View to prevention of cancer

John Cairns

Cancer: Risks and Prevention. Edited by M.P. Vessey and Muir Gray. *Oxford University Press: 1985. Pp.301. £20, $27.95.*
Cancer: An Enigma in Biology and Society. By R. Nery. *Croom Helm, London/ The Charles Press, PO Box 15715, Philadelphia, Pennsylvania 19103, USA:1986. Pp.436. £29.50, $32.50.*

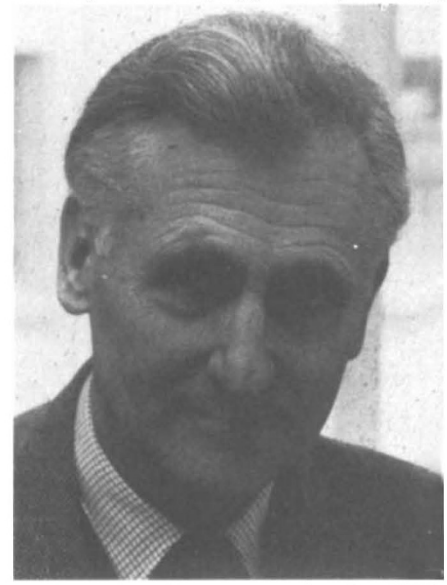
UNTIL the 1940s, cancer research was almost entirely in the hands of pathologists and surgeons. You went to the former for a precise diagnosis and a statement of your prospects, and to the latter for treatment. Although many scientists were struggling to understand carcinogenesis, for example by studying the structure of the different carcinogens and looking for peculiarities in the metabolism of cancer cells, textbooks on cancer remained essentially textbooks of pathology.

Recently all this has changed. The epidemiology of cancer has come under ever closer scrutiny, and as a result we now see that cancer is just another of the preventable diseases — perhaps just as preventable at the end of the twentieth century as were the infectious diseases at the end of the nineteenth century. The treatment of cancer, in particular the development of chemotherapy, has become a multi-million dollar industry inhabited by an army of industrial chemists and genetic engineers (making new products), clinicians (testing the products) and experts in public relations (extolling the virtues of it all). Finally, we are beginning to understand the underlying biology of cancer in terms of certain alterations in genes that affect the exact chemistry or level of expression or subsequent modulation of certain gene products.

This great diversification of cancer research has made it very difficult to write an up-to-date book to serve as a vade-mecum for someone entering the field. There is so much explaining to be done, so much background information to be incorporated which inevitably breaks up the sequence of material that should go into each chapter. How, for example, could one design a good account of the natural history of cervical cancer that would not be thrown completely out of balance by the long dissertation on DNA hybridization that is required if the reader is to understand what we now know about the causation and diagnosis of the precancerous conditions of the cervix? To add to these difficulties, cancer research is not a real scientific discipline. Admittedly, it has become more and more entangled with semi-hard sciences such as biochemistry, molecular biology, developmental biology and even statistics, but unlike those subjects it still seems unrelievedly idiosyncratic because it does not build steadily upwards from a firm base. We can be sure that textbooks of biochemistry, written 100 years hence, will include descriptions of DNA structure and intermediary metabolism that are quite like the descriptions of today. But the future textbook on cancer will probably be largely unrecognizable, save for the sections dealing with the epidemiology and crude anatomical classification of the various cancers. Interestingly, these are two subjects that can still be described in relatively non-technical terms. For example, although epidemiologists employ complex computational methods and sophisticated forms of analysis, the end-results of their efforts can be described using words that could surely be understood by almost anyone.

Partly for these reasons, *Cancer: Risks and Prevention* is a joy to read. It is a set of essays, assembled as a *Festschrift* for Richard Doll on the occasion of his retirement from Green College to a career in "full-time cancer research" (these are the words of the editors). I do not know of any really satisfactory textbook on cancer epidemiology. This is no exception, mainly because it does not include a dissertation on the various techniques used in the practice of epidemiology. The editors point out in the preface that what they have assembled is not meant to be a comprehensive text. Nevertheless, until something more complete comes along, it and the monumental article by Doll and Peto on the causes of cancer, published in the *Journal of the National Cancer Institute* (**66**, 1191–1308; 1981), are the works I shall recommend as essential reading for everyone entering cancer research. The chapters cover all the main topics — diet, smoking, radiation, occupation, infective agents, hormones, drugs and even the use of legislation in the quest for prevention — and they have a certain homogeneity of excellence that is the sign of skilful editing. Taken as a whole, the book gives a wonderfully clear and exciting picture of the field. After reading it I feel more than ever that we will eventually learn how to prevent most forms of cancer to the extent we now prevent the major infectious diseases. This, much more than the breathless accounts of agents such as interleukin-2 which are currently making the headlines, is surely the real message of hope.

The other book, *Cancer: An Enigma in Biology and Society*, is a much less felicitous work. Somehow it seems almost perversely old-fashioned. The highlights of contemporary cancer research are the epidemiology, the molecular biology and the increasing use of carefully designed trials to study treatments and possible means of prevention. None of these subjects is dealt with satisfactorily by Dr Nery. Instead, he tends to dive into the distant past at every opportunity. Tracing



Eye for epidemiology — Richard Doll in 1969, the year of his appointment as Regius Professor of Medicine at Oxford University.

notions about the nature of cancer back to the "spagyric" theory of the sixteenth century may be a mark of erudition but, these days, such learning has a tragico-comical air to it. No amount of erudition can make up for the absence of an up-to-date description of the relationship of oncogenes to chromosomal rearrangements. One of the most exciting developments in the past five years has been the identification of the precise genes whose functions or level of expression is altered by the various chromosomal alterations seen regularly in certain cancers; yet all this gets hardly a mention, and once Dr Nery has given the pathologist's view of the common and less-common chromosomal changes seen in cancer cells, he quickly retreats to atrabilism in ancient Greece and Islam. Plainly, he is uncomfortable with the developments of the past ten to twenty years.

I do not want to seem too unevenhanded in my review of these two books. The totality of cancer research is not an easy subject for one person to deal with, and it does not fall naturally into a single book. One day, it will. But, for the time being, the best reading is bound to come from more limited overviews, especially accounts of the epidemiology and the molecular biology. □

John Cairns is in the Department of Cancer Biology, Harvard School of Public Health, 665 Huntington Avenue, Boston, Massachusetts 02115, USA.

• A new volume in the series *Readings from Scientific American* is *Cancer Biology*, with introductions by Errol C. Friedberg. The book includes reprints of thirteen articles by prominent research workers (among them John Cairns) which cover "much of the essential core" of the subject. Publisher is W.H. Freeman, price is pbk $12.95, £12.95.