. By Paul A. Varg. Princeton. \$6.

A history of Protestant missions in China, and also a valuable study of the influence of missionary activity on American policy toward China, including a discussion of why the Communists succeeded in China.

THE TROUBLE MAKERS: Dissent over Foreign Policy, 1792-1939. By A. J. P. Taylor. Indiana. \$3.50.

A brilliant sketch of British foreign policy from the point of view of the government opposition. Now that the United States has taken on the kind of international burdens long borne by Britain, this essay becomes a sort of fable for Americans.

MARLBOROUGH'S DUCHESS. By Louis Kronenberger. Knopf. \$5.75.

A brilliantly presented account of the first Duchess of Marlborough, who swept, with impervious grandeur, between the days of Pepys and Dr. Johnson.

OPERATION SEA LION. By Ronald Wheatley. Oxford. \$7.

Based on captured German documents, this account shows the elaborate preparations made by Germany to invade England in 1940. Interesting reading for America's isolationists who still say "Hitler never intended to invade England."

Also Recommended:

THE ANCIENT NEAR EAST: An Anthology of Texts and Pictures. \$6. **ARCHAEOLOGY AND THE OLD TESTA-**

MENT. \$5. Edited by J. B. Pritchard. Princeton.

THE WISEST FOOL IN CHRISTENDOM. By William McElwee. Harcourt, Brace. \$5.

THEORIES OF HISTORY. Edited by Patrick Gardiner. Free Press. \$7.50.

Louis C. Hunter

NORWAY: The Planned Revival. By Alice Bourneuf. Harvard. \$5.

The United States stands almost alone today in refusing, as a nation, to recognize that economic planning is a basic function of statecraft, although bits and pieces of such planning find their way through the back door. Miss Bourneuf's account of Norway's postwar experience qualifies as recommended reading (send in plain wrapper, please) for 1960's candidates.

THE SOURCES OF INVENTION. By John Jewkes, assisted by David Sawyers and Richard Stillerman. St. Martin's. \$6.75.

This study considers the causes and conditions of the marked shift during the past fifty years from lone wolf to group, chiefly corporate, inventive activity. General analysis is followed in Part II by brief historical sketches of some fifty inventions, ranging from ball-point pens and self-winding watches to insulin, radar and the cyclotron. To the technologically-minded, a most profitable volume.

THE AMERICAN BUSINESS SYSTEM: A Historical Perspective. By Thomas C. Cochran. Harvard. \$4.75.

In some 200 pages Professor Cochran outlines a half-century's development of what many like to regard as our major contribution to western culture. Values apart, this excellent survey reviews a central segment of our economic and social development since 1900.

ORGANIZED BUSINESS IN FRANCE. By Henry W. Ehrmann. Princeton. \$7.50.

If you are accustomed to thinking of the French economy chiefly in terms of viniculture, luxury specialties, Poujade, and the petite bourgeoisie generally, this volume will be full of surprises. In scale of operations, organizational skills, and entrepreneur-

ial *savoir faire*, French businessmen, as Professor Ehrmann makes clear, can teach us a few lessons.

DESERT ENTERPRISE: The Middle East Oil Industry in Its Local Environment. By David H. Finnie. Harvard. \$5.

This small and competent volume provides a penetrating account of Middle Eastern oil in terms of concrete operating problems and business relationships in the field. A revealing picture of American enterprise in action on a major overseas industrial frontier.

MY LIFE WITH PAPER: An Autobiography. By Dard Hunter. Knopf. \$5.

The author has devoted the greater part of his life to the art of making paper by hand. This experience he describes with skill, particularly his journeyings throughout the world collecting materials and methods of the craft. Excellent photographs.

Kirtley F. Mather

DARWIN'S CENTURY: Evolution and the Men Who Discovered It. By Loren Eiseley. Doubleday. \$5.

EVOLUTION BY NATURAL SELECTION. By Charles Darwin and Alfred Russel Wallace, with foreword by Gavin de Beer. Cambridge. \$4.75.

THE EVOLUTION OF DEVELOPMENT. By John Tyler Bonner. Cambridge. \$3.50.

BEHAVIOR AND EVOLUTION. Edited by Anne Roe and George Gaylord Simpson. Yale. \$10.

From the rising tide of books on evolution these four may be selected as having special value or significance. The first is a brilliant and perceptive account of the origins and development during the nineteenth century of the concept of organic evolution, with some new insights concerning the mental processes of the men responsible for that epochal advance in understanding the ways of nature. The second consists of Darwin's "Sketch" of 1842, his "Essay" of 1844, and the Darwin-Wallace "Papers" of 1858 "On the Tendency of Species to form Varieties," together with an introduction by Francis Darwin and an unusually informative foreword by de Beer. J. T. Bonner's slender volume seeks primarily to understand the mechanisms of development by an evolutionary approach to their many problems. The fourth book is a symposium of twenty-three papers, conceived, presented, discussed, and revised in conferences sponsored jointly by the American Psychological Association and the Society for the Study of Evolution. It demonstrates the fact that behavior is an aspect of animal organisms just as inseparably involved in and explained by the universal concept of evolution as are morphology and physiology.

FRONTIERS IN SCIENCE. Edited by Edward Hutchings, Jr. Basic Books. \$6.

The list of contributing authors is a veritable galaxy of the most eminent American and British research scientists. Each of them is remarkably successful in expressing his ideas in simple language, without risk of distortion, in order to bring the discoveries of the specialist to the non-specialist.

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MOMENTS OF DISCOVERY. Edited by George Schwartz and Philip W. Bishop. Basic Books. Two volumes, boxed. \$15.

PATTERNS OF DISCOVERY. By Norwood Russell Hanson. Cambridge. \$5.50.

Two utterly different but mutually complementary ways of studying the creative achievements of scientists. The first is a sagaciously selected and brilliantly annotated anthology of original accounts of great discoveries. The second is a philosophical "inquiry into the conceptual foundations of science," especially of microphysics; the primary concern is with "theory-finding": not testing hypotheses, but discovering them.

Guy A. Cardwell

SELECTED ESSAYS. By Robert Penn Warren. Random House. \$4.

The wonderfully versatile Mr. Warren here brings together ten essays originally composed between 1935 and 1951. They are as rich with insights as one remembered them to be, as brilliant and carefully worked as his novels and poems. It is good to have readily available his statement on "Pure and Impure Poetry" and his critiques on Coleridge, Melville, Hemingway, Faulkner, Conrad, Frost, Porter, Welty, and Wolfe.

AFTERNOONS OF AN AUTHOR. By F. Scott Fitzgerald. Edited by Arthur Mizener. Scribner's. \$4.50.

There is an impressive sureness of touch about even the earliest and most ephemeral of the stories and sketches in this scattered selection from Fitzgerald's voluminous uncollected work; and the pieces offered show a fairly steady progression from gently ironic treatments of adolescence, almost in the Tarkington vein, to absorbed scrutinies of human failure. Most of these items appeared originally in the *Saturday Evening Post* and in *Esquire*, which hardly ever had it so good.

THE SHORES OF AMERICA: Thoreau's Inward Exploration. By Sherman Paul. Illinois. \$6.75.

CONSCIOUSNESS IN CONCORD: The Text of Thoreau's Hitherto "Lost Journal" (1840-1841). With a Commentary by Perry Miller. Houghton Mifflin. \$3.50.

Basing his study on a close examination of all of Thoreau's writings, published and unpublished, Mr. Paul has written an important "inner life," logging the voyages of self-exploration that ended with Thoreau's becoming a very special kind of American hero. Among the more interesting analyses and side-discussions with which the volume abounds are those dealing with nature and society and those acquainting the reader almost as fully with Emerson as the book does with Thoreau. The book itself is beautifully designed and printed.

The appearance of Thoreau's "lost journal" completes the text of the journals published in fourteen volumes early in this cen-

tury. In the commentary Mr. Miller goes far beyond the minimum duties of an editor: indeed, he presents a very sharply drawn portrait of Thoreau as a writer and as a man. He emphasizes that the journals are deliberate works of art and that Thoreau formed early his habit of literary mosaic-making, and he also stresses Thoreau's egocentricity and his androgynous outlook. Mr. Miller's portrait certainly adds something to that presented by Mr. Paul; possibly it may be thought of as a needed corrective.

John Cournoos

BIZET AND HIS WORLD. By Mina Curtiss. Knopf. \$7.50.

Mrs. Curtiss has done a remarkable piece of research and put in a prodigious amount of labor on a fullfledged biography of the composer of *Carmen* and on the background of his time. She was fortunate in digging up a trove of rich original material. It is possible to say that her book, tremendous in scope and interest, is bound to be the source book for future students of the period that she describes.

PAGAN MYSTERIES IN THE RENAISSANCE. By Edgar Wind. Yale. \$7.

The influence of Greek mysteries on Renaissance artists is revealed in a study that is intended more for the scholar than for the general reader. The author quotes an early sixteenth century authority to the effect that a myth is "a mendacious discourse figuring the truth." This dictum describes the intent and meaning of the book, which is copiously illustrated to show the force that Greek myth gave to Renaissance art.

THE ABBEY THEATRE. By Gerard Fay. Macmillan. \$4.50.

The rise and decline of a famous theater described with authentic intimacy. Readers of theatrical history cannot afford to overlook this small but meaty volume.

SCHUBERT: A Critical Biography. By Maurice J. E. Brown. St. Martin's. \$6.75.

A solid piece of work. The author eschews the romantic attitude that colored previous biographies of Schubert, whose life and work met with the obstacles that are the usual lot of men devoted to creative effort. Here are analyses of music related to the man and his background.

CHINESE ART. By William Willetts. Braziller. \$5.

In China the term "art" includes all manifestations of the artistic spirit, whether conveyed in the form of jade and bronze ornaments, lacquer designs, pottery, or even calligraphy. It is on this basis that Mr. Willetts has composed what amounts to a fairly complete handbook embracing all phases of Chinese art to our own time.

THE SELF-CONSCIOUS STAGE IN MODERN FRENCH DRAMA. By David I. Grossvogel. Columbia. \$5.

Readers should not be put off from this book by the awkward title. It contains excellent analyses of such playwrights as Anouilh, Claudel, Cocteau, Giraudoux, Sartre, and other figures of the new theater.

Robert K. Carr

MARBLE PALACE: The Supreme Court in American Life. By John P. Frank. Knopf. \$5.

An extremely readable and informative book about the Supreme Court by an able legal scholar and practitioner who has thought long and carefully about the Court and its role. Brief and non-technical in language, the book nonetheless supplies many challenging insights and judgments. Perhaps the best "popular" introduction to the Court now available.

PARTY COMMITTEES AND NATIONAL POLITICS. By Hugh A. Bone. Washington. \$4.50.

A much needed and discerning examination of those oft-observed but little-understood party agencies—the national committees, the House and Senate campaign committees, and the Senate policy committees. Supplies an important addition to the slowly growing literature dealing with the role and power of the secretariats, executive committees, and "headquarters" agencies of public and private organizations.

THE DEFENDANT'S RIGHTS. By David Fellman. Rinehart. \$5.

A very useful study of defendant's procedural rights in criminal and quasi-criminal cases with particular emphasis upon Supreme Court decisions interpreting and applying the Bill of Rights. Comprehensive, encyclopaedic, literate, and liberal in outlook, this is the work of an informed, concerned, and humane scholar.

DILEMMAS OF POLITICS. By Hans J. Morganthau. Chicago. \$7.50.

A welcome collection of essays by one of the nation's wisest and most challenging political scientists. Although the items vary widely in length, character, and subject, they are tied together by a consistent theme of first importance: our need to use both the perennial truths of political philosophy and trial-and-error contemporary political experimentation and experience in our continuing attempts to solve the fearfully difficult political problems of the modern era. This is contemporary political science "theory" at its very best.

AMERICA VOTES. By Richard M. Scammon. Macmillan. \$12.50.

This is the second in a series of volumes designed to supply complete and accurate American election statistics, which is being published under the auspices of the Governmental Affairs Institute. Clarity of organization, breadth of coverage, and unusual care in collection and presentation of data make these volumes very useful. This is contemporary political science "quantification" at its best.



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THE STEADY STATE: Physical Law and Moral Choice

(Continued from Page 3)

own species. Our knowledge of the vicissitudes of geological and climatic change, of organic competition, conflict, even extinction, should not blind us to the essential order behind it all. In our consumptive age we hear much talk of the danger of depleting our environment. A far more profound threat lies in our power to disrupt its orderly transformations of material and energy.

The confidence with which the physical scientist faces his task rests essentially upon a few basic assumptions with respect to the orderly behavior of energy and matter. One of the important concepts corollary to these principles is that of the steady state. Systems tend toward conditions of minimum stress and least unbalance—that is, toward equilibrium. Energy flowing into a system operates to upset this trend, unless the system is so organized as to transform that energy in orderly fashion, using it meanwhile to keep the system in good working condition. Such a system, that is, an open steady state, is approximated in living communities. Green plants utilize solar energy to build carbon compounds that sustain themselves and animals as well, while complementary processes return materials for fresh re-use.

The heat from a stove—energy—will keep the pot boiling so long as there is water in it. But it will not replace the water when it is gone, nor mend the pot when it melts. By contrast, an organized pattern of living communities is self-maintaining if energy is available.

These circumstances have long since caught the imagination of men. Harrison Brown and other analysts point out that if man continues to increase in numbers and per capita requirements his fate will depend on his success in tapping additional energy sources rather than on

lack of materials. For example, the mineral content of a ton of granite or a cubic mile of sea water is most reassuring. The hitch comes in the energy cost of reclamation, yet the literature abounds in optimistic assurances that man is clever enough to turn the trick. Now and then, but not always, we see the added proviso that he must first learn how to behave himself better than he does. On a less responsible plane we continue to hear talk of an expanding economy, the conquest of nature, and man's unlimited future.

POKING about such an imposing edifice of technological statesmanship is creepy business, not unlike that of being near neighbor to a high-tension wire or an unguarded atomic pile. Yet certain naive probings seem unavoidable. Why not, for example, divert more of our scientific enterprise to studying the model that is before us, that has operated for more than a billion years, and has made our own existence possible?

Again, why continue, not only to tolerate, but to sponsor reckless and irresponsible multiplication of human numbers? Why accede to the notion that in a world where millions are hungry and malnourished through failure to apply the knowledge we now have, industrial enterprise must concentrate so largely on the mass production of what a philosopher would consider toys for adults?

Why worry so much about the other side of the moon when our cities, bursting at the seams, are erupting into an unplanned chaos? Why dream of escape to other planets when our own would respond generously to kinder treatment? Right and proper it is to push knowledge to the uttermost limits, but why not use what we have to clean the open

sewers we call rivers, purify the air we must breathe, slow down the tragic waste of human ability, and get things about us shipshape? We are sweeping too much stuff under the bed, locking up too many closets.

Probably men will always differ as to what constitutes the good life. They need not differ as to what is necessary for the long survival of man on earth. Assuming that this is our wish, the conditions are clear enough. As living beings we must come to terms with the environment about us, learning to get along with the liberal budget at our disposal, promoting rather than disrupting those great cycles of nature—of water movement, energy flow, and material transformation that have made life itself possible. As a physical goal we must seek to attain what I have called a steady state. The achievement of an efficient dynamic equilibrium between man and his environment must always, in itself, have the challenge and the charm of an elusive goal. The infinite variety and beauty of the world about us, the incalculable facets of human experience, the challenge of the unknown that must grow rather than diminish as man advances in stature and becomes at home here—these are sufficient guarantee that a stable world society need never be a stagnant one.

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