

The 'Scientific Context' in an 'Innovation Economy'
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Is Science Really Moving Faster Than Ever? This was the question Konstantin Kakaes (formerly on staff at *The Economist* and currently a Bernard L. Schwartz fellow at the New America Foundation) and Daniel Sarewitz (currently a Professor in the School of Life Sciences and School of Sustainability and Director of the Consortium for Science, Policy and Outcomes at Arizona State University) debated in early April 2012, in a series of exchanges that appeared on *Slate.com*

In the first entry, *It's impossible to tell*, Kakaes proposes that the truism that “the ‘pace of innovation’ is speeding up” is problematic because it’s impossible to come up with a meaningful metric for innovation and technological change, about which there is little useful quantitative data. He goes on to argue that curiosity and camaraderie are more fundamental to the successful production of scientific knowledge.

In his reply, *What Chairman Mao and a malaria drug can teach us about the societal benefits of science*, Sarewitz tries to draw a distinction between the idea that more scientific knowledge is being produced at a faster rate and the idea that this amounts to greater societal benefits. In short, he contends that determining a metric for the pace of scientific knowledge and innovation tells us nothing about whether such knowledge is beneficial. Greater attention needs to be paid to the institutional context of the “complex innovation ecosystem” instead, so that we can develop policies that contribute to “institutions and programs that link knowledge advance to societal needs.”

In the third entry, *How MBA-speak is hurting the scientific academy*, Kakaes responds that, though a better understanding of the innovation ecosystem is desirable, those tasked with understanding it tend to be policymakers “who’ve emerged from business schools and management consultancies convinced that Excel macros will let them give reality to the shadows on the walls of Plato’s cave.” He also suggests that their attempts tend to be misguided because poor knowledge translation is not a science problem; it’s a problem of political will. Focusing on the link between science and societal needs instead of the role of policy tends to lead to mere short-term optimization.

Sarewitz’s concluding entry, *Are scientists interested only in satisfying their own curiosity, or do they want real-world results?* counters that the traditionalist model defended by Kakaes doesn’t fully appreciate the scientific context. It’s implausible and counter-productive to separate off scientific creativity from real-world problem-solving, which are “both at their best when they can feed off of each other.” This is why the “knowledge translation” view, where society is responsible for translating scientific findings into beneficial policy, fails. He concludes by suggesting that the important question to ask – which no one has yet figured out how answer – is “what’s the rate of production of knowledge and innovation that can make crucial contributions to our well-being and future prospects?”

The key difference between the contributors' views is their answer to the question: what does or should motivate scientific inquiry - curiosity or social need? Or more generally, how is science practiced and how should it be practiced? Kakaes supports the "traditionalist" account, which entails funding basic science guided by curiosity, whereas Sarewitz suggests the distinction between basic and applied science is arbitrary anyway, and that the "innovation ecosystem" brings the two together in ways that show the former distinction to be harmful. Ironically, this difference leads both writers to the same conclusion – that what we should attend to is the scientific *context*. Where Kakaes recommends a context defined by curiosity-guided research and camaraderie between practitioners, Sarewitz includes more motives and actors. But the exchange between Kakaes and Sarewitz reveals a further question which neither address: how is the so-called context of science determined by the even broader context of what some have called the "innovation economy?"

Though the interlocutors both hint at this broader context (Kakaes in more critical terms than Sarewitz), neither explicitly identify the economic assumptions that form the backdrop of their exchange. In a "knowledge economy," it would be a mistake to think of knowledge production and/or translation independently of the political and economic assumptions and imperatives that prioritize innovation. An examination of the social benefits of scientific knowledge of the sort Kakaes and Sarewitz offer cannot ignore the broader economic trends and discursive framing of the issue. To invoke terms like "knowledge translation" or "innovation ecosystem" without recognizing the political and economic paradigm that brought us these terms and legitimizes them as ways to frame our knowledge enterprises would be wrong-headed. I don't imagine that either contributor is ignorant of these issues, but that they aren't addressed specifically in this exchange is surprising.

How does this relate to the original question posed to them – *is science really moving faster than ever?* Surprisingly, Sarewitz's conclusion – that we need to figure out how to meaningfully ask about and answer the question of what rate of knowledge production will lead to societal benefits – is the very question Kakaes rejects at the beginning, suggesting there is no way to quantify and therefore measure this usefully. So what have we learned from this exchange, if anything? The contributors have usefully pointed out that there is a connection between the context in which science occurs and the likely benefits to society, even though they disagree about what constitutes this context and how closely it is or should be linked with social needs. But the next question to be asked – one that the contributors overlook – is to what extent and in what ways should we allow political and economic assumptions and imperatives to determine our practices of knowing? Is drawing the boundaries of the scientific context the responsibility of the science community? And if not them, who?

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