

Editorial

In this, our third issue with Pluto Journals, we have two papers that express reservations about the value of mode 2 and the triple helix. Mode 2 built on an imaginary academe in which academics were independent entities whose love of knowledge made them and their learning valuable to society. Mode 1 never did exist, of course, but the theory helped support the new mode 2, devised by the likes of Michael Gibbons, Helga Nowotny and Peter Scott in the 1990s (e.g., Gibbons *et al.*, 1994; Gibbons, 2000). Their concept described the strengthening relationship between the production of knowledge in universities and its use in the world beyond. If mode 1 depicted science speaking to society, mode 2 saw society answering back and providing a context for the knowledge production of scientists. It all seemed clear enough at the time, but questions had been begged. If university knowledge were expected to be useful mainly outside the university, then was using this knowledge within the university less useful, perhaps even useless? Could – should – mode 1 and mode 2 coexist? If so, would not the very acceptance of mode 2 drain resources from the intellectual dilettantes of mode 1 to academics able and willing to create real value in the real world?

The triple helix concept, formulated slightly later, is not unrelated to mode 2. Its champions, especially Henry Etzkowitz and Loet Leydesdorff, (e.g., Etzkowitz and Leydesdorff, 1998, 2000), saw universities in partnership with industry and government. Teaching and research were no longer their sole roles, or even their primary function. Enter the entrepreneurial university, spinning off high technology companies into business incubators and science parks, valuing patents as much as published papers. Enter the university manager to co-ordinate with manager peers in industry and government, and to control academic performance with metrics. Enter the business school to teach the language and ethics of business and to apply them to whatever could be measured – or counted.

Mode 2 and the triple helix have been the stuff of much academic writing over the last two decades, at first happily utilizing the concepts, but soon finding problems with them (see, e.g., Tuunainen, 2002). *Prometheus* joined in some of this discussion. Michael Gibbons himself put together a special issue of *Prometheus* in 2011 looking back at the formulation and development of the mode 2 concept (*Prometheus*, 29, 4). A special issue on the triple helix, featuring both Henry Etzkowitz and Loet Leydesdorff, appeared in 2014 (*Prometheus*, 32, 4). But the environment, and especially the academic environment, was changing rapidly and neither model had an obvious place in these new circumstances. A *Prometheus* debate of 2017, led by Ben Martin, questioned the function of corporate universities that produced knowledge only to sell to customers in teaching and research, and of self-serving academics who had little interest in any knowledge production that did not register in personal performance indicators (*Prometheus*, 34, 1).

David Foord and Peter Kyberd do not dismiss mode 2 entirely in their study of the i-limb, the world's first commercial prosthetic hand with separately powered fingers. But the knowledge required for this innovation came not from a university laboratory to be rendered useful in industry. Foord and Kyberd find the relevant knowledge to have been created in a hospital prosthetic clinic, what they call a 'location of use'. It was there that the required scientific research and technology development had been gathered and embedded. This embeddedness rather than any flow of information from university was what made the innovation possible.

David Emanuel Andersson and Åke E Andersson are less equivocal. The title of their paper, 'The impossibility of the triple helix', is hardly nuanced. The Anderssons declare that the model has little of value to say about the relationship of university, industry and government. But the authors go further: it never did have much to say. The model had been exploited to justify all manner of mode 2 activities in terms of regional and national economic growth. Thousands of science parks

on thousands of campuses testify to the uncritical acceptance of the notion that knowledge is created in the university and flows out onto the science park next door. The consequences of this misguided assumption are more serious than the disappointing performance of most science parks. The triple helix allows government interference in knowledge production, exposing scientists to the whims of politicians and threatening freedom of expression. Governments almost everywhere justify their response to the current covid-19 crisis in terms of ‘following the science’, but scientists have been quick to appreciate what their political masters want to hear (Horton, 2020). Neither mode 2 nor the triple helix was ever intended to cope with opportunism and cynicism in higher education.

David Holford’s paper looks more forbidding than it actually is. The subject is artificial intelligence (AI) and particularly the tendency of AI to reinforce the requirements of established systems. Flexible and able to accommodate rapidly changing requirements AI is not. AI tends to confirm and entrench, repressing the human ability to adapt and improvise, known as *mètis*, which organizations require to deal successfully with dynamic ambiguities in the form of unexpected emergencies. Holford gives the example of the Airbus A320 which crashed in the Hudson River in 2009. The pilot, one Chesley Sullenberger, was lightning quick to realize that the plane had become the enemy and had to be overcome. All survived. Pilots have been much less successful in defeating the AI systems of the Boeing 737 Max, there have been many fatalities and the plane has been withdrawn from service. Since then, Sullenberger has become an outspoken advocate for teaching pilots how to fly rather than just to monitor systems.

There follows our book review section, opened by Giles Birchley’s review essay of the new book edited by Jonathan Ives, Michael Dunn and Alan Cribb, *Empirical Bioethics: Thinking about Doing*. Bioethics uses philosophical methods to discuss what is good (and ethical and moral) and what is bad in the life sciences: empirical bioethics considers the ways the empirical methods of the social sciences can join in bioethical inquiry. Never a dull moment in our book review section.

References

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