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### DOSSIER: PHYSICIANS , NATURALISTS, AND ALTERITY FROM THE ENLIGHTENMENT TO THE TWENTIETH CENTURY

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ABSTRACT: In the summer of 1796, Pedro María González, a surgeon trained at the College of Cadiz, took part in an expedition commissioned by the Cadiz Consulate with the aim of initiating trading relationships with Smyrna, the most important commercial centre in the Ottoman Empire. On his return, he wrote a document to facilitate future business ventures by Spaniards, describing in detail the customs and traditions of the various social and ethnic groups that inhabited the city of Smyrna. In this paper, I analyse the view of the Turks held by Europeans in the 17th and 18th centuries and the ideological and conceptual factors underlying their negative opinions. I then describe the viewpoint of González himself, especially in relation to Jews, the ethnic group he studied in greatest depth. The fact that they shared a common language, Spanish, undoubtedly facilitated his relationships and his close analysis.

## **Alexander von Humboldt's perceptions of colonial Spanish American societies**

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**ABSTRACT:** This study presents an in-depth analysis of Alexander von Humboldt's descriptions and critical comments on the colonial society of the different regions he visited during his well-known expedition through the Americas (1799-1804). The criticisms of colonialism that he expressed, reflecting his personal convictions, have already been the focal point of many studies, but Humboldt was also able to offer a more differentiated assessment through comparisons of regional and local traditions and developments. This essay focuses on his personal diaries, which offer many interesting comments on colonial societies. These considerations and impressions made during the expedition are of particular scholarly value since they were not subject to censorship of any kind.

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**ABSTRACT:** The army medical officer, Felipe Ovilo Canales, was a prominent and representative figure in colonialist projects in Morocco during the Restoration. Unlike other European powers, Spain's colonial missions were mainly aimed at fostering and controlling the ongoing process of Moroccan administrative reform. In the context of this overall reform strategy, Ovilo developed a political discourse that affirmed the historic convergence of Spanish and Moroccan interests; he played a leading role in Moroccan public health through the Tangiers Health Authority and the Tangiers School of Military Medicine. Finally, he formulated a racial discourse on the «Moors» that was based on historical and moral rather than biological criteria.

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ABSTRACT: This article examines the work of the German-Peruvian physician Max Kuczynski/Máxime Kuczynski-Godard (Berlin 1890-Lima 1967) in rural areas of Central Asia (1924-26) and Peru (1938-48). The main focus of the text is on the scientific approach behind the specific interest of this pathologist in disease and health issues among native populations. Kuczynski's theoretical considerations are analyzed in the context of the wide controversies within the German medical community around a «crisis in medicine» when he was professor at Berlin University during the interwar years. Accordingly, his determination to leave the laboratory and to shift research and healthcare practice closer to rural populations proves to be the expression of profound epistemological and ethical considerations.

**DOSSIER: ISOTOPES: SCIENCE, TECHNOLOGY AND MEDICINE IN THE TWENTIETH CENTURY**

Edited by Xavier Roqué and Néstor Herran

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ABSTRACT: Francis Aston «discovered» the isotopes of the light elements at the Cavendish Laboratory in 1919 using his newly devised mass-spectrograph. With this device, a modification of the apparatus he had used as J.J. Thomson's lab assistant before the war, Aston was surprised to find that he could elicit isotopes for many of the elements. This work was contested, but Rutherford, recently appointed to head the Cavendish, was a strong supporter of Aston's work, not least because it supported his emergent programme of research into nuclear structure. This paper will explore Aston's work in the context of skilled practice at the Cavendish and in the wider disciplinary contexts of physics and chemistry. Arguing that Aston's work was made significant by Rutherford —and other constituencies, including chemists and astrophysicists— it will explore the initial construction of isotopes as scientific objects through their embodiment in material practices. It will also show how the process of constructing isotopes was retrospectively reified by the award to Aston of the 1922 Nobel Prize for Chemistry.

## **Isotope research before isotopy: George Hevesy's early research on radioactivity in the Hungarian context**

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ABSTRACT: This paper presents a framework for the study of George Hevesy's research in the 1910s by distinguishing two styles of radioactivity research: the analytical (as practiced in Manchester and Vienna to some extent) and the natural historical (as practiced in Hungary). Georg Hevesy's approach combined these two types. Indeed, by studying Hevesy's research in context, I show that the earliest applications of isotopes started in parallel with the establishment of the isotope theory of matter.

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ABSTRACT: This paper analyses the role that patents played in the establishment of the isotope industry. In the first part, I survey the number of issued patents on the production of isotopes, also arguing that the isotope industry was typified by inadequate patenting activities. I then examine the factors that hindered these activities by looking at the history of industrial patents in the establishment of the isotope industry. I especially focus on the consequences of the Manhattan Project for patent legislation. As the Atomic Energy Act (1946) made the isotope industry a monopoly of the US Atomic Energy Commission (AEC), it contributed to transform the trading of its relevant patents into a «contentious» business. Since then, inventors and assignors already in possession of isotope production patents could only claim compensation from the AEC, which was authorised to seize them. And those who might have outlined new inventions were now deprived of the economic incentive to do so, since they were prohibited from trading them freely in the international market.

## **Radioisotopes as political instruments, 1946–1953**

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1.—Introduction. 2.—The politics of «American» isotope distribution abroad. 3.—Destinations and complications. 4.—Conclusion: loss of market share.

**ABSTRACT:** The development of nuclear «piles», soon called reactors, in the Manhattan Project provided a new technology for manufacturing radioactive isotopes. Radioisotopes, unstable variants of chemical elements that give off detectable radiation upon decay, were available in small amounts for use in research and therapy before World War II. In 1946, the U.S. government began utilizing one of its first reactors, dubbed X-10 at Oak Ridge, as a production facility for radioisotopes available for purchase by civilian institutions. This programme of the U.S. Atomic Energy Commission was meant to exemplify the peacetime dividends of atomic energy. However, the numerous requests from scientists outside the United States sparked a political debate about whether the Commission should or even could export radioisotopes. This controversy manifested the tension in U.S. politics between scientific internationalism as a tool of diplomacy, associated with the aims of the Marshall Plan, and the desire to safeguard the country's atomic monopoly at all costs, linked to American anti-Communism. This essay examines the various ways in which radioisotopes were used as political instruments during the early Cold War period, both by the U.S. federal government in world affairs and by critics of the civilian control of atomic energy.

**Radioisotopes: «economy of promises»: On the limits of  
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1.—Introduction. 2.—From radium to radioisotopes: The construction of an «atomic medicine». 3.—Biomedicine and radioisotopes in France. 4.—Biomedicine and the construction of the social acceptability of nuclear energy. 5.—Conclusion.

**ABSTRACT:** This paper aims to examine the rise and the fall of biomedicine in the public legitimization of the development of nuclear energy. Until the late 1950s, biological and medical applications of radioisotopes were presented as the most important successes of the peaceful uses of atomic energy. I will argue that the assessment of its medical applications remained relatively limited, despite the major financial investment, the development of the uses of radioisotopes and their important impact on biology and clinical practices. As a consequence, the place of biomedicine in the public legitimization of financial investment in and civilian uses of nuclear energy began to decline from the late 1950s.

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**ABSTRACT:** This paper addresses the technologies used in the production of radioisotopes under the French Atomic Energy Commission (*Commissariat à l'Énergie Atomique*) between 1946 and 1958. Particular attention is paid to the various instruments used for bombarding isotopes, such as accelerators and reactors, and their relationship to the CEA's radioisotope preparation laboratories.

Ultimately, the vast majority of bombardments took place in research reactors. These versatile machines, and the isotopes and other materials that passed through them, act as historical tracers: they shed light on the orientation of the entire atomic energy system in which radioisotope production is found.

### **Isotope networks: training, sales and publications, 1946-1965**

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1.—Introduction. 2.—The isotope market. 3.—The isotope workforce. 4.—Publications. 5.—Conclusion.

**ABSTRACT:** The aim of this paper is to provide an assessment of the spread of isotope-related techniques in Western Europe and the USA during the two first decades after World War II by focusing on structural features. In particular, I analyse three major components of the European «isotope industry»: radioisotope distribution networks, the establishment of training sites and publications in which isotopes played some role as the object of study or as research tools. This leads to an assessment of the importance of industrial applications of isotopes during this period in relation to their biomedical use and offers a transnational comparison in terms of productivity in material resources, workforce and knowledge.

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**ABSTRACT:** Efforts to change the bleak image of the atom bomb galvanised the discourse on the peaceful applications of nuclear energy. This contributed to a utopian vision of nuclear energy, especially of the uses of radioactive isotopes in the immediate post-war period. Desire for peace engendered dreams of a better future based on the use of radioactivity. These dreams were first converted into reality by using isotopes in medicine. These advances were subsequently applied to industry and agriculture. This article gives an overview of the peaceful applications of isotopes in industry and agriculture in Spain. It describes a period in which the initial dreams, sometimes fantastic and sometimes down-to-earth, gave rise to the first applications to meet the needs of economic growth in the 1960s.

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**ABSTRACT:** This paper offers a history of iodine. Goitre is used to trace the trajectory of this element and to articulate a historical account, as a representation of thyroid disorders and of the spaces of knowledge and practice related to iodine. The journey of iodine from goitre treatment and prophylaxis in the late interwar period took on a new course after World War II by inclusion of the element's radioactive isotopes. I intend to show how the introduction of radioiodine contributed to stabilizing the epistemic role of iodine, in both its non-radioactive and radioactive form, in thyroid gland studies and in the treatment of its disorders.

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