

TAKING ON THE "DEMYSTIFIERS" AND THEIR "OTHER WAYS OF KNOWING"

Higher Superstition: The Academic Left and its Quarrels with Science

**Paul R. Gross
and Norman Levitt**
*Johns Hopkins U. P.,
Baltimore, Md., 1994. 314 pp.
\$25.95 hc ISBN 0-8018-4766-4*

Reviewed by Arthur R. Kantrowitz

Paul Gross, a biologist, and Norman Levitt, a mathematician, have performed an important service in challenging postmodern and multicultural efforts to "demystify" natural science. After describing a sampling of this literature, the authors observe that "intellectually these quarrels tend to be tiresome. Nature is the scientist's worthy adversary." Nonetheless, the pigeonholing of science as a white, European, bourgeois and male, etc. view of the world is taken very seriously by many members of the humanities and social science faculties of our leading universities and by literary intellectuals generally. To such "demystifiers" the knowledge produced by science is no more reliable than that produced by "other ways of knowing."

As Gross and Levitt put it, in a chapter called "The Realm of Idle Phrases": "Once it has been affirmed that one discursive community is as good as another, that the narrative of science holds no privileges over the narratives of superstition, the newly

minded cultural critic can actually revel in his ignorance of deep scientific ideas." While I might have preferred less provocative language, I am indebted to Gross and Levitt for their overview and will try to avoid reveling in my ignorance of the depths of this literature.

In his famous 1959 Rede lecture, C. P. Snow described the deep gulf between the literary intellectuals and the scientific culture. Anais Nin most elegantly expressed the literary viewpoint in her aphorism "We don't see things as they are; we see them as we are." Since science is devoted to the effort to see things as "they are," we cannot be surprised that the two cultures see different worlds. In their final chapter, "Does It Matter?" Gross and Levitt sadly report that "we have had to abandon the complacent feeling that the republic of intellectual inquiry is secure from internal decay."

In my own view, this era is an acute phase of an ancient rivalry, and my answer to the question posed in their chapter heading is that it matters a great deal. The central fact is that the art cultivated by literary intellectuals and their students is persuasive language itself, the quintessential double-edged sword. The literary intellectuals control most of the undergraduate years of people who go on to become teachers, lawyers and journalists. To an alarming degree they have broadcast the proposition that science is too dangerous, and they have given prominence to "other ways of knowing," which they have put forward as more politically correct.

In a very perceptive essay in the August 1993 issue of *PHYSICS TODAY* (page 9), Daniel Kleppner quotes Vaclav Havel, one of today's most respected literary intellectuals: "Technical civilization . . . has reached the limit of its potential, the point beyond which the abyss begins." In predicting the future and in matters where most people have only second- or

third-hand knowledge, the persuasive language of an aroused literary community has diminished the hopes that mankind once held for science to enable us to reach new heights. What has so aroused the antiscience literary intellectuals? My answer is that no proud community would quietly step aside as magnificent achievement moved science and science-based technology to dominate the center stage, as has happened in this century.

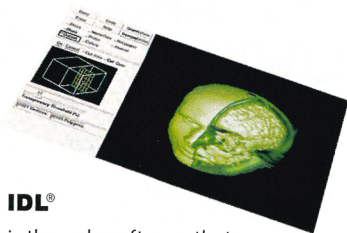
I would like to call attention to another case in which literary intellectuals were aroused by a technology that threatened to displace them: In the massive scholarly work *Science and Civilization in China* (Cambridge, 1971), Joseph Needham describes the spectacular rise and fall of Chinese naval power. Until the early 15th century, Chinese technology led the world. In the early Ming Dynasty, this flowering technology culminated in a remarkable series of naval expeditions by fleets of 1500-ton "treasure ships," each able to carry about 500 men. In the early years of the 15th century, these fleets sailed around Southeast Asia to Bengal and Ceylon and finally, in 1420, down the east coast of Africa.

China made its last great voyage in 1431-33. According to Jung Pang Lo, when the Cheng t'ung Emperor came to the throne in 1436 an edict was issued that forbade the building of ships for overseas voyages ("Decline of the Early Ming Navy," *Oriens Extremus*, Hamburg 1958, Vol. 5, pp. 149-168). After that happened, China lost its leadership in technology and isolated itself as long as it could from the explosive growth of Europe. This isolation became impossible when the military strength of the "barbarians" forced itself upon the Chinese during the Opium Wars four centuries later.

The opportunity to educate the new emperor enabled the literary intellectuals to inflict four centuries of

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insularity and scientific stasis on China. I am persuaded that the power of our literary intellectuals, exercised through their students, is comparable to that of the Chinese intellectual bureaucracy and their all important student.

We should be thankful that Gross and Levitt have provided a wake-up call. Their significant overview of the thinking of those who teach our lawyers, journalists and teachers should be read by all who are concerned by the decline of the status of science in our times.

Order, Chaos, Order: The Transition from Classical to Quantum Physics

Philip Stehle

Oxford U. P., New York, 1994.

332 pp. \$59.95 hc

ISBN 0-19-507513-7

In the history of science, two approaches have long persisted to create tension in the field. The last generation has witnessed the increasing popularity of "external" histories, written largely by professional historians of science and emphasizing the interaction between science and society. But these works have not displaced the more traditional, "internal" narratives, mostly written by scientists themselves and focusing on the technical evolution of science from one discovery to another. Despite its catchy title and the dust jacket's assurance of its being "accessible to non-scientist general readers," *Order, Chaos, Order* represents a rather extreme example of an internal history, with both its strengths and weaknesses.

In the introduction, Philip Stehle, emeritus professor of physics at the University of Pittsburgh and author of several physics texts, makes it clear that his interest "lies more in the evolution and interplay of ideas than in the personalities of the participants." Closely following the original events and publications, he surveys the structure of classical physics as it evolved to the end of the 19th century, its various difficulties, new experimental discoveries and the emergence of quantum theory and relativity in their wake. The account covers mainly the period from 1895 to 1925, with a brief last chapter on the new quantum mechanics. General relativity is not discussed. On each major topic, the author carefully reconstructs both the prevailing theories

and their context, often with thoughtful comments on the connections between various physical concepts.

While specialists will probably find little that is new here, *Order, Chaos, Order* provides a reliable guide to the original literature of the scientific revolution in physics at the turn of the century. The clear presentation should also make it a valuable addition to courses in either physics or physics history. The book reads at times like a physics textbook. The language is plain, but the material is dense. There is a fair amount of mathematics in the text, and there is much more in the exercise-like "amplification" pieces scattered throughout the book.

The strictly internal approach to science history, however, has its shortcomings. Although the book presents a good picture of what physicists did in physics, one learns little about how they did it, much less why. There is no mention, for example, of the profound influence of the philosophies of Baruch Spinoza, David Hume and Ernst Mach in the evolution of Albert Einstein's scientific thinking. Given the minimal reference to secondary sources in the text, the short list of suggested readings at the end of the book hardly serves as an adequate introduction to the large extant body of historical scholarship on the subject.

Order, Chaos, Order was obviously a labor of love and will interest historically inclined physicists. If supplemented by other more "externally" oriented texts, it will also be useful for an undergraduate course in the history of physics, for which Stehle prepared the book in the first place.

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From Alchemy to Quarks

Sheldon Glashow

Brooks-Cole, Pacific Grove, Calif., 1994. 692 pp. \$60.75 hc
ISBN 0-534-16656-3

Since 1979 Sheldon Glashow has been teaching an undergraduate course for nonscience majors at Harvard College based on the material in this book, which he subtitled "The Study of Physics as a Liberal Art." The writing of such a book follows a long-established practice by Eric Rogers, Gerald Holton, Robert March, Steven Weinberg, Leon Lederman and others who have taught—and written physics texts for—nonscience college students interested in satisfying core dis-

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