

## Art and Science in Sorolla's Painting *A Research in Dr. Simarro's Lab*

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The development of painting has been linked to the existence of patrons. The church, the nobility, and the kings were interested in protecting art and culture as a means to enhance and spread their power. Ever since the Renaissance, artistic patronage joined traders and professionals, grouped in the guilds. This provided greater freedom to the compositions of artists, and everyday life, the triumph of science, and industry began to appear in artwork. In the late 19th century, painting depicts the apotheosis of scientific progress of that era, and scientists became protagonists. The content of Sorolla's naturalism ranges from social themes to the exaltation of science. Sorolla painted two masterpieces: *Portrait of Dr. Simarro at the microscope* and *A Research* (in which are identified Madinaveitia, Gayarre, and Sandoval, and perhaps San Martín, among the colleagues and disciples). These paintings may be among the most outstanding world paintings of this genre

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El desarrollo de la pintura ha estado ligado a la existencia de mecenas. La iglesia, la nobleza y los reyes mostraron interés por proteger el arte y la cultura como medio de realzar y difundir su poder. A partir del Renacimiento se incorporan al mecenazgo artístico los comerciantes y los profesionales agrupados en los gremios. Esto proporciona mayor libertad a las composiciones de los artistas y la vida cotidiana, el triunfo de las ciencias y la industria comienza a estar presente en las obras de arte. A finales del siglo XIX la pintura refleja la apoteosis del progreso científico que vive la sociedad y los científicos se convierten en protagonistas. El naturalismo de Sorolla aborda numerosos contenidos que van desde el arte de contenido social a la exaltación de la ciencia. Sorolla realizó dos obras magistrales. Retrato del Dr. Simarro ante el microscopio y Una Investigación (en la que entre los colegas y discípulos se pueden identificar a Madinaveitia, Gayarre y Sandoval y quizás a San Martín). Estas pinturas pueden situarse entre las más destacadas de la pintura mundial de este género.

*Palabras clave: Escuela histológica española, historia de la neurología, instrumentos científicos, arte y ciencia, Sorolla, Spinoza, Spanish Society, Hispanic Society.*

## Art and Power

Human artistic manifestations, fruit of the impulse to create images and objects without any apparent mechanical purpose, have been present ever since the origin of humanity. Initially, such valued artistic objects emerge as a symbol of the difference and the social status of their owners. These painted or carved objects represent daily themes related to survival (agriculture, hunting) and to the veneration of the unknown (the gods, disease, and death). The divine and the human are present in buildings and in everyday artistic objects. Gods, battles, daily life, kings, priests, warriors, scribes, and many other professions are motives that are naturally incorporated into an imaginary artistic collective. The techniques and materials used to make these artistic objects are of a very diverse nature (Piper, 1991). Among them, oil painting is one of the most remarkable in the world of western art, thanks to its many possibilities.

The oriental invention of oil painting, based on incorporating pigments into an oily medium, became popular at the beginning of the 15<sup>th</sup> century in northern Italy and in The Netherlands in cities like Amsterdam, Delft, Haarlem, Utrecht, and Dordrecht (Eastlake, 1847). During the Renaissance, this artistic revolution, full of new possibilities, soon replaced frescos and the art of tapestry in diffusion and prestige. The new techniques for painting on canvas transformed the artistic world at a time when art was an indication of the grandeur of an epoch. A new institutional framework for art was created as a result of progress of this new era. Before, in the Middle Ages, commissioned paintings and sculptures were tailored to the taste of kings and noblemen, the Church, and professional guilds. However, with the arrival of the Renaissance, the artist would not only think about his commission but also about the fact that, through the progress of art, he also has the mission of adding to the glory of his own epoch. The artist works as a scientist and *"his works exist not only for their own sake but also to demonstrate certain problem-solutions. He creates them for the admiration of all, but principally with an eye on his fellow artists and the connoisseurs who can appreciate the ingenuity of the solution put forward"* (Gombrich, 1966, p. 7). In addition to the figure of the patron or the escutcheons, distinctive signs of professions or crafts are now incorporated into the pictorial space, to lend meaning to the work. Without their presence, the work would be pointless. The canonical elements that ordered the entire space of medieval painting were progressively displaced to incorporate new elements that emerged forcefully in the work, with no need to refer explicitly to religious elements or to power.

During the change from the 15<sup>th</sup> to the 16<sup>th</sup> century, the Hispanic kingdoms underwent a phase of artistic splendor. The Church, part of the nobility, and the kings showed increasing interest in protecting art and culture, although,

in contrast to Italy and Holland, this protection was eclectic, as it lacked a definite model (Checa, 1992). In very few years, Spain went through a period in which Spanish art went beyond the frontiers of the Iberian Peninsula. It was a stage in which Spain dominated European politics but, at the same time, would be dominated by the culture of Italy and Flanders (Brown, 1990). The political circumstances of the Netherlands, united by dynastic links to the Spanish Crown, determined the beginning of the artistic tendency of painting sages performing their profession as a central or exclusive motif of paintings. This is the just and proud tribute to these men who, with their new sciences, contributed remarkably to the progress of their epoch.

These were troubled years for these regions of northern Europe, because, due to their economic vitality, they were the object of taxes to pay for the prolonged wars that took place to determine the political and religious hegemony among the three great emerging powers: Spain, France, and England. Open combat against the diffusion of Calvinism fomented the emergence of a seedbed of resistance that led to a long rebellion in the Seventeen Provinces against Spanish politics. These Provinces, linked to the Spanish Crown, found themselves caught up in a lengthy European conflict. The Eighty Years War began in 1568 when the seven Provinces initiated their independence, forming the Republic of the Seven United Netherlands known as Holland. In the end, the Westphalia peace (1648) confirmed their independence, both from Spain and from Germany. Before that, Philip II, contending with France, had sought the solution to the armed conflict by trying to disconnect the region from the direct control of Spain. He named his daughter, the Princess Isabel Clara Eugenia (1598-1633), married to the Archduke Albert VII of Austria, Governess of the Spanish Flanders, but the project failed because she had no heirs. All this time, as a consequence of the war in Holland, the Catholic Church and the Royal House played a complex role as patrons of art and the sciences. By protecting the arts, the Archdukes sought to diffuse the image of power, displaying scenes of the battlefields during the Thirty Years War or scenes from the public life of the rulers. A portrait of the Archduke looking at a landscape has left us what is probably the first testimony of the recently invented and much valued telescope (Molaro & Selvelli, 2009). In the Princess' Collection were most of the contemporary Flemish artists such as Peeter Snayers, Denis van Alsloot, Wenzel Coebergher, Jan Brueghel de Velours, Frans Pourbus, Otto van Veen, Joost de Momper, or Anton van Dyck (Vergara, 1999). Among them was the noteworthy painter, Peter Paul Rubens, the son of a Calvinist, although he was brought up as a Catholic. Rubens refused to be named a Court painter after returning to Ambers in 1608, after a long journey through Europe, where he was a painter in Italy and Spain. In contrast to the guidelines of the Council of Trent, whose pictorial style is represented by Rubens, under the influence of the Reformation in the seven Provinces, the

rise of Protestant art can be seen inside the Gothic churches, whose spaces are emptied and all ornaments eliminated from their walls. This new image was masterfully reflected in the monothematic series of the sacred spaces inside the cathedrals, carried out by Pieter Jansz Saenredam (Helmus, 2008). The two paintings of *The inside of Sint Bavokerk, Haarlem* (1628) of the Philadelphia Museum of Art and the J. Paul Getty Museum of Los Angeles are significant examples.

### Portraying Wisdom

However, despite the political and religious conflicts, the patrons of painting became more numerous in the Netherlands during this epoch. In Holland, flourishing guilds and rich merchants also become the protectors of art. These new patrons form a dynamic clientele, made rich through the vast commerce of the overseas trade empire. The commemorative portrait, either individual or in a group, and usually in a smaller format than the Court or Church portraits, will become the means to satisfy their artistic taste. This new bourgeois class became an important source of income for the painters, providing them with greater freedom in themes and compositions, in contrast to paintings of battles, processions, allegories of saints, or representations of the classic world.

These new consumers joined the consumption of art at the height of the Renaissance. That is, they did so at a moment in which landscapes and daily life images emerged on canvas and naturally became a noteworthy element of the composition. The progress of an epoch, of which the artist hoped to become the notary, is reflected in the paintings. For this purpose, the most valued belongings were also added to the composition, not only expensive products of gold and silver or exquisite fabrics. Other luxuries are also present, products of modern technique, such as mirrors, vases from the flourishing industry of glassware, mechanical clocks, or telescopes. An example that appeared quite early is seen in the work of Jan Van Eyck, painted in 1434. The technique of oil painting was already known in the Netherlands, as documented by the Strasbourg Manuscript (Eastlake, 1847, pp. 126-140). Here, the great achievement of Van Eyck, who invented the formula of quick-drying oils, is the use of glazing, which produced an effect never seen before in this spectacular picture. It represents the *Arnolfini spouses* with a round Dutch mirror in the background, in the center of the wall. The mirror reveals the objects outside of the painting. This is an interesting precedent that later on, in the 17<sup>th</sup> century, will be recreated by Velázquez after contemplating this painting. Although in *Las Meninas*, this resource of using a mirror allows Velázquez to play with the metaphysical approaches to illusion and reality in a much more complex fashion (Piper, 1991, p. 93). In the painting of Van Eyck, we intuit the social position of the depicted

people but we can know little or nothing about their work. Another later painting, *The Goldwäger and his wife*, painted by Quentin Massys in 1514, continues with the fashion of including in the foreground and in a central position a small and prized mirror that reflects the windows that look onto the street. Here, the references to the profession of the portrayed character are made obvious, by placing the bank money and the wife's valuable illustrated book of hours on the table. The existence of these paintings shows us that the political instability of the Netherlands had not decreased prosperity based on commerce. In addition to serving the traditional patrons, the artists expanded their clientele, adapting their work to the taste of their new clients from a predominantly urban society. These citizens of a flourishing middle class made up of merchants and guilds of diverse cities have joined the work of patronizing the arts, which was formerly only performed by the old established patrons. Thus, in the 17<sup>th</sup> century, the bourgeois portrait and the group portrait, representing noteworthy citizens of the city, flourished in Holland (Baljet, 2000). After the invention of printing, the crafts and professions were soon to be seen in the engravings of books that were available to the illustrated bourgeoisie. Early examples are seen in the engravings of Lucas van Leyden, *The milkmaid* (1510) or in *The surgeon and the peasant* (1524), and soon artists will represent these new topics in their paintings. In accordance with the public they target, these pictorial works were adapted to the tastes and possibilities of the bourgeois home or the guild headquarters. They were smaller in size, quite different from the typical size of the paintings of the royal collections that were intended for the palaces. To appreciate this, just compare the dimensions of *Las Meninas* (381 x 276 cm), which Velázquez painted in 1656, with an early Dutch painting, such as *The osteology lesson of doctor Sebastian Egbertsz de Vrij* (135 x 186 cm), painted by Thomas de Keyser in 1619. Such medical lessons were frequent throughout this epoch and there are at least a dozen of them in Dutch museums. Death resurrected for science, which is represented in these pictures, is the counterpoint to the still life paintings with the *vanities* of religious content, so frequent in this epoch. Anatomical studies can be found in very ancient artistic representations and medieval manuscripts. Antonio Pollaiuolo is considered the first artist who studied anatomy by dissecting bodies to place his knowledge at the service of art. Modern anatomical representations continue to appear in the drawings of Leonardo da Vinci, Michelangelo or Durer.

The anatomical drawings of Leonardo da Vinci were created with a scientific orientation, with the intention of achieving the greatest possible precision in the drawings. Among the great masters of painting and engraving, this search for precision and the ideal proportions became mandatory knowledge for artists (Hale & Coyle, 2000). Leonardo's drawings were lost for two centuries. The so-called Windsor Collection is made up of more than 600

drawings carried out by Leonardo da Vinci between the years 1478 and 1518. They are kept in the Royal Collection of the Royal Castle of Windsor and were meant to illustrate a monumental book on anatomy that was never published (Clark & Pedretti, 1968-69). It was quite frequent at that time for very ambitious projects never to be published or to be published in an abbreviated form. In view of the high cost of such editions, their publication was uncertain if the author did not have the necessary support. The work *Andreae Vesalii De humani corporis fabrica libri septem* (Vesalius, 1543) was more fortunate and was published, though not without great effort. Vesalius' book not only contains many anatomical engravings but, in addition, it represents an anatomy lesson in the frontispiece. In the woodcut, Vesalius is teaching a class in a classic amphitheater, full of people. A few pages further on, in the first book, there is another engraving of Vesalius where we can see him as a full professor of anatomy in the University of Padua, dissecting an arm. Vesalius wanted the engravings to be printed in top quality. Joannis Oporini, from Basel, one of the most famous printers of that epoch, took charge of this task. Although Titian was said to have played an important role in the production of these illustrations, according to the available documentation, it is more likely that they were done by various engravers, and the ancient and very busy Titian was not among them. However, there is no doubt that Jan Stephan van Calcar, a student from Titian's workshop, played a significant role as engraving artist and also as supervisor of the work, along with Vesalius (Simons & Kornell, 2008). Anatomical engravings were very frequent in medicine books and we will once again find this interest in combining art and science in the famous "lessons" painted in oils.

A good example of this is *The lesson of anatomy of Dr. Sebastiaen Egbertsz*, painted by Aert Pietersz in 1603. The 29 characters who are in the oil painting are rigidly represented in three rows, as if it were a battle or a religious representation. Other paintings with the same theme are *The anatomy lesson of William van der Meer*, painted by Michiel and Pieter van Miereveld in 1617 or *The anatomy lesson of Dr. Johan Fonteyn* painted by Nicolas Elias (called Pickenoy) in 1625. The style will evolve until reaching the most remarkable representation of all. *The anatomy lesson of doctor Tulp* (169.5 x 216.5 cm). This was painted in 1632 for the surgeons' guild and it was one of Rembrandt's first important painting commissions. Years later, in 1662, he would paint *The syndics of the drapers' guild* (Schupbach, 1982). Three centuries later, photographic support would compete with painting in the representation of these lessons. *The autopsy in Cajal's cathedra* (ca. 1916), in which the scientist examines a corpse under the attentive gaze of his disciples and assistants is very famous and has been extensively reproduced (Moya, 1968, plate 5, p. 49). These paintings, which exalted the development of medicine in the treatment of disease and

pain, contrasted with the classic visions of a religious nature, associated with miraculous cures or the charitable care of the sick. For example, the fresco of Masaccio, *Saint Peter curing the sick with his shadow*, painted in 1425 for the church of Santa Maria del Carmine, Florence. Another example, of the Spanish school is the oil painting on wood by Fernando del Rincón Figueroa *Miracles of the Doctor Saints Cosmas and Damian* (1517, Prado Museum), which represents the amputation of a leg. The presence among the disciples of a woman who is listening to the surgeon's explanations is uncommon. The oil on canvas, *Saint Roch visiting the plague victims and the Virgin in Heaven* (1575, Pinacoteca di Brera in Milan), painted by Giacomo da Ponte Bassano, is from the Venetian school. Pieter Brueghel the Elder, reflects disease in the oil on wood *The cripples* (1568, 18 x 21 cm. Louvre Museum). The Real Alcazar de los Austrias de Madrid held a collection of paintings that represent freaks, deformations, and monstrosities caused by diseases like hypothyroidism, hirsutism, and hormonal imbalance (Sáenz de Miera, 1994). Buffoons, midgets, or bearded women were represented by the painters of the epoch, producing a contrast meant to exalt the perfection of royal power. Among the most well-known works are the midgets of Velázquez, exhibited in the Prado Museum, *The Buffoon Diego Acedo*, "The Cousin" (1635, oil on canvas, 107 x 82 cm), *The Buffoon "Calabacillas"* (ca 1637, oil on canvas, 106 x 83 cm), *Francisco Lezcano*, "The Boy from Vallecas" (ca. 1640, oil on canvas, 107 x 83 cm) or *The Buffoon Sebastián de Morra* (ca. 1646, oil on canvas, 106.5 x 81.5 cm). Juan Carreño de Miranda portrayed *Eugenia Martínez Vallejo*, *The Monster*, dressed and undressed (ca. 1680, oil on canvas, 165 x 107 cm). José de Ribera portrayed *Magdalena Ventura de los Abruzos*, *The Bearded Woman* (1631, oil on canvas, 212 x 144 cm, Tavera Museum, Toledo). These works show the Baroque taste for representations of freaks of nature and the attraction of people with some physical or psychological anomaly.

Any science, in addition to medicine, captured the Renaissance and Baroque artist's attention. For instance, astronomy, which, associated with the development of lenses, popularized the telescope and here, among the artists, we can again mention Brueghel. Traditionally, its popularization has been attributed to Galileo Galilei, but the journal *Science* (Holden, 2009) has revealed the use of sophisticated instruments many years before. In the oil painting *Extensive landscape with view of the Castle of Mariemont* (ca. 1608-1611, Virginia Museum of Fine Arts) by Jan Brueghel the Elder, we can appraise the progress of technology in the newly invented telescope. The Archduke Albert VII appears looking at a landscape with one of the first spyglasses known, which he must have obtained directly from Lipperhey or from Sacharias Janssen. Through a letter from the Papal Nuncio Guido Bentivoglio, we know that the Marquis of Spinola had attended a public demonstration of the telescope in September, 1608. Afterwards, both



the Archduke and the Marquis, who would subsequently be immortalized by Velázquez, showed great interest in acquiring this instrument. Brueghel, in a work carried out together with Rubens, again represented a large retractable telescope in the oil painting *Allegory of Sight* (1617, Prado Museum) (Molaro & Selvelli, 2009).

Gerrit Dou is another painter of this epoch who painted various works praising the triumph of the skilled professions and of science. *The Astronomer* was painted around 1628 and is currently in the State Museum of the Hermitage. In this painting, there is a person seen from the waist up looking reflectively at the celestial globe. Three decades later, around 1665, Dou painted one of his most important works: *The astronomer by candlelight*. It is an oil painting on wood found in the J. Paul Getty Museum of Los Angeles. It shows a rich, dark room, only lit by candlelight, which shines on the astronomer's face. This character is absorbed, holding a candle with his right hand over the book he is reading, and in his left hand, he holds the celestial atlas. Other works of the same genre painted by Gerrit Dou are *Weighing gold*, *The Doctor* (ca. 1660), *The dentist examining the tooth of an old man*, *The violin player* (1653) and *The drowsical woman* (ca. 1663). Johannes Vermeer leaves us a masterpiece in *The astronomer*, painted in 1668. It is an oil painting on canvas, small format (50 x 45 cm) found in the Louvre Museum. *Geographers working* was painted by Cornelis de Man around 1670 and it shows a group of three characters debating around a globe of the earth. Thus, with these "popular" works, the art of painting overtakes that of music, which will have to wait until the arrival of Georg Friedrich Händel (1685-1759). Händel is considered the first modern composer who wrote his own music not only thinking about the traditional patrons but about the tastes of the public of that epoch (Cortes Santamarta, 1996, p. 119).

#### Disease and the Triumph of Science: From Goya to Picasso

During the 18<sup>th</sup> and 19<sup>th</sup> centuries, we still observe the pictorial representation of the Christian exaltation of charity, the evocation of suffering in the face of disease. Little by little, these representations are displaced by others that show us the advances of medicine and of science, without at times refraining from social denunciation. An advance of what is coming is seen in the six paintings of William Hogart *Marriage a la mode* (1745, National Gallery of London). They were conceived as a narrative series to denounce marriages of convenience between a rich bourgeois family and a penniless aristocrat. In two of the paintings, the sequelae of venereal diseases are shown in detail, not only in the guilty parents but also in their innocent offspring. However, art at the service of the description of diseases and their remedies is not an exclusive patrimony of artists; it also becomes a very useful tool in the hands of

some scientists. Such is the case of Charles Bell, a famous Scottish surgeon, who had notable skill as an engraver and painter. He published a human anatomy treatise in three volumes with numerous engravings of anatomy (Bell, 1803). A sample of his skill with the paint brush is his oil painting on canvas, *Opisthónos* (1809, Royal College of Surgeons of Edinburgh), which portrays a soldier who died of tetanus after being injured in the Napoleonic campaigns in the battle of La Coruña. The oil painting on canvas of Constant-Joseph Desbordes, *The Baron Jean Louis Alibert performing the vaccination against small pox in the Castle of Liancourt*, is of the French school (1820, Musée de la Chartreuse de Douai). Just as in historical painting, notable facts—in this case, scientific discoveries—were also appreciated by the public and could then be reproduced by other painters over and over. Gaston-Theodore Melingue did just this six decades later, in 1879, in his painting *Edward Jenner Performing the First Vaccination Against Smallpox in 1796* for the Academie Nationale de Medecine of Paris.

The oil painting *Curing the croup* by Francisco de Goya (before 1812, Araoz Collection, Madrid) is more difficult to include in this category of the description of diseases. Its owner, Dr. Gregorio Marañón, saw in the painting a scene in which an adult tries to relieve a child's neck cramp due to the plaques which develop in the throat because of diphtheria, which caused a slow and anguished death by asphyxia. Goya may have been present at some popular scene in which an adult, in order to ease a child's breathing, desperately tried to tear out the plaques from the child's throat by sticking his fingers into the child's mouth, because the plaques could be seen by the naked eye. However, although Goya may have seen such a scene, in this work, we cannot appraise any desperation in the adult. Now we definitely know that it represents the scene from *The Lazarillo de Tormes*, in which the blind man opens the boy's mouth to sniff the remains of the stolen sausage (Lafuente Ferrari, 1983, p. 194). A quite different work is *Goya attended by Arrieta*, (1820, Minneapolis Institute of Arts). In this self-portrait, Goya represents himself as a dying man assisted by his friend, the doctor. It is dedicated to Dr. Arrieta in gratitude for the care that saved the painter from a serious disease suffered one year previously. The picture has some characteristics that are typical of a religious work but it transcends them to evoke respect and exaltation of science, typical of the late 19<sup>th</sup> century. As noted by Manuela Mena Marqués (1988) "*Goya seems to have dropped the biting satire, still from the 18<sup>th</sup> century,...of the doctor as a "quack"...which appeared in Spanish literature of the Middle Ages...This is far removed from...interpretations...such as [Goya's] Capricho "From what illness will he die?", a ferocious joke about the ignorant doctor", whom he represents as an ass. Goya attended by Arrieta can be considered a precedent of the Science and charity* (1897, Picasso Museum, Barcelona). This early work of Picasso

allows us to glimpse that we are nearing the end of the cycle of this painting genre. With this painting, the very young Picasso became known in the General Exhibition of Fine Arts of 1897 (Exposición Nacional de Bellas Artes, 1897, catalog number 944), where he coincided with Sorolla, who presented *A research* (catalog number 1043). Both compositions were appreciated by the jury, as they both won prizes. Towards the end of the 19<sup>th</sup> century, naturalism emerged as a fashionable tendency, gaining some painters' sympathy. This influence has been well described by Pérez Rojas (2009): *Naturalism also encouraged topics related to the sciences; and interest in new scientific and medical theories. Advances in medicine were remarkable in the final decades of the 19<sup>th</sup> century; important achievements included an increase in the life expectancy of humans... the doctor is painted with an aura of prestige. He is presented in a variety of ways: as a man of science who transmits his knowledge... as the benefactor who brings relief to mankind or as a charitable being who is the bearer of hope* (pp. 38-39).

### The Exaltation of Science in Spanish Painting and the European Tradition

Do allegories to science abound in Spanish painting? If we go over the topics that are addressed by the Spanish school, we see an abundance of paintings of a religious nature in which the sages are the fathers of the Church; in others, we see representations of royal or military power. To show us the profession of the portrayed person, the painter resorts to books, cassocks, military uniforms, weapons, paint brushes, or sculptures but references of an academic or professional nature do not abound and they are usually diffuse. There are painters' self-portraits, portraying themselves with paint brushes. There are even some portraits such as the one by Goya of the diplomat and art connoisseur *Evaristo Pérez de Castro* (1803-1808), with paint brushes in his hand (Pérez Sánchez & Sayre, 1888, p. 84). Sometimes the portrayed person's activity or profession is not obvious unless one knows the clues to place the work within the proper framework. How can one discover philosophy in the frequent paintings of philosophers, represented alone or in groups? Thus, in *The School of Athens* (1511-1512) by Raphael portraying Plato, Aristotle, and other ancient philosophers or in *Aesop* (ca. 1639) by Velázquez or in *The death of Socrates* (1787) by Jacques Louis David, we do not immediately understand what the canvas reflects. However, the activity represented is better understood when the work is manual, whether it has mythological or social connotations. For example, *Vulcan's Forge* (1630) or *The Weavers* (ca. 1648) by Velázquez or the crafts of Goya in *The water-carrier* (1808-1812) or *The knife grinder* (1808-1812) although the craft is not so recognizable in *The milkmaid of Burdeos* (Pérez Sánchez & Sayre, 1888,

pp. 260-263, 376-377). Sometimes, the presence of a music sheet and a keyboard are used as a resource to present a musician (e.g., the portrait of *Félix Antonio Máximo López* painted by Vicente López in 1820) (Portús Pérez, 2005).

However, when we look for the representation of the value of scientific activity, we find that Spanish painters have barely paid any attention to it. When Goya painted the naturalist *Félix de Azara* in 1805, the books are eclipsed by the martial military uniform. In contrast is the *Portrait of Alexander von Humboldt*, painted by Friedrich Georg Weitsch in 1806. Here, landscape, so very present in painting ever since Patinir (Vergara, 2007), plays a decisive role to tell us about the profession of the person portrayed. The illustrious naturalist, sitting in front of a sylvan background, looks at us while resting a herbarium with a tropical flower on his lap. The references to his scientific work consist of the presence of a mercury thermometer in the lower corner of the painting.

Sorolla's paintings of Doctor Simarro in his laboratory should be placed within this European iconographic tradition. In the 19<sup>th</sup> century, Spanish science did what it could to follow the investigative steps of France, Germany, Great Britain, and other nations. That is how Giner de los Ríos described it in the review *Science in Spain* for the journal *Nature*. However, one has the impression that, when Spanish scientists stand out, it is a consequence of their individual work. Our sages worked alone in the national panorama, seeking a niche that would allow them to appear along side of their colleagues from more advanced nations. The case of Doctor Luis Simarro is one of these national singularities. Simarro the investigator, in addition to being a Neurologist, Psychiatrist, and the first Full Professor of Experimental Psychology in Spain, was a multifaceted man, dedicated to politics and an admirer of the Fine Arts (Carpintero, Campos, & Bandrés, 2002). He was a very special personage, capable of leaving the mark of his scientific concerns on the journal *Nature* at the age of 26 years. Giner praised the work of Simarro, who, as a young professor of Physics in the Institución Libre de Enseñanza [Free Teaching Institution] was disseminating Tyndall's experiments on light in Spain (Ginez [sic] de los Ríos, 1877).

Luis Simarro's fondness for painting came from his family. His father, Ramón Simarro, who died prematurely, had been a notable painter who studied with a scholarship in Rome. His son, Luis, the godson of Luis Madrazo, was good at drawing. Enthusiastic about painting, he was a good friend of the painters Aureliano de Beruete and Emilio Sala, among others. However, for Sorolla, the relation went deeper, because they were not only good friends, but Simarro was also his family doctor. And both had become orphans as young children because their parents died in tragic circumstances (from tuberculosis, suicide, and cholera). One could think that the doctor and the painter had heard about the painting *Gros Clinic* (1875) by Thomas Eakins, or the one by de Robert Fleury, *Dr. Pinel freeing*

*the insane in the courtyard of the Salpêtrière* (1876), which represents an event that did not take place during the French Revolution, as has sometimes been said, but rather in 1802 (Fee & Brown, 2006). The *Clinical Session of Dr. Charcot in Salpêtrière*, painted by André Brouillet in 1887, of which lithographic copies were made—one of which hung in Dr. Freud's consulting office since 1891—must have been even better known. Dr. Simarro also knew Charcot well; he had returned to Spain few years ago from his French training stage, during which, like Freud, he had also attended Charcot's classes. In 1888, Simarro had performed a *Legal Medical Report* for a trial in which the report for the other party had been performed by Charcot (Campos, 2002). It is difficult to imagine that neither the painter nor the doctor were familiar with some of these paintings because, in fact, these paintings, many of them very large, praising the knowledge of medical science, were quite popular during the last part of the 19<sup>th</sup> century. Henri Gervex had presented the painting of *Doctor Péan before the operation in the Salon of Society of the French artists* (1887). Shortly afterwards, in 1889, Léon Lhermitte painted *The lesson of Claude Bernard*, a tribute that took place eleven years after the death of the sage who had promoted the method of experimental medicine. An apotheosis of painting dedicated to science occurred when Jean André Rixens painted the *Jubilee of Pasteur on December 27, 1892*. Back in 1885, Albert Edelfelt had also represented the chemist and biologist Louis Pasteur from the waist up, surrounded by the utensils of his laboratory in Ulm Street. In the *Portrait of Louis Pasteur in his laboratory* (1885, Orsay Museum), we see how the scientist carefully examines a bottle that contains the spinal column of a rabbit infected with rabies. Toulouse Lautrec contributes to this pictorial genre painting *An examination at the Faculty of Medicine* (1901, Toulouse-Lautrec Museum) a few months before his death. The scene shows the doctorate examination of his cousin, Tapié de Céleyran, who stands in front of the panel members, professors Wurtz and Fournier

In Spain, the oil painting of Luis Jiménez Aranda *The doctor's visit*, (1889, Prado Museum) shows us the chief doctor doing his rounds in the hospital ward. For Jiménez Aranda, this meant his official consecration after obtaining the first medal in the Universal Exhibition of Paris in 1889. These paintings are the chronicle of the scientific successes of that age and they were frequently reproduced in the illustrated European journals and newspapers during the 19<sup>th</sup> century. It is obvious that this kind of image was not unfamiliar to the public of the epoch, and therefore they could not be unfamiliar either to Simarro or to Joaquín Sorolla. Under the pseudonym of Paco Sincero in the satirical journal *Juan Rana*, Sorolla's canvas is referred to thus:

“‘Look at this canvas!’ exclaims *Alejandro*. It represents the famous doctor Peant (sic) in his laboratory, performing a research [...]

*But it is not doctor Peant; because I knew that doctor painted by Sorolla. It is Doctor Simarro.*’

‘True, true,’ amends *Alejandro*, ‘I was confusing it with a picture by a very notable French painter, which I saw reproduced in *Paris Illustré*.’” (Sincero, 1897).

In what sort of situation does Sorolla propose to carry out a eulogy of science? Before 1897, Sorolla had painted some works of the historical genre (*El Palleter declaring war on Napoleon*, 1884, Valencia Deputation; *Mesaline in the arms of a gladiator*, 1886, Banco Bilbao Vizcaya Argentaria), portraits (*The novelist Benito Pérez Galdós*, 1894, Pérez Galdós House-Museum, Cabildo de Gran Canaria) or of social realism, far from sentimentalism and emphasizing the social thesis (*Another Margerita!*, 1892, Mildred Lane Kempert Art Museum; *The White Slave Trade*, 1895, Sorolla Museum; *And they say that fish is dear!*, 1894, Prado Museum). They are all indoor scenes, some naturalist, others not, painted in his studio. Therefore, *A Research* (1897) is a new challenge for Sorolla, who had to leave his studio at mid-afternoon and paint out of doors until nightfall. Here, he presents Simarro as a man of science who transmits his wisdom investigating and, in addition, it is the triumph of naturalism, as it recreates the environment of the laboratory, catching the luminous atmosphere produced by the artificial reddish-yellow light of a gas burner that contrasts with the weak mauvish afternoon light that shines through the window. In 1899, Sorolla painted *Sad inheritance!* (Bancaja Collection), which led to his international consecration when it won a prize at the Universal Exhibition of Paris one year later. Here, social drama, conceived in the open air at the seaside, naturally integrates light and landscape. Among the group of blind, crazy, crippled, and leprous children, he shows us, with striking realism, the naked body of the child struck polio in the center of the picture, who, with great difficulty, is trying to bathe at the beach with the help of a monk (Bereute, 1901). As noted by Javier Barón Taidigsmann (2009, pp. 265-271), Sorolla initially conceived this canvas as *The children of pleasure* and in it he would display the degeneration caused by vice, a social problem he had already addressed in *The White Slave Trade* and *Another Margerita!* As can be seen, people used to believe that alcoholic or syphilitic parents could transmit degenerative diseases to their children. Moreover, forensic studies could be now conducted on lunatics. Therefore, priest Galeote underwent a mental examination after he had murdered the Bishop of Madrid, Martínez Izquierdo. The debates that were generated during the trial were followed with great interest by the press of the times. Pérez Galdós reported priest Galeote's crime in several chronicles sent in 1886 to the Argentinean newspaper *La Prensa* (Reig, 2002, pp. 57-90). Dr. Simarro, a good friend of Sorolla explained to the judge that priest Galeote's madness was due to his “nervous inheritance” or “degenerative weakness” (Campos Marín, Huertas García-Alejo, & Martínez Pérez, 2001, pp. 95-103).



Although we now know that poliomyelitis, which is in the center of the *Sad inheritance*, has nothing to do with vice (unlike other diseases described by Sorolla and possibly also present in the picture), the notion of relating social degeneration to vice had gained strength among reputed doctors and friends of Sorolla. In Simarro's library, there was a well known treatise about degeneration written a few years previously by one of his Parisian masters (Magnan & Legrain, 1895). Sorolla had some misgivings while painting this picture, even confessing that he was afraid to continue. However, friends like Blasco Ibañez convinced him that *Sad Inheritance* was the most important contribution made in Spain to an art with social content. "I am very uneasy, he wrote,...I painted it with all my soul but, as it is very personal, I fear they may not understand it...it is full of naked (sick) children...the sea is very dark blue... heavy and sad... everything is in the sunshine... but there is no more color than the black robe of the monk and the sickly tones of weak and miserable flesh...all true, but sad, I fear they will criticize me" (Barón Taidisgsmann, 2009, p. 269). The picture was praised by the critics in Spain, but it was also disconcerting, despite the fact that it emphasized the importance of Christian charity as a remedy for the pain caused by disease. Lastly, in view of the opposition of the conservatives, it was not bought by the liberal government, so the picture ended up in New York.

Painting as a support or exaltation of science not only held a place in academies and private offices, but it soon reached the walls of the new temples of science represented by the museums of Natural History. In the evolutionist debates, the biologists used illustrations to communicate their science to the public. The catalogue of the 19<sup>th</sup> century figures, which went from the epic of the historical types and romanticism on to the "costumbrismo" of popular types, with the change of century now expanded until it reached our human ancestors. Soon, the "ape-man" gave way to the educational mural representation like those we can see in the American Museum of Natural History of New York, painted at the time of the birth of jazz, commissioned by its director, the paleontologist Henry Osborn. We can contemplate an early and innovative mural of the Neanderthal man standing upright and alert, making plans for the future, on the walls of this museum (Clark, 2008; Hopwood, 2009). In fact, the scientific advances have served art in various spheres that have contributed to the development of society. Such is the case of the scientific expeditions that, ever since the discovery of the New World, included artists because they were needed to bear witness to whatever they found because of its scientific, economic, or military interest (Bandrés, Campos, & Llavona, 1989). The achievements of the industrial revolution, with factories and smoking chimneys or train stations, are also present in paintings, like modern cathedrals built in the service of progress and of science, as in Monet's *Arrival of the Normandy Train, Gare Saint-Lazare* (1877, 60x80 cm, The Art Institute of

Chicago). The influence was reciprocal and the artists took over the scientific knowledge of perceptive phenomena to place it at the service of pictorial techniques. During the Renaissance, the illusion of perspective was a fundamental value and paintings were a window to enter a real world created by art or by means of illusions created with the technique of the *trompe l'œil*. As of the last third of the 19<sup>th</sup> century, these challenges were accepted radically with the advent of Monet, Cezzane, or Renoir's impressionism, or Seurat's pointillism in *A Sunday afternoon on the Island of La Grande Jatte* (1884, The Art Institute of Chicago). What counted here was not the exact color or the precise detail but the gestalt that is formed in the retina that observes the work and where the final color emerges by contrast of the values placed together. Already in the 20<sup>th</sup> century, Dali's surrealism went one step further leaving us works like *Mae West (Face of Mae West which can be used as an apartment)* (1934, The Art Institute of Chicago), a gouache carried out on the page of a commercial magazine. Or in the portraits of Lincoln, *Study for apparition of a Vermeer figure on Abraham Lincoln's face* (1938), *Gala contemplating the Mediterranean Sea which at twenty meters becomes the portrait of Abraham Lincoln* (1976). Although these works are provocative and very modern, we cannot forget that an antecedent of this genre of trick-portraits was already found in the well-known portraits made from objects, flowers and vegetables by the Italian painter of the 16<sup>th</sup> century, Archimboldo.

### Three Portraits by Sorolla

In Spain, as mentioned, there were few painters who praised the triumph of science in the 19<sup>th</sup> century. However, for a painter of the artistic quality of Sorolla to be one of them confers an artistic value on the three paintings we know to be his which transcends that of the French paintings and likens him to the Dutch painters. The picture *A research*, which belongs to the Sorolla Museum, was painted by Sorolla in 1897. It was presented in Madrid in June of that year in the General Exhibition of Fine Arts in the Palace of Industry (currently the Museum of Natural Sciences) on the heights of the Race Course (Alcántara, 1898). This painting, in which Simarro appears surrounded by other colleagues and disciples, is not the only one in which Sorolla portrays Dr. Simarro. One year previously, in 1896, he had painted the unfinished portrait *Doctor Simarro*, an excellent work (Fig. 1).

The *Ilustración Española y Americana*, on page 25, reproduces *A Research* but the text does not even mention Dr. Simarro: "Master Sorolla's painting represents—says the chronicler—the laboratory of a well-known doctor, justly famous for his very special knowledge and frequently lauded in Academies and Cultural Centers. The doctor is busy with a very difficult examination and his colleagues





Figure 1. Joaquín Sorolla y Bastida. *Simarro*, 1896. Oil on canvas, 46 x 53 cm. Unfinished, unsigned, entitled and dated right upper corner: L. Simarro 1896. (Simarro Legacy Trust, Complutense University).

and disciples attentively watch the course of such an important scientific investigation. Both the figures and the myriad of objects that fill his work table are a marvel of color. Sorolla obtained six votes for the medal of honor in the last General Exhibition of Fine Arts for this painting (De Cuenca, 1897).

The chronicle published in the *Blanco y Negro* reflects the crisis of the historical genre, which was replaced by a naturalist type of painting that places more emphasis on realism and on the social thesis. The chronicler notes that *the State could do something more for Art than to place it beneath the hooves of the horses...There are geniuses that are suddenly revealed...do not search for the outdated and aged painting of history in the modern Exhibitions... Before, an exhibition used to be an apotheosis. Sages, princes, warriors, artists, magnates, archangels, and saints were evoked by the palette and the paint brush. Today, an Exhibition is a public square. Beggars, laborers, seamen, rascals, children, and plain soldiers are in all the paintings and on all the walls; everyone carries the tools of his trade.* The luminous note stands out in the competition and one

of the conquests of our contemporary painters is the sun. Therefore, he ironizes about this, saying that there will have been many cases of sunstroke in view of Sorolla's success. Some people exaggerate the luminous effects so much, continues the chronicler, that *"then, the character; instead of receiving the light, seems to have his own light, like a star"*. When we look at the figure of Simarro in *A research*, we could conclude that the critic has noticed this. Vital Aza, comparing the paintings that won prizes with the classic ones that were not thus favored by the Jury, exclaimed: *"Benlliure... Sorolla... Bah! His fame is pure ostentation!"* (Aza, 1897).

The journal *Gedeón* reviewed the exhibition humorously and, about *A research*, wrote *"Dr. Simarro watches his hands melting after having stuck them into a jar of aqua regia."* About the *Portrait of Dr. Simarro*, it exclaims that it is easy to recognize him upon seeing him at the microscope. It praises the delicious *Portrait of Doña Amalia Romea, (Sra. de Laiglesia)*. The portrayed woman poses with melancholic serenity that evokes a classic relief, from which a symphony of white and vaporous cloths



Figure 2. Joaquín Sorolla y Bastida. *Portrait of Dr. Simarro at the microscope*. 1897 Oil on canvas, 80 x 100 cm. Entitled and signed lower right side, over the books: J. Sorolla B. The painting was exhibited at the National Exhibition of Fine Arts of Madrid in 1897, as *Portrait of Dr. S.*, catalog number 1048. (Simarro Legacy Trust, Fundación General, Complutense University).

emerge, very elegantly, and which is rounded off with a silver frame. It bears the catalog number 1604, which is unrelated to the other nine paintings by Sorolla, all with correlative numbers, so it must have been included at the last minute. Nor does it appear on page 159 of the official catalog *La Parra*, which completes the eleven paintings presented by Sorolla (Exposición Nacional de Bellas Artes, 1897). *A courtyard of the Cabañal* does not seem to please the commentator, who says that “*the genius [Sorolla] is capable of milking a wooden goat.*” (Gedeon, 1897). The journalist and multi-faceted playwright, Antonio Martínez Viera, was even more caustic. Under the pseudonym of Sastre del Campillo, he published a Satirical Catalog of which at least two editions were published, the second one with a circulation of 4000 copies. From *Science and Charity* about Ruiz (whom he deprives of the surname Picasso), he exclaims “*I am truly sorry to be laughing like a rascal, but it’s more than I can take: isn’t the doctor taking the pulse of a glove?*” (Campillo, 1897, 13-14).

In contrast to these frivolous or playful versions, other chronicles of the epoch acknowledge that this General Exhibition of Fine Arts is the most naturalist of all those that have been held so far (Danvila Jaldero, 1897).

What did Sorolla think of this painting? He left us a written account. Reading it, we know that he did not only refer to the prize-winning work but instead he refers to the two known paintings that he did on the same theme *A research* and *Portrait of Dr. Simarro at the microscope*, both painted in 1897.

*The history of this picture—says Sorolla about A Research—if it can be called history, is so natural and simple that it can be told in a few words.*

*I had been working on the portrait of Dr. Simarro in his laboratory [...] and therefore, I often visited the home of my fellow countryman and I attended, as a curious spectator, the scientific investigations to which the doctor was dedicated, with the enthusiastic and assiduous cooperation of his colleagues and disciples. I know it is not usual for a painter to visit the home of the person he is portraying, but my studio is a reserved place, which I only use if it is absolutely unavoidable. Whenever possible, I paint things where they are, and people in their environment, in their own atmosphere, the only way so to paint them so they will turn out as they really are, naturally, intimately, and not as if they were on a visit and in an artificial setting.*





Figure 3. Joaquín Sorolla y Bastida. *A Research*. 1897 Oil on canvas, 122 x 151 cm. Entitled and signed lower right corner: J. Sorolla Bastida. The painting was exhibited at the National Exhibition of Fine Arts of Madrid in 1897, as *A Research*, catalog number 1043. (Sorolla Museum, Madrid).

*Firm in this notion, I was working, as mentioned, in Dr. Simarro's laboratory, where science always lives and Art was nothing more than a stranger who tried to cause as little bother as possible. One night, the doctor, surrounded by his companions, was performing delicate embryogenesis studies with the microscope. He had split open several hens' eggs without finding inside them the phenomena he was seeking, when suddenly he called the attention of his disciples and colleagues, who were anxiously grouped around him, to observe the function or the phenomenon found at last.*

*That lot of intelligent heads, anxious to know, grouped around the microscope [author's boldface] and injured by the artificial light that at the same time lit up a complete arsenal of apparatus, bottles, and reagents, caused a pleasant impact on me, suggesting the idea of the picture, which I began to paint right away.*

*And that was it. Having finished the portrait of the doctor, I continued to go to his laboratory to paint the group [author's boldface] by night and by the light of an Auer burner over gaslight. We all worked in the laboratory: they focused on their investigations, without concerning themselves about my person; I, on the other hand, foreign to their scientific work*

*and only concerned with the lines and colors of their faces, and in general of their figures.*

*I did not want to bother about effect of daylight on the picture until the end. The painting did not leave the laboratory; I made my customary nighttime visit and it can be said that from Dr. Simarro's house, it went to the exhibition room where it now stands (Sorolla, 1897).*

From Sorolla's description, one could conclude that first he painted *Portrait of Dr. Simarro at the microscope*, which was owned by Simarro and currently belongs to the Simarro Legacy of the Complutense University. Doubtless, Sorolla refers to this painting, exhibited in the Salon, when he describes that the doctor is studying embryogenetic preparations under the microscope, but the group has disappeared. As Sorolla states "*having finished the portrait of the doctor [at the microscope, catalog number 1048], I continued to go to his laboratory to paint the group by night and by the light of an Auer burner over gaslight [catalog number 1043] (Figs. 2 & 3).*

However, in *A Research*, the microscope has been replaced by a Leitz microtome and this is the painting



where the doctor's colleagues are surrounding him. A large bottle of potassium dichromate, used for chromoargentic tincion, is in the foreground, and a powerful gaslight that shines from an Auer burner floods the entire scene, leaving Simarro's disciples in the shadow, on a dark background of a shelf filled with laboratory bottles. Simarro is performing the tincion process of the embryonic tissue that he will later mount on the histological plaques to look at them through the microscope. Contemplating both paintings, after reading Sorolla's description, one could conclude that the scene represented in *A Research* is the result of an elaborate staging, set up from what he could observe in that laboratory. As noted by Sorolla, Luis Simarro called the attention of his disciples and colleagues to step up to see what he had found "around the microscope and injured by the artificial light, that lit up...an arsenal of apparatus, bottles, and reagents" (Sorolla, 1897). We can imagine that, at that point, they would approach the table and patiently wait their turn to contemplate the preparation enlarged by the microscope. However, this inspiring scene of the painting is not what Sorolla painted in his picture. In the canvas, he eliminated the presence of the microscope, thereby avoiding the shadows that the light would project on Simarro's face, which thus captures our full attention. In the composition chosen by Sorolla to present in the National Exhibition, the cups of tincion, the plaques, the reagents far away from the face do not distract us and, thus, we can see Simarro's expression sideways, profound and concentrated, focused on his work and gazing away from the spectator, with his back to his colleagues. But, although Sorolla sought the greatest naturalism, the scene is not real, because Simarro's colleagues would feel little interest in observing his technical skill in placing the tissue cut with the microtome at his left onto the glass plaque, if it were not possible to subsequently contemplate any phenomenon with the naked eye. Tissue tincion is a solitary task that can hardly lead to a discovery that must be shared with those present in the laboratory, in contrast to what could occur when observing something through the microscope. What Sorolla saw while Simarro worked in his laboratory led to these two paintings. In one of the paintings, entitled *A Research*, Simarro is surrounded by his colleagues and disciples and absorbed in the tincion tasks, as Sorolla relates. This scene could hardly occur in reality and, in fact, what Sorolla describes is that he saw Simarro's disciples surrounding the microscope to look through it. In the other painting, *Portrait of Dr. Simarro at the microscope*, he appears alone, with the microscope to his right, not covering his face, and standing out in the foreground. For a moment, he has lifted his head to be able to draw his observations but before doing so, he glances at the painter with a preoccupied gaze. Simarro's glance goes right through the spectator to rivet some non-existent place at the far end of the room, behind the nape of our neck. Simarro's gaze reflects his concentration on the work, although he has momentarily lifted his eyes from the lens.

In this position chosen by the painter, the presence of six figures behind him would have altered the composition we now see. Sorolla masterfully resolved in these two compositions the embodiment on canvas of the scientific ambience prevailing the laboratory, without foregoing the artistic component of lights and shadows that can be contemplated at this time of the evening by gaslight.

Could Sorolla have used sketches to organize these compositions? Although we have no proof of the existence of sketches of the colleagues and disciples' heads in the Simarro Legacy, there are two preparatory charcoal sketches of Simarro's image for the two paintings: the profile of his head, looking towards the table and, on the back of that same page, another head, more from the front but not looking directly at us, and a study with objects and the torso and the hands in which Sorolla would later place the microscope (Campos Bueno, 2002, p. 22, 2009). (See Figs. 4 & 5.)

Six members of the jury awarded the laurel -Prize of Honor- to Sorolla and four voted in favor of the sculpturesque group *The tradition* by Agustín Querol. The remaining six members of the jury preferred not to award any prize to the works presented at the contest, thus avoiding the obligation of having to choose between the two opponents. Some of those who voted for Sorolla wrote on their ballots that the prizewinning work was *A Research*, without mentioning any of the other ten canvasses presented at the contest, some of them as notable as *The White Slave Trade* (1895, Sorolla Museum), which had been presented two years before in Madrid. However, the sound execution of the chiaroscuro and solid colors, exact and sober, praised by the critics, creates the illusion that the characters of *A Research* seem to breathe and live. This would explain how a painting, without a transcendental topic, would attract the public as much or more than *The White Slave Trade*, which was capable of impressing the masses due to its dramatic content (Danvila Jaldero, 1897).

With regard to the sculpture prize, the triumph of science is also present. Agustín Querol, in addition to presenting the sculptural group *The tradition* in marble (catalog number 1277, 110 x 50 m) and in bronze (catalog number 1278, 185 x 60 cm), participated with two colossal allegories in marble (280 x 190 cm), which symbolize the triumph of intelligence: *Science* (or *The genius* (catalog number 1282) and *The study* (catalog number 1283) (Exposición Nacional de Bellas Artes, 1897; Campillo, 1897). The origin of the sculptural group *The tradition* is a work in plaster carried out by Querol during his scholarship in Rome. He won the first medal of the National Exhibition of Fine Arts of 1887 in Madrid with this work. The sculpture was cast in bronze for the Prado Museum (160 x 75 x 75 cm), which received it in 1892, after it had obtained the Gold Medal in Munich in 1891. In the National Exhibition of 1987, he participated once again with the two above-mentioned versions (Exposición Nacional de Bellas Artes,



Figure 4. Joaquín Sorolla y Bastida. Preparatory sketch for Portrait of Dr. Simarro at the microscope, 1897. Pencil on paper, 17 x 23.4 cm. Unsigned. (Simarro Legacy Trust, Fundación General, Complutense University).

1987, pp. 198-199). The group, of great naturalism and very meticulous represents an old woman, crowned with ivy as a symbol of tradition, telling a story to two children who listen, fascinated. A crow whispers the story into the ear of the old woman, who is surrounded by books. The scene is an allegory of the transmission of knowledge to the young generations (Azcue Brea, 2007). It is noteworthy that both the artists who were awarded with the Prize of Honor in 1897—Sorolla and Querol—presented allegories of the transmission of knowledge (*A Research* and *The Tradition*, respectively).

Sorolla never sold *A Research* (1897, Sorolla Museum), which allowed him to win the laurels of honor awarded by the Salon, or *The White Slave Trade* (1895, Sorolla Museum), which had been presented two years before in Paris, and, upon the death of the painter, both pictures went directly to the assets of the future Sorolla Museum. The value of *A Research* for Sorolla is obvious because, in addition to



Figure 5. Joaquín Sorolla y Bastida. Preparatory sketch for *A Research*, 1897. Pencil on paper, 17 x 23.4 cm. Unsigned. (Simarro Legacy Trust, Fundación General, Complutense University).

having been selected for the National Exhibition of Fine Arts held in Madrid in 1897, during Sorolla's lifetime, it also participated in the International Exhibitions of Munich in 1906, Berlin, Cologne, and Düsseldorf in 1907, London in 1908, and Rome in 1911. One century later, in the year 2009, it was also present in the Anthological Exhibition of Sorolla of the Prado Museum (Diez & Barón, 2009, pp. 254-257). The second painting, *Portrait of Dr. Simarro at the microscope* (1897, Simarro Legacy Trust, Complutense University) always belonged to Simarro until at his death, when it passed on to the assets of the Trust that carries his name. After the Spanish civil war, the Trust was transferred to the Complutense University. The canvas, lend by the Trust, has participated in exhibitions in Madrid, Estella, San Sebastián, Valencia, Santander, and Zaragoza.

Can we ask when and where he painted both works? In view of the lack of data, one could think that these works, both dated in 1897, were done one after the other, during the winter or spring of that year. Sorolla would go to Doctor Simarro's laboratory in the evening. Was it in General Oraá, as has sometimes been stated? This is impossible because

at that time, Simarro's little house was not yet built and we know that the future laboratory was going to be in the cellar and would extend to the house next door, which belonged to Doctor Madinaveitia. Rodríguez Lafora states that the laboratory was built in 1902 (Rodríguez Lafora, 1968). Moreover, in this laboratory in the cellar, we could not find the window we can see in *A Research*. Sorolla could have gone to Conde de Aranda 1, where, at that time, Simarro had established his consultation cabinet. We can also assume that, given the large size of the flats and the customs of the epoch, Luis Simarro may have lived for some time with Mercedes before changing his residence at the beginning of the 20<sup>th</sup> century. However, it is certain that after his marriage, he kept his laboratory at his single living quarters at Arco Simarro Santamaría 41 (nowadays, Augusto Figueroa), the magical place where Simarro showed Santiago Ramón y Cajal the Golgi preparations (Campos, 2006). Carral (1927) tells us that he lived there with his first wife; “both his house and his laboratory were at Arco de Santamaría. The laboratory was on the ground floor and the rooms at the top”. Both floors communicated through a rudimentary ear-trumpet phone. A family anecdote shows us that he met his disciples there to show them his investigations. Carral tells us how his wife would call him to dinner by means of the phone and “one day when, as usual, he was working in his laboratories with his disciples, when he was very concentrated on his task, his wife told him over the phone that the meal was ready” but Simarro, after half an hour of calls, unhooked “the ear-trumpet and put it into the pocket of his jacket and went on with his explanation for another half an hour.” (p. 9).

### The Portrayed Characters

When observing these works of art—besides the issue of the technical challenge that the artists self-mandated in these works that go beyond the mere portrait—one also feels curious about who is represented in the painting and what they are doing. The answer is not always easy and, lacking documents about the commission of the painting, the possibility of identifying the portrayed person often depends on indirect data and, at times, one must even resort to speculation that may be groundless. The portrayed model may remain anonymous, like *La Gioconda*. Also, as with *The Arnolfini spouses*, one can attribute well-grounded identities (Panofsky, 1934), with which other investigators have disagreed (Koster, 2003). It is different in guild representations, where, besides the syndics who commission the work, there is sometimes included in the picture a sponsor who paid a commission for this purpose. The fresco of Raphael's *School of Athens*, (1511-1512) has posed many problems over the centuries because Raphael did not leave any personal notes on this work. The identification of Plato or Aristotle is clear but other characters are much more controversial. One of

the most well known and analyzed pictures is *The lesson of anatomy of Dr. Nicolaes Tulp*. It was painted in 1632, commissioned by the guild of surgeons, and it represents Dr. Tulp in a practical class, dissecting the muscles of an arm, surrounded by his colleagues, Jacob Blok, Hartman Hartmanszoon, Adraen Slabran, Jacob de Witt, Mathijs Kalkoen, Jacob Koolvelt, and Frans Van Loenen. We even know that the corpse is that of a 41-year-old criminal, Aris Kindt (Adriaan Adriaanszoon), hanged for robbery. The names of the surgeons are written on the list that one of them shows us, although they were added some time after the work was painted (Schubach, 1982).

What can be said about the characters portrayed in *A research*? Who are these colleagues or disciples that Sorolla painted in the picture? Their names are not in the complete file in the Sorolla Museum. Nor are they in the file of Spanish iconography in the National Library of Spain, where the picture is described. Nor are they in the reviews of the journals that chronicled the General Exhibition of Fine Arts of 1897. The picture is reproduced in the *Ilustración Española y Americana*, which shows that it was not changed afterwards to include new characters in the scene, but the names of the portrayed people do not appear in the text, not even the name of Dr. Simarro (De Cuenca, 1897).

Can we identify these portraits? In view of the lack of data provided by their comrades years later, some attributions have appeared without offering any data about their reliability. False attribution is repeated by diverse authors without verification, despite some clearly erroneous identifications. Nicolás Achúcarro Lund (1880-1918), Pío del Río Horteiga (1882-1945), or Gonzalo Rodríguez Lafora (1886-1971) cannot be in the painting simply because, when it was painted, Achúcarro, who was the oldest of the three, was only 17 years old. Achúcarro came to Madrid to study medicine in October of 1897 but the painting had already been exhibited in June of that year. However, other colleagues who are mentioned could have coincided in the laboratory at that time. This is the case of Juan Madinaveitia Ortiz de Zárate (1861-1938) who, five years later, as of 1902, shared a laboratory with Simarro in the cellars of their adjacent houses in General Oraá. Before that date, Dr. Madinaveitia must have been one of the habitual visitors of Simarro's laboratory at Arco de Santa María. Probably, Madinaveitia is the character in a smock in the center of the painting, in the shadow, at the far end of the room, because his face and his receding hairline are very similar to the *Portrait of Dr. Madinaveitia* (ca. 1907) painted by Sorolla. Dr. Madinaveitia and Simarro formed an inseparable trio with Sorolla, who, since 1889, visited San Sebastián on numerous occasions on his way to Paris and to other European destinations. And he went back on four occasions before the end of the century, apparently once in the summer of 1898, after having painted *A Research*. Did he begin to visit Madinaveitia in San Sebastián that year? Was the trio established after having met in the Laboratory



while he was painting the picture? It is hard to know, but there is no doubt that Sorolla visited Madinaveitia several times in his home in Aizetsua, an old Basque country house located in Ayete and restored at the beginning of the century (Fernández Pardo, 1992). There Sorolla painted *The siesta* (1911). Madinaveitia's granddaughter, Carmen, has left us a family memory of those summers with Sorolla (Castro Madinaveitia de Zubiri, 1992).

Miguel Gayarre y Espinal (1866-1936) may be another of the portrayed people, as stated by his granddaughter, and this is feasible because of his friendship with Simarro. Gayarre must be the character with the light smock at the right of the picture, who is leaning over to observe Simarro's work. Lastly, three people who have been mentioned may have been portrayed by Sorolla: Eduardo García del Real and Álvarez de Mijares (1870-1947), José García del Mazo y Cuevas, and Valentín Sama Pérez. Although there is no basis for this last attribution. Other testimonies report that, at that time, in addition to the very young Achúcarro, other distinguished doctors visited Madinaveitia's laboratory. In this case, some of them could have been portrayed by Sorolla. Rodríguez Lafora remembers it thus: "*In the afternoons, we both worked [Achúcarro and Rodríguez Lafora], with other disciples of Madinaveitia and of professor don Luis Simarro in the laboratory that the two masters founded in General Oraá, 3... Madinaveitia's Clinic attracted a brilliant group of doctors distinguished in diverse specialties because of his practical teachings, both clinical and necropsical, (Gayarre, Sandoval, García del Mazo, García del Real, Sama, Botella, Cejudo)*" (Rodríguez Lafora, 1968, p. 95). In fact, in 1898, three of them, Madinaveitia, Gayarre, and Sandoval, shared their works with Simarro in the *Vademecum* (Gayarre et al., 1898). To the two characters identified with some certainty—Gayarre and Madinaveitia—we should also add Dr. Sandoval, who would be the one whose head is sticking out behind Madinaveitia. We can assume this from what we know about "Sandovalito," which was Simarro's nickname for him, as recalled by Juan Ramón Jiménez (López Bretones, 2001, p. 132). Francisco Rodríguez Sandoval, at the time when the poet knew him, was a doctor in the General Hospital of Madrid where Madinaveitia worked, and was one of his young laboratory aids, along with Achúcarro. Sorolla knew him well because he painted him twice, once a sketch that he made shortly before the end of the 19<sup>th</sup> century. Five years later, he painted the portrait in oils, *Doctor don Francisco Rodríguez de Sandoval* (1906, Prado Museum), and he portrayed him again for the gallery of the Hispanic Society in 1920. At the time when Sorolla painted *A Research*, Sandoval already knew Simarro, because he collaborated with him in the *Vademecum* and therefore, we should assume that he would also participate at that time as Simarro's laboratory aid. Moreover, when we observe Sandoval's physiognomy and bearing in Sorolla's sketch, we can see it is very similar to the figure that appears in *A Research*. This seems sufficient

to conclude that Sandoval was also portrayed by Sorolla for the composition of personages who appear in *A Research*.

We have yet to identify the short man, dressed in a dark suit, in the center of the picture. Among the names that have been considered are references to Botella or Cejudo. But it could also be José García del Mazo y Cuevas, or Eduardo García del Real, or Valentín Sama Pérez, although, not having iconographic data that would help us to identify him, it is impossible to opt for any of them. However, a photograph of Dr. Alejandro San Martín y Satrustegui (1853-1908) bears some physical resemblance to the portrayed man, although he would be the only one from the group whom Sorolla did not portray by himself. The friendship with Simarro could date back to 1885 when, as Simarro was returning from Paris, they both coincided in the laboratory of Gorguera Street.

### An Ideal Portrait

There is one final aspect that deserves mentioning. Sorolla portrayed other characters of his times, although in most cases, the objects that accompany the portrait are conventional, and we can see that people are seated in a chair, holding books of their own science, or simply dressed in their everyday clothing (e.g., Cossio, Echegaray, Galdós, Ricardo León, Ortega y Gasset, Rodríguez Marín, or Altamira). However, sometimes, there are elements in the picture that show us the portrayed person's profession (e.g., the sculptors, Mélida and Mariano Benlliure, the painter Muñoz Degraín, or the engineer Torres Quevedo), which can be seen in the collection of the Hispanic Society (Muller & Burke, 2004). The paintings *A Research* and *Portrait of Doctor Simarro at the microscope* also evoke the same intimacy with the interplay of light and shadows similar to the one we find in Sorolla's portrait of the photographer, Antonio García, his father-in-law. It is a scene with a sense of drama that does not appear in his less personal portraits. The painter successfully captured the effects of the artificial light that brushes and defines the factions of the photographer while he examines a plaque in the penumbra of his laboratory, among the glitter of the glass bottles (Muller, 2004, pp. 25-26). The American philanthropist, Archer M. Huntington, after meeting Sorolla in London in 1908, acquired this gallery of illustrious Spaniards for his Museum of the recently founded Hispanic Society, based in New York. Huntington's love of Spanish culture was not limited to the portraits of contemporary characters. The magnate wanted to review the main episodes of the history of Spain that had caused such an impact on his first contact with the Spanish culture. When starting out, Sorolla had also recreated the historicist painting, so admired by many painters during the 19<sup>th</sup> century. He had painted works like *The second of May* (1884), *El Palleter, declaring war on Napoleon* (1884), or the later *Pledging the Constitution by the Queen Regent María Cristina* (1897) (Díez & Barón,

2009, pp. 48-57, 207). However, he was now no longer interested. Therefore, the painter dissuaded Huntington with the argument that he did not have enough historical knowledge to do this type of work, and to do it rigorously would take too much effort. The original project was replaced by Sorolla's proposal, consisting of painting a great mural of 220 square meters, representing *The regions of Spain*. With this work, Sorolla anticipated the great muralists of the 20<sup>th</sup> century. The contract to paint the monumental series *Vision of Spain* (1911-1919) was signed on November 26, 1911 and he received 100,000 American dollars for this commission.

Sorolla's gallery of portraits was completed with the portraits of intellectuals, businessmen, and politicians whom he painted in Spain for other institutions or private parties. Cajal's portrait is worth closer attention. Nine years after *A Research*, in 1906 Cajal, the great Spanish histologist and colleague of Simarro, obtained the Nobel prize. Sorolla then painted the *Portrait of Ramón y Cajal* but this painting is much more conventional than the one he did of Simarro; here, the histologist from Aragon also looks directly at us. He is not working at a table but seated in an armchair. He has no microscope although there are books on a side table; the only histological reference, in contrast to the portraits of Simarro, is a large drawing of the cerebellar cortex leaning on the wall.

This collection of Sorolla's portraits should be completed with the one that has recently been identified. It is the portrait of the philosopher Baruch Spinoza that Sorolla painted by Simarro's commission around the change of the century, at about the same time as when Simarro won the cathedra of Experimental Psychology. It is an idealized portrait of the philosopher, painted from a photograph of an old painting and whose lithographic reproduction was presumably found in a book by Spinoza (Figure 6). Julia Irigoyen, museologist and authority in charge of the artistic patrimony of the Complutense University, was contemplating this portrait of the philosopher by an unknown painter. When she saw the free strokes and the quality of the portrait, she immediately had the feeling that its author was Sorolla (Fraguas, 2009). She requested some help, which she obtained from three sources. The first aid I provided was indirect and documental, based on the collection of books from Simarro's library on Spinoza and his work. In addition, in the program of his cathedra of Experimental Psychology, one of the four parts into which it is divided begins with the following quotation by Spinoza:

*"It is impossible that man should not be a part of nature and he can suffer no changes other than those of nature, because nature is the efficient cause that produces them"*  
(Spinoza, *Etica* IV, prop. 4, in Simarro, 1902).

The second one is in Simarro's testament, where there is a picture painted by Sorolla taken from a photograph of

a painting of Spinoza. And, thirdly, as if these documentary data were not sufficient to corroborate that Sorolla is the author of the portrait, we have the direct testimony of Juan Ramón Jiménez who, after Simarro was widowed in 1903, went to live with Achúcarro in Simarro's house. Some unedited manuscript notes have recently been published in which one can read the following: "[Simarro] gave us his intelligence through talking and reading. He interpreted others' intelligence ...and what others!: Plato, Spinoza, Kant, Hume, Voltaire, Renan, Wundt". In another note we can read: "Dr. Simarro read to me, with his eager enthusiasm, fragments of the *Ethics* - those splendid nights by the fire that glowed on so many books of all kinds and the portrait of Spinoza that Simarro had asked Sorolla to paint for him" (Jiménez, 1990). It is not the only time he remembers how Simarro read Spinoza's works to him. Juan Ramón spent some time in the surgical sanatorium where Simarro had managed to get him a bedroom and a sitting room because he could not tolerate the noise in the center of Madrid. The poet remembers that, at the end of the day, he would see Simarro's car arriving from his



Figure 6. Joaquín Sorolla y Bastida. *Portrait of Spinoza*. Ca. 1902. Oil on canvas, 83 x 60 cm. Unsigned. (Simarro Legacy Trust, Fundación General, Complutense University).

window; Simarro, who treated him like a son and “brought books; he read Voltaire, David Hume, Nietzsche, Kant, Wundt, Spinoza, and Carducci to me” (Jimenez, 1990, p. 181). Unfortunately, the portrait, lost for years, no longer has the original texture and glazing after it was cleaned in the 1980s. The final combination of brushstrokes which, in Sorolla's hands, became a superb pictorial series, has disappeared from the painting. After the restoration, the traces of the technique that the young American aquarellist and painter, Starkweather, tried to discover while he was with Sorolla in Spain were lost. Vain attempt, because the master was not generous and did not reveal them, driving the youth away when the crucial moment arrived “thus he never witnessed Sorolla's final melding of individual brushstrokes into a ‘superb’ pictorial whole although he believed that it was accomplished by interposing through a neutral grey which bound together Sorolla's separate strokes of color” (Muller, 2004, p. 16)

In this commissioned painting by Sorolla, we intuit the concerns of Simarro, the neuropsychologist who addresses human emotional behavior by resorting to the advanced work of Spinoza. He thereby is one century ahead of the work of Antonio Damasio (2003) *In search of Spinoza: neurobiology of emotion and feelings*. Strangely enough, on the cover of Damasio's book was *The astronomer by candlelight*, by Gerrit Dou, a composition that plays with the light on a face that stands out from the dark background, like the images of Simarro's laboratory captured in Sorolla's paintings.

To conclude, it is worthwhile to note that nowhere is the task of a Spanish scientist shown with such force and careful detail as in the two paintings of Simarro in his laboratory—either in any of Sorolla's portraits of illustrious men or in those by any previous Spanish artists. Contemplating these two works painted in Simarro's laboratory, among the series reviewed herein, it is probably not an exaggeration to state that these paintings deserve an outstanding place in their own right, not only in Spanish painting destined to praise the advances of science but among the universal paintings of this genre. Are not the facts presented herein enough to contemplate these exceptional paintings of Sorolla through fresh eyes? Are they not singular works, not only from the artistic viewpoint, but also for their iconographic value? Is this not the best artistic praise that can be made about the Spanish science of the Generation of '98, represented here by a noteworthy character from the flourishing Spanish histological school, whose value is restored by a universal painter? The passing of time and the comparison with other contemporary, much more conventional, works may provide the answer.

## References

Alcántara, F. (1898). *La Exposición Nacional de Bellas Artes de 1897*. Madrid: Centro Editorial Artístico, Estab. Tip. Sucesores de Rivadeneyra.

- Aza, V. (1897). Ven, amigo Nicanor. *Blanco y Negro, Revista Ilustrada*, 318, (June,5).
- Brea, L. (2007). *Agustín Querol*, in J.L. Díez & J. Barón (Eds.), *El siglo XIX en el Prado* (pp. 416-420. Madrid: Museo del Prado.
- Bandrés, J. C., Campos, J.J., & Llavona, R. (1989). Behavioral observation in America: The Spanish pioneers in the 16<sup>th</sup> and 17<sup>th</sup> Centuries. *Bulletin of the Psychonomic Society*, 184-187.
- Barón Taidisgsmann, J. (2009). ¡Triste herencia! In J. Díez & J. Barón, (Eds.), *Joaquín Sorolla 1863-1923* (pp. 265-271). Madrid: Museo Nacional del Prado.
- Baljet, B. (2000). The painted Amsterdam anatomy lessons: Anatomy performances in dissecting rooms? *Annals of Anatomy*, 182, 3-11.
- Bell, C. (1803). *The anatomy of human body*. London: Longman & Rees.
- Berute, A. (1901). Joaquín Sorolla y Bastida. *La Lectura, Revista de Ciencias y de Artes*, 1, 8-29.
- Brown, J. (1990). *La Edad de Oro de la pintura española*. Madrid: Nerea.
- Campillo, S. del (1897). *Catálogo satírico. Exposición de Bellas Artes en 1897* (2<sup>nd</sup> ed.). Madrid: Leonardo Miñón.
- Campos Bueno, J. J. (2009). Light in science. *Contrastes*, 54, 149-155.
- Campos, J.J.(2006). Un día en el Arco de Santa María In A. Ferrús y A. Gamundí (Eds.), *Santiago Ramón y Cajal, 100 años después* (pp.62-92). Madrid: Editorial Pirámide
- Campos Bueno, J. (2002). Simarro: deuda de honor. In H. Carpintero, J. Campos, & J. Bandrés (Eds.), *Luis Simarro y la psicología científica en España* (pp. 21-26). Madrid: Universidad Complutense.
- Campos, J. (2002). Simarro, Charcot y los orígenes de la práctica de la Neuropsiquiatría y Neuropsicología en la España: Informes médico-legales e ideas sobre la hipnosis. *Revista de Historia de la Psicología*, 23, 85-102.
- Campos Marín, R., Huertas García-Alejo, R., & Martínez Pérez, J. (2001). *Los ilegales de la naturaleza: medicina y degeneracionismo en la España de la Restauración (1876-1923)*. Madrid: Consejo Superior de Investigaciones Científicas.
- Carpintero, H. C., Campos, J.J., & Bandrés, F.J. (2002). *Luis Simarro y la psicología científica. Cien años de la cátedra de Psicología Experimental en la Universidad de Madrid*. Madrid: Editorial Complutense.
- Carral, I. (October 5, 1927). De cómo un hombre de tendencias conservadoras tuvo que ser un feroz revolucionario. *Heraldo de Madrid*, 8-9.
- Castro Madinaveitia de Zubiri, C. (1992). Cinco obras de Sorolla que conocí de pequeña. In Fundacion Kutxa, *Sorolla en Guipúzcoa* (pp. 90-93). Donostia-San Sebastián: Fundación Kutxa.
- Checa, F. (1992). Poder y Piedad: Patronos y mecenas en la introducción del Renacimiento en España. In F. Checa Cremades, *Reyes y mecenas: los Reyes Católicos, Maximiliano I y los inicios de la Casa de Austria en España* (pp. 21-54). Madrid: Electa.



- Clark, C. (2008). *God or gorilla: Images of evolution in the Jazz Age*. Baltimore, MD: Johns Hopkins University Press.
- Clark, K., & Pedretti, C. (1968-69). *The drawings of Leonardo da Vinci at Windsor Castle*. London: Phaidon.
- Cortes Santamarta, D. (1996). *Música sacra, Vol. II*. Madrid: Alfaya.
- Damasio, A. (2003). *Joy, Sorrow, and the Feeling Brain*. Orlando, FL: Harcourt.
- Danvila Jaldero, A. (1897) Exposición General de Bellas Artes. *El mundo naval ilustrado*, 1(4), 87-88.
- De Cuenca, C. (July, 1897). *La Ilustración Española y Americana*, 15, (26), 19-23, 25.
- Díez, J., & Barón, J. (2009). *Joaquín Sorolla 1863-1923*. Madrid: Museo Nacional del Prado.
- Eastlake, C. (1847). *Material for the history of oil painting*. London: Longman, Brown, Green & Longmans.
- Exposición Nacional de Bellas Artes (1897). *Catálogo de la Exposición General de Bellas Artes: 1897*. Madrid: Celestino Apaolaza Impresor.
- Fee, E., & Brown, T.M. (2006). Freeing the Insane. *American Journal of Public Health*, 96, 1743.
- Fernández Pardo, F. (1992) In Fundación Kutxa, *Sorolla en Guipúzcoa* (pp. 37-85). Donostia-San Sebastián: Fundación Kutxa.
- Fraguas, R. (June 14, 2009). ¿Pintó Sorolla este cuadro? *El País. Suplemento Madrid*, 1-6.
- Gayarre, M., Madinaveitia, J. Sandoval, F.R., Cisneros, J., Azua, J., & Simarro, L. (1898). *Vademecum Clínico Terapéutico*. Madrid: Romo y Füssel.
- Ginez (sic) de los Ríos, F. (1877). Science in Spain. *Nature*, 16, 362-363.
- Gombrich, E. H. (1966). *Norm and form: Studies in the art of the Renaissance*. London: Phaidon Press.
- Hale, R.B., & Coyle, T. (2000). *Anatomy Lessons from the great masters*. New York, Watson-Guptill.
- Helmus, L. Y. (2008). *Saenredam*. Madrid: Ed. Fundación Colección Thyssen-Bornemisza.
- Hopwood, N. (2009). A clash of visual cultures. *Nature*, 458, 704-705.
- Holden, C. (2009). Scopes in oils. *Science*, 325, 1053.
- Jiménez, J.R. (1990). *Selección de prosa lírica; Notes: F. J. Blasco Pascual*. Madrid: Espasa Calpe.
- Jiménez, J.R. (1998). *Un andaluz de fuego (Francisco Giner de los Ríos) / selección, ordenación y prólogo de M. J. Domínguez Sío*. Sevilla: Ediciones de la Fundación El Monte; Moguer: Fundación Juan Ramón Jiménez.
- Koster, M. (2003). The Arnolfini double portrait: A simple solution. *Apollo*, 158, 3-13.
- Lafuente Ferrari, E. (1983). *Goya en las colecciones madrileñas*. Madrid: Amigos del Museo del Prado.
- López Bretones, J.R. (2001). *Vida y obra poética de Juan Ramón Jiménez*. Madrid: Hijos de Muley Rubio.
- Magnan, V., & Legrain, P.M. (1895). *Les degeneres: Etat mental et syndromes episodiques*. Paris: Rueff et Cie
- Mena Marqués, M. (1988). Goya atendido por Arrieta. In A. E. Pérez Sánchez & E. Sayre (Directors), *Goya y el espíritu de la Ilustración*, (pp. 371-2). Madrid: Museo del Prado.
- Molaro, P., & Selvelli, P. (2009). The mystery of the telescopes in Jan Brueghel the Elder's paintings. *Memorie della Societa Astronomica Italiana/Journal of the Italian Astronomical Society*, 75, 282-285. (arXiv:0908.2696v1 [astro-ph.IM])
- Moya G. (Ed). (1968). *Nicolás Achúcarro, su vida y su obra*. Madrid: Taurus.
- Muller, P.A., & Burke, M.B. (2004). *Sorolla. The Hispanic Society*. New York: The Hispanic Society of America.
- Muller, P. A. (2004). Sorolla and America. In P. A. Muller & M.B. Burke (Eds.), *Sorolla. The Hispanic Society* (pp. 9-41). New York: The Hispanic Society of America.
- Panofsky, E. (1934). Jan van Eyck's "Arnolfini" portrait. *The Burlington Magazine*, 64, 112-127.
- Pérez Rojas, F.J. (2009) Sorolla's Naturalism. *Contrastes*, 54, 33-41.
- Pérez Sánchez A. E., & Sayre, E. (1988). *Goya y el espíritu de la Ilustración*. Madrid: Museo del Prado.
- Piper, D. (1991). *The illustrated history of art*. London: Mitchell Beatzley.
- Portús Pérez, J. (2005). *El retrato español del Greco a Picasso*. Madrid: Museo Nacional del Prado.
- Reig, R. (2002). *El crimen de la calle Fuencarral. El crimen del cura Galeote*. Toledo: Ediciones Lengua de Trapo.
- Rodríguez Lafora, G. (1968). Mis recuerdos de Nicolás Achúcarro. In G. Moya (Ed.), *Nicolás Achúcarro, su vida y su obra* (pp. 93-105). Madrid: Taurus.
- Sáenz de Miera, J. (1994). Lo raro del Orbe. Objetos de arte y maravillas en el Alcázar de Madrid. In F. Checa, *El Real Alcázar de Madrid. Dos siglos de arquitectura y coleccionismo en la Corte de los Reyes de España* (pp. 264-287). Madrid: Nerea.
- Schupbach, W. (1982). The paradox of Rembrandt's anatomy of Dr. Tulp. *Medical History Supplement*, 2, 1-110.
- Simarro, L. (1902). *Expediente personal*. Archivo Historico Nacional, Universidades 1713. Exp. 66.
- Simons, P., & Kornell, M. (2008). Annibal Caro's after-dinner speech (1536) and the question of Titian as Vesalius's illustrator. *Renaissance Quarterly*, 61, 1069-1097.
- Sorolla, J. (1897). Una investigación. *Blanco y Negro. Revista Ilustrada*, 318, (June 5).
- Sincero, P. (1897). Murmuraciones. *Juan Rana. Revista Satírica Ilustrada*, 1 (12), (June 3).
- Vergara, A. (1999). *El arte en la corte de los Archiducos Alberto de Austria e Isabel Clara Eugenia (1598-1633)*. Madrid: Sociedad Estatal para la Conmemoración de los Centenarios de Felipe II y Carlos V, Patrimonio Nacional.
- Vergara, A. (2007). *Patimir*. Madrid: Museo Nacional del Prado.
- Vesalius, A. (1543). *Andree Vesalii. De humani corporis fabrica libri septem*. Basileae: ex Officina Ioannis Oporini.

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