

Robert K. Merton and the Second Mathew Effect

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ROBERT K. MERTON occupies a very special place in the study of science and technology, and I am humbled to be the first recipient of the award established in his honour by the International Sociological Association. When thinking about how to express my gratitude, I went back half a century ago, when I started working in the field of science, technology and development. A coincidence, clearly of the type Merton was fond of highlighting in his remarks about serendipity (Merton & Barber, 2004) led me to be in Lima at the time the National Research Council of Peru was created, and I was looking for a PhD dissertation topic in operations research and social systems sciences. Soon, I focused on how to design policy interventions and plan the development of science and technology capabilities in developing countries.

This continues to be the most important issue, one of the most pressing in our times. While income and wealth inequalities between rich and poor countries have captured international attention, inequalities in science, technology and innovation capabilities are much more pronounced. The average income per capita of the Organisation for Economic Co-operation and Development (OECD) countries—the rich countries club—is about sixty times greater than that of the low-income countries as defined by World Bank indicators; however, the number of scientific articles published per 100,000 inhabitants in rich countries is 170 times greater than that of low-income countries, and the number of patents registered in the former is 1,000 times greater than that in the latter (Sagasti, 2018). Bear in mind that rich countries have accumulated these advantages for a long time, and that the ‘Mathew effect’, clearly identified and reported by Merton (1968) and Zuckerman (1977),

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confers additional advantages on those that already have science and technology capabilities.¹

Merton's monograph and book—*Science, Technology, and Society in Seventeenth Century England* (1938, 1970)—was among the first works I read on the subject. Based on Merton's contributions, together with those of scholars like Derek the Solla Price (1963), John D. Bernal (1971), Lewis Mumford (1962), Jacob Bronowski (1965), Stephen Toulmin (1960) and Latin American intellectuals Raúl Prebisch (1973 [1949]), Helio Jaguaribe (1971), Jorge Sábato (1971), Amílcar Herrera (1968) and Marcel Roche (1968), among others, I began to develop a systemic approach to the design and implementation of science and technology policies in developing countries. My dissertation advisor, Russell L. Ackoff,² guided my steps when venturing into the then no-man's land of science, technology and development to embark in what, together with Jean-Jacques Salomon, Francisco Sagasti and Céline Sachs-Jeantet (1994), we defined as an 'uncertain quest' a couple of decades later.

Let me now link some of the work I did, at that time, with the seminal ideas of Robert K. Merton. In a sense, his characterisation of 'obliteration by incorporation' (Merton, 1996a) led to my taking several of his contributions for granted, and when revising his texts for this address, I realised how much of my early work is owed to him.

First, 'middle-range theories' are what I set to develop in my dissertation and further research: those that lie between broad generalisations, aiming at unified and universally applicable theories, and those intellectual constructs focused on specific issues derived from empirical evidence (Merton, 1968). As I worked in Latin American, African and Asian countries, I found similarities that afforded not only a certain degree of generalisation but also contextual differences that precluded sweeping statements and theories applicable in all settings.

My work was also 'middle-range' in another sense: it lay squarely between academic intellectual work and practical public policy interventions. Theory and practice have been inextricably intertwined right from the beginning of my academic and professional life: not yet 30 years old, even before defending my PhD dissertation, I became vice-Chairman of the Board of the Industrial Technology Institute in Peru (Sagasti, 1975). The middle-range character of most of my work, which combines theory and practice, continues until now.

Moreover, constructing theories to guide the creation of science and technology capabilities in developing countries is decidedly a 'middle-range' task. During the past five decades, I have been fortunate to be involved in numerous actual policy and political problems that required innovative concepts and interpretations to guide practical interventions. These include my work in several Peruvian and Latin American public and private institutions, in the Science and Technology Policy Instruments (STPI) project carried out in 10 developing countries with more than 150 full-time researchers during the 1970s, in the preparations for and negotiations of the 1979 UN Conference on Science and Technology for Development (Sagasti, 1978, 1982, 1984), in the creation of the Group for the Analysis of Development (Grupo de Análisis para el Desarrollo [GRADE], n.d.), the leading Peruvian think tank I helped

to set up during the 1980s, in the organisation of the Strategic Planning Division at the World Bank, in the UN Advisory Committee on Science and Technology as member and chairman, in several international boards and advisory committees and in many other organisations and agencies I have had the opportunity to work and collaborate with.

Second, the idea of ‘unanticipated consequences of social action’, articulated by professor Merton, has led to detailed examinations of inconsistencies in science and technology policy design and implementation. Finding that science and technology policies often hit a wall when other policy interventions—economic, social, financial, trade, labour and so on—block their intended effect, we developed the concepts of ‘explicit, implicit and resultant policies’; ‘equivalent explicit policies’; ‘policy instruments structures, vintages and pathologies’; ‘contextual factors’ and ‘clusters of function- and issue-oriented policy instruments’; as well as criteria for evaluating the adequacy and effectiveness of different ways of designing and implementing science and technology policies (Sagasti, 2015; Sagasti & Araújo, 1976).

With some trepidation, following in the footsteps of Robert K. Merton and Harriet Zuckerman, I would like to propose a ‘second Matthew effect’. According to verse 6:3 of the Gospel of Matthew, ‘when you do merciful deeds, don’t let your left hand know what your right hand does’. This clearly explains what happens when the merciful deed of designing and implementing science and technology policies with a government’s right hand is frustrated by the impact other government policies designed and implemented with the left hand. Since the early 1970s, we have found many instances of the ‘second Matthew effect’ all over the world in which other public policies undermine and sabotage efforts to develop science and technology capabilities. This is also closely related to what I covered in my book—*Science, Technology and Development: the Sisyphus Challenge of the 21st Century*—which describes how carefully built capabilities are destroyed at the stroke of a pen by indifferent, ignorant or incompetent politicians and government officials (Sagasti, 2004, 2013).

Let me conclude with some remarks on how they will affect my work in the future. Robert K. Merton’s references to Sir Francis Bacon in his *Science, Technology and Society in Seventeenth Century England* awakened my interest in the life, work and impact of this extraordinarily complex philosopher and statesman. Over the years, I have tried to flesh out and understand better what philosopher Hans Jonas (1984) referred to as the ‘Baconian program’ of dominating nature through understanding. After many years of research, I am now half way in the process of writing a book on the twilight of Bacon’s age, which attempts to provide an account of the unfolding, deployment, triumph and twilight of the programme that Bacon articulated four centuries ago (Sagasti, 1997, 2000, 2006).

Finally, there is a passage in Robert K. Merton’s seminal 1972 article on ‘Insiders and Outsiders’ that I would like to quote at length:

As the society becomes polarized, so do the contending claims to truth, At the extreme, an active and reciprocal distrust between groups finds expression in

intellectual perspectives that are no longer located within the same universe of discourse. The more deep-seated the mutual distrust, the more does the argument of the other appear so palpably implausible, even absurd, that one no longer inquires into substance or logical structure to assess its truth claims. ... In the political arena, where the rules of the game often condone and sometimes support the practice, this involves reciprocated attacks on the integrity of the opponent; in the academic forum, where the norms are somewhat more restraining, it leads to reciprocated ideological analyses (which easily declines into innuendo). In both, the process feeds upon and nourishes collective insecurities. (Merton, 1996b, p. 241)

Bearing in mind such clear-headed admonishment, I decided a couple of years ago to fully wade into the political swamps. Together with many other committed colleagues, we have created a new political party to participate in the 2021 Peruvian national elections.³ I will run for political office, attempting to find common ground between those holding opposite views and to introduce integrity and some measure of sanity in the way our country is run.

Armed with a panoply of intellectual weapons, several of them inspired by Robert K. Merton, in a very 'middle-range' way, I hope to contribute both to a better understanding of the human predicament at the twilight of Bacon's age and to help improve the opportunity structure and the quality of life in my own and in other developing countries.

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NOTES

1. Matthew's gospel 25:28 says 'For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath'. Merton (1973) and Zuckerman (1977) referred to the fact that scientific credit and recognition are frequently awarded to academics already famous and recognised in their fields, whose significant achievements place them better to keep on reaping academic rewards.
2. Professor Russell L. Ackoff was my dissertation advisor and his early article on operations research and science policy (Ackoff, 1968) inspired my subsequent work in the field. I was also considerably helped by professors and mentors, Eric Trist, Hasan Ozbekhan and Howard Perlmutter, at the University of Pennsylvania, Ignacy Sachs at the École Pratique des Hautes Études and highly indebted to mentor and close friend Professor Geoffrey Oldham of the Science Policy Research Unit at the University of Sussex.
3. See www.franciscosagasti.com, tab on political activities.

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