Science and Prejudice in Historical Perspective*

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There has always been, and there probably always will be, an intimate connection between how people recognize good knowledge and how they conceive a good society. The relationship is not one of mere analogy; it is constitutive. The making of reliable, objective, and robust knowledge-- that is, for us, science-- is accomplished by communities of expert human beings-- that is to say, scientists-- and it has always been considered unlikely that an unjust community of knowers can produce anything but distorted knowledge: not science but ideology or dogma or error. Verity and virtue march through history in lock-step, as do error and evil. The Republic of Science bears a family resemblance to The City of God.

And that is perhaps why the communities of authentic scholars and scientists have intermittently been held up to the wider society as models of communal virtue. If, it has been said, matters were ordered in the wider society as they are in the Republic of Science (or Letters), the result would not only be a

more knowledgeable society but a more just society. Observe and imitate.

We find it hard to imagine-- we may even find it inconceivable-- that the knowledge which fuels social hatred could emerge from a properly organized and properly regulated intellectual community. How could a genuine Republic of Science produce such pathologies as racialist biology or the imputation of so-called "Aryan" or "Jewish" physics?

The late twentieth century inherits from the European historical past several ways of talking about the good society that uniquely produces good knowledge. By far the most influential of these ways of specifying the relations between knowledge and virtue comes down to us from the Scientific Revolution of the seventeenth century and the Enlightenment of the eighteenth.[1]

The story goes like this: human beings are intellectually imperfect and limited; they are subject to tidal currents of passion and interest; these currents flow against their rational faculties and hinder or distort the operation of rationality. Instead of reckoning rightly or seeing what is authentically there to be seen, passion- and interest-influenced human beings tend to think and see not what is but what they wish to be the case.

Francis Bacon enumerated the Idols that corrupt human judgment and perception. We are prone to mistake because each of us has his or her individual prejudices or enthusiasms (the Idols of the Cave), because we use the common language and misapply words to things (the Idols of the Market-Place), because some of us are drawn to the dogmas of systematic philosophies (the Idols of the Theatre), and, lastly, because we are all emotional and interested people who tend to accept the evidence of our own senses when the information delivered by those senses is likely to be unreliable, colored by emotion and interest (the Idols of the Tribe).[2]

We are human, all-too-human; we are fallen and we are fallible; and such is our fate. The order of human thought will never reflect the order of things unless we can purposefully join a reflective awareness of our fallible nature to our own cultural innovations-- innovations that have the capacity to discipline, to manage, and to mitigate the corrupting effects of the distortions to which human beings are prone. How, if not to eliminate prejudice and bias, can we make their workings as harmless as possible?

In seventeenth-century Europe these innovations took several forms. Most were methodological in character. If only the fallible human mind were directed and disciplined by rational method, then our knowledge would be well founded. We would be

able to penetrate to the hidden causal structure of things, or, if not that far, we would at least recognize the factual limits of what human beings could know with certainty. The rational methods offered up by early modern philosophers varied enormously-- the English tended to embrace Baconian induction and probabilism, the French Cartesian deduction and logical certainty-- but method was meant to mend all.

Yet method could do little by itself: it had to be encouraged, implemented, and enforced by intellectual communities, whose members had to willingly accept and enforce its disciplines. The rational methodologies that were supposed to deliver correct knowledge had to be embedded within communities of virtue. Rational method required, so to speak, its ventriloquists-- those collectively organized bodies who could speak with authority in its favor and whose virtues could commend it.[3]

These virtues were simultaneously intellectual and moral. Even to enumerate the norms obedience to which was supposed to guarantee proper knowledge of the natural world is to list what was, and is, widely counted as proper behavior in the social world.[4] So seventeenth-century scientific and philosophic reformers commended an openness and freedom of mind. The genuine philosopher was a person of integrity and the Republic of Science was a community of integrity. Descartes, for example, announced

his personal openness and freedom by claiming that he had set aside everything he had been taught at the Jesuit college of La Flèche, and Robert Boyle later celebrated his openness and freedom by saying that he hadn't read Descartes.[5]

For Boyle, as for Bacon, commitment to existing systems of thought compromised the authenticity of individual judgment-- whether that was individual sensory experience of the world or individually conducted trains of rational reflection-- and such commitments just had to be shrugged off. Traditional knowers were encumbered by accretions of custom and convention whose acceptance caused both the unfreedom of knowers and the distortion of their thought. The modern knower was supposed to be an unencumbered self whose freedom allowed his knowledge to mirror nature.[6] There was nobility in that view, for, as modernist rhetoric had it, who would rather be a slave to Aristotle than to submit his judgment alone to the tribunes of reason or of reality?

And who would ignobly accept another's word when he could-- by experiment or observation-- submit himself directly to nature's testimony? So it was not just Aristotle and ancient authority that had to be set aside; routine reliance upon the testimony of other contemporary observers was likewise rejected. If you really want to secure truth about the natural world, you must not only forget tradition and ignore authority; you must

also be sceptical of what others say about the world and you must rely only upon what you yourself can see and show. As John Locke said, "we may as rationally hope to see with other men's eyes, as to know by other men's understandings. So much as we ourselves consider and comprehend of truth and reason, so much we possess of real and true knowledge. ... In the sciences, every one has so much as he really knows and comprehends. What he believes only, and takes on trust, are but shreds." To know about the natural world was to know by yourself.[7]

Within that reformed and virtuous community of knowers, all were to be accounted equal. The Republic of Science was no traditional school, where some taught and the rest submitted. Instead, several of the new scientific societies founded from the middle of the seventeenth century insisted upon the equal capacity of all men to make contributions to the stock of knowledge: all men, whatever their wealth, their nation, or their social station. If the wider society was hierarchical, and riven by distinctions of religion, rank, and nation, there was every reason for the Republic of Science to reject these distinctions as prejudices. The Thirty Years' War had recently written the lesson of such prejudices in pools of European blood, and Leibniz was not alone in trying to build a new pan-European harmony on the model of the reformed scientific academy.[8]

It was considered that the Republic of Science simply could not afford to be carved up into nation-states with divided confessional allegiances in the same way that Europe was. There was no place for intolerant and divisive patriotism or religious bigotry in a community whose products counted as universal knowledge about a shared and mutually accessible reality. In seventeenth- and eighteenth-century Europe, as in ancient Greece, philosophers might describe themselves not as citizens of Athens or Rome but as "citizens of the world." If European nations and faiths battled each other, still, it was recurrently said, "the sciences were never at war."[9]

So the English historian Edward Gibbon wrote that "It is the duty of the patriot to prefer and promote the exclusive interest and glory of his native country but a philosopher must be permitted to enlarge his views and to consider Europe as one great Republic whose various inhabitants have attained almost to the same level of politeness and cultivation." Just as the object of scientific and philosophical inquiry was the whole world, so the authentic intellectual was said to be a stranger nowhere in the world, subject to no merely national or confessional constraints: "Die Gedanken sind frei." The Frenchman Montesquieu wrote that "I prefer my family to myself, my country to my family, but the human race to my country," and he was much admired by the Scot David Hume for so saying. The man of science

or letters-- free of national or confessional prejudice-- was the only authentic European.[10]

Freedom from intellectual prejudice; freedom from divisive parochialisms; freedom from custom and tradition; freedom from arbitrary or conventional authority; freedom from distinctions among the ranks and sorts of human beings. This was a vision of philosophical virtue handed down from the seventeenth-century Scientific Revolution to the eighteenth-century Enlightenment and from the Enlightenment to liberal and pluralistic traditions of nineteenth- and twentieth-century culture and social thought.

In eighteenth-century France this could be a politically radical vision. Just because the Republic of Science was free of prejudice, arbitrary authority, and distinction of rank, its advocates could advertise it as a standing criticism of Old Régime society. Seven years before the storming of the Bastille, a radical French journalist celebrated the egalitarianism of the ideal scientific community, which "can know neither despots, nor aristocrats, nor electors. ... To admit a despot, aristocrats, or electors who by edicts set a seal upon the products of geniuses is to violate the nature of things and the liberty of the human mind. It is an affront to public opinion which alone has the right to crown genius."[11] And a year after the Bastille was taken, Condorcet's éloge of the American Benjamin Franklin announced that "Forever free amidst all manners of servitude, the

sciences transmit to their practitioners some of their essence of independence or either fly from countries ruled by arbitrary power or gently prepare the revolution that will eventually destroy it."[12]

Some English natural philosophers hoped for their own (kinder, gentler) revolution, and likewise pointed to the Republic of Science as a model of social equality and justice. The chemist Joseph Priestley wrote that "Any man has as good a power of distinguishing truth from falsity as his neighbours"; "This rapid progress of knowledge will, I doubt not, be the means under God of extirpating all error and prejudice, and of putting an end to all undue and usurped authority in the business of religion as well as of science. ... The English hierarchy (if there be anything unsound in its constitution) has ... reason to tremble even at an air pump or an electrical machine."[13]

The liberal vision of social equality and fairness modelled on the scientific community continued in vigor in the twentieth century. The founding father of the sociology of science-- the influential American sociologist Robert K. Merton-- famously described the unique and effective "norms of science"-- those values held dear by the scientific community and enforced upon its members. Just on the condition that the scientific community embraces these values and punishes those who betray them, that

community will be able to fulfill its institutional goal of extending certified knowledge.[14]

First articulated in the late 1930s and early 1940s, Merton's norms nonetheless draw upon sentiments about the scientific community and scientific practice expressed from the seventeenth century. Members of that community should be, and Merton said they were, open-minded, sceptical, disinterested, and universalistic. They obeyed no irrelevant distinctions of rank, race, religion, or sex, evaluating all contributions to scientific knowledge on intellectual merit alone. Science, indeed, was the great meritocracy of modern times. Submission to these norms guaranteed the production of authentic science, while at the same time holding up to Western society a mirror of what it ought to be.[15]

Merton did not shrink from the opportunity to draw lessons from epistemic virtue to social justice. The situation in Nazi Germany, he wrote, is an object lesson in how political interference with scientific norms yields such corrupt products as "Aryan physics." That scientized corruption then goes on to fan the flames of social hatred. When external social prejudice intrudes itself upon scientific judgment, the result is at most only the appearance of objective science, but no longer its reality.

Knowledge free of prejudice-- coming to experience without any prior judgment or expectation-- and knowledge that is objective because of that freedom; guaranteed by a community which had found a formula for keeping prejudice at bay, a community whose unique virtue could provide a concrete model for social virtue. It is a noble vision. Others have called it the Enlightenment Vision and so shall I. That Vision is still with us. And those who have dissented from it have done so in the cause of some of the greatest crimes committed in the present century.

For these and other reasons, one criticizes the Enlightenment Vision with great caution. Yet exempting that Vision from dispassionate and disinterested scrutiny would be to betray it, just as it would be to accept its historical accuracy merely on the grounds of faith, because it counted as an authoritative statement about the nature of science and the communities that have produced it. Freedom from arbitrary and destructive prejudice is so appealing and important as a social goal that one justification for criticizing the Enlightenment Vision is the hope that such freedoms might be <u>better</u> secured by other means.

There are two major faults with the Enlightenment Vision of the relations between science, prejudice, and social virtue. The first may be called historical and the second moral and

political. Descartes was wrong: it is not humanly possible to build a house of knowledge on foundations wholly new, wholly to reject traditionally received knowledge; and his own medical and physiological writings-- owing so much to Galenical thought-- prove him wrong out of his own mouth. Locke was wrong too: to reject taking knowledge on trust is not to have a purer form of knowledge but to have no knowledge at all. How else could Robert Boyle know the shape and size of icebergs off the coast of Newfoundland-- and he did know such things-- except by trusting trustworthy sources? How else could the community of seventeenth-century English astronomers know the apparent motion of the comet of 1665 across the skies except through trusting the observations of astronomers in Poland, Germany, Italy, Spain, and even at a rustic institution in Massachusetts called Harvard?[16]

That reliance on trust and testimony might be-- indeed, ought to be-- thought innocuous. Making scientific knowledge is a communal matter, and scientists-- whatever their expressed scepticism or their faith in method-- have the same task as the rest of us, deciding whom to trust. And there is no rational formula for making that decision, or at least I known of none.

Trust is central to social order, but the attribution of trustworthiness is not equally distributed among all human beings. Early modern scientists agonized about whom to trust, but their solutions broadly followed the contours of social power.

The word of gentlemen might be trusted-- the honor-code stipulated that it must be trusted-- while the testimony of the vulgar, the unlettered, and women might be held suspect. So when the uneducated Dutch draper and microscopist Antoni van Leeuwenhoek reported seeing hosts of small animals in a drop of pond-water, the gentlemen of the Royal Society required that his skill and probity be vouched for-- not by equivalent experts, for there were none as skilled as him, but by the ministers and lawyers of Delft.[17]

But there are other respects in which the Enlightenment Vision bears historical scrutiny, and these might be thought less innocuous, and more central to concern with social prejudice. So, when, for example, members of the seventeenth- or eighteenth-century Republic of Science announced their openness to everyone, the everyone they had in mind was definitely <u>not</u> all human beings. Their academies, their salons, and their deliberations included few non-Europeans and few women. The domestic membership of the Royal Society of London in the seventeenth century encompassed few Roman Catholics, almost no Quakers, no Jews, and no women. The Paris Academy of Sciences was more catholic-- in both senses of the word-- but, after the Revocation of the Edict of Nantes in 1685, French academic life just became impossible for Huguenot scholars.[18]

The exclusions of women and Jews at least are pretty much what you would expect of seventeenth-century English literate culture, largely matters of course. Like the vast majority of the illiterate poor, they had no effective access to the institutions of higher education, and so one did not have to exclude them by statute, just because they were effectively excluded by lack of relevant expertise. So one historian has wittily written that the Royal Society of London was open to `everybody' in just the same way that the Ritz Hotel is open to `everybody.'[19] The warning "Let no one ignorant of mathematics enter here"-- inscribed on the gateway to Plato's Academy-- is socially innocuous just on the condition that everyone has equal access to acquiring mathematical expertise. But there was no such equal access. How sure are we that there now is? Intellectual communities not open to all are prone to produce knowledge unattractive to those who are excluded. So the condition for a biology supporting the inferiority of women or of Jews or Slavs is a biological community purely composed of males or Gentiles or non-Slavs, or, at least, a community whose structure of authority is dominated by them. But the independent causal consideration here is not a science of hatred but the system of exclusions that permit such a science ever to develop.[20]

Both the cosmopolitanism of the Republic of Science and the universalism of its knowledge were key articles of its advertised social justice. But the cosmopolitanism needs qualification and

the universalism needs to be treated with caution. Until the late eighteenth century confessional allegiances were almost certainly more important criteria to be rejected by the virtuous Republic of Science than were national origins, just because centralized nation-states were relatively weaker than they later became, and because science in the seventeenth and eighteenth centuries could contribute far less to state power than it later came to do.[21] If "the sciences were never at war" in the early modern period, by the time of Los Alamos and Peenemünde no such global statement was any longer sensible.

Latin was the universal language of the Republic of Science through much of the seventeenth century-- the intellectual Euro-currency of its time-- but its universality was very like that of mathematical and scientific expertise. When it was said that "everyone spoke it," the sense, of course, was "everyone that mattered."[22] Moreover, the very claims to universal knowledge and universal method that give the air of nobility to the Enlightenment vision have their darker sides. By the early eighteenth century, as Isaiah Berlin noted in one of his more beautiful essays, such critical voices as that of the Neapolitan Giambattista Vico were bridling at the illegitimate vaulting ambition-- and the cultural intolerance-- contained in the conviction that to every question there was only one true answer, "true universally, eternally and immutably."[23]

For these and many other reasons, the historical case for knowledge without prejudice is not good. Knowledge free of prejudice has not been obtained in historical practice, and, it is probably impossible to obtain in principle. The Republic of Science seems rather to reflect the most widely distributed prejudices of its time and of its citizens. And, insofar as these are so widely distributed, they may appear to its citizens as no prejudices at all, though hindsight (if not academic history) reserves the right to judge otherwise. For the historian to <u>understand</u> the general taken-for-grantedness of early modern exclusions of Jews, women, and the vulgar is not-- of course, cannot be-- to approve them for us.

For all that, the rejection of prejudice is neither empty of content nor devoid of consequence. Properly understood, such rejection is not absolute but relative, not global but partial. Rhetoric rejecting authority and testimony translates as the rejection of certain <u>kinds</u> of authority and certain <u>types</u> of testimony; rhetoric commending the openness of intellectual forums means openness to relevant others; the participation of "all men" decodes as everyone possessing the credentials deemed necessary for competent participation. And, because the rejection of prejudice cannot be absolute, we have no universal rational formula for which prejudices to reject and which we have no choice but to embrace. Absent such formulae both intellectuals and others have to do the best they can.

The absolutist version of the Enlightenment Vision is also at the root of its moral and political faults. While there is nobility in the vision, there is also the possibility of hubris and inhumanity. In its absolutist form it charges the individual with terrifying responsibility: it leaves us all alone, mistrustful of our emotions and instincts, mistrustful of our community's customs, and mistrustful our ancestors' wisdom. In the name of the liberty of everyman, it enjoins everyman to be sceptical of every other man.[24]

Edmund Burke's reflective defense of reasoned prejudice picked out just this point. French Jacobin philosophers and politicians have, Burke wrote, "no respect for the wisdom of others; but they pay it off by a very full measure of confidence in their own." The English were more sensible-- this was Burke's prejudice: "We are afraid to put men to live and trade each on his private stock of reason; because we suspect that this stock in each man is small, and that the individuals would do better to avail themselves of the general bank and capital of nations, and of ages. Many of our men of speculation, instead of exploding general prejudices, employ their sagacity to discover the latent wisdom which prevails in them. If they find what they seek, and they seldom fail, they think it more wise to continue the prejudice, with the reason involved, than to cast away the coat of prejudice, and to leave nothing but the naked reason; because

prejudice, with its reason, has a motive to give action to that reason, and an affection which will give it permanence."[25]

If there is much nobility in the Enlightenment Vision, there is much humanity in recognizing its limits. We depend for our knowledge not just on our individual reason and individual experience but on our ancestors and on each other. If we expect to know together, then we must expect to live together, in all our diversity. Just as people have hated in the name of their religion, their sex, their nation, and their race, so they have expressed intolerance and committed injustices in the name of the one universal reason that secures the one universal truth about the world.

So the moral of the story told by a historian of science is at once simple and endlessly complex. Knowledge without prejudice is not possible and neither is social life. Prejudice can be selectively managed and disciplined but it cannot be eliminated. We have to pick out those prejudices which we find intolerable and oppose them as vigorously as we can with whatever resources we can. But we are going to have to do so without a rational master formula derived from the history of the Republic of Science.[26]

NOTES

1. The historical usages of the "Republic of Science" and the "Republic of Letters" are largely interchangeable. For their genealogies, and, especially, their eighteenth-century references, see Dena Goodman, The Republic of Letters: A Cultural History of the French Enlightenment (Ithaca, N.Y.: Cornell University Press, 1994); Anne Goldgar, Impolite Learning: Conduct and Community in the Republic of Letters, 1680-1750 (New Haven, CT: Yale University Press, 1995); Geoffrey V. Sutton, Science for a Polite Society: Gender, Culture, and the Demonstration of Enlightenment (Boulder, CO: Westview Press, 1995); Hans Bots and Françoise Waquet, La république des lettres (Paris: Belin, 1997); and Zygmunt Bauman, Legislators and Interpreters: On Modernity, Post-Modernity and Intellectuals (Oxford: Polity Press, 1987), esp. pp. 25-26. For seventeenth-century views on the relationships between virtuous social order and proper knowledge, see, for example, Steven Shapin, Die wissenschaftliche Revolution, trans. Michael Bischoff (Frankfurt-am-Main: Fischer Taschenbuch Verlag, 1998), chapter 3.

2. Francis Bacon, "The New Organon [1623]," in The Philosophical Works of Francis Bacon, eds James Spedding, Robert Leslie Ellis, and Douglas Denon Heath, 5 vols. (London: Longman and Co., 1857-1858), Vol. IV, pp. 39-248, on pp. 58-64.

3. For this point, and the material in the following three

paragraphs, see Shapin, Die wissenschaftliche Revolution, chapters 2-3.

4. For the character of the experimental natural philosopher, see Steven Shapin, "`A Scholar and a Gentleman': The Problematic Identity of the Scientific Practitioner in Early Modern England," History of Science 29 (1991), 279-327; also Mario Biagioli, "Etiquette, Interdependence, and Sociability in Seventeenth-Century Science," Critical Inquiry 22 (1996), 193-238; Lorraine J. Daston, "Baconian Facts, Academic Civility, and the Prehistory of Objectivity," Annals of Scholarship 8 (1991), 337-363.

5. For Boyle, see Steven Shapin, A Social History of Truth: Civility and Science in Seventeenth-Century England (Chicago: University of Chicago Press, 1994), chapter 4. Descartes's iconic anti-authorianian and anti-traditionalistic gesture is in the Discourse on Method, Part I.

6. Charles Taylor, Sources of the Self: The Making of Modern Identity (Cambridge, Mass.: Harvard University Press, 1989), chapters 8-9.

7. John Locke, Essay Concerning Human Understanding (1690), Book I, chapter 3, section 24; Book IV, chapter 15, section 6.

8. For Leibniz, see Rudolph W. Meyer, Leibnitz and the Seventeenth-Century Revolution, trans. J. P. Stern (Chicago: Henry Regnery Co., 1952), and Ayval Ramati, "Harmony at a Distance: Leibniz's Scientific Academies," Isis 87 (1996), 430-452.

9. Lorraine J. Daston, "The Ideal and Reality of the Republic of Letters in the Enlightenment," Science in Context 4 (1991), 367-386; see also Gavin De Beer, The Sciences Were Never at War (London: Nelson, 1960).

10. For Gibbon, Montesquieu, and Hume, see Thomas J. Schlereth, The Cosmopolitan Ideal in Enlightenment Thought: Its Form and Function in the Ideas of Franklin, Hume, and Voltaire, 1694-1790 (Notre Dame, IN: University of Notre Dame Press, 1977), pp. 47-48. For cosmopolitanism, solitude, and asceticism in images of the Western intellectual, see, for example, Steven Shapin, "`The Mind is Its Own Place': Science and Solitude in Seventeenth-Century England," Science in Context 4 (1991), 191-218; idem, "The Philosopher and the Chicken: On the Dietetics of Disembodied Knowledge," in Science Incarnate: Historical Embodiments of Natural Knowledge, eds Christopher Lawrence and Steven Shapin (Chicago: University of Chicago Press, 1998), pp. 21-50.

11. The journalist was Jacques-Pierre Brissot de Warville, writing in his 1782 book De la Vérité: quoted in Roger Hahn, The Anatomy of a Scientific Institution: The Paris Academy of Sciences, 1666-1803 (Berkeley: University of California Press, 1971), p. 153. For the idea of scientific genius during that period, see, for example, Simon Schaffer, "Genius in Romantic Natural Philosophy," in Romanticism and the Sciences, eds Andrew Cunningham and Nicholas Jardine (Cambridge: Cambridge University Press, 1990), pp. 82-98, and Richard R. Yeo, "Genius, Method and

Morality: Images of Newton in Britain, 1760-1860," Science in Context 2 (1988), 257-284. For the growing significance of "public opinion" in science, see Thomas H. Broman, "The Habermasian Public Sphere and `Science in the Enlightenment'," History of Science 36 (1998), 123-149.

12. Quoted in Charles B. Paul, Science and Immortality: The `Éloges' of the Paris Academy of Sciences (1699-1791) (Berkeley: University of California Press, 1980), p. 67; see also Hahn, Anatomy of a Scientific Institution, p. 165; and Keith M. Baker, Condorcet: From Natural Philosophy to Social Mathematics (Chicago: University of Chicago Press, 1975), esp. pp. 293-299.

13. Joseph Priestley, An Examination of Dr Reid's Enquiry into the Human Mind on the Principles of Common Sense (London, 1774), p. 74, and idem, Experiments and Observations on Different Kinds of Air, 3 vols. (London, 1774-1777), Vol. I, p. xiv (both quoted in Dorinda Outram, "Science and Political Ideology, 1790-1848," in Companion to the History of Modern Science, eds R. C. Olby et al. [London: Routledge, 1990], pp. 1008-1023, on p. 1017).

14. Robert K. Merton, "Science and the Social Order [1938]," in idem, The Sociology of Science, ed. Norman W. Storer (Chicago: University of Chicago Press, 1973), pp. 254-266; idem, "The Normative Structure of Science [1942]," in ibid., pp. 267-278.

15. David A. Hollinger, "The Defence of Democracy and Robert K. Merton's Formulation of the Scientific Ethos," Knowledge and Society, eds Robert Alun Jones and Henrika Kuklick (Greenwich CT:

JAI Press, Vol. 4 (1983), 1-15; idem, Science, Jews, and Secular Culture: Studies in Mid-Twentieth Century American Intellectual History (Princeton, N.J.: Princeton University Press, 1996).

16. This is the main argument of Shapin, A Social History of Truth, esp. chapters 1, 5-6.

17. Ibid., pp. 306-307 (for Leeuwenhoek) and chapters 3 and 8 (for trustworthiness and social standing in general).

18. For membership of the early Royal Society of London, see Michael Hunter, The Royal Society and Its Fellows 1660-1700: The Morphology of an Early Scientific Institution (Chalfont St. Giles: British Society for the History of Science, 1982); for the Paris Academy, see Hahn, Anatomy of a Scientific Institution; for women in French Enlightenment salons, see Dena Goodman, "Enlightenment Salons: The Convergence of Female and Philosophic Ambitions," Eighteenth-Century Studies 22 (1989), 329-350; for women in early modern science generally, see Londa Schiebinger, The Mind Has No Sex? Women in the Origins of Modern Science (Cambridge, Mass.: Harvard University Press, 1989); for the Huguenot scholarly diaspora, see Goldgar, Impolite Learning.

19. Margaret 'Espinasse, "The Decline and Fall of Restoration Science," Past and Present 14 (1958), 71-89, on p. 86.

20. This is the intellectual argument for a scientific community representative of the society that supports it and that depends upon its epistemic products. For an entry to debates over whether the modern scientific community is genuinely open to all and

meritocratic, see, for example, Anne Sayre, Rosalind Franklin and DNA (New York: W. W. Norton, 1975); Jonathan R. Cole, Fair Science: Women in the Scientific Community (New York: Free Press, 1979); Harriet Zuckerman, Jonathan R. Cole, and John T. Bruer, eds, The Outer Circle: Women in the Scientific Community (New York: W. W. Norton, 1991); Barbara Laslett, Sally Gregory Kohlstedt, Helen Longino, and Evelynn Hammonds, eds, Gender and Scientific Authority (Chicago: University of Chicago Press, 1996). This intellectual argument for a representative scientific community is formally independent of current American justifications of "affirmative action" on grounds of economic and social equity or for the purpose of providing so-called ethnic and gender "role models."

21. See Daston, "Ideal and Reality of the Republic of Letters".

22. See Françoise Waquet, Le Latin ou l'empire d'un signe (Paris: Albin Michel, 1999).

23. Isaiah Berlin, "The Divorce between the Sciences and the Humanities [1974]," in idem, The Proper Study of Mankind: An Anthology of Essays, eds Henry Hardy and Roger Hausheer (New York: Farrar, Straus and Giroux, 1998), pp. 326-358, on p. 327; also idem, "The Counter-Enlightenment [1973]," in ibid., pp. 243-268.

24. Taylor, Sources of the Self, esp. pp. 167ff.

25. Edmund Burke, Reflections on the Revolution in France [1790], ed. Conor Cruise O'Brien (Harmondsworth: Penguin, 1986), pp. 183-

184.

26. For a wonderful attempt at reviving a more modest, `case-by-case' approach to ethical decision-making, see Albert R. Jonsen and Stephen Toulmin, The Abuse of Casuistry: A History of Moral Reasoning (Berkeley: University of California Press, 1988).