

IN RETROSPECT

When business became biology's plague

A 1920s best-seller about risky campus capitalism and early phage therapy still resonates today.

Arrowsmith

by Sinclair Lewis

P. F. Collier: 1925. 448 pp.

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Sinclair Lewis's novel *Arrowsmith* was a best-seller in 1925. It is a stinging satire of the US medical system from an era when quacks and their dubious cure-alls abounded — before the advent of antibiotics, double-blind trials and the Food and Drug Administration.

More than 80 years on, the problems of medical practice and research — as explored in the story of central character Martin Arrowsmith's capricious career from medical school to a top-notch research institute — are remarkably relevant. For example, as a young country doctor in North Dakota, Arrowsmith deals with the kind of militant anti-vaccinationists that recently caused child immunization rates for measles, mumps and rubella to plummet in the United Kingdom and in Switzerland, which is currently witnessing a measles epidemic. Indeed, one of the recurring themes of *Arrowsmith* is the difficulty that researchers have in communicating to the public.

The overarching thesis of this story is the powerful and sometimes damaging influence of business over medicine and science. During Arrowsmith's student days, most of his medical schoolmates are much more interested in their economic prospects than in learning. Later on in the book, he does a stint in the luxurious Rouncefield Clinic in Chicago, Illinois, where his bosses maximize their profits by arguing that: "Any proportion of the body without which people could conceivably get along should certainly be removed at once." Arrowsmith disdains this approach, and Lewis adds with a wink that: "The clinic did, perhaps, give over-many roentgenological examinations to socially dislocated women."

Lewis also satirizes the ease with which 1920s doctors and patients alike were apparently fooled, citing from a fictitious catalogue of a medical supplies company: "We guarantee that by the installation of a New Idea Panaceatic Electro-Therapeutic cabinet, you can increase your income from a thousand to ten thousand annually and please patients more than by the most painstaking plugging." This jibe brings to mind the numerous recent studies that show the large influence of even small gifts such as

pens on the prescribing habits of doctors, or that more expensive placebos have a greater healing effect than cheaper ones.

Lewis decries the effects of a rapacious business attitude on a scientific institution. At the climax of his career, Arrowsmith works in New York as a researcher at the privately funded McGurk Institute (modelled, scholars say, on New York's Rockefeller University). McGurk's director is a slick manager who sees his institution in a global competition for glory and cash. When Arrowsmith finds a cure for plague, his director pushes him to publish the results and dash into the clinic, even though there is insufficient



Scientific satire: Ronald Colman as Arrowsmith in the film of the same name.

evidence. The director is also unfazed by the necessity of fudging the data just a bit — the likes of Koch and Pasteur have to be beaten.

There were two reasons why Lewis was able to dissect the medical system so revealingly and why his analysis of its weaknesses is still largely valid. First, his father was a country doctor. Second, and more importantly, he had an informant: Paul de Kruif, the scientist-turned-science writer. De Kruif had worked on respiratory infections at what was then the Rockefeller Institute for Medical Research (now the Rockefeller University) and had an excellent insight into the guts of the medical system and its protagonists. He was fired from the institute after publishing a book chapter that was highly critical of US medicine. Its gist: too much business and mindless ritual, too little science. De Kruif instilled this sceptical view

into Lewis's story along with his own ideals of medicine based on thorough science.

One incident in the book places these ideals in the foreground. Arrowsmith is summoned with his yet unproven plague medicine to a Caribbean island where an epidemic is raging. His mentor, called Max Gottlieb (modelled on de Kruif's own mentors Frederick Novy and Jacques Loeb), is adamant that Arrowsmith does a controlled study, giving his drug to only half of the sick. This was not common practice in the 1920s, and some characters in the novel denounce the act as inhuman — again, Lewis touches on a subject that is still hotly debated today.

The treatment that Arrowsmith uses in the study is a bacteriophage, a virus that kills bacteria — in this case, the plague-causing bacterium *Yersinia pestis*. At the time, this was cutting-edge science. Phages had been discovered less than ten years earlier and were used for treating certain infections for only about five years. When Arrowsmith's wife Leora, who accompanies him to the island, becomes infected with the plague and dies, her grieving husband abandons the trial protocol and treats everybody with phages. Again, Lewis's and de Kruif's analysis turned out to be an uncannily accurate reflection of the real-life history of phage studies.

Most actual phage trials were carried out without rigorous controls. Thus, a proper basis for the therapy was never laid — one reason why it was forgotten after the 1940s. Interestingly, infectious-disease specialists today are once more studying phage therapy owing to widespread bacterial resistance to antibiotics. Unfortunately, the mistakes of the early days of phage research are still felt. Many researchers who are unfamiliar with the modern work still think of it as an obsolete method. If only the early phage therapists had read *Arrowsmith*.

To extricate himself from all the entanglements, Arrowsmith finally resigns from McGurk and lives with a colleague in the woods — like Henry Thoreau in *Walden; or, Life in the Woods* — where they make immune sera to finance their livelihood and their pure research. It is a utopian dream to which many pressurized researchers will still relate today. ■

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