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Contributions to Animal Ceroplastics

The Sculptor Cristóbal Garrigó de Nis (1800–1863) and the Anatomical Cabinet of the Royal Veterinary School in Madrid

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Abstract

The aim of this article is to disseminate the scientific and artistic contribution made by Cristóbal Garrigó de Nis (1800–1863). A professor of veterinary medicine, his career as an anatomical sculptor has left us one of the most unique ceroplastic collections in Spain. It currently forms part of the Complutense Veterinary Museum (Madrid). This article presents previously unpublished data about his personal life and professional activity that was gathered from primary sources – archives and the press – of the era. This has allowed us to reconstruct his life story, find out more about his dual training and understand the reasons that led him to create the teaching models for the anatomical cabinet of the Royal Veterinary School in Madrid. Of special interest are his main contributions to the manufacture of these anatomical pieces and specifically his invention of his own papier-mâché paste in 1848.

Keywords

Cristóbal Garrigó – Ceroplastics – Royal Veterinary School in Madrid

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1 Introduction

Recent historiography has highlighted the connections between the history of the sciences and artistic production and has begun to consider the value provided by the different uses given to collections and instruments (scientific artefacts) in reaching an understanding of their changing meanings.[1] During the 18th and 19th centuries, artificial models of human, animal or botanical anatomy competed with other means of visualization such as the illustrations contained in atlases. These models succeeded in setting very high expectations in a range of cultural contexts and contributed to the launch of a new teaching strategy in medical and veterinary institutions all over Europe. Careful observation provides us with an understanding of the strategies used by the modelers in their efforts to establish their products as scientific technologies and it also contributes to the reconstruction of a historic vision of the social and cultural messages they sought to highlight.[2] Since bodies for dissection were scarce and the tissue deteriorated rapidly, methods were sought to preserve them and to provide more durable learning tools by employing a variety of materials such as wax, wood, papier-mâché and glass. The artefacts produced with wax obtained widespread recognition due to their refinement and technical precision, their high degree of realism and their utility.[3] The latter was achieved specifically by creating three-dimensional models that

1 Numerous studies have been published on this topic in Spanish journals, such as *Arbor*, *Asclepius* and *Dynamis*, and internationally in *Annals of Science*, *Early Science and Medicine*, *History of Science*, *Journal of the History of Ideas*, *Journal of Interdisciplinary History*, *Osiris* and *Science in Context*. For an in-depth analysis of the specific contributions of this type of artefact in the history of science, see: Alfons Zarzoso, "Colecciones anatómicas y regímenes de exhibición. Una introducción," *Dynamis*, 2016, *36*/1:11–25, http://dx.doi.org10.4321/50211-95362016000100001; Anna Maerker, "Uses and Publics of the Anatomical Model Collections of La Specola, Florence, and the Josephinum, Vienna, around 1800," in *From Private to Public: Natural Collections and Museums*, edited by Marco Beretta (Sagamore Beach, MA: Science History Publications, 2005), pp. 81–96.

2 Anna Maerker, "Anatomizing the Trade: Designing and Marketing Anatomical Models as Medical Technologies, ca. 1700–1900," *Technology and Culture*, 2013, *54*/3:531–562, pp. 531–532; Ludmilla Jordanova, *The Look of the Past. Visual and Material Evidence in Historical Practice* (Cambridge: Cambridge University Press, 2012); Ead., "Material Models as Visual Culture," in *Models: The Third Dimension of Science*, edited by Soraya de Chadarevian, Nick Hopwood (Stanford: Stanford University Press, 2004), pp. 443–451.

3 On the uses and circulation of these models in medical museums, see Rafael Mandressi, Laurence Talairach-Vielmas, "Modeleurs et modèles anatomiques dans la constitution des musées médicaux en Europe, XVIIIe–XIXe siècle," *Revue Germanique Internationale*, 2015, *21*:23–40.

contributed to improvements in public health training. Following the modeler Gaetano Giulio Zumbo (1656–1701),[4] the art of colored wax modelling was perfected thanks to the technical expertise of Ercole Lelli (1702–1766), who worked for the Anatomical Museum of the Istituto delle Scienze, in the Palazzo Poggi. His eight anatomical models showing the musculoskeletal system, made from natural skeletons covered with wax paste, are unsurpassed for their artistic quality and innovative technique. Over the next century and a half, the Bolognese school of wax modelling produced many famous artists, such as Anna Morandi Manzolini (1716–1774), Gian Battista Manfredini (1742–1829), Pietro Sandi (1789-?), Giuseppe Astorri (1785–1852) and Cesare Bettini (1801–1855).[5]

The educational potential of artificial bodies was praised and this inspired the creation of the most famous collection of anatomical wax pieces, produced under the direction of the renowned natural philosopher, Felice Fontana (1730–1805), and exhibited at the "La Specola" Royal Museum of Physics and Natural History in Florence.[6] One of the most important modelers to emerge from his workshop was Clemente Susini (1757–1814), whose skill in the art of wax modelling raised him to the pinnacle of scientific and artistic excellence.[7] The idea that anatomical models were useful spread during the 18th century and led modelers to increasingly focus on pieces for schools, universities and public institutions, which they considered potential clients for the acquisition

4 Maria L. Puccetti, Liberto Perugi, Paolo Scarani, "Gaetano Giulio Zumbo. The Founder of Anatomic Wax Modeling," *Pathology Annual*, 1995, *30*/2: 269–281, https://www.researchgate.net/publication/14630806 (accessed 14 Aug. 2019).

5 Nadir M. Maraldi, Giovanni Mazzotti, Lucio Cocco, Francesco A. Manzoli, "Anatomical Waxwork Modeling: The History of the Bologna Anatomy Museum," *The Anatomical Record* (*New Anat.*), 2000, *261*/1:5–10, https://doi.org/10.1002/(SICI)1097--0185(20000215)261:1<5::AID-AR3>3.0.CO;2-U.

6 For a detailed description of the history of the anatomical models produced by the Florentine school, see: Anna Maerker, "The Anatomical Models of La Specola: Productions, Uses, and Reception," *Nuncius*, 2006, *21*:295–321, pp. 295–296; Benedetto Lanza, Maria Luisa Poggesi, Antonio Martelli (eds.), *Le cere anatomiche della Specola di Firenze* (Firenze: Arnaud Editore, 1979); Maria Luisa Azzaroli, "The Zoological Museum of Florence," *Curator*, 1972, *15*:93–117, https://doi.org/10.1111/j.2151-6952.1972.tb00447.x In order to obtain an in-depth knowledge of La Specola's naturalist collections, the activity of his workshop under the direction of Fontana and the methods of exhibition chosen, we refer the reader to Curzio Cipriani, "Felice Fontana and the Formation of the Naturalistic Collections of the Imperial Royal Museum of Physics and Natural History of Florence," *Nuncius*, 2006, *21*:265–294.

7 Antonio Riva, *Flesh & Wax: The Clemente Susini's Anatomical Models in the University of Cagliari* (Nuoro: Ilisso Edizioni, 2007).

of their products. Maerker has explored both, the problems encountered by modelers in their efforts to establish their products in the field of medical technologies and the association of these models with the advancement of knowledge and/or with public entertainment.[8]

In the present day, wax models have acquired a new functionality; they form part of our historical heritage and constitute primary sources for investigating multiple aspects of the material and visual culture of science and teaching.[9] In the design and use of these artefacts it is possible to detect pedagogical, aesthetic and technical decisions regarding the presentation of scientific information. This has led in recent years to new lines of research that focus on documenting and preserving objects of this kind.[10]

The Complutense University has a number of collections of wax models including the one preserved in the Complutense Veterinary Museum. This collection, which was started in the Anatomical Cabinet of the first Royal Veterinary School in Madrid in 1793, has had an eventful history, although a representative number of pieces have managed to survive.[11] The institution spent a considerable amount of its budget on producing these didactic models due to their teaching and exhibitive value and they were originally used as a tool for training military veterinarians.[12]

8 Maerker, "The Anatomizing the Trade" (cit. note 2), pp. 532–546.

9 Specifically, in 2006, the journal *Isis* published a monograph on "Science and Visual Culture." Particularly we point to the works by M. Norton Wise, "Making Visible," *Isis*, 2006, *97*/1:75–82; Pamela H. Smith, "Art, Science, and Visual Culture in Early Modern Europe," *Isis*, 2006, *97*/1:83–100.

10 The *Leiden Declaration on Human Anatomy/Anatomical Collections* voices the concerns of custodian institutions regarding the conditions under which this type of historical heritage is conserved. See "The Leiden Declaration on Human Anatomy/Anatomical Collections," International Conference on "Cultures of Anatomical Collections" (Leiden University, 2012), available at https://www.universiteitleiden.nl/binaries/content/assets/geesteswetenschappen/lucas/leiden-declaration.pdf (accessed 21 Aug. 2019).

11 The collection of wax animal models held by the Complutense University is the largest in Spain, although another, less numerous and more monographic collection can be found at the Anatomy Museum of the Faculty of Veterinary Medicine in Zaragoza. Although there is no conclusive proof, they are thought to be the work of Pedro Garrigó Cánovas (1826–1858), an anatomical sculptor from that university and son of Cristóbal Garrigó de Nis. His three-dimensional wax models must have been made in the 1850s for didactic purposes. See Pedro Poza Tejedor, Laura Lomas Lirio, Alicia Sánchez Ortiz, Joaquín Sánchez de Lollano Prieto, "Pedro Garrigó Cánovas (1826–1858) y la ceroplástica en Veterinaria: obra y trayectoria vital," in *Proceedings of the XIV Congreso Nacional y XV Iberoamericano de Historia de la Veterinaria* (Almería: Colegio Oficial de Veterinarios de Almería, 2018), pp. 363–367.

12 The collection is currently on show in the Complutense Veterinary Museum and is one

FIGURE 1
Cristóbal Garrigó de Nis at the Royal Veterinary School in Madrid in 1861 (right in the middle of the photograph)
DOCUMENT FROM THE ARCHIVE OF THE COMPLUTENSE VETERINARY MUSEUM, MADRID, COLLECTION OF GRADUATION'S PHOTOGRAPHS, 1861 GRADUATION

Although some of the wax sculptures are the work of other artists, most of the models in our collection were produced by Cristóbal Garrigó. Along with his teacher Pedro Sánchez Osorio, who was a wax sculptor from the College of Medicine and Surgery of Madrid, Garrigó also undertook to restore earlier models. Being an expert in anatomical dissection, he prepared many fluid-preserved specimens and he mounted skeletons and many different models for teaching veterinary anatomy. A disciple of the Florentine wax modelling school, he furthered his training as an artist and continued to innovate until the end of his days, producing a succession of ground-breaking models, each more technically challenging. His most important contribution was the invention of a new papier-mâché paste coated with a thin layer of wax. The breadth, the scientific, educational and aesthetic value of his work, and his innovative spirit compelled us to devote a study specifically to this artist and scientist (Fig. 1).

of its most valued. For a history and study of the collection and its evolution, see Joaquín Sánchez de Lollano Prieto, Alicia Sánchez Ortiz, "The Ceroplastic Collection of the Royal Veterinary School in Madrid. A History Waiting to be Recovered," *Journal of the History of Collections*, 2019, *31*/2:291–308, https://doi.org/10.1093/jhc/fhy032.

2 Notes on the Biography

In the first third of the 19th century, when Cristóbal Garrigó joined the staff as a professor of anatomy, the Royal Veterinary School of Madrid was emerging from a very difficult period in its history. This first school of veterinary science in Spain, inaugurated in 1793, was under the directorship and control of its founder, Segismundo Malats y Codina (1750–1826), who shunned innovation, and avoided using anatomy texts from other authors and other countries. This had a negative effect on both the teaching of veterinary science and the running of the Department of Anatomy. In 1816, with Malat's influence in decline, the School opened its doors to modern texts, thus raising the institution to the level of its European counterparts. After this shaky start, the School suffered the consequences of the Peninsular War (1808–1814) and the subsequent occupation by French troops in 1823. The determination of the Protector, the Duke of Alagón, to provide the institution with a Department of Anatomy for teaching students and showcasing the scientific quality of the School, allowed a young Vice Professor of anatomy to take center stage.[13]

Until recently, very little was known about this teacher, anatomist and anatomical sculptor or his work. Historiographical references are scarce except for the brief mention of the quality of his pieces by Sanz Egaña.[14] His academic file confirms that he was born in Madrid on March 10, 1800. One important piece of information discovered during this research is the name of his parents. Although he was always cited using only his first surname, it has been shown that his mother, María de Nis Foncueva, came from Badajoz and his father, also called Cristóbal Garrigó, was from Valencia.[15]

In order to understand the artistic vocation and the creative aptitudes of Garrigó it is important to be aware of his father's influence. In 1781, his father competed for the Prizes of the San Fernando Royal Academy of Fine Arts in

13 See the previous footnote on the historical development of the School and the repercussions of the Peninsular War on the collection of anatomical models. On the history of the Royal Veterinary School of Madrid and the state of veterinary medicine at that time, see Guillermo Suárez Fernández (ed.), *Libro Conmemorativo del Bicentenario de la Facultad de Veterinaria, 1793–1993* (Madrid: Editorial Complutense, 1993), pp. 33–64.

14 Cesáreo Sanz Egaña, *Historia de la Veterinaria Española* (Madrid: Espasa Calpe S.A., 1941), p. 260.

15 General Archive of the Complutense University (from now on AGUCM), Madrid, cat. nº V01–186 and cat. nº 20/06/001, contains the extract of his baptismal certificate, Book 29 of baptisms of San Andrés, sheet 272. See also Military Archive in Segovia, file on Cristóbal Garrigó.

Madrid.[16] In the artists' biographies he is cited as a Valencian painter, painting teacher at the San Luis Academy of Fine Arts in Zaragoza in 1818, and author of a number of sketches as well as the famous front curtain for the Teatro Principal.[17] Everything indicates that the Garrigó family established itself in Madrid, where the wax sculptor was born in 1800. Another extremely important fact is that he was related to Carlos Risueño Mora (his uncle).[18] In 1817, Risueño was a teacher at the Royal Veterinary School in Madrid,[19] would later become its Director, and would go on to be one of the leading figures in Spanish veterinary profession.[20] Everything indicates that this kinship played a significant role in Garrigó's entry into the institution and his later progress.

Garrigó's admissions file confirms that he was accepted as an internal student in October 1817 at the age of seventeen[21] and that he completed his studies

16 San Fernando Royal Academy of Fine Arts, Madrid, *Historia y Alegoría: los concursos de Pintura de la Academia* (*1753–1808*) (1781), available at https://www.realacademiabellasartessanfernando.com/assets/docs/historia_alegoria_premios_pintura/1781.pdf?PHPSESSID=0c3159bd747e539003obf7ecab72284d (accessed 6 Mar. 2018).

17 Oil on reused canvas. The following dedication appears in the lower central part: "To Her Excellency the Marchioness of Lazán, your very devoted servant Garrigó Zaragoza year 1818" (Zaragoza, Private Collection). Archive of the San Luis Academy of Fine Arts, Zaragoza, 1818 file. Manuel Santiago García Guatas, "Telones y teloneros," *Artigrama: Revista del Departamento de Historia del Arte de la Universidad de Zaragoza*, 1993, *10*:455–480, p. 458; Manuel Santiago García Guatas, "Oficios del pintor en el Siglo XIX," in *El Arte del Siglo XIX*, edited by Maria Carmen Lacarra (Zaragoza: Institución "Fernando El Católico" CSIC, 2013), pp. 313–359: 340–341; Jesús Pedro Lorente Lorente, "La Academia de Bellas Artes de San Luis y los pintores de Zaragoza en el Siglo XIX," *Artigrama*, 1991–1992, *8–9*:405–434, pp. 430–431.

18 In the formal application that Garrigó submitted he gave his surname as Garrigó Nis y Risueño. This emphasises his kinship with Risueño and presents the latter as guarantor. AGUCM, cat. nº 20/06–001, official application dated September 28, 1817.

19 The School was created by Royal Order of February 23, 1792, and allocated land in the convent of San Felipe Neri, located outside the Puerta de Recoletos city gate in Madrid. The first protectors and directors were appointed at the same time. The institution had an evident military focus. From the very first by-laws, which date from 1800, the Protector was the highest authority, appointed by the King at the proposal of the Supreme Cavalry Committee, who would discuss the affairs of the School directly with the monarch. The Director was to be a veterinary surgeon and would govern the school in both academic and administrative matters. He was empowered to call a meeting of the Faculty Board.

20 Joaquín Sánchez de Lollano, "Carlos Risueño Mora (1781–1847)," in *Semblanzas Veterinarias*, edited by Francisco L. Dehesa, María Castaño, Jose M. Etxanitz, Luis A. Moreno, Martí Pumarola, Joaquín Sánchez de Lollano (Madrid: Consejo General de Colegio Veterinarios de España, 2011), pp. 67–81.

21 General Archive of the Administration (from now on AGA), Alcalá de Henares, Madrid, file on Cristóbal Garrigó, box 31, document 14821. AGUCM, cat. nº V01–186. Student number 217. The same document records his notes in subjects such as pathology, surgery and

on October 30, 1821.[22] That same year he took and passed the exams to obtain a post as military veterinary surgeon. On September 5, 1823, he was proposed as Chief Veterinary Surgeon of the Cavalry Brigade based in Cartagena. He attempted to establish himself there as farrier and horse vet, but he soon left when he realized that the post paid much less than what he needed to maintain his family. Remarkably, he then decided to open a shop selling fans, and a report on his conduct from that period shows that, in order to subsist, he devoted himself to "making artificial flowers" (at that time artificial flowers were made using silk, wax, etc.). This work, of a more creative nature, must not have prospered either and he applied for readmission to the army.[23]

He returned to his post in the army but, in 1827, he once again requested a transfer to Madrid to take exams for a post as professor in the Royal Veterinary School.[24] He sat an exam for the post of Vice-Professor of Anatomy, but was unsuccessful on that occasion.[25] On March 20, 1828, he tried again, this time for the position of Vice-Professor of Medical Issues. He finally passed the exam for Vice-Professor of Anatomy and was given leave from the army on July 1, 1828, to take up his post in the Anatomical Amphitheatre.[26]

In his new job Garrigó was responsible for dissection, the construction of artificial models and skeletons and for anatomical preparations.[27] In order to facilitate this work, he was provided, in January 1829, with rooms at the School that he shared with his mother and his family.[28]

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medical issues. These personal details are confirmed in dossiers AGUCM, cat. nº 20/06–001, which include his record of acceptance.

22 His service record shows that he held the title of Veterinary Teacher, issued October 29, 1821, and this was changed to Veterinary Surgeon First Class on July 6, 1852. AGA, file on Cristóbal Garrigó, box 31, document 14821. AGUCM, cat. nº V01–186 and cat. nº 20/06–001.

23 AGA, file on Cristóbal Garrigó, box 31, document 14821. Military Archive in Segovia, file on Cristóbal Garrigó.

24 A certificate dated April 21, 1827, records that he requested a post as Veterinary Surgeon in Madrid. AGUCM, cat. nº V02–024. AGA, file on Cristóbal Garrigó, box 31, document 14821. His army file includes another request made by his mother, on April 27, 1827, requesting that her son be attached to the Regiment of Royal Guards, which would enable him, as her only son, to care for her and also to take the entrance exams for the post of Vice Professor at the Royal Veterinary School. Military Archive in Segovia, file on Cristóbal Garrigó.

25 Application dated February 16, 1827, requesting permission to apply for the post of Vice Professor of Anatomy at the School to fill the vacancy caused by the death of Damián Oliver. General Military Archive in Segovia, file on Cristóbal Garrigó.

26 He was appointed by Royal Order of July 25, 1828, with an annual salary of 7,700 *reales*. AGA, file on Cristóbal Garrigó, box 31, document 14821. Document written by the Protector dated March 20, 1828, AGUCM, cat. nº V02–024.

27 AGUCM, cat. nº V01–034, minutes of November 25, 1830.

28 AGUCM, cat. nº V01–005, document dated January 3, 1829.

As far as his academic career is concerned, we should highlight that he held the post of Secretary at the institution from August 1, 1828, to December 31, 1832. The records show that he chaired the committees during the time that he was Vice-Professor.[29] On October 3, 1833, it fell to him to deliver the inaugural lesson[30] and he also appeared as a substitute teacher in the competition exams for professors and supernumeraries at the Veterinary schools.[31]

In the professional sphere, he was connected with such important institutions as the Veterinary Mutual Society[32] and was a founding member of the Veterinary Medicine Society.[33] One curious fact, found during the search for primary sources, are the licenses he applied for to obtain mining rights.[34]

3 Artistic Training in the Art of Anatomical Ceroplastics

Garrigó received his skills in anatomy from the professor Antonio Bobadilla y Brieva, who was assisted by the dissector Damián Oliver.[35] When Garrigó joined the teaching staff, after Oliver's death, he found himself under the orders of Guillermo San Pedro, recently appointed Professor of Anatomy in 1827.

He was given technical training in the art of wax by Pedro Pablo Sánchez Osorio, second *constructor* or modeler at the San Carlos Royal College of Medicine and Surgery in Madrid.[36] This institution already possessed an excellent collection of anatomical models, the result of the fusion between the local techniques employed by the sculptors of the court in Madrid, such as Juan

29 AGA, file on Cristóbal Garrigó, box 31, document 14821.

30 AGUCM, cat. nº V01–00l, minutes of September 19, 1833, and in *Diario de Avisos de Madrid*, Monday, September 30, 1833.

31 *Boletín de Veterinaria*, November 25, 1858, *14*/31:405.

32 The Veterinary Mutual Society was a social assistance organisation created by veterinary surgeons for themselves and their families. It was short-lived. Garrigó held the post of Vice-Secretary in 1841 (*Gaceta de Madrid*, December 23, 1841, 4, https://www.boe.es/datos/pdfs/BOE//1841/2631/A00004-00004.pdf) and Secretary in 1845 (*Boletín de la Veterinaria*, September 30, 1845, *1*/11:222).

33 *Boletín de Veterinaria*, March 20, 1854, *10*/260:126.

34 Coal-mining rights in Guadalix, Madrid, *Boletín Oficial de Madrid*, June 8, 1842, 2.

35 Suárez Fernández, *Libro conmemorativo* (cit. note 13), p. 53; Sanz Egaña, *Historia de la Veterinaria Española* (cit. note 14), p. 260.

36 For detailed information about the anatomical cabinet of the San Carlos Royal College of Medicine and Surgery in Madrid, we refer the reader to Alicia Sánchez Ortiz, Nerea Del Moral Azanza, Sandra Micó Boró, "Entre la ciencia y el arte. Ceroplástica anatómica para el Real Colegio de Cirugía de San Carlos (1786–1805)," *Archivo Español de Arte*, 2012, *85*/340:329–349.

Cháez, and those that were characteristic of the Florentine ceroplastics school. The latter were imported by Luigi Francesqui and preserved firstly by Dionisio Giraldo Bergaz and later by Sánchez Osorio himself.[37] Osorio boasted of his Italian school and as De Ceglia stated at the time "the term 'Florentine' became a brand with which to baptize pieces of the most disparate origins, certifying the charisma of aesthetic refinement and science accuracy."[38]

The Protector of the School, the highest authority at the veterinary institution, the Duke of Alagón, went to great lengths to create an Anatomical Cabinet suitably endowed with wax pieces that would enhance the reputation of the Royal School.[39] From the very beginning of his protectorship he provided resources to ensure that it functioned correctly. It was the Duke who proposed selecting and training a teacher at the School "who demonstrated aptitudes" to avoid the considerable expense incurred by commissioning artificial models for the Cabinet from external sources. A number of students expressed interest in learning the art of wax, but given Garrigó's status as teacher, his aptitudes, and his "intelligence and enthusiasm," it was decided that only he be instructed by Sánchez Osorio.[40] In order to keep the "Waxwork Laboratory" functioning and prevent the need to acquire artificial models from foreign workshops, he would be asked to train future students of the center in the same way.[41]

Garrigó began his apprenticeship in 1829. He learned quickly from his master, who praised his progress after twenty-two months and considered his training to be completed in 1831. In order to validate the knowledge acquired by the disciple, the Protector requested that the members of the Board of the Royal School subject him to a practical exam.[42] However, they finally decided against

37 In a certificated dated March 31, Sánchez Osorio declared himself a disciple of the art of wax of the Florentine school; he broadened his training for miniatures in Paris, for drawing in Valencia and other schools (Granada, Barcelona), and relief engraving in the school of Madrid. AGUCM, cat. nº V01–004, certificates dated March 7 and 31, 1831.

38 Francesco P. de Ceglia, "The Importance of Being Florentine: A Journey Around the World for Wax Anatomical Venuses," *Nuncius*, 2011, *26*:83–108, p. 86.

39 They took their inspiration from L'École Royale de Vétérinaire de Lyon (1761–1889) and the L'École Vétérinaire d'Alfort. See Alcide-Louis-Joseph Railliet, Léon Moulé, *Histoire de l'École d'Alfort* (Paris: Asselin et Houzeau, 1908); Christophe Degueurce, *Honoré Fragonard et ses écorchés, un anatomiste au Siécle des lumiéres* (Paris: Éditions de la Réunion des muséees nationaux, 2010); Jonathan Simon, "The Theatre of Anatomy: The Anatomical Preparations of Honoré Fragonard," *Eighteenth Century Studies*, 2002, *36*:63–79.

40 "A professor who is almost reaching the end of his career should not sit in the same class alongside those who are currently learning." AGUCM, cat. nº V01–034, minutes of June 22, 1829.

41 AGUCM, cat. nº V01–005, document written by the Protector dated June 7, 1829.

42 AGUCM, cat. nº V01–004, document written by the Protector dated March 15, 1831.

it because the construction of a new wax piece required a great deal of time. As an alternative they decided to give him a certificate and assess the technical skill of his later works. Sánchez Osorio finally ceased to be his master on March 31, 1831.[43]

Due to the Protector's enormous interest in possessing a ceroplastic collection that could compare with those existing in the rest of Europe, he released Garrigó from his teaching and academic duties[44] to facilitate his artistic training and thereby promote the creation of new artificial models. In October 1829, the Protector decided that Garrigó should attend drawing classes in the evening, accompanied by a groom from the institution, and that he be relieved from other tasks, with the exception of his duty shifts at the hospital. His post as School Secretary was filled temporarily by Antonio Santos[45] and he was exempted from teaching for the same reasons (the fact that he was studying drawing and the art of working in wax).[46] The documentation preserved at the San Fernando Royal Academy of Fine Arts has enabled us to verify that, in 1830, Garrigó was registered as a student at the De la Merced Royal Studios, an institution devoted to teaching the principles of drawing. In July, he began studying the subject of Heads at the afore-mentioned Academy.[47] His dedication and progress in the work intended for the Anatomical Cabinet were rewarded with a bonus of a thousand *reales*.[48] His progress in drawing was verified periodically by the Protector.[49] During 1835, 1836 and 1837 he would

43 He resigns his post, ceases to receive his salary as master and requests a certificate for his past work, but this is not issued.

44 AGUCM, cat. nº V01–034, minutes of June 28, 1830. Juan Infante has been assigned to the anatomical amphitheatre to assist Garrigó in the construction of anatomical skeletons. The Protector states that the latter should devote himself exclusively to wax and cease working on the skeletons and demands a monthly progress report on the pieces that he makes. A later official letter confirms that the professor Guillermo San Pedro will be responsible for constructing skeletons.

45 AGUCM, cat. nº V01–005, minutes of October 12, 1829. AGUCM, cat. nº V01–034, Faculty Board, minutes of October 12, 1829 and document written by the Protector, dated October 8, 1829. AGUCM, cat. nº V01–005.

46 AGUCM, cat. nº V01–034, Faculty Board, minutes of February 22, 1830.

47 On July 20, 1830, Garrigó was admitted to the class to study Heads at the De la Merced Drawing Studio, Archive of the San Fernando Royal Academy of Fine Arts, General Secretary. Order, official letters and passes. 1830–1833, document 4-54-12.

48 AGUCM, cat. nº V01–034, minutes of June 28, 1830, and official letter written by the Protector, dated October 4, 1830. He requests that the Board present him with a report on Garrigó's progress.

49 AGUCM, cat. nº V01–034, in the minutes of November 2, 1830, Garrigó's drawings are submitted to the Protector so that the latter can verify his progress at the Academy.

continue to attend classes at the Academy where records show he was enrolled in the subject of Plasters.[50]

4 Maker of Anatomical and Pathological Models in Wax

From that time on, Garrigó carried out his duties without the support of his instructor. The School now had its own specialist in the subject who was qualified to produce any anatomical or pathological piece, as he possessed the skills necessary for modelling and molding in plaster and casting and coloring wax.

On January 13, 1832, he was appointed as Maker of Wax Pieces and Anatomical Dissector of the Royal Veterinary School.[51] This appointment entailed an endowment of twelve thousand *reales* per year, with honors, professorial status and widow's pension rights for his wife.[52] According to the appointment order, his obligations included dissection, the preparation of anatomy lessons in the winter months, the construction of all of the pieces needed in the Cabinet, increasing and perfecting the collection of pathological and natural specimens, and teaching the art of waxwork to two students who would be designated by the School Protector from among those who showed the most promise. The justifications for the new post included the need to enrich the Cabinet with a complete collection of anatomical and pathological wax pieces "like those that exist in all establishments of healing science, without incurring the costs

50 Archive of the San Fernando Royal Academy of Fine Arts, Madrid, documents 1-22-19 and 1-22-20; Esperanza Navarrete Martínez, "Alumnos de las Salas del Yeso, del Natural y del Colorido de la Real Academia de San Fernando (1800–1844)," *Academia: Boletín de la Real Academia de Bellas Artes de San Fernando*, 2008, no. 106–107:159–238, pp. 195, 197. Available at: http://www.realacademiabellasartessanfernando.com/assets/docs/boletines/2008 (accessed 6 Mar. 2018).

51 Royal Order dated December 10, 1832, Military Archive in Segovia, file on Cristóbal Garrigó and AGA, box 31, document 14821. Official appointment of Garrigó as maker of pieces, AGUCM, cat. nº. V01–006, December 17, 1832. Copy of this appointment also in AGUCM, cat. nº V02–051. He obtained final confirmation in this post on January 13, 1852.

52 The documentation written by the Protector in response to the Queen's order, establishes that Garrigó is permitted to continue living at the School and stipulates that the timetable for carrying out his obligations would be from 8 a.m. to 1 p.m. plus two hours in the afternoon. Every three months, the Faculty Board would submit proposals to the Protector regarding the pieces that had to be built. The latter insisted on the importance of Garrigó perfecting his skills in the subject of drawing, sculpture and engraving. AGUCM, cat. nº V01–006, official letter written by the Protector dated December 17, 1832.

generally caused in them by the salaries that have to be paid to those commissioned with creating it …"[53]

The appointment process contains keys to Garrigó's creative vocation. It was he himself who proposed the post arguing that the death of Francisco Puente meant that the post of Professor of Medical Issues was vacant, and that this post, along with its higher salary, corresponded to him on the grounds of seniority.[54] In spite of this, he suggested an alternative whereby he received a salary increase, although below the amount paid to a professor,[55] and the post of Maker of Pieces was created instead, a position that already existed at the San Carlos Royal College of Medicine and Surgery in Madrid. In return, his position as Vice-Professor would be eliminated, and he would be able to continue making wax pieces. During the arrangements being made for this new post, a recurring theme in his career arose, the poor hearing he had suffered from for some time. That was the argument he used as a reason for not being the most suitable person to opt for the abovementioned Chair of Medical Issues as he considered that his hearing could "hereafter prevent him from fulfilling his duties."[56] Whether it was due to his hearing defect or perhaps his more creative tendencies, or a combination of both, he decided to devote his efforts to the construction of anatomical and pathological models rather than to continue with a teaching career. After several reports, the Protector finally decided that it would be beneficial to create the new post and eliminate the Vice Professor position. In 1847, Garrigó submitted a complaint concerning his status and salary due to a pay reduction proposed by the Board of the Royal Veterinary School after changes made to the regulations.[57]

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53 This refers to commissions given to makers of pieces external to the School and how expensive these were for the institution. Military Archive in Segovia, file on Cristóbal Garrigó, AGA, box 31, document 14821.

54 AGUCM, cat. nº V01–004, minutes of August 29, 1831. The Board announced that Francisco Puente had died on August 24, and that as Garrigó was the most senior Vice-Professor, it fell to him to assume the deceased's obligations. Consequently, he was informed that he should finish what he was working on because, as of December 1, he would commence giving lessons in Medical Issues.

55 He proposed an intermediate endowment somewhere between the twelve thousand *reales* he was being paid and the seventeen thousand received by full professors at that time. AGA, file on Cristóbal Garrigó, box 31, document 14821.

56 AGA, file on Cristóbal Garrigó, box 31, document 14821. Official request dated September 14, 1831.

57 Decree dated August 19, 1847, whereby new Veterinary schools were created. The decree introduced changes affecting teaching at the schools which resulted in salary increases for other professors and a reduction, in his case, from 12,000 to 10,000 *reales* per year. Garrigó argued that his was unfair and was not sufficient to "pay for his material and intel-

5 Garrigó's Work and Personal Contribution to Ceroplastics

Although we shall focus on Garrigó's contribution to ceroplastics, as Vice-Professor he had to attend to the academic and professional obligations described and he produced numerous prepared specimens, skeletons, dissected items, collections of bones, etc., to provide material for the teaching of Anatomy at the Royal School.[58]

He combined the production of new wax models, to meet the demand of the professors of the School, with maintenance tasks carried out on pieces that already existed in the Cabinet. Both Garrigó and his master, Sánchez Osorio, devoted part of their time and knowledge to repairing models that had been damaged by use and a variety of historical vicissitudes. These tasks were recorded in the report presented by the members of the Board at the end of the 1829–1830 academic year;[59] in the documentation from 1829, there is a reference to the need to repair a set of jaws due to their poor condition.[60] Finally, Dionisio Giraldo, in a certificate issued on October 22, 1831, provides details of the reconstruction of other pieces:[61] a stomach, a liver, a rectum, a bladder, a heart and a lobe from the diseased lung of a donkey foal.

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lectual work, requiring much patience and study and for which there are few artists in Spain"; He also added that he had a family and an octogenarian mother to maintain. In this official request, addressed to the General Directorate of Public Education and dated November 29, 1847, he attached some interesting details, ratifying his academic record and referring to his professional experience. AGA, file on Cristóbal Garrigó, box 31, document 14821.

58 In an official request from 1847 he argued that he had carried out his work at the School with the greatest precision and "having almost filled the shelves of the cabinet with anatomical and pathological pieces, monsters and skeletons that were drying out, as well as preparing in the time of descriptive anatomy the daily sessions for the professor and standing in for the latter voluntarily in the event of his illness or absence, which he was not obliged to do by the regulations." AGA, file on Cristóbal Garrigó, box 31, document 14821.

59 AGUCM, cat. nº V01–051, annual report for the academic year 1829–1830, records the "[…] deteriorated state of the Anatomical Cabinet as a result of the unfortunate times […] repairing in such a way that it can be compared with all of those of its kind, particularly the display of surgical and clinical instruments, and, with regard to the anatomical and pathological pieces, as well as reassembling all of those which existed and to the point of leaving them as good as new considering the useless state many of them had been in and especially the hindquarter of a horse which, in addition to its serious deterioration, exhibited a great number of imperfections."

60 AGUCM, cat. nº V01–005, minutes of December 7, 1829.

61 AGA, file on Cristóbal Garrigó, box 31, document 14821.

We can date the start of Garrigó's artistic production to 1829, when Sánchez Osorio announced that Garrigó had made clay models of jaws for a six-year-old, a two-year-old, and a pathological piece representing the ruptured abdomen of a horse.[62] In another document, dated December 7, 1829, he stated that Garrigó had also sculpted a fully accurate heart in clay and two 6-year-old jaws in wax.[63] These were the first models that he made for the Cabinet at the Royal School.[64]

We can differentiate between two periods in his production. The first, in which he learned the techniques of wax art with Sánchez Osorio, encompasses the pieces they made together or which he made under the careful supervision of his master.[65] The second, which began in March 1831, covers his individual creations. We have chronologically grouped the data regarding authorship of the sculptures referenced in the archive documentation (those indicated with an initial are the ones which have been preserved): pathological piece representing a ruptured abdomen (1829), horse head showing neck, ligaments and veins (MV-670) (1830) (Fig. 2), myology mounted on a panel (MV-671) (1830), clastic brain (MV-682) (1830) (Fig. 3), monstrosity of two deformed female piglets (1830), the right lobe of a lung in a pathological state (1830) and the myology of the donkey foal (MV-300) (1831). To these we must add a collection of jawbones that he began in 1829 and continued until 1833. There are more than fifty pieces showing the evolution of the dentition of the horse, donkey, cow and dog. Of these, only 11 examples of the equine species have survived (MV-1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705) (Fig. 4).

The following models correspond to the period which followed Sánchez Osorio's departure from the School: five cow jaws (1831), the womb of a cow (MV-677) (1832), two hernias (1832 and 1833), and a hindquarter of a horse with a hernia that is causing gangrene of the intestines (MV-674) (Fig. 5), two knees of a horse and another of a hinny (cross between a male horse and a female donkey), all with carcinomatous lesions (1832), a model of general neurology

62 AGUCM, cat. nº V01–034 minutes of August 3, 1829.

63 Certificated issued by Pedro Osorio, dated November 30, 1829, and minutes of December 7, 1829, AGUCM, cat. nº V01–005. Three wax hearts (MV-663, 692, 693) and a fragment (MV-667) are preserved in the Complutense Veterinary Museum.

64 AGUCM, cat. nº V01–005, minutes of November 7, 1829.

65 By way of example, the pieces which have not been preserved of the ruptured abdomen of the horse from 1829. AGUCM, cat. nº V01–005, report by Sánchez Osorio dated July 31, 1829, and cat. nº V01–034, minutes of August 3, 1829; and the lobe of a lung AGUCM, cat. nº V01–034, minutes of November 8, 1830.

FIGURE 2 Cristóbal Garrigó, *Horse Head*, 1830. Colored wax on anatomical structure of bone and metal, Complutense Veterinary Museum (MV-670)
PHOTO: LUIS CASTELO

(1832),[66] eight front sections of dog jaws of different ages (1833), ten front sections of cow jaws (1833), a model of an ear (1833), abdominal and thoracic cavities with viscera of a horse with miliary tuberculosis (1834), pathological piece of a female camel (1833), hindquarters of a mare (MV-672) (1834), a horse's spleen (MV-771) (1835), stomach of a ruminant (1835), two equine stomachs (MV-664, MV-669) (1835), the natural delivery of a mare, in anterior presentation or head first (MV-683) (1836), the natural delivery of a mare, showing the posterior presentation where the hind legs appear first (MV-681) (1837), and the preternatural deliveries of the mare (1837), one of them possibly piece (MV-678) (Fig. 6). There are several pieces for which we do not

66 Probably one of the most difficult pieces he was commissioned to produce, due to the complexity and the time involved, it has unfortunately not been preserved.

FIGURE 3 Cristóbal Garrigó, *Clastic Brain*, 1830. Colored wax, Complutense Veterinary Museum (MV-682)
PHOTO: LUIS CASTELO

FIGURE 4 Cristóbal Garrigó and Pedro Pablo Sánchez Osorio, *Collection of Jaw Bones*, 1829–1833. Colored wax, Complutense Veterinary Museum (MV-300)
PHOTO: LUIS CASTELO

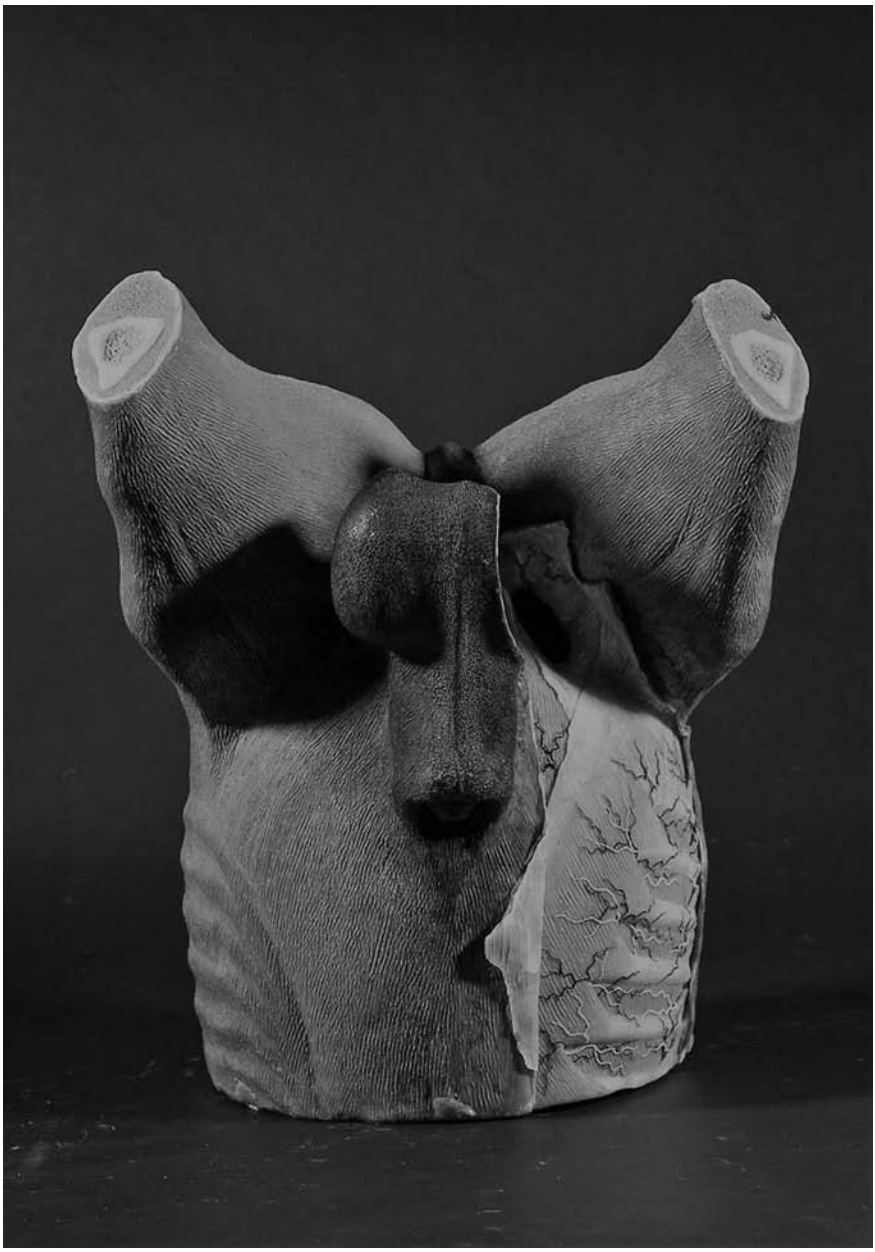

FIGURE 5 Cristóbal Garrigó, *Inguinal Hernia of Horse*, 1832. Colored wax. Complutense Veterinary Museum (MV-674)
PHOTO: LUIS CASTELO

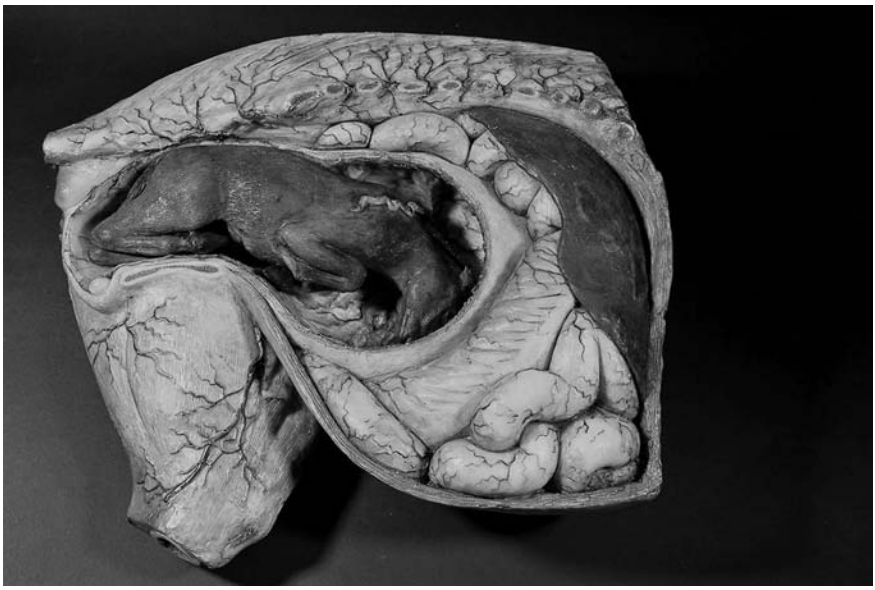

FIGURE 6 Cristóbal Garrigó, *Gestation of the Mare*, 1835. Colored wax. Complutense Veterinary Museum (MV-678)
PHOTO: LUIS CASTELO

have an exact date: the polycystic kidney of a horse mounted on a walnut panel (MV-676), an equine liver (MV-675), the hind leg of a horse (MV-679), the kidney of a female camel and the larvae of a stomach parasite affecting horses.

The quality and quantity of Garrigó's wax sculptures were highlighted by the veterinary historian Sanz Egaña.[67] Furthermore, until the 1950s it was possible to enjoy almost all of his work, together with that of the wax sculptors who preceded him, in the cabinet of the Veterinary School of Madrid. One document of great interest in his personal file is the economic and artistic evaluation presented by Dionisio Giraldo Bergaz, maker of pieces at the San Carlos Royal College of Medicine and Surgery in Madrid, which includes a list of the sculptures that Garrigó had made and repaired under Sánchez Osorio's supervision.[68] It praises their quality and the promising future of the artist, and places special emphasis on the head and neck of a horse and the full-scale statue of the donkey foal, "as they were the most studied works"[69] (Pieces MV-670 and MV-300).

67 Sanz Egaña, *Historia de la Veterinaria Española* (cit. note 14), p. 260.
68 Document written by Dionisio Giraldo Bergaz, dated October 22, 1831. AGA, file on Cristóbal Garrigó, box 31, document 14821.
69 Currently pieces MV-670 and MV-300 at the Complutense Veterinary Museum.

Close observation of the anatomical wax models that have survived until the present day, and on exhibition in the Complutense Veterinary Museum, combined with information from the documentary sources in the archive, enable us to understand the *modus operandi* of this sculptor[70] who, over time, developed a highly personal production process. A careful analysis of his output demonstrates that he considered each piece a challenge.

Garrigó's technical evolution shows this constant trend towards innovation. This can be seen in the enormous diversity of choices made during the creative process, depending on the distinctive characteristics of the specimen that he had to reproduce. He reinvented the paste he used for modelling. He used plaster molds for casting the wax, iron frames to provide internal supporting structures and vegetable fibers to give the pieces greater strength. He also incorporated other components (animal bone, plaster, metal plates, etc.) and was extremely meticulous when reproducing the smallest anatomical detail (reproduction of the animal's coat, positioning of the vessels, arteries, veins and muscles).

In order to reproduce the specimens that were more complex from an anatomical point of view, Garrigó employed the traditional technique of casting wax using plaster molds (unfortunately, they have not been preserved). He began by creating a clay model to imitate the specimen chosen and used this reproduction to produce the molds that would enable him to obtain a final copy. He carried out the molding process on a pine board. The inside walls of each of the molds were greased with a small amount of plain oil and, once the pieces of the mold were fitted together, he tied them using hemp cord. Immediately afterwards he poured in the wax paste, which was applied in successive fine layers of varying thickness. The more delicate preparations required the process in the workshop to be carried out with great care in order not to damage them and, on occasion, he applied a first subtle layer of wax inside the mold with a brush. Depending on the effect he wished to obtain, he chose pastes that were light or dark colored.

Once he had removed the wax from the mold and obtained the positive mask of each element, he removed the burrs from the joins and soldered the individual pieces together to construct the complete figure. He then commenced the most delicate and painstaking phase, which consisted of imitating the bodily structure that he sought to represent. He overlaid other structures onto the

70 AGUCM, cat. nº V02–024, July 6, 1829, Extraordinary Budgets for the Wax Pieces Laboratory and 2nd fortnight of September 1829, Materials destined for the Anatomical Amphitheatre and the Cabinet.

body of the sculpture such as blood vessels, nerve innervations, etc., which he had previously painted on the surface of the wax with a fine, smooth brush using the corresponding color. To reproduce the striations he used scrapers, toothpicks and spatulas, and to create the membranes he slowly poured small amounts of very fluid virgin beeswax onto a slab of jasper and laminated it with a flat sculpting tool until he obtained the desired transparency.

Over time Garrigó combined a range of techniques and materials, which would vary depending on the characteristics he had to reproduce. For the smaller, less complex tasks he modelled directly in clay and cast in a single mold, as in the case of the collection of jawbones or other small pieces. For larger objects he used several different molds, such as in the case of the clastic brain, which had seventeen detachable pieces (MV-682). At times he used only wax paste, but at others he added a preparatory white layer and overlaid this with colored wax, as in the case of the hearts. The level of technical complexity increased when it came to imitate other types of structure, such as the horse head (MV-670). For this he used the skeleton of a horse and mounted it using metal struts fixed to a pedestal to act as a base for modelling the anatomical morphology of the animal in wax.

6 Invention of a New Paste

Garrigó's total dedication to the Wax Pieces Laboratory and his constant desire to experiment with various sculptural techniques led him, in January 1848, to try a new combination of materials to reduce the disadvantages of wax, i.e. its high cost and its tendency to become brittle over time. This search concluded with the invention of a new paste that he would apply in layers combined with colored wax. He used this technique with molds to build an anatomical model that he called general myology.[71] The results obtained at the beginning were not completely satisfactory. Some parts of the figure stuck to the inner wall of the mold and broke when they were being removed. This forced him to make a new clay model of the specimen and repeat the casting process.

Given the need to create less expensive, more specialized artificial models intended for practical use, it was increasingly common in the 1840s for modelers to experiment with different artistic materials, including plaster and papier-mâché, in an attempt to adapt the technique to the demand. Several

71 AGUCM, cat. nº V01–022, official letter written by Garrigó dated January 9, 1848.

companies, such as Tramond, Deyrolle and Auzoux, in France, or Zeiller and Ziegler, in Germany, developed marketing strategies and produced catalogues of their products for export to schools, universities and museums around the world. Papier-mâché has come to be associated with the name of Louis Auzoux (1797–1880).[72] The paste, consisting of cork, clay and paper mixed together with organic glue, was easy to handle and could be used to produce the different pieces that made up the final model. It became hard when it dried but, at the same time, it conserved a certain lightness and flexibility that were highly valued by sculptors since it overcame the usual problems of working with wax. Although wax was very well suited to recreating organic objects with the highest degree of detail, using wax was an extremely laborious process and increased costs. Furthermore, it did not guarantee the survival of the model due to its low resistance to changes in temperature.

This importance of the new material was confirmed by Garrigó himself who, in an official letter dated June 30, 1857, to apply for a license, referred to himself as "Anatomical Dissector and Maker of Wax and Papier-Mâché Pieces at the Madrid Veterinary School."[73] The displacement of wax sculpting by papier mâché was caused not only by the advantages of the paper paste and the prevailing fashion, but also by the gradual decline in the School's economic situation, which would be obliged to close departments, including the Wax Pieces Laboratory, and even lay off staff.[74]

Furthermore, the teachers had already accepted the practical and economic advantages of Doctor Auzoux' new models compared with the costly and difficult artificial models made with colored wax paste, as shown in a report issued by the Faculty Board in 1859:

> [...] anatomical and pathological pieces have not been produced in wax for some years as it has been recognized that they are extremely costly and pastes have been invented which are better suited for molding and coloring, are considered to be longer-lasting, are faithful copies of anatomical

72 The famous industrial physician designed and sold anatomical models for the study of human, animal and botanical anatomy. His most famous models were of horses. For more information, see Christophe Degueurce, Philipp J. Adds, "The Mannequins of Dr. Auzoux, An Industrial Success in the Service of Veterinary Medicine," *The Journal of Plastination*, 2015, 27/1:18–28; Christopher Degueurce, "Les mannequins du Dr. Auzoux, une réussite industrielle au service la médecine vétérinaire," *Bulletin de la Société Française d'Histoire de la Médecine et des Sciences Vétérinaires*, 2013, 13:7–33.

73 AGA, file on Cristóbal Garrigó, box 31, document 14821.

74 AGUCM, cat. nº V01–066, 1854. Document written by the Director in which he refers to the state of the buildings and the cutbacks caused by the lack of budget.

> parts, and are acquired in Paris for a much lower cost than if they were commissioned to be made in wax, and this method of acquisition is the one which has been adopted by schools in the provinces.[75]

The professional press, when announcing Garrigó's death,[76] referred to his invention of the above-mentioned paste "with better qualities than papier-mâché" as one of his main achievements. He used it to make his last piece, the egg with chicken embryo.[77] The news, published in the newspapers of the period, confirmed that he was working on the composition of the paste when he died. Unfortunately, the sculpture he was testing it on has not survived. No information is available regarding the composition of this new paste, and we know nothing about the ingredients or proportions of the recipe. There is also no information about how many works he may have made with it. It was lost with his death.

We can, however, plot certain milestones in his career: the period of training and the production of the first artificial models in wax with the help of his master Sánchez Osorio (1829–1831); the surge in his output from that year until 1840; the beginning of a period with less dedication to ceroplastics, which coincides with the posts he held in the Mutual Society, and which led to the invention and use of papier-mâché paste as early as 1848. From that time on, little information has been found about his activity until his final years when he returned to the work.

From a scientific point of view, his work is valuable in that it each model embodied the scientific theories and conception of anatomy that prevailed at that time. In the time of Garrigó, the post-Vesalian anatomy of the previous centuries had evolved from the merely descriptive to include the functional and relational aspects of each structure studied. The incorporation of topographic anatomy, which focused on the study of bodily regions, was equally important for surgeons. In fact, the emergence of medicine and veterinary science schools in the Spain of the Enlightenment is based on the need to provide efficient surgeons for the army, for whom a solid training in anatomy was essential. The growing interest in comparative anatomy in veterinary teaching at the start

75 AGUCM, cat. nº 89/ 06–001. Drafts written by the Director, 1859.

76 *El Monitor de la Veterinaria*, March 5, 1863, 5/132:29. Available at: http://helvia.uco.es/xmlui/handle/10396/1752 (accessed 3 Oct. 2018).

77 This piece was conceived in 1860 and the Director of the School requested permission for Garrigó to enter the Natural Science Museum in Madrid and copy a model of the development of the egg and its embryo, AGUCM, cat. nº 89 06–001. Document written by the Director, dated February 7, 1860.

of the 19th century is also reflected in some of Garrigó's models, mentioned above, including species not usually studied in veterinary medicine. Indeed, his models are an effort of synthesis and versatility and some were designed for use in the teaching and study of other subjects in addition to anatomy (obstetrics, pathology, surgery, physiology, etc.). Furthermore, the systematic and didactic nature which predominated years later with the introduction of the clastic papier-mâché models could be observed decades earlier in some of his wax models, especially the clastic horse head (MV-682) and the clastic bovine heart.

7 Illnesses and the Final Years of Activity of the Anatomical Cabinet

In the summer of 1857, at an advanced age, Garrigó requested sick leave to take mineral and sea baths on the advice of his doctors due to a chronic illness he had suffered from for some time: "frequent headaches with dizziness and clouded vision and other phenomena of a congestive nature," "to which he is prone due to his sanguine temperament and nature of the life he leads in his occupations and work as anatomical modeler."[78]

The last years of his life would not be easy. In addition to his chronic health problems, his son Pedro died prematurely in 1858 at the age of 32.[79] Cristóbal Garrigó died suddenly on the morning of February 27, 1863.[80] The veterinary press of the era published this sad event as front-page news, stating that he had suffered a severe stroke:

> He leaves a vacant post which will be difficult and almost impossible to fill due to the construction of pieces of plastic anatomy in which he was a specialist, having invented for that purpose a paste with better qualities than papier-mâché. He was using this paste to create a model of all of the phases of the development of a chick inside an egg, a work which

78 Medical certificates issued in 1857 listing his symptoms. AGA, file on Cristóbal Garrigó, box 31, document 14821. They are also mentioned in the School's archive documentation, V02–014, document written by the Director, dated July 10, 1857.

79 Records show that he was born in 1826, AGUCM, cat. nº V01–187 and his military file gives the date of his death as December 22, 1858. General Military Archive in Segovia, file on Pedro Garrigó Cánovas.

80 AGA, file on Cristóbal Garrigó, box 31, document 14821. The same date is given in the documentation of the Veterinary School, AGUCM, cat. nº V01–020, document written by the Paymaster dated March 9, 1863.

> is now unfortunately lost. The Veterinary School in Madrid, his disciples and friends feel sorry for such a sad and unexpected loss.[81]

His post as Anatomical Dissector and Maker of Pieces was filled temporarily by Santiago de la Villa Martín and on a more permanent basis by Rafael Espejo del Rosal in 1863.[82] No document has been found to show that this new modeler produced any wax pieces, except for two jaws. However, we do not know if they were jawbones or something different. Classes for students who were going to learn the technique from him were not continued either. The only person to continue his work as wax sculptor, as far as we can tell from the documentary sources, was his son, Pedro Garrigó Cánovas.

Garrigó's son studied for a Degree in Veterinary Medicine between 1843 and 1848.[83] When he completed his academic training, he joined the army, as his father had done before him, as a military veterinary surgeon. It was there that he produced a number of didactic models in wax. There is no record of any wax model at the General Cavalry School, later called the Cavalry Academy in Valladolid, or in its museum or in the present-day Army Museum. His army record states that he was posted from May to December 1851 in Madrid as a military vet at the General Cavalry School in Alcalá de Henares, where he constructed wax models of horses for the purpose of teaching the external anatomy of the horse and external illnesses.[84] A year later he was admitted to the Veterinary School in Zaragoza as a modeler. A number of artificial wax models currently in this Faculty are attributed to him.[85] Everything indicates that the technique and improvements developed by the father had been passed on to this young sculptor, who died prematurely and brought to an end the line of veterinary wax sculptors in Spain.

8 Conclusion

Based on the sources found, we can attribute a certain sense or intention to the life of this artist and scientist, but we know little about the scale of his vet-

81 *El Monitor de la Veterinaria*, March 5, 1863, *5*/132:29. Available at: http://helvia.uco.es/xmlui/handle/10396/1752 (accessed 21 Mar. 2018).

82 AGUCM, cat. nº V01–020, communiqué from the Dean, dated August 4, and communiqué from the Director, dated August 10, 1863.

83 AGUCM, cat. nº V01–187, file on Pedro Garrigó Cánovas, born in Getafe, son of Cristóbal Garrigó and Olaya Cánovas, entered the School as a boarding student by agreement of the Board, dated October 12, 1843. He sat and passed his final exams in September 1848.

84 General Military Archive in Segovia, file on Pedro Garrigó Cánovas.

85 See note 11.

erinary and scientific vocation compared to his artistic or creative drive. We cannot discard the influence of his all-encompassing and omnipresent uncle, Carlos Risueño, who may have played a decisive role in his choice of career and his dedication to the construction of anatomical models.

Garrigó's artistic talent stands out from among the other facets of his life. Son of an artist, he was selected and promoted to produce sculptures due to qualities that must have been evident. These manual skills were broadened and consolidated by means of his training in the plastic arts at the San Fernando Royal Academy of Fine Arts and the lessons in ceroplastics he received from his master, Sánchez Osorio. Although he had the opportunity to forge a professional career in teaching, he preferred to develop his artistic side, focusing on his work and the improvement of his technique. Here he found a place where he could express and realize himself to the full.

The figure we have studied offers a dual scientific (veterinary) and artistic profile that can only be found in a limited number of anatomical sculptors in Spain, such as Ignacio Lacaba or Laureano Coll, both anatomical dissectors and sculptors. His work, scientific contributions and career make Cristóbal Garrigó de Nis worthy of inclusion in the list of outstanding anatomical sculptors. What remains of his extensive collection of wax models must be protected, but not only for its historical value. Each of the models in the collection and the way they are made reveal a purpose that the veterinarians of the Royal School of Madrid of the 19th century were so keen to disseminate. Garrigó's models constitute material evidence of the importance of procedures and artistic techniques in building knowledge.

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