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## History and the public understanding of science: Problems, practices, and perspectives

IN THE ENGLISH-SPEAKING WORLD, the public understanding of science (PUS) became a watchword of the 1980s. The effect was electrifying, as writer after writer, institution after institution, and museum after museum competed to become more user-friendly and thereby more effective in communication of the principles of science to the lay public. The incentive for action was evidence of alarming levels of ignorance allied to either fear or indifference on the part of the non-scientific lay public.<sup>1</sup> In response, the Royal Society set up its Committee for the Public Understanding of Science (COPUS), and the Royal Institution and the British Association for the Advancement of Science followed suit with their own initiatives. In the universities, a visiting professorship in the history and public understanding of science was established at Imperial College, London, in 1988, and a decade or so later the University of Oxford created its own chair of the public understanding of science, which has been held since its inauguration by the zoologist Richard Dawkins.

For museums of science and technology and the relatively new and small family of major science centres, the movement offered both challenges and opportunities, and these were duly seized not only in Britain but across our continent. The question that immediately presented itself in this context was that of location. Could the new drive to communicate be accommodated within existing structures, or did PUS demand a completely fresh start? The ‘fresh start’ philosophy had its first and most striking realization in Paris. Here, there had long been a demarcation between the role of the Conservatoire des arts et métiers, with its historic collection begun in the aftermath of the French Revolution, and that of the Palais de la Découverte, which had focussed, since its foundation in 1937, on the communication of contemporary science to a broad lay public. In the 1970s, it seemed that either institution might be renewed in ways that would allow a fresh start, drawing perhaps on the experience of the science centres that had grown up, mainly though not exclusively in North America, since the 1960s. But rather than renewal, the French government, initially during the presidency of Valéry Giscard d’Estaing and then under François Mitterand, chose to break completely new ground. Its working party, which began work in 1979, quickly developed plans for the completely new institution, on a new site, that was inaugurated in March 1986 as the Cité des Sciences et de l’Industrie.

In its glittering premises at La Villette in north-eastern Paris, the Cité had an immense impact both on the PUS movement and on the museum world. Its lack of an historic collection immediately set it apart from the older museums, not only the Conservatoire but also the Deutsches Museum in Munich (founded in 1903) and the Science Museum in London (with roots going back far into the nineteenth century). And that in itself raised questions for institutions that had always invested heavily in the acquisition, conservation, and study of historic objects. If the objective of even the older museums was to convey understanding, as was generally believed, might the example and early success of the Cité suggest that such investment was largely wasted? Might the traditional curators who had devoted their careers to the care of a collection suddenly be on a slippery slope to extinction? Robert Anderson, the

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<sup>1</sup> Striking evidence of this kind emerged from surveys conducted in Britain and the USA in 1988. For a brief summary, see John R. Durant, Geoffrey A. Evans, and Geoffrey P. Thomas, “The public understanding of science”, *New Scientist*, 340 (6 July 1989), p. 11–14. A fuller account is the same authors’ “Public understanding of science in Britain: the role of medicine in the popular representation of science”, *Public Understanding of Science*, 1 (1992), p. 161–82.

future Director of the British Museum, went at least so far as to ask the question, in 1985.<sup>2</sup> And in 1999 the Director of the Science Museum, Neil Cossons, was raising the same possibility, at least by implication, when he predicted (and welcomed) changes that would ‘blow away the cobwebs from some of the dingier corners of the museum world’, exposing ‘grumpy fundamentalists in their protected habitats for what they are’; accountability, he insisted, would threaten curatorial autonomy, and rightly so.<sup>3</sup> In Cossons’s ‘new’ museum, curators with essentially historical expertise and interests seemed unlikely to flourish. And as traditional curatorship went into retreat, it required little imagination to suppose that libraries and other scholarly resources too might in due course come under painful scrutiny. The tension was clear, as it had been for almost twenty years by the time Cossons spoke. On the one hand, the old guard of curators found themselves tarred with the brush of dusty, remote scholarship or dilettante connoisseurship. On the other, a new world beckoned, one in which communication skills and openness were the priorities. In the face of that tension, could research, in particular historical research, survive?<sup>4</sup>

It is to some extent paradoxical that the very years in which the most searching questions were being asked about the roles of curators and collections were also ones in which the major national museums made significant efforts to promote research. A restructuring of the Science Museum in 1988 led to the establishment of a Research and Information Services Division, with a head whose task it was to encourage and guide research throughout the museum. Three years later, the Deutsches Museum set up a largely external advisory committee, the Wissenschaftsbeirat, whose main task was to promote the interests of the museum’s in-house research centre, the Forschungsinstitut für die Geschichte des Naturwissenschaften und der Technik (founded in 1963). And in 1997 the commitment to historical research was taken a stage further by the creation of the Munich Centre for the History of Science and Technology, a centre that brought together groups of historians not only from the museum but also from the universities of Munich — the Ludwig Maximilians-Universität, the Technical University, and the Universität der Bundeswehr.

The attempt simultaneously to promote more accessible forms of communication and to foster research would suggest that the new PUS movement and scholarship were brothers in arms. But through the 1990s it became evident that not all the leading communicators of science for the lay public were convinced of the value of perspectives on science drawn from the humanities and the social sciences. The mere chronicling of science was perfectly acceptable, of course, and the kind of history that focussed on breakthroughs and heroes was even better. But what disturbed many scientists active in the world of PUS was the growing prominence of critical insights on science drawn mainly from the social sciences. What could, and surely should, have been a constructive alliance between the scientific community and the heterogeneous world of historians, sociologists, anthropologists, and policy analysts was simply not coming to be.

The tensions came to a spectacular head in the ‘science wars’ episode of a decade ago, when Alan Sokal, a physicist at New York University, published a hoax article composed of a patchwork of non-sensical elements drawn from the more vacuous realms of modern, essentially post-modernist, social science literature. The article was brilliantly done, to the point that the editors of the cultural studies journal in which it appeared, *Social Text*, unhesitatingly waved it through on its way to publication.<sup>5</sup> Much of Sokal’s argument had real substance: the ways in which the social scientists who were his

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<sup>2</sup> Robert Anderson, “The museum curator as an endangered species”, in Neil Cossons (ed.), *The Management of Change in Museums* (London: National Maritime Museum, 1985), p. 27–9.

<sup>3</sup> Neil Cossons, “Museums in the New Millennium”, in: Svante Lindqvist (ed.), *Museums of Modern Science* [112<sup>th</sup> Nobel Symposium] (Canton, MA: Science History Publications, 2000), p. 3–15 (11).

<sup>4</sup> For my own comment on this dilemma, written after time I spent, between 1986 and 1988, first at the Cité des Sciences et de l’Industrie and then at the Science Museum, see Robert Fox, “Research and curatorship in the national science museums: a reflexion on threats and opportunities”, *Impact of Science on Society*, 40 (1990), 263–71. An important more recent study is Robert Anderson, “To thrive or survive? The state and status of research in museums”, *Museum Management and Curatorship*, 20 (2005), p. 297–311.

<sup>5</sup> Alan Sokal, “Transgressing the boundaries: towards a transformative hermeneutics of quantum gravity”, *Social Text*, no.46–7 (1996), 217–52. A useful website giving access to the original article and many of the responses to it can be found at <http://www.keele.ac.uk/depts/stt/stt/sokal.htm>.

targets sought to incorporate a veneer of scientific jargon in their writings betrayed an ignorance of science that deserved exposure. But when Sokal revealed that the article was the fabrication that no one had perceived it to be, reactions were mixed. Many scientists expressed delight at the vindication of the hostility that they had long felt towards what they saw as the insidious undermining of science by its critics. Among the targets of the hoax and those who found themselves uncomfortably close to them, there was a broad spectrum of response. Historians of a more traditional persuasion could easily dissociate themselves from the new departures that had brought the social sciences into their discipline; they had never condoned such departures in any case. For historians whose work had come to be informed by approaches drawn from the social sciences, however, the task was more difficult. There boundaries had to be more carefully drawn between the manifestly helpful insights developed in what Dominique Pestre has analysed as the 'new history of science'<sup>6</sup> and the more recondite and essentially unhistorical analyses in (to use the term very broadly) the postmodernist mould.

The science wars affair could be, and was, soon dismissed as a passing spat in which some had had their portentousness exposed for what it was and many others had suffered unfairly from a rather indiscriminately directed attack. But the affair laid bare deep and enduring divisions between the more defensive wing of the scientific community and the very different non-scientific community intent on subjecting science to the scrutiny appropriate to any social phenomenon. Those divisions are still with us, and they are profoundly damaging in a world in which the public's understanding of science must surely rest upon questioning and not just the assimilation of scientific information. In that assertion there lies a challenge to us as practising historians. The challenge is simply put. How can we contribute not just to the diffusion of scientific knowledge but also to the fostering of a public engagement in debate about the great issues that science (and here of course I include technology and medicine) presents in our world?

To meet the challenge, we have to find a middle way while remaining true both to traditional scholarship and to those methodological new departures that have made our discipline a pace-maker for colleagues across the board of historical scholarship and writing over the last thirty years or so. The social and cultural trends in historiography are here to stay, at least for some time to come, and I see it as our task to show our colleagues in the sciences that such trends are rich in insights. If we show science to be a social process as well as an other-worldly intellectual one, then so be it. Let us say so loud and clear. Let us not be afraid to say that if we are seen as undermining the dignity of science, the fault may well lie in a false perception of what constitutes that dignity. For this point to be convincing, we need to demonstrate our credentials as commentators and critics, neither systematically hostile to science nor sycophantic in our admiration of it. There are dangers on both sides. But above all, as I should argue, we must keep our distance. We must be alert to the danger of our being dragged into a form of PUS that is far closer to the public justification of science than to the spread of understanding. After all, there is something that we are good at doing, namely thinking about science. And that is something for which modern scientific education offers next to no preparation.

From our historical work there spring many crucial lessons that are too little understood in the non-scientific culture that surrounds us. We can demonstrate the provisional nature of much scientific theorizing; we can show how false starts and blind alleys far outnumber successful discoveries and applications; we can show the extent to which ambition and chance enter into the strategies that scientists adopt in their work; and we can drive home the message that in the modern world science can only suffer from being presented as an activity beyond normal comprehension, soaring above the lives of ordinary people. In this, each of us can play only a small part, but collectively we can make a difference. Those of us working in museums can strive to convey subtler images of the great man or woman of scientific or inventive genius. And in our writings, we can demonstrate the power of persuasion, rhetoric, and accident in the complex processes that lead to consensus, whether in scientific debate or in the technologies that provide the parameters of our every-day lives. The casualties of such an engagement will be simplistic views of 'heroic' invention and perceptions of science as a straightforwardly cumulative process in which the truths of nature are gradually uncovered by the application of observation and clear reasoning. But those can hardly be deemed casualties when set beside the benefits of a richer under-

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<sup>6</sup> Dominique Pestre, "Pour une histoire sociale et culturelle des sciences: nouvelles définitions, nouveaux objets, nouvelles pratiques", *Annales: Histoire, sciences sociales*, 50e année (1995), p. 487–522.

standing of science. It is on that richer understanding that we might hope to build a context for dialogue between scientists and the lay public, rather than the monologue from on high that has all too often characterized the PUS movement.