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In praise of 'useless' endeavours

'Silicon Valley would never have boomed were it not for the fact that state funding enabled the development of the World Wide Web'

Gillian Tett



3 HOURS AGO by: **Gillian Tett**

Almost eight decades ago, the American educationalist Abraham Flexner published an essay entitled *The Usefulness of Useless Knowledge*. In it, he argued that the most powerful intellectual and technological breakthroughs usually emerged from research that initially appeared “useless”, without much relevance to real life.

As a result, it was vital, Flexner said, that these “useless” endeavours should be supported, even if they did not produce an immediate payback, because otherwise the next wave of innovation simply would not occur. “Curiosity, which may or may not eventuate in something useful, is probably the outstanding characteristic of modern thinking,” he declared. “It is not new. It goes back to Galileo, Bacon and Sir Isaac Newton, and it must be absolutely unhampered.”

It is a powerful point to ponder, particularly as Donald Trump’s new administration gets to work. When Flexner wrote those words in 1939, he knew that he was grappling

with an epoch-making period: not only had the US just experienced a long depression but Europe was on the brink of war.

All of this understandably made it hard to justify spending money on “frivolous” research. But Flexner was committed to the cause: in 1929, he persuaded a wealthy American family, the Bambergers, to use some of their largesse to fund the Institute for Advanced Study (IAS) at Princeton to support exactly this kind of “undirected” research.

And it paid off: brilliant Jewish scientists fleeing from Nazi Germany, such as Albert Einstein, congregated at the IAS to explore undirected ideas. And while some of these, such as Einstein’s own work developing his earlier theory of relativity, did not initially seem valuable, many eventually produced powerful applications (albeit after many decades).

“Without Einstein’s theory, our GPS tracking devices would be inaccurate by about seven miles,” writes Robbert Dijkgraaf, the current director of the IAS, in the foreword to a [newly released reprint \(https://www.ias.edu/about/usefulness-useless-knowledge\)](https://www.ias.edu/about/usefulness-useless-knowledge) of Flexner’s essay. Concepts such as quantum mechanics or superconductivity also seemed fairly useless at first — but yielded huge dividends at a later date.

This point might seem familiar. Most books about innovation today stress the importance of blue-sky thinking and serendipity — look, for example, at [Obliquity \(http://next.ft.com/content/dfa5f69a-27e0-11df-9598-00144feabdc0\)](http://next.ft.com/content/dfa5f69a-27e0-11df-9598-00144feabdc0) by my colleague John Kay. But the reason why the IAS is re-releasing Flexner’s essay now is that scientists such as Dijkgraaf fear this core principle is increasingly under threat.

That is partly because the Trump administration has released a [projected budget \(http://next.ft.com/content/1fd2d3ec-09a1-11e7-97d1-5e720a26771b\)](http://next.ft.com/content/1fd2d3ec-09a1-11e7-97d1-5e720a26771b) that threatens to slash funding for the arts, science and educational groups. But the squeeze — and concern — pre-dates Trump. Back in 1964, Dijkgraaf points out, the US Federal research and development budget was about 2.1 per cent of GDP. Last year it was around 0.8 per cent, half of which was earmarked for defence spending. Meanwhile the budget for the National Institutes of Health (NIH) has tumbled 25 per cent in the past decade.

Some rightwing voices might argue that this is no bad thing; many Republicans believe

that research is better funded by business or philanthropists than by government. But one striking fact about the past century is how much American innovation originated in NIH and federal projects; Silicon Valley would never have boomed were it not for the fact that state funding enabled the development of the World Wide Web, for example. Right now there is little evidence that business will plug the gap; on the contrary, business has accounted for just 6 per cent of US spending on basic research in recent years, partly because shareholder pressure makes it hard for businesses to spend money on research that does not produce a swift return.

Some scientists hope that private sector benefactors could get involved, as they did in Flexner's day. A few billionaires have indeed jumped in: look, for example, at how the Bill & Melinda Gates Foundation is supporting medical research. But benefactors often want to tie their money to specific research goals, directing studies into a particular problem or challenge (such as, say, developing a specific vaccine or clean energy). And universities tend to be increasingly wary of boundary-busting research — in today's academic world scientists are under pressure to specialise in rigid disciplines if they want to win grants and tenure.

Hence the reason Flexner's essay needs to be reread, not just by government officials and business leaders but by scientists and voters as well. Justifying seemingly "useless" research is never easy; in today's cash-strapped world it is doubly hard. Now, more than ever, civic-minded billionaires need to swim against the tide; and maybe even recruit some modern-day Einsteins to take this fight forward.

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