

*Evidence of Primate Asymmetries*, Springer-Verlag, in press]). Impressive new evidence also has been reported by the zoologist Marc Hauser and his colleagues (*Behavioral and Brain Sciences*, 14, 342 [1991]). It is ironic that, even while, as Corballis correctly observes, "animals are slowly but surely disappearing" from mainstream psychology, they may be enjoying something of a renaissance in the rapidly growing psychology of laterality.

Given the extent to which key issues are empirically driven, no one can have the last word on the subject of discontinuity and the evolution of cerebral asymmetry and the generative mind. Corballis, however, tackles this immensely difficult and multifaceted subject in a lively and engaging way and presents his views crisply, thoughtfully, and always with a modesty and a touch of good humor. *The Lopsided Ape* is full of intellectual riches, and it deserves and, I hope, will find a wide readership.

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## The Landsat Case

**Viewing the Earth.** The Social Construction of the Landsat Satellite System. PAMELA E. MACK. MIT Press, Cambridge, MA, 1990. xii, 270 pp., illus. \$27.50. Inside Technology.

Early in the 1960s scientists and engineers familiar with military reconnaissance programs, weather satellites, and astronauts' observations recognized that there could be significant benefits from using remote sensing of the earth for assessing our planet's resources. Over the next decade and a half, NASA played the lead role in the development of this capability with its Landsat program. Space historian Pamela Mack not only delineates the creation of the Landsat system but also explains the failure of its proponents to give this technology a secure operational status in the United States during the 1980s.

Mack's book is of special interest because she presents her story as an extended case study in the social construction of technology. In her view, a narrative that focused on the technical goals and activities of the scientists and engineers who designed, developed, and operated Landsat satellites and analyzed Landsat images would be missing the most intriguing and important dimensions of this technological innovation. Siding with the avant-garde in the history of technology, Mack insists that negotiations among interest groups play the central role

in establishing the characteristics, applications, and meanings of new technological systems. She consequently gives primary attention to the competing endeavors by groups in NASA, the Departments of Defense, the Interior, and Agriculture, and the Bureau of the Budget to shape the Landsat satellite system in accord with their respective interests.

Just how far Mack can go with this approach is suggested by her handling of NASA-DOD conflicts over Landsat technology. It was in 1963-64, she reports, that geologists associated with NASA's lunar program initiated an earth resources program. By 1968 NASA's planning for an earth resources satellite had progressed to the point that the agency sought partial access to the military's relatively advanced technology for reconnaissance satellites. Refusing to cooperate, the Pentagon urged NASA to drop the earth resources program on the grounds that success was bound to bring unwanted attention to space-based reconnaissance. NASA decided to go ahead on its own. DOD countered by blocking significant funding for Landsat until the space agency quietly agreed not to develop earth resources sensors having a resolution better than 20 meters. Soon NASA officials, scientists, and engineers were telling potential users that Landsat images would, at best, have a 30-meter resolution. In supporting this limit, they made little or no reference to the political compromise with DOD but rather, according to Mack, emphasized the technical difficulties of developing sensors with higher resolution, the technical and financial difficulties of coping with all the data that a high-resolution system would yield, and the technical suitability of the 30-meter scale for assessing many earth resources. These were good arguments. Indeed, without much closer attention to their origins and influence than Mack provides, one is left wondering about the relative roles of political and technical considerations in limiting the resolution of Landsat's sensors.

Though Mack quite possibly underestimates the role of technical considerations in the shaping of Landsat, her approach does much to illuminate the federal government's inability to embed this innovative technology in a viable operational system. There were, her history suggests, four main reasons why the United States failed to capitalize on its head start in remote-sensing earth resources technology, a failure that gave France the opportunity to seize leadership in this arena during the 1980s with the SPOT satellite system. First, NASA was not very successful in building a broad-based coalition of Landsat data users. The space agency was so keen to continue research and devel-

opment on the Landsat system and so reluctant to guarantee the ongoing availability of standard data that many medium-sized and small users shied away from the requisite investments in equipment and training. Second, the two largest users—the Departments of the Interior and Agriculture—were continually struggling with NASA and one another over the shape, operation, and future of the Landsat system. Each bureaucracy was so wed to its own vision of the system that politically effective cooperation was impossible. Third, the benefits of the Landsat system—for geology and other earth sciences, oil and mineral exploration, agricultural forecasting and disease control, and management of natural resources—did not result in sufficient savings or revenues to turn Landsat into a potentially profitable undertaking. And fourth, the Office of Management and Budget acted on behalf of a string of administrations that were opposed to any expansion of federal services by steadfastly thwarting all efforts in the 1970s and early 1980s to put Landsat on a solid operational footing. The denouement came in the mid-1980s with the privatization of the Landsat system.

Throughout her thought-provoking analysis of the development of Landsat satellites and early applications of Landsat images, Mack makes effective use of interviews and archival holdings as well as published materials. Her book does a fine job of helping inaugurate the Inside Technology series that MIT Press is devoting to studies of the social construction of technology.

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## Physics in Canada

**Physics and the Rise of Scientific Research in Canada.** YVES GINGRAS. McGill-Queen's University Press, Buffalo, NY, 1991. xii, 203 pp., illus. \$37.50. Translated from the French edition by Peter Keating.

How did the Canadian physics community grow from the small, fragmented group of teachers it was in the 1850s to the large, cohesive body of researchers recognized and supported by society that it had become by the 1960s? To answer this question of institutional development, Yves Gingras combines historical and sociological perspectives.

Though a research ethic surfaced in universities during the decades around 1900, Gingras explains, it was the involvement of physicists in World War I that established

the importance of basic and applied research. The universities of Toronto and McGill advanced the nascent movement to supplement the teaching mission of physicists with a research orientation. In addition, the National Research Council (NRC), founded during the war ostensibly to promote Canadian industrial research, provided the physicists with a governmental source of support. Though the venerable Royal Society of Canada tried to keep abreast of disciplinary developments, the NRC provided financial props for physics students and faculty and sponsored the pioneering *Canadian Journal of Research*. During World War II, the contributions that physicists made especially to military technology ensured their place in the Canadian social fabric.

Around 1950, however, Canadian physicists struggled to pin down their group identity. Industrial physicists, faced with recent federal labor regulations, pushed for a "professional" organization of the type used so successfully by engineers to control access to jobs. University physicists, in contrast, favored a more "disciplinary" organization—one that provided research forums, supported publications, recognized meritorious contributions, fostered physics education, and represented the membership in broader deliberations on science policy in this emerging era of Big Science. The academic faction prevailed, and the new Canadian Association of Physicists took its current shape as a "disciplinary" rather than a "professional" grouping.

Gingras tells his story, one that repeatedly intersects with the histories of the larger and more established British and U.S. communities, with much attention to statistical and biographical detail. Though careful to include the contributions of French-speaking physicists, he points out that the English-speaking researchers laid the groundwork of the modern community. Key players included Ernest Rutherford, who during his turn-of-the-century stay at McGill University infused life into the Canadian research enterprise, and John C. McLennan, who

Gingras has left room for other scholars to add to the Canadian narrative; for example, he has included only passing discussions of the impact of World War II on the physics community. He also has provided only preliminary support for his broader suggestion that the physicists' institutional emergence not only was similar to other Canadian scientists' cases but also stimulated the rise of scientific research generally in Canada. Though the English translation is occasionally awkward, the eight main chapters of this short work can be read quickly and easily. Overall, Gingras has taken an important step toward unraveling the complex story of the

institutional formation of the Canadian physics community.

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## Books Received

**Advances in Molecular Biology and Targeted Treatment for AIDS.** Ajit Kumar, Ed. Plenum, New York, 1991. x, 365 pp., illus. \$89.50. George Washington University Medical Center Department of Chemistry Annual Spring Symposia. From a symposium, Washington, DC, May 1990.

**Animal Cells.** A. Doyle, R. Hay, and B. E. Kirsop, Eds. Cambridge University Press, New York, 1991. xvi, 191 pp., illus. \$34.50. Living Resources for Biotechnology.

**Bacteria.** L. R. Hill and B. E. Kirsop, Eds. Cambridge University Press, New York, 1991. xiv, 186 pp., \$34.50. Living Resources for Biotechnology.

**Barons of the Sky.** From Early Flight to Strategic Warfare. The Story of the American Aerospace Industry. Wayne Biddle. Simon and Schuster, New York, 1991. 366 pp. + plates. \$22.95.

**Behavioral Biology.** Neuroendocrine Axis. Trevor Archer and Stefan Hansen, Eds. Erlbaum, Hillsdale, NJ, 1991. xiv, 269 pp., illus. \$49.95. From a symposium, Gothenburg, Sweden, Dec. 1989.

**The Cretaceous in Australia.** A Re-appraisal of the Evidence. M. A. J. Williams, P. De Deckker, and A. P. Kershaw, Eds. Geological Society of Australia, Sydney, 1991. x, 346 pp., illus. Paper, \$A45. Geological Society of Australia Special Publication No. 18.

**Carbonylation.** Direct Synthesis of Carbonyl Compounds. H. M. Colquhoun, D. J. Thompson, and M. V. Twigg. Plenum, New York, 1991. xii, 296 pp., illus. \$65.

**Catalytic Ammonia Synthesis.** Fundamentals and Practice. J. R. Jennings, Ed. Plenum, New York, 1991. xx, 451 pp., illus. \$89.50. Fundamental and Applied Catalysis.

**Des Miasmes aux Viruses.** Histoire des Maladies Infectieuses. Jean Théodorides. Editions Louis Pariente, Paris, 1991. 382 pp., illus. Boxed. 450 F.

**Detection Theory.** A User's Guide. Neil A. Macmillan and C. Douglas Creelman. Cambridge University Press, New York, 1991. xvi, 407 pp., illus. \$59.50; paper, \$24.95. Intended for students of psychophysics and related subjects.

**Energy and the Environment in the 21st Century.** Jefferson W. Tester et al., Eds. MIT Press, Cambridge, MA, 1991. xx, 1006 pp., illus. \$50. From a conference, Cambridge, MA, March 1990.

**Evolution of the Vertebrates.** A History of the Backboned Animals Through Time. 4th ed. Edwin H. Colbert and Michael Morales. Wiley-Liss, New York, 1991. xviii, 470 pp., illus. \$49.95.

**Evolutionary Biology.** E. Edward Bittar, Ed. JAI Press, Greenwich, CT, 1991. xii, 333 pp., illus. \$78.50. Fundamentals of Medical Cell Biology, vol. 1.

**Fishing Vessel Safety.** Blueprint for a National Program. Committee on Fishing Vessel Safety, National Research Council. National Academy Press, Washington, DC, 1991. xx, 282 pp., illus. \$29.95.

**Flavins and Flavoproteins, 1990.** B. Curti, S. Ronchi, and G. Zanetti, Eds. De Gruyter, New York, 1991. xxiv, 945 pp., illus. DM 390. From a symposium, Como, Italy, July 1990.

**The Global Citizen.** Donella H. Meadows. Island Press, Washington, DC, 1991. xvi, 300 pp., illus. Paper, \$14.95.

**Global Climate Change and Life on Earth.** Richard L. Wyman, Ed. Routledge, Chapman and Hall, New York, 1991. xxii, 282 pp., illus. \$55; paper, \$24.95. Based on a conference, Albany, NY, April 1989.

**Human Factors for Informatics Usability.** B. Shackel and S. J. Richardson, Eds. Cambridge University Press, New York, 1991. xvi, 438 pp., illus. \$59.50. Based on a meeting, Loughborough, UK, Dec. 1986.

**Human Paleopathology.** Current Syntheses and Future Options. Donald J. Ortner and Arthur C. Aufderheide, Eds. Smithsonian Institution Press, Washington, DC, 1991. vii, 311 pp., illus. \$70. From a symposium,

Zagreb, Yugoslavia, July 1988.

**Integrated Design of Water Treatment Facilities.** Susumu Kawamura. Wiley, New York, 1991. xxii, 658 pp., illus. \$69.95.

**Interaction and Determination.** Attempt at Elaborating an Up-to-Date Theory of Determinacy in Natural Philosophy. Antal Müller. Akadémiai Kiadó, Budapest, 1991. 235 pp., illus. \$29. Translated from the Hungarian edition, with revisions, by Matild Gulyas.

**Issues in Science Education.** Science Competence in a Social and Ecological Context. Torsten Husén and John P. Keeves, Eds. Pergamon, New York, 1991. viii, 255 pp., illus. \$50. From a symposium, Stockholm, June 1989.

**Laser Interaction and Related Plasma Phenomena.** Vol. 9. Heinrich Hora and George H. Miley, Eds. Plenum, New York, 1991. xvi, 653 pp., illus. \$125. From a workshop, Monterey, CA, Nov. 1989.

**Life Under Extreme Conditions.** Biochemical Adaptation. Guido di Prisco, Ed. Springer-Verlag, New York, 1991. xii, 144 pp., illus. \$65. From a meeting, Rome, July 1989.

**Mapping Crime in Its Community Setting.** Event Geography Analysis. Michael D. Maltz, Andrew C. Gordon, and Warren Friedman. Springer-Verlag, New York, 1991. xxiv, 173 pp., illus. \$55.

**The Mars Project.** Werner von Braun. University of Illinois Press, Urbana, 1991. xi, 91 pp., illus. Paper, \$9.95. Translated from the German edition (Esslingen, 1952). Reprint, 1953 ed.

**A Natural History of Trees of Eastern and Central North America.** Donald Culross Peattie. Illustrations by Paul Lanacre. Houghton Mifflin, Boston, MA, 1991. xviii, 606 pp. Paper, \$16.95. Reprint, 1948 ed.

**A Natural History of Western Trees.** Donald Culross Peattie. Illustrations by Paul Landacre. Houghton Mifflin, Boston, MA, 1991. xvi, 751 pp. Paper, \$18.95. Reprint, 1950 ed.

**Occurrence, Characteristics, and Genesis of Carbonate, Gypsum, and Silica Accumulations in Soils.** W. D. Nettleton, et al., Eds. Soil Science Society of America, Madison, WI, 1991. xviii, 149 pp., illus. Paper, \$18. SSSA Special Publication no. 26. From a symposium, Anaheim, CA, Nov. 1990.

**The Patient's Ordeal.** William F. May. Indiana University Press, Bloomington, 1991. xiv, 218 pp., \$24.95. Medical Ethics Series.

**Pattern Formation in Plant Tissues.** Tsvi Sachs. Cambridge University Press, New York, 1991. xii, 234 pp., illus. \$75. Development and Cell Biology Series.

**The Rainforests of West Africa.** Ecology—Threats—Conservation. Claude Martin. Birkhäuser Boston, Secaucus, NJ, 1991. 235 pp., illus. \$39.80. Translated from the German by Claude Martin.

**Report of the Working Group on High Luminosities at LEP.** E. Blucher et al., Eds. CERN, Geneva, 1991. x, 308 pp., illus. Paper.

**Science and Empire.** East Coast Fever in Rhodesia and the Transvaal. Paul F. Crane. Cambridge University Press, New York, 1991. xviii, 385 pp. \$65. Cambridge History of Medicine.

**Science and Technology of Thin Film Superconductors.** 2. Robert D. McConnell and Rommel Noufi, Eds. Plenum, New York, 1990. xviii, 639 pp., illus. \$125.80. From a conference, Denver, CO, April 1990.

**Taking Software Design Seriously.** Practical Techniques for Human-Computer Interaction Design. John Karat, Ed. Academic Press, San Diego, CA, 1991. x, 357 pp., illus. Based on a workshop, Seattle, WA, April 1990.

**Technoculture.** Constance Penley and Andrew Ross, Eds. University of Minnesota Press, Minneapolis, 1991. xviii, 327 pp., illus. \$39.95; paper, \$15.95. Cultural Politics, vol. 3.

**Values, Self, and Society.** Toward a Humanist Social Psychology. M. Brewster Smith. Transaction Books, New Brunswick, NJ, 1991. xx, 289 pp. \$34.95.

**Vegetation and Climate Interactions in Semi-Arid Regions.** A. Henderson-Sellers and A. J. Pitman, Eds. Kluwer, Boston, MA, 1991. vii, 238 pp., illus. \$180. Advances in Vegetation Science, 12. Reprinted from *Vegetatio*, vol. 91. From a conference, Sydney, Australia, Jan. 1990.

**Whose Science? Whose Knowledge? Thinking from Women's Lives.** Sandra Harding. Cornell University Press, Ithaca, NY, 1991. xiv, 319 pp. \$34.50; paper, \$12.95.

**Wildlife, Forests, and Forestry.** Principles of Managing Forests for Biological Diversity. Malcolm L. Hunter, Jr. Illustrations by Diane Bowman. Prentice Hall, Englewood Cliffs, NJ, 1990. xiv, 370 pp. \$47.

**Zoology.** Robert L. Dorit, Warren F. Walker, Jr., and Robert D. Barnes. Saunders, Philadelphia, PA, 1991. xxvi, 1009 pp., illus., + appendixes + index. \$57.25.