

## 'Regular science' is inherently political

With allusions to Nietzsche, violent anti-GM organisms groups, nefarious 'parallel scientists' and numerous other actors and actions, Marcel Kuntz manufactures a bizarre alchemy to cast postmodernism as an 'assault' on science [1]. Whilst one can dispute his use of the 'postmodern' label itself and the idea that tolerance of ambiguity and diversity of opinion is a twentieth century phenomenon, we discuss here why Kuntz mischaracterizes his home base of science as a purely technical and objective enterprise.

First, Kuntz frames 'regular science' as an apolitical, value-neutral enterprise that is immune to social and political forces. This belies decades of serious scholarship. The entire trajectory of scientific inquiry, from conception of a hypothesis to translational research and application, is subject to internal and external political determinants. By 'political', we refer to the entire constellation of situations in which 'what is apparent' differs distinctly from 'what is actually intended or at work'.

For instance, an analysis of scientific expertise about the risks and benefits of biotechnology applications in human genetics and in the agri-food domain in 17 subsystems in Europe and North America found that scientists are less likely to agree among themselves about the risks and benefits of biotechnology applications than other policy actors, and are motivated by strongly held beliefs and convictions [2].

Similarly, a look at the history of science in tobacco smoke and lung cancer risk, or global warming, firmly attests that science is a political act [3]. In the case of tobacco research, for example, the only significant factor associated with the conclusion that 'passive tobacco smoke exposure and lung cancer risk are not related' was whether an author was affiliated with the tobacco industry, after controlling for article quality, peer-review status, article topic and year of publication [3].

In our absent self-awareness of this decisive political component, we—scientists, policy-makers and the public—run the risk of naively trusting science and technology elites, who are clearly not aligned themselves in belief and conviction [2]. In short, there is no credible basis for assuming that scientists invariably consider the best interests of society when engaging in the scientific enterprise.

Second, Kuntz's attempt to hermetically seal 'regular science' from the political world and frame it as purely objective and unbiased undermines the field. Addressing politics is both intrinsically and instrumentally important. The dialectic of regular and parallel science only serves to stew an unchecked political agenda that undermines the scientific method by creating more uncertainty and less robust science. In trying to artificially 'box in' science and place it on a pedestal allegedly immune to politics, Kuntz risks creating intrinsic and instrumental fault lines and greater uncertainty.

Twenty-first century scientific enterprises should build new pillars to recognize the value of a reflexive 'check' on the gaps between 'what is apparent or stated' and 'what is actually intended or at work'—that is, politics. By grafting the political wing onto the social architecture of science and its public extensions, knowledge-based innovations will be better attuned to societal norms, contextually sensitive and thus, socially robust and sustainable [4]. There is ample evidence that extended peer review and knowledge co-production beyond the classic expert communities—for instance by engaging with end-users of scientific knowledge—can substantially benefit scientific design to ask the right questions that are relevant to patients and other users, and thus, help minimize research waste [5].

Finally, Kuntz's framing is one of scientism and technological determinism, evident in his portrayal of the social construction of scientific knowledge and technology as assaultive Luddite anarchy. It would be a mistake, however, to focus entirely on the military rhetoric or scientism invoked in the article. We thus conclude our analysis by 'turning the table around', with a broader call to be reflexive, to leave our own epistemic cultures, and to recognize the politics of science and technology as well as the politics entrenched in social science and the humanities.

We emphasize this last point because it would be naive to place card-carrying social scientists and moral philosophers above the fray and to think that they are apolitical and désintéressé. The myth of value-neutral or invariably reflexive social science and humanities inquiry is busted when one steps into a careerist social science laboratory or moral philosophy office securing non-reflexively the next self-serving notch

on the academic ladder, and thus, observes the more haphazard and messy realities of how politics is ever-present in human practices, be it natural science, social science or the humanities [4,6].

The real risk is not in politics, but in being ignorant of politics; by not permitting its 'unpacking', robust scientific inquiry is threatened.

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### CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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## Commentary to 'The postmodern assault on science' by Marcel Kuntz

As a scientist, one shares the worries of Marcel Kuntz [1] concerning the increasing relativism and anti-science opinions among the general public. Perhaps the most extreme manifestation of this trend is the resolute anti-science stand of the religious right in the USA that even imprints its mark on politics. This is illustrated by the tragi-comical House Bill 819 proposition in North Carolina that forbids evaluations based on global warming scenarios for coastal management purposes.