

ALAN IRWIN, CITIZEN SCIENCE

London: Routledge, 1995

By Hannah Mowat

Upon this gifted age, in its dark hour,
 Rains from the sky a meteoric shower
 Of facts . . . they lie unquestioned, uncombined.
 Wisdom enough to leech us of our ill
 Is daily spun; but there exists no loom
 To weave it into fabric; undefiled
 Proceeds pure Science, and has her say

...

Edna St. Vincent Millay, *Huntsman, what Quarry?* (1927-1938)

‘When 100,000 people flood the streets with messages of peace and sustainability and still all we get is promises of geo-engineering, nuclear power, carbon sinks, mega dams and carbon-trading, what can we now do?’¹ As one follows the climate negotiations, year after year, one cannot help but feel frustrated, and wonder how we got to this impasse between policy-makers – who are advocating techno-fixes to engineer our way out of the problem, and citizens – who are pushing for democratic, sustainable, people-oriented solutions. To illustrate this, I present two dichotomous initiatives to the climate change crisis: on one hand, the Cochabamba People’s agreement, calling for a ‘global referendum or popular consultation on climate change in which all are consulted’ and the Copenhagen Accord on the other where a handful of world leaders – technocrats – tried to take the planet’s future into their own hands.

Alan Irwin, currently Dean of Research at the Copenhagen Business School, is a professor of science and technology studies and has written extensively on the relationship between scientists and the public. In *Citizen Science*, he proposes innovative ways in which citizens and scientists can come together in productive relationships to tackle environmental problems, but only if the public understanding of science is matched by science’s understanding of the public. More than fifteen years after the release of *Citizen Science*, it would seem that not much has changed: citizens and scientists are still locked into the usual ‘sterile dichotomy’ of ‘science vs. anti science’ (Irwin 1995: x, 33). So why am I proposing to revisit it?

Two years following the release of *Citizen Science*, consensus on global warming was met and a global agreement on climate change was signed. Following Irwin’s argument, environmental problems are a common ground where citizens and Science can meet, forming a collaborative relationship ‘within the terms of citizens themselves rather than being state-led activities’ lest ‘inter-governmental discourse becomes a constraint on local initiative rather than a stimulus’ (Ibid: 178). This was not, however, the case. The International Panel on Climate Change, a global knowledge-making institution sought scientific facts, and the UN sought a global consensus, which it achieved with the Kyoto Protocol. From this globalised knowledge came centralised solutions, such as those cited above; citizens were hence obsolete. Scientific problems demanded scientific solutions, which citizens seemingly knew nothing about. But the implication was that they ‘need not worry,’ as the ‘situation was under control’. It is precisely this rationale that the author rejects in *Citizen Science*. Over a decade

1 Comments from a climate activist in a plenary discussing tactics for mobilisation during Cancún, at the European Climate Justice Assembly, 26th-29th November 2010. For more information see <http://climateassembly.wordpress.com/>

since the Kyoto Protocol, global emissions have risen steadily, the negotiation of a second commitment period seems unachievable, and a few dubious emails from a certain university in Britain have meant a renewal of climate denialism. Science is currently experiencing a violent ‘backlash’ from the public whose knowledge has been so long undermined, just as Irwin predicted in a later article (Irwin 2006: 312). This backlash and rejection of science has serious consequences, with a rise in climate scepticism, NIMBYism, a rise in direct action, demonstrations and the creation of separate negotiating spaces such as at Cochabamba. Though over a decade and a half have passed since *Citizen Science* was published, I argue that Irwin’s proposals for a dialectical relationship between science and citizens has never been more relevant or more timely. Situating Irwin’s work within a wider body of theory of knowledge production, I will review whether *Citizen Science* can help us identify the failure to break the current deadlock, take up the challenge of global warming and critique the solutions being proposed, with a particular emphasis on scale. With this aim in view I pose two related questions. How can his work help us move forward and propose constructive solutions? And, as Irwin himself asks, is a citizen-oriented science, or *citizen science* achievable? (Irwin 1995: 32).

Knowledge Production, or, how many experts are there?

To understand why certain solutions prevail over others, Irwin emphasises the importance of understanding where knowledge comes from—of analysing the *production* of knowledge—and thus viewing it as a construct or process rather than something that simply ‘falls from another planet’ (Ibid: 2). It thus becomes essential to ask, *who is the expert, or how many experts are there?* *Citizen Science* challenges the view that science is neutral and value-free, and opens it up, prising open Latour’s (or is it Pandora’s?) black-box of ostensible facts, so it becomes a ‘contested and negotiated area of understanding’ (Ibid: 62). Irwin focuses on the human purposes that drive science and innovation in the first place, saying that all knowledge is produced within a theoretical, cultural and political context (Ibid: 2). By challenging the idea that there is one way of knowing about environmental problems, or that environmental issues are necessarily scientific questions for most citizens (Irwin 1995: 144), Irwin subscribes to the idea that there is no singular universal knowledge but a plurality of knowledges. Moving away from a ‘deficit’ understanding of the public (Ibid: 92) – where the public is ignorant and needs a unilateral course of information to understand the issues involved – to one of dialogue and a mutually reciprocal need/exchange of knowledge, is a vital step in bringing citizens and science closer together. We must not underestimate the continuing radicalism of this contention. Many authors since Irwin still dare not take this dialogue as a given, as a right. Even citizen-expert-environment author Frank Fischer begins and ends his work with the question, ‘how can citizens deal with issues so obviously dependent on scientific knowledge?’ (Fisher 2000: 6, 259). Irwin, refreshingly never asks this question, preferring *how can we create the space for such interaction?*

If scientists ‘know’ from a certain perspective, then for more ‘complete’ knowledge – one based on ‘cultural context’ as much as ‘cognition’, other parties must be called upon to give their perspectives (Irwin and Michael 2001: 22). This process is one of contextualising scientific expertise within a wider, more complex and messy world of connections where each individual understands things in different ways. According to this account, science, which *de facto* has an allegiance to a particular field, needs citizens to make better decisions. In a process of re-scaling spaces of knowledge production, instead of seeing scientific experts as having the ‘global’ vision, it is in fact citizens that are able to give a broader, more diverse understanding, and who Irwin later describes as the ‘embodiment of knowledge about the practical world’ (see Box 1 for an interesting contemporary project where this is put into practice) (Irwin 2010: 118). Irwin’s discourse on the production of knowledge reveals that the dominant climate change narrative is an over-simplified one, squeezed into a narrow, scientific box. ‘The story of global climate has in many senses become the story of global temperature’ which has given decision-makers a ‘false sense of confidence that the problems are easy to identify and the solutions straightforward to implement’ (Hulme 2010: 3; Radcliffe et al 2010: 104). Contextualising

science, as Irwin proposes, would mean that global warming goes beyond a scientific problem, and becomes a social one, where citizens have a place in proposing solutions since ‘the challenge of how to value and protect the natural environment is as much social as it is technical or environmental’ (1995: 39). To arrive at this result, Irwin concedes, we must forget the UN’s desire for consensus, and be prepared for conflict.

Box 1 – Climate Justice Testimonies – Friends of the Earth Europe

For the past couple of months, I have been part of a climate justice in Europe project that uses testimonies of those who are suffering from climate change or who are fighting against the supposed ‘solutions’ that are having a negative affect on local communities. In this project, it is citizens that are the experts, able to precisely record the changes that are happening to their environment, and offer solutions over how to adapt and how to mitigate the problem. Relating this to Irwin’s work, we have experienced that ‘non-expert’ testimonies are providing the elements of a more comprehensive understanding’ of the environmental problems that we are facing. (Irwin 1995: 148) For more information, or to view a video of these testimonies, visit <http://climatejusticetoolkit.wordpress.com>.

The importance of diversity: challenging consensus, a tool of the powerful

In the opening pages, Irwin states that the ‘endeavour’ of the book will be to consider science from the citizen’s side, rather than from that of the scientific establishment, in a process of re-scaling these relationships which, up till now, were unequal. By ‘side’ I do not interpret Irwin as wanting to pit two opposing sides against one another, and disagree with Horlick-Jones’ comment that Irwin – whose approach he conflates with ‘radical anti-capitalism’ – treats ‘lay knowledges (as) in some sense special’, as if for ideological reasons (1997: 526). Horlick-Jones’ condescending review of Irwin’s defence of the ‘poor down-trodden workers’ misses, I argue, a key point in the argument of how to achieve citizen science, which is precisely to overcome the separation of ‘sides’ and show that scientists and citizens are mobile, interchangeable positions. Scientists are always already citizens, and the opposite, as the previous discussion of the production of knowledge reveals, is also true. A close textual analysis of Irwin’s language shows that to imbricate popular and expert epidemiologies requires an active and ‘creative’ process, a point he repeats several times: ‘the issue for policy responses is to facilitate rather than obstruct these dialectic and creative processes...a constructive, challenging and forward-looking relationship’ (1995: 180-181), quoting Funtowicz and Ravetz who see the conflict between citizens and scientists as a ‘creative conflict...serving to improve scientific knowledge’ (1993: 752, quoted in Irwin 1995: 172). Science, however, avoids conflict at all costs. Though Irwin’s later work attests to a surge in science-public engagement, which has become ‘fashionable’ and near mandatory (2010), politicians and scientists, who hold power and set the agenda, require closure that true conflictual dialogue cannot accord. Citizens are allowed to contribute, participate, engage, but this must be to ‘close-down’ and legitimate a pre-determined programme, rather than ‘open-up’ discussion. Referring to a report published by the House of Lords Select Committee on Science and Technology, he comments that ‘their call for ‘increased and integrated’ dialogue is intended to secure what the Lords see as science’s ‘licence to practise’ not to restrict it’ (2006: 308). Irwin’s later work goes further in challenging the necessity, or indeed the possibility, for consensus, seeing it as another form of scientific absolutism that silences the plurality of citizen engagement: ‘there is no guarantee that public debate will lead to consensus...with increased awareness, the old certainties and possibilities of consensus may no longer hold sway’ (1995: 151). With this, Irwin sets up an interesting framework from which to analyse our empirical case study.

The global agreement on climate change, by imposing a consensual framework, has meant that a plurality of knowledges, or understandings, of situations and solutions has become one globalised

knowledge, which has led to the rationale of the 'already powerful' to prevail. Geo-engineering projects, now being seriously considered by the Royal Society (Royal Society 2009), and other solutions such as nuclear power, mega dams, REDD+ forest mechanism and carbon offsetting projects are scientific solutions that challenge global warming from a purely climate-science perspective, and are being pushed by governments and scientists according to their centralising rationale. Many NGOs, social movements and civil society organisations are labelling these as 'false' solutions, not only because they create as many problems as they solve, but because they do not allow citizens to engage with them, and so are undemocratic, unsustainable and inherently flawed. As Irwin writes, 'consensus is a way of closing-down complexity', a complexity that must be explored if real solutions to global warming are to be found (Ibid: 123).

In our discussion above of knowledge and action, we have discussed why citizen science is so key to a successful climate agreement, as well as what is needed and what must be avoided to achieve citizen science. It may seem, in the flurry of calls for citizen participation and engagement that the sciences are becoming more porous, but this is certainly not the case. The state of the climate negotiations show that we have never been further from accommodating citizen science, let alone incorporating or practicing it. Though Irwin acknowledges that 'science is the servant of power – (whose) investigations serve to reinforce the existing social order', his firm belief that 'citizen voices provide a useful antidote to prevailing notions of scientific and technological determinism' seems hard to believe in 2011 (Ibid: 29, 136). Whilst citizens are certainly vocal – as 100,000 in the streets of Copenhagen proved – 'freeing the voices' is not proving to be the 'anti-dote' needed. Irwin stresses the importance of well timed 'up stream' rather than what Habermas calls 'end-point' consulting (1980: 79). What is more important, however, is that citizen participation and dialogue with policy and scientific processes has tangible end-point effects. In order to achieve this, citizens must have a role in defining and controlling whose knowledge counts (STEPS 2010). This discourse of rights and justice (Visvanathan 2005) is something I find lacking in Irwin's work. Steve Kroll Smith makes a similar critique, saying in his review of *Citizen Science* that, whilst the idea that 'science serves the interests of the state and business communities' is present, 'curiously, this point is not theorised...that powerful idea of "social learning" is a much more complicated process than Irwin allows in this study' (1997). Rather than offering a theorisation, however, Kroll-Smith makes a defeatist assumption that 'nascent citizen science' will have to settle with pursuing interests of its own in non-science institutions rather than challenging political power (Ibid.) If the buffer zone around science and politics is preventing real citizen engagement, then, rather than avoiding it, I suggest working to understand the reasons why this is so, in the hope to better challenge them.

Though I fundamentally agree with Irwin's proposals for citizen science, I argue that his book lacks a political analysis of why the 'prevailing order' is consistently maintained, even in the midst of strong citizen voices (1995: 29). It is important to identify and name what that prevailing order is – neo-liberal capitalism – in order to fully understand its motives and rationale. It demands that science provides solutions that mean that economic growth is not challenged, and that business as usual can continue, something which a globalised carbon market, nuclear power, CCS and all geo-engineering projects ensure. Though sustainable development also depends on science, it is not the grand, big science of nuclear fission, fusion, CCS and, most exciting of all, geo-engineering, where for the first time in scientific history, the whole world is, quite literally, an experiment. Shiv Vasvanathan gives us an interesting concept – cognitive justice – that may be one way of imposing and legitimating citizen knowledge more plausibly. If we were able to legitimate a form of cognitive justice, scientific policy would no longer be articulated 'within one monochromatic frame of knowledge but within an existential plurality of them...cognitive justice goes beyond voice or resistance to recognising constitutionally the body of knowledge within which an individual is embedded' (2005: 92-93). Though it would seem that the impasse between science and citizens is too large to bridge, innovative propositions such as Vasvanathan's show us it is possible, not forgetting, above all, that *Citizen Science* manages to do so too. Though we have used our contemporary empirical example to problematise

Irwin's theory, I in no way mean to undermine Irwin's achievement in this text. It is to this achievement I turn to in my conclusion.

Irwin has, with *Citizen Science*, written a text that not only radically rethinks the position of the citizen in relation to knowledge production, and persuades his readership with powerful theoretical arguments and empirical evidence that their expert status is readily accepted and welcomed, but has also sustained the importance of science to environmental questions, managing to bring them together into dialogue. His critique of science does not seek a revival of anti-science discourse, but a plural, non-consensual framework that allows for both the wisdom of normal science and of citizen world-views. In my introduction, I mentioned two texts that propose to deal with climate change in radically different ways: the Copenhagen Accord, with global, techno-scientific methods, and the Cochabamba People's Accord, with local citizen-centred sustainable projects. In his opening pages, Irwin argues that we cannot have one or the other, but that we must have both, together. 'Issues of environmental threat and world development cannot be successfully tackled without full consideration of local as well as global initiatives and of *citizen-oriented* as well as state-led programmes' (6). Though our discussion of political context reveals this political project to be even harder in 2011 than in 1995, it is nonetheless a project that must continue to be championed and led. These challenges are being taken up in many different forums, with initiatives such as those at the Chorley institute, of 'Extreme Citizen Science' (ExCitSci)² pushing the boundaries of citizen science. Jerome Lewis and Muki Haklay refer to this as 'Mode 2' citizen science, where power relations between citizens and scientists are re-scaled and levelled out, and citizens do not only participate and provide legitimacy to pre-defined problems but are central to problem definition, responsible for data set requirements and are part of the scientific analysis itself. It is critical that these re-scaled, democratic relationships are attained at an international level in order to have a chance to find solutions that both scientists and citizens can work on. Irwin described this in 1995 as a wider challenge 'we have yet to fully recognise' (171). Sixteen years later, the problem is no longer one of recognition, but of action.

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Bibliography

- Beck, U. *Risk society: towards a new modernity*, London: Sage Publications, 1992.
- Fischer, F. *Citizens, Experts and the Environment: the politics of local knowledge*. Durham: Duke University Press, 2000.
- Funtowicz, S.O. and Ravetz, J. 'Science for the post-normal age,' *Futures*. 27.7. 739-755.
- Habermas, J. *Toward Rational Society*. London: Heinemann, 1980.
- Hand, E. 'Citizen Science: People Power,' *Nature*. 466. 685-687, 2010.
- Horlick-Jones, T. 'Review of Citizen Science,' *Science, Technology & Human Values*. 22.4. 525-527, 1997.

² This information comes from personal communication with two active members in this project, Dr Muki Haklay and Dr Jerome Lewis at UCL, London. For more information see <http://povesham.wordpress.com/about/>

Hulme, M. 'Problems with making and governing global kinds of knowledge,' *Global Environmental Change*. 20.4. 558-564, 2010.

Irwin, A. *Citizen Science*. London: Routledge, 1995.

Irwin, A. and Wynne, B. (eds) *Misunderstanding Science*. Trowbridge: Redwood Books, 1996.

Irwin, A. 'Constructing the scientific citizen: Science and democracy in the biosciences,' *Public Understanding of Science*. 10.1.1-18, 2001.

Irwin, A. and Michael, M. *Science, Social Theory and Public Knowledge*. Maidenhead: Open University Press, 2003.

Irwin, A. 'The Politics of Talk : Coming to Terms with the 'New' Scientific Governance,' *Social Studies of Science*. 36. 299-320, 2006.

Irwin, A. 'Nations at Ease with Radical Knowledge : On Consensus, Consensusing and False Consensusness,' *Social Studies of Science*. 40. 105-126. 2010.

Kroll-Smith, S. 'Review of Citizen Science,' *Organisation and Environment*. 10.1. 97-100, 1997.

Millay, E. *Huntsman, what Quarry?* London: Harper & Brothers, 1939.

Radcliffe, S.A., Watson, E.E., Simmons, I., Fernandez-Armesto, F., Sluyter, A., 'Environmental thinking and/in geography,' *Progress in Human Geography*, 34.1. 98-116. 2010.

Royal Society. *Geoengineering the climate: Science, governance and uncertainty*.
<<http://royalsociety.org/geoengineering-the-climate/>> (Accessed 30 December 2010).

STEPS. *Innovation, Sustainability, Development: A new Manifesto*, Brighton: STEPS centre.
<http://anewmanifesto.org/wp-content/uploads/steps-manifesto_small-file.pdf> (Accessed 5 December 2010).

Visvanathan, S. 'Knowledge, Justice and Democracy,' Leach, M., Scoones, I., Wynne, B., eds. *Science and Citizens*, London: Zed Books, 2005.

Wilsdon, J., Wynne, B. and Stilgoe, J. 'The Public Value of Science or how to ensure that science really matters,' <<http://www.demos.co.uk/publications/publicvalueofscience>> (Accessed 1 December 2010).