

beginning to disclose social inequalities in vaccination status. The new Kennedy administration, far more amenable to federal involvement in health care than Eisenhower's had been, sought ways of reaching unvaccinated children in deprived communities. Soon afterwards a measles vaccine was licensed. But it was expensive, rarely made available through public clinics, and generated little public excitement. So, when public health physicians came up with the idea of measles *eradication*, the problem of reaching the unvaccinated acquired a new significance. The result, an ironic one, since measles eradication had been "undertaken amid the Great Society's spirit of community mobilization and empowerment" (p. 177) was the re-emergence of compulsion. By 1981 all states had passed legislation making vaccination against most vaccine-preventable diseases mandatory for school entry. And so the stage was set for renewed controversy as "patients' rights", and in particular the right to choice, to informed consent, became an increasingly central aspect of health care. Vaccines are complicated substances, and uncertainties regarding their functioning are easily used to fan the fires of controversy. And so they are in regard to the MMR vaccine today, and will be in regard to the many vaccines now becoming available. Have we come full circle?

James Colgrove's book is well researched and well written, showing clearly the changing tensions that have characterized the difficult reconciliation of the protection of the health of the community with an individualistic and market-oriented health care system.

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Toine Pieters, *Interferon: the science and selling of a miracle drug*, Routledge Studies in the History of Science, Technology and Medicine, London and New York, Routledge, 2005, pp. xvi, 264, illus., £90.00, \$155.00 (hardback 0-415-34246-5). Also available as a Kindle e-book through Amazon Digital Services, \$75.60 (including free wireless delivery via Amazon Whispernet; [http://www.](http://www.amazon.com/Interferon-Science-Selling-Technology-Medicine/dp/B000OI15WA/ref=dp_kinw_strp_1//s?ie=UTF8&search-type=ss&index=digital-text&field-author=Toine%20Pieters)

[amazon.com/Interferon-Science-Selling-Technology-Medicine/dp/B000OI15WA/ref=dp_kinw_strp_1//s?ie=UTF8&search-type=ss&index=digital-text&field-author=Toine%20Pieters](http://www.amazon.com/Interferon-Science-Selling-Technology-Medicine/dp/B000OI15WA/ref=dp_kinw_strp_1//s?ie=UTF8&search-type=ss&index=digital-text&field-author=Toine%20Pieters)).

Interferon is a wonderful object for the historian of medicine. The drug remains a major blockbuster selling \$5 billions in 2005. It is one of the rare products of genetic engineering, which has found significant clinical use, for treating cancer in particular. More importantly interferon's development lasted thirty years, encompassing the entire postwar biomedical era. Making the best of this long trajectory, Toine Pieters' biography of the drug is a timely book. Following interferon from the laboratory to the market and the public sphere it sheds new light on the intimate relations biology and medicine have developed during that period and the inevitable tensions they created. Coming after Ilana Löwy's *Between bench and bedside* and Peter Keating and Alberto Cambrosio's *Biomedical platforms*, it complements their perspectives on the detailed construction of biomedical knowledge, while opening new vistas on the role of marketing and public cultures. The book's subtitle is therefore not misleading: science and the selling of its products are actually discussed.

This dual approach is well reflected in the roughly chronological organization of the book. The first three chapters focus on the period 1957–75, dominated by laboratory research and the (failed) attempts to turn interferon into a drug against viral infections. The last three chapters present the making of a biotech-based wonder drug, instrumental in treating (if not curing) cancer. "Making" should be understood in a broad sense since interferon's success owed much to forms of biomedical work typical of the second half of the twentieth century, i.e., clinical trial management and public promotion, media coverage in the first instance. This is not to say that interferon is not a powerful drug under specific circumstances and indications. Pieters is too good a connoisseur of science and technology studies to avoid the question of how it became effective.

Book Reviews

Well served by detailed and vivid writing, *Interferon* relies on rich but contrasted bodies of sources, which exemplify the variety of angles and approaches one single story may deserve. The first part is a meticulous account of bench work and early clinical trials. It draws on the archives of the Medical Research Council and the universities, which hosted and supported initial work on interferon. It also relies on extremely valuable, and otherwise inaccessible, documents that Pieters gathered while interviewing the participants in this first phase. The second part provides a more overarching handling of the rapidly growing scientific literature on interferon and of various media sources (not only in the press but also TV and radio shows). Occasional use of the archives of the National Cancer Institute (NCI) and of the American Cancer Society archives finally sheds light on the organizational and administrative work involved in the 1970s' expansion of clinical interferon research.

These two sets of resources produce different benefits. The first part of the book confirms—if there is still a need for such proof—that experimental work and practices matter. The laboratory making of interferon is a highly contingent, material, collective, and political construction, combining the resistance of materials and work with the flexibility of socially situated interpretations. Wonderful episodes thus illustrate the genesis and the dismantling of various interferon facts. Born as a *process* of interference between viruses that resulted in resistance to infection, interferon became a *substance* showing cellular specificity and contributing to a particular form of immunity against viruses. The emergence of a micro-collective rooted in the coalescence of operationally defined entities triggered the change. Nevertheless, the career of interferon was almost terminated in the early 1960s when the industrial partners of the Medical Research Council stopped investing in its future, doubting that the interfering substance could be prepared industrially in any meaningful way.

Readers versed in science studies will find the second part more challenging since it addresses key aspects of late-twentieth-century

biomedicine, namely a pervading culture of miracle drugs and the activities of research entrepreneurs turned public experts. Pieters' analysis of their articulation has nothing to do with a rolling snowball. It is rather a fragile, problematic and contentious process. In showing the many reasons why interferon might well never have become a cancer drug, the book follows two tracks. The first focuses on the status of clinical trials. At stake here is not the nature of care, the forms of clinical work or even the statistical outcomes of therapeutic trials, but rather the management of trials as a system building legitimacy. Hence the importance the book gives to science policy events where these trials were launched and discussed, such as the carefully staged multi-party conference that the immunologist Mathilde Krim set up in 1975 in order to make the NCI consider interferon as an anti-cancer drug. The second track focuses on the public sphere *per se*. Interferon was the topic of congressional hearings and media campaigns, which linked scientists, drug companies, and journalists building the various, not always positive, images of the drug. In the 1960s, the BBC presented interferon as a new penicillin, meaning a magic bullet against infection, and a British invention to be protected. In the late 1970s, the US press linked it with genetic engineering. The book analyses such internal and external developments as elements in “cycles of hopes and promises” that characterize the life of major drugs, resulting in periods of high expectations and investment that alternated with moments of crisis and pessimism, whose outcome is unpredictable.

Toine Pieters' story of interferon would—here and there—have benefited from a closer discussion of the existing literature. It is nonetheless and without any doubt a stimulating book, refreshing old debates regarding the nature of biomedicine, the way we write about it, as well as pointing to new frontiers like the media culture of present medicine.

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