

Turning Stone into Gold and Silver into Stone

On the importance of studying innovation

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ABSTRACT

This discussion paper offers a reflection on the importance of studying innovation, using illustrative examples from 16th century Spanish history. Comparing the innovation policies of two successive rulers of the ancient city of Granada the paper makes the case that well-functioning innovation systems can be gradually developed, but also rapidly destroyed, through different public policies. The main argument is that it is possible to oppose the devastation of successful innovation systems by conducting and diffusing good social research that points to principles upon which such systems are based.

Keywords: innovation systems, public policy, social development

Without science and technology, the life of man
would be solitary, poor, nasty, brutish and short.

Keith Pavitt

For a long time, I thought that there must be plenty of topics that are both more important and more enjoyable to study than innovation. I have come to believe that there are certainly topics that are more enjoyable, but few that are more important. This change of heart did not occur all of a sudden, but came sneaking up on me gradually. Sure enough, academic books and lectures have taught me that innovation -the creation of higher quality, lower cost products and services - is crucial for the long-term economic growth and welfare of a society; that it does not accrue in equal amounts in all parts of the world; that specific combinations of public policies and social structure offer distinct possibilities for innovation and so on. Yet, these theories never set off an *eureka* moment of the sort that clears the fog in front of the researcher's eyes and makes it evident why some obscure problem is worth years of arduous study. Rather, I think my conviction emerged from glimpses of resemblance between observations I made at the University when I was trying hard to think about innovation and some I made in my leisure time when I was trying very hard not to. One such glimpse I got while holidaying in the ancient Spanish city of Granada in the summer of 2003. At the time, I was spending lazy hours leafing through Amin Malouf's (1993) *Leo the African* and Washington Irving's (1832) *Tales of the Alhambra*. The books told the following story:

After the fall of Cordoba and Seville, Spanish Muslims sought refuge in Granada, where the founder of the Nasrid dynasty, Muhammad Ibn Al-Ahmar established an independent emirate in 1238. Stretching from the strait of Gibraltar to east of Almeria this became the final remnant of Muslim domination on the Iberian peninsula ruled by the Nasrids from the lavish Alhambra palace for 250 years until the Catholic invasion in 1492.

In this period, Granada became one of the richest and most populous regions in medieval Europe. Being tolerant of people from different religious and cultural backgrounds the Nasrids attracted a large number of scholars, artisans and merchants who were persecuted elsewhere on the peninsula. This fast growing population of highly skilled inhabitants induced two centuries of artistic, scientific and economic splendour in Granada. In those days, the ancient university of Granada functioned as a pathway of science and technology from Greece to Western Europe and, because of its wide acclaim as the best university of the world, it attracted students from Europe, North Africa and Asia-minor who exchanged knowledge about a wide variety of scientific and technical topics such as medicine, algebra, cultivation of crops, textile manufacture, water irrigation and architecture. Moreover, in this period Granada's manufacturing industries thrived. Textiles of unsurpassed quality were widely exported and the region's silk products were used as a benchmark of superior quality. In the Romantic classic *Tales of the Alhambra*, Washington Irving illustrates the success of king Al-Ahmar in the following way:

The Moors of Granada regarded the Alhambra as a miracle of art and had a tradition that the king who founded it dealt in magic, or at least was versed in alchemy; by means he procured the immense sums of gold expended in its erection. A brief view of his reign will show the real secret of his wealth. He introduced abundant streams of water into the city and constructed aqueducts and canals to irrigate and fertilise the vega (...). He gave premiums and privileges to the best artisans, improved the breed of horses and other domestic animals and increased the natural fertility of the soil twofold by his protection, making the lovely valleys of his kingdom bloom like gardens (...). He fostered also the growth and fabrication of silk, until the looms of Granada surpassed even those of Syria in the fineness and beauty of their productions (Irving, 1832: 287-291).

By the end of the 15th century, a catholic army led by Fernando of Castile and Isabel of Aragon, pushed across the emirate besieging towns until they finally captured Granada in 1492. Religious persecution soon followed. Jews were expelled from Spain soon after the city's conquest. A few years later, all Muslims who refused to convert to the Catholic faith or failed to prove that they had done so were persecuted and forced into exile.

In step with the capture of Granada, the Catholic rulers started their conquest of the Americas. Emperor Charles the 5th, grandson of Fernando and Isabel, saw Spanish conquistadors take over vast tracts of the American mainland, subduing the indigenous population. The new colonies sent huge cargoes of silver, gold and other riches back to Spain where the crown was entitled to one fifth of the booty. Charles' son Felipe the 2nd (1527-98) presided over the zenith of Spanish power. Yet his reign contrasts strongly to the rule of Muhammad Ibn Al-Ahmar. Felipe received greater flows than ever from the Americas, but went bankrupt. Silver and gold that was not spent on wars and crusades went into the construction of stone churches, palaces, fortresses and monasteries. The Spanish inquisition banished all literature and education that was not consistent with the scholastic tradition of the Catholic Church and thus removed most of what remained of the country's scholarly and scientific knowledge.

This, in combination with steep inflation brought about by the influx of precious metal from the Americas and the catholic gentry's general disdain for commerce paved the way for Venetians and Dutch to take over Spanish production and trade. The following quotation, taken from a letter from Luiz Ortiz, Spain's minister of finance, to King Philip II in 1558 illustrates these states of affairs:

Of the raw materials from Spain and the West Indies – particularly silk, iron and cochinitilla (a form of red dye) –for which they pay only 1 ducat, the foreigners produce manufactured goods that they, in turn, sell to the Spaniards for between 10 and 100 ducats. In this way, the other European countries inflict greater humiliation upon Spain than the Spanish themselves cause upon the Indians. The Spanish receive gold and silver in return for scrap of greater or lesser value; but by buying back their raw materials for an enormous price, Spain has made itself the laughing stock of all Europe (Reinert 2004: 64).¹

The century following the capture of Granada saw the dramatic decline of Spain from being one of Europe's richest countries towards becoming one of the poorest. While there were a lot more stone palaces, churches and monasteries in Spain in the early 17th century than there had been in the late 15th, Spain became almost completely de-industrialised in this period. Spain, it was said, had discovered the magic formula of turning silver into stone.

While sitting on the hot walls of the Alhambra chewing on these things, it struck me that king Al-Ahmar had in fact contributed to building what current students of innovation would call a system of innovation. By system of innovation, I mean a social system in which a set of economic, organisational and cultural factors - such as a first-rate education system, institutions promoting continuous creation of technical knowledge, an established network of entrepreneurs and financiers, a variety of interlinked industrial branches, and an ambience of openness and tolerance - facilitates innovation. In developing such a system, the Moorish rulers set off a long period of economic growth, social cohesion and welfare in Granada. The Catholic rulers, it seems to me, did quite the opposite; they razed the system with great efficiency and thus contributed to initiating a period of Spanish economic decline that lasted for several centuries.

The above is of course a much simplified version of a complex historical process and the problems facing 16th century Spain are in many ways different from those facing present day welfare states. Yet, the story of Muhammad and Felipe should direct our attention towards one powerful reason for doing social research on public sector innovation. We might never be able to unveil the exact nuts, bolts, cogs and wheels that underlie the innovative capacities of firms, regions and nations, but by doing good social research that points to broad trends and principles on which such capacities are based we might at least oppose the destruction of existing systems of innovation, and perhaps even contribute to the creation of new ones. While the relationship between innovation and economic prosperity seems reasonably clear today, the long term implications of appropriate innovation policies and the fragility of existing innovation systems are perhaps less obvious. Knowing a thing or two about innovation is important not only to those who wish to increase or sustain the level of prosperity in their own (rich) societies, but also for those who want to change the direction of global economic development and contribute to narrowing the yawning gap of wealth between the most- and the least developed parts of the world. In addition, finding ways of

promoting technological innovations, as well as social and cultural ones, is decisive for dealing with the most serious challenge facing humanity today, namely the protection of the environment.

In the complex landscape that is long-term technological, economic and social development, the important thing is to remain ever sceptical towards simple solutions and never stop searching for more accurate descriptions, better explanations and deeper understanding.

About the author

Jarle Moss Hildrum is a senior researcher at the Center for Technology, Innovation and Culture at the University of Oslo. His present research deals with the management of innovation in information technology (IT) and telecom industries. Hildrum holds a PhD in Innovation Studies from the University of Oslo and an MA degree in Science, Society and Technology Studies from the University of Oslo and the Autonomous University of Madrid. His research is published in journals such as *Industry and Innovation* and *Economics of Innovation and new Technologies*. The author can be reached at jarle.hildrum@tik.uio.no

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