



Cuadernos de Ilustración y Romanticismo

Revista Digital del Grupo de Estudios del Siglo XVIII

Universidad de Cádiz / ISSN: 2173-0687

nº 28 (2022)

THE GOTHIC AND THE DEBATE ON SCIENCE IN SPAIN: ECHOES OF *FRANKENSTEIN* IN «UN CRIMEN CIENTÍFICO», *PASCUAL LÓPEZ* AND *EL ÁRBOL DE LA CIENCIA*

María Eugenia PEROJO ARRONTE

(Universidad de Valladolid)

<https://orcid.org/0000-0002-8981-0899>

Recibido: 16-11-2021 / Revisado: 14-7-2022

Aceptado: 25-7-2022 / Publicado: 25-11-2022

ABSTRACT: This article studies Gothic motifs and tropes in José Fernández Bremón's «Un crimen científico», Emilia Pardo Bazán's *Pascual López: autobiografía de un estudiante de medicina* and Pío Baroja's *El árbol de la ciencia* within the tradition of Mary Shelley's pioneering novel *Frankenstein*. They are instrumental for conveying the vexed question of the modernisation of Spain through scientific progress, with approaches that range from the nuanced optimism of Fernández Bremón to the downright pessimism of Baroja. This trend is part of the wider movement for a moral, political, and cultural regeneration that characterised Spanish intellectual activity at the time. The tensions between past and present appear in the three narratives in a line of continuity and readjustment of high aesthetic and intellectual relevance.

KEY WORDS: *Frankenstein*, «Un crimen científico», *Pascual López*, *El árbol de la ciencia*, José Fernández Bremón, Emilia Pardo Bazán, Pío Baroja, debate on science, regeneration of Spain.

LO GÓTICO Y EL DEBATE SOBRE LA CIENCIA EN ESPAÑA: ECOS DE *FRANKENSTEIN* EN «UN CRIMEN CIENTÍFICO», *PASCUAL LÓPEZ* Y *EL ÁRBOL DE LA CIENCIA*

RESUMEN: Este artículo analiza los motivos y tropos de carácter gótico en «Un crimen científico», de José Fernández Bremón, *Pascual López: autobiografía de un estudiante de medicina*, de Emilia Pardo Bazán, y *El árbol de la ciencia*, de Pío Baroja, dentro de la tradición de *Frankenstein*, de Mary Shelley, como novela precursora de la ciencia ficción gótica. La interpretación de estos elementos está relacionada con el tema de la modernización de España a través del progreso científico, tratado desde perspectivas que oscilan

del optimismo moderado de Fernández Bremón al pesimismo de Baroja. El contexto general es el de la regeneración moral, política y cultural característico del pensamiento español de la época. La evolución en estas obras de las tensiones entre el pasado y el presente propias del género gótico adquiere un gran interés estético e intelectual.

PALABRAS CLAVE: *Frankenstein*, «Un crimen científico», Pascual López, *El árbol de la ciencia*, José Fernández Bremón, Emilia Pardo Bazán, Pío Baroja, debate sobre la ciencia, regeneración de España.

INTRODUCTION

Since the publication of Mary Shelley's *Frankenstein* in 1818, the connection between the Gothic and science fiction genres has resulted in a fruitful symbiosis for creativity not only in the literary field, but also in a variety of cultural expressions. Aldana Reyes has noted that science became «a new source of terror and wonder» for many late nineteenth-century writers (2017: 122). Sian MacArthur has defined Gothic science fiction as «a sub-genre of the Gothic, recognizable by its specific interest in science, industry and technology within a Gothic structure» (2015: 2). She explains the phenomenon in terms of the development of the Gothic motifs and the addition, in Morton Paley's words, of «socially relevant» moral questions (qtd. in MacArthur, 2015: 3). From a wider aesthetic perspective, Robert Cobbett insists on the fact that *Frankenstein* was the work that definitely linked Romanticism to science fiction (2001: n. p.). The Gothic motifs most clearly discernible in the new Gothic science fiction, with a variety of emphases and uses, are mystery and secrecy, a flawed hero —or hero-villain, quite often in the form of the mad scientist— and an ominous atmosphere. In the end, as MacArthur states, it is the fear of the unknown, «regardless of the context in which the unknown appears» (2015: 160), that is the driving force and the *raison d'être* of these narratives. In fact, science evolves into the uncanny and the fear of the unknown paralyzes Mary Shelley's protagonist when he has to face the responsibility of his creation. The voice of reason warning against (wild) scientific speculation and practice is also a recurrent motif in the three narratives under discussion.

The literary reception of *Frankenstein* in Spain has been considered a rather late phenomenon since the first translation was published in Buenos Aires (Argentina) in 1912 by the hand of Luis Costarias. The novel's presence in Spanish literature is conspicuous in several contemporary writers of recent decades. However, Mary Shelley and her novel received little attention in nineteenth-century Spain. The first reference to my knowledge appeared in 1844 in a news piece on the Irish Nationalist leader Daniel O'Connell in the newspaper *El Corresponsal*, where Shelley is described as «[u]na dama Inglesa, de gran fama en las letras» (1844: n. p.) and *Frankenstein* is already mistakenly identified as the monster's name. In 1876 *Frankenstein* is mentioned in an article authored by A. M. Fairbairn on the philosopher David Friedrich Strauss in the elitist magazine *Revista contemporánea* (1876: 352). Spanish readers' knowledge is not necessarily implied in neither of these cases since the pieces are translated from British newspapers. Nevertheless, echoes of Mary Shelley's apocalyptic novel *The Last Man* (1826) are found in «Cuento futuro» (1886) by Leopoldo Alas and «El fin de un mundo» (c. 1897) by José Martínez Ruiz (Sánchez Tió, 1995: 25), which indicates that *Frankenstein's* author may have been better known than has generally been acknowledged.

Central themes and motifs in Mary Shelley's novel characteristic of Gothic science fiction such as the uncanny, a flawed hero or a mad scientist, an ominous atmosphere,

the material and ethical challenges of science, the Doppelgänger, and (pro)creation were developed in various ways by José Fernández Bremón in his short story «Un crimen científico» (1875),¹ Emilia Pardo Bazán in her first novel *Pascual López: autobiografía de un estudiante de medicina* (1879), and Pío Baroja in his masterpiece *El árbol de la ciencia* (1911). Even if the impact of *Frankenstein* was indirect, a comparative analysis of these three works shows its relevance for the development of the Gothic and its motifs in Spanish literature related to scientific issues when the regeneration of Spain was a central debate among the leading thinkers and writers of the time.

Spanish science fiction was a more productive genre in the late nineteenth and early twentieth centuries than has traditionally been acknowledged (Lawless, 2011: *passim*). Both «Un crimen científico» and *Pascual López* bear aspects of science fiction, and science is a central theme in *El árbol de la ciencia*. All three works reflect the intellectual climate of their time, as science became one of the main topics among Spanish intellectuals since it was generally viewed as a solid foundation upon which to base the regeneration and modernisation of the country (Hibbs and Fillière, 2015: 14). However, the opposition of the Catholic Church and conservative governments at times denied the means necessary for a sound development of what was understood as modern science. In the 1870s, when both «Un crimen científico» and *Pascual López* were published, heated debates on the role of the Spanish contribution to science and on Darwinism were taking place. On the one hand, Spanish nationalism and Europeanism were the two sides upon which the contenders respectively focused their discourse; on the other, divergent views on the conception of science, essentially philosophic idealism *vs* positivism and the experimental method, were confronted by a complex variety of positions (García Camarero and García Camarero, 1970). Fernández Bremón and Pardo Bazán became involved in the controversies through articles in the press. As the discussion below will show, their works reflect their stance in relation to the polemic. Generally, both writers exploit the Gothic science motifs to undermine the excesses of speculative science, although Fernández Bremón's attitude may be more ambivalent.

The chronological proximity between Fernández Bremón's and Pardo Bazán's narratives can also account for their stylistic similarities. They are somehow placed at a period of transition towards Realism and in both there is a certain generic hybridity since they contain elements from science fiction, the Gothic, Spanish *costumbrismo*, and the detective novel—in «Un crimen científico»—or the picaresque—in *Pascual López*. Nevertheless, their science fiction and Gothic features also place them within a larger literary trend.

JOSÉ FERNÁNDEZ BREMÓN'S «UN CRIMEN CIENTÍFICO»

José Fernández Bremón was a prolific short story writer: over a hundred of his tales appeared in the press between 1866 and 1909 (Martín, 2013: 11-12); he was also a playwright, a journalist, and a novelist. He has been classified as one of the earliest Spanish science fiction writers. He acted as a disseminator of scientific novelties between 1876 and 1909 for *La Ilustración Española y Americana*, the most important periodical of the second half of the nineteenth century. His scientific reports were correct, but often filtered through and manipulated by his conservative ideology (Corell Doménech, 2013: 326). Rebeca Martín has described his attitude towards science as ambiguous, or rather ambivalent, always wavering between fascination and caution (2008a: 172).

¹ I thank Santiago Rodríguez Guerrero-Strachan for drawing my attention to this text.

«Un crimen científico» was originally published in instalments in the periodical *El Globo* in June-July 1875 (Fernández Bremón, 2008: 5n.) and was shortly afterwards included in an anthology of short stories entitled *Cuentos*. Several works have been proposed as sources of inspiration. Rebeca Martín (2008: xxiv) has mentioned Nathaniel Hawthorne's *Rappaccini's Daughter* (1844) and «The Birthmark» (1846). Another possible source is *La Recherche de l'absolu* (1834) by Balzac, an author Fernández Bremón admired (Martín, 2010: 49). Other possibilities are *L'illustre Docteur Matheus* by Emile Erckmann and Alexandre Chatriá, which deals with palingenesis, or even E. T. A. Hoffmann's «The Sandman», which includes a similar obsession with eyes. Both Hoffman and Edgar Allan Poe were translated and widely read in Spain in the second half of the nineteenth century (Guerrero Strachan, 1999; Roas, 2002). They were usually mentioned together, which Fernández Bremón did on some occasions (Martín, 2013: 120). As to *Frankenstein*, most critics refer to it, although in a rather vague manner (Molina Porras, 2006: 41; Rødtjer, 2015: 64; Sánchez Tió, 1995: 7). Rebeca Martín rejects any direct influence because Fernández Bremón never mentioned Mary Shelley in his critical writings and because there was no Spanish translation of *Frankenstein* at the time (2013: 242). One possibility is that since the first translation into French appeared in 1821, Fernández Bremón read the novel during his political exile in Bayonne at some point between 1868 and 1870. His use of scientific articles in English also allows speculation about his reading it in the original language. Moreover, he was related to Catalina Macpherson Hemas (1826-1881), a Spanish writer of Scottish descent born in Gibraltar and married to Joaquín María Fernández Bremón y Zaragoza, Fernández Bremón's uncle. She was well acquainted with English female novelists. Given their literary careers, some kind of personal contact between them can be supposed. Fernández Bremón wrote her obituary for *La Ilustración Española y Americana*, where he does not fail to mention Guillermo Macpherson, Catalina's brother and reputed translator of Shakespeare (1881: n. p.).

«Un crimen científico» deals with a brilliant ophthalmologist, Dr Ojeda, who is obsessed with the idea of curing his blind daughter. Like Victor Frankenstein, his quest is driven by an impossible dream, to discover whether it is possible to see without eyes. He thinks that with practice his daughter will develop the ability to see through touch and forces her to try to read by passing her hand over a lens applied to a book. The young woman, of course, becomes frustrated at every attempt. Nevertheless, Fernández Bremón, like Mary Shelley,² gives verisimilitude to Ojeda's absurd pretension. The narrator makes reference to a famous medical case that had appeared in the London paper *El Español Constitucional* (September 1818-April 1819). The article was a summary of the original English report *A Narrative of the Case of Miss Margaret McAvoy*, published in 1817 by Dr Thomas Renwick, a physician at Liverpool Infirmary. As Renwick reports, several tests seemed to prove that the woman, having gone blind, could «see» by means of touch. Obviously, some kind of trick must have been at play, but the report caused a certain controversy among specialists. Together with this useless experiment, Ojeda keeps a host of one-eyed animals around his premises whose eyes he has removed with the aim of creating an artificial eye. The dynamics of transplantation, which is at the core of Frankenstein's experiment, is also the basis of Ojeda's experiments. Fernández Bremón's character succeeds in making his two blind servants recover their sight by xenograft—transplant between different species— from a pig and from an orangutan, respectively, and he finally manages to make his daughter see by a transplant from a peasant.

² In the 1818 and 1831 Prefaces to the novel, Shelley refers to the scientific background upon which Frankenstein bases his quest.

Michael A. Gómez (2018) has delved into the scientific background of «Un crimen científico» in relation to contemporary theories of light and optics, concluding that Fernández Bremón must have definitely been acquainted with them. The surgical advances at the time make Ojeda's transplants not even remotely possible. Experiments with corneal transplants had been developed since the early nineteenth century (Crawford et al., 2013; Van Rij et al., 2016). The first attempts at animal-to-animal corneal transplant were performed by Franz Reisinger in 1818, who, similarly to the fictional Ojeda, used rabbits and chickens. In 1837 the Irish surgeon Samuel Bigger performed the first successful allograft —gazelle to gazelle. A year later, Richard Kissam performed the first —only partially successful— xenograft by implanting a pig's cornea into an Irishman who had limited sight in his one functional eye. The cornea was rejected within a month of the operation. It was in 1905 that the first successful corneal transplant on a human was performed. Fernández Bremón, still alive, would have seen that his science fiction had come true.

The profusion of experiments on domestic animals conducted by Reisinger is reminiscent of Ojeda's farm of eyeless creatures. If this was mere chance, the experiment performed by Kissam is so strikingly similar to the one Ojeda performs on his servant —xenograft from a pig to a human— that it is tempting to think that he knew about it. Besides, Henri Power had conducted similar transplants on humans and animals, which he reported in 1872 at a conference in London, whose proceedings were published in 1873. In 1876, Power's report was published in Spain in *La crónica oftalmológica*, the first Spanish specialist periodical. Since Fernández Bremón's story appeared in 1874, he may have had direct or indirect access to the English report of the previous year. It was in 1876 too that the experimentations on artificial eyes by the Siemens brothers —considered the pioneers in the field of telecommunication— were published in several scientific journals. They used the photosensitive properties of selenium produced by electricity (Lange, 2003). In the same year, a report of their achievement in this field was published in *La crónica oftalmológica* by Francisco Pérez Escudillo under the startling title «Un ojo artificial que vé».

Although science supported Ojeda's surgical success, the ophthalmologist's quest surpasses its limits. At the end of the story he insists on continuing with the impossible pursuit of making people «feel colours», showing the obstinacy with which he is described by the narrator, who attributes to him «la tenacidad científica del sabio en lucha con lo imposible o lo desconocido» (Fernández Bremón, 2008: 10).³ Furthermore, the name of his servant, Lazarus, miraculously cured by him, indirectly invests Ojeda with a Frankenstein-like superhuman power. However, the distinction between the impossible and the unknown marks the difference between the brilliant scientist, who discovers the unknown, and the mad one, who vainly struggles to achieve what is impossible. Ojeda is incapable of discriminating between true science and chimeric quests; Quixote-like, he wastes his talent pursuing what is clearly impossible, disregarding his great success at eye transplantation. His servant, the Sancho of the story, does not fail to note the greatness of his achievement, but Ojeda considers it a mere technical ability compared to his sublime aspirations: «Aquella [empirical science] consiste en la habilidad del operador únicamente; esta [his chimeric quest] es la sublime, porque ha de confirmar la teoría de los físicos» (Fernández Bremón, 2008: 33). As Jové (2001) notes, the author uses humour and ridicule on his character to criticise the eccentricities of what he considered as pseudoscience. Fernández Bremón was in favour of practical knowledge and empirical

³ Unless otherwise stated, the italics within quotes are mine.

demonstration, and against what he deemed wild speculation. This stand and his strong Catholicism led him to question Darwin's theories:

A los milagros falsos de la Edad Media han sucedido las leyendas científicas [...] Darwin es, pues, un sabio sospechoso de alucinación científica [...] No negaremos que su concepción es gigantesca y le coloca entre los grandes pensadores y naturalistas; pero, antes de aceptar sus obras como expresiones de verdad, es preciso que se sometan a comprobaciones vigorosas que no se han hecho todavía (1882: 266).

A more profound reflection on science relevant to *Frankenstein* is made explicit in another of Fernández Bremón's science fiction short stories, «Los microbios». In it, electricity is made the instrument of immortality through its power to destroy microbes. The result is a society of elderly but completely healthy people, where the sick are burnt in an oven. Fernández Bremón's characteristic humorous twist, as Rebeca Martín remarks, undoes the ghastly prophetic tone of the tale (Martín, 2013: 255).

In one of the reviews of Fernández Bremón's *Cuentos*, which appeared in *La Ilustración Española y Americana*, the critic showed his faith in scientific progress regarding Dr Ojeda's experiments, although he considered the author unaware of their transcendence (Escobar, 1879). In another contemporary critique published in *El Globo*, a reputed critic and writer such as Manuel de la Revilla (1879) dismissed the fantastic element in Fernández Bremón's stories for being at odds with the prevailing positivism. It is obvious that only specialists in the field would have been able to judge the scientific background of «Un crimen científico». One of the keys to understanding this game of perspectives is Fernández Bremón's use of the uncanny. Gothic motifs surround Dr Ojeda. His solitary, mysterious castle, in the middle of a wild and phantasmagorical forest, the cries from the tortured animals and their ghastly eyeless figures lead the villagers to believe him to be a necromancer. Only the young peasant Tomás dares to approach the castle, driven by the need to recover his gambling losses and aided by his rational frame of mind: «su espíritu, poco dado a lo maravilloso, buscaba en vano explicaciones naturales al fenómeno» (Fernández Bremón, 2008: 8). As Rocío Rødtjer has noted, the name of the character evokes the figure of Doubting Thomas (2015: 76). The Gothic motifs are bidirectional as signs of the uncanny. The thick forest that separates Ojeda from the village and his mysterious castle are ominous elements in the unenlightened minds of the peasants but they also become metaphors of Ojeda's indiscriminating judgement. Thus, just as the common people find themselves alienated from scientific progress, the scientist is completely alienated from the common sense and pragmatic logic of real life, represented through the characters of Tomás and Ojeda's servant.

EMILIA PARDO BAZÁN'S *PASCUAL LÓPEZ*

While only conjectures can be proposed regarding Fernández Bremón's knowledge of Mary Shelley, Pardo Bazán's case is more conclusive, at least as regards knowledge of the English author. Emilia Pardo Bazán (1851-1921) mentions Shelley in her famous collection of critical essays *La cuestión palpitante* (1883), although it is only a passing reference including her within a list of female authors (1998: 273). Critics have noted that French influence, particularly that of Émile Zola, is notable in Pardo Bazán's narrative work, but she was also an admirer of the Romantic European tradition, whose characteristics are conspicuous in her early works and even discernible in her later writing.

Pascual López. Autobiografía de un estudiante de medicina was published in 1879, both as an independent volume and in instalments in the periodical *Revista de España*. It is written as a fictional autobiography, with features from Spanish picaresque and *costumbrista* traditions, as Hemingway has noted (1983: 70). Cristina Patiño (1996) has proposed Émile Zola's *Souvenir X* (1868) as a direct inspiration source. Links to *Frankenstein* have been made, among others, by Anne W. Gilfoil, who has studied how both Shelley and Pardo Bazán questioned «prevailing notions about science» (1999: 158) and Eva Acosta (2007: 146). José Carlos Tenreiro Prego (2013) also argues in favour of a direct influence. According to him, the use of Gothic motifs and their combination with proto-naturalistic characteristics in *Pascual López* portray Galicia's backwardness (2013: 84 and *passim*).

The plot of *Pascual López* is split into two parts. The first is the narrative of the protagonist's life as a student of medicine in the Galician city of Santiago de Compostela. Pascual neglects his studies and leads a profligate life. He is rescued by a priest sent by his parents and his reformation is completed by the priest's niece, Pastora, to whom he becomes engaged. The turning point occurs when Pascual attends the lectures of Professor Don Félix O'Narr, a brilliant scientist who has come to Santiago to pursue his quest to transform coal into diamonds. O'Narr wants all the glory for himself and chooses Pascual as his assistant precisely for the young man's scientific incompetence and lack of ambition, but they both meet with tragedy: O'Narr loses his life in an explosion during one of his experiments and Pascual loses Pastora because of his irredeemably profligate nature and dubious ethics.

Félix O'Narr is clearly the Victor Frankenstein of this story. Curiously, both bear a first name with a Latin etymology that is easily recognised and ironic as they are certainly neither «happy» nor «victorious» in the end. They also have foreign surnames associated with magic and necromancy. Frankenstein is a medieval Frankish name, and so has a strong Gothic resonance. Moreover, Frankenstein Castle outside the German town of Eberstadt, which Mary Shelley visited in 1814, was the birthplace of Johann Conrad Dippel, a seventeenth-century theologian, physician, and alchemist who has been claimed as a possible inspiration for Shelley's character. Similarly, the pseudo-Irish name «O'Narr» may also serve to parody esoteric connections in the character's pursuit, which is a version of the search for the Philosopher's Stone. This is one of young Frankenstein's quests too, together with the elixir of life.

Several candidates belonging to Pardo Bazán's intellectual circle have been proposed (Clémessy, 1981: 210-220; González Herrán, 2012; Villar Piñón, 2014: 141-149; Otis, 2002: xix). One more possibility, only cautiously suggested by Villar Piñón (2014: 149), is Augusto González de Linares, a professor of natural science and an active Darwinist who lectured on Darwin's theories at the University of Santiago in 1872. He was deposed from his Chair, like many other of his colleagues, by the Royal Decree of 26 February 1875, that imposed serious restrictions on academic freedom (Sotelo Vázquez, 2015: 99-101). Villar Piñón even affirms that Pardo Bazán was secretly in love with the brilliant naturalist (2014: 100), who was a native of another northern Spanish Celtic province, Cantabria. One of his pupils, José Rodríguez Carracido, later a professor of Chemistry, described him as a sociable, passionate, and eloquent man who always wore very particular garments (1917: 274-275). The description roughly fits that of Professor O'Narr in the novel. Moreover, they are both staunch supporters of «transformist» theories, as Darwinism came to be known among its Spanish opponents, including Pardo Bazán herself, and both became martyrs of what she thought to be a wrongly understood, highly speculative form of science, as I will discuss below.

Félix O’Narr’s experiment can be considered one instance of «transformism», albeit devoid of the negative religious and ethical implications that Darwinism posed at the time. As stated above, it relates to Frankenstein’s pursuits in the field of alchemy. It was in fact a chemical transformation of matter supported by recent scientific developments. Pardo Bazán had a great interest in thermodynamics and a thorough knowledge of the experiments carried out in this field. Laura Otis gives a list of the scientists whom she may have consulted (1995: 82). She even disseminated their work through articles published in 1876 and 1877 in the section «La ciencia amena» of the periodical *Revista Compostelana*. Attempts to produce artificial diamonds had been reported by James Ballantyne Hannay («On the Artificial Formation of the Diamond») in the *Proceedings of the Royal Society* in 1880, one year after the publication of *Pascual López*. It may not be coincidental that in 1880 Pardo Bazán’s friend Rodríguez Mourelo published an article entitled «El diamante artificial». It appeared first in the journal *Novedades científicas* and immediately afterwards in the *Revista de Galicia*, edited by the novelist. Although the success of the experiment was very limited, the publication may have been intended to support the scientific thesis of Pardo Bazán’s work (González Herrán, 2012: 180).

The author also establishes a play with fiction and verisimilitude in literary terms. In the prologue, the narrator-protagonist of *Pascual López* qualifies the tale as «esta verdadera cuanto inverosímil historia» (Pardo Bazán, 1999: 11), an ironic statement on the factual and fictional elements of the novel. It may be said that, at least partially, *Pascual López* is fiction in the guise of scientific discourse and this was Pardo Bazán’s view of Darwinism (Fernández, 2014: 601). Only two years before the composition of *Pascual López*, in 1877, the author had published her famous article «Reflexiones científicas contra el darwinismo» in *La ciencia cristiana*, where she bluntly states that Darwinism is nothing but a novel. She equals it to Ovid’s *Metamorphoses*, which she qualifies as a magical tale («cuento de magia») of transformation (Pardo Bazán, 1877: 488, 492). *Pascual López* is her version of Darwin’s magical tale, where a scientist tries, like Frankenstein, to transform matter by means of electricity.

Other similarities with Mary Shelley’s novel can be found. O’Narr is described in terms that recall Shelley’s Promethean hero: «entre la ceniza de sus pardos ojos brillaba *sobrehumano fuego*» (Pardo Bazán, 1999: 96). Frankenstein is moved by a desire for fame and power (Haynes, 1994: 95), and the same with O’Narr, «[*wealth*] was an inferior object; but what *glory* would attend the discovery, if I could banish disease from the human frame and render man invulnerable to any but a violent death!» (Shelley, 2003: 42). Pascual, however, is only moved by the prospect of material gain. In a dialogue between the two characters, the author develops a Quixote-Sancho dichotomy opposing Enlightenment values (O’Narr) to ignorance and superstition (Pascual). The transformation of coal into diamonds is like the impossible transformation of Pascual, representing backwardness, into a modern scientist. The whole tale can be read as a metaphor for the attempt to modernise Spain led by intellectuals in the late nineteenth century. Moreover, O’Narr lives alone in a big, old, and decaying mansion in Santiago de Compostela. His loneliness and lack of affection is the price he must pay for his pursuit of knowledge and fame, similarly to Victor Frankenstein, who established the model for the lonely scientist (Haynes, 1994: 95). Pascual, O’Narr’s antithetical counterpart, also suffers the consequences of his greed in losing Pastora and what she represents: domesticity, affection, and common sense. Similarly, Frankenstein loses his newly-wed wife Elizabeth and the characters’ end in both novels is a tragic one.

On another plane, the limits of science are exploited under the veil of esotericism and Gothicism, which are conveyed through Pascual, always ready to be impressed on account

of his irrational fears. Night-time scenes and architecture are used to this effect: Pascual sees the decay of the scientist's mansion in a sinister Gothic key, taking things for what they are not and showing how his simple, uninformed mind creates monsters, whereas the professor, rational, brilliant, and informed, creates diamonds. Pascual's entrance into O'Narr's world is presented as a descent into hell, foretelling a tragic end and the explicit Faustian nature of their pact. Pardo Bazán's Gothicism has been associated with the dichotomy between rural (backward) and urban (modernised) Galicia. The depiction of the city of Santiago de Compostela in the novel has been found to prefigure later decadent representations (Tenreiro Prego, 2013: 90; Otis, 2001; García Candeira, 2019). In fact, this dichotomy could also apply to the whole of Spain and thus the novel can be read as a transfer of Frankenstein's experiment to Spanish intellectual death. O'Narr cries out to Pascual: «¡Usted es la materia, la materia inerte y pasiva; yo soy la fuerza, la idea, la actividad, el genio!» (Pardo Bazán, 1999: 116). Laura Otis has noted the relevance of this image in which a foreigner «motivating a Spaniard to act [...] suggests Pardo Bazán's concern with national *abulia* and intellectual backwardness» (1995: 94). The *mezocrazia* that Pascual represents is hopeless, attracted only by the glitter of diamonds. In a similar manner, the character of Formoseda, a dandy whom Pascual wishes to imitate, stands for the old-fashioned and unproductive Spanish aristocracy of the time. The experiment works as a metaphor for the regenerationist cause —moral, cultural, and material— that pervaded the Spanish milieu of the time.

PÍO BAROJA'S *EL ÁRBOL DE LA CIENCIA*

Pío Baroja's *El árbol de la ciencia*, published in 1911, presents some similarities with Pardo Bazán's novel. Together with *La dama errante* (1908) and *La ciudad de la niebla* (1909), *El árbol de la ciencia* belongs to the trilogy called *La raza*, where *raza* means the idiosyncrasy of the Spanish people. The biblical resonance of the novel's title reflects its central theme: the duality between the tree of life and the tree of knowledge, expressed in poignant existentialist terms that recast, deliberately or not, the anguish of Mary Shelley's «Modern Prometheus».

As indicated, critics have not previously considered *El árbol de la ciencia* in relation to *Frankenstein* although Baroja could have read it any time since he was a great admirer of English literature (Alberich, 1961) and he even travelled to England several times, the first one in 1906 (Alberich, 1966). *La ciudad de la niebla*, the second novel of the trilogy to which *El árbol de la ciencia* belongs, reflects his views of the city of London. Years later, an important reference to *Frankenstein* appears in the fictionalised prologue to a collection of short stories entitled *Locuras de carnaval*, published in 1937, where the character of Baroja establishes a fictional dialogue with a lady in a train about modern literature. When he comments that plots are limited in number, she asks him about the possibility of finding inspiration in cinema. She mentions *Frankenstein* as a film that may be productive in this sense, thus showing her ignorance of its literary origins. The author corrects her, telling her about its date and author (Baroja, 1937: 887-888). By bringing *Frankenstein* to the forefront in this dialogue on creativity and originality, Baroja is not merely paying a personal homage to Mary Shelley's work, but placing it in the mainstream of Western tradition. The tacit connection with his masterpiece cannot be passed over.

Baroja's novel is a kind of tragic *Bildungsroman* that narrates the early youth and passage to maturity of Andrés Hurtado, covering his years as a student of medicine in Madrid and his later experience as a young doctor. It ends tragically with the protagonist's suicide at the age of twenty-eight. The novel contains many autobiographical elements, as Baroja

himself and Francisco Fuster (2014b: 177), among many critics, have noted. The author too studied medicine in Madrid and had a brief experience as a general practitioner in Cestona, a small town in his native Basque country. The protagonist's family in the novel and key events related to them bear similarities with Baroja's family life: the difficult relationship with the father, the sister taking the mother's role, and the elder brother's death from tuberculosis. Even two of Hurtado's friends have been identified as Baroja's friends: medical students Carlos Venero (Julio Aracil) and Pedro Riudavets (Montaner) (Fuster García, 2014a: 182-183). Thus, in narrative terms, we move on from the fictional autobiography of *Pascual López* to a kind of biographical fiction.

The novel consists of seven parts (divided into chapters) and can be more generally split into two, with a philosophical dialogue in the middle. Hurtado's disappointing experience as a medical student is portrayed in the first part, where the realistic picture of student life depicted in *Pascual López* finds a continuation. Baroja's view, however, is darker, with an emphasis on the backwardness of scientific studies in Spain and the ineptitude of the teachers at the school of medicine (Otis, 1994: 147; 1995: 96). The picaresque tone is also present, although devoid of Pardo Bazán's humorous tone and shifting into a naturalistic portrait of the city's underworld. A parade of human misery —poor patients in dark and dirty hospitals, the lives of prostitutes, and immoral characters— progressively undermines Hurtado's ideals and faith in the progress that science seems to offer. As a consequence, he falls prey to a thoroughly Darwinian determinism and existentialist pessimism.⁴ Several events add drama and pathos to the story. Like *Frankenstein*, the first tragedy in Hurtado's life is his mother's early death. The similarity with Shelley's novel is strongly reinforced by the coincidence of the only sister taking care of the family. And also like *Frankenstein*, Hurtado is appalled by his younger brother's early death.⁵ The fact is that despite his efforts to cure him, the boy dies and Hurtado sees science to be useless for the first time in his life. He is by then working in an isolated northern village and he is surprised at his lack of grief. This is a sign of having reached the state of *acedia* —an emotional paralysis— he is searching, but it also causes him deep remorse. Like Shelley's protagonist, Hurtado has managed to isolate himself in his intellectual world, which alienates him from the joys and pains of life. And like *Frankenstein's* creature, Hurtado's intellectual growth through the reading of his favourite authors (Kant, Fichte, and Schopenhauer) contributes to deepening his existential anguish.

At this point, Hurtado engages in two philosophical dialogues about life and science with his uncle Iturrioz, who has been considered to represent the mature Baroja's personality (Fuster García, 2014b: 249). The two exchanges recall *Frankenstein's* dialogues with the creature, recreating the father/son-God/Adam opposition, where experience and inexperience are confronted. Iturrioz offers Hurtado a practical view of life away from the useless and hopeless struggle of his idealism. It echoes *Frankenstein's* dichotomy between biology —the power of life, with all its cruelty— and ethics. Iturrioz undermines Hurtado's idealism, fiercely attacking the idea of the noble savage and advocating life at the expense of science (reason), while Hurtado struggles dialectically to maintain his faith in it. Nietzsche's man of action and Schopenhauer's contemplative life, the tree of life, and the tree of knowledge, are thus confronted. At one point, an exultant Hurtado exclaims: «¡Cuántos terrores no nos ha quitado de encima el análisis! Ya no hay *monstruos* en el *seno de la noche*, ya nadie nos *acecha*», to which his uncle replies: «Sí, nos ha quitado

⁴ Pura Fernández singles out *El árbol de la ciencia* among all of Baroja's novels for its use of Darwin's theories (2014: 620).

⁵ In real life, it was Baroja's elder brother who died of tuberculosis.

terrores [...] pero nos ha quitado también vida» (Baroja, 1985: 185, 186). The message is made even more explicit in Hurtado's ironic words: «Habrá que creer que el árbol de la ciencia es como el manzanillo, que mata a quien se acoge a su sombra», which Iturriz bitterly confirms (1985: 182). The tree of knowledge destroys the tree of life. The illustrations chosen for the front and back covers of the first edition of the novel were the image of the thinker from Albrecht Dürer's famous engraving and a tree growing upon a skull, respectively. They are no doubt fully symbolic of this passage and of the central message of the novel (Fuster García, 2014b: 55-57). These ideas have to be understood within the climate of the early twentieth-century intellectual disenchantment with science after the previous enthusiasm over scientific positivism (Pratt, 2011: 11; Fuster García, 2014b: 232).

The second part of the novel takes Hurtado to a disappointing experience as a doctor in a little town in the region of La Mancha, where he must face the harshness of life in rural Spain. His pessimism is exacerbated and he returns to Madrid, where Lulú, a kind of feminine alter ego, offers him a chance to be happy. They get married and Hurtado abandons medicine to become a translator of scientific articles, implying that this is the only possibility for a scientist in Spain. Like Victor Frankenstein's failed attempt, he tries to create his own paradise in a life of seclusion and domesticity, isolated from the external world in the company of his wife. But he must face a challenge, that of procreating, of giving life. On account of his nephew's poor health, Iturriz warns him against it with the following sombre and startling statement: «yo no creo, como Calderón, que el delito mayor del hombre sea el haber nacido. Esto me parece una tontería poética. El delito mayor del hombre es hacer nacer» (Baroja, 1985: 287). Initially, Hurtado's fears of engendering a sick child dissuade him from becoming a parent, but his wife's deep sadness obliges him to play his final game of chess with death. His fears come true since his child is stillborn and his wife dies soon afterwards. Hurtado feels deeply guilty and commits suicide. As in *Frankenstein*, the supreme act of life —giving life— ends in death and annihilation.

As to the Gothic element, although a minor note in *El árbol de la ciencia*, its presence is nonetheless relevant from a comparative perspective precisely because the general tone of the novel runs in a different direction and its insertion thus has significance. Macabre scenes occur when Hurtado, with a crude naturalism, describes the disrespectful manner in which the students treat the corpses used in their anatomy lessons, where they play crass tricks with them. The dissection practices are also a source of grisly scenes. Hurtado, however, takes a certain Frankensteinian relish in them since these dead bodies contain the enigma of life for the young man:

A pesar de la repugnancia que le inspiraban tales cosas, no le preocupaban; la Anatomía y la disección le producían interés. Esta curiosidad por sorprender la vida; este instinto de inquisición tan humano, lo experimentaba él como casi todos los alumnos (Baroja, 1985: 57).

Architecture becomes another Gothic motif through the family house: «La casa era grande, con esos pasillos y recovecos un poco misteriosos de las construcciones antiguas» (Baroja, 1985: 51). While still a student, Hurtado chooses a small room in the attic to isolate himself from his family and to be able to concentrate on his studies. It is a small, shabby place, described as a monk's cell or a necromancer's study, where the young Hurtado becomes a kind of Faustus or Frankenstein:

El cuartucho tenía un aspecto de celda; Andrés [...] lo llenó de libros y papeles, colgó en las paredes los huesos del esqueleto que le dio su tío el doctor Iturrioz y dejó el cuarto con cierto aire de antro de mago o de nigromántico. (1985: 51).

Although Baroja allows limited space to Gothic motifs, they retain their uncanny connotations: they set the main character within the *Frankenstein* tradition and ironically suggest the *naïveté* of his youthful enthusiasm about science, foreboding not only disenchantment, but also tragedy.

CONCLUSION

As in Mary Shelley's novel, in these three Spanish narratives, the characters are trapped at a crossroads between past and present. The message revolves around the tension in this dichotomy between a disquieting past and a disquieting future.⁶ They represent different aesthetic and chronological periods and different personal approaches to science, where Shelley's cautionary tale finds an echo, ranging from the nuanced optimism of Fernández Bremón to the downright pessimism of Baroja. Some Gothic motifs in «Un crimen científico»—forest and architecture—work as symbols of superstition and ignorance for the village people; only the main character, driven by his prosaic fears overcomes their apparent ominous threat. By facing them, he undoes the mystery surrounding Dr Ojeda, from whose surgical skills he finally benefits. Thus the Enlightenment and science triumph in Fernández Bremón's novel, but only, or so the story implies, when kept within the limits of the reasonable. They fail for Ojeda himself, who gets lost in the forest of his final, impossible pursuit, for which he is ridiculed at the end of the story. In her novel, Pardo Bazán, writing in midst of the Spanish 1870's debates on science, lampoons Pascual's ignorance and what he represents. However, through O'Narr's death, she also warns against the consequences of uncontrolled scientific progress. It may be worth noting that in Swedish and Norwegian, *narr* means «fool» and «jester», which may have been a deliberate pun. Pardo Bazán was in favour of science and progress, but they must be properly checked. Thus in both novels there is an ambivalent approach to science articulated by Gothic science fiction motifs. The same ambivalence is found in *El árbol de la ciencia*, where the Gothic motifs evoke a literary tradition already established and herald the main character's tragic end at the crossroads between the tree of life and the tree of knowledge. In his essay *La caverna del humorismo*, originally published in 1919, Baroja writes: «La incógnita de la vida humana no se resuelve nunca; pero el hombre de ciencia moderno, aunque sepa esto, marcha siempre adelante. Es el héroe de la tragedia moderna» (1948: 477).

It can thus be concluded that both «Un crimen científico» and *Pascual López* are culturally recast versions of Gothic science fiction as inaugurated by Mary Shelley. They illustrate the power of the literary Gothic and Gothic science fiction beyond aesthetic and chronological boundaries. They are also very good instances of the adaptation process that the Gothic underwent in Spanish soil, becoming «a key articulator of inherently national preoccupations» (Aldana Reyes and Rødtjer, 2020: 285). Baroja's novel follows the thread of its predecessors in a new aesthetic and cultural background. *El árbol de la ciencia* is not a Gothic science fiction novel but science is a core issue in it and central themes in Shelley's novel find an echo in the backdrop of the early twentieth-century Spanish cultural milieu. Moreover, the existential anguish that is already foreshadowed in

⁶ According to MacArthur, science fiction is built upon this double past and future perspective (2015: 160).

the character of Frankenstein acquires a darker and deeper import within the intellectual context of the novel. If direct influence cannot be definitely concluded for any of these narratives, certainly indirect influence through other science fiction narratives inspired by it and the power of the new literary tropes created by Shelley's novel are clearly displayed in them.

REFERENCES

- ACOSTA, Eva (2007), *Emilia Pardo Bazán. La luz en la batalla*, Barcelona, Lumen.
- ALBERICH, José Luis (1961), «La biblioteca de Pío Baroja», *Revista Hispánica Moderna*, vol. 27, no. 2, pp. 101-112. Online (JSTOR).
- ALBERICH, José Luis (1966), *Los ingleses y otros temas de Baroja*, Madrid – Barcelona, Alfaguara.
- ALDANA REYES, Xavier (2017), *Spanish Gothic. National Identity, Collaboration and Cultural Adaptation*, London, Palgrave Macmillan.
- ALDANA REYES, Xavier and Rocío RØDTJER (2020), «The Gothic in Nineteenth-Century Spain», in Dale Townsend and Angela Wright (eds.), *The Cambridge History of the Gothic. Vol. II. Gothic in the Nineteenth Century*, Cambridge, Cambridge University Press, pp. 285-302.
- BAROJA, Pío (1948), «Locuras de carnaval», in *Obras completas*, vol. 6. Reprint, Madrid, Biblioteca Nueva, 1978, pp. 883-975.
- BAROJA, Pío (1985), *El árbol de la ciencia*, Madrid, Caro Raggio, Cátedra.
- BAROJA, Pío, (1948), «La caverna del humorismo», in *Obras completas*, vol. 5. Reprint, Madrid, Biblioteca Nueva, 1993.
- CLÉMESSY, Nelly (1981), *Emilia Pardo Bazán como novelista: de la teoría a la práctica*, vol. I. Translated by I. Gamba, Madrid, Fundación Universitaria Española.
- CORBETT, Robert (2001), Introduction to *Romanticism and Science Fictions – A Special Issue of Romanticism on the Net*, no. 21, n. p., <https://doi.org/10.7202/005970ar>.
- CORELL DOMÉNECH, M. Vicenta (2013), *Científicos, vulgarizadores y periodistas: estudio y análisis de la divulgación de la ciencia en La Ilustración Española y Americana (1869-1898)*, PhD Dissertation, Universitat de València. <<https://roderic.uv.es/handle/10550/29039>>
- CRAWFORD, Alexander Z., Dipika V. PATEL, and Charles NJ MCGHEE (2013), «A Brief History of Corneal Transplantation: From Ancient to Modern», *Oman Journal of Ophthalmology*, vol. 6, no. 1, pp. 1-16. Online.
- «Cronica Estrangera», *El Corresponsal*, 26 de marzo de 1844, n. p.
- ESCOBAR, Alfredo, «Crónica del lunes», *La Época*, 16 de junio de 1879, n. p.
- FAIRBAIRN, A. M. (1876), «David Federico Strauss. Un capítulo de la historia del pensamiento religioso moderno», *Revista contemporánea*, vol. 5, pp. 341-361.
- FERNÁNDEZ BREMÓN, José (1881), «Crónica general», *La Ilustración Española y Americana*, no. 21, p. 366.
- FERNÁNDEZ BREMÓN, José (1882), «Crónica general», *La Ilustración Española y Americana*, no. 16, p. 266.
- FERNÁNDEZ BREMÓN, José (2008), «Un crimen científico», in Rebeca Martín (ed.), *Un crimen científico y otros cuentos*, Madrid, Ediciones Lengua de Trapo, pp. 1-60.
- FERNÁNDEZ, Pura (2014), «“Sketching like Darwin”: The Darwinian Imaginary in Spanish Literature of the Nineteenth Century», in Thomas F. Glick and Elinor Shaffer (eds.), *The Literary and Cultural Reception of Charles Darwin in Europe*, vol. 4, London, Bloomsbury, pp. 593-620.
- FUSTER GARCÍA, Francisco (2014a), «Baroja como materia de sus libros: para una lectura de *El árbol de la ciencia* (1911) en clave autobiográfica», *Revista de Literatura*, vol. 86, no. 151, pp. 171-197.

- FUSTER GARCÍA, FRANCISCO (2014b), *Baroja y España: un amor imposible. Un ensayo sobre El árbol de la ciencia y la crisis de fin de siglo*, Madrid, Fórcola.
- GARCÍA CAMARERO, ERNESTO and ENRIQUE GARCÍA CAMARERO (1970), Introduction to *La polémica de la ciencia española*, Madrid, Alianza Editorial, pp. 7-22.
- GARCÍA CANDEIRA, MARGARITA (2019), «¿Santiago de Compostela, ciudad gótica?: lo siniestro y lo decadente en Pascual López (1879), de Emilia Pardo Bazán», *RILCE*, vol. 35, no. 2, pp. 478-500.
- GILFOIL, ANNE W. (1999), «Mary Shelley and Pardo Bazán: Women Writers and Science in the Nineteenth Century», in Gibert Paolini and Claire J. Paolini (eds.), *La chispa '99. Selected Proceedings*, New Orleans, Tulane University.
- GÓMEZ, MICHAEL A. (2018), «Shedding Light on José Fernández Bremón's "Un Crimen Científico": Science and Science Fiction in Restoration Spain», *Anales Galdosianos*, vol. 53, pp. 33-53.
- GONZÁLEZ HERRÁN, JOSÉ MANUEL (2012), «Antonio Casares Rodríguez y Emilia Pardo Bazán», *Boletín das Ciencias*, vol. 75, pp. 177-187.
- HANNAY, JAMES BALLANTYNE (1880), «On the Artificial Formation of the Diamond», *Proceedings of the Royal Society of London*, vol. 30, nos. 200-205, pp. 450-461.
- HAYNES, ROSLYNN D. (1994), *From Faust to Strangelove. Representations of the Scientist in Western Literature*, Baltimore and London, The Johns Hopkins University Press.
- HEMINGWAY, MAURICE (1983), *Emilia Pardo Bazán. The Making of a Novelist*, Cambridge, Cambridge University Press.
- HIBBS, SOLANGE and CAROLE FILLIÈRE (eds.) (2015), Introduction to *Los discursos de la ciencia y de la literatura en España (1875-1906)*, Vigo, Editorial Academia del Hispanismo, pp. 13-28.
- JOVÉ, JORDI (2001), «Fantasía y humor en los Cuentos de Fernández Bremón», in Jaume Pont (ed.), *El cuento español en el siglo XIX. Autores raros y olvidados (Scriptura 16)*, Lleida, Servei de Publicacions (UdL), pp. 119-32.
- LANGE, ANDRÉ (2003), «L'oeil électrique artificiel des frères Siemens (1876) à l'origine des premières recherches sur la transmission des images à distance», *Histoire de la Télévision (et de quelques autres médias)*. <<https://www.histv.net/werner-and-william-siemens>>
- LAWLESS, GERALDINE (2011), «Unknown Futures: Nineteenth-Century Science Fiction in Spain», *Science Fiction Studies*, vol. 38, no. 2, pp. 253-269. Online (JSTOR).
- MARTÍN, REBECA (2008a), «La ciencia dislocada. Los sabios de José Fernández Bremón en su narrativa breve», in Montserrat Amores y Rebeca Martín (eds.), *Estudios sobre el cuento español del siglo XIX*, Vigo, Editorial Academia del Hispanismo, pp. 153-172.
- MARTÍN, REBECA (2008b), «Prólogo» to *Un crimen científico y otros cuentos*, Madrid, Ediciones Lengua de Trapo, pp. ix-xliv.
- MARTÍN, REBECA (2010), «Alfonse Karr en la obra de José Fernández Bremón», in Marta Giné and Solange Hibbs (eds.), *Traducción y cultura. La literatura traducida en la prensa hispánica (1868-1898)*, Bern, Peter Lang, pp. 43-59.
- MARTÍN, REBECA (2013), *Ficciones no disimuladas. La narrativa breve de José Fernández Bremón*, Santander, EEE Propileo.
- MACARTHUR, SIAN (2015), *Gothic Science Fiction. 1818 to the Present*, Basingstoke, Palgrave Macmillan.
- MOLINA PORRAS, JUAN (ed.) (2006), *Cuentos fantásticos en la España del Realismo*, Madrid, Cátedra.
- OTIS, LAURA (1994), *Organic Memory. History and the Body in the Late Nineteenth & Early Twentieth Centuries*, Lincoln and London, Nebraska University Press.
- OTIS, LAURA (1995), «Science and Signification in the Early Writings of Emilia Pardo Bazán», *Revista de Estudios Hispánicos*, vol. 29, no.1, pp. 73-106.
- OTIS, LAURA (ed.) (2001), *Literature and Science in the Nineteenth Century: An Anthology*, Oxford, Oxford University Press.
- PARDO BAZÁN, EMILIA (1877), «Reflexiones científicas contra el darwinismo», *La ciencia cristiana*, vol. 5, pp. 218-233.

- PARDO BAZÁN, Emilia (1998), *La cuestión palpitante*. Edited by Rosa de Diego, Madrid, Editorial Biblioteca Nueva.
- PARDO BAZÁN, Emilia (1999), «Pascual López. Autobiografía de un estudiante de medicina», in Darío Villanueva and José Manuel González Herrán (eds.), *Obras completas, I (Novelas)*, Madrid, Fundación José Antonio de Castro, pp. 1-189.
- PATIÑO ERÍN, Cristina (1996), «El Souvenir X de Émile Zola y Pascual López de Emilia Pardo Bazán: un juego intertextual de fantasía científica», *Moenia*, vol. 2, pp. 539-548.
- PÉREZ ESCUDILLO, Francisco (1876), «Un ojo artificial que vé», *La crónica oftalmológica*, vol. 6, no. 9, pp. 227-229.
- POWER, Henri (1873), «On Transplantation of the Cornea», in Henry Power (ed.), *Report 4th International Congress of Ophthalmology, Held in London, August, 1872*, London, Savill, Edwards and Co., vol. 4, pp. 172-176.
- POWER, Henri (1876), «Comunicacion presentada al Congreso Oftalmológico sobre la transplantacion de la córnea por el Doctor M. Henri Power», *La crónica oftalmológica*, vol. 6, no. 5, pp. 129-32.
- PRATT, Dale J. (2011), *Signs of Science. Literature, Science, and Spanish Modernity since 1868*, West Lafayette (Indiana), Purdue University Press.
- RENWICK, Thomas (1817), *A Narrative of the Case of Miss Margaret McAvooy; with An Account of Some Optical Experiments Connected with It*, London, Printed for Baldwin, Cradock and Joy.
- REVILLA, Manuel de la, «Revista bibliográfica», *El Globo. Diario ilustrado político, científico y literario*, 23 de junio de 1879, n. p.
- ROAS, David (2002), *Hoffmann en España. Recepción e influencias*, Madrid, Editorial Biblioteca Nueva.
- RODRÍGUEZ CARRACIDO, José (1917), «La doctrina de la evolución en la Universidad de Santiago. (Un recuerdo de mi vida estudiantil)», in *Estudios histórico-críticos de la ciencia española*. Facsimile of the 2nd ed., with an introduction by Antonio Moreno González and Jaume Josa Llorca, Barcelona, Editorial Fontalba, 1988, pp. 237-277.
- RODRÍGUEZ GUERRERO-STRACHAN, Santiago (1999). *Presencia de Edgar Allan Poe en la literatura española del siglo XX*, Valladolid, Secretariado de Publicaciones e Intercambio Científico Universidad de Valladolid.
- RØDTJER, Rocío (2015), «Oculists and Other Modern Visionaries: Epistemological Myopia in José Fernández Bremón's *Un Crimen Científico*», in Patricia Novillo-Corvalán (ed.), *Latin American and Iberian Perspectives on Literature and Medicine*, New York and London, Routledge.
- SANTIAÑEZ-TIÓ, Nil (ed.) (1995), *De la luna a Mecnópolis. Antología de la ciencia ficción española (1832-1913)*, Barcelona, Quaderns Crema.
- SHELLEY, Mary (1992), *Frankenstein or The Modern Prometheus*. Reprint, London, Penguin, 2003.
- SOTELO VÁZQUEZ, Marisa (2015), «Emilia Pardo Bazán y la polémica en torno al Darwinismo», in Solange Hibbs and Carole Fillière (eds.), *Los discursos de la ciencia*, Vigo, Editorial Academia del Hispanismo, pp. 99-101.
- TENREIRO PREGO, José Carlos (2013), *Gothic, Gender and Regenerationism in Emilia Pardo Bazán's Galicia*, PhD Dissertation, University of Exeter, ORE (Open Research Exeter). <<https://ore.exeter.ac.uk/repository/handle/10871/15516>>
- VAN RIJ, Gabriël and Barth T. H. VAN DOOREN (2016), «The History of Corneal Transplantation», in Jesper Hjortdal (ed.), *Corneal Transplantation*, New York, Springer, pp. 1-8.
- VILLAR PIÑÓN, José Antonio (2014), *La apropiación de la obra científica de John Tyndall en España: (1868-1898)*, PhD Dissertation, Universitat Autònoma de Barcelona, TDX (Tesis Doctorals en Xarxa). <<http://hdl.handle.net/10803/285116>>

