



The Key Reporter

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PHI BETA KAPPA AWARDS 1978 BOOK PRIZES

Presentation of the three Phi Beta Kappa \$2,500 prizes for books published during 1977-78 took place at the Senate dinner in Washington on December 8. The awards are presented annually to authors of books that represent significant contributions to learning in three areas of humanistic scholarship. Charles R. Anderson, *Caroline Donovan Professor of English emeritus at Johns Hopkins University*, received the Christian Gauss Award for literary scholarship and criticism for *Person, Place, and Thing in Henry James's Novels*, published by Duke University Press. Bruce Kuklick, professor of history at the University of Pennsylvania, was given the Ralph Waldo Emerson Award for studies of the intellectual and cultural condition of man for his book, *The Rise of American Philosophy: Cambridge, Massachusetts, 1860-1930*, published by Yale University Press. Colin Blakemore, Royal Society Locke Research Fellow at the University of Cambridge, received the Phi Beta Kappa Science Award for *Mechanics of the Mind*, published by Cambridge University Press.

In citing *Person, Place and Thing in Henry James's Novels*, the chairman of the Gauss Committee stated: "In this most perceptive and intellectually sustained of studies, Professor Anderson's examination of James's art becomes the illumination of a major aesthetic movement. Focussing on the manner in which the environment works upon

human sensibilities, Professor Anderson shows how James was developing perspectives the French Impressionist painters were revealing to the world. Going further, he shows how James achieved what is not within the power of painting, representing through language and narrative the processes of the comparable modulations humans effect in each other. The poise and grace of the writing give the final distinction to this splendid study."

Dr. Anderson taught first at Duke University and then at Johns Hopkins until his retirement in 1969. His other books include *Emily Dickinson's Poetry: Stairway of Surprise*, which was chosen for the Christian Gauss Award in 1961. In 1976 he initiated the project that resulted in the placing of a memorial marble to Henry James in the Poets' Corner of Westminster Abbey.

In selecting Bruce Kuklick's *The Rise of American Philosophy: Cambridge, Massachusetts, 1860-1930* for the Emerson prize, the Award Committee noted: "This splendid book analyzes, in a clear and graceful manner, the changing conceptions of American philosophy during a period in which academic philosophy in the United States came almost to be equated with Harvard. It is a superb piece of intellectual history in which basic philosophic ideas are spelled out and analyzed. Furthermore, the book goes beyond a concern with ideas to an inquiry into the societal, and particu-

larly the academic, context from which they emerged. Thus, the book contains a penetrating examination of the rise of academic specialization, and its various consequences. In this illuminating chapter in the history of American higher education, Kuklick also examines a wide range of issues, such as the role of academic nativism and antisemitism, the mystique of the Harvard gentleman-scholar, the abhorrence of political radicalism, and, tragically for the department, the impact of World War I."

Professor Kuklick is currently on leave from the University of Pennsylvania, as a Fellow at the Center for Advanced Study in the Behavioral Sciences, Palo Alto, California. His interest in philosophy and the history of ideas has led to graduate degrees in American Civilization and in philosophy. He is the author of two other books, *Josiah Royce: An Intellectual Biography* and *The United States and the Division of Germany*.

Colin Blakemore's popular Reith Lectures of 1976, which were broadcast on BBC Radio, served as the basis for his award-winning *Mechanics of the Mind*. The award committee said of this work: "Professor Blakemore has made his book about the complicated field of brain research not only superbly intelligible, but absolutely fascinating. He accomplished this by putting problems about the brain, none

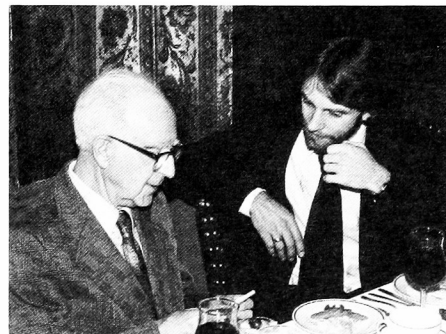
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Emerson Award winner Bruce Kuklick (left) meets committee chairman David Fellman at the reception honoring the winners.



Celebrating the award of the Gauss prize are (left to right) Mrs. Anderson, winner Charles R. Anderson, Mrs. Arthos, and John Arthos, chairman of the Gauss Award Committee.



Science Award committee chairman T. M. Sonneborn (left) consults with winner Colin Blakemore at the Senate dinner.

SCIENCE, ANTI-SCIENCE AND HUMAN VALUES

by John Compton

One of the social functions of a philosopher has always been to try to reflect on the human condition of his time and place and give some critical assessment of it. Today there is one recurring subject of analysis, and that is the impact of natural science and technology on human life. We seem to be at a new critical stage of ambivalence concerning the scientific and technical sources of our culture, and we are surrounded by a cloud of witnesses expressing their deepest misgivings about the entire scientific and technological project of western man. Of course, these anxieties are not new; they are at least as old as the Romantic poets and painters of the 19th Century. And popular uncertainty about the value of new ideas and new skills is as old as man himself. At present we find these misgivings focussed in the work of a group of humanists such as Jacques Ellul, in his book, *The Technological Society*; Lewis Mumford, in *The Pentagon of Power*; and Theodore Roszak in his latest, *Where the Wasteland Ends*. They reveal widespread public mistrust of the technical success of science and personal alienation from it.

At the same time, ambivalent reactions to science and technology are also being expressed within the scientific and technological community. Jerome Ravetz, for example, in a recent book, *Scientific Knowledge and Its Social Problems*, documents the effects of the intensification and industrialization of scientific research and development on the morale and internal self-image of scientists. Scientific work, in the new dispensation, tends less to be an expression of the ancient aristocratic ethos of the love of knowledge, and more a job to be done — whether by the employer-entrepreneur who secures his own funding and administers his own empire, or by the employee of someone else who does. Every scientific association in the country has its subgroup formulating codes of professional ethics, and the National Science Foundation has been sponsoring a series of workshops designed to elicit public discussion of science policy.

These signs of the times may be dismissed as the result of a momentary failure of nerve in a period of general social malaise. International problems

abound; our economic system seems far less within our control than we thought it was; and political life shows signs of moral decay. No doubt some are tempted to fix upon the massive influence of science and technology and blame them for our situation. In addition, for some scientific people, there are guilt feelings just below the surface. These derive from a sense of complicity in the development of nuclear weapons and the technological assault on the environment and from a sense of having shared in the overselling of the power of science to solve human problems.

I believe, however, that our current concern is a manifestation of a deeply felt, continuing problem with which we must grapple — that of assimilating science and technology into our culture. Moreover, I think that lurking behind and through this problem of cultural assimilation are fundamental philosophical issues, questions of self-understanding, as well as more obvious problems of policy and political action.

Let me take as my point of departure Theodore Roszak's, *Where the Wasteland Ends*, a book being discussed and denounced within and without the scientific community. It is flamboyant and outrageous in many ways, but it cannot be dismissed.

Rozsak sees in modern life a wasteland of the human spirit, produced by a pervasive scientific consciousness, and expressed in widespread social and political alienation. He is not really concerned with understanding science in internal terms; rather he deals with it as a form of consciousness, as a generalized approach to the world, which has determined what he calls the "mindscape" of modern man. He sees it as setting the limits of what we consider rational in our thinking, what we take to be real in the world around us, and what we take to be desirable as ends for human life. Beyond the obvious gains in objective knowledge and in material well being which science and technology have produced, he finds immense psychic and social costs. Among the psychic costs are a drying up of our abilities to enjoy the senses, to participate in bodily feeling and to exercise imaginative and visionary power. The result is that we sophisticated moderns tend to feel less at home in nature and tend to find our surroundings inert and lifeless, mere objects of curiosity and exploitation.

The social costs follow: "We conquer nature, we augment our power and wealth, we multiply the means of distracting our attention this way and that . . . but the despair burrows in deeper and grows fatter; it feeds on our secret sense of having failed the potentialities of the human being." The logical outcome is rapacity toward the environment; a politics dominated by irrational dependence upon nuclear stalemate; the exile of art, poetry, and religion to what are at best exotic cultural forms; and the creation of a new class of managers, the technocrats, in whose hands we find ourselves throughout business, industry, the military, government, and even communications, recreation, and education. In short, however useful and liberating science and technological progress may have been, its human consequences have been destructive.

My view of these charges, in general, is that it is a mistake to join either the opponents or the proponents of scientific and technical development on their own simplistic terms. Human reality includes both the positive interest of scientific and technical knowledge and the concern to express these interests in a humanly fulfilling life. In order to recapture this sense of wholeness, it is necessary that we come to a more adequate philosophy of science than we currently possess. There are three themes that should be considered for such a philosophy: the meaning and implications of scientific objectivity; the place of the reductive tendency in the scientific study of nature; and the relation of scientific thinking to technology and to political life.

In the first place, what are we to say about scientific objectivity and its cultural meaning? Here the response to Mr. Roszak seems to be clearest. Exact science is, of course, a discipline which inhibits spontaneity of desire and belief. Scientific knowledge is, as John Ziman termed it, "public knowledge"; that is, knowledge certified by a public process of scrutiny which can in principle be checked by any technically qualified person. For this reason, such knowledge seeks controlled, quantitative measures of data and rigorous mathematical argumentation. Science necessarily abstracts from individual feeling, from the richness of sensory life, and from the vitality and human interest of its subject matter — precisely in order to study that subject matter. Moreover, this is what we ought to want science to do — namely to give us the best technical answers to the severest and most rigorous technical questions.

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Because this requirement of objectivity is inseparable from scientific practice, it does not follow that scientific methodology is omni-competent. As one physicist put it, "quantitative analysis tells you something about everything but very little about anything." A severe sense of the limits of such scientific analysis in areas closely related to human concerns, is a crucial correlative to an appreciation of its positive value within its proper context.

Moreover, just because scientific knowledge as a product is necessarily depersonalized and public, it does not follow that the pursuit of science as a process of inquiry is impersonal. Far from it. This process is rather interpersonal and communal and historical. Over the last fifteen to twenty years, from the work of Karl Popper and *Michael Polanyi on the personal* and conjectural elements in science, and from the work of Thomas Kuhn on scientific growth, we have learned that the achievement of public knowledge is not mechanical. We now understand scientific activity to be a combination of imaginative conjecture with a push and pull among proponents of varying points of view, guided by general, but differently applied, canons of logical and experimental test. There is an ethic of scientific objectivity, but it is a much more personal and historical ethic than we had supposed.

Consequently, science has every right to be included as a part of the humanistic tradition, if we mean by that the history of creative, passionate, and fallible efforts by human beings to understand themselves in terms of symbols of their own invention, tested in and through their own experience. This is not just to say that scientists too are human beings. The point is logical or conceptual; this humanity is essential to the conduct of science and to our understanding of it.

Finally, if one agrees with Roszak, and I do, that we moderns have great difficulty in accepting intense feeling, in enjoying our bodily senses and desires, and in knowing what to do with visions and dreams and mystical experiences of unity with nature, it will not simply be because science has made us this way. It will rather be because the severe tension between objective, critical thought on the one hand and a deep personal need to participate, enjoy and exult on the other, is basic to our nature. Our psychic problems of assimilating science are but intensified forms of a continuing struggle that human beings face in becoming a part of any civilized, structured, and inhibitory community.

A second theme in the humanistic critique of science is the reductive tendency of science, its way of viewing the world, and man in it, simply as a material system subject to exact laws. There is nothing so deep in the humanist's — and in every man's — discontent with science as the sense that it profanes the mysteries of experienced things, depreciates their sensuous qualities, and exiles from what it calls the "real world" their dynamism and activity. And in exchange, science seems to leave only atoms and the void. It is essential to reassert that the experienced world is not simply the scene of blindly hurrying matter and that animal and human life are not simply the intersections of causal processes. A clear understanding that science is a radical simplification of our experience, that it considers only what is measurable and mathematically lawful in events, and that it therefore exercises a severe abstraction in its view of the world, is essential to any adequate philosophy of science.

At the same time, we must be aware of how much we have learned from the reductive approach. Since the 17th Century, natural science has pursued the ideal of a unified theory of matter which would not only encompass all physical phenomena, but which could be used to explore and explain complex chemical, biological, psychological, and social events as well. In my view, we humanists ought to take the position that what we are learning precisely through this reductive, simplifying approach is extremely valuable. We should be hoping for more success, new concepts, and new clarity. For psychic, and also, ultimately, for metaphysical reasons, we dare not box ourselves into a fear of science, as if it were something imposed upon us from without. Insofar as man and world are open to analysis in materialist terms, we must interpret this knowledge and integrate it with our more familiar and richer experience of things.

This has been a basic task of philosophers since the most ancient times for it concerns nothing less than our most inclusive categories of understanding: What does "matter" mean? What or where is "mind"? Can conscious life be completely understood by a reductive analysis of it in terms of physiological processes and behavior — for animals or for men? How are we to understand human freedom, personal dignity, and responsibility? Is it the case that the theoretical framework of science could ever replace, in some sense completely replace, the framework of our ordinary, daily experience? Or is it, as I

find more intelligible and plausible, that our developed theoretical models are so parasitic for their meaning upon ordinary ways of experiencing and dealing with the world, that we have to consider these theoretical constructions as ways of representing the world for certain purposes only?

While, of course, I cannot take up the conceptual issues involved in all of these questions, I can make some observations. In the first place, it is crucial to see that the content of scientific thought is open; that we have today a concept of nature much different from that of the 17th Century. The earlier, largely Newtonian view had supposed that nature was simple in structure, mechanically determined in behavior, and static in form. Post-Newtonian natural philosophy finds nature much more complex. It shows many levels of order, each with its own distinctive forms and laws, with many types of elements at these levels, and with an increasing rather than a decreasing multiplicity of questions to be asked as inquiry proceeds. Recent scientific thought also finds nature far from strictly causally determined. It appears rather to be a field of chance and of statistical as well as causal uniformity. Finally, current views find it far from static. On the contrary, nature appears to be a field of evolving forms — physical, geological, biological, and cultural. Nature, just as much as human culture, seems to be historical. Each form of system, with its laws, succeeds the other, revealing new potential within it — the potential for life and mind, for example — and containing within it the potential for future forms.

For our assessment of the reductive tendency in scientific thinking, this suggests that reduction seems to be dialectical. There is some basis both for the conviction that matter-theory can explain the complex and for the view that as it is called upon to do so, the very concept of matter is modified and expanded. What were thought to be simples give way to complex structural relations; a single level of structure gives way to a hierarchy of levels; mechanical repetitiveness gives way to statistical uniformity; a steady state universe reveals, on closer examination, a dynamic historical process of evolution. Insofar as this is so, there is some basis for the hope that an integrated science may save the phenomena of complex wholes, and that scientific analysis of the material world and our full-blooded human experience of its meaning may be deeply coherent after all.

It should also be noted that however the sciences come to analyze human

nature, there is no chance that they will somehow eliminate the significance of human experience, conceptual thought, and free action, for the obvious reason that the entire validity of scientific claims depends upon them. The scientist must be able to invent conceptual models, submit them to test in terms of his observations, and freely evaluate the results; otherwise his conclusions have no epistemic merit. His own molecules must be rich in potentialities for the kind of creative, personal, aesthetic, and even religious project which is scientific investigation. It will be a long time, if ever, before we are clear how this is possible. But that it is so, that scientists and other people are material systems who at the same time sense and feel and think and choose, that is as much a foundational truth for science as it is for the rest of human life.

Finally, let me turn to the third theme I mentioned, the impact of science on social and political life through technology. In this connection, it is important to remember that the industrial revolution of the late 18th and 19th Centuries was not a scientific revolution. Systematic research science has been coupled with technological development only since the very latter part of the 19th Century and, in its most dramatic manifestations, only since World War II.

Technology has so surrounded us with machines, techniques, and their products, that our urban society is largely an artificial world. The effects of this are many: chemical technology works massive damage in the environment; communications technology has modified our perceptions of space and time; national politics is dominated by the thirst for energy, and international politics is held hostage by a fragile nuclear arms balance. The immense growth in the scope and complexity of social institutions, with their dependence on research and development, has thrust issues of science policy into the center of political concern. Moreover, when we reflect on such issues as energy, pollution controls, the deployment of nuclear power plants, economic development, agricultural policy, medical research, and the like, we realize that decisions which affect us all are increasingly removed from the competence of ordinary people. We have reason to fear that such decisions are being made for us by some unchosen few, some priesthood of scientists, policy analysts, or management and systems engineers. In short, gains in material well-being through technology are bought at considerable political cost.

The Roszакian response favors dismantling the entire political edifice and attempting to create small communities of a radically simpler and less technologically dependent life-style within which men and women might more fully and satisfactorily relate both to nature and to one another. He calls these communities "visionary commonwealths." Such utopian experiments have some value, but they provide no general solution. They will not help developing nations or disadvantaged minorities; they will not provide political leadership; they will not aid in the search for new sources of energy or for less environmentally damaging means of large scale production.

We need, I think, to take a less apocalyptic but more difficult approach based on two principles which are in tension with one another. First, we need to affirm the fundamental reality and essential worth of the scientific and technical capacities of man — our right and responsibility to intervene in nature in order to try to improve the quality of human life, and we must recognize and accept the organized social institutions of an industrial society which go with these capacities. But, we must insist equally upon the limitations of our foresight into the environmental and social effects of using any technical tool and recognize the concentrations of special interest and power, in government and in industry, which limit our ability to control the effects of technical change even when we can anticipate them. Thus, we must be prepared to take the legal and political steps necessary to restrain abuses of technical knowledge.

There are both political and philosophical implications to the acceptance of these principles. If we seriously affirm both the possible benefits of scientific and technical knowledge and the perils in which we stand through abuse of it, we need to carry on the political process of criticism and debate against seemingly closed bureaucratic and technocratic decisions. Presidential advisory panels, Congressional and other committees, can serve in this way, but only incompletely. Ever since the advent of nuclear weapons, and in more massive fashion recently, scientifically and technically trained people, together with knowledgeable lay-people, have also organized to enter the political arena. That such groups take differing positions in the political spectrum is just the point; this is necessary in order to get before the public the fullest variety of interpretations of the facts on the SST, on nuclear power

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When La Guardia Was Mayor: New York's Legendary Years. August Heckscher with Phyllis Robinson. Norton. \$15.
The Little Flower's 12 years (three terms) as Mayor of New York City are masterfully detailed from new sources. The 30s and 40s come alive in a narrative that portrays the Mayor with objectivity—crises, hard decisions, and antics—as he converted New York into a modern city and constructed new relationships with Washington.

Himself: The Life and Times of Richard J. Daley. Eugene Kennedy. Viking. \$10.95.
Though marred by purple passages and clichés, the book presents a fast-moving review of Chicago's "chieftain" who ruled the city for 24 years. An essentially correct view of Daley in party, mayoralty, and national politics.

Justice Hugo Black and the First Amendment. Ed. Everette E. Dennis & others. Iowa State. \$11.50.

A dozen essays by journalists and legal historians examine Black's philosophy and opinions on freedom of expression in press law cases. This interesting addition to interpretations of Black treats his absolutism, misuse of history, and argues, contrary to popular view, that he maintained a consistent theory of the First Amendment to the end. One author contends that Black would have upheld a journalist's right to protect the identity of sources and the confidentiality of notes and tapes.

The Work Ethic in Industrial America, 1850-1920. Daniel T. Rodgers. Chicago. \$15.

In a valuable contribution to intellectual history, the author explores the "commitment to the moral primacy of work" in the preindustrial economy of the North; the undermining of the value by the industrial revolution and factory; and attempts of reformers to revive work values. The monograph explains how the ethic permeated religion, children's storybooks, political rhetoric, and feminist controversies. A superbly written study with implications for today.

The New American Political System. Ed. Anthony King. Institute for Public Policy Research. p. \$6.75.

Ten widely recognized political scientists describe and assess the consequences of changes in political institutions during the 60s and 70s. They find no organizing public philosophy since the 1970s demise of New Deal cleavages. In a concluding essay, King sums up the systemic character of the changes, noting the proliferation and disintegration of extra-constitutional political structures. He stresses the atomized politics supplanting

the traditional coalition-building politics forged by the Founding Fathers. Further, King forecasts the disappearance of political parties and a media takeover of the task of sorting candidates, should a national presidential primary be adopted. Finally, with the dispersion of pockets of leadership and decision-making throughout the system, he asserts "no one" runs America. An important book.

Women & Art: A History of Women Painters and Sculptors from the Renaissance to the 20th Century. Elsa H. Fine. Allanheld & Schram/Prior. \$38.50; p. \$11.50.

An excellent review of the lives and works of more than 90 major artists from the early 15th century to the present, amply illustrated with monochrome reproductions and color plates. The author places the artists within a social, economic and cultural context and recounts obstacles to serious careers. She offers worthwhile insights and closes a considerable gap in scholarship.

GUY A. CARDWELL

The Origin of German Tragic Drama. Walter Benjamin. Trans. John Osborn. Schocken. \$16.

Reflections. Walter Benjamin. Trans. Edmund Jephcott. Harcourt Brace Jovanovich. \$12.95.
The melancholic, brooding, destructive Benjamin has been rescued from the oblivion that followed upon his suicide in 1940. He is now rated a major commentator on aesthetics, literature, language, and society. His writings embrace his book on baroque drama and eight volumes of brief pieces, some still forthcoming in Germany.

Philosophical Hermeneutics. Hans-Georg Gadamer. Trans. & Ed. David. E. Linge. California. p. \$3.95

An extensive introduction and well-chosen selections open up the most popular current conception of hermeneutics. Gadamer's ideas—drawing upon and diverging from Schleiermacher, Dilthey, and Heidegger—are of great importance to humanists and historians.

The Harvard Guide to Modern Psychiatry. Ed. Armand M. Nicholi, Jr. Harvard. \$29.50

An authoritative handbook for students and practitioners that may also be made to serve the general reader as a combination history and encyclopedia.

The Whispered Meanings. Simon O. Lesser. Eds. Robert Sprich and Richard W. Noland. Massachusetts. \$12.50.
Prefatory matter by the editors and the sometimes brilliant essays by Lesser can be read with interest and profit even by those who reject the application to

literary criticism of psychoanalytic method.

The Economy of Literature. Marc Shell. Johns Hopkins. \$10.

The sociology of literature has become a major field of interest. Now Shell offers a learned, fascinating study of the relationship between economic thought and linguistic matter.

The World Within the Word. William H. Gass. Knopf. \$10.

Gass, an admired critic and writer of prose fiction, follows Valéry, among others, in arguing for the autonomy of art. Readers of different persuasions can nonetheless be enchanted by the stylistic energy and originality of his critiques on writers like Malcolm Lowry, Gertrude Stein, Proust, and Faulkner.

The Composition of Four Quartets. Helen Gardner. Oxford. \$32.50.

Using extant drafts and relevant letters, Dame Helen Gardner clarifies numerous problems having to do with Eliot's sources, concerns, and intentions as he advanced toward the final text of a poetic masterpiece.

Samuel Beckett: A Biography. Deirdre Bair. Harcourt Brace Jovanovich. \$19.95.
This big book achieves importance chiefly because the writer interviewed friends and acquaintances of Beckett and gained access to unpublished letters. In view of Beckett's reputation for being a very private person, surprisingly intimate, painful details are included. At times the pages become vivid with sketches of the life of the arts in Dublin, London, and Paris.

Religious Art in France: The Twelfth Century. Emile Mâle. Ed. Harry Bober. Trans. Marthiel Mathews. Bollinger Series XC. 1. Princeton. \$40.

At present available only in part in English, the complete four volumes of Mâle's work, long recognized as a "foundation stone in the edifice of medieval studies," are being luxuriously offered in this series.

Life in the English Country House. Mark Girouard. Yale. \$25.

A handsomely illustrated account of the evolution of the country house from the fortified dwelling to the stately home of this century. Girouard is expert on architecture and informative as to the habits of occupants.

Inventing America: Jefferson's Declaration of Independence. Garry Wills. Doubleday. \$10.

A lively revisionist study that finds the roots of the *Declaration* in the philosophy of the Scottish Enlightenment and compels reconsideration of some firmly established opinions on Jefferson's mind and meaning.

The Reversible World: Symbolic Inversion in Art and Society. Ed. Barbara A. Babcock. Cornell. \$15.

Literary scholars are prominent among those from various disciplines who contribute to this excellent collection of articles on an aspect of a highly popular topic: symbolization.



RONALD GEBALLE

Geared to the Stars. Henry C. King. Toronto. \$50.

This book relates the history of astronomical clocks and planetary machines from Archimedes to late-model planetaria. We are accustomed to viewing devices of this kind as we tour ancient town squares in European cities and file through museums. King treats the details of their design and connects them with concurrent advances in astronomy and physics. In collaboration with John R. Milburn, he offers us through descriptions and profuse illustrations the opportunity to appreciate what is inside the devices and to recognize more fully the technological and artistic achievements they really are. Perhaps best of all, we learn about the designers and craftsmen themselves, their ingenuity, diverse backgrounds, friendships and rivalries, and the settings in which they worked. The importance of planetary devices for education is exemplified by a quote from a 1719 popular work, "O! pray! move on, Sir, said she, this is amazingly fine: I fancy myself travelling along with that little earth in its course round the gilded Sun, as I know I am in reality with that on which I stand, round the real one." King has given us more than a comprehensive reference work, it is an interesting and handsome one.

Essays and Papers in the History of Modern Science. Henry Guerlac. Johns Hopkins. \$20.

More than thirty years of scholarship by a primary figure in the history of science as presented in this collection of papers and essays. Guerlac's major research efforts have been directed toward the work of Lavoisier and the Newtonian period; both of these interests are well-represented here. In addition, some of his important writings on the relationship of the history of science to general history and the humanities are included.

Experiencing Science. Jeremy Bernstein. Basic Books. \$11.95.

Eight profiles of scientists by a working physicist with a considerable gift for interpreting science and the doing of science. Physics, biology and mathematics are represented. Five of the pieces appeared in periodicals. The semi-fictional account of the author's incomplete struggle to understand Godel's famous theorem is vivid and fun to read.

Cosmos, Earth and Man. Preston Cloud. Yale. \$14.95.

Unlike most such efforts, this book handles the complexity of its enormous range of subject matter with skill and lucidity. The theme is the interconnectedness of all we know about the universe from quantum physics through the formation of elements in the early cosmos, the evolution of the solar system and of earth, attention being given to the interactions between the young, restless earth and early life forms that produced the water and atmosphere necessary for us, the development of animal life and man, ending with a discourse on the predicament of an expanding population

on a finite planet. There is nothing dogmatic here, only the overarching integrative view of a broad-gauged, thoughtful scientist after a long and distinguished career.

The Second Law of Thermodynamics.

Ed. Joseph Kestin. Dowden Hutchinson & Ross. \$30.

A collection of thirteen of the papers most basic to the development of the Second Law and two others of later vintage, commenting on it. Where indicated, translations into English have been used or specially prepared. The longer papers have been excerpted. A valuable aid to the teacher and student.

On Aesthetics in Science. Ed. Judith Wechsler. MIT. \$12.50.

Growing out of a course taught by the editor that enlisted visiting lecturers, this volume contains six essays illuminating the central point of the course, "The choice of orientation is not necessarily set in science by the problem but by a mode of thinking." All are interesting; Cyril S. Smith's opener, "Structural Hierarchy in Science, Art and History" is a particularly valuable treatment of the relationship between parts and wholes.

The Kind of Motion We Call Heat.

Stephen G. Brush. North-Holland. 2 vols. \$75.

At the start of the nineteenth century the caloric theory of heat was dominant; at its end, Planck stood on the threshold of quantum theory. This comprehensive work covers the struggle for acceptance of the atomic viewpoint, the development of the laws of thermodynamics, the introduction of statistical concepts into physics. It treats historical and philosophical aspects of the growth of kinetic theory and offers biographical information as well.

EARL W. COUNT

Approaches to Archaeology. Peter J. Fowler. St. Martin's. \$14.95.

Within this matured discipline, all is not spade-work. The very conceiving of problems and ways to their inquiry, has carried the venture beyond the layman's grasp; yet interest and relevance have grown richer. Air surveys reveal (Britain's) ancient and current uses of surface; buildings, standing as well as fallen, are proper documents; excavation continues, but technically and interpretatively more refined; some antique constructive procedures can be replicated, that their durability and manner of decay may be studied. The layman need not be left behind.

Time and Traditions. Bruce Trigger.

Columbia. \$12.50.

A full-statured "New Archaeology" is or could be dynamic, a pathfinder of evolutionary and cultural processes; were it to transcend feature-analyses by querying systems, it might integrate nomothetic and idiographic procedures, and move toward "abolishing the false dichotomy between . . . science and history." Yes, some colleagues may well be heeding this leader. No, he is quite mindful of us

laymen among his listeners. May these essays prove a landmark.

Coins and Their Cities: Architecture on the Ancient Coins of Greece, Rome, and Palestine. Martin Jessop Price & Bluma L. Troll. Wayne State. \$30.

Coins perhaps always can tell the spade-men authoritatively what their own exposures of fundaments never can. Here is abundant and precise evidence of it—and a numismatist's delight.

Secrets of the Stones: The Story of Astro-Archaeology. John Michell. Penguin. \$2.95. Stonehenge is featured, though not exclusively. Like the natural histories of other sciences, this one has had its early, lore-burdened cranks who eventually were discredited, and its uncredited amateurs who finally won their vindication. Thus the story, from the 18th century to Lockyer's sound work in Egypt in 1890. Archaeologists have learned to suspect dabbling astronomers; yet astro-archeology has arrived to stay—what with its newer and sophisticated ways, applied from Britain to Mesopotamia; the very increase and shape of its riddles is an earnest of its reliability.

Archaeology in the Land of the Bible.

Avraham Negev. Schocken. \$12.50. Undoubtedly a noble procession of writings on this subject will continue for a long time to come; this little gem will be for the layman a sort of primer or an essential summary, from prehistory to the crusaders.

Anyang: A Chronicle of the Discovery, Excavation and Reconstruction of the Ancient Capital of the Shang Dynasty. Li Chi. Washington. \$25.

Anyang (lower middle Hvang-Ho) is one of the world's very few supreme archaeological recoveries; and no one has been more responsible for it than this dogged scholar and modest author. Chinese archaeology commenced with Occidental pioneers; their native pupils and successors made their way in the face of entrenched literary-historical authority—and even won it over.

The World of Odysseus. M. I. Finley. Revised edition. Viking. \$10.

" . . . European history began with the Greeks (and) . . . Greek history began with the world of Odysseus. (Yet) . . . history is the one field of study in which one cannot begin at the beginning." The importance to us of the Bronze Age world is unsurpassable; yet Homeric Troy itself belongs in the limbo of legend. This revision substantiates the limbo.

The Sea Peoples: Warriors of the Ancient Mediterranean. N. K. Sandars. Thames & Hudson. \$12.95.

Levantine-European culture-tradition's Bronze phase crumbled to Dark Age in the waning of the 2nd millennium B.C.—remarkably as did that of 1½ millennia later, and quite as meaningfully. Except that, in the earlier phase, the violent barbarians swarmed by sea as well as by land. This is a professionally thrifty account; precise, informative, readable, well illustrated.

MADELINE R. ROBINTON

Memorbook: History of Dutch Jewry from the Renaissance to 1940. Mozes Heiman Gans. Trans. Arnold J. Pomerans. Abner Schram. \$75.

This is a monumental book, literally and figuratively, eight hundred and fifty pages, nine by twelve inches in size, beautifully illustrated with paintings, drawings, engravings, and photographs and illuminated by skillful use of contemporary sources. It depicts and memorializes the life of the Jewish community in the Netherlands, beginning with the flight to Amsterdam of the refugees from the Spanish Expulsion in 1492, and later, of the Marranos fleeing the Inquisition in Spain and Portugal, and ending in 1940 when the Netherlands were overrun by the Nazis and the Jews were rounded up and sent to concentration camps in Germany. The community had prospered under the House of Orange. In the seventeenth century, Spinoza said, "It has been our rare good fortune to live in a commonwealth that warrants everyone complete freedom of opinion and worship." Only a small remnant of that community survives today. This book in Dutch has been reprinted four times in three years; its author has been called to the Cleveringa Chair at the University of Leiden.

Germany 1866-1945. Gordon A. Craig. Oxford. \$19.95.

This volume in the Oxford History of Modern Europe is a balanced and thoughtful account of the history of modern Germany from its creation by Bismarck. With his mastery of both historical and literary sources, Professor Craig of Stanford reveals how Germany developed its hegemony of Europe, politically and culturally. The incredible story of how the Nazis emerged and came to power and what they did with that power is skillfully narrated and consumes almost half the volume.

The Horse of Pride: Life in a Breton Village. Pierre-Jakez Hélias. Trans. Laurence Wylie. Yale. \$15.

This fascinating volume by the folklorist and ethnologist who teaches Celtic at the University of Rennes was written originally in his mother tongue, Breton, and then translated into French by him. Although non-political, it points up the inherent cultural conflict of an ethnic minority. It describes his life growing up in Brittany; although autobiographical, lyrical, and poetic as he details legend and peasant aphorism and wisdom expressed by his peasant grandfather, it has the additional strength of the disciplined mind of the anthropologist as he brings to life the villagers among whom he grew up. This is an absorbing book to read as he describes their customs and his own assimilation on being sent to the French Lycée in Quimper. In a final chapter he shows how Brittany itself has been assimilated to France by the impact of two world wars and modern technology. At the same time there has emerged among the young the creation of Celtic Clubs and the attempt to maintain

Brittany's identity by revival of the old traditions and customs that have lost the basis for their existence. A beautiful illustration of the new "ethnicity."

Norway to America: A History of the Migration. Ingrid Semmingsen. Trans. Einar Haugen. Minnesota. \$12.95.

This is the story of the Norwegian migration to America beginning in 1825 with fifty-two emigrants who sailed across the Atlantic in a sloop one quarter the tonnage of the *Mayflower*. It has been estimated that by 1920 the Norwegian population in America equalled half the population of Norway. Who they were, why they came, the increasing flow, where they settled, the communities they established as well as the communities from which they came—all this is integrated with the broad outlines of the significant and relevant developments in both Norway and the United States.

Anatomy of a Power Elite: The Provincial Governors of Early Modern France.

Robert R. Harding. Yale. \$20.

The Agony of the Republic: The Repression of the Left in Revolutionary France, 1848-1851. John M. Merriman. Yale. \$20.

What both these monographs in different periods of French history have in common is the skillful use of archival material, both public and private, to reconstruct the functioning of governmental institutions and therefore better evaluate the significance of their role and the social as well as the political milieu in which they operated. Harding deals with the problem of the relation of the intendants to the governors in Renaissance France; he focuses on a detailed study of the governors to question the use of intendants as a conscious move toward royal absolutism. He concludes it was rather "the collapse of aristocratic and local domination" that led to the development of intendency, a response to the weakness of the governors not to their strength. Merriman is concerned with the repression of the Left in Revolutionary France, 1848-1851; he pinpoints the mechanism of repression of the press, of associations, of assemblies, and the purge of radicals in positions of authority. Both authors refute or refine the generalized theories of historical development that have been applied to their respective areas.

JAMES G. STONE

A Child Goes to School. Sara Bonnett Stein. Doubleday. \$5.95.

In words and pictures, the book tells how children as children react to their world and the adult world.

Looking at Law School. Ed. Stephen Gillers, Taplinger. \$9.95.

This is a useful guidebook for anyone thinking about entering the legal profession.

Legal Handbook for Educators. Patricia A. Hollander. Westview. \$14.50. Education too has become a legalistic enterprise and this book is a practical guide.

Roots of Open Education in America.

Ruth Drogen & Arthur Tobier. City College Workshop Center. \$5. The authors have edited a series of chapters on the roots of open education, beginning with the Iroquois Confederacy, WPA schools of the Great Depression, through early progressive schools.

Four Critical Years. Alexander W. Astin. Jossey-Bass. \$12.95.

This is an authentic, up-to-date, much-needed report on the effects of college-going.

On the Idea of a University. J. M. Cameron. Toronto. p. \$3.95.

This paperback contains four lectures which argue eloquently the advantage of liberal education.

The Perpetual Dream. Gerald Grant and David Riesman. Chicago. \$15.

The well-known authors provide an overview and overall evaluation of the 1960s' innovations in undergraduate education.

Public Policy and Private Higher Education. Eds. David W. Breneman & Chester E. Finn, Jr. Brookings. \$16.95; p. \$7.95.

This book on the politics and economics of private higher education in America was written by staff members of the Brookings Institution.

Must We Bus? Gary Orfield. Brookings. \$16.95; p. \$7.95.

Another Brookings Institution report—this one on the whole issue, problems, and solutions to the desegregation problem in "el-hi" public school systems.

Freedom and Education. Eds. Donald P. Kommers & Michael J. Wahoske. Notre Dame. \$4.95.

The authors have edited a paperback covering the legal status of private "el-hi" education, beginning with the famous Supreme Court case in 1925 of *Pierce vs. Society of Sisters*.

The Gifted and the Creative. Eds. Julian C. Stanley, William C. George & Cecilia H. Solano. Johns Hopkins. \$4.95.

Commemorating the 50th anniversary of Terman's first study, the authors have edited eight essays on the gifted child from 1869 to the present.

Reforming Education. Mortimer J. Adler. Westview. \$14.50.

The well-known traditionalist presents a provocative discussion on liberal education and schooling at a time when back-to-basics has become a national trend.

School Stress and Anxiety. Beeman N. Phillips. Human Sciences. \$9.95.

For a look at another side of the present back-to-basics trend, read about the theory and measurement of stress and anxiety among children in school.

Supervision and the Improvement of Instruction. Nathan Stoller. Educational Technology. \$15.95.

Using a dialogue technique, the author offers his insights into the nature of learning, of teaching, of supervision.

SCIENCE AND VALUES

(continued from page four)

plants, on food processing, recombinant DNA research, and the like. In this way, some measure of external, knowledgeable, public criticism can be brought to bear on corporate and governmental decisions.

The philosophical point behind such action is the recognition that the scientific role in modern society has decisively shifted from a purely theoretical to a political one. As I see it, we are now able to appreciate the implications of what the propagandists for the new science told us those many centuries ago when they proclaimed, in Descartes' words, that science would make us "masters and possessors of nature." Scientific knowledge is not in fact an absolute end in itself; it is essentially technological, and therefore essentially political, that is, its costs and its benefits are necessarily of public concern. This is not to say that individual scientists are not motivated by a desire to discover the truth for its own sake, for they typically are. This is rather to say that, as an established communal activity growing out of western culture, exact natural science is best understood as part of a larger human project to objectify the natural order so as to be able to predict it, intervene in it, and control it. The application of scientific theory to the exploitation of nature is not an accident; the very forms of scientific explanation are such as to be "apt" for application. This is because the entire methodological style of natural science is one which seeks lawful relations among events. Its laws have the form: When-

ever A occurs or varies in such and such a way, then B will occur or vary in such and such a way. This is a formula for action. Practical application only awaits someone's thinking that it might be profitable to try to mobilize A's in order to produce B's.

If we understand this point, we see that scientific disinterestedness is at best provisional and, in the end, impossible. Scientific inquiry serves a genuine human interest in the control of nature and, consequently, ethical and political considerations are appropriate in the planning, carrying out, and application of all research. If this philosophical thesis is taken seriously, scientists and non-scientists alike will be more likely to think realistically in the political arena on matters relating to science policy and technology assessment.

Let me put my conclusion about the confrontation between science and anti-science in the following way: There is a crucial distinction to be made between science and scientism, the view that science alone is sufficient for human understanding; and a correlative one between technology and a faith in the omnipotence of technology. Science and technology are deeply important tools with liberating social benefits as well as serious risks. Scientism and faith in technology, on the other hand, are socially destructive myths. The true targets of the humanistic critique of science are these myths which need to be exploded, both for the health of science and for the realization of our deepest human values.

The Danish philosopher Søren Kierkegaard once told of a man traveling in

a strange town. As he was going by a shop window, he looked in and saw a sign which said, "Philosophy done here." He rushed in to ask if he could buy some, only to find that the sign itself was for sale! There are no demonic forces or magical powers at work in the world. No one can do our problem-solving for us. We have to take the sign, or read the signs, and try to solve them for ourselves.

BOOK AWARDS

(continued from front cover)

of them simple or easy, into the perspective of history, noting their relations to philosophy, literature and art, and then telling how, in his judgment, they stand today in the light of past and current research and thought. That, along with a flowing, apt style, is how he manages to inform, stir and excite the reader about localization of diverse functions in the brain, about the body-mind problem, consciousness and free will, about sleep and dreams, about memory, learning and language, about the complex relation of vision to external reality, about mental illnesses and the collective mind of society."

Born in Stratford-on-Avon, Dr. Blake-more has many American connections. After receiving his B.A. and M.A. degrees from Cambridge University, he received his Ph.D. degree from the University of California at Berkeley in 1968, and has served as Visiting Professor at New York University and MIT. Beginning in October 1979, Dr. Blakemore will assume the duties of Professor of Physiology and Head of the Physiology Department at Oxford University.



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