

## COMMENTARY/

# THE PRICE OF FOR-PROFIT-ONLY SCIENCE

By Bernard Dixon

**I** have a nightmare, in which our world is increasingly given over to people who believe that the profit motive is our only sure guiding principle . . . that education and research and creativity are best supported by those who have proven themselves in the world of profit making."

When I came across those words recently, I was struck by how vividly they reflect the principles that have misguided the funding of much British science over the past 12 years. Yet they were spoken, not by a rabid revolutionary or innocent Marxist, time-warped through the collapse of communism in Eastern Europe, but by a distinguished pioneer of microbial biochemistry. Rollin Hotchkiss was speaking during a symposium commemorating the discovery of gramicidin by Rene Dubos, the proceedings of which have now been published as *Launching the Antibiotic Era* (edited by Carol L. Moberg and Zanvil A. Cohn, Rockefeller University Press, NY).

Hotchkiss and the other contributors to this enthralling book have all been central characters in the story of antimicrobial drug development—a tale characterized by continuous, symbiotic interplay between academic and industrial science. So none of them would quibble with the commercial imperative or question its powerful influence on pharmaceutical research and development. What haunts Rollin Hotchkiss is the spectre of profitability dominating totally the course of science—and much else besides.

During the 1980s, that nightmare became reality for unlucky casualties of Prime Minister Thatcher's attitude toward research funding in the U.K. While market-oriented science policy brought new money and an invigorating climate for many go-getting high-flyers, other university researchers became dispirited by the incessant demands for short-term, practical returns from science. Some, particularly those brilliant but timorous souls who would not know how to sell an umbrella in a monsoon, have been driven out of the system, taken early retirement, or gone off to do something entirely different with their lives. And the science base—that corpus of fundamental and often esoteric knowledge that provides the wherewithal for unpredictable practical advances—has suffered similar neglect. Only last month, the Royal Society issued a detailed report highlighting the urgent need to strengthen this substructure in Britain.

There could scarcely be a more telling example of the long-term importance of investment in the science base than the story of AIDS. In a world in which all research was mission-oriented, every project targeted, and the cost and potential value of every experiment assiduously calculated, the mysterious arrival of this extraordinary condition would have posed an insurmountable challenge to the scientific community. In reality, because those responsible for assessing grant proposals in past decades backed many hard options and unpredictable outsiders alongside the sure winners, there *was* a substan-

tial body of information upon which the first AIDS investigators could begin their work.

To give just one example, determination of the complete nucleotide sequence of HIV—which was accomplished within two years of HIV being identified—rested upon the molecular biology initiated half a century ago in Cambridge, when Max Perutz and John Kendrew began their painstakingly slow work of protein crystallography. For virtually a decade, they published very little, and it is beyond belief to imagine that the dominant philosophy of U.K. science policy nowadays would allow space and time for work of this sort to proceed at all, let alone to flourish.

Discussing strategies currently being applied to the AIDS problem in the current *Oxford Innovation News* (7:3, 1992), Alan Kingsman of the University of Oxford gives other examples of the studies through which HIV has become, astonishingly quickly, the best understood of all human pathogens. "This progress is a manifestation of the enormous basic science resource that could be applied to the problem," he writes. "Without this resource the AIDS problem would be even worse than it is." One example cited by Kingsman is the emergence and coalescence of a vast body of knowledge regarding the function and structure of HIV protease, leading to the production and clinical testing of appropriate inhibitors. "This illustrates beautifully how detailed molecular information from a variety of sources, that may seem esoteric at times, can lead to the design and production of a new therapeutic agent."

Ironically, the commercial companies involved in these developments—especially Merck and Roche—have shown greater conviction in their attachment to basic science than have many of the politicians whose judgments determine the course and style of academic research these days. Suddenly, and particularly in Britain, there are as many instances of long-term thinking in the industrial sector as there are in the universities, whose historic freedom was open to abuse, *was* abused on occasions, and was certainly unsustainable as the sole criterion for sponsoring science in the modern world. As Rollin Hotchkiss feared, however, what has happened is a change in climate so swift and far-reaching as to be positively harmful.

But what of that other sector of research support—the medical and other charities? In recent years in Britain, their grant monies have certainly grown dramatically and have helped to make good the decline in government funding. Most conspicuously, the Wellcome Trust, following the sale of shares in Wellcome (London), is poised to double its support of medical research to a point where within a year or two its contribution will rival that of the government. Will this mean greater investment in the science base—or an increase in targeted research on specific diseases? Watch this space.