

## The Circulation of Penicillin in Spain: Health, Wealth and Authority

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In the summer of 1948 Alexander Fleming, known around the world as the discoverer of penicillin, visited Spain. Fleming had published his famous paper on the antimicrobial effect of the *Penicillium notatum* mould in 1929. During the 1930s researchers worked on methods to extract therapeutic agents from the mould, and by 1942 drug companies in the US had developed efficient methods of mass production. Penicillin was used heavily by Allied troops during the Second World War and quickly spread around the world. Smuggled supplies first arrived in Spain in 1944, with the first official batches following a year later. Its capacity to cure previously fatal infections appeared almost miraculous. It was the wonder drug which defined the new antibiotic age.

Spain was one of many overseas locales visited by Fleming during the period, and he was received with gratitude and admiration almost everywhere. But there was something different about the adulation that met him in Spain. From the moment he stepped off the plane in Barcelona he was mobbed by members of the public, by well-wishers, by scientists and physicians, and by politicians and public figures. Patients who had been treated with penicillin showered him with expressions of gratitude, with letters and poems lauding him as a magician, a hero, a saint. Everywhere they went, Fleming and his wife were followed by cheers and applause, and laden down with flowers and gifts. His visit was celebrated in national newspapers and newsreels. He was invited to broadcast to the nation on public radio, addressed crowds in football stadiums and bullrings, and spoke to packed halls in universities across the country. The Minister of Education gave him a medal, apparently at the special request of Franco. 'Had I been a visiting Royalty or Winston Churchill', Fleming wrote after the visit, 'I could not have been more widely acclaimed'.<sup>(1)</sup>

Fleming's reception seems particularly noteworthy given the political context of the time. It occurred during a period of post-war Spanish isolation, when the Franco regime's ties to the fascist powers defeated during the Second World War had seen it excluded from the UN and subject to a widespread diplomatic boycott. By 1948 some of this hostility had begun to thaw, and the regime was in the process of negotiating a new trade deal with the UK. But high-profile foreign visitors to the country were still few and far between. The regime remained cut off from the institutions and debates which were shaping the post-war world, and its commitment to autarky seemed to preclude involvement in the economic, scientific, and intellectual

networks which were driving the spread of penicillin across the globe.

But for María Jesús Santesmases, the rapturous reception to Fleming's visit reflected important aspects of the Franco regime's policies and ideology. For the Spanish public, penicillin promised to help overcome the repression, hunger, poverty, and illness which had characterised life in Spain since the end of the civil war. Penicillin supplies were extremely scarce, managed as a privilege through government systems, or available to elites through the black market; as with other basic commodities, access to it was used as a tool to maintain social order. Public responses to Fleming were not coordinated directly by the regime, but were stoked by its habits of myth-making and its promises of salvation through authority figures. They emerged from a population which had grown accustomed to worshipping heroic symbols of authority, and which was eager for scientific and technological progress to help alleviate their suffering.

It is Fleming's visit which opens Santesmases' account of the circulation of penicillin in Spain between the 1940s and the 1980s, an account which aims 'to tell a history of Spain through a scientific and medical object' (p. 185). In part it is the story of the drug itself and its impact on Spanish science and medicine. But it also explores the individuals, ideas, and processes involved in the drug's circulation; its cultural and social significance beyond the confines of the hospital and the laboratory. In doing so this book provides a new perspective on some of the key developments in mid-20th century Spanish history and on many of the themes which have preoccupied historians of the period.

Perhaps its most important contribution is the new light which the story of penicillin sheds on gender and gender relations in Franco's Spain. In the aftermath of the civil war, the regime sought to re-establish the traditional gender roles which it felt had been undermined by the modest reforms of the Second Republic. Part of this involved dissuading women from participating in the labour market, restricting access to employment, and curtailing economic rights, all with the aim of limiting women to the domestic sphere and boosting the regime's pro-natalist policies. It comes as something of a surprise, then, to discover that women played an important role in the manufacture of penicillin in Spain, and that women workers featured prominently in contemporary press and publicity about Spanish penicillin factories. But their presence was both symbolically and structurally aligned with the regime's gendered values. Penicillin itself was envisaged as 'a caregiver, a saviour, a clean, pure final product from the manufacturing line able to cure.' As such, its production was promoted as 'a delicate task associated with the way women provide care' (p. 72). Women workers were generally restricted to certain roles within the manufacturing process, managed by and paid less than men. As Santesmases shows, however, there were a number of pioneering Spanish women who managed to reach senior technical and research positions within the industry, their overlooked role paralleling the significant contribution of women in the UK and US to the discovery and development of penicillin between the 1920s and the 1940s.

The circulation of penicillin also forms an important part of the history of rationing, smuggling, and the black market in Franco's Spain. The 'hunger years' which followed the end of the civil war saw widespread shortages of basic goods, including food and medical supplies. Rationing allowed the regime to manage this scarcity, claiming that it was ensuring supplies would go to the most needy. In reality it prioritised the regime's supporters over those of the defeated Republic. Systematic corruption allowed regime insiders to sell supplies on the black market, making huge fortunes in the process, and further restricting access of working-class populations to basic goods. Penicillin was one of these goods, initially only available through the black market before official supplies began to enter the country, and afterwards still an important resource when distribution was controlled by a special government committee. For many people, it was a product surrounded by risk and rumour, sought out in bars and cafes and hidden from public view. Using personal memoirs and some fascinating new archival sources from the Spanish smuggling courts, Santesmases explores how penicillin fit into this illicit economy. It was both a legal and illegal product, imported and distributed through legal channels, and smuggled across borders on boats and donkeys. The black market raised prices beyond the reach of many, but represented a way for others to survive privation and evade official restrictions. The regime sought to regulate its supply and stamp out smuggling, at the same time as the black market flourished and corrupt officials grew rich off its back.

From the 1950s penicillin played its part in the 'developmentalist' phase of the dictatorship, which witnessed the liberalisation and modernisation of the economy, and which paralleled Spain's semi-integration into the political structures of the Cold War West. Spain's penicillin production had begun in 1950, with two factories established by joint ventures between Spanish firms and foreign drug companies which owned manufacturing patents. Although production was approved and managed by the regime's autarkic industrial agencies, these agreements reflected the importance of purchased foreign patents to Spanish industry by the late 1940s. In 1954 one of these collaborations, between the Spanish firm CEPA and the US drug company Merck, was expanded into a research programme for new antibiotics. The screening processes involved the analysis of soil samples to detect antimicrobial activity, integrating Spain into international post-war practices of industrial research. As with penicillin production, this screening programme featured significant contributions from female researchers. By 1966, the laboratory had succeeded in identifying a previously-unknown antibiotic, thanks largely to the introduction of new screening techniques transferred from the US. From the early 1970s, phosphonomycin was manufactured and marketed in Spain and licensed around the world; this drug is still being prescribed today. Its discovery was presented to the Spanish public as a proud achievement of Spanish research and the expanding, globally-integrated Spanish economy.

The search for new antibiotics, of course, was driven by the fears and reality of antibiotic resistance. As in other countries, there was growing scientific and public awareness of the dangers of antibiotic resistance from the 1950s. Penicillin usage had originally been regulated by the Franco regime during the early years of scarcity, at least outside of the black market. But as supplies increased these restrictions were removed, and the fragmented and underfunded Spanish health system lacked the structures necessary to effectively monitor antibiotic usage. It was only with the transition to democracy after 1975, and the health reforms that followed in the 1980s, that a revitalised public health system could begin to address the issue of over-prescription and resistance in a coordinated manner.

At the heart of Santesmases' study is the idea of circulation. Penicillin circulated in the wake of infections which spread freely across national and territorial borders. But that circulation was not a simple process. It involved the circulation of physical objects—mould samples, drug flasks, manufacturing equipment—transported by governments, drug companies, smugglers, and patients. It also involved the circulation of technical knowledge through paper (correspondence, scientific journals) and people (exchanges of researchers, study visits). And around these new products and techniques circulated the hopes and fears of ordinary people: information carried in press reports and newsreels; rumours about supply, cost and availability; faith in scientific progress; and fears about antibiotic resistance. These patterns of circulation were shaped by women, smugglers and workers; by industrialists, financiers and politicians. The case of Spain also highlights the impediments to such circulation. Particularly during the 1940s and early

1950s, the Franco regime placed restrictions on the movement of people, money and goods; government spending favoured defence over science; public health was never a priority; and the regime's political isolation hindered knowledge exchange and economic cooperation. 'Beyond the trend towards global narratives or any apparent homogenisation through standardisation', Santesmases reminds us, 'nations remain relevant within the history of antibiotics' (p. 200).

This unique case study of circulation will find an attentive audience among historians of science, technology, and medicine. It provides us with a new insight into what the 'antibiotic age' meant in the context of post-war Spain, and how the processes of circulation worked in a society where science, industry, and international exchange were all tightly regulated. But it also makes an important contribution to our understanding of Spanish history during the mid-20th century. Despite the thriving and diverse research into the Francoist period and its aftermath taking place within Spain itself, English-language publications have been more limited in scale and scope, particularly in comparison to the volume of work we have available on neighbouring European states. *The Circulation of Penicillin in Spain* represents the kind of archivally-based, transnationally-minded research that we need to enrich our understanding of the period and to embed modern Spanish history into its European and global contexts.

## Notes

1. Alexander Fleming papers, British Library, Add MS 56118. [Back to \(1\)](#)

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