

SCIENCE AND TECHNOLOGY IN THE PHILIPPINES AS CULTURE AND PRACTICE

Professional narratives of Filipino scientists and technologists provide a glimpse of the culture and practice of science and technology in the country. They feature trajectories that constitute the course of a career, usually made up of major events, contexts and mechanisms of such events (e.g., opportunities for education and training), and consequences for those who are involved (e.g., membership in various epistemic communities that provide access to social and cultural capital). These trajectories are not only biographical but also direct the analysis to building a model of the world of scientists and technologists.

At *The Symposium on Science and Technology as Culture and Practice* that the Philippine Sociological Society organized in March 2006, natural scientists, technologists, and sociologists gathered together to examine how professional biographies and narratives of Filipino scientists and technologists reflect the culture of knowledge acquisition, creation, and utilization in the Philippines, and how everyday life, the State and capital create the context for science and technology. It featured presentations by Dr. Estrella Alabastro, Secretary of the Department of Science and Technology (DOST), Dr. Conrado Dayrit, member of the National Academy of Science and Technology (NAST), and noted for his work on virgin coconut oil; Dr. Ma. Assunta Cuyegkeng, Professor of Chemistry and Vice-President for the Loyola Schools of the Ateneo de Manila University; Dr. Severino Magat of the Philippine Coconut Authority; and Fr. Delfin Felipe who developed a "Filipino Utility Vehicle." Three of the papers are included in this issue.

The Mertonian paradigm looks at how modern science functions as a structured social system, whose autonomy allows it to create scientific knowledge independent of social influences. Although science and technology is currently being understood as socially embedded, we learn from Merton that certain institutional arrangements are conducive to the practice of science. These are: communalism (publicly sharing information about one's research), universalism (disregarding personal and social characteristics of other scientists when evaluating their research), disinterestedness (truth above personal gain), and organized skepticism (withholding judgment on the validity of others' research). Conformity to these norms enables scientists to achieve their goal.

Estrella Alabastro's contribution highlights the importance of these institutional arrangements, not only within the laboratories of science. She discusses the need to strengthen our "National System of Innovation." National systems of innovation are

typically anchored upon the network of relationships that enable firms to innovate, and the role of the State in coordinating and carrying through long-term policies for industry and the economy. In her discussion, we see that the social construction of technology and actor-network theories (see Introduction) are empirically grounded in the national education system, industrial relations, technical and scientific institutions, government policies, national institutions, and cultural traditions, which together comprise a national system of innovation (Feeman 1995).

Ma. Assunta Cuyegkeng's professional autobiography illustrates that indeed a scientist's "choice of where to use one's skills and expertise is a product of socio-historical context and personal beliefs." The notion of the social constructiveness of scientific practice and culture allows us to appreciate that scientific knowledge and artifacts result from the purposive and directional effort of scientists toward the production of knowledge as defined by one's scientific community (Knorr Cetina 1981). Cuyegkeng asked the Filipino community of scientists, as practical, contextual, and economic reasoners, to be mindful of the historical, social, and cultural contexts of the scientific enterprise and of their role as agents of change and national development.

While Cuyegkeng's professional biography offers a glimpse of the scientist as a contextual reasoner, **Delfin Felipe's** article—the first public exposition of his car project—presents the contexts of technological innovation in the Philippines. Felipe's account of his experience in building his alternative vehicle, DPROX (Disenyo Pilipino Rurban Overland Excursion Vehicle), illustrates Thomas Kuhn's concept of a "scientific paradigm." Kuhn argues that scientific and political revolutions share similarities: both happen when a "narrow subdivision" of a given community sense a malfunction in the system. Thus, knowledge is not merely cumulative and scientific production is not simply about adding more sophistication to a stable base. Stability is often subject to periodic rupture or revolutions. However, a revolution in the design of the jeepney was not forthcoming since the manufacturers, users, and relevant institutions never considered the jeepney status problematic.

One observation on the culture and practice of science and technology in the Philippines is possible at this point. The accounts by Cuyegkeng, Felipe, and Alabastro indicate that there is indeed a subculture of science and technology in the Philippines. However, this subculture is inhabited by only a few and is unable to triumph over the public, everyday culture. Creativity and ingenuity can prosper despite the lack of governance structures, but State-regulated policy and implementation mechanisms are needed to make the most of such creativity and ingenuity.

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