

Book Reviews

SCIENCE, MONEY AND POLITICS: POLITICAL TRIUMPH AND ETHICAL EROSION

By Daniel S. Greenberg. 528 pp. Chicago, University of Chicago Press, 2001. \$35. ISBN 0-226-30634-8.

DANIEL S. Greenberg states up front in the introduction to this study that “this is not a work of reverence, as are many books about science.” To those who have followed Greenberg’s career — as an investigative journalist for *Science* magazine; as publisher of *Science and Government Report*, a biting and penetrating biweekly science-policy newsletter; and as the author of a previous irreverent study of science policy in the United States, *The Politics of Pure Science* (New York: New American Library, 1967) — such a declaration is unnecessary and even redundant.

But it would be wrong to be diverted by Greenberg’s long-held credentials as a gadfly to the science-policy pooh-bahs in Washington, D.C. Although it builds on a vast foundation of first-hand journalistic knowledge, *Science, Money and Politics* transcends journalistic fact gathering and presents cogently argued themes to explain the history and present state of the “science enterprise” in the United States. The book chronicles many of the events, clashes, and trends in U.S. science policy over the past three decades, from President Richard Nixon’s banishment of science from the White House to the high drama in which science funding was held hostage in the titanic budget clash between President Bill Clinton and the Republican Congress in 1995. The book ends on the high note that, in the year 2000, federal support for basic research reached an all-time high of more than \$20 billion.

So what is the problem? In Greenberg’s eyes, it is that science is in danger of losing its “soul” through a steady “ethical erosion” and the “misuse” of the trust and confidence placed in it by the American people and their political representatives. He states that, “by virtually every relevant measure, the United States leads the world in the financing, quality and volume of research . . . and [it] appears bound to maintain, and increase, its supremacy far into the new century.” Yet those involved in the science enterprise are plagued by fear and paranoia, as exemplified by the self-serving myths of a “golden age” of government largesse in the past, the jeremiads depicting science as a “financially deprived ward of the government,” and the belief that public understanding of science is “an indispensable ingredient of public support for science.”

Greenberg systematically demonstrates that, despite “fiscal doom mongering,” the United States has been “on a research spending spree” for the past 30 years. Between 1969, when Nixon took office, and 1998, total support for research and development in the United States increased from \$26 billion to \$228 billion; 2000 was the 26th year in which federal support, in constant dollars, was greater than it had been the previous year. Yet in the early 1990s, Nobel prize winner Leon Lederman stated that the “current capacity for research” in the United States was only one third of what

it had been in the 1970s — one of numerous examples of statements by science-policy leaders in which, according to Greenberg, “precision took second place to propaganda.”

There is also a widely held but erroneous assumption that “science, democracy and prosperity” are at risk. Greenberg argues that “no evidence is offered, and none exists,” for a correlation between the public understanding of science and the “provision of public money for research.” And in telling examples, he points out that in 1998, the National Institutes of Health (NIH) spent about \$500 million on research on breast cancer, a highly publicized and politicized disease, while the Department of Energy spent almost \$700 million on research on high-energy physics, a discipline virtually unknown to the public and obscure even to scientists in other fields.

Readers of the *Journal* will be particularly interested in where biomedical research fits into Greenberg’s analysis. He readily acknowledges the extraordinary achievements that have been made in the biomedical sciences and in biotechnology during the past several decades. At the same time, he fears the “ethical erosion of American science” in these areas of research. In Greenberg’s view, pressures have emerged from the “pervasive invasion of the money ethic in the conduct and presentation of research.” He cites the increasing incidence of the invention or misuse of data, duplication of research, and flagrant conflicts of interest among scientists involved with corporate programs. He is particularly concerned about the rise of entrepreneurs in universities whose main goal is to promote technology transfer through the exploitation of university patents.

The book is much stronger (and longer) on analysis than on prescription. Greenberg devotes only 5 of almost 500 pages to “modest” recommendations. A central theme of these prescriptions is that working scientists must become more involved in politics. They must speak out regarding the large issues facing the United States and the world, and the nation would benefit greatly if more scientists moved directly into elected and appointed offices. “The aim,” notes Greenberg, “is to dislodge science from its comfortable ghetto and move it into the waters of the political mainstream.”

The press and Congress must also assume new roles: journalists should stop acting as “cheerleaders” for science and become informed and skeptical critics — particularly of the “shrill Washington lobbies for science.” Similarly, Congress should move beyond its “uncritical pandering” to science and instead exercise real oversight and force the executive to institute real spending priorities. Greenberg also recommends several institutional reforms, including a breakup of the “ossified,” elephantine NIH.

Greenberg himself would no doubt admit that none of these proposals are given adequate analysis in the space allotted. No matter. The real strength of this study lies in its challenging and disturbing analyses, which constitute an indispensable primer for all serious debate on the future of the science enterprise in the United States.

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THE PSYCHOBIOLOGY OF THE HAND

(*Clinics in Developmental Medicine. No. 147.*)

Edited by Kevin J. Connolly. 276 pp., illustrated.

London, Mac Keith Press, 2000. \$69.95.

ISBN 1-898-683-14X.

“OUR hands are central to our psychology as they continually switch between executive, exploratory and expressive activity.” This statement from the editor’s preface gives an idea of the content of this fascinating book by well-known experts on hand function. The editor has assembled a coherent account of research on the human hand, which was rekindled in the mid-1980s and is now a hot topic.

The main focus of the book is on normal manipulatory functions, with an emphasis on development. To be sure, the capacity of nonhuman primates for fine control of hand grip is hardly less than that of humans; chimpanzees can even use pounding tools to open nuts. Arguably, however, human hands can perform tasks that are not possible for other primates. Perhaps the ultimate manual skill is a virtuoso performance of music. These higher human faculties are typically represented asymmetrically in the hemispheres of the brain, a topic of considerable clinical relevance.

This is one of the few books that synthesize progress in our understanding of the physiological and behavioral principles underlying manipulations of the hand. It does not include many new discoveries, nor does it address current research on the representations of the hand in widely distributed cortical and subcortical networks. The intended audience for the book consists primarily of neurologists, pediatricians, persons involved in rehabilitation, psychologists, and neurophysiologists.

Forsberg provides a useful overview of grasping during development. Changes may be observed until the age of six years or later, when the features of adult grasping are established. For example, the force for lifting an object (load force) and the grip force are less coordinated and the force traces not as smooth in young children as they are in adults. This lag has to be taken into account when one evaluates brain-damaged children. The rich supply of cutaneous and deep receptors is not only important for conscious perception, but is also essential for proper grasping. The configuration of the grip and the degree of its force depend critically on the form, weight, and surface texture of the grasped object. If the force is not strong enough, the object will slip, whereas too much force may destroy it. The actual force ratio (i.e., the ratio of grip force to load force) is carefully controlled and is normally only slightly higher than the ratio at which the object would slip out of the hand (i.e., a force ratio equal to the friction between hand and object).

We learn from experience and program the forces on the basis of an internal model (motor memory and representations), and we rely on vision for shaping the configuration of the hand when we are about to grasp an object. But the hand receptors are also essential and come into play to update the memorized representations. Besides the (unconscious) use of the hands in adaptive corrections of the grip, the hands are, of course, used for conscious perception of an object’s properties (reaching to sense the immediate environment, a particularly important activity for normal development).

Because of the complexity of the hand, the functional

changes that occur during development must often rely on some key features that can be assessed by videotape clips or simple behavioral measures. Newell and Cesari explore changes in the configuration of the grip for various objects as a function of body scale during development. De Manoel and Connolly illustrate nicely how goal-directed grasping tasks are solved by children of various ages. The younger child who has not yet acquired fine motor skills may nevertheless succeed with less effective strategies. Many manipulatory skills of everyday life require both hands. Fagard summarizes her pioneering work on the development of interlimb coordination during infancy.

The last four chapters of the book deal with problems in children who have particularly difficult disorders, such as the developmental coordination disorder, learning difficulties, and dyspraxia and dysgraphia. It is suggested that, particularly in these complex cases, evaluation of distinct functions such as the kinetics of grasping, the temporal coordination in reach-to-grasp actions, or interlimb coordination (the study of modular components) may help identify and quantify disordered functions.

Overall, I highly recommend this book on the hand and on its use in daily life. It is clearly not a comprehensive work, but it will help readers interested in pursuing research on the human hand. Much remains to be done on this fascinating topic.

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AT THE SIDE OF TORTURE SURVIVORS: TREATING A TERRIBLE ASSAULT ON HUMAN DIGNITY

Edited by Sepp Graessner, Norbert Gurrig, and Christian Pross.

241 pp., illustrated. Baltimore, Johns Hopkins University Press,

2001. \$46.50. ISBN 0-8018-6627-8.

AVAILABLE for the first time in English, *At the Side of Torture Survivors* is an outstanding collection that brings an extraordinary international perspective to the growing literature on the treatment of the survivors of torture. The book’s 12 chapters and afterword, all by members of the staff of the Berlin Center for the Treatment of Torture Victims, are consistently well written and substantive. Each chapter contains an intimate and unflinching description of the treatment of victims of torture and at the same time takes great care to provide context for professional and lay readers. The authors are clinicians who openly acknowledge the atrocities committed during World War II by many Germans, including members of the medical profession. For these authors, this history makes their work that much more necessary and meaningful. These clinicians face the reality of torture head on and, through their excellent writing, help the reader to face it, too.

The authors explain in detail that the goal of torture is the destruction of a person’s identity. With this in mind, the goal of treatment is to restore that identity, to help the survivor of torture to be able to say, “Yes, that really did happen to me, but I am no longer a victim; I am a survivor.” To reach that goal, the Berlin Center for the Treatment of

Torture Victims, founded in 1992, provides a variety of services for torture survivors, including general medicine, psychiatry, psychotherapy, physiotherapy, art therapy, social work, and administration. Persons come to the center from more than 30 countries, with many recent arrivals from Yugoslavia and Turkey.

The great strengths of this book are its courageous depiction of the complexities of torture and the treatment of torture victims and its honest appraisal of when and how treatment succeeds or fails. Each chapter offers a different perspective on what can be done, and many offer specific examples that put a human face not only on the torture survivor but also on the therapist. The descriptions of the tortures themselves are detailed and graphic; the reader is forewarned of this and also advised that confrontation of the horrors that human beings force on one another is a necessary part of treatment. It is also a necessary step toward ending the practice of torture.

The topics covered in the book include physical-rehabilitation techniques, the role of advocacy in treatment, the effects of torture on memory, the complex relation between the physical and psychological consequences of torture, the effects of torture on personal relationships, the specific physical consequences of particular forms of torture, the grim reality of life in refugee camps, and special treatment methods, such as dream work and storytelling. The crucial significance of the cultural characteristics and personal history of the patient and how these attributes must be incorporated into treatment are discussed throughout the book. The descriptions of treatment also deal with the effects of the treatment process on the therapist during individual sessions and over the long term. The treatment methods described are grounded in theory, most notably object-relations theory, which suggests that torture undermines a person's core identity and that the goal must be to help patients reconnect with their identity and with the reality of their past, their future, and most important, their present. The authors also take a fresh look at the debate about the applicability of the diagnosis of post-traumatic stress disorder to survivors of torture by describing the specific symptoms that may make a diagnosis of complex post-traumatic stress disorder or disorder of extreme stress more appropriate.

The authors are clearly well acquainted with current research and with approaches used in torture-treatment centers throughout the world. What comes through in their writing is the extraordinary respect that they hold for their patients as they accompany them through the hell of their past toward a future that, though it may not hold a cure, may bring an easing of pain and a renewed ability to find joy.

In his foreword, Bahman Nirumand notes that the therapists who work with these patients "dedicate a portion of their very own being, of their soul, to each individual victim. How can one thank them for this selflessness?" This is a good question, for it is at the heart of this selflessness that true healing can begin. The world owes them thanks not only for their courageous clinical work but also for their efforts to share their experiences and those of their patients with all of us in this exceptional book.

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BOOKS RECEIVED

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SURGERY

- Blueprints in Surgery.** (Blueprints USMLE Steps 2 and 3 Review Series.) Second edition. By Seth J. Karp, James P.G. Morris, and David I. Soybel. 151 pp., illustrated. Malden, Mass., Blackwell Science, 2001. \$26.95. ISBN 0-632-04487-X.
- Clinical Pathways in Glaucoma.** Edited by Thom J. Zimmerman and Karanjit S. Koener. 565 pp., illustrated. New York, Thieme, 2001. \$99. ISBN 0-86577-919-8.
- Current Therapy in Vascular Surgery.** Fourth edition. Edited by Calvin B. Ernst and James C. Stanley. 944 pp., illustrated. St. Louis, Mosby, 2000. \$179. ISBN 0-323-00901-8.
- The 5-Minute Orthopaedic Consult.** Edited by Paul D. Sponseller, with James F. Wenz and Frank J. Frassica. 362 pp., illustrated. Philadelphia, Lippincott Williams & Wilkins, 2000. \$79.95. ISBN 0-683-30088-1.
- Glaucoma Handbook.** Edited by Anthony B. Litwak. 364 pp., illustrated. Boston, Butterworth-Heinemann, 2000. \$95. ISBN 0-7506-9776-8.
- Handbook of Kidney Transplantation.** Third edition. By Gabriel M. Danovitch. 443 pp., illustrated. Philadelphia, Lippincott Williams & Wilkins, 2001. \$42. ISBN 0-7817-2066-4.
- Key Techniques in Orthopaedic Surgery.** By Steven H. Stern. 338 pp., illustrated. New York, Thieme, 2001. \$119. ISBN 0-86577-922-8.
- Lasers for Ischemic Heart Disease: Update on Alternatives for the Treatment of Diffuse Coronary Artery Disease.** Edited by Xavier M. Mueller. 243 pp., illustrated. New York, Springer-Verlag, 2000. \$99. ISBN 3-540-67654-6.
- Management of Strabismus and Amblyopia: A Practical Guide.** Second edition. Edited by John A. Pratt-Johnson and Geraldine Tillson. 308 pp. New York, Thieme, 2001. \$89. ISBN 0-86577-992-9.
- Manual for Eye Examination and Diagnosis.** Fifth edition. By Mark W. Leitman. 101 pp., illustrated. Malden, Mass., Blackwell Science, 2001. \$39.95. ISBN 0-632-04542-6.
- Minimally Invasive Cancer Management.** Edited by Frederick L. Greene and B. Todd Heniford. 385 pp., illustrated. New York, Springer-Verlag, 2000. \$129. ISBN 0-387-98710-X.
- Oxford Textbook of Surgery.** Second edition. Edited by Peter J. Morris and William C. Wood. 3701 pp. in three volumes, illustrated. New York, Oxford University Press, 2000. \$395. ISBN 0-19-262884-4.
- Principles and Practice of Orthopaedic Sports Medicine.** Edited by William E. Garrett, Jr., Kevin P. Speer, and Donald T. Kirkendall. 1062 pp., illustrated. Philadelphia, Lippincott Williams & Wilkins, 2000. \$169. ISBN 0-7817-2578-X.
- Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice.** 16th Edition. Edited by Courtney M. Townsend, with R. Daniel Beauchamp, B. Mark Evers, and Kenneth L. Mattox. 1750 pp., illustrated. Philadelphia, W.B. Saunders, 2000. \$125. ISBN 0-7216-8269-3.
- Shoulder Surgery: An Illustrated Textbook.** Edited by Nikolaus Wülker, Michel Mansat, and Freddie H. Fu. 674 pp., illustrated. London, Martin Dunitz, 2001. \$249.95. ISBN 1-85317-563-3.
- Surgery of the Liver and Biliary Tract.** Third edition. Edited by L.H. Blumgart and Y. Fong. 2228 pp. in two volumes, illustrated. Philadelphia, W.B. Saunders, 2000. \$389. ISBN 0-70202-5011.

MISCELLANEOUS

- Consent to Treatment: A Practical Guide.** By Fay A. Rozovsky. Gaithersburg, Md., Aspen, 2000. \$85. ISBN 0-8342-1875-5.
- Human Paleobiology.** (Cambridge Studies in Biological and Evolutionary Anthropology. Vol. 26.) By Robert B. Eckhardt. 350 pp., illustrated. New York, Cambridge University Press, 2000. \$80. ISBN 0-521-45160-4.
- Information Technology for the Practicing Physician.** (Health Informatics Series.) Edited by Joan M. Kiel. 271 pp., illustrated. New York, Springer-Verlag, 2001. \$55. ISBN 0-387-98984-6.