



The Key Reporter

VOLUME XLII □ NUMBER FOUR □ SUMMER 1977

CHAPTERS SPONSOR VARIED PROGRAMS

The annual reports which chapters of Phi Beta Kappa send to the Washington office indicate that many interesting and varied programs are sponsored by the Society's campus constituents.

Several chapters marked the Bicentennial by holding impressive symposia and lecture series. At Colby College, the participants in a two-day symposium on "The Next Two Hundred Years" were Ellen Burstyn, Robert Heilbroner, Linus Pauling and Paoli Soleri. At Lake Forest College, "British Arts and Culture" was the theme of both lectures and creative arts presentations. Continuing its established program of cultural activities, the chapter at Boston University sponsored a Robert Frost Celebration, "Friends Remembering Robert Frost." Informal reminiscences of Frost revealed much hitherto unavailable biographical material. The gathering was one in an annual series arranged and conducted by the undergraduate members of the chapter.

Another project to involve undergraduates in Phi Beta Kappa activities was undertaken by the chapter at Sweet Briar College. Members-in-course of the Virginia chapters were invited to submit scholarly work, such as honors papers and the results of individual research, for presentation at the first Phi Beta Kappa Intercollegiate Forum. One of the student participants was a direct descendent of Chief Justice John Marshall, a founder of the Society.

A great many chapters give awards for outstanding scholarship at various levels of the educational ladder. In a departure from the more frequent prizes to upper-classmen, the Alpha of Tennessee at Vanderbilt has inaugurated Freshmen Seminar book awards to encourage academic excellence at an early stage in students' careers. Undergraduate members of the chapter judge the papers and supporting documents of those nominated by their instructors. Since 1950 the chapter at the University of Iowa has presented

four annual awards to Iowa high schools, classified by enrollment, whose graduates in their first year at the University attain the highest combined scholastic average. Other chapters, such as Theta of Massachusetts at Mount Holyoke, give prizes for creative and critical work for which all students are eligible.

At a number of institutions, chapters also give awards to outstanding professors and attempt, in several instances, to honor especially good teaching or the promising work of younger scholars.

GIFTS TO PHI BETA KAPPA

Members of Phi Beta Kappa will be interested to know that the United Chapters has recently received two bequests of approximately \$10,000 each. These sums have been added to the endowment of the Phi Beta Kappa Foundation. Income from the foundation provides the funds to meet the annual operating deficit of the United Chapters.

The two bequests were the gifts of Marjorie B. Vary and May Oakley Horning. Mrs. Vary was elected to the Society at Wesleyan University in 1915. She was a long-time resident of Kalamazoo, Michigan before moving to Clearwater, Florida. Because her major philanthropic interests were in education and in the fine arts, she left gifts not only to Phi Beta Kappa but also to Kalamazoo College, the University of Wisconsin and the Museum of Fine Arts of St. Petersburg, Florida, as well as to other institutions and organizations.

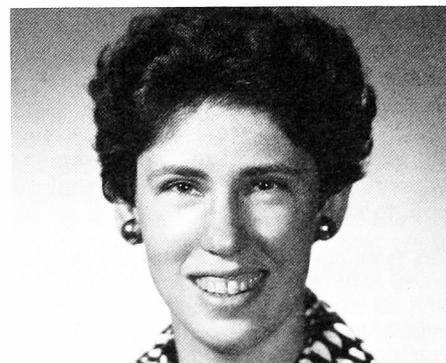
Mrs. Horning, also a resident of Florida, maintained many connections with her home state of Ohio. She received her B.A. and was elected to Phi Beta Kappa in 1907 at Flora Stone Mather College (now part of Case Western Reserve University). Her alma mater and several other Ohio institutions were also beneficiaries of her estate.

SIBLEY FELLOWSHIP WINNER

The Mary Isabel Sibley Fellowship for 1977 has been awarded to Barbara Burrell, a Ph.D. candidate in classical archeology at Harvard University. The subject of Miss Burrell's dissertation is an interdisciplinary study of the Greek cities in Asia Minor that were awarded the title "neokoros." This much-sought-after grant entitled them to build temples and maintain a cult in honor of the reigning Roman emperor. One of Miss Burrell's special fields of interest is numismatics, and it is from ancient coins and medals that she expects to collect much evidence relating to the urban social and religious institution of the neocorate to add to the literary, historical and archeological research she has done. During her fellowship year, Miss Burrell will use her \$6000 stipend to travel to England, France and a number of other countries to study major coin collections.

The new Sibley Fellow completed her undergraduate work at New York University where she was elected to Phi Beta Kappa. While a graduate student at Harvard, she has served as Keeper of the Coin Collection at the Fogg Museum, participated in archeological expeditions and spent one year at the American School of Classical Studies in Athens.

The Sibley Award for 1978 will be offered for French language and literature. Candidates must be unmarried women between 25 and 35 years of age who hold the doctorate or who have fulfilled all the requirements for
(continued on back cover)



Barbara Burrell

HUMANITY IN SCIENCE: A Perspective and a Plea

by June Goodfield

As we meet here in Denver we are the heirs of a worthy tradition which goes back some 146 years — to 1831 when the British Association for the Advancement of Science held its first meeting in York and started these annual celebrations of worthy endeavour and high purpose. If we look at this present gathering, and retrospectively at history, we are tempted to deduce that all is well with the relationship between science and society, and that 146 years ago all, indeed, was well; that from the beginning, the public and the scientific profession have had a happy partnership. Both deductions are quite wrong. All is presently not at all well with the relationship between science and society; and in the early years, too, when the scientific profession was born in Europe, all was not well. There were, in fact, very great tensions as the profession emerged, and, equally, there are some now. I shall argue that at least one of the problems that lies at the root of some of our present tensions was also a spectre at those early feasts, and has haunted the profession ever since. It is the theme of my lecture: the problem of humanity in science.

This phrase can have several meanings. Let me first just tease them out. Marie Curie once said, "Science deals with things, not people." Difficulty arises if and when scientists and technologists are tempted to deal with people as things. It arises from the inevitable stance of detached objectivity with which a scientist must approach the natural world. It can be no problem, or, as recent work in the biomedical sciences and genetic engineering demonstrates, it can be a serious one. At this time, when the social contract between the scientific profession and society is in the process of being renegotiated, humanity in science, considered in these terms, becomes deeply significant.

The second interpretation of this phrase focuses on the human beings who do science, those remarkable people who come to us in an assemblage infinitely more varied than Heinz's 57 varieties of soup. It is difficult to reach out and touch the humanity, or the humaneness, in the people who do science, because science is

essentially a communal activity whose results must be expressed in passive-voice terms in order to be understood by anyone throughout geographical space and historical time. The expressions of science come in forms from which all the human content has necessarily been drained. So there are questions: Who are the people who do science as individual human beings? What is the relationship between them and the scientific ideas they create? How and in what form are individuality and creativity brought to bear and expressed in science? These are pressing matters which have not received the attention they deserve. There is another related question as well. Why, with very few exceptions, have these themes or these people never stimulated great works of literature or art?

Finally, the problem of humanity in science can refer to the relationship between scientific and humanistic modes of thought and their impact upon one another. This theme touches upon the central core of creativity that lies at the heart of humanistic and scientific work.



The founding of the British Association for the Advancement of Science was stimulated by a book by the English mathematician Charles Babbage, *Reflections on the Decline of Science*. The book was written in 1830, at a time when the word 'scientist' was not even coined. After travelling extensively on the Continent, Babbage came to the conclusion that measured by most criteria — status, honorary distinction, or government post — science did not enjoy a status comparable to other professions in England. Not only was it in a very inferior position; it was not a profession at all. As a result, the British Association for the Advancement of Science was formed, and held its first meeting in York in 1831. What were the motives of its founders? I will quote: "To give a stronger impulse and a more systematic direction to scientific inquiry and to obtain a greater degree of national interest in the objects and prosecution of science." What were their aims? The

members of the Association did, indeed, want to remedy the situation that Babbage had portrayed, but they also felt that by showing society the practical justification for the existence of science — by demonstrating science's capacity to respond to social problems — they would strengthen the ties between the practitioners of science and the public. In other words, they had Rousseau's original social contract in mind, defined as a situation of mutual support in which each party relinquishes a measure of freedom for the wider social good.

While all their initial efforts were not quite disastrous, it is absolutely true to say, in the words of Wellington after Waterloo, "It was a damned close run thing." For ten years the profession and the British Association were subjected to indifference, derision and parody, and at times were treated with such humiliation by the newspapers that one wonders how the profession got off the ground at all. It must be admitted that, to a certain extent, the members of the British Association were sitting ducks for parody, for as membership increased so did the publicity both before and after the meetings. As the publicity became more flowery and full of puff, the hospitality grew more lavish and the dinner menus lengthened. These were published along with the scientific papers! After the Newcastle Meeting in 1838, the *London Literary Gazette* printed a report from the *Newcastle Journal* that listed the amount of game donated to the feast by the aristocratic lords of Newcastle, "to prove that gastronomy beats astronomy." The *Times*, reporting on the very same meeting, spoke of the grand promenade in the ballroom of Newcastle's finest hotel, where some 4,000 people were entertained. In spite of the association's very genuine attempts to improve public understanding of science, what in fact emerged was an indiscriminate mixture of science, technology, pomposity and vanity.

One particular gadfly was Charles Dickens. In 1837, when he was the editor of *Bentley's Miscellany*, he wrote an account of *The Full Report of the First Meeting of the Mudfog Association for the Advancement of Everything*. Among other things, Dickens described Mr. Tickle's spectacles, which had been designed to enable the wearer to discern, in very bright colours, objects at a very great distance, but which would render him wholly blind to those immediately before him. He parodied recent government reports by questioning whether one could utilize the labor of

This is an abridged version of the ØBK-AAAS lecture delivered on February 24, 1977. Dr. Goodfield is the author of The Siege of Cancer, now available in Dell paperback, and of Playing God, to be published in September by Random House.

industrious fleas in the zoos. The thrust of Dickens' parody is not difficult to fathom: the first thing he hated was humbug; the second was the denial of humanity.

The detached, objective stance that Dickens disliked has served and will continue to serve scientists admirably as a methodology when they are investigating the passage of gases through the pores of a leaf. But it becomes a source of concern when we look at the effects of recent biomedical research work or many of the implications of recombinant DNA research as they relate to human genetic engineering. Whenever science begins to impinge on the autonomy of human beings such problems come up, and they force us to re-examine in a new setting a question first posed explicitly in mid-nineteenth century by a president of the British Association: Where is the allegiance of scientists properly due? Is it to an abstract ethic? Is it to a methodology? Is it to themselves as a profession, or to society?

In the nineteenth century it was taken for granted that the profession's allegiance was solely to a disinterested search for truth. But in the last quarter of this century it has surely become clear that there are new ethical imperatives operating both on science and on society. For example, the United States has the most sophisticated biomedical research establishment in the whole world and a scientific profession which is highly privileged. I agree with the distinguished immunologist Dr. Barry Bloom that it is both morally right and scientifically possible for us to concentrate some of our intellectual and technological effort on the pressing medical problems of the Third World — leprosy, malaria and schistosomiasis for a start. There is something distasteful in the sight of a highly developed society expending great resources, both financial and intellectual, on the cure of its own self-inflicted diseases. We can characterize these diseases which arise from excesses in our lifestyle or from the pollution of our environment as diseases of choice. The World Health Organization estimates that to do an effective interdisciplinary remedial job on Third World diseases, those that arise not by choice but by causes external to the people themselves, would cost only fifteen million dollars per annum. I would like to see the development of a *Scientific Peace Corps* devoted to tackling such problems, to gaining much more knowledge and to helping implement solutions compatible with the cultures and aspirations of Third World countries. Nothing would do more political good

for this nation and no single act, I think, would bring more decency into the world.

I should emphasize that there is nothing God-given or immutable in the scientific profession's allegiance to the apolitical disinterested search for truth. Even in the seventeenth century, more than one third of the papers of the Royal Society were about social problems and the relationship of science to them. In addition, as we have noted, the initial aims of the British Association were to bring the problems of society and the skills of science together. We now have the need for a similar emphasis in the late twentieth century. I do not wish this point to be misunderstood. This is not a plea for less basic research. Not only is basic research essential, but I am continually impressed with how such work can have an impact in other areas — how, for example, basic immunological studies bear immediately on auto-immune disease. This plea is for a change in attitude and for a research program directed to the problems I mention.

Having touched on one critique, that science is cold and inhuman and does not concern itself with the needs of society, I shall now take the second critique as my next theme. Somehow science manages to extract the warmth and beauty from the world and also to drain the humanity from the personalities of the practitioners of science. Consequently, insofar as they are scientific, our solutions to society's problems inevitably become inhumane and cold, too. It is argued therefore that science can provide neither tools nor methods for improving and humanizing our society.

One counterclaim has been offered. In the effort to humanize ourselves, to enhance our ethical and moral sensibilities, people have often appealed to the humanities to do it for us, almost as to an ideology. The redemptive power of the humanities to produce an enlarged consciousness, to make us aware of the reality of our human predicament, and to enlarge our sympathies, has been an important theme in Wordsworth, in Shelley and in many twentieth-century writers. I am skeptical about this assumption. People can be extraordinarily sensitive to music and poetry and not necessarily apply this sensitivity to their daily lives. George Steiner in his essay, *In a Post-Culture*, has reminded us that people returned from a day's work as guards in the concentration camps and then put Mozart on their gramophones. Let us ask ourselves if the Shakespearean plays, with their almost God-like

insight into the way that people behave, made people understand more, act better, or feel nicer — more humane. It was with considerable surprise that I learned from Professor David Daiches that the people who went to the Globe Theatre and saw those marvelous dramas, with their rich poetry and their human understanding, would at the same place, in the same afternoon, watch a monkey tied to the back of a horse being chased by dogs who slowly bit it to death. I think it unfair and unwise to create a myth of the therapeutic power of the humanities. They are good in themselves and should not be regarded as remedies for our failings. I think, too, that we must not delude ourselves into believing that words and university courses are a substitute for human hearts and human action.



To return to my second question: Why is there the myth that humanity and warmth are being drained from the world by science, and how is it that scientists have not been the objects of great works of art or literature? There are, of course, a few famous exceptions, such as George Eliot's *Middlemarch*, Sinclair Lewis's *Arrowsmith*, and to a certain extent the novels of C. P. Snow. Here again we must review the historical background. In the early years of the French Revolution, the romantics initially heralded the new age of freedom and reason as a time when poetry and science would lie down like the lion and the lamb and inspire and celebrate together. By the middle of the nineteenth century this assumption had faded. Partly, it was the Terror followed by Bonapartism that smashed the vision; partly, it was the effect of the Industrial Revolution, which led to scientists being equated with the engineering devils who had blackened the face of England. The New World that emerged seemed totally alien to the world of poetry and art. Moreover, the scientist came to be viewed as the detached onlooker who stood aside from the world. So the rift began. Among the poets and the artists there was the cultivation of that inner realm of feeling which poetry and not science would reflect, a place a scientist would never inhabit and could not understand.

One consequence of this rift was reflected in education, a second in the ignoring of science and its ideas as themes for artists. For example, the relationship between a sensitive artist and bourgeois society, which has been a major theme of literature, never found its counterpart in literature about science. The psychology of artistic creation has been with us for 200 years, and even though Poincaré raised similar questions about scientists, no one has ever gone deeply into the psychology of scientific discovery. The human themes around science are vivid and fascinating but remain unexplored. Writers don't know how scientists work. They see science as power or politics, but there is no account of the way the scientific imagination is expressed. Yet, if you wish as a sympathetic hero a man of imagination, of intellectual interests, of deep moral dilemmas, a scientist, especially, perhaps, a recombinant DNA scientist, would fit the picture not only as well as an artist or a writer, but perhaps better.

It may be argued that we do, after all, have a long tradition of looking at science. We have indeed the professional scrutineers of the enterprise, the philosophers and the historians of science. But how have we professionals measured up? Have we succeeded in getting science to recognize its own likeness? No. Judged by scientists and others, much philosophy of science has been just downright irrelevant, at best a series of brilliant axiomatic games, more often pretentious nonsense. Even worse is what has been omitted. Reichenbach said, "Philosophers of science are really not interested in the context of discovery but only in its justification." Where philosophy is incomplete, it fails.

What of history of science, the profession I have chosen to practice for the greater part of my academic life? I look around and ask, "Where in history of science is our Macaulay, our Namier? Come to that, where is Tolstoy?" History as we know it is a mosaic made up of bits of everyday, individual events. We derive the pieces of the mosaic from a whole variety of sources over and above formal academic articles — from newspapers, journals, diaries, cabinet documents, etc. The real historian is the one who can piece them together imaginatively and so present the past to us in its full, vivid color. We have seen almost nothing of this kind attempted in history of science. There are, of course, a few notable exceptions such as Gerald Holton on Einstein and Charles E. Rosenberg in *No Other Gods*. Both are

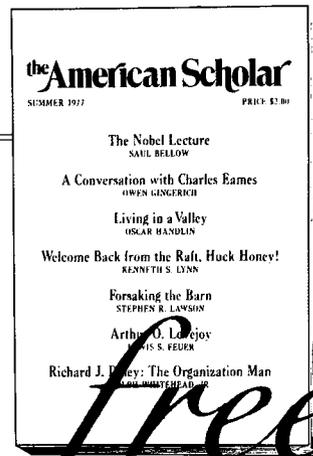
convinced that the scientist's subjective state of mind has a marked influence on the progress of science. Koestler's vivid account of Kepler in *The Sleepwalkers* is another example as is that delectably waspish memoir, *The Double Helix*, though perhaps we would be much better advised to turn not to Watson, but to Ann Sayre's *Rosalind Franklin and DNA*.

To be fair to the members of my profession who I by no means disavow, science makes it very difficult for us to comprehend its history. First, the pieces of the mosaic are often just not there. And second, because of editorial demands, as Sir Peter Medawar has said, a scientific paper not only conceals but in fact actually misrepresents the reasoning, the imagination and the creation that has gone into it. Medawar also emphasized that the past of science does not have a dignified independent existence of its own, for a scientist's present work is of necessity shaped by what others have done and thought before him. Science is a wave-front of a continuous process that carries its own history with it.

Even admitting the difficulties, I still believe that we historians could, and should, be much more imaginative and comprehensive. I am confident that this is possible because during the last two-and-a-half years I have been following Sir Peter Medawar's recommendations, and Gerald Holton's, and have been listening in at the keyhole of daily science. I have, in fact, been living with one group of scientists, day after day, as they do science, not as they afterwards say they do science. I have been seeing the smudges, the thumbprints and bloodstains of a personal struggle with one's ideas. Now, after twenty years in orthodox history of science, I am appalled that I could have so ignored the very human core of its history. Where are the people that as an historian of ideas I wrote about? Did I paint them so that I could recognize them and their unique personalities and how they bore on their science? Could I have talked to them, or recognized them on the street? No, I could not. My plea is that it is time to recognize and apply to the history of science the lessons of Vico and Herder so beautifully expounded in the latest book by Sir Isaiah Berlin.

History is not an unknown country. It is a study of the human past as a form of collective self-understanding of human beings and their world. It is a story of human activities, what men did, what they thought, what they suffered, what they strove for, what they

(continued on back cover)



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ELLIOT ZUPNICK

Britain's Economic Problem: Too Few Producers. Robert Bacon & Walter Eltis. St. Martins. \$14.95.

The authors, Oxford economists, locate the major source of Britain's postwar economic difficulties in the political decisions which resulted in a too rapid expansion of the non-marketable goods sector. These decisions left the marketable goods sector with insufficient resources to supply an adequate flow of investment goods, exports and consumer goods. The inevitable results, according to the authors, were a slow growth rate, balance of payments problems and inflation. This thesis, however, does not bear close scrutiny. It was not the decision to expand the output of the non-marketable goods sector that was at fault but rather the failure to implement this decision with appropriate monetary and fiscal policies. Inflation and balance of payments deficits reflect imbalances between aggregate expenditures and output and not the composition of final output.

How Japan's Economy Grew So Fast.

Edward F. Denison & William K. Chung. Brookings. \$10.95; p. \$4.95. Between 1953 and 1973, Japan's national income expanded by a phenomenal 543 percent while income per capita increased by 400 percent. What are the sources of this growth? Can the growth rate be sustained? Applying the methods developed by Denison in two earlier studies, the authors estimate that 72 percent of the Japanese growth over this period can be attributed to three factors: an increase in the capital-labor ratio (27%); advances in knowledge (25%); and economies of scale (20%). Because much of Japan's recent expansion reflected a "catching up" phenomenon, the authors suggest that the 9.6 percent annual average growth rate Japan enjoyed between 1961-71 is likely to be reduced to around 3 percent by the year 2000.

Industrial Organization in Japan. Richard E. Caves & Mas Uekusa. Brookings. \$9.95; p. \$3.50.

That the organization of industry in Japan differs markedly from that in the West has been often noted. Western observers have called attention, *inter alia*, to the system of permanent employment, the low regard with which the pursuit of profit is held in Japan, the duality in the factor markets which results in widely different wage and interest costs to firms of different sizes, the heavy involvement of government in economic activity and the extensive cartelization of industry, and have concluded that these "Japanese

influences" must have an adverse effect on the functioning of the economy. The distinctive feature of this study is that it subjects this assumption to rigorous tests. The results, frequently surprising, help put the Japanese economy in better perspective.

Industrialization in the Low Countries, 1795-1850. Joel Mokyr. Yale. \$20.

Belgium and Holland, "two economies of similar size and location with comparable lingual and cultural traditions," underwent widely different experiences between 1795 and 1850. Belgium succeeded in transforming itself from one of the most economically backward countries on the continent to the most industrialized, while Holland, on the other hand, stagnated. Mokyr relies on modern developmental models to explain the divergent paths taken by these two economies. Despite a relative absence of hard data, this study illustrates how productive the blending of economic and historical analyses can be.

Economic History of the Jews. Ed.

Nachum Gross. Schocken. \$15; p. \$5.50. This book consists of a collection of articles initially written for the **Encyclopedia Judaica**. Professor Baron's survey of the economic history of the Jews from the earliest times to the onset of the modern period is masterly and reflects the broad sweep and wide erudition for which he is justly celebrated. Arcadius Kahan's essay covering the modern period is a superb complement to Baron's essay. Shorter studies on the role of the Jews in agriculture, industry and services complete the volume. This book provides a good introduction to a fascinating, complex and little known area.

VICTORIA SCHUCK

Electing Black Mayors: Political Action in the Black Community. William E.

Nelson, Jr. & Philip J. Meranto. Ohio State. \$20. The authors analyze black politics in northern cities by closely examining the St. Louis, Cleveland and Gary mayoralty elections of 1967. They argue that electoral victories do not liberate black communities and offer several radical alternatives.

Marathon: The Pursuit of the Presidency 1972-1976. Jules Witcover. Viking. \$10.

The Election of 1976: Reports and Interpretations. Gerald Pomper and Colleagues. Ed. Marlene M. Pomper. David McKay. \$8.95; p. \$3.95.

Participation in American Presidential Nominations, 1976. Austin Ranney. American Enterprise Institute. p. \$2.25. Three genres of campaign literature

furnish varied approaches to the 1976 election. Veteran newspaper man, Witcover, has written a mammoth, fast-moving and absorbing narrative of the presidential campaigns of candidates from invisible beginnings through the election. The book is no rewrite. The author incorporates new material and adds new insights to the ordeals, mistakes, and triumphs. The seven short reports by five political scientists substitute facts for features and include congressional, state and local elections as well as the presidential. A Pomper chapter sees the presidential election as a national rather than a sectional decision. Ranney in a 36-page pamphlet focuses entirely on nominating systems and finds that none of the goals of the advocates of "participatory democracy" have been achieved.

Women and Equality: Changing Patterns in American Culture. William H. Chafe. Oxford. \$8.95.

Sex Roles in the State House. Irene Diamond. Yale. \$12.95.

Nobody Speaks for Me! Self Portraits of American Working Class Women. Nancy Seifer. Simon & Schuster. \$10.95.

Three important books address the subject of sex roles and equality in America. The historical essays of Chafe present fresh analysis of the characteristics of social controls and social change as they relate to women and the Women's Movement. Almost two-thirds of the book is devoted to a discussion of the analogy of sex and race, a parallel which he contends is useful not as a description of the condition of women and blacks but as illustrative of the process of change and control. The deftly written empirical study by Diamond like that of Chafe concludes by calling for a restructuring of the institutions of American society. Her book divides into two parts: the first tells us where women are in state legislatures (the greater the competition for seats, the fewer the women); the second delineates sex differences and women's legislative roles. Ten oral histories of working class women by Seifer emphasize the emergence of women from housewifery to activism and even leadership in solving family, job, and community problems.

Tweed's New York, Another Look. Leo Hershkovitz. Anchor/Doubleday. \$12.50.

History has left us with the image of "Boss" Tweed guilty of corruption to the core. Not so, states his new biographer who with New York City's recently discovered financial records and family papers in hand seeks to rehabilitate the 19th century Schem of Tammany Hall. He pictures Tweed as the progressive force shaping a city destined for greatness.

The Lawless State: The Crimes of the U.S. Intelligence Agencies. Morton H. Halperin & Others. Penguin. p. \$2.95. A description drawn from documentary sources of the transgressions perpetrated by the CIA, FBI, the National Security Agency, Military Intelligence, the IRS and even grand juries that have endangered our constitutional system.

RONALD GEBALLE

Science and the Media. Peter Fargo. Oxford. \$8.75.

This thin volume analyzes the difficulties in the way of communicating science to the general public, those problems inherent in the nature of science and those peculiar to the press, magazines and television. The troublesome characteristics of scientists and of journalists are also treated. It is a thoughtful work, providing insight for academics who feel it important to do better with the task and who want to understand the obstacles.

Symmetry Discovered. Joe Rosen. Cambridge. \$11.95.

An easy introduction to symmetry in geometry and in time, leading to its appearance in natural phenomena and its value in constructing physical theories. Many examples are given and the author has included a useful bibliography. He writes carefully and with enthusiasm.

Highlights in Astronomy. Fred Hoyle. Freeman & Co. \$10; p. \$5.50.

The distinguished author uses his profound knowledge of the subject and his widely-appreciated skill as a writer to present a simple account of the solar system, stars, galaxies and the universe, not omitting to offer his views on the possibility of life elsewhere. His attempt to "present something of grandeur and the precision of the things we know about" within the confines of such a short volume is remarkably successful.

Space Structures: Their Harmony and Counterpoint. Arthur L. Loeb. Addison-Wesley. \$19.50; p. \$9.50.

An explication by a Philomorph, one of the group of people who delight in their consciousness of the patterns that underlie virtually everything in nature and are important to abstract knowledge as well as to games, entertainment and the arts. The reader learns why Buckminster Fuller's geodesic dome is designed the way it is, why a cube cannot possibly be rigid and that valency is a more basic concept than chemistry students realize. The book shows how simple but rigorous mathematics leads to elegant understanding of structure.

The Solvay Conferences on Physics: Aspects of the Development of Physics Since 1911. Jardish Mehra and D. Reidel. Dordrecht, Boston. \$59.

The Solvay Conferences have been attended by most of the great figures of the century, among whom fateful exchanges took place, especially during the early days of quantum theory. The Bohr-Einstein discussions were the most famous, but on the whole no more influential forum has existed for Physics. Originating from the concern of Ernest Solvay, an industrial chemist, who had heard about the difficulties of reconciling the classical Maxwell-Boltzmann kinetic theory with the newer concerns introduced by Planck and Einstein, there have been 16 conferences to date. The book traces the topics of each and contains much interesting history and many fine anecdotes; a fair amount of technical expertise is needed to appreciate parts.

Cosmology Now. Ed. Laurie John. Taplinger. \$10.95.

"Now" in the history of the cosmos might or might not be a unique moment but in the history of cosmology it is a particularly interesting one. Astronomical discoveries made within the past few years have combined with advances in physics and in computational technology to enable the speculations of cosmologists to range more soundly than ever before into distant reaches of time and space. Eleven eminent scientists give their impressions of what is solidly understood, where controversies rage and the ways in which the known fundamental laws of physics are being strained to the limit and beyond in order to encompass observation and yield a consistent story. In his introduction, Sir Bernard Lovell asks that the book "be read as the authors intended — the best description of the universe which can be given today — and not as a final solution to a problem whose immensity we still may not be able even to envisage." It is made pleasant to read by an informal, non-mathematical style (it has been adapted from a BBC lecture series) which continually reminds that cosmology is made by persons rather than anonymous workers.

GUY A. CARDWELL

A Supplement to the Oxford English Dictionary. Ed. R. W. Burchfield. Oxford. Vol. II. \$60.

Two additional volumes will complete this updating of the greatest dictionary ever made. Indispensable.

Dionysos: Archetypal Image of Indestructible Life. G. Kerényi. Trans. Ralph Manheim. Bollingen Series LXV. 2. Princeton. \$30.

A richly informed account of the god from his Minoan origins to late Roman times. Handsomely produced.

The Monastery of Saint Catherine at Mount Sinai: The Icons. Vol. 1. Kurt Weitzmann. Princeton. \$85.

Pre-iconoclastic Byzantine icons so numerous and exceptional that this presentation may revolutionize the history of the field. Plates, many in color.

The Mycenaean World. John Chadwick. Cambridge. \$17.95; p. \$6.95.

A readable though sometimes technical description of Greece during the Bronze Age. The famous author gives documentary evidence complemented by the more usual archaeological evidence.

The Heritage of Apelles: Studies in the Art of the Renaissance. E. H. Gombrich. Cornell. \$22.50.

Papers by a notable historian tracing the role of the classical tradition in Western art. They show how artists demonstrate originality in imitating nature and in realizing sensuous beauty.

Dostoevsky: The Seeds of Revolt, 1821-49.

Joseph Frank. Princeton. \$16.50. The first impressive volume of what promises to be a definitive four-volume

life that utilizes scrupulously assembled biographical and social-cultural data to illuminate the writings.

Vico & Herder: Two Studies in the History of Ideas. Isaiah Berlin. Viking. \$12.50.
Spiritus Mundi: Essays on Literature, Myth, and Society. Northrop Frye. Indiana. \$11.50.

Thought, Words and Creativity: Art and Thought in Lawrence. F. R. Leavis. Oxford. \$10.

Sociology as an Art Form. Robert Nisbet. Oxford. \$8.95.

These four titles by a philosopher-historian, two literary critics, and a sociologist treat related topics, most of which were scrutinized from new perspectives by Vico and, a little later by Herder. Current interest in language, poetry, myth, religion, science, civilization, barbarism, and their relationships remains intense.

The Autumn of the Patriarch, Gabriel García Márquez. Harper & Row. \$10. Latin American novels have captured international attention within the last few years, and this passionately rhetorical political fantasy of a dictator is one of the most compelling.

JAMES C. STONE

Handbook for Successful Urban Teaching. Johanna K. Lemlech. Harper & Row. \$8.95.

Here is a book that is what the title says it is — a practical and theoretical guide for successful teaching in urban (most) schools. The volume has been carefully and creatively put together to serve the needs of preservice students learning to teach. Of its unique features, I applaud the author's scholarly approach combined with real-world applications, achieved through a workshop section at the end of each chapter. The book is well-grounded on sociological and psychological theory and many charts and diagrams are used to add clarity to these discussions. The final chapter is "Mainstreaming" — one of the latest challenges to face the nation's schools.

Education for Human Development.

Mario M. Montessori, Jr. Schocken. \$7.95. The author, Maria Montessori's grandson, draws on his experience as a psychologist to up-date and modernize Maria's once radical idea that society must discover the child and structure experiences to bring him into the modern world. I like the stress placed on the importance of ecology as a major facet of modern Montessori education.

Traditions of American Education.

Lawrence A. Cremin. Basic. \$8.95. Professor Cremin knows the history of education better than most historians, and knows how to tell this exciting story in scholarly, readable fashion. The origin of the book was a series of lectures — the Merle Curti Lectures — at the University of Wisconsin and covers the Colonial Experience (1607-1783), the National Experience (1783-1876), and the Metropolitan Experience (1876-1976). Cremin was the former education

reviewer for the **Key Reporter**, and his many readers will find this little volume a reminder of his authoritative sweep, precision and style.

Schooling American Society. Ramon Sanchez. Syracuse. \$12.

The author, who teaches educational philosophy at Hunter College, reexamines the democratic ideology, beginning with Plato and Rousseau and on through the various periods of American education. He documents the contradictions of our times between the democratic dream of the distribution of power vs. the stark reality that our schools preserve the power of the elite. The author proposes a model, with special reference to New York City. New Yorkers should read it. It just might work.

Race, Color, and the Young Child. John E. Williams & Kenneth Morland. North Carolina. \$12.95.

After fifteen years of researching what and how children learn about race and color, the authors have put this volume together in order to share what they have discovered and point out what still needs to be learned. They have carefully integrated their own findings with those of other researchers, making the volume a valuable, comprehensive treasure. Consider the educational implications of this one finding: "Virtually every child has experiences early in life which lead to the development of a preference for light over darkness."

Facing the Future: Issues in Education and Schooling. Eds. John I. Goodlad & J. S. Golub. McGraw-Hill. \$7.95; p. \$4.95. This volume is a reprint of 16 articles that have been published over the past decade. The editors have updated the material, offering interpretations and trends. Readers who like to dream of better education for tomorrow will be rewarded with the last chapter, Goodlad's own dream of "The School I'd Like to See."

MADLINE R. ROBINTON

To Jerusalem and Back: A Personal Account. Saul Bellow. Viking. \$8.95. Saul Bellow, the newest Nobel laureate in literature, spent several months in Jerusalem in 1975. This is an account of what he saw, what he heard and what it meant, brilliantly written. But it is more than that. It is his reflections on this stay filtered through his wide reading in literature, his own awareness and understanding. Returning to Chicago via London, he discusses Arab-Israeli relations with many experts, reads extensively on the problems and shares his thinking with his readers.

Lenin in Zurich. Alexander Solzhenitsyn. Trans. H. T. Willetts. Farrar, Straus & Giroux. \$8.95.

This is a strange and interesting book. Purporting to be an historical account of Lenin's years in Switzerland, 1914-1917, it is rather a chronicle of those years using the device of fiction. The hero, Lenin, tells us what he is thinking, what he sees, what he fears, and what he says in his day-to-day contacts with his fellow exiles. What unfolds is a

fascinating psychological study of a revolutionary by a gifted novelist. It is Solzhenitsyn's very personal projection of Lenin. Its historical validity is open to serious question.

The Fabians. Norman & Jeanne MacKenzie. Simon & Schuster. \$12.95. Founded in 1883, the Fabian Society was "a mere group of friends meeting to discuss their own intellectual difficulties." A new world was emerging and dissatisfaction with traditional values — religious, social and sexual — was rife among the young middle class intellectuals. One among many radical and socialist organizations formed about this time, the Fabians survived because of the quality of its leadership. The MacKenzies do a brilliant job in weaving together the biographies of its leaders, not only the famous, but also many of the others, well-known and arresting figures who drifted in and out of the group. The ways in which they helped to shape the thinking and direction of twentieth century Britain are portrayed in absorbing fashion.

The Governance of Britain. Harold Wilson. Harper & Row. \$10.95. This book was begun April 17, 1976, two days after Sir Harold Wilson resigned as Prime Minister and left #10 Downing Street. It is a very personal book. Although "aimed at describing how the British system of parliamentary and Cabinet government works," it inevitably centers on the role of the Prime Minister in relation to his Cabinet, to the Parliament and to the Party as seen through Sir Harold's eyes, illustrated with anecdotes, reminiscences and sometimes rationalizations, and includes an interesting comparison with the office of the American President.

Religion and Respectability: Sunday Schools and Working Class Culture, 1780-1850. Thomas W. Laqueur. Yale. \$22.50.

The English Sunday School movement was an attempt to teach reading and sometimes writing and arithmetic to working-class children who worked long hours in factory or field and could not attend day school. Professor Laqueur, on the basis of careful research, argues that the Sunday School was a relatively autonomous, largely working-class institution. This leads him to question many hypotheses and assumptions that have been made by social historians as to the role and social purposes of the Sunday Schools, for example, that they were imposed on the "lower orders" to fit them into industrial society.

The Ottoman Centuries: The Rise and Fall of the Turkish Empire. Baron Kinross. Morrow. \$18.95.

A posthumous one volume history of the rise and fall of the Ottomans (to 1914), this is a very personal account by an Englishman, a journalist, who had spent many years in the Levant and especially Turkey, and had written several books on the area including a well-known biography of Atatürk. This volume reveals his fascination with his subject and his ability to translate this to his readers.

EARL W. COUNT

Anthropology, peculiarly among intellectual disciplines, must come to terms with the How of science together with the What-Why of humanism. And the world-views of man, the religious animal, know no disciplinary boundaries. So try reading the first eight as an octet:

The Navajo Hunter Tradition. Karl W. Luckert. Arizona. \$10.50.

The author, historian of religion, follower of Mircea Eliade, field-collector of the traditions he handles, passes beyond them to an arresting perspective on the world-view of the human mind which covered almost all of its formative millennia and is now rapidly vanishing.

Olmec Religion: A Key to Middle American and Beyond. Karl W. Luckert. Oklahoma. \$9.95.

The rich and many-voiced Olmec monuments are eloquent of their makers' concern to face the greater-than-man while yet coping with the "scientific" realities of sustenance. (The author's more particular thesis: the Olmecs focused their symbol-making upon the serpent rather than the jaguar.)

The Transformation of the Hummingbird: Cultural Roots of a Zinacantan Mythical Poem. Eva Hunt. Cornell. \$18.50. Quite different, yet no less scholarly, powerfully acute and readable. The author steps adroitly amid the poly-semantics of Zinacantan (Chiapas, Mexico) myth-symbolism. It is a tough and resilient idiom — and "any human explanation of (the) numinous nature (of a world of contradictions) is the best possible within its own time and place."

Egyptian Saints: Deification in Pharaonic Egypt. Dietrich H. Wildung. New York University. \$22.50.

"Saint" and "deification" evolved through Egypt's centuries; nor were their ascriptions confined to the pharaohs.

The Treasures of Darkness: A History of Mesopotamian Religion. Thorkild Jacobsen. Yale. \$15.

In large measure, this is a Summing-Up of what one of the world's great scholars nobly explored through a lifetime. In course of four millennia, apace with political development and vicissitude, the metaphors of theology and world-view deepened: the yearly cycles of the Providing Gods; cosmogonic, Ruler Gods; the Personal Gods. The immense time-sweep places the literary monuments, e.g., Atrahasis, Gilgamesh, Enuma elish, truly as eloquent period-pieces. From prayer for sustenance to psalm of piety.

The Hittites: People of a Thousand Gods. Johannes Lehmann. Trans. J. Maxwell Brownjohn. Viking. \$11.95.

How the Hittites, their culture, their language, came forth from Biblical obscurity to tangibility, is a story of its own. They were Indoeuropeans or the latter's close relatives. In their heyday, they gave political Mesopotamia and Egypt jarring pause; yet before Herodotus the "Nation of a Thousand Gods" had vanished without legacy.

(continued on back cover)



HUMANITY IN SCIENCE (continued) aimed at, what they accepted, what they rejected or conceived, or imagined. It tells us about their motives, their purposes, their ambitions, their ways of acting and their ways of creating. These, Vico insisted, are the activities we know, and we know because we are all involved in them as actors, not as spectators. Historians and philosophers of science have been too much spectators and have not been sufficiently involved with science. The kind of knowledge we seek is not just the knowledge of facts, or the knowledge of logical truths, or the logic of method. The kind of knowledge we seek is more like the knowledge of a friend, his character, his ways of thought and action, an intuitive sense of the nuances of his creative personality. We must use imaginative power of a high degree to enter into the other's mind and world. Without entering into history in this sense, the past remains dead, a collection of objects. Similarly, without entering into science in this sense, scientific history will remain a dead collection of objects or ideas which apparently has been created by stuffed figures in a museum. The only way of achieving this understanding is systematically to retrace our steps, historically, psychologically and above all, anthropologically into science. We can begin to study science as it is done and try to understand the scientists' private moments of creativity. We must enter with imaginative sympathy into other people's minds and into their modes of being. Then and only then can we go back and re-do the history of science. As a result, the scientific life and the scientific imagination would become accessible and we could de-

mythologize it. Science could then be incorporated into public understanding and truly integrated into our culture.

We agree, I believe, that science and society can no longer afford to entertain myths and misunderstandings about each other, as the present public debates about recombinant DNA reveal. Public understanding of science is as essential as ever it was in the early days; and there is, too, the other side of this coin, the scientist's need to understand the public. When the one is truly incorporated into the other, nonscientists will appreciate the humanity that has in fact always been present in science. I have argued that the scientific profession should consider new ways of expressing this humanity in response to the new social imperatives in our society. I also believe that society should find new ways of helping scientists to do this. Their allegiance — the profession's allegiance — can no longer be to a methodological ethic alone. This does not mean giving up objective truth. I am not urging a return to stages of irrationality or wishful thinking, but I am suggesting the application of knowledge in new compassionate ways. I think we are reasonably entitled to ask the scientific profession to assess the problems of contemporary society, and where scientific solutions are called for, to give them their first priority. It would be most rewarding if, instead of being on the defensive vis-à-vis society, as they have been in recent years, scientists actively extended their notion of accountability in this way. With their example before us, we might then go on to deal with the problem of accountability in other

groups — in industry and in the media, for example, and thus help to create a climate where all professional groups recognize their debt and responsibility to society at large. Now is very much the right time — is it not — when one may use old-fashioned words such as "morality" and "honor" without fear of being sneered at.

BOOK REVIEWS (continued)
The Stone Circles of the British Isles. Aubrey Burl. Yale. \$20.

At last a precise descriptive compendium of them all, plus a perspective upon their meaning. Nevertheless, the sadly irreducible truth remains: today the stones are well-nigh mute.

Jerusalem Revealed: Archaeology in the Holy City 1968-1974. Ed. Yigael Yadin. Yale. \$12.95.

Thirty-two contributions from the professional journal **Qadmoniot**, abbreviated, translated. Probably, Jerusalem imposes the most stupefying archaeological problem in the world; yet in six years the recoveries extend from the most ancient city through the crusades: the monuments are Israelitic-Jewish, Christian, Moslem; sacred and secular buildings, tombs, walls, aqueducts. And they beggar reviewing.

The Archaeology of North America. Dean Snow. Viking. \$18.95.
Lucid, compact, comprehensive, ordered, from Arctic to the Rio Grande.

SIBLEY FELLOW (continued) the doctorate except the dissertation. They must be planning to devote full-time work to research during the fellowship year which begins September 1, 1978. Further information and application forms may be obtained by writing to the Mary Isabel Sibley Fellowship Committee, Phi Beta Kappa, 1811 Q Street, N.W., Washington, D.C. 20009.



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