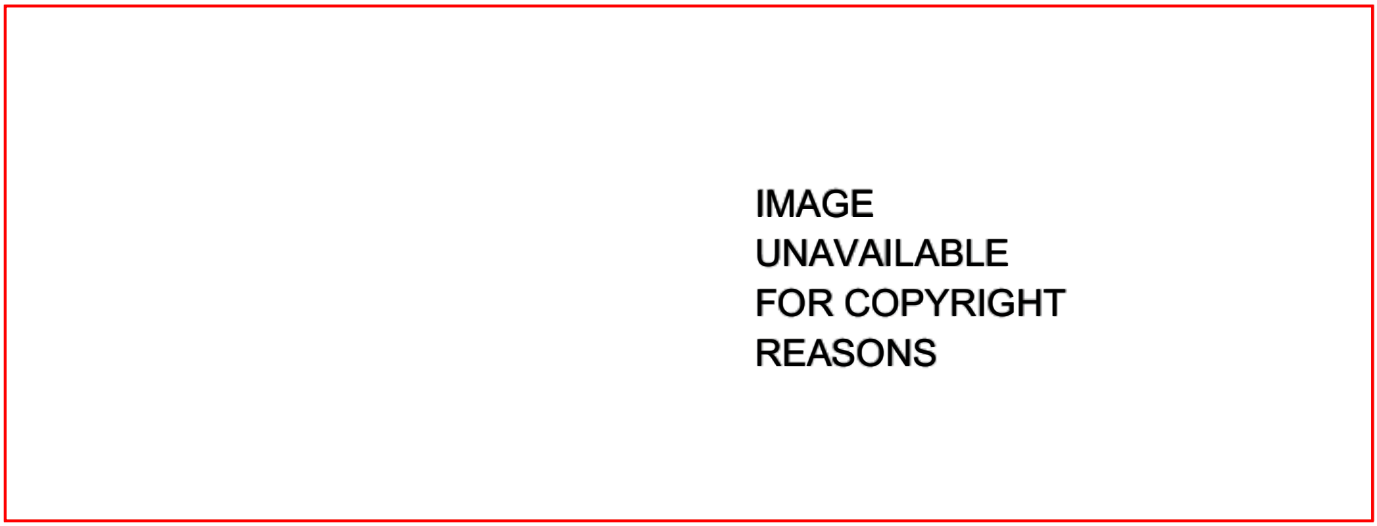
BOOKS & ARTS



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Fear of the future

Will scientific innovation bring progress and benefits, or just risks and dangers?

Unersättliche Neugier: Innovation in einer fragilen Zukunft. [Insatiable Curiosity: Innovation in a Fragile Future]
Helga Nowotny
Kulturverlag Kadmos Berlin: 2005. 203 pp. €19.90

Hubert S. Markl

Helga Nowotny is not only *la grande dame* of science studies in Europe, she is also one of the most savvy and influential people in European research affairs. She chairs the European Research Advisory Board and is a board member of the nascent European Research Council. Reason enough, then, to turn to this book with high hopes (or even, to borrow from the title, "insatiable curiosity") for her deliberations on science, technology, innovation and the human future.

I must admit though that this half-popular, half-scholarly essay made rather uncomfortable reading for a dyed-in-the-wool natural scientist like me, who finds himself the guinea pig of science sociology studies. A psychoanalyst might say that such resistance is the first sign of trouble with our scientific–rational world-view. Or, as German chemist Justus von Liebig once remarked: "I seldom have a good idea, but if someone else comes up with one, I immediately have a better one!" However, it is useful to see how a highly knowledgeable sociologist of science looks at our science through the lens of her discipline. I assume Nowotny had precisely this in mind: to incite readers from any persuasion to argue emphatically about the issues she raises in this book.

What are these issues? The subtitle says this is a book about innovation and its decisive role for our unpredictable future (I wonder what is meant by "fragile" future — has it ever seemed anything else?). Nowotny tells us a great deal about the sources of scientific and technological innovation and its increasing influence on economic competitiveness in a globally accessible world. Solving problems and serving desires, and thus creating new problems to be solved, with respect to energy supplies and world climate, resource depletion and waste accumulation, water and food availability, pandemics, the flood of global media and rising social unrest. All this is argued persuasively, although not always in a novel way, and there is a sense of anxious urgency, like that of a rodeo rider clinging to the back of a bucking bronco.

The book contains some interesting historical vignettes and clear-sighted comparisons between biological and cultural innovations. They strongly emphasize symbol technologies, although strangely the book neglects the human achievements that drove the most innovation: tool-making and language. In fact the whole exercise seems somewhat mistitled: the book seems profoundly ambivalent to innovation. Of course, like other texts from the sociology of science, it is not so much a book on science as on writing on writing on science, far enough removed from the research enterprise to take the sometimes rather supercilious attitude occasionally found in research on research.

Above all, the book never fails to chastise the "hubris of believing in progress" — that deeply flawed illusion of the past centuries — while passing over the doubling or tripling of life expectation, the abolition of regular mass starvation in many formerly stricken countries, the conquering of diseases such as smallpox and poliomyelitis in large parts of the world, the disappearance of many horrendous superstitions, and so on. These achievements are presumably not even worthy of notice, as all of this and much more is taken for granted. This is not progress, but entitlement, according to those critical of progress, although strangely enough these are not goods received from caring gods, but from that progress-blinded sci-tech civilization. The fence between pro- and anti-science, and pro- and anti-innovation, seems to be firmly straddled here — maybe not the most pleasant place from which to dwell on thorny issues. Is it not difficult to both have one's cake and discard it as garbage?

Nowotny makes the point that our future is wide open to risks and dangers of our own making, as we try to steer between 6 billion and 9 billion humans through the uncharted waters of their unknown destiny. She emphasizes correctly the increased volatility of too many of the foundations of our wheelings and dealings. But I wonder whether the future was any less unpredictable for those ancient women and men, scared by the vicissitudes of only too certain failed harvests, plagues or threats from fellow beings. Such scenarios cannot have been less menacing than those of our innovation-bound societies. Of course, if you include the religious promise of eternal life after death, life expectancy wasn't quite as bad back then, as historian

Arthur Imhof has remarked. But when humanists belittle the progress made in the past few centuries, I doubt that they would have us regress to such pre-Enlightenment conditions.

This book seems to emanate a feeling of suffering from modernity, while emphasizing that innovation will be the inevitable hallmark of modernity (or rather, postmodernity, as the dark alley ahead of modernity will always have to be called). As the Roman historian Titus Livius succinctly put it more than 2,000 years ago, "*Nec vitia nostra nec remedia pati possumus*" ("We can endure neither our vices nor their remedies"), which shows that this ambivalence is not so recent.

There are a few minor points to be raised. First, it seems regrettable that this essay from a leading European science-policy figure has not been published in English. Maybe this is because the mixture of socio-scholarly, doubt-ridden, intellectual *Zeitgeist* and *Menschenbild* worries is only too German? It is to be hoped, however, that this is not the *Menschenbild* exemplified by the art of Patricia Piccinini on the cover of this book, which depicts a young family of pig-like humans or humanized pigs! If there is to be an English edition, hopefully minor errors, such as the claim that prokaryotes evolved from eukaryotes (it was the other way round), or the figures for derivative financial markets, which mix up US trillions and the German *Trillionen*, can be corrected.

Such minor quibbles aside, this is a very readable book. It is thought provoking, but also incited me to disagree with some of its doom-laden messages. Insatiable curiosity? Let's hope so, under the challenging demands of unending necessity. ■

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A climate for social change

The Weather in the Imagination
by Lucian Boia
Reaktion: 2005. 224 pp. £14.95

Julian Hunt

It's probably only fair that *Nature* should publicize the views of a historian about meteorology, because in the past it has published influential letters by meteorologists on history. Lewis Fry Richardson demonstrated that differential equations and statistical laws that can successfully model weather systems should also be able to model humans' behaviour and maybe even psychology, from their proclivity for conflict to their appreciation of jazz. This approach not only explains quantitatively how wars did or did not develop, but in 1935 and 1951 predicted future developments (see *Nature* 411, 737; 2001).

Lucian Boia, a historian at the University of Bucharest in Romania, has written a stimulating book, *The Weather in the Imagination*, reviewing the literature on theories of how climate has affected societies, and of how humans may have influenced climate. He concludes with a personal, if not entirely accurate, account of the science of human-induced climate change, and debates the current policy options. He reveals his methodological bias, however, when he implies that Newton's work on predicting the movement of planets is a rather simple matter compared with studying the complexity of history. (Richardson, in contrast, had noted that, like the natural world, societies can in some respects have simple mathematical descriptions, for example in the way that armaments can grow exponentially before a war, and that the frequency of conflicts tends to follow a Poisson distribution.)

The big historical question in this book — the extent to which national characteristics are determined by the weather and climate — has been addressed in fascinatingly different ways by Hippocrates, historian Edward Gibbon, French philosopher Montesquieu, the Arab historian Ibn Khaldun, and more recently by Hubert Lamb and Emmanuel Le Roy Ladurie. Much of the evidence is anecdotal and rather surprising. The Greeks thought that the cold weather made the British not only aggressive but sexually promiscuous — obviously the directors of recent reality TV shows could have saved themselves a lot of money by staying in Britain, if only they had read their Hippocrates. Gibbon extended this climate hypothesis by arguing that people from northern Europe had also been influenced by the way they modified their climate through deforestation and agriculture. Some writers included real weather observations: the Venerable Bede in the eighth century included in his chronicle a now well known statistical forecast: "Red sky at night is a shepherd's delight." Montesquieu, in contrast, studied the taste buds of sheep's tongues and their blood circulation at various temperatures, and concluded that northern people were bold and not very devious or sensitive compared with those from lower latitudes!

This kind of thinking and eccentric collection of data continued until the early twentieth century when geographers, historians and anthropologists pointed out that societies evolve as much through organization and religion, for example, as through climate.

Boia brings a topical dimension to his perspective when he emphasizes the relation between the way societies have dealt with climatic events and with natural disasters. In their reactions to the sudden loss of life and disruption associated with the latter, most societies have sought religious explanation. The Bible and other early writings focused on whirlwinds, fire, earthquakes, floods and droughts. They also revealed how various kinds of 'divine intervention' have helped or hindered the hazard, depending on the point of view: the Japanese, for example, are grateful for the 'kamikaze' typhoon that saved them from Genghis Khan. The ice age was the last globally significant climate change that humans endured. It was also a natural disaster of huge proportions as the ice retreated some 10,000 years ago. This shaped the landscape of Britain and was probably associated with floods in the Middle East, India and the north-western United States (where the mythical raven god carried people away on its wings).

This extreme form of climate change was feared by religious alarmists to be imminent at the start of the sixteenth century. This led the president of the Toulouse parliament in France to use the famous woodworking skills of the region to build another ark. According to the Michelin guide, these skills later led to the Lagardère media company and Airbus.

In the concluding chapter on climate change, Boia sides with Bjørn Lomborg in suggesting that a 2 °C change in global temperature is

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More sex please, we're British: did the climate, painted here by Constable, make people promiscuous?