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GUEST EDITORIAL

The sociality of science

Science is inherently and essentially social. While the image of a solitary scientist, an individual of genius, continues to be a powerful one in science, it is an image that is not true of modern scientific practice. This practice has become so inherently social that science is now primarily seen as a collaborative activity, both at the individual level as well as that of institutions and nations. Not only have co-authored papers become the norm today, but there is also an increasing number of co-authors in a paper, with some instances of more than one thousand authors.

With its unwavering focus on nature as its object of study, the importance of the social that operates within science is often ignored. What is ignored too in the larger understanding of science is the interesting work in science studies, particularly in the sociology of science, which has consistently pointed to the social nature of science, both in its practice and discourse.

The social is often hidden in the narratives of science through the emphasis on an individual's capacity to 'do' science. This narrative privileges the creative capacities of individuals and the social only plays a supportive role. However, this view does not correctly capture the sociality of scientific activity.

The first sense of the social in science arises through its link to institutions. Modern science, as we see it practised today is deeply indebted not only to the creation of new knowledge (in places like universities and scientific laboratories), but also to institutions like the Royal Society started as early as 1660, the various national academies, and international associations. One of the essential tasks of these institutions was to make science socially acceptable, both with the patrons as well as the members of the society.

The recognition that science had to be communicated and demonstrated to the larger public begins right from these early times. There was an elaborate culture of performing scientific experiments in the public domain, so that people could pay money to come and watch the performance of an experiment. The early impetus to science seemed to have been deeply conscious of the importance of making science public and showing its importance to society.

However, this aspect of science is not what I mean by the sociality of science. In the early public demonstrations of science, the scientist was still a figure of individual importance. Science was built around the power of these individuals such as Newton. Institutions were seen as ways that would enable individuals to do science without constraints. The attraction of science was still captured within the imagination of a few individual giants who were responsible for creating grand new ideas of science.

However, even then it was clear that grand ideas of science arise only through a shared social network of individuals, institutions and shared social practices of scientists across the world. In fact, no other human activity over the last two centuries illustrates the international possibilities of collaboration like science has. Even in the midst of the World Wars, scientists worked on theories developed by colleagues from warring nations. For example, the work of British experimentalists and theorists in the fields of quantum and relativity theories along with their German counterparts exemplifies the importance of the social practice of science, which could transcend political divisions. Similar instances of scientists drawing on and supporting the work of scientists in countries which are politically polarized continues even today. In a way this is ironical, since scientists are also at the forefront of pioneering weapons technology and are zealously protected by their States.

The sociality of science, while dependent on these institutional modes of establishing the social, also goes beyond it. Scientific knowledge, and not just scientific practice, is essentially social. How do we understand this social nature of knowledge itself? First, scientific knowledge is socially produced. Even in theoretical work, there is a deep social production, starting with the common sociality of languages, concepts and theories used by the scientists. The very possibility of scientific knowledge depends on how the social can be maximally utilized. The culture of journals, publishing and citation – which are the essential ingredients of science today – is nothing but different modes through which the social becomes an integral part of the production of scientific knowledge.

There are at least two fundamental reasons as to why the social is not foregrounded in our understanding of science. One is the importance given to the idea of the human individual as the primary agent of creativity and

autonomy. The other is the belief that the domain of the natural is essentially different from the domain of the social. The claim that science is primarily about the discovery of truths about the natural world, in turn reinforces the importance of the natural over the social. However, both these beliefs about the importance of the human individual as well as the meaning of the natural have come to be challenged. There is a different approach to the question of the social within science, largely driven by work in science and technology studies (STS) through the work of Bruno Latour and others. One of the most significant insights in these approaches is the argument that the distinctions between the natural and the social, between humans and non-humans, are not tenable. As geographers have repeatedly pointed out, there is nothing natural about nature. The very idea of the natural and constructions of the natural are social constructions. The definition of nature is actually quite slippery and is different for different natural sciences. So the claims of scientific truths about nature have to be seen at best as truths about the socialized forms of the natural.

Another way of stating this is as follows: every discipline creates its own objects of discourse, objects which are the focus of its study. Nature is a quintessential object for science, but each of the scientific disciplines has to construct its own view of nature. In fact, it is the uniqueness of their views of nature that distinguishes disciplines, as much as other elements like method. For physics, nature is something that is endowed with laws and hence, laws of nature are an important ingredient of what nature is for physics. But there are many fundamental questions about the meaningfulness of the laws of nature. Do these laws govern nature? Do they govern objects of nature? If so, how? Or is it only that these are ways of talking about some processes in nature? For biology, the idea of nature is not the same as that of physics, and there are no laws of nature in biology like those of physics. That is, although we use the common term 'nature' in both physics and biology, the meanings of this object are quite different. Similarly, nature for chemistry is also quite different from the meanings of nature for physics, although there is much of physics that is present in chemistry. The resistance of reducing chemistry to physics, for example, is as much about the different meanings of nature that are implicitly present in each of these disciplines.

While the approaches focusing on the social in science have their critics, it is nevertheless useful to think through this framework that breaks the distinction between the natural and the social. The argument that even objects 'act' is an important one, and is driven largely by the nature and function of scientific objects. In fact, STS as a discipline has been at the forefront of arguments that refuse to accept traditional accounts of the social as being independent of the scientific and the technological. Their argument is that modern societies are as much formed by S&T and one cannot define the social only as something to do with a collection of human beings without recognizing that this collection should include scientific and technological artefacts too. So the social is not merely a collection of human beings, but the sum total of beings and objects. In other words, scientific objects have a social life of their own, just as individual scientists have a social life.

There are many consequences of explicitly acknowledging the social nature of science. A specific view of nature has often been invoked to protect science from various forms of ethical challenges. The argument that science only discovers truths about the natural world and that humans (and society) are only enabling agents to do this has been repeatedly used to keep questions of ethics outside scientific practice.

Why emphasize the social as an essential element within scientific knowledge as well as scientific practice? In the long history of science, and in the ways by which it is presented to the public, the centrality of the social is often erased. Using a specific idea of nature as the focus of science allows science to protect itself against questions of responsibility and ethics. If science is seen only as an activity that produces knowledge about the world, then scientists can evade responsibility for 'discovering' knowledge about the world. The argument that science should not be held responsible for the truths it discovers about the world is often based on the argument that it is people who are responsible for the problems related to that knowledge. The widely quoted example of a knife that can be useful as well as harmful has been harmfully used to claim that science is value-neutral. However, this example is flawed, since the knife is primarily a social object and it acts in the social world with its own domain of meanings that include both the harmless and harmful aspects of it.

To be social is to be in a relationship with other entities that constitute the social. Thus, the very notion of the social comes with a sense of responsibility towards other elements of the social. The origin of ethics within the sciences comes through this recognition of the intrinsic sociality of science. This ethical stance that is necessary for science is a responsibility not just to the world, but also to the society in which science functions as a member. It is also a responsibility to be sensitive to the other constituents of the social and thus demands sensitivity to other ways of knowing and living.

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