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A GLIMPSE OF OUR PAST

Antonio Gimbernat y Arbós: An Anatomist-surgeon of the Enlightenment (In the 220th Anniversary of his ''A New Method of Operating the Crural Hernia'')

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This article focuses on Antonio de Gimbernat y Arbós (1734–1816), with particular attention paid to his famous publication ''Nuevo método de operar en la hernia crural'' (2013 marking its 220 anniversary), which was translated into English by Thomas Beddoe two years later (*A new method of operating for the femoral hernia Translated from the Spanish of Don Antonio de Gimbernat, To which are added, with plates by the translator, queries respecting a safer method of performing inoculation*). Antonio de Gimbernat y Arbós, a Spanish anatomist and surgeon, was one of the pioneers during the ''Age of Dissection'' (late 18th Century). He was a man of great willpower, bright, thorough, and unique. From his careful anatomical study in the inguinal region, he made a detailed description of the lacunar ligament, which John Hunter called the Gimbernat's ligament in his honor. Antonio de Gimbernat y Arbós also proposed an advanced treatment for strangulated femoral hernias. He acquired extraordinarily broad surgical skills with therapeutic orientation, conservative, not aggressive, based on the knowledge he had gained through dissection. Furthermore, though this is less well known nowadays, Antonio de Gimbernat y Arbós was also relevant organizer of education and health-services — as it was the custom of the great physician of this time. Consequently, Antonio de Gimbernat y Arbós is truly representative of the great figures of the anatomists-surgeons of the Enlightenment. Clin. Anat. 26:800–809, 2013.

Key words: femoral anatomy; eighteenth century anatomists; eighteenth century ophthalmology; eighteenth century urology; smallpox vaccine; botany

''My favourite author has been the human body''.
Antonio de Gimbernat y Arbós

INTRODUCTION

In Medicine the eponym Gimbernat refers to both the lacunar ligament and a specific historical method of operating on the femoral hernia (Dorland's Dictionary, 2005). Table 1 offers good example of how Antonio de Gimbernat y Arbós (in the following, A. Gimbernat) is associated with the femoral hernia across the history of surgery up to present day.

Due to the celebration in 2013 of the 220th anniversary of his work ''Nuevo método de operar en la Hernia Crural'' (Gimbernat, 1793; translated into English in 1795 as A new method of operating for the femoral hernia Translated from the Spanish of

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TABLE 1. The outcome of a search in PubMed with the term Gimbernat (excluding references to institutions under his name) gives immediate hint of the permanence of Antonio Gimbernat's work throughout time

No.	Authors	References
1.	Zandieh S et al.	2011. Hydrocele in the woman as Gimbernat hernia. Rofo 183:855–857.
2.	Loukas M et al.	2007. Gimbernat y Arbós, Antonio de (1734–1816). World J Surg 31:855–857.
3.	Stagnitti F et al.	2006. The femoral hernia: problems in emergency surgery. G Chir 27:290–294.
4.	Rutkow IM.	2003. A selective history of hernia surgery in the late eighteenth century: the treatises of Percivall Pott, Jean Louis Petit, D. August Gottlieb Richter, Don Antonio de Gimbernat, and Pieter Camper. Surg Clin North Am 83:1021–1044.
5.	Puig-La Calle J, Marti-Pujol R.	1995. Antonio de Gimbernat (1734–1816). Anatomist and surgeon. Arch Surg 130:1017–1020.
6.	Bendavid R.	1989. Femoral hernias: primary versus recurrence. Int Surg 74:99–100.
7.	Zaragoza Rubira JR.	1963. 2 little-known aspects of the work of Antonio Gimbernat. Med Esp 49:46–61.
8.	Matheson NM.	1949. Antonio de Gimbernat, 1734–1816. Proc R Soc Med 42:407–410.

Search Date: 20/09/2012

Don Antonio de Gimbernat, To which are added, with plates by the translator, queries respecting a safer method of performing inoculation, in the following abbreviated as A new method of operating for the femoral hernia... [Gimbernat, 1795]), we thought it was appropriate to recall his scientific contributions. A. Gimbernat's work was developed in many fields, not only in Anatomy and Surgery but also Preventive Medicine and Botany. These seemingly different disciplines could seem disconnected from a prevalent professional trajectory, but this is perfectly understandable considering the scientific context of their time. Thus, before glossing over his contributions we think that it is important to make a short summary of his time: the Enlightenment.

HISTORICAL CONTEXT

During the 18th Century, the Enlightenment, a cultural movement with the declared intention of dissipating the darkness of humanity by the light of reason, spread throughout Europe and then the World. Its central idea was that there would be no other knowledge of the world that was not derived from experience — i.e., that provided by the senses. Enlightened reason, the basic belief of its practitioners, goes from the fact to the principle, and not the reverse. The thinkers of that era valued science, more in its applied than pure form. The hegemony of the Italian universities disappeared and movement toward Northern Europe began. Anatomical investigation shifted to Leiden, Paris, Edinburgh and London (Laín-Entralgo, 1978).

The pure anatomist tended to disappear, studies being guided by the desire of discoveries suitable for practical application, linked to surgical activity and obstetrics. Anatomical research at the direct service of surgical technique became steadily more the domain of the surgeon (Castiglione, 1941). The study of hernias, ophthalmology, urology, and the treatment of aneurysms were foremost matters at that time. Percival Pott studied congenital inguinal hernias, Morgagni congenital diaphragmatic hernias (Arráez-Aybar et al., 2009), and Ritcher partial enterocoele. Antonio Scarpa, one of the leading anatomists of his period and an excellent surgeon, studied the inguinal region to establish the mechanism for the formation and best repair of the hernia sac, but also diverse questions of the ear, ophthalmology, the malformations of the extremities, and aneurysms. William Hunter, representative of the Humanist surgeons of the period and a great coin and book collector, made his name in the study of aneurysms, while his brother John laid the scientific foundations for surgery. Antoine Louis improved amputation techniques (Garza-Villaseñor, 2000). Jacques Daviel developed a new method to operate on cataracts. François Chopart founded topographic anatomy.

In medicine, the most notable achievements were in the field of public health, thanks to Edward Jenner and his vaccination against small pox. Physicians, as Peter Frank, began to think in terms of the health of populations as well as of individuals. Institutions for the teaching of obstetrics were founded and the concept of the hospital became reorganized. In France, the physician and surgeon shared the same qualified level. In the United Kingdom, in 1745 the ''Guild of Surgeons within the City of London'' broke away from the barbers to form the Company of Surgeons (Fu, 2000). In Spain, the new Bourbon dynasty restructured the Navy, expelling from their ships the barbers and substituting them with competent surgeons in 1703 (Astrain-Gallart, 1996). However, medical and surgical education lacked suitable anatomical training in the Spain of that epoch. The Crown, with the aim of providing practical teaching of surgery and of medicine to the military surgeons, established a School of Anatomy in Cadiz (1716), which was transformed into the Royal College of Surgery of the Navy (1749), a non-university teaching institution under the direction of Pedro Virgili (1699–1776). Next would follow Barcelona (1760) and

Madrid (1787), respectively, for the formation of surgeons of the army and of civilians. This gave impetus to the modernization and unification of the studies of medicine and surgery in Spain, although initially it was off the university. These actions, which were not exempt of struggles for power among the professional and teaching institutions that represented them, crystallized with the creation of the ''*Real Colegio de Medicina y Cirugía de San Carlos de Madrid''* (San Carlos' Royal College of Medicine and Surgery) in Madrid (1827). This College would become the seed of unification of medical and surgical teaching in the Spanish university, evolving into the Faculty of Medicine of the Central University of Madrid in 1843, currently the Complutense University of Madrid.

LIFE AND MEDICAL WORK

The Spaniard Manuel Luis Antonio de Gimbernat y Arbós (Fig. 1) was born on 15 February 1734 in Cambrils (Tarragona, Spain). In 1749, he enrolled in the University of Cervera (Lérida, Spain), where in 1755 he earned a Bachelor of Arts degree in Latin and Philosophy. In 1758, he began his studies in surgery at the Royal College of Cadiz. As a student, A. Gimbernat stood out in most subjects, in particular for being dedicated and diligent in anatomical studies, where he made certain original observations in the peritoneal folds and in congenital anomalies (Matheson, 1949). In 1760, on being accepted at the College of Barcelona (which was a part of Santa Cruz Hospital) and without having yet finished his studies, he was named dissection assistant (Puig-LaCalle and Martin-Pujol, 1995). Two years afterwards, he earned his title as ''Latin Surgeon'' and as such he joined the Spanish Navy. However, due to his skills in anatomical dissection, he was immediately named honorary professor with an option to fill the first vacancy available. On 1 February 1766, he was nominated full professor of Anatomy at Barcelona, a rank that carried with it his rise to ''*Cirujano Mayor*'' (head surgeon) of the Army, and he went into the Military Staff of the Military Hospital of Barcelona, a position that for his age could not be occupied until one year later.

As director of the Surgery Service, he developed pioneering surgery, progressively more daring, always based on his anatomy studies and designing new surgical instruments. According to Torres-Amat (1836), in 1774 he had already carried out 32 dissections of the human body in its full extension. He achieved and defended the gradual compression of the main arterial trunk in the treatment of aneurysms. He stood out in urology for the practice of perineal lithotomy with the use of lithotomy forceps of his own invention in 1773, for the elimination of renal calculi, which rapidly made him popular together with the use of the dart catheter or lancet, with which he avoided losing the opening of the urethra (Otero-Tejero, 2011). He also developed his own technique for the radical cure of hydrocoele by a double puncture, which was stated by Townsed in his work *A Guide for Health,* published in 1796 (Salcedo y Ginestal, 1926).

Fig. 1. Portrait of de Antonio Gimbernat y Arbós. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

However, his surgical experience extended also to ophthalmology (Loukas et al., 2007), where, between 1786 and 1788, he removed 47 cataracts, 41 successfully, even designing an apparatus to retract the eyelids, which he called the ''eye ring'' to be able to undertake the extractions with more safety. He also invented ''*algalias*'' (grooved probes) for hearling ''*rijas*'' (nasolacrimal duct obstructions). In addition, he prepared his own eye drops to combat corneal lesions, and treated staphylomas by an infusion of myrtle leaves. ''Gimbernat's Collyrium'', according to the Dictionary of Medicine by Littré and Robin, published in 1878, was a solution of 5 centigrams of caustic potassium in 30 grams of water, it was widely cited in European pharmacopoeia (Salcedo y Ginestal, 1926).

In 1774, A. Gimbernat and Mariano Ribas, Professor in the College of Cadiz, were commissioned by the Spanish King Carlos III to visit several European cities (Paris, London, Edinburgh, Amsterdam, and Leiden) and inspect first hand the most advanced state of Medicine, with the aim of organizing a new College of Surgery in Madrid. In Paris, he attended the clinics of the hospitals clinics of the *Hôpitaux Hôtel-Dieu* and *Charité*, where they made contact with Antoine Louis, Joseph Desault, and François Chopart, visibly the heads of The Royal Academy of Surgery and with chemists such as Pierre Joseph Macquer. The military physicians in Spain were pio-

TABLE 2. Key publications of Antonio de Gimbernatat y Arbós

Year	Title
1773	Importancia de la Anatomía y la Cirugía (discurso inaugural del Real Colegio de Cirugía de Barcelona)
1787	Sobre el recto uso de las suturas y graves daños que se seguían de los abusos introducidos en su práctica (discurso inaugural del Real Colegio de Cirugía de San Carlos de Madrid)
1787	Informe sobre el mal método de administrar las unciones en el Hospital Militar
1793	Nuevo método de operar en la hernia crural
1794	Formulario quirúrgico para el uso del Hospital General de Madrid
1802	Disertaciones respecto a las úlceras de los ojos que interesan la córnea transparente

neers in the idea of moving the chemical laboratory to the hospital (Arechaga, 1977).

In 1776, A. Gimbernat and Mariano Ribas visited London, where they worked in different hospitals, such as St. Thomas' Hospital, Guy's Hospital, and St. Bartholomew's Hospital (Matheson, 1949), witnessing the operations undertaken there by Samuel Sharp and other surgeons. They also followed a complete course on ''medical material'' with William Saunders and another on surgery with John Hunter. All these experiences were recognized in the notebook entitled ''*Notas Prácticas*'' (*Practical Notes*). According to Torres-Amat (1836) on 25 April 1777, a major event occurred in A. Gimbernat's life at that point. After a demonstration by John Hunter concerning techniques known up to then, A. Gimbernat asked permission to show his own technique designed to reduce the strangulation of the hernia, which involved an incision in the lacunar ligament. The reaction of those present was surprise in the face of such boldness. Nevertheless, John Hunter consented. Rapidly but meticulously, A. Gimbernat dissected the crural region and proceeded with his technique. When the dissection was finished, John Hunter placed his hand on Gimbernat's back and said: ''You are right, Sir''. John Hunter not only approved the procedure but also declared that he would use and recommend the technique in the future, adding that in honor of the Spaniard, he would call the lacunar ligament as *Gimbernat's ligament*. This eponym *Ligamentum lacunare Gimbernati*, remained in official anatomical terminology until being eliminated the Anatomical Terminology of Paris (Kachlik et al., 2008), yet persisting for some years more in anatomical journals (Radojevič, 1969) and being currently still in use by herniologists (Simons et al., 2009).

In October 1778, after visiting Edinburgh to study the methods of William Cullen, and then Amsterdam and Leiden, where Pieter Camper was a great attraction, A. Gimbernat and M. Ribas returned to Spain. From that time forward, A. Gimbernat started to receive a series of appointments to official positions that led to a corresponding change in his professional activity. This began the most illustrious part of his work, in which we can distinguish two fundamental facets: that of publicist and that of educational and health-services organizer.

PUBLICATIONS

The amount of publications of A. Gimbernat is smaller than what we would have expected of him (Arechaga, 1977). Of all his biographers, Salcedo and Ginestal (1926) were the ones who wrote the largest catalog of A. Gimbernat's publications, but there most publications are academic reports and inaugural lectures, sometimes referred to dubious sources. Table 2 summarizes A. Gimbernat's publications that we think are of major importance.

A. Gimbernat considered himself the heir to the brilliant Spanish Renaissance surgery, especially that of Juan Fragoso and Dionisio Daza Chacón (Bujosa-Homar, 1983), and hence a member of a movement that had it impetus in the Surgery Academy of Paris, of which the main ambassador in Spain had been Pedro Virgili. On numerous occasions, he proclaimed the importance of the anatomical knowledge in the training of a surgeon.

In the following lines we will focus on his two main publications, emphasizing the one entitled ''*Nuevo método de operar en la Hernia Crural*'', so as to underline the important anatomical descriptions upon which he based his surgical technique.

''*A New Method of Operating on the Femoral Hernia*''

On 9 October 1788, in a ''literary board'', (that is, in a series of clinical sessions celebrated on Saturday mornings in the San Carlos' Royal College in Madrid), A. Gimbernat read his famous dissertation on ''*Nuevo método de operar en la Hernia Crural*'', which was published with the same name five years later (Fig. 2) (Gimbernat, 1793). Based on several years of personal experience, the dissertation was divided into three parts. In the first, A. Gimbernat reviews and criticizes the previous surgical techniques used to treat the femoral hernia. In the second, he offers a careful anatomical study of the inguinal region in which he described the ligament that was named after him by John Hunter, and claimed to have discovered it in 1768. In this publication (p 31–36), A. Gimbernat provided a detailed anatomical description of the femoral canal and the lacunar ligament and sketched the characters of the ileopectineal arch and the pectineal ligament. To illustrate this, we reproduce in the following several sections of A. Gimbernat's book as translated into English by Thomas Boedden: ''*A new method of operating for the femoral hernia*...'' (Gimbernat, 1795). In them, after the name or description used by A. Gimbernat we add between brackets the term recommended by the current Anatomical Terminology (FCAT, 1998).

Firstly A. Gimbernat made a complete study of the inguinal ligament: ''In the lower part of the abdomen, the external oblique muscle forms a strong and broad aponeurosis. The fibers are parallel; they

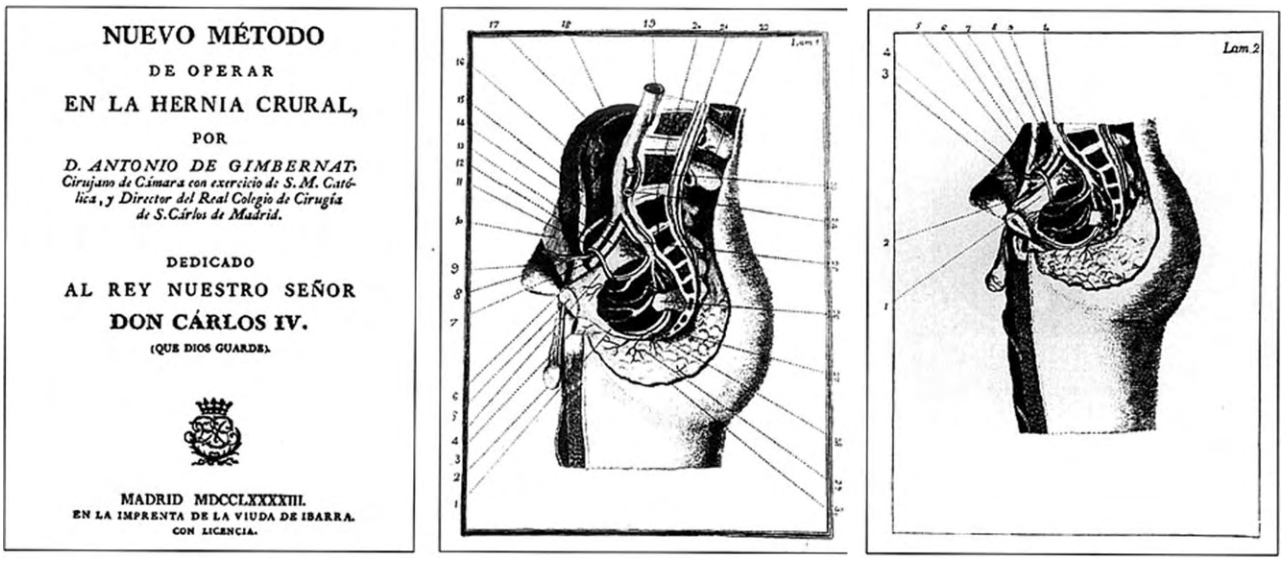

NUEVO MÉTODO
DE OPERAR
EN LA HERNIA CRURAL,
POR
D. ANTONIO DE GIMBERNAT,
Cirujano de Cámara con exercicio de S. M. Católica, y Director del Real Colegio de Cirugía de S. Cárlos de Madrid.
DEDICADO
AL REY NUESTRO SEÑOR
DON CÁRLOS IV.
(QUE DIOS GUARDE).
MADRID MDCCLXXXXIII.
EN LA IMPRENTA DE LA VIUDA DE IBARRA.
CON LICENCIA.
Lam. 2

Fig. 2. Title page and figures of ''A new method of operating the crural hernia'', Madrid (1793).

descend obliquely from without inwards; and the lower extend from the superior anterior spine of the ilium, to the os pubis, at a little distance from which they open into two bands, or pillars, to form the inguinal ring [A04.5.01.013. Annulus inguinalis superficialis]. In this entire tract, the aponeurosis forms a duplicature inwards. This duplicature, which is more manifest toward the os pubis, constitutes a strong whitish cord, which Fallopius supposed to be a ligament; and so it was called, till of late, when it received the name of crural arch [A04.5.01.009. Ligamentum inguinale. Arcus inguinalis], because at the top of the thing, it has some distant resemblance to an arch or vault. This aponeurotic duplicature in its inside forms a canal, which is larger toward the os pubis, and lodges the spermatic vessels. These vessels run for a certain space through the canal, before they traverse the inguinal ring, where the canal terminates.

Between the ilium and os pubis, the arch is kept sufficiently tense by an expansion of the fascia lata, which unites intimately with it in its whole length, in such a manner, that if the expansion be cut, the arch is considerably relaxed. In the natural state, the tendons of the psoas and iliac muscles pass beneath it, as also the great crural vessels, and the lymphatic coming from the lower extremity. In the diseased state, some of the parts contained in the abdomen, also pass, and form a tumor at the lower part of the groin. This is what is called a crural hernia.

This arch offers to our consideration some peculiar contrivances, little or not at all understood, though the knowledge be absolutely necessary to a perfect idea of the crural hernia, and to the safe operation for its cure''.

We can understand the importance of this description better if we consider that until then Falopio (1606) and Poupart (1702) had described the inguinal ligament as a pelvic ligament where the external oblique muscle was fixed secondarily and not as a dependence of that muscle as A. Gimbernat indicated (Arechaga, 1977).

After this right definition of the inguinal ligament A. Gimbernat made a group of original contributions such as the lacunar ligament: ''*When the inferior band separates from the superior to form the inguinal ring, it goes to insert itself in a tubercle of the os pubis* [A02.5.01.303. Tuberculum pubicum], *which has been denominated its spine, and which gives origin to the crest of the superior branch of this bone* [A02.5.01.308. Pecten ossis pubis], *and is a continuation of the linea ileo-pectinea* [A02.5.02.007. Linea terminalis]; *moreover this pillar is not only inserted into the spine by a considerable union of aponeurotical fibers, but the duplicature of the arch* [A04.5.01.010. Ligamentum lacunare] *being much greater there, it is continued inwards along the crest of the pubis by means of a remarkable plait or duplicature, consisting of a portion of the aponeurosis. The particular disposition of this duplicature, extending from below upwards and its insertion from the spine to the end of the crest, which makes more than an inch in some subjects, is highly worthy of our consideration; for without it, we should all probably suffer large and dangerous protrusions of the contents of the abdomen''.* This detailed description of the lacunar ligament is accompanied by two beautiful illustrations (Fig. 2). In these, A. Gimbernat depicts the ligament in sagittal and not from below but from above. Considering these illustrations, Matheson (1949) raised de question, of why, with the advent of anesthesia, a mid-line approach was not advocated until A. K. Henry (1936) described his particular operation.

Next, A. Gimbernat details the relationships between the thigh superficial aponeurosis and the crural arch: ''In consequence of this structure, the crural arch has two edges; one external, rounded

like a cord, thicker toward the pubis, and resembling a ligament, as Fallopius actually denominated it; to this adheres the expansion of the fascia lata: in emaciated persons, the direction and tension of this cord may be felt through the integuments. The other edge, which I have called internal, is the termination of the edge of the aponeurosis; it is very thin, and from its origin unites intimately with the aponeurosis that covers the iliac muscle. This strict union, and that of the fascia lata with the external edge, are most perceptible from the anterior superior spine of the ilium to the neighborhood of the crural vessels; hence the crural arch is more flattened and fixed down in all this course on the iliac muscle, serving it as a band to keep it in its place during its contractions; consequently it is impossible that a crural hernia can ever take place in this tract, as some have supposed''.

Then, A. Gimbernat shows the characters of the iliopectineal arch and the pectineal ligament: ''As soon as this intertexture of aponeurosis reaches the great secondary external iliac artery, there is detached from the internal edge of the crural arch a membranous expansion [A04.5.02.010. Arcus iliopectineus] (which is strengthened by the tendon of the small psoas muscle, when this muscle exists,) and insinuates itself behind the great secondary external iliac artery and vein. This expansion goes to be inserted close to the external edge of the pectineus muscle: moreover, one lamina from it passes over that muscle, and is attached to the crest of the branch of the os pubis, where it is united with the duplicature of the arch which terminates in the same crest. By this union is formed a species of ligament [A04.5.01.101. Ligamentum pectineum] which passes along the crest, below which the superior extremity of the pectineus muscle is inserted''.

In this same opus (p 37–38) A. Gimbernat also describes the lymph node that years later would become known as Cloquet's or Rosenmüller's gland: This is a node in the femoral canal, often mistaken for a femoral hernia, and important in the differential diagnosis of lumps in the groin: ''*In the internal lateral parts of the [femoral] sheath close to the branch of the os pubis, precisely where the insertion of the duplicature of the arch ends, and on the inside of the great secondary iliac vein, there is left a foramen.*

Sufficiently distinct, almost round, at which many lymphatics [A13.3.05.007. Nodi inguinalis profundi] enter. A lymphatic gland [A13.3.05.008. Nodi inguinalis profundi (Nodus proximalis)] is sometimes fitted into this foramen, and the parts which form the crural hernia always pass through it, consequently we may properly call it the crural ring [A04.7.03.014.Anulus femoralis]. A single gland placed in this ring would prevent the issue of the parts contained in the abdomen; but if a portion of the intestines should slide behind, so as to get out of the cavity, it would be very difficult to distinguish the hernia at first. A surgeon not acquainted with the structure would be much embarrassed if he were to attempt the operation''. In the third part of this book, A. Gimbernat proposes his new surgical technique, divided into two phases: one devoted to introducing the prolapsed intestinal content in the abdomen; the other comprising the authentically surgical act, which A. Gimbernat himself called a ''bloody operation''.

All of the anatomical details described and the new surgical technique proposed in the book were widely accepted outside Spain, as the work was translated into English two years later by Thomas Beddoes (Gimbernat, 1795), who acknowledged the ''superiority of the surgical method used'' and later into German in 1817 and French in 1827. This book, together with writings by Percival Pott, Jean Louis Petit, August Gottlieb Richter, and Pieter Camper, constituted one of the key texts in the transition from the treatises ''of only text'' prior to 1750 to the profusely illustrated monographs of the 19th Century (Rutkow, 2003) and the foundation of multiple techniques of radical cures that are known today.

''*Eye Ulcers that Involve the Transparent Corneal*''

Nevertheless, A. Gimbernat also wrote diverse publications on cataracts and corneal ulcers. His dissertation on *Eye Ulcers that Involve the Transparent Corneal*, though published in Spanish in 1802 (''*Disertación sobre las úlceras de los ojos que interesan la cornea transparente*'')*,* had previously been lectured in French to the Medicine Society of Paris in 1800 (Arechaga, 1977). The translation of this article into French was done by A. Gimbernat's son Carlos, who was also a physician and naturalist. In this essay, A. Gimbernat distinguishes two types of ulcers: superficial and deep. It is noteworthy that, in both cases, based on his experience, he recommends a therapy consisting on eye drops to replace surgical treatments; this confirms that his therapeutic orientation tended toward conservative, less aggressive surgery.

According to Matheson (1949), in the Museum of the Royal College of Surgeons in Lincoln's Inn Fields, London, UK, stood two display cases of models illustrating in detail the pathology of the eye. Those exhibits, made under A. Gimbernat's supervision by Josef Valls, were of a perfection seldom seen before. Others numerous models, described in a letter from A. Gimbernat to William Clift, bore striking testimony to the high standard of ophthalmology in A. Gimbernat's hands. It is fortunate that we have kept a list of those demonstrations, for the specimens were lost forever during the bombing on the night of 10 May 1941.

THE WORK OF A. GIMBERNAT AS AN EDUCATIONAL AND HEALTH-SERVICES ORGANIZER

King Carlos III, in a document of 13 April 1780, ordered the establishment in Madrid of the San Carlos' Royal College of Medicine for the training of civil surgeons (Usandizaga, 1948). A. Gimbernat and M. Ribas were chosen to lay the foundations for this. This project was finished in 1781, but many different difficulties delayed the opening for six years. A. Gimbernat was named head of operations, assuming together with M. Ribas the direction of the College,

position that he would combine in an efficient way. On 1 October 1787, A. Gimbernat inaugurated the new College with the discourse "*Sobre el Recto Uso de las Suturas y Graves Daños que se Seguían de los Abusos Introducidos en su Práctica*" (*On the Correct Use of Sutures and Serious Damage Caused by Abuses in Their Practice*), a difficult subject to approach and not devoid of interest. The discourse was considered a masterpiece, but it was not published until 1801 (Puig-LaCalle and Martin-Pujol, 1995). In it, A. Gimbernat, after studying the fundamental types of sutures, provides his personal experience to demonstrate that a solid skill in the technique of bandaging offers the surgeon ample options to avoid the painful suture, achieving better results with less agony.

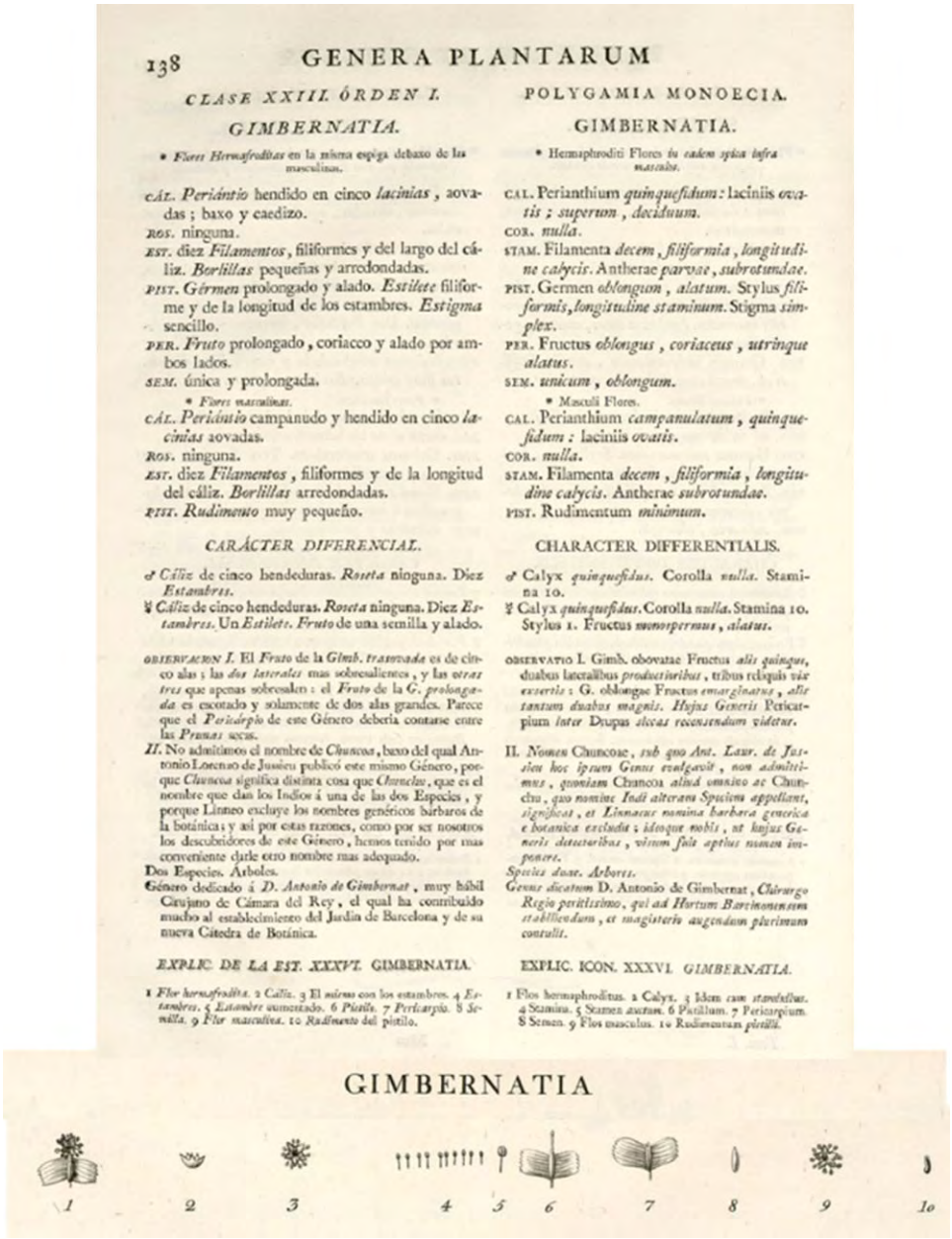
So that the San Carlos' College could offer an effective and scientific education to those aspiring to be surgeons, A. Gimbernat wanted surgery students to stay five years and, each year, combine practice and theory. The basic pillars of the theoretic training of new surgeons would be: the anatomy of Jakob Winslow, the physiology of Albrecht Haller and of Hermann Boerhaave, the pathology and medical material of the latter, the treatise on childbirth by Jean Astruc and, for surgery proper, the works of Joannes Gorter and, with reserves, the "*Curso Teórico-Práctico de Operaciones de Cirugía" (Theory-Practice Course of surgical Operations)* of Diego Velasco and Francisco Villaverde, published in 1763 (Bujosa-Homar, 1983)

The students, on enrolling, had to have full command of Latin, hold bachelor's degrees and have good knowledge of logic, algebra, geometry, and physics. Together with the strictly surgical concerns (bandaging, surgical effects, operations, surgical algebra — namely, the treatment of fractures and dislocating among other surgical tasks), A. Gimbernat proposed that the students also studied pathology and therapeutics, arguing that it was progressively more difficult to separate internal and external maladies. He also placed great importance on the basic sciences: mathematics, physics, chemistry, botany, physiology, and especially anatomy. "*It is, thus, Anatomy the fine line marking the surgeon and that should never be lost from sight; with it he fulfilled the duties of his faculty with exactitude and good success, which were of such consequence that most of them carried grave damages".* (Salcedo y Ginestal, 1926). In the anatomical theatre of San Carlos Royal Colleges (Fig. 3), he provided the students dissection experience from the first day of class, and not with the mere help of illustrations or wax images, to learn the surgical techniques on cadavers.

Nevertheless, the San Carlos' Royal College had an anatomical–pathological cabinet (1806–1830), under the exclusive direction of A. Gimbernat. This cabinet had in it natural as well as artificial models of anatomical and organic diseases. For the making of models -under the direction of Ignacio Lacaba, first as the one in charge of dissection and afterwards as Professor of Anatomy- worked two sculptors: the Spaniard Juan Cháez and the Italian Luigi Franceschi, the latter a pupil of Felice Fontana, who specialized in making wax anatomical models. There were at least 57 pieces of wax, among which was an outstanding collection representing the different stages of pregnancy, from conception to birth. According to Comenge-Ferrer (1914), within six years the anatomical and pathological Museum of Madrid had no rival in Europe and those who have examined Gimbernat's specimens could well believe it. Botany was included, as might be expected from one who knew Holland, hard on the heels of Boerhaave and Linnaeus. Now, during his stay in Barcelona, A. Gimbernat had advocated the creation of a full professorship and a botanical garden. This interest of A. Gimbernat for the promotion of Botany was recognized by Ruiz and Pavón (1794) with the designation of the genus Gimbernatia (Fig. 4).

Fig. 3. Portrait of anatomical amphitheater of San Carlos' Royal College of Surgery of Madrid.

On the other hand, no book could be published legally in 18th century Spain without a royal license. Political and religious censorship is well known, but the Crown was also concerned that only reliable scientific texts freely circulate, and that the public not be confused by "useless works". The Council of Castile, which had final authority to grant or withhold a license, frequently sought expert advice when faced



138 GENERA PLANTARUM

CLASE XXIII. ÓRDEN I.

GIMBERNATIA.

* *Flores Hermafroditas* en la misma espiga debaxo de las masculinas.

CÁL. *Perianto* hendido en cinco *lacinias*, aovadas; baxo y caedizo.
COR. ninguna.
EST. diez *Filamentos*, filiformes y del largo del cáliz. *Borlillas* pequeñas y arredondadas.
PIST. *Gérmen* prolongado y alado. *Estilete* filiforme y de la longitud de los estambres. *Estigma* sencillo.
PER. *Fruto* prolongado, coriacco y alado por ambos lados.
SEM. única y prolongada.

* *Flores masculinas.*

CÁL. *Perianto* campanudo y hendido en cinco *lacinias* aovadas.
COR. ninguna.
EST. diez *Filamentos*, filiformes y de la longitud del cáliz. *Borlillas* arredondadas.
PIST. *Rudimento* muy pequeño.

CARÁCTER DIFERENCIAL.

♂ *Cáliz* de cinco hendeduras. *Roseta* ninguna. Diez *Estambres.*
☿ *Cáliz* de cinco hendeduras. *Roseta* ninguna. Diez *Estambres.* Un *Estilete. Fruto* de una semilla y alado.

OBSERVACION I. El *Fruto* de la *Gimb. trasvada* es de cinco alas; las *dos laterales* mas sobresalientes, y las *otras tres* que apenas sobresalen: el *Fruto* de la *G. prolongada* es escotado y solamente de dos alas grandes. Parece que el *Pericárpio* de este Género deberia contarse entre las *Prunas* secas.

II. No admitimos el nombre de *Chuncoa*, baxo del qual Antonio Laurento de Jussieu publicó este mismo Género, porque *Chuncoa* significa distinta cosa que *Chinchu*, que es el nombre que dan los Indios á una de las dos Especies, y porque Linneo excluye los nombres genéricos bárbaros de la botánica; y así por estas razones, como por ser nosotros los descubridores de este Género, hemos tenido por mas conveniente darle otro nombre mas adequado.

Dos Especies. Arboles.

Género dedicado á *D. Antonio de Gimbernat*, muy hábil Cirujano de Cámara del Rey, el qual ha contribuido mucho al establecimiento del Jardin de Barcelona y de su nueva Cátedra de Botánica.

EXPLIC. DE LA EST. XXXVI. GIMBERNATIA.

1 *Flor hermafrodita.* 2 *Cáliz.* 3 El mismo con los estambres. 4 *Estambres.* 5 *Estambre aumentado.* 6 *Pistilo.* 7 *Pericarpio.* 8 *Semilla.* 9 *Flor masculina.* 10 *Rudimento* del pistilo.

POLYGAMIA MONOECIA.

GIMBERNATIA.

* Hermaphroditi Flores *in eadem spica infra masculos.*

CAL. Perianthium *quinquefidum*: laciniis *ovatis; superum, deciduum.*
COR. *nulla.*
STAM. Filamenta *decem, filiformia, longitudine calycis.* Antherae *parvae, subrotundae.*
PIST. Germen *oblongum, alatum.* Stylus *filiformis, longitudine staminum.* Stigma *simplex.*
PER. Fructus *oblongus, coriaceus, utrinque alatus.*
SEM. *unicum, oblongum.*

* Masculi Flores.

CAL. Perianthium *campanulatum, quinquefidum*: laciniis *ovatis.*
COR. *nulla.*
STAM. Filamenta *decem, filiformia, longitudine calycis.* Antherae *subrotundae.*
PIST. Rudimentum *minimum.*

CHARACTER DIFFERENTIALIS.

♂ Calyx *quinquefidus.* Corolla *nulla.* Stamina 10.
☿ Calyx *quinquefidus.* Corolla *nulla.* Stamina 10. Stylus 1. Fructus *monospermus, alatus.*

OBSERVATIO I. Gimb. obovatae Fructus *alis quinque,* duabus lateralibus *productioribus,* tribus reliquis *vix exsertis*: G. oblongae Fructus *emarginatus, alis tantum duabus magnis. Hujus Generis* Pericarpium *inter* Drupas *siccas recensendum videtur.*

II. *Nomen* Chuncoae, *sub quo Ant. Laur. de Jussieu hoc ipsum Genus evulgavit, non admittimus, quoniam* Chuncoa *aliud omnino ac* Chinchu, *quo nomine Indi alteram Speciem appellant, significat, et Linnaeus nomina barbara generica e botanica excludit: ideoque nobis, ut hujus Generis detectoribus, visum fuit aptius nomen imponere.*

Species duae. Arbores.

Genus dicatum D. Antonio de Gimbernat, *Chirurgo Regio peritissimo, qui ad Hortum Barcinonensem stabliendum, et magisterio augendum plurimum contulit.*

EXPLIC. ICON. XXXVI. *GIMBERNATIA.*

1 Flos hermaphroditus. 2 Calyx. 3 Idem *cum staminibus.* 4 Stamina. 5 Stamen *auctum.* 6 Pistillum. 7 Pericarpium. 8 Semen. 9 Flos masculus. 10 Rudimentum *pistilli.*

GIMBERNATIA

1 2 3 4 5 6 7 8 9 10

Fig. 4. Page and figures of "Descripción y láminas de los nuevos géneros de plantas de la Flora del Perú y Chile" of Hipólito Ruiz and Joseph Pavon (1794) where they established the genre Gimbernatia in honor a Antonio Gimbernat, for his great contribution to the establishment of Botanical Gardens and the creation of the Chair of Botany in Barcelona. [Color figure can be viewed in the online issue, which is available at wiley onlinelibrary.com.]

with a work of science. Confidence in A. Gimbernat quickly led to confidence in the College itself. A year after it opened, San Carlos' College received an order from the Council requesting a critique of an anatomical and surgical dictionary. Two months later the college replied that the work was "in complete, of little value, and quite possibly dangerous". Thus began the role of San Carlos' College as principal censor of medical book (Burke, 1977).

Moreover, the Crown frequently called upon A. Gimbernat for advice on matters unrelated to San Carlos' College. For example, according to Burke (1977) in 1778 A. Gimbernat's approval was sufficient for the Hospital de Santiago in Toledo to obtain royal permission to sep up a special clinical for venereal diseases.

In 1789, King Carlos IV of Spain bestowed A. Gimbertna with the title Royal Chamber Surgeon, a rank

that went with noble privilege, being relieved of surgical instruction.

From this moment on, a large part of his time would be consumed with the founding of new surgery colleges (Santiago de Compostela, Burgos, Salamanca, and Mallorca) in pursuing uniformity (creating the Higher Governing Board of the Royal Colleges, a historical precedent for the Higher Facultative Board of Military Health) (Arechaga, 1977) and finally in the incessant struggle against the University and Protomedicato (an institution created in 1477 by the Catholic Monarchs to regulate the professional exercise of Spanish physicians).

The aim of A. Gimbernat was to unify medicine and surgery in the Spanish university. A goal that had been so successfully achieved with the Royal Colleges of Surgery of the Navy (Cadiz) and the Army (Barcelona).

In these final years of the 18th Century, there were harsh struggles between those who sought to unify the professions of medicine and surgery under a university title and physicians who did not want to give up their supremacy over the surgeons. A. Gimbernat was strongly aligned with the former. Throughout 1799–1800, the first attempt to unify medicine and surgery in Madrid was held at the San Carlos' Royal College, the renamed as ''*Real Colegio de San Carlos para la Facultad Reunida'' (Royal College of San Carlos for the Reunited Faculty),* which titled both teacher and graduate students as ''Físico''; now for the first time in Spain, San Carlos' Royal College title authorized the exercise of both medicine and surgery. Unification was less successful in eliminating the traditional prejudices against the surgeon. Proof being that when A. Gimbernat was nominated a member of the Royal Academy of Medicine, they did not wish to accept him as more than a ''físico'', refusing him the category of ''médico'' (physician). As a consequence, A. Gimbernat rejected the nomination (Usandizaga, 1948).

In 1801 he was named first surgeon of the Royal Chamber of His Majesty and president of all the Surgery Colleges in Spain. As a Royal Advisor too, A. Gimbernat played a key role in the global spread of smallpox vaccination.

As noted above, most notable achievements of the Medicine of the Enlightenment were in the field of public health, nevertheless thanks to Edward Jenner and his vaccination against small pox. Edward Jenner was disciple, collaborator and friend of John Hunter, considered ''the father of experimental surgery''.

The Illustration spirit also produced many of the biggest oceanographic expeditions with a naturalistic or geographic aim of the past (e.g., those of Bougainville, Cook or Malaespina). Oddly the Spanish Crown sponsored the Royal Philanthropic Expedition of the Vaccine or Balmis Expedition, named after a Spanish royal physician and honorary surgeon Francisco Javier Balmis (1753–1819). The Balmis Expedition undertook the inoculation against small pox in the Spanish colonies in the Americas and Philippines, visiting Puerto Rico, Venezuela, Mexico, the Philippines and China (Macau, Canton). On his way back to Spain, Balmis convinced the authorities of Saint Helena's Island (British Overseas Territories) to take the vaccine. It may be considered the first international health-care expedition in history. Preservation of the virus was a problem, which Balmis overcame in a practical manner. Sailing with the ships were 22 boys; at the outset one was inoculated. The virus was carried from arm to arm, from boy to boy (Franco-Paredes et al., 2005). Jenner himself wrote: ''*I don't imagine the annals of history furnish an example of philanthropy so noble, so extensive as this''*. About the same fact Alexander von Humboldt wrote in 1825: ''*This travel will be the most memorable in history''.* May be is noteworthy to recall also that Balmis Expedition had a female member on it. As Royal Advisor, A. Gimbernat's efforts proved outstanding for Balmis Expedition. Then, though A. Gimbernat did not go on the expedition himself, he was involved in planning it as Chair of its Scientific Advisory Committee.

In 1802, Napoleon invaded Spain, installing his brother Joseph on the Spanish throne. As A. Gimbernat admired French surgery, he swore loyalty to the French and ordered all the professors of the seven Surgery Colleges in Spain at that time to do the same. On 28 January 1811, José I ordered the High Royal Gubernatorial Boards, of Pharmacy and Royal Surgery Colleges, until then independent from one another, to join as a single entity: The Superior Council of Public Health. A. Gimbernat was named its president. For all these events, A. Gimbernat joined the core of those labelled ''Frenchified'' (López-Piñero, 1992) and in 1814, with the return on the Spanish throne of Fernando VII, he was subjected to harsh political sanction that stripped him of all of his honors. His socioeconomic and professional decline was accompanied by failing health. Practically blind and mentally failing, he died in Madrid on 17 November 1816, repudiated by politicians but recognized by his professional peers, who established a series of conferences published in his honor and commissioned a marble bust to preside over the San Carlos College.

CONCLUSION

During the Enlightenment, the healing possibilities of surgery and other specialities emerging in the 18th Century (such as obstetrics, ophthalmology, or urology) became broadened because of deliberate development of anatomy at the direct service of them and their operational techniques. So was the genesis of the topographic anatomy, the prelude of 19th-Century surgical anatomy. The treatments of some hernias became strictly regulated operations, as the regions where they occur were carefully studied. Thus, is not surprising that important eponyms such as Winslow's hiatus hernia, Petit's triangle hernia, Haller's tripod, Scarpa's triangle, etc. came from this period characterized by talented surgeons-anatomists. A. Gimbernat, was one among them, and not the minor.

A. Gimbernat, who had strong determination and was considered brilliant, meticulous, and creative,

reached a good number of his goals, although the social structures, particular interests, and traditions filled his task with difficulties. The eponym Gimbernat will inevitably go together with his devoted study of inguinal anatomy, leading him to devise a legendary surgical technique in repairing femoral hernias, which set the stage for future development.

In this account, we have set out to show that A. Gimbernat, the most important Spanish anatomist of the 18th Century, not only developed among a good number of most comprehensive, well-founded and restorative surgical practices, as was the custom with the great doctors of his time, but also had a central role as educational and health organizer. Despite its succinctness, the oeuvre of A. Gimbernat reveals the image that the author had of his own place in the flow of renewing 18th Century surgery, revealing him as one of the most exemplary international anatomists-surgeons of the Enlightenment.

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