

INTRODUCTION

In August 2005, the TV channel BBC asked its overseas viewers to vote for the "Greatest Briton." In that poll, Sir Isaac Newton, who contributed much to the world's understanding of gravity and planetary motion, was voted the greatest. If a poll on the "Greatest Filipino" were done in the Philippines, who would she or he be? Would a scientist be voted the greatest Filipino? Or would the greatest Filipino turn out to be an actor, a politician, a singer, or a boxer?

This issue of the Philippine Sociological Review is about two topics: the culture and practice of science and technology in the Philippines, and the *study of* the culture and practice of science and technology. In the first, we have a chance to see the scientific mind at work as scientists and technologists think about the problems we encounter daily in the country; in the second, we find out about how science and technology can be understood using the language of sociology.

The exploration of these two topics takes the view that science and technology can be understood sociologically through its culture. As a set of ideas, values, and practices, culture provides a framework for organizing the world and our place in it. Thus, while the physical world is generally pre-given, culture may radically shape the implications of this reality for society.

As a rational way of understanding the physical world, science allows societies to develop technologically-based cultures that have the capacity to adapt to or alter the physical environment. Culture, as this issue will use the term, specifically refers to the patterns and dynamics of scientific and technological pursuits and the meanings that practitioners attach to these activities. Culture, then, refers to practices (Knorr Cetina 1999), and science and technology can be understood within a performative idiom (Pickering 1995) or as being in-the-making (Latour 1987). How indeed might sociological frameworks and methods contribute to an understanding of science and technology in general, and of Philippine science and technology in particular?

Science is concerned with the laws of nature which natural scientists (e.g., biologists, chemists, physicists) seek to discover and understand. Using nature's laws, technologists (e.g., designers, inventors, engineers, craftspeople) adapt nature to human needs. They use their knowledge and skills to design and manufacture a world that fulfill human needs.

A sociology of science and technology applies the analytic resources of sociology to science and technology in order to understand them. In general, sociologists of technology concern themselves with technology and the development of innovative processes and products, while sociologists of science study how an understanding of

the basic natural processes in the universe is arrived at. Based on current practice, the sociology of science and technology is related to the multidisciplinary field of science and technology studies (STS) that have their roots in history, philosophy, economics, sociology, humanities, among others. However, while the study of science and technology has been undertaken by many disciplines, STS research continues to heavily rely upon disciplinary-based master narratives (Bowden 1995).

The earliest forerunners of today's studies of science and technology looked at science and technology as entities separated from their social context. In the 1960s, for example, sociologists such as Merton looked at the institutional structure of science and its pattern of communication and reward. In the arena of technology, one of the earliest views is that of technological determinism, or a view of technology as independent and external of society yet exerting tremendous influence upon it.

In the mid-1960s, the insight that science and technology as a complex enterprise takes place in specific social contexts developed. Discourses moved from standard engineering (e.g., finding technical "solutions" to problems) to humanistic discourse (e.g., emphasizing human values, issues of ethics).

One point of inquiry in the sociology of science is the area of scientific knowledge, as inspired by Merton's (1968) claim that the sociology of science is "a subdivision of the sociology of knowledge." By the mid-1970s, the content of scientific knowledge became subject to sociological inquiry. One approach follows the Mertonian ideal of studying the social environment of knowledge which "springs from and returns to controlled experiment or controlled observation." The sociology of scientific knowledge (SSK) offers an alternative view: it argues for both the empirical examination of the social bases of scientific knowledge and the recognition of the social construction of scientific knowledge claims and technological artifacts (Knorr Cetina 1981).

Insights from the inquiry into the social bases of knowledge were extended to technology. The turn to technology within science studies is exemplified by the work of Trevor Pinch and Wiebe Bijker (1987) and the movement known as social construction of technology (SCOT). Social construction of technology (SCOT) theory, along with actor-network theory (ANT) (see, for example, Callon 2005), represents the constructivist approaches in the study of technology.

One axial assumption of constructivist approaches to science and technology is that as a technological artifact passes through different phases of design, production, marketing and consumption, it is shaped and reshaped by people who form alliances and networks. Through the relationships that are established between the social actors involved in the development of a technological product (e.g., policymakers, inventors, research and development [R&D] departments, designers, producers, marketers, and clients), an actor-network is formed.

Both SCOT and the Sociology of Scientific Knowledge (SSK) view the development process of scientific knowledge and technological artifacts as alternations of variation and selection whereby relevant social groups play a great part in determining which variant of the scientific knowledge or technological artifact or process will be adapted (Knorr Cetina 1981; Bijker and Pinch 1987). Over time, the scope of the constructivist approach to technology, which initially examines the shaping of technology in the hands of its creators, expanded to an examination of how users or consumers are shaping technology. Thus, from studies that look into how the refrigerator got its humming sound, or how the typing case turns out to be “QWERTY,” attention shifted into how users first adapt to the presence of the microwave or the computer in the home. Most recently, the mobile phone and the internet stand at the center of the examination of the consumption of technology.

An understanding of the culture and practice of science and technology in the Philippines must, however, take into account the various settings that support the development of such culture and practice. Pertierra (2003) provides an account of the state of science and technology in the Philippines in terms of technology indices (i.e., middle rank in Southeast Asia in terms of telephone, computer, and Internet use), government knowledge bureaucracies (i.e., a gap between policy planning and implementation), world rankings of the country's tertiary institutions (i.e., relatively low rankings which suggest a weak culture of research in Philippine universities), presence of science and technology in the media (i.e., very limited audience reach), among others. He also offers a view of a Filipino epistemic culture characterized by television programs that trivialize knowledge, and a State that is far from providing Daniel Bell's “theoretical knowledge” as a source of predictable social outcomes. Non-scientists such as politicians and media personnel often share the same space as scientists, and expertise and competence are not given the role to resolve mainly scientific disputes. Certainly, Pertierra's account is but one of many, and there is a need to further chart the Philippine scientific and technological terrain.

A sociology of science and technology that encourages an examination of the culture and practice of science and technology in the Philippines will not only make it possible for us to answer the question I posed at the beginning of this Introduction. The daily activities and the social relationships being created by scientists, technologists, and users of scientific knowledge and artifacts can be the means of understanding the society which generates such culture and practice. In turn, knowledge of society can be the means of understanding this society's scientific and technological enterprise. Both explorations allow a fuller understanding of imperatives for the culture of science and technology to be present in everyday life.

Czarina Saloma-Akpedonu
Editor

REFERENCES

Bijker, Wiebe and Trevor Pinch

1987 "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other." In W. Bijker, T. Hughes, and T. Pinch (eds.) *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Massachusetts and England: The MIT Press, 17–50.

Bowden, Gary

1995 "Coming of Age in STS: Some Methodological Musings." In S. Jasanoff et al. (eds.) *Handbook of Science and Technology Studies*. Sage Publications. 64-79.

Knorr Cetina, Karin

1981 *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*. U.K.: Pergamon Press.

Latour, Bruno

2005 *Reassembling the Social: An Introduction to Actor-network Theory*. Oxford: New York: Oxford University Press.

1987 *Science in Action: How to Follow Scientists and Engineers through Society*. Massachusetts: Harvard University Press.

Merton, Robert

1968 *Social Theory and Social Structure (Part Four)*. New York: Free Press.

Pertierra, Raul

2003 *Science, Technology and Everyday Culture in the Philippines*. Quezon City: Institute of Philippine Culture, Ateneo de Manila University.

Pickering, Andrew

1995 *The Mangle of Practice*. Chicago: University of Chicago Press.