measure of respectability. Patients may have access to investigational drugs for their own treatment outside clinical trials. The FDA has tried to expedite both testing and approval. All this has made the drug testing process more inclusionary and, arguably, more efficient and has shortened the time between the beginning of clinical trials and new drug approval.

But none of these changes proves that AIDS has revolutionized drug development. The fundamental goals and methods of both FDA and NIH remain essentially the same. And, unfortunately, there remains an element of tokenism in participation by people with AIDS in scientific endeavors. At the International Conference on AIDS held in July 1992 in Amsterdam, for example, most HIV-positive speakers were relegated to unenlightening sessions on policy, law, and ethics.

Arno and Feiden also believe that AIDS activism has made a difference in the pharmaceutical industry. They suggest that because ACT-UP took dramatic actions to protest high drug prices, drug companies are now careful not to price their drugs too high. But one could argue that the industry learned precisely the opposite lesson. When Burroughs Wellcome initially priced AZT at $10,000 for an average year's supply and got away with it, the industry learned that it could charge whatever the market would bear. The more "desperate" the market, the higher the price. Lyphomed Inc. raised the price of injectable pentamidine as an orphan drug four times as the aerosolized version appeared more effective. Burroughs Wellcome's AZT price decrease, four days after ACT-UP's Wall Street demonstration, also coincided with developing challenges to its patent and threats of congressional hearings. The company might have learned then that a high starting price could later be reduced to garner good publicity and still leave the company with a handsome profit. AZT sales boosted the company's stock price enough that, in July 1992, about 30 percent of its stock was sold for more than $4 billion. Income from the proceeds, reinvested by the nonprofit Wellcome Trust, should generate about $187 million for medical research. So far, none of that research is expected to be directed at AIDS. The federal government, which helped develop AZT and subsidizes its purchase for Medicaid patients, has made a substantial financial contribution to British medical research.

It is difficult to find any dramatic change in industry practices yet. The industry has withstood repeated attacks on its prices without ever being forced to disclose its costs of research, development, or manufacturing, its pricing methods, or its profit margin. Since it is industry that ultimately decides whether or not to put new drugs on the market and at what price, it is unclear how the AIDS model can affect long-term access to new drugs. All of the reforms in government research and regulation will count for naught if no new effective drugs are developed or people cannot afford the drugs that are produced.

The truth may be that very little has changed. What has changed are the expectations of the AIDS community. As the authors note, many activists grew up in an America with "confidence in the miracles of Western medicine." In the early 1980s, with vaccines against poliomyelitis, measles, and other infectious diseases, it was easy to believe that, given enough money and attention, modern science could cure virtually any disease. It took almost a decade of AIDS to shake that faith. Once lost, faith is difficult to restore. But a more realistic faith may result. The more sophisticated students of the AIDS epidemic now recognize that HIV is a nasty, complicated virus that will not yield its secrets easily. Government is no longer seen as the only obstacle to overcoming this dread disease. At the Amsterdam conference, Mark Harrington of ACT-UP asked the right question: "What is the point of streamlining access and approval when the result is merely to replace AZT" with "mediocre, toxic, expensive" drugs?

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Microstructure Revealed

Images of Materials. DAVID B. WILLIAMS, ALAN R. PELTON, and RONALD GRONSKY, Eds. Oxford University Press, New York, 1992. xiv, 379 pp., illus. $75. From a symposium, Chicago, Sept. 1988.

The systematic analysis of microstructure in materials science began with the study of steels by H. C. Sorby of Sheffield in the 1860s. For decades thereafter, light microscopy was the exclusive means for microstructural analysis. The advent of the transmission electron microscope in the 1930s paved the way for an array of increasingly powerful techniques that use electrons or ion beams for "illumination."

The impact of these techniques can be understood through the remarkable improvements in spatial resolution. The resolution of light microscopy is limited by diffraction to half a wavelength, or about one quarter of a micrometer. In the electron- and ion-beam methods, this limitation is virtually eliminated by either reducing the wavelength of the illuminating beam to sub-angstrom levels or reducing the size of the beam to submicrometer diameters. These methods have now progressed to what might be considered the ultimate resolution of microscopy—the ability to observe and identify individual atoms.

Images of Materials is an exceptional collection of 12 chapters describing several types and techniques of microscopy that are the basis of modern microstructural analysis in materials science. Although each of the topics covered is broad, the authors have generally provided complete introductions, with numerous examples showing the present state of the art. With their extensive references, the chapters also serve as a guide to further information on various aspects of each type of microscopy.

The chapters on transmission electron microscopy by Williams and Vecchio ("Electron diffraction images") and Gronsky ("Atomic-resolution imaging") are outstanding in that they are written and illustrated sufficiently clearly to be informative to the nonspecialist and are detailed enough to be a valuable reference for those experienced electron microscopists who wish to learn about these specialties. Williams and Vecchio's treatment of convergent-beam electron diffraction is particularly welcome as an introduction to the sometimes difficult-to-decipher technical literature on this topic. It describes the diffraction effects due to kinematical and dynamical scattering, which can be used to determine crystal point symmetry and space group from volumes of material as small as 10^{-14} cubic millimeter. Similarly, Gronsky's chapter clearly explains the principles of "phase-contrast" imaging and illustrates the need for image calculation in the interpretation of atomic-resolution micrographs.

All of the chapters are written in a clear style well suited to the nonexpert reader. Topics treated (besides those mentioned above) include light-optical, acoustic, scanning-ion, scanning-tunneling, and atom-probe field-ion microscopies, various specialties of scanning and transmission electron microscopy, and computer enhancement and analysis of micrographs.

A major strength of the book is that it is very well illustrated with excellent reproduction of the micrographs. The numerous images include 77 color plates. One stated goal of the editors is to celebrate "the beauty of the structure of materials that we use in our everyday life," and this book indeed provides a delightful view into the world of materials.

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