

5. POSTMODERN SCIENCE: THE DECLINE OR LIBERATION OF SCIENCE?

1. INTRODUCTION

I sometimes think that the appeal of postmodernism to many people, myself included, is that it relieves us of the effort of trying to make sense of a world that no longer seems to make sense. This would have profound implications for science, which is, after all, about making sense of the world.

It is not that simple, of course. But postmodernity does pose interesting and important challenges for science – and for science communication and the public understanding of science. Science communication is, and must be, about much more than ‘selling’ science to the public. Fundamentally, it concerns the relationship between science and society, and it has a powerful role in shaping this relationship and also in what science is done and how it is used, not just economically, but culturally too. This means science communication is also closely associated with science policy issues.

In this chapter, I want to look broadly at several different – but, I think, related – aspects of how science could influence and be influenced by cultural developments, especially in modern Western societies. In particular, I want to look at the possible impact on science of the cultural changes associated with postmodernity, the relationship between science and material progress, and, finally, the potential for a reconciliation between scientific and spiritual world views. All have far-reaching implications for humanity. And depending on how these matters are played out, we could see, in the 21st century, either the decline or liberation of science.

2. POSTMODERNITY AND SCIENCE

Postmodernity (or late modernity, as some scholars prefer to call it) describes a world coming to terms with its limitations, including the recognition that the ‘modern’ dream of creating a perfect social order is ending, and that some of our problems may be insoluble. Postmodernity is marked by ambivalence, ambiguity, relativism, pluralism, fragmentation, contingency and paradox. There are no grand narratives or creeds that define who we are and what we believe, but a multiplicity of them.

Science and technology are among the key instruments of the modernist vision. As Anthony Elliott (1996) states:

Science, bureaucracy and technological expertise serve in the modern era as an orientating framework for the cultural ordering of meaning. (pp. 18 - 19).

This changes in a postmodern world. Elliott argues that the vision of the Enlightenment has faded.

The grand narratives that unified and structured Western science and philosophy... no longer appear convincing or even plausible

From a postmodern perspective, he says,

knowledge is constructed, not discovered; it is contextual, not foundational.

Elliott (1996) argues that knowledge generated by experts and institutions is no longer equated with increasing mastery and control of the social order. In fact, he says, the advance of modernisation is increasingly equated with the production of risks, hazards and insecurities on an unprecedented global scale.

Put more accurately, technological knowledge and control of the social world today are as much about managing socially produced risks and dangers which are worldwide in their consequences as about unbounded mastery in the service of political domination. (pp. 66-70)

The profound paradox of our situation is well described by Marshall Berman (cited by Elliott, 1996), who said:

To be modern is to find ourselves in an environment that promises us adventure, power, joy, growth, transformation of ourselves and the world - and, at the same time, that threatens to destroy everything we have, everything we know, everything we are. (p. 11)

So we can see that there are two aspects to the postmodernist critique of science: epistemic relativism; and science as a two-edged sword.

Scientists are most hostile to the first charge - that scientific knowledge is culturally adulterated. I do not entirely agree with this assertion. Scientific knowledge does transcend its cultural context; science does 'advance' in a way that is, I think, unique. But scientific knowledge is never the whole truth or an absolute, immutable truth. And what science is done, and how its results are applied, are powerfully determined by its cultural context.

So, given that we choose into which corner of the dark cavern of the unknown we shine the light of scientific inquiry, and given that we will never light up everything, then we do need to acknowledge the degree to which what we see depends on what influences our choice of where to look and what to look for - that is, on who we are and what we believe. This degree of cultural construction depends on the science: smaller in the case of the physical sciences, larger in the social; lesser in pure science than in applied.

The second charge against science - that it is a mixed blessing - is uncontestable, and doesn't need elaboration. This applies to specific products of science (technologies) such as nuclear energy, pesticides or genetic modification, or more broadly to the whole relationship between science and material progress - a subject to which I will return later.

There is a second factor which could compound the effect of postmodern thinking on science: the possibility that science may have to confront its own intrinsic limitations.

John Horgan (1996) has argued that we must accept the possibility that the great era of scientific discovery is already over. He is not referring to applied science, which still has an abundance of problems to solve, but what he calls 'science at its purest and grandest, the primordial human quest to understand the universe and our place in it'. Horgan develops an idea propounded by Gunther Stent in *The Coming of the Golden Age: A View of the End of Progress*, published thirty years ago. Stent argued that if there are any limits to science, any barriers to further progress, then science may well be moving at unprecedented speed just before it crashes into them. When science seems most muscular, triumphant, potent, that may be when it is nearest death, Stent said.

Indeed, the dizzy rate at which progress is now proceeding makes it seem very likely that progress must come to a stop soon, perhaps in our lifetime, perhaps in a generation or two.

Horgan implies three different reasons for this view. One reason is that all the major discoveries—or should we call them 'constructions'?—may have been already made:

Now that science has given us its Darwin, its Einstein, its Watson and Crick, the prospect arises that further research will yield no more great revelations or revolutions but only incremental, diminishing returns.

(He discusses, but dismisses, the claim that scientists thought this about physics last century.) Another reason is that even seemingly open-ended sciences like physics inevitably confront physical, financial and even cognitive limits: modern physics, for example, is becoming increasingly difficult for anyone, even physicists, to comprehend. A third factor is the intrinsically indeterministic nature of many natural phenomena - that is, they are unpredictable and apparently random-making them resistant to scientific analysis. The work emerging from chaos and complexity theories demonstrates that science, when pushed too far, culminates in incoherence.

I am not necessarily endorsing Horgan's arguments, only suggesting they deserve consideration in looking at the future of science.

3. POSTMODERN SCIENCE

So science is being assailed by two forces: the first, postmodernism and its challenge to science's social and intellectual authority; the second, science's own 'limits to growth'. What will be the consequences?

While technological innovation will continue apace, science will cease to be the defining and dominant feature of our society. It will co-exist, often uncomfortably, with irrationalism, superstition and other belief and knowledge systems. In losing its ideological dominance as the source of progress, science is losing its own internal coherence, and the philosophy and culture that have held it together. While good

science will remain rigorous and empirical, this will be more a question of professional ethics and sheer pragmatism - this science delivers the best results - than the sort of ideal represented by sociologist Robert Merton's four norms of science: universalism, communism, disinterestedness and organised scepticism.

Like everything else, science is fragmenting. Much more openly and unequivocally than in the past, science today serves different masters and different purposes. Its culture and norms become those of its users. Thus, it is increasingly meaningless to talk about a single form of scientific progress, or about attitudes to science in any generic sense. Public opinion about science depends on which public and which science. The epigraph on the United States National Academy of Sciences building in Washington—

To science, pilot of industry, conqueror of disease, multiplier of harvest, explorer of the universe, revealer of nature's laws, eternal guide to truth

will, with its implied congruence and attainability of all these goals, its unified vision of progress, become a quaint anachronism in the postmodern world.

This is already apparent from surveys of how people perceive science and technology. They are ambivalent and contradictory in their views - and also discerning. Take, for example, a study I initiated several years ago, under the auspices of the Australian Science, Technology and Engineering Council, which explored young people's hopes and fears for Australia in the year 2010: a key finding was the extent to which views on science and technology were embedded in a wider social context (Eckersley, 1999). The role young people saw for science and technology changed markedly between their expected and preferred futures.

Young people are not so much *against* science and technology. Indeed, they acknowledge their importance in achieving a preferred future. But they are astute enough to realise science and technology are tools, and their impacts depend on who controls them and whose interests they serve. They *expected* to see new technologies used further to entrench and concentrate wealth, power and privilege. They *wanted* to see new technologies used to help create closer-knit communities of people living a sustainable lifestyle.

For example, young Australians (aged 15-24) were asked in one poll question to agree or disagree with nine specific statements about science and technology. The responses showed that:

Young people believed science and technology offered the best hope for meeting the challenges ahead (69%), but also that they were alienating and isolating people from each other and nature (53%).

They believed that computers and robots were taking over jobs and increasing unemployment (58%), and a significant minority believed that they would eventually take over the world (35%).

They were more likely to think that governments would use new technologies to watch and regulate people more (78%) than they were that new technologies would strengthen democracy and empower people (43%).

They expected science to conquer new diseases (87%), but not that it would find ways to feed the growing world population (39%), or solve environmental problems without the need to change lifestyles (45%).

In another question, young people were asked to nominate which of two positive scenarios for Australia in 2010 came closer to the type of society they both expected and preferred:

A fast-paced, internationally competitive society, with the emphasis on the individual, wealth generation and 'enjoying the good life'. Power has shifted to international organisations and business corporations. Technologically advanced, with the focus on economic growth and efficiency and the development of new consumer products.

A 'greener', more stable society, where the emphasis is on cooperation, community and family, more equal distribution of wealth and greater economic self-sufficiency. An international outlook, but strong national and local orientation and control. Technologically advanced, with the focus on building communities living in harmony with the environment, including greater use of alternative and renewable resources.

Almost two thirds (63%) said they expected the first, 'growth' scenario. However eight in ten (81%) said they would prefer the second, 'green' scenario. About a third (35%) expected the 'green' scenario, and 16% preferred the 'growth' scenario.

One possible consequence of postmodernity is that science will become a greatly diminished cultural influence in our lives and in national affairs (even while we continue to embrace its products). For example, Horgan (1996) sees the limitations of science contributing to a growing reluctance by the public to support science, and even to the rise of anti-scientific sentiments. He notes that Oswald Spengler foresaw the disillusionment with science in *The Decline of the West*, published in 1918: Spengler predicted that the demise of science and the resurgence of irrationality would begin at the end of the millennium. As scientists became more arrogant and less tolerant of other belief systems, notably religions, he believed society would rebel against science and embrace religious fundamentalism and other irrational systems of belief.

There are signs that this might be happening, although public sentiment has not so much swung against science and technology as shifted towards superstition and fundamentalism. For example, Americans view science and technology as the engines of the past century's economic prosperity and the main reasons for the improvements in their well-being, and are optimistic about further gains in the next century. Yet they also express misgivings about the way their country has changed culturally and spiritually (Pew, 1999). Asked in a recent poll what was more important, encouraging a belief in God or encouraging a modern scientific outlook: 78% of Americans chose 'a belief in God', and only 15% 'a modern scientific outlook' (Washington Post/Kaiser/Harvard, 1998). Over a third (36%) believe the Bible is the actual word of God, to be taken literally word for word, while almost half (48%) believe it is the inspired word of God, but not everything in it should be taken literally. Only 14% regarded the Bible as an ancient book of fables, legends, history and moral precepts recorded by man.

But there are also other possibilities. In the early 1990s, I wrote in essays for the Australian Commission for the Future and *The Futurist* that science could play a crucial role in achieving the sort of cultural or values shift necessary to address 21st

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