RESEARCH VIRUS

ENVIRONMENTAL TRANSITION

ISABELLE ARPIN

SCIENTIFIC RESEARCH BOTHERED BY THE WICKED PROBLEMS OF THE ANTHROPOCENE

PUG

The **Environmental Transition** series
is part of the **Research Virus** collection

Series coordinator: Magali Talandier
Collection coordinator: Alain Faure
Publication manager: Sylvie Bigot
English translation: Harry Forster
Design: Catherine Revil

Produced in collaboration with the scientific council on the Green Capital and Transition chaired by Magali Talandier, as part of Grenoble European Green Capital for 2022 – Climate Air Energy Territorial Plan – Grenoble Alpes Métropole.

Published with the support of Banque des Territoires.

ISBN 978-2-7061-5438-6 *(e-book PDF)*
ISBN 978-2-7061-5439-3 *(e-book ePub)*

15, rue de l'Abbé-Vincent – F-38600 Fontaine
www.pug.fr

ENVIRONMENTAL TRANSITION
A SERIES IN THE **RESEARCH VIRUS** COLLECTION

With growing awareness of the climate emergency and its environmental challenges, scientists are speaking out!

Under the aegis of the scientific council on the Green Capital and Transition, this new series of e-books offers previously unpublished articles by researchers from many backgrounds: hard science, Earth science, engineering, and human and social sciences.

In relation to the agenda of the scientific council – made up of almost 40 scientists representing a full range of disciplines – these short texts aim to disseminate knowledge on issues raised by environmental transition and its impacts.

All the way through 2022 publications in this series have reflected ongoing debate as part of European Green Capital status awarded to the city of Grenoble by the European Commission. Every month has seen a new topic addressed, including climate, atmosphere, energy, mobility, food and urban life.

Scientists are passionate people too. Their papers reveal their learning, but also cast light on the controversies affecting their subject and the sensitive nature of their work in research, with its tentative progress, doubts, puzzles but also its hopes.

Have a stimulating read!

SCIENTIFIC RESEARCH BOTHERED BY THE WICKED PROBLEMS OF THE ANTHROPOCENE[1]

ISABELLE ARPIN, SOCIOLOGIST (UNIVERSITÉ GRENOBLE ALPES, INRAE)

In the late-1960s and early-1970s research scientists working on urban planning[2] began to distinguish a category of problems, such as poverty or criminality, which they characterized by the lack of a consensus on how to define or solve them, but also by the fact that though rooted in singular contexts they were nevertheless interconnected. It seemed essential to solve these problems, given their gravity and the scale of the stakes; but it was also extremely difficult, perhaps impossible, to do so because each attempt only made things worse, for example by creating fresh difficulties. The English-speaking authors who first raised the issue referred to them as 'wicked', which may be derived from the Old English *wicca*, meaning 'wizard' or indeed 'witch'.

Radical changes

As global movement of goods, people and data has gathered speed, more and more wicked problems have cropped up, particularly in healthcare and the environment. Instances that spring to mind are climate change, loss of biodiversity and the present health crisis. Some of these problems even count as 'super wicked', their immediacy compounding their previously cited characteristics. They represent part of the challenges posed by the Anthropocene. This term, which is still subject to debate, was hatched to qualify an epoch in which humankind has acquired the ability to exert a major influence on the planet and how it evolves.

---

1. This text draws in particular on debate arising from the ANR Collab[2] project (ANR-19-CE03-0002).

2. Rittel, H. W. J. & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*, 155-169.

In the face of these super-wicked problems, bodies such as the Intergovernmental Panel on Climate Change[3] and the International Platform on Biodiversity and Ecosystem Services[4] have made increasingly pressing appeals for swift, radical changes in our lifestyle: the way we produce and consume goods, travel and co-exist with other living organisms. We are seeing, too, an increasing number of calls for a change in the way scientific knowledge is produced[5]. Since the 19th century scientific research has mainly developed in a growing number of relatively self-contained disciplines, in universities and research institutes which are fairly cut-off from the rest of society. Furthermore this has all happened in a social climate that pays little attention to the natural world. This form of research seems increasingly ill suited to the characteristics of wicked problems. Various proposals co-exist for addressing these challenges by 'doing' research otherwise. They fall into three main groups.

Nature and society are indissociable

The first set of proposals, which we owe to the social and human, and natural sciences, highlight the need to stop separating nature and society, and instead to focus primarily on their interaction.

In the social and human sciences, this determination has given rise to a fresh definition of human societies, according to which non-humans are equally entitled to be treated as members of such societies[6]. To do so it is necessary to renew the concepts and techniques of inquiry in sociology, anthropology, geography, history, law and such, and establish 'environmental humanities'[7].

3. https://www.ipcc.ch/

4. https://ipbes.net/

5. Pahl-Wostl, C., Giupponi, C., Richards, K., Binder, C., de Sherbinin, A., Sprinz, D., […] Van Bers, C. (2013). Transition towards a new global change science: Requirements for methodologies, methods, data and knowledge. *Environmental Science & Policy*, *28*, 36-47.

6. See, for instance, Latour, B., Politiques de la Nature. Comment Faire Entrer les Sciences en Démocratie?, La Découverte, Paris, 1999 [Politics of Nature: How to Bring the Sciences into Democracy, Harvard University Press, Cambridge, MA, 2004].

7. Blanc, G., Demeulenaere, E. & Feuerhahn, W. (ed.), Humanités Environnementales. Enquêtes et Contre-enquêtes, Publications de la Sorbonne, Paris, 2017.

In the field of ecology proposals have highlighted the socio-ecosystem concept to emphasize the fact that natural and social systems cannot be dissociated: together they form complex adaptive systems[8].

Open production of learning

According to a second set of proposals researchers, on their own and all the more so if they work in only one discipline, cannot fully grasp wicked problems. To do so they must join forces with other scientists and other types of actor. The surge in trans- and inter-disciplinary research[9] – involving non-academic researchers and actors[10] – and participatory, citizen science[11], is part of this trend. Although scientific inquiry has always involved a wide variety of people, it is a new departure for non-academic actors to be explicitly expected to contribute to the production of knowledge, in particular by bodies funding research.

The literature that promotes this approach to research and provides readers with practical recommendations to this end also advocates and theorizes contributions of this sort[12]. Significant changes can be seen in the processes used to assess both research collectives and individuals, and their output. For example many publications have been launched to create space for participatory, trans- and inter-disciplinary research, as well as work on interaction between societies and nature. The scale and scope of collaboration between researchers and artists has increased too, the better to come to grips with wicked problems.

8. Preiser, R., Biggs, R., de Vos, A. & Folke, C. (2018). Social-ecological systems as complex adaptive systems: organizing principles for advancing research methods and approaches. *Ecology and Society*, *23*(4).

9. Frodeman, R., Thompson Klein J. & Mitcham C. (ed.), The Oxford Handbook of Interdisciplinarity, Oxford University Press, Oxford, 2010.

10. Hirsch-Hadorn, G., Hoffmann-Riem, H., Biber-Klemm, S., Grössenbacher-Mansuy, W., Joye, D., Pohl, C., Wiesmann, U. & Zemp, E. (ed.), Handbook of Transdisciplinary Research, Springer, Netherlands, 2008.

11. Hecker, S., Haklay, M., Bowser, A., Makuch, Z., Vogel, J. & Bonn, A. (ed.), Citizen Science: Innovation in Open Science, Society and Policy, UCL Press, London, 2018.

12. Witness the three works cited above.

Further controversies

Finally, the third batch of proposals seeks to limit the extent to which the practice of research itself contributes to the wicked problems of the Anthropocene. A growing number of scientists have realised that their work – which entails travel to attend international meetings or do field work, massive use of the internet, and the production, dissemination and storage of large amounts of data, among others – actually plays a part in exacerbating the problems it sets out to address. So, individually and collectively, they are trying to find ways of working that take better care of nature and people, witness the Labos 1point5 initiative[13].

Ultimately there have been a host of conceptual proposals and practical experiments with a view to carrying out research to address specifically Anthropocene wicked problems. They have prompted lively debate, for such approaches upset the advocates of the most conventional forms of scientific inquiry. The latter uphold the merits and necessity of continuing academic and disciplinary research, including with regard to wicked problems. They also highlight the risk that research may lose its independence, due to the growing importance of collaboration with a broad range of actors. In some cases they even dispute the quality of data produced in this way and/or the relevance of conceptual proposals.

There is of course no end of debate between the supporters of new proposals, which may be mutually constructive, but also counter-productive. For instance, some authors[14] hold that treating non-humans as members of human society is an obstacle to identifying those responsible for the climate crisis and overthrowing an economy based on exploiting fossil fuels. As such it is a dead-end rather than a theoretical step forward.

The marginal nature of alternative research

So what proportion of scientific inquiry is concerned by these 'alternative' approaches? Without claiming to answer this question precisely, it is fair to say that most of the scientific output of universities and research centres is currently

13. https://labos1point5.org/

14. Malm, A., The Progress of This Storm. Nature and Society in a Warming World, Verso, London, 2018.

the fruit of conventional academic and disciplinary research. Similarly it seems likely that a concern with caring for climate or biodiversity has little impact on the everyday practice of research. So the relatively marginal nature of alternative research may raise doubts about its function. To what extent does it count as one of the activities through which society's relationship to nature re-invents itself? Or is it just an alibi that enables academia to carry on with conventional research? In either case such alternative research does have the merit of triggering debate that shows there is no single answer to the questions raised by the wicked problems of our times.

Personally I am doing sociological research on wildlife, conservation areas and more broadly policy on biodiversity. I have long been convinced that humans are unable to make human society on their own, and I think it is vital now to emphasize the radical otherness of nature and the uneven distribution of human responsibilities and vulnerabilities, from the local up to the global scale. I am equally convinced of the merits of working with our counterparts in life and Earth sciences, as well as some players in biodiversity management and conservation. Lastly I believe that we must make allowance, in the way we work, for the gravity and urgency of the environmental crisis. But it is clear too that individual responses will not be enough: in the field of scientific research too, we need policies that measure up to the wicked problems of the Anthropocene.

Discover more contributions in the RESEARCH VIRUS collection.