
4-2020

The Responsibility of Scientists in Public Policy

Samuel S. Otálvaro
Bridgewater State University

Follow this and additional works at: https://vc.bridgew.edu/br_rev



Part of the [Environmental Education Commons](#), and the [Natural Resources Management and Policy Commons](#)

Recommended Citation

Otálvaro, Samuel S. (2020). The Responsibility of Scientists in Public Policy. *Bridgewater Review*, 39(1), 8-12.

Available at: https://vc.bridgew.edu/br_rev/vol39/iss1/5

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.

The Responsibility of Scientists in Public Policy

Samuel Serna Otálvaro

“Then, as the crisis deepens, many of these individuals commit themselves to some concrete proposal for the reconstruction of society in a new institutional framework.”

– Thomas Kuhn, *The Structure of Scientific Revolutions*, (93)

As a scientist working for and with amazing researchers, always running to complete the next experiment, grant, conference, or visa application, it has been difficult to explore a passion I have had since my high school days: the study of the laws not dictated by nature, but the *iuris* of humanity. In love with science but not happy with the traditional institutionalized path for these fields, I also pursued studies in law, in parallel with physics engineering. At that time, it sounded more like a naïve desire of coming back to the “Age of Enlightenment.” Two undergrad programs in two different universities gave me the opportunity to learn from both humanities and sciences, and understand in a deeper way that both are necessarily and inevitably linked. Eventually, the two universities’ calendars did not coordinate with each other and so I completed my degree in the hard sciences without being able to complete my dream of finishing my law degree.

Nevertheless, public policy has always remained a passion. As I gained experience, I started realizing that social theories were lacking more and more in the scientific setting and more scientific principles and reasoning were missing in the public debates and larger social discussions. So, I started remembering all the theories, stories, books and discussions from my study of law. From the code of Hammurabi, through the Greek definition of democracy, Kant, Rousseau, Montesquieu, and later Kelsen and Hart, among many others,

all of them came back to help me read this situation for what it currently is: a crisis scenario.

For centuries, scientists have played important roles in decision making and in the definition of legislation, giving tools to improve the general quality of social life. It is important to clarify at this point that the actual concept of scientist (and the foundation of the scientific method for that matter) is a very recent invention, so what I am calling scientists here are the people dedicated to the study of natural events.

Nevertheless, in the latest decades, we, the scientists, have become more like instruments of political, military and corporate interests rather than having decision-making power. For instance, today, we are witnessing and actively participating in the era of both the fastest growth in technology and scientific activity ever registered in history. While, at the same time, in the superstructure of society, we are seeing the rise of “counter-scientific” movements supporting ideas like the Earth is flat or climate change is not accelerated by humankind. So, the access to such a large amount of information exposes the vulnerability of people not used to challenging this information with critical thinking, fact checking, or, in most cases, the filter of the scientific method.

As Walter Benjamin wrote in his “The Work of Art in the Age of Mechanical Reproduction,” referring to the appearance of video/cinema, “The transformation of the superstructure, which takes place far more slowly than that of the substructure, has taken more than half a century to manifest in all areas of culture the change in the conditions of production. Only today can it be indicated what form this has taken.” This slow adaptation of the superstructure is more evident today. The appearance of mass media created a huge shift by transforming consumers from passive actors into potential producers of information. Large amounts of dispersed data, without proper individual filtering or peer verification, leads toward what I would call the «desacralization» of (hard) science. The scientific method is sacred in that for centuries scientists all over the world have agreed to follow the process of characterizations, hypotheses, predictions and experiments. The «desacralization» of this process then could be understood as a disenchantment that is accompanied with either disbelief or with the blind belief in non-scientific theories that are presented in an alluringly accessible way. This problem

gets translated in the relativization of everything and science gets replaced by dogma.

Paraphrasing Benjamin, for the first time in world history, mass social media emancipates the sharing and communication of positivistic sciences from its parasitical dependence on ritualized legitimacy (for instance, sharing ideas in highly specialized conferences, research results from labs and publications in elite universities). For example, we now can share and critique our questions and results via webinars, blogs, and other forms of social media, independent of the major academic conferences and journals. I do not mean to imply that I believe we should eliminate discussion in person or that scientific conferences are irrelevant. My concern here is that in principle it is meaningful and, I deeply believe, necessary to have more broad and free access to discussion of scientific questions, approaches, research and results because it is more democratic across the globe. However, broad and free access must also be accompanied with the means to carefully analyze the information. For this,



Breakthrough discovery in astronomy: first ever image of a black hole announcement.
(Photo Credit: European Commission – Official social media) <https://youtu.be/Dr2of1gczeE?t=523>

and in terms of scientific information, it means people need tools and understandings of scientific methods.

But, just as Benjamin critiques the rapid evolution of the cinema, the process here in science is happening faster than we can responsibly adapt. We are not adjusting to this “desacralization”

of scientific legitimacy based on the scientific method and this vacuum has been filled with another kind of praxis: *a political one*. Freed from the mystification of scientific research (dependence on the cloistered spaces of certain conferences and institutions to which few have access), the media *could* cultivate more critical individuals able to judge and analyze content and context. So, the new mass communication technologies have the clear promise to bring scientific research nearer; to eliminate the authoritarian distance between highly specialized scientific communities and the public. However, this opportunity also brings the risk of reactionary movements promoting misleading information or “alternative facts,” moved by only political interests. What we must have, and to avoid any censorship, are citizens with access to all of the scientific information, videos, data, and conferences so they can include proper scientific arguments in their political decisions and policy makers can include the words of scientists in general legal development. In other words, scientists must be part of public policy discussions while policy makers and legal officials should be involved in scientific discussions.

Our (still) respected position in society as researchers could influence policy makers and strengthen social movements within topics such as global climate change, the fight against poverty ... access to potable water, housing, food security, or access to equal opportunities. Having these discussions, and doing so globally, is urgent, not abstract, and requires action.



2015 International Year of Light and Light-based Technologies – Opening ceremony, UNESCO headquarters, Paris, 19th January 2015 - Nobel Prize winner (1999) Ahmed Zewail. (Photo Credit: UNESCO/Nora Houguenade) <http://www.unesco.org/new/en/media-services/multimedia/photos/photo-gallery-2015-international-year-of-light>

This point of departure is not intended to romanticize the potential role of the masses in scientific research, but rather the opposite. This is an opportunity to bring the expertise and experience of scientists to the table, encourage them to leave the desks, the labs, and start working with communities and political actors in government, industry, and academia. By this, I mean we can employ *soft power*, or the capacity of the institutional structure, to influence the behavior of others by policy making at all geographical levels, from the neighborhood to the international organizations. Scientists must be involved in this soft power. I do not necessarily mean activism. I just mean that we as scientists should be aware of the social impact of our research.

What Thomas Kuhn calls *normal science* should be evaluated. In a very succinct way, actual science consists of solving outstanding puzzles and problems which require ingenuity, funding, and dedication. Nevertheless, we are in the presence of an “anomaly” that cannot be answered by the science of today and we are passing now from the normal science into a “state of crisis.” For example, some of the arguments

people give for the anti-vaccine movement reveals the extent and the consequences of not following the scientific method. The scientists cannot just turn their backs saying that the anti-vaccine arguments are *ridiculous*. It is, rather, our responsibility as scientists to learn how to reach the public with tools to be able to filter this information with scientific methodologies. There are two ways in which the current crisis could be solved: (1) most of the anomalies would be resolved within the paradigm of the scientific method, then the confidence of the scientists and the public will be restored and (2) a new

there must be a radical transition to solve it, a different way of thinking and applying scientific principles. In our case, and different from Kuhn’s ideas, the crisis is not because science is stuck, but because science, as a whole, is not contributing and participating enough in other spheres.

Our (still) respected position in society as researchers could influence policy makers and strengthen social movements within topics such as global climate change, the fight against poverty (In 2050, 1/6 of world’s population is estimated to live in slums), access to potable water, housing, food security,

... in the superstructure of society, we are seeing the rise of “counter-scientific” movements supporting ideas like the Earth is flat or climate change is not accelerated by humankind. So, the access to such a large amount of information exposes the vulnerability of people not used to challenging this information with critical thinking, fact checking, or, in most cases, the filter of the scientific method.

paradigm emerges. If the majority of the scientific community embraces this new paradigm and abandons the old paradigm then we can reach a scientific revolution. In my opinion, option 1 is not sufficient to solve the political and structural crisis we are witnessing and

or access to equal opportunities. Having these discussions, and doing so globally, is urgent, not abstract, and requires action.

It is the role of members of the scientific community to serve as the interface between science and public decisions

– letting the science talk when the pure political discourse starts failing. For instance, “Today science is giving a lesson to politicians, it is showing that today, to take a picture of something that one man dreamt 100 years ago, you need people from 40 different countries, you need people from all over the world” (Carlos Moedas, European Commissioner for Research, Science and Innovation in the press conference for the Black Hole image release). This image was not only a major milestone in astrophysics, but also an example of collaboration between multicultural scientists backed up by a diversity of countries with public funding. This project was also accompanied by several outreach activities in many countries and free online material for the general population. Furthermore, the National Science Foundation (NSF) in the USA and the European Commission for Research are implementing more and more the mandatory open access data and freely available publications resulting from their funding. So, any citizen around the world has access to the description of the experimental setup, procedures, data, and discussion.

There is a third major dimension to this crisis scenario that is not often discussed in the U.S. academy, nor in scientific, social media or public policy circles in general, but which has a severe consequence. This has to do with the challenges many scientists face in not only doing their research, but also having access to publish their results. Some scientists are unable to study, research and participate in educational and research institutions, labs, and conferences because their travel is restricted, often due to their nationality. In this way, then, scientists and science itself, are deeply impacted by public policy. This is why in connection with the Statement of Support for the Recognition of the Human Rights of Scientists and Engineers, according to which all scientists and engineers should be able to live without

restraint and be free from torture and persecution, organizations like The Optical Society (OSA) strive to urge all governments to allow scientists to travel and have even voiced concern for the revised 6 March 2017 Presidential Executive Order 13780 “Protecting the Nation From Foreign Terrorist Entry Into the United States” (www.osa.org/en-us/get_involved/public_policy/science_policy_issues/osa_responds_to_immigration_ban/).

In the midst of all the elements of this crisis, we actually have a clear example of scientists worldwide being involved in socio-political issues in ways that

coordinate sending messages to society. In the words of the Director-General of UNESCO Audrey Azoulay, “All its natural benefits and its scientific and technological applications make light an essential part of the daily life of our societies; these benefits and applications make light an important issue for the Sustainable Development Goals (SDGs) of the 2030 Agenda.” From playing a fundamental role in increasing budgets for research and education to making fundamental calls for human rights and securing equal opportunities, scientists must play a main role in supporting the SDGs.



Scientists from different states in front of the office of Sen. Warren before a meeting. Congressional visits 2019 from The Optical Society (OSA) and the International Society for Optics and Photonics (SPIE). (Photo Credit: David Lang, Senior Director of Government Relations at The Optical Society)

intend to reach the public, politicians, and other powers with tools to be able to evaluate scientific evidence. Let’s take, for example, the initiative of the UNESCO International Year of Light 2015. After this initiative’s huge success, May 16 was subsequently declared the International Day of Light (<https://en.unesco.org/commemorations/day-of-light>). It proved an enormous step toward building public awareness of light science as well as a yearly time to

Many scientific communities have started to pay serious attention to these topics, in particular with the so-called Scientific Diplomacy, which refers to a number of formal or informal technical, research-based, academic or engineering exchanges, particularly between countries. Nations like Denmark already have a Tech Ambassador who has a global mandate and a physical presence across three continents: America (Silicon



“Studying,” by Handi Laksono, home in Wae Rebo, Flores NTT, Indonesia, 1 September 2014. (From SPIE, photonicsforabetterworld.blogspot.com)



“Sustainable Energy,” by Dipayan Bhar, residence without electricity, Kolkata, India, 21 January 2013. (From SPIE, photonicsforabetterworld.blogspot.com)

Valley), Europe (Copenhagen) and Asia (Beijing). This model transcends borders and regions and allows the Danish research system to expedite, formalize and dynamize the exchange of ideas, property, researchers, and equipment with a person in the government specifically dedicated to being a bridge between the community, economic, academic, and political players.

Another example that several technical societies are starting is annual congressional visits of their members. This initiative gives the scientific community a voice in the halls of Congress – calling on elected officials to recognize the importance of science and technology, but furthermore to take positive action in keeping federal R&D (Research and Development) funding levels consistent and sustainable, and support education

and outreach programs. There are many other resources such as legislative networks as well as congressional fellowships, where scientists work as staff members of a congressperson. This program should be reproduced at the state, county, and city/town levels, hand-by-hand with universities. Concretely, Bridgewater State University (BSU) plays a key role in education for Southeastern Massachusetts and has the potential to become a development pole for the communities excluded from the metropolitan Boston area. From the particular situation of BSU, which is similar for many regions relegated by big cities around the world and being both inside and excluded from the system, it is a good place to propose new approaches for the reconstruction of society in this time of crisis. The clock is ticking and now it is up to us.

This point of departure is not intended to romanticize the potential role of the masses in scientific research, but rather the opposite. This is an opportunity to bring the expertise and experience of scientists to the table, encourage them to leave the desks, the labs, and start working with communities and political actors in government, industry, and academia.



Samuel Serna Otálvaro is Assistant Professor in the Department of Physics.