Is the Life of the Scientist a Scientific Unit?
Author(s): Theodore M. Porter
Source: *Isis*, Vol. 97, No. 2 (June 2006), pp. 314-321
Published by: The University of Chicago Press on behalf of The History of Science Society
Stable URL: http://www.jstor.org/stable/10.1086/504737
Accessed: 03/09/2015 10:43

Is the Life of the Scientist a Scientific Unit?

*By Theodore M. Porter**

ABSTRACT

The biographical study of scientists, though familiar, has mostly seemed anodyne rather than profound as a tool of history of science. But it bears closely on the public role of the scientist, associated nowadays with the detachment of objectivity and with a sense of the scientific life as a fracturing of "the science" from other aspects of a career. Although this division is indeed characteristic of the modern scientific identity, historians should not take it as natural or inevitable. The life of the statistician Karl Pearson, who endeavored to live out a *Bildungsroman,* demonstrates the survival into the twentieth century of alternative ideals and, with them, of ambitions for science going far beyond the professionalization of a technical field. Pearson's career offers a model for historicizing the relationship of science to public reason.

HOW DOES THE SCIENTIFIC LIFE relate to the life of science? Our culture celebrates biography as a way of humanizing the scientist, who seems to require little more to gain recognition as a fellow mortal than unscrupulous ambition or an inordinate fondness for practical jokes. Textbooks feature scientists in sidebars to commemorate great discoveries and attach them to real persons without implying any intrinsic relation between scientific knowledge and its cultural location. The field of history of science, in contrast, has emphasized institutions and shared understandings over what seems merely personal. Thus, while individuals often figure as convenient units of study in history of science, and biography as a genre has flourished in recent years, only rarely are scientists depicted as whole persons for whom science is part of the meaning of a life. Biographies, even by historians, typically sequester the science in separate chapters, if they include it at all. I would argue that the culture of science shapes and is shaped by the people who practice it and that the scientist, as a human type, has a history that matters.

Following individual scientists is a fine strategy for demonstrating the wide scope of scientific activity. We find them not only conducting experiments, peering through microscopes, analyzing data, and building physical or mathematical models but also casting horoscopes, studying theology, seeking patronage, treating patients, advising monarchs or

* Department of History, UCLA, 6265 Bunche Hall, Box 951473, Los Angeles, California 90095-1473.

Isis, 2006, 97:314–321

0021-1753/2006/9702-0006$10.00

high functionaries, giving popular lectures, negotiating with publishers, writing grants, exploiting patents, and founding companies. The shifting patterns of these activities structure our historical understanding of science, and the development of history of science as a scholarly field might be summarized as a succession of endeavors to recognize new dimensions of scientific life. Pierre Duhem inverted the rhetoric of conflict between knowledge and faith to argue that Christian institutions and faith played a constructive role in establishing the modern epistemology of science. Alexandre Koyré inspired a great generation of Anglophone historians with his close analyses of the philosophical content of scientific texts. The sociological "strong programme" emphasized the role of social factors, such as social ideologies, in the resolution of scientific disputes, and the cultural turn that followed and competed with it added gender, ethnicity, and new dimensions of class and caste to show how science participates in and is shaped by larger cultural movements. All of these moves, and especially the last, linked the character of the science with the identities of the practitioners.

The notion of "identity," that buzzword of recent scholarship, reached history of science about 1990.[1] It was applied initially to the early modern period, and a growing recognition of the heterogeneity of scientific identities raised doubts that the mostly anachronistic term "science" could define a limited and coherent topic for historians of the "scientific revolution." With regard to the burgeoning institutions of science in the last two centuries, questions of identity have not seemed to cut so deep. Although some of the most stimulating research of recent decades, and perhaps especially on the nineteenth century, has aimed to recover and rehabilitate the scientific efforts of artisans, laborers, women, poets, popular writers, and other outsiders, its authors have relied on the assumption of a coherent tradition of elite science to settle the basic definitional issues.[2] Established science, even by this account, was mainly and increasingly a technical activity, tending almost ineluctably toward independence and neutrality.

This teleology, of professionalism in science moving ever forward, gives an answer to the problem of scientific biography by placing a wall between science itself and other aspects of the lives of scientists. Postwar sociology viewed the "scientific role" this way, defining it in relation to the theory of modernization.[3] During the Cold War efflorescence of social science, this and other "ations" achieved a status akin to that of the "isms" bequeathed by the century of Napoleon and Bismarck. Modern society, so the argument goes, needs high-level professional science to understand and manage a complex interdependent world. Its *telos* was seen as encompassing specialization, institutionalization, and, above all, professionalization. The scientist in this modernized world became a special form of humanity, blazing a trail to the twenty-first century. It was his vital task to lay the foundation of abstract knowledge on which was to be built the habitable structures of engineering, medicine, social science, and administration. But this role required self-re-

[1] I think of Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago: Univ. Chicago Press, 1993); and Steven Shapin, *The Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: Univ. Chicago Press, 1994).

[2] This is especially true of work on nineteenth-century Britain. See, e.g., Roger Cooter, *The Cultural Meaning of Popular Science: Phrenology and the Organization of Consent in Nineteenth-Century Britain* (Cambridge: Cambridge Univ. Press, 1984); Adrian Desmond, *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (Chicago: Univ. Chicago Press, 1989); and James Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of* Vestiges of the Natural History of Creation (Chicago: Univ. Chicago Press, 2000).

[3] Joseph Ben-David, *The Scientist's Role in Society* (Englewood Cliffs, N.J.: Prentice-Hall, 1971).

straint, an ennobling detachment and narrowness, in view of the separation of objective science from more mundane activities. A scientist was entitled to a private life and to ideological commitments, provided these were kept apart from the science. The term "scientism" came into use as a reproach to those who would extend science beyond its proper frontiers. A scientist may be religious, but proper science implies *disenchantment.* Max Weber's ambivalence about these tendencies was sharpened by critical theory in the Frankfurt tradition but mostly put out of mind by later social science.[4]

Historians, especially those who take an interest in scientific people as well as institutions, have depicted the emergence of scientific modernity as a more human process—and often as a contested one. The "edge of objectivity," in Charles Gillispie's account, moved forward through struggles unceasing against manifold pretenders, often of great eminence, who continued into the twentieth century to mix feelings and values with nature. Gillispie even spoke of this edge as "cruel," though he applauded its achievements.[5] By now, few historians are comfortable making sharp distinctions between real science and mere subjectivity. Great scientists, as well as poets, mystics, and priests, have sometimes refused to admit a world purged of human significance. And many who endorsed rigorous detachment and objectivity regarding nature have seen science itself as a moral quest. Biography, if it does not assume the separation of science from life, can recapture some of the ways that scientists found meaning in the world and attached moral value to their work.

The victory of the mood of neutrality and technicality was in some ways a withdrawal of reason from public life. In our age of professional specialists, scientific knowledge no longer qualifies a person as a thoughtful intellectual. With this in mind, the triumphant strains of modernization theory can now be echoed in a minor key. Science, which seeks sustenance from the state and from powerful industrial enterprises, avoids, in the name of objectivity, any identification with strong positions on politically contested issues, except to defend naturalistic explanation—its own special cause. Few look to it for subtle insights. Instead, its public role is identified with solid "information" that appears straightforwardly factual, requiring no interpretation.[6] The need for creativity and imagination in basic research may be granted, but science is best able to advance rationality, so it seems, when the generation of knowledge is as automatic as possible.

Science in this mold presumes a special form of humanity to assume the persona of "the scientist." Specialized expertise is essential, and with it the capacity to focus, to avoid distractions. Familiarity with adjacent scientific fields might come in handy, and a broad education extending to history or literature can be harmless enough, possibly even useful as an aid to clear communication. But science has come to mean, above all, technical skill and knowledge, which, in the preferred idealization, draws little from the broader culture except material resources. What science contributes is primarily at the level of technology or of solutions to narrow and clearly articulated problems. To bring up *wisdom* in this

[4] Max Weber, "Science as a Vocation," in *From Max Weber,* ed. and trans. H. C. Gerth and C. Wright Mills (New York: Oxford Univ. Press, 1946), pp. 129–156, writing with irony and evident ambivalence.

[5] Charles Coulston Gillispie, *The Edge of Objectivity: An Essay in the History of Scientific Ideas* (Princeton, N.J.: Princeton Univ. Press, 1960). Compare the work by his student Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, N.J.: Princeton Univ. Press, 1995), where the theme of sacrifice and adaptation to circumstances of political distrust is emphasized more strongly.

[6] Yaron Ezrahi, "Science and the Political Imagination in Contemporary Democracies," in *States of Knowledge: The Co-production of Science and Social Order,* ed. Sheila Jasanoff (New York: Routledge, 2004), pp. 254–273.

connection would be a category mistake. Idealistic educators still sometimes speak earnestly of science as a way of knowing—and more commonly about the defects of public understanding. But the most-lamented consequence of scientific illiteracy is simply false belief of the flat-earth variety. Scientists are troubled when lay citizens reject the theory of evolution, practice feng shui, live in fear of abduction by space aliens, or condemn genetically modified foodstuffs. Such a public is evidently out of tune with scientific thinking and is likely to be unsympathetic to public support for basic research.

The island view of science now predominates. Outsiders should not participate in making science but need only accept its conclusions, regarding it not mainly as a path to understanding but, rather, as a source of factual information. The isolation of scientific knowledge is in some respects mythical and certainly has its limits. Scientists, now more than ever, are permitted and often required to participate in the world of technology, production, commerce, and finance. A few, like Einstein with his unsteady bicycle and unruly hair, are put in the role of sage. But the so-called Enlightenment project—really more typical of the nineteenth century—to make science the basis of a shared intellectual culture and of enhanced public rationality in all aspects of life has lost its credibility. The social history of science as the progress of professionalization, no less than the late culturalist version of science as the hegemony of experts, rules this vision out of court. So also does our vernacular philosophy of science in its most severely rationalist mode, which insists on sharp boundaries to demarcate science from nescience.

Science continues of course to inform the public, perhaps more than ever, and it is often in the news. Its relation to public reason, however, has been reshaped along with the character and formation of scientific practitioners. The term "scientist," as an occupational category, became common only toward the end of the nineteenth century. Missionaries of Victorian naturalism such as T. H. Huxley, whose campaigns have too often been interpreted as a mere drive for professionalization, disliked it. His ambition was never to wall science off, but to diffuse it through a whole culture. This he did with immense success; he was paid handsomely to write for the best periodicals, drew great audiences from all classes to his lectures, moved in elite circles, and was appointed to high government commissions. All the same, he claimed special authority for the trained man of science, whose access to deeper truths entitled him to an almost priestly status.[7]

Karl Pearson, three decades younger, was a more tragic figure. No less an author than George Bernard Shaw promised in a wry letter in 1893 to put his hand soon to "Karl Pearson: A Tragedy." He was referring specifically to Pearson's professed withdrawal from open political activity, in particular his refusal to join the Fabians. Shaw participated wholeheartedly in that club as thinker and propagandist and even distributed long ideological prefaces at the performances of his plays. Pearson was as concerned with the public role of the scientist as was Shaw with that of the dramatist. But the opposition Pearson asserted between the "enthusiasm of the study" and that of the "market-place" required scientists to keep clear of political entanglements, though not to refrain from speaking out on "questions of the day and fray."[8] No; just because the knowledge and wisdom of science was so urgently needed, the scientist should hold to a position, independent of party, from

[7] Adrian Desmond, *Huxley: From Devil's Disciple to Evolution's High Priest* (London: Penguin, 1998); and Paul White, *Thomas Huxley: Making the "Man of Science"* (Cambridge: Cambridge Univ. Press, 2003).

[8] Karl Pearson, "The Enthusiasm of the Market-Place and of the Study," in *The Ethic of Freethought and Other Addresses and Essays* (London: T. Fisher Unwin, 1882). "Questions of the Day and Fray" was the umbrella title for a series of lectures Pearson organized in the early twentieth century.

which he could speak unvarnished truth. Pearson tried to do so, not without success, though none in his generation achieved the prominence of Huxley or John Tyndall.

I was drawn to write on Pearson by his effort to reconcile an emotional commitment to selfless impersonality and to universal measurement with a stormy, romantic temperament and an irrepressible longing—which he felt he had to renounce—for direct and immediate experience of objects in the world. I was enchanted, too, by the intellectual range and ambition of a man who based a tragic *New Werther* and then a "nineteenth-century passion play" on his own early life and thoughts, studied with an earnest sense of its contemporary relevance the historical period of the Protestant Reformation in Germany, theorized a nonrevolutionary transition to socialism as the next phase of history, worked out a positivist-idealist philosophy of science as the key to modern citizenship, formed a "Men and Women's Club" to discuss the social status of women and nonsexual friendship across the sexual divide, proposed a hydrodynamics of ether squirts as the revolutionary new foundation for physical science, and took up graphical geometry as the successor to algebra and the unified basis of applied mathematics—all this before accepting statistics, biometry, and eugenics as his scientific calling. It appears a remarkably heterogeneous intellectual career. Yet he could not see it as disjointed. For Pearson, a post-Romantic Protestant unbeliever and no enlightened smooth mover like Pierre-Louis Moreau de Maupertuis, was all interiority, even to the extent that he lacked the means to cover it. He viewed his disparate pursuits as episodes in the formation of a tense and conflicted but coherent self, stages in the *Bildungsroman* of his life. I was enchanted by the themes that resonate through, even if they could not quite harmonize, these disparate intellectual activities and by what they showed about the relations of his personal to his scientific life.[9]

But Pearson's desperate attempt to assert the wholeness and integrity of his life was not merely personal. What this student of neo-Kantian philosophy aspired to for himself he would willingly have prescribed as a universal law, pertaining specifically to the cultural role of the scientist. His missionary ambitions for science as a basis of education appear pointedly in such works as *The Grammar of Science* (1892) and *The Function of Science in the Modern State* (1902). Admitting specialization as intrinsic to modern science, even if it was not exactly to his taste, he proposed a way to recover a meaningful whole from the fragments. The intense investigation of a particular science, he explained, was far superior to superficial study of many sciences, because knowing in depth was the only way to master "scientific method." He advised his self-improving audiences on how to study and on picking books that were not mere popularizations. Technical mastery was, for the citizen, no more than a means to an end, since the method of science stood above all technicality. He once compared scientific method to the Boy Scout injunction to keep your eyes open and use common sense. Really, it was a moral imperative: to examine facts systematically and impersonally rather than leaving opinion to whim, ignorance, and bias. Once acquired, it would guide students through thickets of sound and misguided claims to valid knowledge on any topic.

Pearson sketched out this idealized democracy of method in order to avoid the isolation of science on the mountaintop of expertise. Yet he often appeared in his own time, and still more so to history, as a missionary for specialized, technical knowledge, such as the

[9] Theodore M. Porter, *Karl Pearson: The Scientific Life in a Statistical Age* (Princeton, N.J.: Princeton Univ. Press, 2004). On Maupertuis see Mary Terrall's essay in this Focus section and her book *The Man Who Flattened the Earth: Maupertuis and the Sciences in the Enlightenment* (Chicago: Univ. Chicago Press, 2002).

mathematical form of statistics to which he devoted the last forty-five years of his life. This was, in a way, a tragic failure, in the face of historical tendencies by which he was swept up even as he tried to combat them. Yet he gave much thought to the cultivation of the scientist. His educational program for expert scientists enjoined them to seek out a wide range of knowledge and experiences. To this end he outlined a form of apprenticeship that recalled his own meandering course, a modernized liberal education involving languages, literature, art, travel, and history as well as mathematics. Close reading in a particular science might suffice for a sincere but unsophisticated citizen, who could thereby learn enough about the scientific ethos to be able to recognize the work of an expert. The guides themselves required something more. Sound scientific practice drew necessarily from wisdom, which was most efficiently acquired in the way of the medieval university, through a close long-term relationship with a real master. It could not be machine-like and uniform, a matter of rote calculation, but was inseparable from individuality. Pearson thus tried to assimilate into scientific education that most essential ideal of literary study, a program of personal growth and the cultivation of a unique personality.[10] He wanted to avoid the partitioning of scientific work from life. His own career demonstrated a rich and multifaceted interaction, though by no means a reconciliation, of the personal and the impersonal.

As a socialist, Pearson loathed individualism, but he was obsessed with individuality. He held on to both sides of this near contradiction in his statistics, which, by amassing large numbers, reduced individuals to insignificance and yet, by denying the absolute likeness of any of the constituent elements, supported a metaphysics of teeming variability. The fundamental diversity of nature, the element of chance, was evident not only in living organisms but also in stars, atoms, and even geometrical objects such as circles. Some very personal obsessions were expressed by this statistical ontology. He insisted on his own coherence as a person and on the distinctive imprint of a unique personality to be found throughout his work. And he readily generalized to others: a pioneering table of numbers or an insight in applied mathematics, no less than the images and sonorities of a poem, must display the individuality of its author. Accordingly, even scientific work can be properly comprehended only when seen in the context of a life. He feared, prophetically, that his own achievements in statistics would be condensed by historical memory into an eponymous formula or constant that ignored the hopes and passions and the personality behind the work. He gave extensive and learned lectures on great figures in the history of statistics with the complementary aims of demonstrating their relationship to the cultural history of their age and of bringing out the distinctive characteristics of each individual author.

Ambitions and anxieties of this kind made Pearson tolerable and even appealing to me as a biographical subject. In his mature works, the tensions and nuances are overshadowed by the arrogance of his public persona, and the wisdom he claimed for science is now difficult to square with the vitriolic eugenic campaigns to which he devoted so much public writing and lecturing in the second half of his life. I could not have appreciated his complexities without the guidance provided by a vast collection of letters and other archival documents that he guarded as a legacy and that his family chose to preserve and to make accessible.[11] They provide materials for integrating the personal and the scientific, for

[10] He participated actively in debates on university education. See Karl Pearson, *The New University for London: A Guide to Its History and a Criticism of Its Defects* (London: T. Fisher Unwin, 1892).

[11] Karl Pearson Papers, Manuscripts Room, University College London.

locating his passions and frustrations historically and linking them to a scientific vision and mathematical style. These private papers, I should add, may also be seen as revealing new unpleasant dimensions of a thoroughly unappealing character, as overbearing sometimes in his personal relations as in his proselytizing lectures. The insertion of intellectual doctrines into every aspect of Pearson's life is part of his tragedy. His attempt to regulate his personal role as husband and father according to high principles of impersonal science and socialism led to some very unhappy results.

Whether, despite it all, an author or reader is able to find Karl Pearson a sympathetic figure is not the main point. He was for me a lucky find, combining a tortured romantic temperament and a strong confessional urge with fastidious record keeping in a way that cannot be common.[12] My problem was not so much to reconstruct a life from highly fragmentary remains as to exploit their abundance: to make sense of Pearson's extraordinarily diverse researches and activities and to draw from the rich autobiographical materials without taking them at face value. I did not try to give a full account of his mathematical writings on statistics, his career as director of several laboratories and founder of a research school, or even the many controversies that followed from his effort to reshape the human sciences, including eugenics and medicine. I aimed, rather, to comprehend the romantic temperament of this objectifying scientist—a passionately unreasonable missionary for reason—and how the auto-Pygmalionism of his scientific quest was simultaneously an effort to reconstruct society.

Pearson was an odd bird, but the scientific life matters in every time and place. The formation and the character of the scientist reflect and shape the public roles for which he or she is understood to be suited. Those who came to maturity since the massive expansion of science in the twentieth century, and especially after World War II, have been taught to regard science as a way to rise above our profane world where loose standards of knowledge permit subjectivity and self-interest to hold sway. Modern claims for the special authority of science presume this disinterested disengagement, which, though an old ideal, was never before institutionalized to the same degree. This view of scientific objectivity as arising from disciplined acquiescence rather than heroic self-overcoming came to be accepted as the nature of science, especially of quantitative science.[13] But the category of the scientist has a history. The background and training expected of a scientist—including gender, religion, personal character, familiarity with classical learning and with arts and letters, engagement with political and social issues, and links to business and technology—are all historically variable and often are at issue.

Pearson, living and working during a period of professional consolidation in the generation after Huxley, is something of a Don Quixote figure. He found the modern age disenchanting, and in later life he complained bitterly of the reduction of science to a profession, just another way to earn a living. I follow, as a methodological dictum, the principle that intellectuals and scientists do not merely reflect their context but seek out a position within a field of possibilities—and not only, as Pierre Bourdieu suggests, for strategic reasons. Pearson, who is often to be found tilting against what he saw as the dominant tendencies of his age, is of interest to a more general history not only because

[12] But there are similarities in the sources available to Thomas Söderqvist for his *Science as Autobiography: The Troubled Life of Niels Jerne,* trans. David Mel Paul (New Haven, Conn.: Yale Univ. Press, 2003).

[13] We might compare Pearson's tempestuous life with the calm professionalism of Herbert Simon, as portrayed in Hunter Crowther-Heyck, *Herbert A. Simon: The Bounds of Reason in Modern America* (Baltimore: Johns Hopkins Univ. Press, 2005).

of what he achieved in science but also because he exemplifies the tensions and contradictions of his time, the possibilities that could be dreamed but were not realized. He took his bearings from the past and not only from an imagined future. The training up of the new man and new woman in technical skills was not so important for him as were those enduring moral and intellectual traits that, he thought, could be formed more perfectly through scientific education than by training in classical literature.

Ironically, his work helped to furnish science with the stamp of impersonality that he rejected. No other form of scientific method can match the status of statistics as relevant public knowledge. Pearson, who really founded the field, ought to be on a very short list of the scientists who did most to shape the contemporary world. But he could not make statistics, much less the world, as he chose. A string of successors, beginning with R. A. Fisher, competed to refashion statistics, and in science it was valued more and more for its mechanical aspects. In consequence, biographers regard impersonal statistics as an unpromising home for outsized heroes by comparison to modern physics or molecular biology. Pearson struggled vainly against this spirit of statistical impersonality, partly because he wanted to be remembered for more than specific technical contributions, but also because he had a distinctively expansive view of the public role of science. He conceived scientists not as specialists standing outside of their culture but as leaders, whose logic should become the idiom of debate and decision in the public arena. Scientific wisdom would depend on broad vision and the cultivation of individuality.

Modern historians of science learn at the outset of their training not to be too hasty in judging the knowledge of the past against what we now believe. It would be well if we allowed also for more contingency in the habits and roles of scientists. These are produced not merely by training in a discipline but by all the circumstances, relationships, and expectations that structure their lives. A more inclusive form of biographical study can provide materials for a history of the scientist, a vital dimension of the history of reason in the world.