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ADVOCATING THE HISTORY OF SCIENCE

ABSTRACT

Everett Mendelsohn has advised candidates for the Ph.D. degree to go out to Harvard Square and explain their dissertation. That it is important to communicate with an audience is one message. That we, in the academy, should take our knowledge to society, is another. That is one use of scholarship, and has been a driving force in Everett's career. Everett founded the *Journal of the History of Biology* in 1968 and edited it for 31 years, and he trained several generations of historians of biology. Indeed, he was instrumental in founding the field. It is therefore appropriate to ask: what do we gain by studying the history of biology and the history of science generally? This paper explores answers to that question. History of science helps make science better and helps make us better citizens. In effect, this is an argument for the promotion of history of science in the public interest.

When I was growing up in Oak Ridge, Tennessee, it seemed clear what social responsibility the scientist had. He (usually "he") should go to the lab in the morning wearing a suit, work all day, then come home and leave his work behind. After all, it was privileged knowledge (not that we called it that) with a top security clearance. Certainly it was not something to be shared with families, as the billboards at the edges of town reminded everyone with their exhortations to "sssh ..." and "protect American security". This all seemed perfectly normal, and soon the atom really would produce energy "too cheap to meter". Atomic bombs were effective deterrents to war, and besides, my dad was head of the peaceful and friendly neutron physics division. Pure science, right? Promoting the public good, right? Was I naïve? Yes. Was this comfortable and reassuring? Yes. Surrounded by all this lovely science, there seemed to be no question that my brother and I would become scientists too.

Then my freshman year at MIT in 1968–1969 brought a tumult of challenges. Against the backdrop of the Vietnam War, leading scientists offered a day-long "teach-in" to discuss "science in the public interest" and "the social responsibility of the scientist". One after another, these eminent scientists

challenged the easy assumptions that scientists have a license simply to pursue their “pure science”, leaving it to a presumably responsible public to decide on appropriate uses. They all accepted J. Robert Oppenheimer’s lament that “scientists have known sin” and set out to debate what followed from that realization. What should a socially responsible scientist do? What did it even mean to be “socially responsible”, much less a “socially responsible scientist”? Heady stuff for a college freshman, and I don’t pretend to have gone very far at the time in thinking it all through. But up Massachusetts Avenue at Harvard, Professor Everett Mendelsohn had already embarked on a long career of trying to make sense of the history of science, and of what that history tells us about the meaning of social responsibility.

Everett’s brand of social responsibility has focused on promoting world peace, especially through his decades of work with the American Friends Service Committee. Fortunately, Harvard has afforded him the support necessary to carry on that service while sustaining his academic life. He has managed to bring these interests together through courses that explore the social context and the social nature of science – even before it was trendy to do so. Through his editorial ventures, he has encouraged scholars to publish social analyses of science. In the History of Science Department, Everett has nurtured interest in social responsibility at many levels.

Cambridge served as a visible center for Vietnam War protests and advocacy for political change, with some scientists playing important roles in accepting and even leading the challenges. Cambridge also became a center for lively debates about the social responsibilities of biologists through Matthew Meselson’s widely-acknowledged concern with biological and chemical weapons; and again, as recombinant DNA research provoked new concerns about safety and science. Issues of racism and IQ, and the need to temper an excessive genetic determinism that can serve as justification for racism and other social inequities, have likewise placed Cambridge at the center of debate. Everett has played a part in many of these discussions.

It is easy among academic liberals to point to one side of these various issues and to applaud advocates’ courage in taking a stand for what they believe is right. Indeed, most discussion of the “social responsibility of the scientist” has assumed that we know what is right, and has focused on how active and social a role the scientist should play in effecting the presumed proper and just position. In the Cambridge context, the Vietnam War was bad, most war is bad, biological and chemical warfare is bad, genetic engineering is at least potentially bad, racism is bad, sexism is bad. While these views seemed defensible and widely shared in academia, they are not all universally held and are not often held simply by virtue of being a scientist.

This brings us to questions about the appropriate social role of the scientist: is it to do good science, or also to be a good scientist in some wider sense and to raise social issues insofar as they derive from scientific work? In this case, the developmental biologist might say “please notice that I have made it possible to clone humans, and you people should figure out the ethical issues”. Or is it, even further, to serve as a public intellectual and to take positions of presumed

social good more generally: “I have invented cloning techniques and urge you not to use them for cloning people”? What social responsibilities arise by virtue of being a scientist, and what responsibilities arise by virtue of being an educated citizen? These are complex questions with a multitude of conflicting interpretations. While traditional liberalism would have us focus on rights and associated responsibilities, other political doctrines emphasize the obligations of contracts, or the needs of the presumed existence of community or absolute normative truths. Thus, people can – and do – disagree about what ideas and responsibilities particular players have in the social order. This is often difficult for academic liberals to accept. In their often-isolated realm, they believe that they know what is good and right, all the while calling for inclusion of a babble of diverse voices and “stories”. Indeed, some attempts to call for “tolerance” in the name of political correctness have foundered upon the reality that some views and some behaviors are intolerable.

My intention is not to discuss social and political theory, however, but rather to acknowledge the verifiable fact that social responsibility of scientists has been an important category of interest for many, including Everett Mendelsohn. Everett’s career pushes us to think about this more carefully. I want to consider a special aspect of that discussion, asking about the social role of the *historian* of science. Not the social responsibility, because I do not have compelling grounds for claiming any moral imperative or clearly defined responsibility. Rather, I wish to look at the social opportunity offered the historian of science. And for those who accept that there is responsibility, realizing this opportunity will be a moral good. For others, it may be pragmatically and politically, as well as socially, expedient for reasons that I will discuss. I contend that the historian (and the philosopher) of science has valuable, socially useful knowledge. This is knowledge about what science is, how it works, what forces change science over time, and its past significance and value. The historian of science has insight, perspective, and information in the form of examples and generalizations that can shape the way society thinks about science and its products. Historians of science can help inform social decision-making and can help guide the process by which we adjudicate competing and conflicting claims. In other words, I am claiming for historians of science a sort of “privileged knowledge”, much as my father had, although we can and should share it. I quite realize that some will find such claims objectionable. But please note that I am not claiming for historians of science the sole right of arbitration or the ultimate or only valuable knowledge. Rather, historical knowledge can enlighten and improve our social decisions in ways open to multiple sets of values and goals. I will outline some examples before offering suggested audiences for history and philosophy of science. I will explore especially the value for promoting public understanding of science, informing science education, and advancing social goals.

PROMOTING THE PUBLIC UNDERSTANDING OF SCIENCE

With few exceptions, we accept public understanding of science as a good thing. We can argue about what this really means, about how much understanding is best, about who qualifies as the public and such things, but only the most extreme science bashers would resist the abstract goal. There have been times when elitists have argued that the public did not need science and was better kept in the dark, but with the accepted public support of science in this century, this reasoning has virtually disappeared. While there are questions about the legitimacy and risks of secrecy in particular cases, the dominant view in recent decades has been that we should tear down the barriers, and teach the public about science and its power. In the post-Sputnik era, we generally assume that scientists are necessary to do good things, and that the public should have access to this work.

So, given that the public understanding of science is a good thing, who should promote it, and how? In part this should take place in the schools, through science education, though we do not always do this or do it well. We also need a wider effort addressed at adults, going beyond the schools to reinforce and extend the message outside academia. Science – and technology – serve as a central force of change for society, and increasingly many decisions will be based on scientific claims. Assuming that we would rather make wise and informed choices when we have the option, we need for at least the decision-makers to have some understanding of the science on which the issues and their decisions must be based.

For example, Members of the United States Congress (and apparently every other country's leaders) make many decisions about science and based on science. Yet only two members of the United States House of Representatives are Ph.D. scientists, although there is also a handful of physicians and people with related technical degrees. The one Ph.D. historian of science, Bob Filner (Democrat from San Diego), has focused on Veterans issues that dominate his district, rather than directly on science. Yet some have suggested that at least half the votes in Congress either require scientific knowledge or directly influence the doing of science. Since Congressmen are not scientists themselves, they must rely upon others for expertise – either their personal staffs (few of whom are trained as scientists, and many of whom openly admit that they tried to avoid science courses in college), committee staffs (and even in the House Science Committee, many do not have any scientific training), lobbyists (who have their own goals, although some, such as Research!America, lobby for all biomedical scientific research) or nonprofit organizations (well-intentioned, though often incomplete and directed at some particular, selected set of political goals).

The experience of serving as science advisor for my Congressman for the two years of the 105th Congress (1997–1998) was instructive. The Congressman representing the university district approached our College of Liberal Arts and Sciences, from which he had graduated as an English major with fluency in Mandarin Chinese. A first term conservative Republican who supported Newt

Gingrich's "Contract with America", he was appointed to the House Science Committee. He came, asking how he could learn from the many scientists working at the Research I university in his district. Significantly, he wanted to avoid making unwise decisions that would antagonize the university and its scientific core. So, Arizona State University developed a plan to place a faculty member "on assignment" to work with him, while also developing projects and information of value to the university. The university agreed to pay salary, travel costs and living expenses in Washington, D.C. Both the Congressman and the university preferred someone with broad scientific interests, and preferably a senior faculty member, with the understanding that the person should remain politically neutral. That was how I came in.

Technically, I became a Congressional Fellow and in that role served as Congressman Matt Salmon's science advisor. I was not really "staff" in the usual sense – assigned to cover a particular set of my own issues – but instead worked with all the regular government employees on issues related to science, technology, research, and education. This was a tremendous learning experience for me and also, evidently, for the Congressman. And here is the point of this story: my status as an historian and philosopher of science was important in gaining credibility because I was not seen as serving any one narrow or particular political or academic interest (this is, in part, for the rather depressing reason that nobody thinks of history and philosophy of science as being a field important enough to have interests to be served). Someone who reflects upon science more generally, and someone willing to work at communicating about what is at issue in a range of particular cases asks about ways to go about making decisions informed by past experience, using the best available present knowledge – that was what everyone wanted. Being a senior faculty member and older (and more liberal) than anybody else in the office, (including the Congressman) provided an amusing twist at times, and gave me credibility that I might not otherwise have had – as long as I was eager to listen and learn as well as to teach.

Historians of science have special opportunities to play roles as Congressional Fellows. Other historians of science who have served as Fellows (Ron Overmann, who worked with Senator Mitchell from Maine, and Rivers Singleton, who worked with the late Congressman George Brown of California) agree that we have special opportunities in this area. Indeed, when I met Congressman Brown, who had chaired the Science Committee with distinction for the Democratic majority, he immediately asked "why are you working with Matt Salmon? Why aren't you working with me?" He said that he would like an historian of science in his office to provide perspective. (Unfortunately, Congressman Brown, a great supporter of science, has died recently and will be greatly missed). Congressman Vernon Ehlers (a Republican physicist from Michigan) agrees that professionals with a wider view of the sciences, and those willing to learn, are indispensable for informed and intelligent decision making – and are all too rare. Let us look at some differences we can make.

On several occasions, a heated topic provoked lively and partisan discussion. Cloning was such a case, in which the immediate reactions were shaped by

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