

Riding the Wave to Reach the Masses: Natural Events in Early Twentieth Century Portuguese Daily Press

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Abstract This paper brings together science communicated in newspapers in Portugal by looking at how news on natural events were communicated in two different newspapers—the capital newspaper *Diário de Notícias* (*Daily News*) and the *Diário dos Açores* (*Azores Daily*). In particular, we look at how the 1900 solar eclipse, a hot topic throughout Europe, was reported by the capital newspaper, and how news on seismology were conveyed in the period 1907–1910 in the newspaper published in Azores, an archipelago with a significant seismic and volcanic activity. We argue that the importance conceded to these scientific news was related to their overwhelming features, that their dissimilar presentation stemmed from their local relevance allied to their different nature, predictable in the case of eclipses, and unpredictable in the case of earthquakes, and that behind these two instances of science journalism laid an attempt by the scientific and political communities to gain the support of the general public to such an extent that these two specific instances of science journalism transcended their usual features to become successful forms of expository science.

1 Considerations on the Communication of Science in Newspapers

This paper focuses on science communicated in newspapers. In our view this constitutes a particular field which may at times fall under the realm of the so-called popularization of science. Newspapers are by definition a media whose aim is reaching the masses, not merely segments of lay albeit variably educated social strata. In this sense, communication

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of science in newspapers is utterly popular. This fact alone seems to impart specific traits to communicating science in newspapers, defining a particular genre.

The case study addressed here is not about using newspapers as historical sources with the purpose of studying a particular historical question, but as objects of study in their own right, while vehicles for communicating science (Papanelopoulou et al. 2009a). Although newspapers might have similarities with journals devoted to the so-called popularization of science—both are periodical—they present important distinctive features. According to Groth, a newspaper is distinct from a journal or a magazine: it has to be published periodically, at least once a week, by a mechanical process; it has to be easily accessible to anybody who wishes to buy it, as opposed to being addressed to an exclusive and esoteric audience; it should have a generalist character and be organized to ensure continuity; finally, it should be punctually released (Otto Groth quoted in Kronick 1992).

Compared with journals which communicate science to lay people newspapers aim at reaching a broader audience than journals, reaching beyond educated and average cultured readers to cater for people who simply are able to read and even those who cannot read, but willing to listen to others' reading or oral accounts of the news. For this reason, contents have to be presented in the most accessible possible form. It is rather common procedure for newspapers to extract texts from books and journals communicating science to non-experts. But these extracts undergo reduction in size and further simplification (a complex process in itself), which is imposed by the very vehicle of communication—the newspaper—and the public it intends to address. Newspapers, in addition, seek an immediate impact on the public, by reporting and informing about the latest scientific novelties and events. News, reports and articles vary in size and depth, but they all aim at being quickly 'digested' because, by their very nature, newspapers deal with the ephemeral. Their influence in readers is usually reduced to a short time span, despite their mobilizing intent, as newspapers are often associated with specific political projects and marked by particular ideological orientations.

In addition to being highly politicized objects, they are also commercial enterprises, which not only have to be financially viable, but often highly lucrative (Papanelopoulou et al. 2009a; Papanelopoulou and Kjaergaard 2009). The scientific topics which are communicated and the way in which they are communicated have to meet the political orientation of the newspaper and the expectations of the readers, as well as ensuring its profitability or, at least, its sustainability. For all these reasons, newspapers are powerful instruments, in which issues relevant in a particular time and place are often decided on their pages, rather than in parliaments, government meetings or courts of law.

Science communicated in newspapers situated in peripheral countries, a rather new field of work within the community of historians of science (Andersen and Hjermitsev 2009; Gonzalez-Silva and Herran 2009; Mergoupi-Savaidou et al. 2009; Papanelopoulou and Kjaergaard 2009; Tavares et al. 2009), surely deserves further historical analysis.¹

By bringing newspapers into the fore, the clarification of what does popularization of science mean in a European periphery such as Portugal becomes clearer.² If we take

¹ This work emerged within the context of discussions of the specificities of popularization of science in the European periphery, specifically focused on historiographical reassessments (Gavroglu et al. 2008; Josep Simon and Néstor Herran 2008; Papanelopoulou et al. 2009b).

² Reflections on popularization of science in the European periphery have profited from critical reviews on the history of science popularization, with their emphasis on circulation instead of transfer, on communication and expository science instead of popularization, discussions of different aims for the representations of science, as well as on the different forms and functions of expository science, have been discussed (Secord 2004; Bensaude-Vincent and Rasmussen 1997; Shinn and Whitley 1995; Cooter and Pumphrey 1994; Topham 2000; Hilgartner 1990; Cantor and Shuttleworth 2004, FOCUS issue of *ISIS* 2009).

popular to mean either non-elitist or common to all social strata, in a periphery like Portugal the notion of popularization of science as understood by Cooter and Pumphrey (1994) does not hold. For example, nineteenth-century Portuguese journals explicitly aimed at communicating science to wide audiences (Reis 2007), through an adaptation of particular scientific topics to an educated elite, rather than to a wide group of readers including the working class, which in the Portuguese case was poor and generally illiterate. Despite the wishful thinking of their editors and their commitment to target people from all walks of life, these journals were not popular at all; they merely circulated inside a non-expert elite (Reis 2007). In such a context, popular seems particularly suitable to science communicated in the press, whose audience does not exclude the poorly educated and even the illiterate.

In Portugal, in the last quarter of the nineteenth century and early twentieth century, the press emerged as a strong reading reference. In 1906, two of the daily newspapers published in Lisbon of greater circulation sold 70–80 thousand copies daily. Newspapers assumed a truly ‘democratic apostolate,’ by passing onto the public sphere topics ranging from State affairs to diplomacy which up to then did not reach the eyes and ears of common people. They filled a space of the public domain, which aimed at imprinting on the readers the ‘spirit of the century’, that is modernity and progress, and so they were self-conscious of their powerful role. They acted as mediators between people and events, and influenced and marked the country’s agendas (Ramos 2001).

Characterized by the immediate or imminent importance of scientific news for the local population when contrasted with expository science, the topics and forms adopted by newspapers in communicating science became more readily accessible to uneducated populations. With a rate of 70% of illiterate population at the turn of the nineteenth to the twentieth century, through collective readings or oral transmission at taverns, cafés and all sorts of shops, the Portuguese population could have more easily albeit indirect access to newspapers’ contents, including scientific ones.

Having in mind the association of science with the ideas of development and progress, and their smooth articulation with the political agenda of nineteenth century Portuguese liberalism as well as the trends informing both monarchical and Republican movements in Portugal at the end of the nineteenth century, a relevant place was conceded to the regular publication of news about science and technology in these generalist newspapers, including news of local, national and international import.

Science proper was not a major issue when compared with medicine and technology. In this period Portuguese newspapers reported on the latest developments of science and technology by choosing topics which had an impact on people: from railways and telegraphy to cures for tuberculosis and cholera, medicine and matters of public health emerge as those which newspapers ascribed a prominent place (Tavares et al. 2009).³

³ Research for this paper has been done in the framework of the research project *An open window to representations of Science and Technology in the Portuguese Press (1900–1926)*, funded by the Portuguese Research Council (FCT/MCTES). It aims at analyzing public perceptions of science and technology in a country of the European periphery, during the first decades of the twentieth century. It relies on a comparative methodology based on the contrast of news issued in generalist newspapers of different political orientations and geographical provenance and covers a period from the end of the Monarchy (1900–1910) to the end of the First Republic (1910–1926). This project grew out of the collective attempt by some members of the STEP (Science and Technology in the European Periphery) international history of science group to prepare the ground for a comparative study of the views on science and technology as voiced in newspapers in the beginning of the twentieth century in different countries of the European periphery. A very preliminary draft of this paper (Simões et al. 2009) was presented in the International Congress for the History of Science held in Budapest in 2009 and published in a MPIWG preprint (Schirmacher 2009).

Especially when epidemics threatened to disrupt individual, social, economic and even political life, information about what science had to say and offer deserved special attention from the newspapers. Microbes, however, were not easily seen, as they required microscopes and the mastery of techniques inaccessible to the average reader. Despite the damage and danger they might pose to the physical integrity and people's well-being, the very existence of microbes was a matter of believing in the word of scientists, physicians or their reporters, rather than seeing with one's own eyes the agents of disease.

Although topics associated with public health had a high potential of persuading people to engage with science, natural events of local/national import with a spectacular character such as eclipses, earthquakes and volcanoes presented themselves as unique opportunities to reach the masses and earn them to the causes of local scientists and politicians for whom science was the driving force of progress. Regardless the level of instruction, nobody could remain indifferent as the observation of such phenomena does not require mediators or sophisticated instrumentation.

This paper brings together science communicated in newspapers in Portugal—that is science addressed to the people or to the masses. We selected the *Diário de Notícias* (*Daily News*), founded in 1865, a newspaper issued in Lisbon, the political centre and main urban site of Portugal, and the *Diário dos Açores* (*Azores Daily*), founded in 1870, a newspaper published in Ponta Delgada, São Miguel, one of the Atlantic islands of Azores, located mid-way between Europe and America, which due to geo-strategic reasons has often played an important role in Portuguese history.⁴ We further chose to address how two sorts of natural events, eclipses and earthquakes were used in these newspapers to capture the interest in early twentieth-century Portuguese science of the widest audience possible. In particular, we look at how the 1900 solar eclipse, a hot topic throughout Europe, was reported by the capital newspaper, and how news on seismology were conveyed in the period 1907–1910 in the newspaper published in Azores, an archipelago with a significant seismic and volcanic activity.⁵

We argue that the importance conceded to these scientific news was related to their overwhelming features, that their dissimilar presentation stemmed from their local relevance allied to their different nature, predictable in the case of eclipses, and unpredictable in the case of earthquakes, and that behind these two instances of science journalism laid an attempt by the scientific and political communities to gain the support of the general public to such an extent that these two specific instances of science journalism transcended their usual features to become successful forms of expository science. Expository strategies enabled the scientific community, either through their own articles, written anonymously or not, or through the mediation of journalists, to actively enrol the public. Not only did they include forms of public entertainment, but also the participation of the public in observational tasks. In the specific case of the eclipse these tasks encompassed data collecting or pictorial representations to be taken during the event. Regarding earthquakes, the aim was gaining support for the establishment of seismological stations able to register seismological data, which was seen by local scientists as a step towards successful earthquake prediction.

⁴ Newspapers abbreviations used: DA, *Diário dos Açores*; DN, *Diário de Notícias*.

⁵ São Miguel, the island where the newspaper was published has three active volcanoes; in 1957, the major eruption of the Capelinho volcano enlarged the Faial island by 24 km², causing about 300 seismic activities during more than 1 year.

2 Two Portuguese Daily Newspapers: *Diário de Notícias* and *Diário dos Açores*

The last quarter of the nineteenth century was a troublesome period for Portugal. After about three decades (1850–1880) of relatively economic prosperity and domestic political peace (Esteves 2005, 305–335), both based on the positive effects of the Regeneration’s policy of material improvements,⁶ Portugal had to face once again an atmosphere of instability. By 1880, the financial credibility of the country had faded away, and in 1891–92 Portugal was at the verge of bankruptcy.⁷ This climate of suspicion continued until the 1930s.

The 1880s were also a political turning point. The Berlin Conference of 1884–1885 was the summit of the new world order based on the western powers’ voracious appetite for African wealth. Portugal was, suddenly, forced to rethink its colonial agenda in order to accommodate the new ‘effective occupation’ paradigm. The Portuguese *Pink Map* project (1886) voiced this new type of sovereignty over colonial territories. By creating a Portuguese ‘coast to coast’ colony, that is a continuous territory from the western coast of Angola to the eastern coast of Mozambique, Portugal would become one of the leading exploiting powers in Africa. This plan, however, jeopardized the British ambitious ‘Cape to Cairo Red Line,’ a plan authored by Cecil Rhodes, that aimed at linking the northern and southern African territories under British administration. The Portuguese monarchy’s failure to secure the Pink Map project, mainly by accepting the 1890 British ultimatum to drop it, was used by the increasing republican opposition as a banner against monarchic government and its incapacity to assert Portuguese rights both in the national and international/colonial arenas. After a vain attempt to seize control in 1891, the republicans eventually took power in the 1910 revolution.

Both the final years of the Portuguese monarchy and especially the First Republic (1910–1926), used science and technology as part of their political agendas and popularization strategies, at times associated with the adult education movement. In this context, newspapers played an important role in educating the masses.

The second half of the nineteenth century witnessed a vertiginous increase in the number of periodicals appearing yearly in Portugal. To give an example, in the 1880s, 184 periodicals were created contrasting with 35 in the 1850s. By 1894, Brito Aranha (1883–1914), the editor of *Diário de Notícias* estimated at 389 the total number of newspapers and periodicals circulating in the Portuguese mainland and colonies, with a somewhat uneven geographical distribution (Lisbon: 188, Oporto: 91; Coimbra: 32, Ponta Delgada, Azores: 23), placing Portugal above France and England regarding the rate of newspapers per inhabitant (Aranha 1900; Ramos 2001). This is, however, a misleading comparison which should be contrasted with the total number of copies and the newspaper life span.

In 1880, the average total number of copies amounted to 1,00,000 (Tengarrinha 1989); in the beginning of the twentieth century, 67% of the total number of newspapers released between 200 and 800 copies, contrasting with the 70,000 copies of *Diário de Notícias* in

⁶ The *Regeneração* (Regeneration) marks the beginning of the Portuguese industrialization. The Regeneration’s agenda was based on the increasing efficiency of infrastructures in order to enhance the circulation of goods and spur the growth of factories.

⁷ In the 1850s, 60s and 70s, Portugal belonged to a selected group of countries that used gold as their monetary standard, thus enjoying considerable credibility on the international money market. By 1880 Portugal belonged (together with Spain and Italy) to the so-called “Latin group” of European nations, reputed for their troublesome financial balance and organization.



Fig. 1 Frontpages of newspapers *Diário de Notícias* and *Diário dos Açores*

1906.⁸ The two newspapers chosen were among a limited group of around 20 newspapers which had been printed consistently for 30 years, a fact revealing their considerable influence in Portuguese society.

The capital newspaper, *Diário de Notícias*, was paradigmatic of the movement of industrialization of the Portuguese press, which took place roughly in the period from 1865 to 1885. In 1890, the *Diário de Notícias* began using a Marioni rotary printing press, which printed 15,000 copies per hour; in 1904, manual setting-up type was replaced by Lynotype, whose work was equivalent to five type setters (Ramos 2001). These technical modifications were clearly associated with an increase in the number of copies per issue and in the importance of advertisements, with a concomitant decrease in copy price and a concern to reach as enlarged an audience as possible, offering a new style of journalism based on descriptive news by contrast to more literary news expressing particular opinions. José Eduardo Coelho (1835–1889), the founding editor of *Diário de Notícias*,⁹ aimed at creating a popular newspaper costing just 10 réis and accessible to all people who bought it from ‘ardinas,’ newspaper boys, who moved around the city and announced sensational news with characteristic street-cries (Cunha 1904; Ramos 2001).¹⁰

The newspaper *Diário dos Açores* was founded, in 1870, by Manuel Augusto Tavares Resende, an Azorean self-made man who started as a typographer, and managed to buy his own typography. He directed the newspaper for 22 years as a family enterprise. Following his death the ownership was passed onto his nephew Manuel Resende Carreiro for more than 40 years, and then to his children (Moscatel 2000) (Fig. 1).

The creation of this newspaper, which inaugurated the daily press in the Azorean islands,¹¹ was inspired by the creation of *Diário de Notícias*, in Lisbon, in 1865. The context of creation of *Diário dos Açores* was far from favourable: high rates of illiteracy,

⁸ Although the numbers of the *Diário dos Açores* are not available it is plausible to think that its output was arguably smaller.

⁹ Together with Thomaz Quintino Antunes.

¹⁰ The famous appeal to the creation of cheaper newspapers was made by Eduardo Coelho, while president of the *Associação Typográfica* (Typographical Association). In effect, the price of newspapers with a higher output decreased successively from 30 to 20 and then to 10 réis (Portuguese currency). On the other hand the newspapers’ boys were an innovation in Portugal introduced by Eduardo Coelho, who for each 10 réis gave 3 réis to them.

¹¹ Up to then newspapers in the Azores were published every 2 weeks and were overtly marked by political agendas.

and poor circulation of people, goods and information. The aim of this newspaper was to reverse this situation by providing news with the least delay possible, but it had to overcome complex technical difficulties, and scarcity of subscribers and funds, notably due to the initial absence of advertisements.

Resende, however, resorted to various strategies: the publication of serials; articles popularizing inventions, science and technology novelties and curiosities, certainly to please part of the Azorean elite engaged in science, and with a definite project; articles giving special emphasis to topics of local interest; the creation of an organized network of correspondents in São Miguel Island; finally, subscribers received small gifts with the newspaper. Articles and reports were often anonymous or signed by a pen-name, but in the first decades of the twentieth century, the names of the poet Theobaldo da Câmara, the naturalist Bettencourt Ferreira and of Carlos A. Menezes were recurrent.

In the early twentieth-century, the *Diário dos Açores* was aligned with the journalistic tradition of the nineteenth-century: it was politically engaged and in tune with the local progressive monarchic intelligentsia linked to the *Partido Progressista* (Progressive Party). The modern and dynamic character of this newspaper brought to the islanders debates and discussions on the cultural and political renovation of Portuguese society, voiced by important intellectual movements, in particular the 1870 Generation and its sequels.¹²

The *Diário dos Açores* was also engaged in the promotion of scientists and intellectuals born in Azores, whose work had earned recognition on the continent and abroad, and naturally paid particular attention to local questions and causes.

Like the capital newspaper, it had a large format and was composed of four pages, two of which were devoted to advertising, and seldom used illustrations. Around 1910, it was organized in nine sections average, titled respectively: Scientific Review; Cases and Notes; Impressions and Notes; Military Review; Small News Throughout the World; Science latest News; Lectures held at the Commercial Athenaeum; Agricultural Section; Through the Fields and Gardens. Often articles on science were extracted from foreign publications, usually presented as curiosities. Like in newspapers on the continent, hygiene and public health were dominant topics, but the *Diário do Açores* is exceptional by giving a prominent place to meteorology, oceanography, botany and occasionally geology, certainly due to the position of the islands in the middle of the Atlantic, its particular flora and its volcanic nature and high seismic character (Tavares et al. 2009).

Contrary to the Azores' newspaper which was politically engaged in a double sense, either by aligning itself with a particular political party, or by making politics its main theme, the capital city newspaper took a 'neutral' stance from the political point of view as a result of its ideological commitment to a new descriptive trend in journalism, by counteracting a former style based on interpretative news (opinion news). It assumed itself as a popular newspaper, in which political neutrality combined with trivial news. Its main purpose was to eradicate long opinion articles, avoid discussions of political and polemic issues, leaving to the reader the task of forming his own opinion based on factual descriptions of events.

¹² The 1870 Generation (*Geração de 70*) was a group of Portuguese intellectuals who held meetings at a casino, in Lisbon, in which they set out to reflect and discuss political and social change in the world and in Portugal, as stated in their manifesto. They shared an internationalist outlook in social, political and cultural matters, refused the idea of their country continuing to remain alien to the new ideas circulating in Europe, and engaged in investigating the conditions for the political, economic, social and moral transformation of Portuguese society.

In both newspapers, *Diário de Notícias* and *Diário dos Açores*, the editor played a determining role in shaping the profile of the newspaper and its contents.¹³ Besides the editor, who was usually the soul of the whole enterprise, the newspapers' staff consisted of a publisher, and a few more people, including reporters who covered national news, and occasionally special reporters who were sent abroad to cover international events which were becoming an increasingly important part of their content. The telegraph was nevertheless the privileged means of communication to transmit news from abroad, which prior to this period were received with a delay of several days or even weeks.

By taking into consideration the high illiteracy rate of the Portuguese population at the end of the nineteenth century (Marques 1976),¹⁴ it becomes clear that generalist newspapers were addressed to the masses, which included a small fraction of literate people with reading habits who could afford to buy daily newspapers and those who, despite being unable to read and write, joined in taverns, cafés, barber shops etc. to listen reading the latest news. It is evident that readers were voluntarily receptive to the news and opinions expressed in newspapers. However, and contrary to recent trends in journalistic practice which take into consideration specific profiles and expectations of readership audiences, the nineteenth-century journalistic ideal envisioned newspapers as a forum for the expression and transmission of specific trends of thought, fulfilling the higher mission of informing, clarifying and forming popular opinion. By playing the role of mass educators and agents of social transformation, their contents were shaped mainly by publisher and editorial policies, mirroring the opinions of intellectual, economic and/or political elites.

3 Earthquakes, Volcanoes and Weather in the Azorean Newspaper

Since the nineteenth century, due to its peculiar geographic position and natural features, in particular its endemic fauna and flora, the Azorean archipelago attracted the curiosity of distinguished naturalists. In 1838, 2 years following the landing of Charles Darwin in Azores, the Swiss Augustin Pyramus de Candolle, who developed innovative research on plant systematics and physiology, suggested his colleague Heinrich J. Guthnick, working at the Botanical garden, in Bern, to investigate the Azorean flora. A mission was sent to the Azores and the specimens collected resulted in the publication of the *Flora Azorica* (1884), following De Candolle's death, by the German botanist Moritz Seubert, who actually never set a foot in the archipelago. The presence and interest of foreign naturalists in the Azores, surely imprinted a mark on local scientists as in the case of the young and promising naturalist Arruda Furtado, who became Darwin's correspondent in the islands (Tavares 2010).

The geology of Azores, in addition, also awakened the interest of naturalists. In 1857, the Prussian Georg Hartung visited the islands and studied their geological features, following the exploration of Madeira and the Canary islands together with Charles Lyell, in the years 1853 and 1854, the very same period in which he had learnt how to become a geologist (Tavares 2010).

¹³ Using as role model Eduardo Coelho, his successor as editor of *Diário de Notícias*, the journalist Brito Aranha, was a self-made man who had started as an apprentice typographer and became the author of the last volumes of the impressive *Dicionário Bibliográfico Português* (*Portuguese Bibliographic Dictionary*), still a fundamental source of information for historians (Aranha 1858).

¹⁴ In 1900, 78.6% of the population was illiterate—71.6% men, 84.9% women—from a total of 54,23,132 inhabitants. In 1900, inhabitants of Lisbon totalled 3,56,009, the inhabitants of Oporto 1,68,000.

Throughout the nineteenth century, the archipelago was able to grow its own brand of naturalists, among which captain Afonso Chaves, a naturalist, geophysicist and meteorologist, emerges as the most prominent: not only did he initiate the international cooperation for the investigation of meteorological phenomena in the Northern Atlantic, thereby contributing to the improvement of weather forecasting on the European continent, but he is also associated with the beginnings of seismology, geomagnetism and volcanism in the North-eastern Atlantic. In this context, his association with Prince Albert I of Monaco has been recently object of investigation (Tavares 2009).

The *Diário dos Açores* reflected this local context. Between 1907 and 1910, the *Diário do Açores* under the directorship of Manuel Pereira de Lacerda published news on seismology and volcanology. Their distribution was the following: 1907, five pieces on the whole, one of which in serial form composed of four long pieces, authored by Theobaldo Câmara,¹⁵ and one short anonymous piece.¹⁶ During 1908, three pieces were published, an anonymous short one on an earthquake¹⁷; one on the Earth's interior, also anonymous¹⁸; one on the future of the globe, basically extracts from Camille Flammarion, signed by the pen-name Syll¹⁹; finally, one on a seismograph, also by Syll.²⁰ Throughout 1909, 10 pieces of news were published on earthquakes and seismographs and related topics: two were not signed²¹; three extracts from *La Nature*, two of which signed by the pen-name Iman²²; one piece signed by the pen-name Syll²³; and four anonymous pieces.²⁴ During 1910, seven pieces were published: one in serial form composed of two anonymous pieces, with the content of a lecture delivered by Afonso Chaves²⁵; one anonymous interview to Paul Choffat²⁶; a serial composed of three anonymous pieces on the Halley comet, which included a few references to earthquakes, also based on a lecture delivered by Afonso Chaves²⁷; one short piece on volcanoes,²⁸ and one long piece on the future of Europe based on alleged claims by the French populariser Abbot Théophile Moreux.²⁹

The interest of *Diário dos Açores* in seismology and volcanology was certainly precipitated by the natural disasters which occurred in the first decade of the twentieth century. The years between 1902 and 1909 saw the occurrence of earthquakes, which left behind a trail of destruction and human loss in various regions around the globe: the first in the Martinique, in 1902; in 1903, in Mendoza (Argentina) and in central Portugal; in San Francisco (USA), in 1906; in 1908, in Messina (Italy), and finally, in 1909, in Ribatejo (Benavente), a Portuguese province not far from Lisbon. Following the disaster of Messina, the Association of

¹⁵ DA, 4, 7, 24 May 1907; 3 July 1907.

¹⁶ DA, 19 July 1907.

¹⁷ DA, 11 April 1908.

¹⁸ DA, 11 March 1908.

¹⁹ DA, 3 June 1908.

²⁰ DA, 13 November 1908.

²¹ DA, 7 October, 24 December 1909.

²² DA, 1 and 3 February, and 30 March 1909.

²³ DA, 3 February 1909.

²⁴ DA, 7 October; 24 and 29 December 1909.

²⁵ DA, 1 and 4 February 1910.

²⁶ DA, 4 February 1910.

²⁷ DA, 26 and 30 April; 2 and 3 May, 14 June 1910.

²⁸ DA, 14 June 1910.

²⁹ DA, 2 July 1910.

Portuguese Civil Engineers, a powerful organization given the prominence of engineers in the political sphere, had appointed, on 27 February 1909, a Commission in charge of studying earthquakes that had occurred in Portugal, but the seism in Ribatejo on 23 April 1909, generated a movement involving the Portuguese Parliament and the press, which prompted the government to initiate the process of creating a national seismological service. To this end, the Ministry of Public Works appointed two committees: one in charge of investigating methods of construction and reconstruction in seismic regions, as well as of studying quakes from a scientific point of view; the other, appointed on 2 December 1909, was entrusted the organization of the seismological study of Portugal. This committee was composed of the directors of the meteorological observatories of Oporto, Coimbra, Lisbon, and Azores. Chaves represented the Azores Meteorological Observatory in the committee, which also included the geologists Alfredo Bensaude—a mineralogist trained in Germany, founder and first director of the Technical Institute, created in 1911—and Paul Choffat—a Swiss geologist who worked in the Portuguese Geological Survey for more than 40 years. As up to then Portugal did not possess a seismological network, in January of the next year, this committee selected the places in the country where observatories and seismological stations should be established (Choffat 1909).

Since 1902, the year of the seism of the Martinique, two seismological stations had been established in the Azores, in Ponta Delgada and Horta. The next year, another station was set up in Coimbra, and only in 1910 was Lisbon endowed with one. The pioneering role of Azores in establishing seismological stations reflects the commitment of the Azorean elite, which knew how to play its cards, by taking advantage of the geological nature of the islands.³⁰

It is worth noting that the *Diário do Açores* throughout 1909 hardly mentioned the Ribatejo seism, giving more space to the Messina earthquake, which had occurred on 28 December 1908. The only reference to the Ribatejo seism appears with regard to the organization of the national seismological service.³¹ In it, readers are informed that Chaves had sailed to the continent on board of the ship *São Miguel* to attend the meetings of the above mentioned committee. This piece of news reflects that what really mattered to the Azorean newspaper was the local relevance of the organization of a national seismological service, following in the footsteps of the meteorological network in which the islands, through Chaves, participated. Furthermore, when comparing the extensive coverage of the Ribatejo seism in *Diário de Notícias*, which occupied the frontpage for successive days, weeks and months, it is again the locality factor which appears to be guiding the extent and contents of news' coverage. Except for few news of a scientific character, dealing with the causes of earthquakes, all news deal with the social implications of the seism, enumerating with detail the many actions taken by the government and all sorts of entities to help the suffering population. In the Lisbon newspaper it is not the seism as a natural phenomenon that matters but its physical consequences and the role of the newspaper as mediator between the population and decision makers.³²

³⁰ In 1929, Porto had a seismological station and in 1932, Angra do Heroísmo, in Azores, was also set up a station.

³¹ DA, 29 December 1909.

³² DN, 24 April 1909. "Yesterdays's earthquake." From there on, news on the earthquake appear daily and prominently in the front page, as well as in successive pages. After mid-June their positioning in the first page is less striking. The exceptions of a scientific character are DN, 29 April 1909; DN 9 June 1909, which include news on the preparation and delivery of scientific talks by members of the Portuguese scientific elite organized by the newly founded Academy of Sciences of Portugal; and DN 5 May 2010, Section Scientific Chronicle, another article on the causes of earthquakes signed by the naturalist and popularizer J. Bettencourt Ferreira.

Coming back to *Diário dos Açores*, in subsequent news, an earthquake in Mexico, a submarine volcano observed by a ship somewhere near Belle Isle, or the formation of a new island following a volcanic eruption in Burma, always deserved a few lines. But more or less long articles on seismology and volcanism aimed at acquainting the readers with hypotheses and theories on the causes of these phenomena, and at enlisting them in the scientific projects and causes of the local intellectual elite. The hope of rendering these natural events predictable and in this way diminish their impact was certainly assumed as being appealing to Azoreans, who live permanently under the threat of earthquakes whose consequences they know too well.

Long articles on seismology and volcanology were often published, usually on page one and in a serial form, by authors—under their own name or a pen-name—of whom little is known so far, or by an anonymous reporter. The approach is often historical as past theories are presented to readers in a chronological framework, together with the discussion of the latest hypotheses and conflicting theories. Controversy is taken as part and parcel of the construction of scientific knowledge as well as its incomplete nature. The views of philosophers and of more or less renowned local or foreign experts, who were then trying to unveil the causes of earthquakes and volcanoes, are used as sources of authority and legitimation.

In a serial written by Theobaldo da Câmara, one of the topics addressed was the origin of the Universe, the Earth's hidden interior, volcanoes and the causes of earthquakes.³³ The Earth's interior is discussed, in particular its temperature and physical state, from the surface to the centre. Regarding volcanoes, a short review is made from the mythological interpretations of antiquity to the views of the American Thomas Sterry Hunt, advocating that between the surface and the centre of the Earth there is an intermediate layer of molten rocks from which lava originates. From his various sources, Câmara concludes that volcanic eruptions seemed to be the result of a struggle between the vapours inside the Earth and huge masses of solidified matter obstructing their passage. The geographical distribution of volcanoes in the vicinity of seas and oceans seemed to corroborate this interpretation, but Stanislas Meunier, the French herald of experimental geology, denied it: he claimed that the Andes and the Abyssinian mountain ridges pointed precisely to the contrary.

Earthquakes were up to then often associated with volcanoes, although they are distinct phenomena and not necessarily linked. Câmara sets out to discuss the causes of earthquakes. He begins with theories ascribing to the Moon, the Sun or other planets the cause of seismic phenomena, then moves to the tectonic theories of Albert Lapparent, and presents a typology of earthquakes based on their possible causes: subterranean collapsing, volcanic and structural. He then proceeds to the theories of the Austrian Eduard Suess and the American James Dwight Dana, Lapparent, and the Irish Robert Mallet. Their views pointed to the fact that the Atlantic axis, where Azores is located, and the depression of the Great African Lakes were the regions of the globe of highest seismicity. Given the hypothetical status of all these theories, only the methodical and systematic recording of seismological data could lead to sound conclusions about the causes of seismic activity. Câmara reaches this conclusion at the end of this serial, which is telling. Although at this point he does not make explicit the importance of Azores in a network of seismological observatories, the fact that the islands were then part of an international meteorological network reinforces the mutual association of meteorology with seismology. Both were

³³ DA, 4, 17, and 24 May, and 3 July 1907.

based on recording data by means of instruments, and linked by the same assumption, the need to predict phenomena in order to reduce possible damages.

Meanwhile, short news on earthquakes occurred in other parts of the world, notably in the UK, began to make readers familiar with seismographs. As Mercurio, certainly a pen-name, reports: ‘From London, seismographs continue to record violent earthquakes (...)’.³⁴

It is worth mentioning that short news on seismology published in 1910 also focussed on seismological stations,³⁵ notably on the fact that nationwide, including the Azores, these stations were required to report any event to the Central Seismological Station Don Luis, in Lisbon; or that the geologists Bensaude and Choffat required the Observatory of the University of Coimbra to analyse seismograms from the earthquake felt on mainland Portugal, on 23 April 1909.

In this and subsequent serials on this topic, the aim is increasingly to reinforce the agenda whose core argument was the need to establish in Portugal an internationally linked seismological network. Surely, the participation of Portuguese seismology in the international scene by means of its own network of seismologic stations was perceived as an element contributing to raising the country’s prestige abroad, still suffering from the sequels of the trauma inflicted to national pride by the British Ultimatum, in 1890.

A serial by an unknown author focussing on the Seismological Service of Portugal began being published on 1 February 1910, reproducing a lecture delivered by the local expert Chaves. In turn, Choffat was interviewed about the possibility of predicting earthquakes through the use of seismographs.³⁶ Choffat’s penetrating eyes and vivacious expression, features usually present in descriptions of his persona, are emphasised by the anonymous reporter, undoubtedly to accentuate the authority of his source. Perhaps unexpectedly, Choffat argues unequivocally that, so far, there was not a single instrument capable of predicting earthquakes: seismographs simply record the motion of the ground while earthquakes are occurring, and seismograms are interpreted following the phenomenon.

Surely, with the aim of counterbalancing Choffat’s categorical statement, the reporter mentions Father Atto Maccioni, director of the Geodynamic Observatory of Siena (1908), Italy, who argued that the magneto-electric waves produced by seismic phenomena can be detected by appropriate apparatuses shortly before an earthquake. But in view of Choffat’s authoritative statement, the reporter recognised with some dismay that Maccioni’s claims required further proof.

In the same issue, readers are informed that Choffat had replaced Chaves in the international conference on seismology, which took place in Zermatt, Switzerland. On his arrival, Choffat was again interviewed, and reiterated his views on the prediction of earthquakes by arguing that seismographs were still unreliable: the proof was that at Zermatt, none of the models competing for a prize met the requirements. Confronted with Choffat’s authority, the reporter wondered how one could believe in the claims on earthquakes made by fortune tellers often published in newspapers. In the next issues, however, *Diário dos Açores* will allocate considerable space to extraordinary claims, surrounding earthquakes and volcanoes.

Volcanoes could also play a part in utopias of progress—which the newspaper uses to seduce its readers and secure their support—with mankind profiting from natural resources and phenomena, reaching easily the highest standards of living, and even overcoming those

³⁴ DA, 19 July 1907.

³⁵ DA, 1 February, 17 August 1910.

³⁶ DA, 4 February 1910.

then available only to a few fortunate millionaires. In par with synthetic dyestuffs and fabrics that would make women's dresses accessible, the power generated from volcanic eruptions would be used in the workings of civilization.³⁷

The association between meteorology and seismology is made more explicit in a serial whose first article refers to an official report dating from 1904,³⁸ the pretext being a lecture delivered by Chaves at the local Commercial Athenaeum. The unknown author begins by drawing attention to the past links between astronomy and meteorology, but the core argument is the meteorological relevance of Azores in the international scene and the use of various instruments like thermometers, hygrometers and barometers whose role in helping to predict the weather is explained in some detail. In effect, with the establishment of the submarine cable in 1893, linking Ponta Delgada (Azores) to Cascais (near Lisbon), meteorological data from the islands, relevant to the Atlantic routes, was sent by telegraphy to Lisbon and London, and from these cities to Madrid and Paris.

Chaves's lecture is then reported in the next page (p. 2), his main argument being the need to create an institute devoted to seismology, following the example of other countries. The topics addressed by Chaves are listed: methods of weather forecasting; history of the use of telegraphy in communicating weather reports; the situation of meteorology in the most advanced countries, with particular emphasis on the USA; the creation of the Azorean Meteorological Service and the importance of the islands from this point of view; seismology and earthquakes prediction; classification of earthquakes; seismic and a-seismic regions; modern distribution of three seismic regions based on geosynclines; underwater depressions and sea floors; propagation of quakes, seismographs and Maccioni seismic monitor; finally, Azores's seismicity, especially of São Miguel island.

This accurate account on the state of seismology does not exclude fantastic accounts from the newspaper, the article titled 'Earthquakes and the future of Europe' being a fine example of its kind.³⁹ It is based on the claims of a French astronomer, meteorologist and populariser, Abbot Théophile Moreux,⁴⁰ a friend of Camille Flammarion, who is only mentioned at the end of the article, surely to raise readers' expectations.

According to the alleged claims of Moreux (1909), which border satire and anecdote, the Iberian Peninsula would become an island, in the future. Great convulsions such as volcanoes and quakes would cause the disappearance of southern France in the Ocean, and Portugal and Spain would be surrounded by the sea. But readers had nothing to fear, as the reporter reassures them that the structure of the Iberian Peninsula and life would be pretty much the same, unlike southern France and the Balearics, which would be swallowed by the Mediterranean.

Despite the bleak prospects, all these terrifying events would also lead to providential results, in the end: with France reduced to a half, the French were then concentrating on the plans to build a canal right through their nation, between the Atlantic and the Mediterranean, which would be far better than resorting to Gibraltar.

Surely, the experience of French entrepreneur-engineers in building canals such as the Suez, in 1866, explains Moreux's alleged burst of optimism shared by the Azorean newspaper. Despite the loss of part of its territory, it seems that with the providential help

³⁷ DA, 15 February 1910.

³⁸ DA, 13 May 1910.

³⁹ DA, 2 July 1910.

⁴⁰ In the Azorean newspaper his name is misspelled as Moreaux.

of nature Moreux (1924) was allegedly giving French engineers the chance to recover from the failure in building the Panamá Canal (1880–1885).

But natural providence would be felt more widely even if disguised in a catastrophe of this magnitude. In the alleged Moreux's account, England would vanish and Germany's expansionist pretensions would be equally punished: Germany had no choice but to resign to a smaller territory. Russia, in turn, would lose the steppes and Italy, for so long enduring violent earthquakes and volcanic eruptions, would be spared as a kind of compensation.

The future would belong to the Latin race, concluded the anonymous reporter from Moreux's alleged forecasts. While the British, the Saxons and the Slaves would be left with practically nothing, the Latin world would finally regain its former glory and power, since Portugal, Spain and Italy would remain unaffected by these extraordinary natural events.

The possibility of Moreux being a *blagueur* is, however, raised by the reporter, but he argues that the French *savant* had based his predictions on scientific data. By comparing Moreux's with Flammarion's less radical theories, he ends by reassuring his readers that, in any case, these events would take place in a time span of hundreds of years.

An article signed by Carlos A. Menezes,⁴¹ on the origin of the vegetation of the Atlantic islands, establishes a connection between their flora, climate and volcanic origin. He argues that the islands were spared from the glacial cooling, the descendants of the Tertiary flora remained, and the affinity between these floras and those of the European continent were explained by the prolonged communication between the islands and the continent. Menezes resorts to the hypothesis raised, in 1855, by the Swiss palaeobotanist Oswald Heer who had collaborated with the Portuguese Geological Survey, about the possible existence of Atlantis, the mythical continent linking Europe, Africa and America, of which the Atlantic islands would be the vestiges. This very hypothesis was to be adopted by the Portuguese geologist Pereira de Sousa, in his seismological studies published in the first decades of the twentieth century (Carneiro and Mota 2007).

Azores's peripherality in relation to mainland Portugal, in turn a peripheral land in the European continent, seems to have awakened a wish of belonging to a brotherhood of nations articulated on the basis of common racial, linguistic, cultural and territorial roots, like Atlantis, and translated into expressions like the Latin race, or the Atlantic/Mediterranean people, which although more abundant in popular science, also appear in scientific writings. As localism and nationalism were not enough to affirm the Azores and Portugal in the European chessboard, both politically and scientifically, a coalition of Latin countries would have more chances to succeed even if in the realm of utopia. Besides, Nature seemed willing to cooperate again with its providential hand as it had done in the ancient past, when Atlantis existed in its greatest splendour, or when the Romans controlled a vast empire.

The volcanic nature of Azores and its geographical location in the Atlantic made meteorology and seismology appealing to local readers who had firsthand experience of the effects of earthquakes and of the vagaries of the weather. Both sciences relied on the systematic recording of data by instruments, with a twofold purpose: the explanation of causes and the prediction of events. However, the degree of predictability and reliability of instruments was seemingly higher in meteorology than in seismology, but in both sciences the participation in international networks of meteorological and seismological observatories was perceived as crucial, given the widespread and even global impact of geophysical phenomena. In order to make islanders realise that the advancement of both sciences was of their own interest, various strategies of persuasion were put in place.

⁴¹ DA, 31 August 1910.

News on seismology and volcanology in *Diário dos Açores*, therefore, turned into instances of expository science: they relied primarily on the scientific authority of the sources, used history as a form of legitimating arguments, and resorted to utopia and predictions of overwhelming natural disasters to persuade readers of the need to engage with the advancement seismology, volcanology and meteorology, as championed by the local elite, eager to win the support of its fellow islanders.

4 The 1900 Solar Eclipse in the Lisbon Newspaper

In the same way as the islander newspaper gave preference to news of special relevance to its inhabitants and to the local scientific community, the capital newspaper assumed its role as a national newspaper and reported extensively on the eclipse of 28 May 1900, whose totality path crossed the Iberian Peninsula, both in Spain and Portugal. It is, therefore, certainly not a coincidence that it was the capital newspaper which gave greater prominence to the 1900 solar eclipse. This is especially clear when comparing the coverage of the event by *Diário de Notícias* and *Diário dos Açores*, and when comparing the coverage by the capital newspaper of the 1900 eclipse with the coverage of the eclipse of 30 August of 1905, whose totality path crossed Spain, but not Portugal. In both cases coverage was clearly asymmetrical in quantity and depth of information. In *Diário dos Açores* few news addressed the event, tellingly beginning with an indication of local observational conditions at the city of Ponta Delgada in the island of São Miguel, followed by cursory notices on scientific matters and popular reactions by uneducated people.⁴² In 1905, there were substantially less news on the eclipse in *Diário de Notícias*, and they focused exclusively on matters of national relevance such as the organization of training expeditions to Spain for students of the Naval School.⁴³

The 1900 total eclipse's national relevance materialized in 38 articles in *Diário de Notícias*, distributed from 8 March to 12 December, making often front page. Extensive information on the happening, with descriptions of preliminary observations from various places, was included on the 2 days following the eclipse.⁴⁴ Its importance was such that both the eclipse's day and the day after were declared holidays.⁴⁵

By 1900 there was already an established tradition of organization of scientific expeditions to observe total solar eclipses, which involved scientific societies, astronomical observatories and the sponsorship of governmental entities (Pang 2002). It was furthermore expected that local astronomical communities, from the country where the eclipse was to be observed in its totality, should provide all sorts of information from weather conditions to administrative and logistic facilities, and finally give required support.

Thereby, local astronomical communities were in close connection with expeditionary foreign teams, often escorted them, and at times made observations on site. Of course, this

⁴² DA, 25 May: Local conditions of eclipse observation in the city of Ponta Delgada. DA, 29 May: reporting a telegram listing the two locations of the eclipse's observation in its totality in Portugal (Viseu and Ovar). DA, 16 June: reference to the many news published in other newspapers and the fears of the uneducated population; report on Camille Flammarion's declarations in Spain; DA, 19 June: reference to forthcoming eclipses, especially the one happening in 1905; DA: 21 June, partial transcription of Oom's description; DA: 27 June, report of temperature measurements taken by a woman balloonist.

⁴³ DN 8 April 1905. DN 21 May 1905. DN 27 June 1905. DN 21 July 1905. An exception is the long article by the naturalist and popularizer Bettencourt Ferreira in DN 29 August 1905.

⁴⁴ DN, 29 May 1900. DN, 30 May 1900.

⁴⁵ DN, 13 May 1900. DN, 17 May 1900. DN 22 May 1900. DN 23 May 1900.

did not mean that their observational agendas were the same. On the very contrary, observational programs were prepared beforehand with great care and precision (Wise 1995), and they depended on the astronomical agendas of different teams. Since mid-nineteenth century, a new promising field within astronomy emerged, called at times astrophysics, physical astronomy or solar astronomy, to such an extent that observations performed during total solar eclipses could be guided either by the traditional agenda of positional astronomers or by the new aims of astrophysicists (Smith 2003). For positional astronomers the most important measurements were the moments of the so-called contacts of the moon with the solar disc, particularly the second contact, when totality begins, and the third contact when totality ends. These measurements led to refinements of the relative positions of the Earth, Moon and Sun, and were used for calculations in celestial mechanics. The observation of solar eclipses had also another aim for positional astronomers: they expected to be able to explain the secular changes in the perihelion of Mercury, by looking for the presence of intra mercurial planets. Absorbed as they were with totality time, astronomers did not notice other phenomena of interest to astrophysicists who used new instrumentation, including great reflectors, telescopes of increased light gathering and greater resolution, astrophotography and spectrographs, in order to determine the physical and chemical constitution of the sun, including features of corona, solar prominences and sunspots cycles (North 1994).

The 1900 solar eclipse was therefore an international astronomical event of great importance, commanding the attention of foreign well-known astronomers, who visited Portugal to take part in the eclipse's observations. The capital newspaper assumed its function of a national, not just local, newspaper, reporting on international events especially relevant to the Portuguese population. The newspaper listed the names of foreign astronomers, including the British Frank W. Dyson, Charles Davidson, G.F. Chambers, William H. Christie, the Germans G. Müller, and E. Jost, as well as Alexander C. Dixon, Augustin Morford, and two American women astronomers G. Sawyer and Trittwitz.⁴⁶ Furthermore, it announced special exemptions for them, their luggage and instruments, special train schedules and fares, and best observational sites.⁴⁷ Foreign astronomers, including teams from the same country, split between the two best observational sites, Ovar and Viseu, and as usual in similar situations specialized on different kinds of observations.⁴⁸ The British astronomers from Greenwich, Dyson, Christie and Davidson held an astrophysical agenda, and chose Ovar as their observational site,⁴⁹ as well as the German astronomer Jost while Müller went to Viseu.⁵⁰ Both German astronomers paid special attention to Mercury (Carolino and Simões submitted in 2010). News from weather predictions—thunders and rain—for the day of the eclipse were voiced by the Spanish astronomer Escolastico and given wide publicity.⁵¹

The solar eclipse became also a national event by enrolling the expertise of local astronomers who became key players in a political maneuver of the Portuguese government to recover international prestige after the damaging clash between British and Portuguese, following the Berlin Conference and the British Ultimatum. It was crucial to

⁴⁶ DN 7 May 1900. DN 10 May 1900. DN 22 May 1900. DN 23 May 1900.

⁴⁷ DN, 1 April 1900: Astronomers were exempted from charges on luggage and instruments. DN, 15 March 1900: The Royal Railroad Company offered 50% discount in the fares.

⁴⁸ DN 3 May 1900. Indication of observational site in Viseu.

⁴⁹ DN 17 May 1900.

⁵⁰ DN 27 May 1900. Special reference to Muller.

⁵¹ DN 20 May 1900.

make sure that the Portuguese scientific community proved to be up to international standards of hospitality expected in similar astronomical occasions, in order to help change the negative international opinion on Portugal and the Portuguese (Carolino and Simões submitted in 2010).

News coverage confirmed local astronomers' scientific capabilities. Members of the scientific commission created for the event were announced in the newspaper. The commission was presided by Mariano Cyrillo de Carvalho, formerly professor at the Polytechnic School and director of its astronomical observatory built recently for teaching purposes, Campos Rodrigues, Frederico Tomás Oom, respectively director and sub-director of the Astronomical Observatory of Lisbon, Artur Teixeira de Bastos, who was also a member of the team of astronomers of the Astronomical Observatory of Lisbon, and José Nunes da Matta, professor at the Naval School.⁵²

The Astronomical Observatory of Lisbon was the leading observatory in Portugal despite being more recent than the Observatory of Coimbra, built in the eighteenth century in the context of the Marquis of Pombal's reforms of the teaching system (Simões et al. 1999; Carneiro et al. 2000). By 1900, following a long period of decline, and striving to respond to the new trends in astronomy, efforts were made to turn the observatory into a leading centre in astrophysics in Portugal (Costa Lobo 1933). Contrary to the Observatory of Coimbra's main objectives, the Astronomical Observatory of Lisbon continued to work expertly in the framework of positional astronomy. Despite the increasingly difficult financial situation it went through during the last decade of the nineteenth century, the inventiveness of its director Campos Rodrigues, a true astronomer *bricoleur*, and his ability to introduce ingenious improvements in various instruments, together with the industry and rigor put in all tasks performed by Oom, allowed the observatory to make a mark in international programs aiming at new determinations of the length of the solar parallax (Raposo 2006a, b).

It, therefore, comes as no surprise that Oom was the real moving soul in the commission. He prepared timely and meticulously the reception of foreign teams. He wrote extensively on the eclipse both from the scientific and educational point of views, preparing the population for the events to come before, during and right after totality (Carolino and Simões submitted in 2010). He published a long memoir, including qualitative descriptions and quantitative calculations of the eclipse, characterization of instruments, and specific instructions for all those who wanted to participate, which followed the pattern of eclipse's memoirs (Oom 1900). Five hundred copies were initially printed and the Lisbon Geographical Society was granted a special permission to sell them.⁵³ The parts selected to appear in the newspaper included the characteristics of the eclipse and its progressive phases,⁵⁴ mapped its totality path and presented calculations,⁵⁵ described the effects it provoked on animals, and called attention to its importance for the observation of the solar corona and prominences.⁵⁶ Although the Lisbon Astronomical Observatory specialized in positional astronomy, and Oom belonged to such a tradition, the new roles for eclipses within the recent framework of physical astronomy were highlighted in the selected parts. His scientific description was couched in poetic terms meant to captivate his

⁵² DN, 3 April 1900.

⁵³ DN, 29 April 1900.

⁵⁴ DN, 28 April 1900.

⁵⁵ DN, 25 May 1900.

⁵⁶ DN, 30 April 1900.

broad readership. He certainly knew how to do it as he had long experience of writing popularization texts on astronomy.

The solar eclipse became also a genuinely national event by enrolling several Portuguese scientific institutions in its preparation and observation. Both the Astronomical Observatory of Lisbon and the Lisbon Geographical Society took part in tasks attendant to the preparation and reception of astronomical expeditions by providing logistical and scientific support to foreign astronomers, and involving local authorities and the army in the preparations.⁵⁷ They were also involved in the organization of expeditions involving local astronomers from Lisbon. The astronomers from the Lisbon Astronomical Observatory Campos Rodrigues, Teixeira Bastos and Guilherme Capelo went to Serra da Estrela, close to Viseu.⁵⁸ Astronomers from the Observatory of Coimbra made astrophysical observations in Viseu.⁵⁹ A memoir with the results of their observations, including photographs of the different phases of the eclipse and the solar corona was announced.⁶⁰ Furthermore, the Lisbon Geographical Society organized a ‘scientific excursion’ to Viseu for those interested,⁶¹ including members and spouses. Members were supposed to cooperate in observations, to follow specific instructions,⁶² and preliminary and final results were to be published in the Society’s newsletter.⁶³ Photographic works were especially encouraged due to their scientific and artistic worth.⁶⁴ The scientific excursion was a success involving more than 300 people.⁶⁵

Students from the Naval School, Army School and Polytechnic School participated also in expeditions, which held mainly a training character.⁶⁶ Teachers and students from a school in central Portugal made several observations, including a registration of the variation of temperature during the eclipse. Their results were published afterwards, and highly regarded by the authoritative Oom, who supervised their observations and acted as their expert interlocutor.⁶⁷

As Ruiz-Castell has pointedly remarked, eclipses became often ‘national fiestas,’ events which were used as privileged occasions for national celebrations and partying involving all sorts of people (Ruiz-Castell 2008). The 1900 eclipse acquired also this extra national dimension by enrolling the participation of the population, from the Queen and the consort

⁵⁷ DN 13 May 1900. The Astronomical Observatory secured the transmission of time by its pendula to the telegraphic stations of Ovar and Viseu. Personnel of the telegraphic stations were asked to provide help to astronomers if needed.

⁵⁸ DN 21 May 1900. It is wrongly stated that Oom was a member of the expedition, and there is confusion between the observational site chosen. DN 15 May 1900. DN 23 May 1900. Reference to the preparation of instruments for the eclipse’s observations.

⁵⁹ DN, 3 May 1900. DN, 23 May 1900. DN, 27 May 1900.

⁶⁰ DN, 2 September 1900. Apparently this memoir was never published.

⁶¹ DN, 18 April 1900. List of members of the commission assembled to prepare the scientific excursion. DN, 22 April 1900. Special prices listed for first and second class passengers on the train for first 250 members of the Geographical Society.

⁶² DN, 26 April 1900. The instructions were taken from the memoir prepared by Oom which included a map with the totality path.

⁶³ DN, 19 March 1900.

⁶⁴ DN, 19 April 1900.

⁶⁵ DN, 28 May 1900.

⁶⁶ DN, 29 April 1900. DN 27 May 1900. The team from the Polytechnic School made observations in Viseu.

⁶⁷ DN, 12 December 1900.



Fig. 2 Political cartoons: political astronomy and international eclipse

Prince to uneducated people,⁶⁸ all becoming amateur observers of such a rare phenomenon. They were so many that Viseu accommodated 3,000 visitors, a number which amounted to 1/3 of its population.⁶⁹ Social and cultural events were organized for special guests, from tours to cultural sites to outdoor dinners. In fact, it was announced that the mayor of Viseu prepared visits to the cathedral, to the paintings of the famous Portuguese painting school of Grão Vasco, and organized an excursion on the eve of 29 May to the mountain of Bussaco to enjoy the sun rise. Furthermore, special accommodations, meals, and resting places were arranged by the mayor to all those visiting the city.⁷⁰

The astronomical event also gave way to different extra-scientific uses, from commercial to political ones. An advertisement of German lenses (Bacon lenses) specially fit to follow the eclipse safely through all its phases and sold in a Lisbon shop testifies to its commercial appropriation.⁷¹

Having in mind the international and national political contexts to which we referred previously it is no wonder that the eclipse also gave rise to different political appropriations which used the satirical mode, and specifically cartoons, to convey their criticisms of political international matters of interest to the Portuguese (Fig. 2).

On the eclipse’s day a cartoon dubbed ‘International eclipse’ depicted two astronomers looking at the face of the Sun which represents the politician Paul Kruger, leader of the Boer resistance against British dominion, and elected President of the Republic of Transvaal for the fourth and last time, in 1898. During the II Boer War, his position became unstable. By the day of the eclipse, the situation could not be worse.⁷² While news on the Boer War were often included in national newspapers, it is difficult to ascertain the reasons behind the use of a visual appropriation of the eclipse in such political context.

⁶⁸ DN 23 May 1900. DN 24 May 1900. DN 28 May 1900.

⁶⁹ DN 28 May 1900.

⁷⁰ DN, 24 April 1900. DN, 3 May 1900. DN, 8 May 1900. DN, 27 May 1900.

⁷¹ DN, 24 May 1900.

⁷² DN, 28 May 1900. He left Pretoria the day after the eclipse, at first kept in hiding and then leaving for exile.

But we should have in mind that the persistent interest of Portugal in the Boer War was associated with the construction of a railway linking Lourenço Marques (now Maputo), in Mozambique, to Transvaal. Furthermore, by associating the sun with the leader of the Boers, the cartoon could also reflect an indirect, but still very strong, popular anti-British sentiment, while simultaneously British astronomers were given all support.

At the national level, the political appropriation of the eclipse materialized in a revealing cartoon named ‘Political Astronomy,’ which sharply depicted the great political instability Portuguese society was going through in the last years of the monarchical regime which ended in 1910.⁷³ The sun represented the face of the politician José Luciano de Castro, leader of the Party in power (Partido Progressista). The government was to resign on 25 June, but by 14 May Luciano de Castro was still the commanding Sun, albeit challenged by protests and political rallies, symbolized by the white clouds, and by the Azorean Ernesto Hintze Ribeiro, a man of the opposition and central figure of the rival party (Partido Regenerador), whose face’s contour is symbolized by the big black menacing cloud. He was soon to become Prime-Minister.

The special role played by the capital newspaper in covering news on the 1900 solar eclipse materialized not only in their number, regularity and detail, but also in the different literary genres chosen to convey different types of news. In fact, we can argue that seen through the lenses of the capital newspaper the articles surveyed represent the eclipse in multiple and complementary formats, ranging from organizational leaflets, scientific news, popular texts and cartoons satirizing political events, which were evidence of the mixed features in which the eclipse was appropriated for national purposes. In fact, the eclipse acquired extra lives. It started as an international scientific event which became a national matter with both scientific and social implications. It became the occasion for educating the population, for celebrations and partying. Finally, by turning the eclipse’s day and the day after into two successive holidays, Portuguese astronomy and astronomers were given extra credit and legitimacy.

5 Concluding Remarks

In this paper, two different instances of popularization involving the discussion of sporadic natural phenomena with different characteristics appearing in two Portuguese newspapers were discussed.

Earthquakes and volcanoes are natural episodic phenomena whose occurrence was basically unpredictable while eclipses had been for long accurately predictable by astronomers. Earthquakes and volcanoes commanded respect for their frightening consequences and eclipses for their spectacular features. Their impact could not go unnoticed by the population, from educated people to the masses. Their choice for news’ topics shaped the ways the two sorts of events turned from mere topics for science news into popularization of science accounts: the unpredictability of the first gave way to sophisticated historical digressions, calm outlines of future projects, and fictional accounts; the eminence of the second turned newspapers into efficient vehicles for enlightening readers on the eclipse’s astronomical features and impact, and entreated people to become active participants in the observations.

Furthermore, their choice for news’ topics cannot be taken as neutral information on scientific matters of local or national interest. In fact, both were used by the scientific

⁷³ DN, 14 May 1900.

community as legitimizing strategies through the mediation of journalists who acted between them and the masses. On the one hand, they provided the occasion for the affirmation of Portuguese science and scientists both in the national and the international context; on the other, they provided the opportunity to renegotiate the country's situation in the political and scientific geography of nations. In this context, they emphasized the participation of Portugal in an international network of seismologic stations, welcomed foreign astronomers, and fictionalized a situation in which Portugal would occupy a central position as a mediator between a reshaped Europe and the USA. All added up to a reaction to the negative consequences for Portugal of the British Ultimatum (1890) and the Berlin Conference (1895).

Finally, at the historiographical level, the news on the eclipse reveal how communication of science has to be viewed as a two-way process, in which the population was involved as an active participant, by collaborating in observations which were subsequently incorporated in scientific reports on the eclipse. As instances of so-called popularization of science, eclipse news not only contributed to the affirmation of Portuguese science but also to the affirmation of Portuguese astronomy as part and parcel of the life of the country, counting whenever possible with the active participation of its people.

The case of the Azorean newspaper portrays a distinct situation. The contents and style of the articles were oriented to an educated audience, which was expected to lobby for the interests of the island both in the national and international context, by promoting the participation in a nationwide internationally linked seismological network.

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