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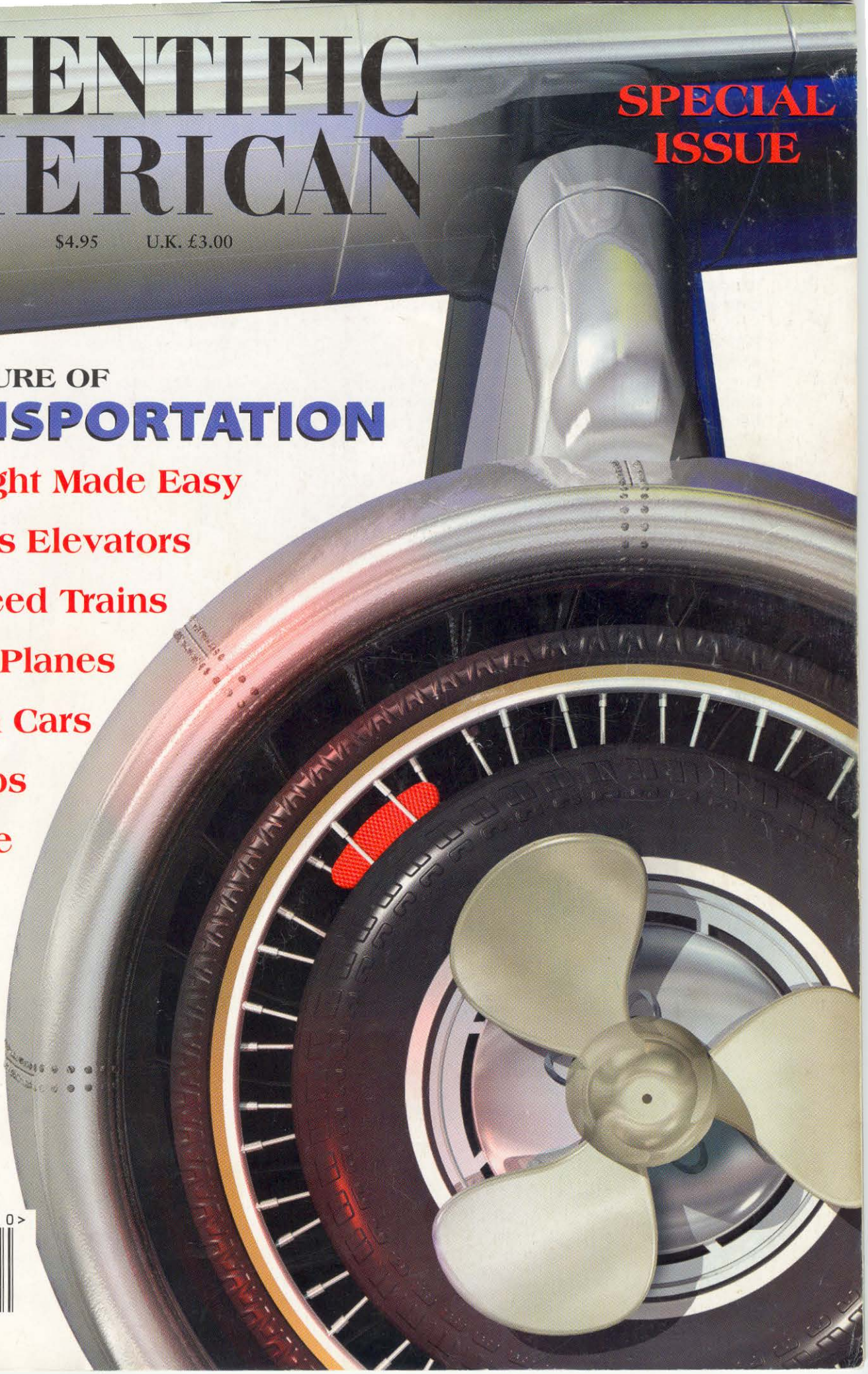

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QUEER SCIENCE INDEED

Review by Tom Boellstorff and Lawrence Cohen

Queer Science: The Use and Abuse of Research into Homosexuality
BY SIMON LEVAY
MIT Press, Cambridge, Mass., 1996 ($25)

A Natural History of Homosexuality
BY FRANCIS MARK MONDIMORE
Johns Hopkins University Press, Baltimore, Md., 1996 ($15.95)

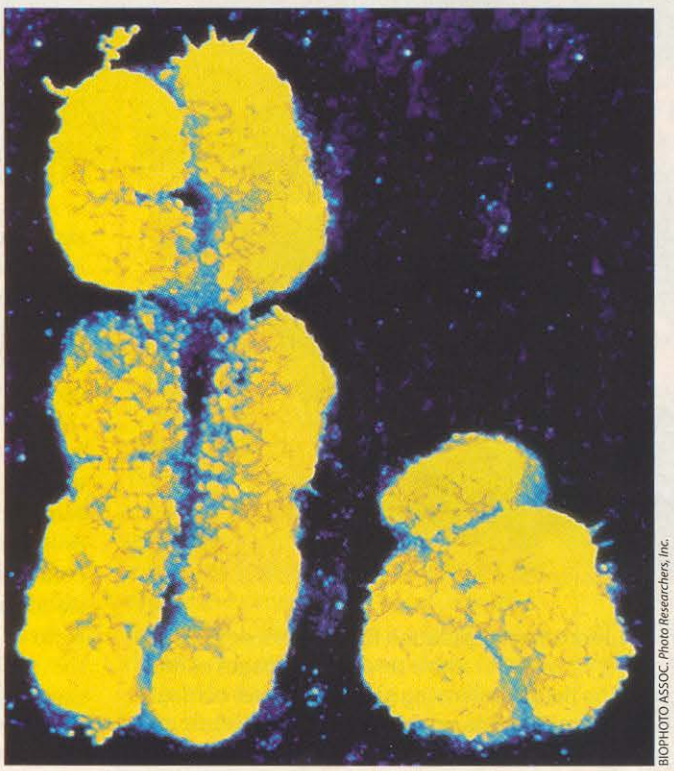
Despite scientific findings that remain inconclusive, contested and (in some prominent cases) irreproducible, the biology of human sexual variation has gradually become respectable. In these two ambitious books, which epitomize the direction of current thinking, neuroanatomist Simon LeVay and physician Francis Mark Mondimore review several decades of biological research on homosexuality and place it in its historical and political contexts. Both authors devote great space to summarizing the work on same-sex eroticism done by anthropologists and historians; their willingness as biologists to examine this research demonstrates an interest in dialogue with social scientists that is all too rare and seldom reciprocated.

Yet these efforts at integration meet with limited success. The two authors refer to the ethnographic and historical record without engaging it. Once he has mentioned the myriad ways that humans have coupled, for instance, LeVay glosses over them: "To try to take all this potential [cultural] diversity into account right at the beginning would be a recipe for paralysis."

This attitude is symptomatic of a more general malaise in the academy. The "two cultures" gap between science and the humanities has led researchers to believe that sexuality must be either biological or cultural and that we grant it being one at the expense of the other. These books demonstrate how even the best of authors get drawn into turf wars. Instead of evaluating good science, they become less than critical boosters of any putatively scientific effort to defeat the "higher superstition" of those who suggest that culture plays a fundamental role in sexual orientation. In spite of their detailed historical and cultural discussions, both LeVay and Mondimore frequently reduce a broad spectrum of anthropological and historical work to a caricature of social constructivism—the notion that sexuality is entirely the product of cultural decisions. This straw man forecloses the possibility of a true dialogue between biological and social studies of homosexuality.

At times, the authors offer a more synthetic point of view—that humans have biological potentials that take a completed shape under specific personal and social circumstances, leading to great diversity in sexual experience and identity. Mondimore in particular focuses on the ways in which the brain is structured through interaction with the environment, an emphasis that puts him somewhat at odds with LeVay's enthusiasm for hormonal explanations. Such arguments are worth continued exploration. But LeVay's and Mondimore's "biological potentials" look suspiciously like the folk categories familiar to most Americans: straight and gay. Indeed, much of the biological research that has been done in the field seems to be based on the popular stereotype that gay men are feminized males and lesbians masculinized females.

The ethnographic record, however, documents behaviors that do not accord with these ostensible biological categories. For example, Tomas Almaguer of the University of Michigan has looked at the common Latin American split between people who penetrate ("active" men) and people who get penetrated (women and "passive" men). Men who penetrate other men are not marked as homosexual. Jonathan Marks, a biological anthropologist at Yale University, has said that the standards of validity for scientific research should be higher when the results appear to reinforce folk assumptions than when they contradict the popular wisdom. Thus, we should be wary when LeVay claims, without any supporting evidence, that "we have a core identity, of which our sexual



BIOPHOTO ASSOC./Photo Researchers, Inc.

HUMAN SEX CHROMOSOMES show the familiar X (left) and Y (right) shapes. But human sexuality is not so clearly defined.

orientation is an important element, that radiates outward and richly informs and energizes our lives." Why does this formulation make intuitive sense, and does this intuition point to a biologically determined universal or to a very American notion of individualism, choice and self-integrity? LeVay's formulation begs the question of why sexuality of any form is seen as a central aspect of one's identity. Understanding why people have felt this way in some cultural contexts but not in others would be of great use in formulating a biology of sexual orientation.

The worldwide intensification of media and consumer culture, along with the international battle against AIDS, has led to the global diffusion of the terms "lesbian," "gay" and "straight." But we should not infer from the spread of these categories that they reveal an underlying similarity. One of us (Boellstorff) has shown how Indonesians who use terms such as "gay" do not simply import them from the West but transform them in unexpected ways. Societal differences in both the classification and experience of sexuality continue to exist and may actually be increasing.

Such complications should be helpful to biologists who are interested in moving beyond general folk models of sexuality toward a science more grounded in the biological correlates of behavioral plasticity and its limits. They force us to be ever more precise in what we mean by a biological potential and to examine sources of bias in our methods and conclusions.

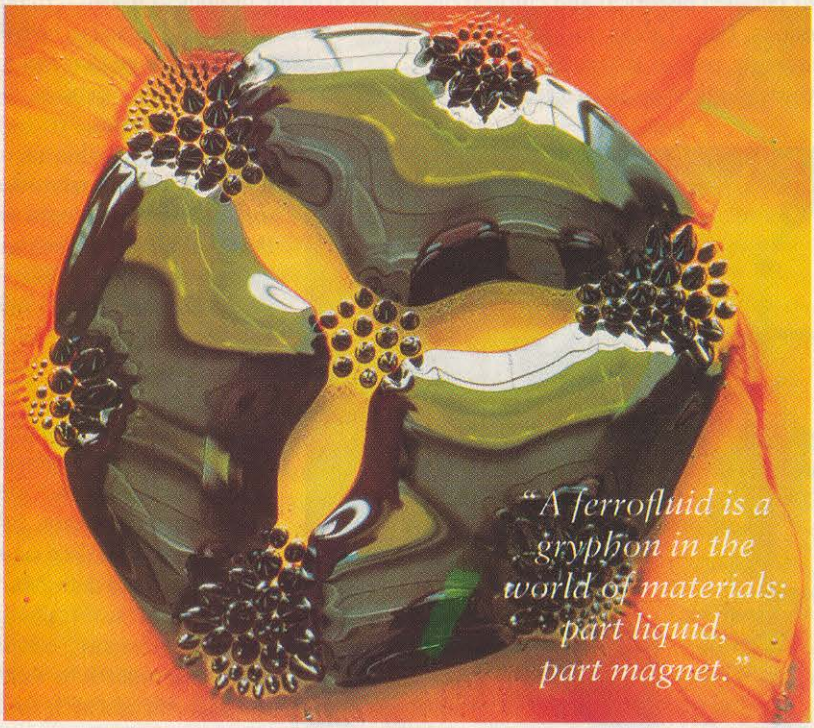
Mondimore and LeVay recognize the usefulness of social analysis, but both reach an impasse when they try to square a constructionist view of sexuality with notions of choice. They seem to believe that because most people do not choose their sexual orientation, it must be purely a matter of biology, immediate and precultural. LeVay claims that "sexual attraction is an aspect of consciousness; it is directly experienced, like hunger, thirst, seeing the color red, taking fright, loving one's mother, and countless other aspects of our mental life." This statement is indicative of the primary conceptual weakness of his (and, to a lesser extent, Mondimore's) reasoning. The empirical data simply do not support the notion that any aspect of consciousness—sexual attraction or love or even color vision—is directly experienced before the influence of culture. All humans grow up in a specific culture, and *Homo sapiens sapiens* has evolved to be shaped by culture not only on the level of ideas and symbols but on neurological levels as well.

As a result, any analysis that omits specific cultural contexts in favor of biological "foundations" is inadequate. Only by beginning with all the data—cultural, genetic and neurological—can scientists undertake a rigorous study of the wide range of human sexuality. Furthermore, instead of assuming that similarities in such diversity are determining or "underlying" factors, we believe researchers should consider the diversity of causes that can lead to the most similar of results. We are not engaging in philosophical hair-splitting; such a paradigm shift would have profound implications for the ways in which people think about and conduct research on sexuality.

Even where sameness appears across societies (the existence of plural grammatical forms, nurturing of children, same-sex behavior), it manifests itself only in the cultural context. It is to these contexts that we must turn to understand human actions and artifacts that seem to be cross-cultural. To start with the postulate that diversity underlies sameness recognizes the remarkably underdetermined nature of human genetics (as Mondimore acknowledges). Such a scientific methodology does not exclude biology, nor does it relegate biology to a subordinate position. Instead

THE ILLUSTRATED PAGE

On the Surface of Things: Images of the Extraordinary in Science
BY FELICE FRANKEL AND GEORGE M. WHITESIDES
Chronicle Books, San Francisco, 1997 ($22.95)



FELICE FRANKEL

Materials science bears an unfortunate reputation for dullness, dealing as it does with the stuff of everyday life. A ramble through the pages of this poetic volume, however, exposes the field's underlying luster. A droplet of magnetic fluid (*shown above*), a shard of broken glass or a swatch of plastic fabric reveal themselves as things of colorful, otherworldly beauty. The words are no less remarkable, balancing weighty concepts from the laboratory with a literate tone as light and elegant as a spiderweb. A wonderful achievement. —*Corey S. Powell*

it recognizes that culture is biological—that human beings have evolved biologically so that they need to live in specific cultures.

In a sense, we would argue that *H. sapiens sapiens* has evolved so that we have no sexual orientation without reference to a particular, historically located culture, just as we have no way of speaking without using a particular, historically located language. Such a framework does not discredit the work of researchers such as LeVay and Mondimore; rather it builds on their own stated desire to integrate biology and culture by offering a way to unite these apparently disparate domains of human existence in a way that subordinates neither.

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DARREN MICHAELS Columbia/TriStar

WITH A BORROWED GENOME Vincent (Ethan Hawke) perpetuates a false identity in front of Irene (Uma Thurman) in Gattaca.

CLEAN GENES

Review by Philip Yam

Gattaca
WRITTEN AND DIRECTED BY ANDREW NICCOL
Columbia Pictures, 1997

Gattaca joins *The Fly* and *The Island of Dr. Moreau* as the latest piece of science fiction to explore the dangers of tampering with the genetic code. Scheduled to open this month, the movie tells of a not too distant future in which almost everyone has been screened in a petri dish for the most desirable traits possible from their parents' DNA. The unfortunate few who are conceived naturally, the so-called In-Valids, are doomed to discrimination and an underclass life.

One In-Valid determined to beat the odds is Vincent Freeman (played by Ethan Hawke), whose genes indicate he is likely to develop a fatal heart condition in his early 30s. His dream to be an astronaut is thwarted, until he decides to buy the genetic code of Jerome Morrow (Jude Law), a former superior rendered a paraplegic in an accident. Armed with blood and urine samples that Jerome dutifully supplies every day for testing, Vincent rises through the ranks of the Gattaca Aerospace Corporation, a space-launch firm. Just a week before Vincent is set to depart to Titan, a mis-

BRIEFLY NOTED

DARWIN AMONG THE MACHINES, *by George B. Dyson. Helix Books/Addison Wesley, Reading, Mass., 1997 ($25).*
Machines, like living organisms, evolve. They do so, however, in a peculiar ecosystem consisting largely of human designers and users. People's hands and minds are essential to breeding and reproduction in the mechanical world. George B. Dyson, son of Freeman Dyson, demonstrates the complexity of talking about nonbiological evolution. His book provides useful information, regrettably immersed amid relentless prose and often gratuitous quotations.

PLANET QUEST, *by Ken Croswell. Free Press, New York, 1997 ($25).* **WORLDS UNNUMBERED,** *by Donald Goldsmith. University Science Books, Sausalito, Calif., 1997 ($28.50).* **THE QUEST FOR ALIEN PLANETS,** *by Paul Halpern. Plenum Publishing Corporation, New York, 1997 ($27.95).*
Two years ago astronomers discovered the first planets circling sunlike stars, proving that our solar system is not unique. These books offer fine but distinctive introductions to this mind-opening discovery. Ken Croswell takes a charming, historical approach, beginning with Giordano Bruno's vision of a multitude of worlds and continuing through the personalities and techniques involved in the latest findings. Donald Goldsmith omits some of the background details in favor of lively discussions about how planets form and whether any of the new bodies could support life. And Paul Halpern steers a middle course, adding a short discussion about the possible connection between planets and dark matter.

CARTOGRAPHIES OF DANGER, *by Mark Monmonier. University of Chicago Press, 1997 ($25).*
Maps are powerful tools for understanding the distribution of risks all around us—ranging from radon to burglaries to tornadoes. Crime plots enable police to target their manpower more effectively; fault-zone maps guide architects building in earthquake-prone areas. The author calls on cartographic techniques to show the (often misunderstood) complexities of environmental hazards in the U.S., giving rigorous response to the victim's cry of "Why me?"