



Ultrasound breast scanner developed by John Wild, working in Minnesota in the 1950s and '60s. To produce images without causing tissue damage Wild adopted a "pulse-echo" technique that "enabled a single transducer to act as both transmitter and receiver, a melding of function that became basic to the emerging technology of ultrasound." Often enmeshed in controversy, Wild had fallings out with the sponsors of his research, and in 1962 the National Institutes of Health confiscated his equipment. At the time such research "evoked very little interest from the private sector." [From *Naked to the Bone*; courtesy of Barry Goldberg, Archives Committee, American Institute of Ultrasound in Medicine]

that the body's interior remained terra incognita until 1895, whereas in fact, through surgery, dissection, and anatomy drawings, the world beneath the skin had been known for centuries. But Kevles tells her basic story interestingly and well, and she makes a convincing case that the x-ray and its sequelae brought a revolution in perceptions of the human body that resonated powerfully in many realms of thought and culture. *Naked to the Bone* brilliantly explores that liminal frontier terrain where medicine, technology, economics, and culture converge and interact.

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## Clinical Trials from Close Up

**Between Bench and Bedside.** Science, Healing, and Interleukin-2 in a Cancer Ward. ILANA LÖWY. Harvard University Press, Cambridge, MA, 1996. vi, 370 pp., illus. \$39.95 or £26.50. ISBN 0-674-06809-2.

Conducting a clinical trial of a novel cancer therapy entails orchestrating the actions of many different individuals and organizations, including clinicians, bench researchers, nurses, cancer foundations, pharmaceutical companies, and government agencies,

as well as, of course, cancer patients and their families. These diverse actors face the difficult and often unenviable task of doing science and making medical decisions in an environment where the most mundane activities are intertwined with matters of life and death and where no one can draw sharp boundaries among scientific, clinical, organizational, and ethical questions.

The goal of Ilana Löwy's study *Between Bench and Bedside* is to provide a probing description of the institutional complexities of this social world. To accomplish this, she spent about four years following the development of a particular clinical trial, conducted during the 1980s in Paris, where she sat in on group meetings, observed laboratories, and interviewed personnel. The trial was a high-profile test of interleukin-2 (IL-2), a molecule that to some mid-1980s observers represented an immunological strategy so novel and promising that it inspired visions of a spectacular turning point in cancer therapy. Although these hopes soon faded, by the early 1990s IL-2 had found a respectable place in the oncologist's arsenal, alongside many other treatments of real yet limited efficacy.

More than most areas of science, clinical research lends itself to melodramatic narratives, but Löwy is not interested in telling a simple story of heroes, villains, and victims. She explicitly rejects both "white" accounts (that uncritically report the views of the scientists who organized the trial) and "black" accounts (that describe how self-serving professionals and industrialists profited at the expense of patients). Instead, she sets herself to the far more ambitious task of understanding the trial as a social and historical phenomenon.

An important starting point for Löwy's analysis is the insight that cooperation among the participants in a trial cannot be assumed as a given but must be explained as an outcome. The immunologists, oncologists, and others who tested IL-2 did not always share precisely the same goals, and they approached the project with different conceptual and material "tool kits." Moreover, as Löwy points out, agreement among the investigators about "the broad outlines of collaboration did not always prevent friction over issues such as the right to use space and equipment, to employ technicians, to recruit patients, to change protocols, to supervise students' work, to obtain biological materials from the clinics, to control patient-derived substances, and to present authorized accounts of the trial." The suffering of patients, some of whom experienced terrible side effects, also contributed to the fragility of the trial, especially as the overall results began to suggest that miraculous cures would be infrequent.

To control tensions between the clinicians and the laboratory scientists, the trial organizers had to build shared understandings about which decisions belonged under whose control. According to Löwy, one means for achieving this was defining a zone of "intermediary" issues that were neither "clinical" questions for oncologists to resolve nor "immunological" matters solely in the bench scientists' domain. Because neither group could exert exclusive control over the intermediary zone, it became a shared space for negotiating about the authority to make decisions, the right to interpret trial results, and the distribution of professional rewards. Establishing an intermediary zone was only one of a set of social, discursive, and material techniques that Löwy argues served to routinize the actions of trial participants, deflect internal and external criticism, and allow work to proceed.

Löwy devotes roughly half the book to situating the trial in the history of cancer research. Using a structure somewhat reminiscent of a series of photographs at increasing magnification, she begins with a high-altitude look at the culture of clinical experimentation in oncology, then broadly surveys the history of cancer immunotherapy (with one chapter devoted to the period 1894–1979 and another to 1980–1990), and finally zooms in on the trial itself. By carefully setting the IL-2 trial in context, Löwy intends to illustrate how the institutions and practices that shaped the trial are embedded in larger historical processes. However, owing to their sweeping scope, the historical sections of the book seem loosely connected to her tightly focused examination of the IL-2 trial. Nevertheless, *Between Bench and Bedside* provides a view into the world of oncology trials that will interest scholars in science and technology studies and in the history and sociology of medicine.

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## Books Received

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## Vignettes: Purveying Science

"No pictures, no story." This is the philosophy of television. Without pictures—and they usually have to be moving ones, that is, video or film—very few television shows will want to give you air time.

That's one reason chemistry or physics stories rarely get on television: Molecules are invisible, and so are subatomic particles. Computer imaging has allowed viewers to see computer simulations of the unseeable, but they hold viewers' interests just so long. Remember: You're competing for television time with Oprah, Geraldo, football, and *ER*.

—Ira Flatow, in *A Field Guide for Science Writers: The Official Guide of the National Association of Science Writers*, Deborah Blum, Ed. (Oxford University Press)

The challenge facing scientists is to find a way to convey the essential features, elegance, and simplicity of important works of science so that those features may be appreciated, just as they are appreciated in important works of art. We need a discipline that might be called "science appreciation" to go along with the well-established discipline of art appreciation. . . . For most scientists . . . the desire to have their work better understood is motivated principally by the idea that the culture of science—which they regard as a precious part of the modern age—should be shared with and understood by the society that is immersed in it and yet apart from it. In this they have the same motivation as the artists.

—Alfred K. Mann, in *Shadow of a Star: The Neutrino Story of Supernova 1987A* (Freeman)

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