

## SCIENCE'S COMPASS

has been allowed to decline in many graduate programs at a time when it ought to be growing. This contrast underscores the timeliness of Krolik's text. I hope that *Active Galactic Nuclei* will help educate the next generation of AGN researchers, whose discoveries will require it to be extensively revised in a few years time.

### BROWSINGS

**Beauty and the Beast.** The Aesthetic Moment in Science. *Ernst Peter Fischer. Translated by Elizabeth Oehlkers.* Plenum Trade, New York, 1999. 216 pp. \$25.95. ISBN 0-306-46011-4.

Fischer, a historian of science, examines aesthetic aspects of research and discovery. He concludes that notions of beauty and harmony are important components of both the scientific mind and process, and he urges that they be given greater consideration.

**Disasters by Design.** A Reassessment of Natural Hazards in the United States. *Dennis S. Mileti.* Joseph Henry (National Academy Press), Washington, DC, 1999. 371 pp. \$47.95. ISBN 0-309-06360-4.

Building on findings from the past two decades, Mileti and his contributing authors

propose a redirection of research and policy for natural and technological hazards. They advocate the adoption of sustainable development principles as the best means of reducing the financial and social burdens of disasters.

**Metapopulation Ecology.** *Ilkka Hanski.* Oxford University Press, Oxford, 1999. 323 pp. \$85, £45. ISBN 0-19-854066-3. Paper, \$45, £22.50. ISBN 0-19-854065-5.

Hanski offers a state-of-the-art review of the ecological dynamics of metapopulations, assemblages of local breeding populations. Because the world is patchy, and becoming more so, this synthesis of current research (including the author's substantial contributions to the field) will be of particular interest to conservation biologists.

**Walther Nernst and the Transition to Modern Physical Science.** *Diana Kormos Barkan.* Cambridge University Press, Cambridge, 1999. 300 pp. \$64.95, £45. ISBN 0-521-44456-X.

Nernst, the 1920 Nobel laureate in chemistry, made substantial contributions to our understanding of solutions, chemical equilibria, and the behavior of matter at

high temperatures. Barkan's scientific biography examines his work at the intersection of chemistry, physics, and technology in turn-of-the-century Germany.

**Science Without Laws.** *Ronald N. Giere.* University of Chicago Press, Chicago, 1999. 295 pp. \$25, £17.50. ISBN 0-226-29208-8.

Giere rejects the Enlightenment view of science as a "uniquely rational activity leading to the discovery of universal truths." In these essays, he argues for considering science as the development of "more or less abstract models of specific aspects of the world."

**Understanding Quantum Mechanics.** *Roland Omnès.* Princeton University Press, Princeton, NJ, 1999. 321 pp. \$35, £21.50. ISBN 0-691-00435-8.

Writing for beginning students and experienced physicists, mathematicians, and philosophers, Omnès provides a comprehensive overview of the conceptual framework of quantum mechanics. Organized using logically consistent histories, his updating of the Copenhagen interpretation incorporates recent research on the decoherence effect and the correspondence between quantum and particle physics.

### NOTA BENE: THEATER

## A Gamete Gambol

If a woman in her late thirties who is determined to become a mother seems an unlikely subject for a play, then Carl Djerassi, the chemist who synthesized the first contraceptive pill, may be an even more unlikely playwright. But in the wry and witty *An Immaculate Misconception*\*, an eleven-scene science-in-theater play, Djerassi jettisons his contraceptive beginnings to delve into the thespian world of conception.

Melanie Laidlaw, a widowed career scientist, is wondering if she has left it too late to have a baby. But Melanie, unlike her contemporaries, has a certain advantage—she happens to be a reproductive biologist who has perfected a new technique, ICSI (intracytoplasmic sperm injection), that dramatically increases the chances of fertilizing a human egg in the laboratory. With her clinical collaborator, the fiendish Felix, she prepares for the ultimate test of ICSI: the injection of a single sperm into a human egg and implantation of the resulting embryo into the egg donor. The desire for motherhood prompts Melanie to use her own eggs for the crucial experiment but, after much soul searching, she eschews the sperm bank in favor of a sperm sample from her lover, Menachem, an Israeli nuclear engineer. Predictably, her carefully "hatched" experiment starts to go wrong when she discovers that because of a radiation accident, Menachem is infertile. This problem is set to sink the experiment and Felix (unbeknownst to Melanie) decides to fix it with a sperm donation of his own.

In between the capers, the play airs some of the ethical and social issues raised by in vitro fertilization (see essay on p. 53). Who owns gametes and how crucial is donor consent? What determines paternity: a complement of genes or the

dedication of a loving father? Are scientists playing God when they manipulate conception? Should technology be used to extend the age at which women can conceive? Melanie's decision to not tell Menachem of her plans for his sperm provides one of the play's funniest moments—our heroine secretly sneaking a used condom into a dewar flask of liquid nitrogen—as well as the backdrop against which the protagonists heatedly debate sperm ownership and donor consent. Through Melanie's son, Adam, "the first ICSI baby," the play considers the issue of paternity. The artful switching of sperm samples by Felix casts uncertainty upon the identity of Adam's genetic father; yet the final scene leaves us in no doubt that Adam's real father is Menachem.

But there are two premises upon which the plot hinges that stretch one's credulity. It seems doubtful that Melanie, at 37, would try a new in vitro fertilization technique (untested in humans) before seeing if she could conceive Nature's way. Even more unlikely is the notion that a reproductive biologist would risk fertilizing a human egg with sperm that might carry genetic abnormalities.

Nevertheless, *An Immaculate Misconception* appeals because of the unusual plot, the well-drawn characters, and the simple but effective touches of modern technology, such as a screen on which e-mail exchanges between Melanie and Menachem appear during scene changes and the screening of real video footage of ICSI (courtesy of UCSF) as Melanie performs the first-ever injection of a single sperm into a human egg.

It is encouraging to see modern science brought to life through theater, one of the most ancient and artistic forms of communication.

—ORLA SMITH

\**An Immaculate Misconception* will be performed from 15 August to 6 September 1999 in the Unadilla Theater in Marshfield, Vermont, USA.