EDITORIAL

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The scientist citizen: time to become political

Shifting political landscapes in the United States and European Union have seeded uncertainty in the scientific community. Intellectual freedom, funding and scientist mobility must be protected to secure the future of biological research.

The outcome of the UK referendum on European Union (EU) membership and Donald Trump's ascent to power in the United States are posed to reshape science on both sides of the Atlantic. The shifting political balance has the potential to exacerbate the ever-present funding woes of scientists, and to limit the movement of researchers and exchange of ideas.

Although post-recession public expenditure on research and development has stagnated in the United States and Europe, it has been punctuated by programmes supporting research and innovation. For the United Kingdom this includes an estimated ~15% of the €80 billion Horizon 2020 EU programme. Despite the UK government's guarantee to underwrite existing EU research projects post-Brexit, it is unclear whether this will match EU funding levels in the long-term. The UK's place in such EU ventures is also uncertain — although non-EU countries may participate, relinquishing EU membership will require renegotiation of the UK's inclusion, which could be complicated by restricting free movement of people, as seen following Switzerland's tightening of immigration laws in 2014. Exploring opportunities for science collaboration outside the EU will also necessitate more clarity on the terms of EU withdrawal once Brexit is formally triggered. The process could prove lengthy and governments and policymakers on both sides must work closely with scientists to ensure that research within the broader context of Europe will be protected.

The situation in the United States is equally nebulous. Despite falling short of restoring "science in its rightful place" as promised in 2009, President Obama bowed out after Congress passed the 21st Century Cures Act, pledging US$4.8 billion to three initiatives driven by the NIH over the next 10 years. Sadly, science has not featured significantly in Trump rhetoric, beyond an alarming disregard of climate change science, and evasive statements about evolution by Vice-President Pence. Although retaining Francis Collins as NIH director signals some continuity for biological and biomedical research, it is uncertain how federal funding will fare under the new administration, and fears abound that ideology might drive changes in regulation and policy. A potentially vulnerable area is research involving human embryonic stem cells and fetal tissue, which the current Vice-President and Tom Price, the new Secretary of Health and Human Services, vocally oppose. That the new president has not clarified his views on science is worrying, also given his responsibility to respond to international health crises, such as the Ebola and Zika virus outbreaks of past years. The new administration should engage with scientists, heed their advice on matters of policy, and commit to uphold the free exchange of ideas and evidence-based scientific method without political or ideological influences.

The anti-immigration stance of the current UK and US governments is an additional cause of concern for scientists, who recognize that isolationism and closed borders are not conducive to scientific endeavour. Both countries have benefited immensely from scientific mobility and collaboration. According to UNESCO, the US and UK are among the top destinations for postdoctoral researchers and host 49.1% and 9.2%, respectively, of international science and engineering doctoral students, with 34.8% of US and 55.9% of UK scientific publications including foreign co-authors. In the United Kingdom, the Campaign for Science and Engineering reported that 26% of academic staff were non-UK nationals in 2014–2015, and a staggering 72% of UK academics have worked at institutions abroad between 1996 and 2012 according to the UK Department of Business, Innovation and Skills. Nevertheless, a key goal of Brexit is to disengage from the EU's principle of free movement and the Trump administration declared its commitment to increase immigration control with a controversial executive order prohibiting US entry to citizens of seven majority-Muslim countries, also affecting many scientists. Restricting scientist mobility will deprive the United States, EU and United Kingdom of vital additions to their innovation and cultural capital, and could jeopardize their leading positions in world research.

The restrictions that Brexit and the Trump presidency might impose on research have elicited strong opposition in the scientific community in the form of news pieces, petitions, demonstrations, and public letters signed by prominent scientists. According to a *Nature* poll, UK scientists overwhelmingly opposed Brexit prior to the referendum. After the vote, a joint statement by the UK national academies voiced concerns about the challenges Brexit poses for UK research. The Trump executive order on immigration also spurred opposition from major US scientific organizations including the ASCB, AACR, and AAAS. More striking have been the grassroots movements that gained widespread support through social media, including 'Scientists for EU' in the UK, and the 'March for Science', which is set for Earth day on 22 April in Washington DC, with sister marches around the world. At the time of writing, the Brexit bill is being debated in the UK Parliament, and the fate of the — suspended — Trump executive order will be decided by the US courts. Although it is too early to predict what the Trump presidency, Brexit or grassroots efforts will mean for research, the increased mobilization of scientists and the vigorous public debate reveal an urgency to be heard and to engage socially and politically.

In his work *Politics,* Aristotle stated that man is by nature a political animal. In ancient Greek this extends beyond the modern definition of 'engaging in politics' to mean 'of the *polis*', belonging to the city in the sense of community. For Aristotle, human beings can only reach their full potential and live well by actively participating in society. With global politics in flux there is a pressing need to ensure that evidence and reasoned argument rather than ideology and political partisanship guide decisions on science and policy. To safeguard the future of research the scientist citizen must advocate using our most reliable weapons: critical thinking, rational debate and evidence-based approaches. Science should not be influenced by politics, but scientists must be political animals.