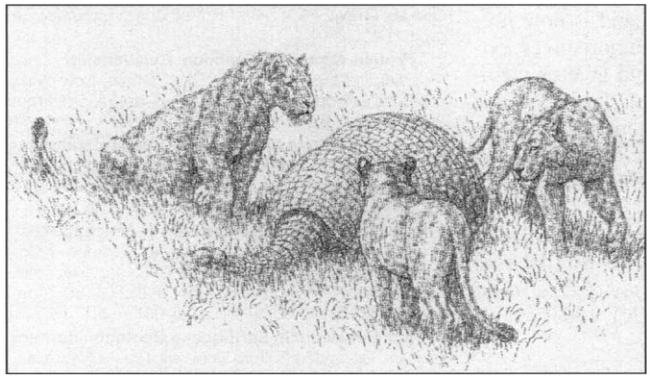
BOOK REVIEWS

Famous Felids

The Big Cats and Their Fossil Relatives. An Illustrated Guide to Their Evolution and Natural History. ALAN TURNER. Illustrations by Mauricio Antón. Columbia University Press, New York, 1997. xx, 233 pp., illus., + plates. $39.95. ISBN 0-231-10228-3.

A sabertooth "tiger" snarling at passing drivers from an Interstate 35 billboard attracts locals and tourists alike to the nearby private cave attraction where its real-life counterpart once lived. Entrepreneurs know: sabertooths are second only to dinosaurs in their ability to fascinate the public.

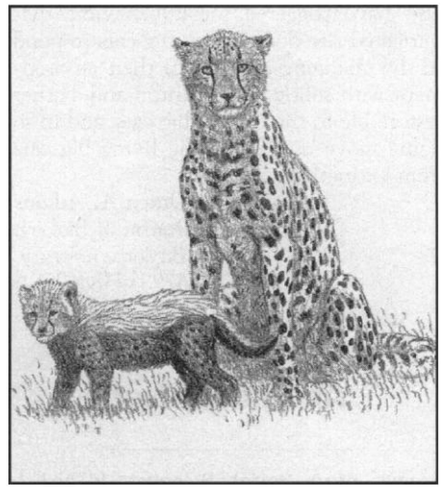


Facing a glyptodont. "This scene, set in the Pleistocene of Peru, shows a small group of lions puzzled by an individual of the genus *Doedicurus*. . . . Whether the animal could move quickly enough to employ the expanded, macelike feature of the tail is unclear, but its armor alone is likely to have afforded adequate protection for the adult." [From *The Big Cats and Their Fossil Relatives*]

Yet, as Alan Turner notes, relatively little has been written for the non-specialist about the evolution of the cats. He and artist Mauricio Antón therefore set out to provide "an authoritative and yet popular and accessible account of the evolution of the larger cats by bringing together the evidence of modern behavior and the fossil record." Their book does exactly that. Antón's illustrations, refreshingly "based directly on the skeletal evidence available and . . . not merely slightly altered versions of living cats with the addition of large fangs," are perhaps the finest ever published. They are intertwined with Turner's cogent text in an eloquent demonstration of the interplay between art and science, paleontology and zoology, predator and prey, ecology and behavior, and anatomy and geography. This can be seen in the tale of *Megantereon* and *Homotherium*.

Remains of these two Plio-Pleistocene sabertooths often occur in the same quarries. *Megantereon* was similar in size and build to a jaguar; *Homotherium* was larger, with the sloping, short-backed build seen in hyenas. Antón's figure of the two cats together communicates the magnitude of these anatomical differences as no text could, driving home Turner's assertion that such variation precludes meaningful reconstruction of a single "sabertooth" hunting behavior or ecology. Although an apparent *Homotherium* den site in Texas contains the remains of over 70 baby mammoths, suggesting cooperative hunting of these species, Turner urges us to avoid assuming that such evidence represents an entirely typical behavioral pattern, given the flexibility in hunting behavior that large predators in general exhibit.

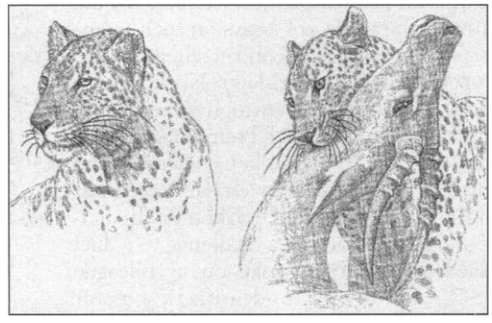
Patterns of kill method and prey size interweave with such factors as predator size and build, social structure, type and size of prey, general prey availability, and composition of the local carnivore guild. Although many cats sever the spinal cord to kill prey, others suffocate their prey with a muzzle "bite" or by twisting its neck backward to occlude the trachea. However, tigers sometimes break the necks of even large animals, and jaguars kill capybara by biting through the ear canal into the brain. While many lions hunt zebra, those of Chobe hunt primarily elephants and those of Lake Manyara live on male buffalo. The jaguars of Belize, similar in size and build to the La Brea Tar Pit sabertooth *Smilodon*, subsist on armadillos.



Adult and juvenile cheetah, displaying one type of difference between juvenile and adult coats in a living species. [From *The Big Cats and Their Fossil Relatives*]

Leopards take small prey in parts of Asia where their range overlaps with that of tigers, and in parts of Africa where "the presence of spotted hyenas forces [them] to take carcasses up into trees more often." However, changes in the local predator guild may also trigger cooperative hunting, as social behavior patterns apparently exist in species (such as tigers) that have traditionally been considered solitary. Even changes in landscape or vegetation—from forests where solitary ambush is possible to open areas that require cooperative pursuit of prey, for example—can trigger significant behavioral changes.

The spectrum of ecological and behavioral relationships between the living large cats suggests that although *Homotherium* may have pushed *Megantereon* to take smaller prey than it would have otherwise hunted, competition between them could



The use of whiskers. Left, "a leopard in a relaxed pose. The whiskers are extended laterally or even slightly backward." Right, the animal "extends its whiskers in front of its mouth as it applies a throat bite to an impala, and [is thus] able to make a more precise judgment of the movement and position of the prey." [From *The Big Cats and Their Fossil Relatives*]

also have triggered social behaviors that mitigated size dominance. Big cats respond to the changing rhythms of their environment with subtle grace. Antón and Turner restore life to the extinct big cats, and in so doing move us to save the living big cats from extinction.

Dawn A. Adams
Department of Biology,
Baylor University,
Waco, TX 76798–7388, USA

■

An Epoch Past

Essays of a Soviet Scientist. VITALIĬ I. GOL'DANSKIĬ. AIP Press, Woodbury, NY, 1997. xvi, 303 pp., illus. $32.95. ISBN 1-56396-454-6. Masters of Modern Physics.

Vitaliĭ Gol'danskiĭ's astonishing range of work in chemical, particle, and nuclear physics has put him at the epicenter of scientific and political events in the former Soviet Union for more than half a century. He has known many of the scientific luminaries of the period and has been an active participant in the events of the epoch during which the former Soviet Union first developed nuclear weapons, started to develop nuclear energy for peaceful purposes, then went through a still not completely understood metamorphosis from world superpower to a collection of independent states.

This collection of his essays reproduces his opinions and impressions of people, places, and events during this most contentious and crucial period. We are given a selection of brief but telling interviews he gave and essays he wrote on a variety of occasions—to commemorate an anniversary, to reminisce about a colleague, or to address an issue of public interest. Flashing through the pages are essays on such scientists as physicist L. D. Landau, chemist (and Gol'danskiĭ's father-in-law) N. N. Semenov, physicist and astrophysicist V. L. Ginzburg, chemist A. N. Frumkin, chemical physicist A. I. Shal'nikov, chemist and physicist Ya. B. Zel'dovich, and physicist and statesman Andrei D. Sakharov. Included are a description of a challenge to a duel issued as a practical joke on a colleague ("S.R.," not otherwise identified); a report of repartee between Semenov and prominent playwright Korneichuk, the former advising the latter that he was "no Shakespeare," the latter responding that the former was "no Newton"; and a congratulatory poem to Zel'dovich advising him not to "stick your nose in the air." These glimpses only hint at the richness of the personal lives and the deep relationships, both friendly and adversarial, that were part of everyday life among the scientific elite of the Soviet Union.

About two thirds of the book is devoted to reflections on public issues. The urgency of disarmament is highlighted, in keeping with Gol'danskiĭ's long involvement with Pugwash conferences and the nuclear disarmament movement. Other essays on the importance of supporting basic research, on culture ("high" and "low"—in the cinema, for example), and on the changing relationship of the Soviet Union and its successor states with the rest of the world touch on wide-ranging issues with wit and insight. In three late pieces (among them a much-noted "Letter to the General Secretary") that conclude the book Gol'danskiĭ takes a stand against the rising tide of anti-Semitism and "ethnic turmoil" unleashed in the former Soviet state by the very *perestroika* that led to the destruction of the communist system.

The book is in a sense reminiscent of Chekov's *The Cherry Orchard*. The world depicted was once so real and is now irretrievably gone. This collection gives evidence that the author could give us memoirs "with the spaces filled in," in which the people he knew and the events in which he participated would be more richly and fully described. Let us hope he takes the time to do so.

Joseph L. Birman
Department of Physics,
City College, City University of New York,
New York, NY 10031, USA

■

Other Books Received

Aping Science. A Critical Analysis of Research at the Yerkes Regional Primate Research Center. Committee on Animal Models in Biomedical Research. Medical Research Modernization Committee, New York, 1996. x, 102 pp., illus. Paper, $12. *Perspectives on Medical Research*, vol. 5 (1995).

Bats. Biology and Behavior. John D. Altringham. Oxford University Press, New York, 1996. x, 262 pp., illus. $65. ISBN 0-19-854075-2.

Chinese Studies in the History and Philosophy of Science and Technology. Fan Dainian and Robert S. Cohen, Eds. Kluwer, Norwell, MA, 1996. xiv, 471 pp., illus. $250 or £160 or Dfl. 375. ISBN 0-7923-3463-9. Boston Studies in the Philosophy of Science, vol. 179. Translated by Kathleen Dugan and Jiang Mingshan.

DNA Sequencing Strategies. Automated and Advanced Approaches. Wilhelm Ansorge, Hartmut Voss, and Jürgen Zimmermann, Eds. Wiley, New York, and Spektrum, Heidelberg, Germany, 1996. xiv, 202 pp., illus. Spiralbound, $39.95. ISBN 0-471-13683-2. EMBO Practical Course.

Eyewitness to Discovery. First-Person Accounts of More Than Fifty of the World's Greatest Archaeological Discoveries. Brian M. Fagan, Ed. Oxford University Press, New York, 1997. x, 493 pp., illus., + plates. $39.95. ISBN 0-19-508141-2.

Feminism, Science, and the Philosophy of Science. Lynn Hankinson Nelson and Jack Nelson, Eds. Kluwer, Norwell, MA, 1996. xx, 311 pp. $115 or £77 or Dfl. 175. ISBN 0-7923-4162-7. Synthase Library, vol. 256.

Gel Electrophoresis. Proteins. D. M. Gersten. Wiley, New York, 1997. xii, 177 pp. Spiralbound, $23.95. ISBN 0-471-96265-1. Essential Techniques.

Homogenization and Porous Media. Ulrich Hornung, Ed. Springer-Verlag, New York, 1996. xvi, 279 pp., illus. $59.95. ISBN 0-387-94786-8. Interdisciplinary Applied Mathematics, vol. 6.

Immobilization of Enzymes and Cells. Gordon F. Bickerstaff, Ed. Humana, Totowa, NJ, 1996. xiv, 367 pp., illus. $74.50. ISBN 0-89603-386-4. Methods in Biotechnology, 1.

Liquid-Liquid Interfaces. Theory and Methods. Alexander G. Volkov and David W. Deamer, Eds. CRC Press, Boca Raton, FL, 1996. xx, 421 pp., illus. $125. ISBN 0-8493-7694-7.

Microbial Diversity in Time and Space. R. R. Colwell, Usio Simidu, and Kouichi Ohwada, Eds. Plenum, New York, 1996. viii, 172 pp., illus. $75. ISBN 0-306-45194-8. From a symposium, Tokyo, Oct. 1994.

Modes of Thought. Explorations in Culture and Cognition. David R. Olson and Nancy Torrance, Eds. Cambridge University Press, New York, 1996. x, 305 pp., illus. $49.95, ISBN 0-521-49610-1; paper, $19.95, ISBN 0-521-56644-4. From a workshop, Toronto, Sept. 1993.

Molecular Mechanisms in Striated Muscle. S. V. Perry. Cambridge University Press, New York, 1996. x, 168 pp., illus. $50, ISBN 0-521-57001-8; paper, $19.95, ISBN 0-521-57916-3. Lezioni Lincee.

Protein Sequencing Protocols. Bryan John Smith, Ed. Humana, Totowa, NJ, 1996. xiv, 375 pp., illus. $69.50. ISBN 0-89603-353-8. Methods in Molecular Biology, 64.

Protein Structure-Function Relationship. Zafar H. Zaidi and David L. Smith, Eds. Plenum, New York, 1996. xii, 298 pp., illus. $95. ISBN 0-306-45285-5. From a symposium, Karachi, Pakistan, Jan. 1995.

Quantum Statistical Theory of Superconductivity. Shigeji Fujita and Salvador Godoy. Plenum, New York, 1996. xx, 338 pp., illus. $59.50. ISBN 0-306-45363-0. Selected Topics in Superconductivity.

Red-Winged Blackbirds. Decision-Making and Reproductive Success. Les D. Beletsky and Gordon H. Orians. University of Chicago Press, Chicago, 1997. xxii, 294 pp., illus. $65 or £51.95, ISBN 0-226-04186-7; paper, $21.95 or £17.50, ISBN 0-226-04187-5.

Soil Behaviour in Earthquake Geotechnics. Kenji Ishihara. Clarendon (Oxford University Press), New York, 1996. x, 350 pp., illus. $95. ISBN 0-19-856224-1. Oxford Engineering Science, 46.

Structured Biological Modelling. A New Approach to Biophysical Cell Biology. Michael Kraus and Bernhard Wolf. CRC Press, Boca Raton, FL, 1996. xvi, 219 pp., illus., + plates. $160. ISBN 0-8493-4772-6.

Teaching Introductory Physics. A Sourcebook. Clifford E. Swart and Thomas Miner. AIP Press, Woodbury, NY, 1996. viii, 558 pp., illus. $75. ISBN 1-56396-320-5.

Technology Fountainheads. The Management Challenge of R&D Consortia. E. Raymond Corey. Harvard Business School Press, Boston, 1996. xiv, 197 pp., illus. $29.95. ISBN 0-87584-723-4.

Telling Lives in Science. Essays on Scientific Biography. Michael Shortland and Richard Yeo, Eds. Cambridge University Press, New York, 1996. xiv, 295 pp., illus. $75. ISBN 0-521-43323-1.

Thermal Field Theory. Michel Le Bellac. Cambridge University Press, New York, 1996. xiv, 256 pp., illus. $69.95. ISBN 0-521-46040-9. Cambridge Monographs on Mathematical Physics.

Viruses of Plants. Descriptions and Lists from the VIDE Database. Alan Brunt *et al.*, Eds. CAB International, Oxford, UK, 1996. iv, 1484 pp. $185. ISBN 0-85198-794-x.

The Zebra Finch. A Synthesis of Field and Laboratory Studies. Richard A. Zann. Line drawings by Michael Bamford. Oxford University Press, New York, 1996. xvi, 335 pp., illus. $105. ISBN 0-19-854079-5. Oxford Ornithology, 5.