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Paolo Mascagni and Alessandro Moreschi: who discovered the vascular structure of urethra? Anatomy of an intellectual property dispute

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Abstract. In the beginning of the XIX century, when both vascular and cellular texture theories concerning the penis structure were still coexisting, three figures were involved in the controversy about the priority of the discovery of the vascular nature of human erectile tissues: Paolo Mascagni (1755-1815), represented by his pupil Tommaso Farnese (1780-1829), and Alessandro Moreschi (1771-1826). In the *Elogio del celebre anatomico Paolo Mascagni* (1816), Farnese attributed to his mentor the demonstration in 1809 of the continuity between arteries and veins and the description of venous plexuses, this term replacing the previous and misleading name of spongy body attributed to the inner part of penis. But in 1817 Moreschi inflamed the dispute, claiming for the priority of that discovery, with the publication of his anatomical work and a polemical essay against Farnese. Farnese promptly replied with *Note addizionali del Dottore Tommaso Farnese al suo elogio di Paolo Mascagni* (1818), where he reported a meeting with Moreschi in Bologna in 1810. In that occasion, Farnese explained a Mascagni's technique to perfuse urethral blood vessels that Moreschi would have plagiarized. Furthermore, Farnese also included eight testimonies claiming to have seen Mascagni performing such injections before 1810. The *Prodromo della grande anatomia*, a posthumous work of Mascagni edited in1819, includes a plate dedicated to the structure of the urethra and a comprehensive view of this scientific story. In short, Mascagni developed a technique to inject urethral blood vessels, but Moreschi was the first to publish an accurate work on this subject. For this reason, many Italian and international authors have attributed to the latter the discovery of the venous circulation of the urethra.

Key words: Paolo Mascagni, Alessandro Moreschi, anatomy

Introduction

For a scientist one of the greatest ambitions is to be remembered as responsible for scientific discoveries and technological progress. Often this desire has animated intellectual rivalries, concluding with unfair attributions of discoveries. It is sufficient to recall some of the most significant events of 20th century medicine. In 1962 James Watson and Francis Crick won, along with Wilkins, the Nobel Prize for Medicine for the discovery of the structure of DNA and its replication mechanism, while Rosalind Franklin's fundamental research was not rewarded. Also on the priority of the discovery of the virus responsible for AIDS a heated scientific controversy occurred, which ended in 2008 with the attribution of the Nobel prize to Montagnier and Barre-Sinoussi for the discovery of the HIV virus, but no recognition was given to Robert Gallo, whose work has made a fundamental contribution to the test that reveals the presence of the infection (1). Finally, the trademark possession rights of Stent's Composition, an innovative material for dental

impressions, were examined in a court of law at the beginning of 20th century and the action is still used today as a reference in Anglo-Saxon case law (2).

The present paper deals with a classic dispute concerning the priority of an anatomical discovery. The subject of this controversy concerns the description of the vascular structure of spongy erectile tissue of male urethra. The first modern anatomical description of erectile tissues dates back to Andreas Vesalius (1514-1564) who illustrated male genitals in his famous masterpiece *De Humani corporis fabrica*. Vesalius denied the nature of cavernous bodies of the penis in terms of blood vessels, nerves, tendons, bones or ligaments, but he recognized the presence of venous (dark) blood, describing several fasciculi of arteries and veins closely interwoven, within an investing sheat (3).

After the discovery of the blood circulation described by William Harvey (1578-1657) in the famous *Exercitatio anatomica de motu cordis et sanguinis in animalibus* (4), published in 1628, and the microscopic identification of capillaries by Marcello Malpighi (1628-1694) in the *De pulmonibus observationes anatomicae*, published in 1661, it became clear the continuity between arteries and veins (5). It should be considered that in the *Dissertatio epistolica varii argumenti de cornuum vegetatione, utero, viviparorum ovis, plantis &c* Malpighi considered the structure of the penis as composed of diverticula or appendices of veins (6).

In the 18th century, the development of wax injection techniques and the creation of anatomical models contributed significantly to the anatomical discoveries and their demonstration.

However, in the late XVIII century this vascular disposition was not recognized in all organs. In some particular tissues, such as spleen and genitals, the anatomical continuity between arterial and venous system still had to be clearly demonstrated. This uncertainty favoured alternative hypotheses.

Albrecht von Haller (1708-1777), Regnier de Graaf (1641-1673), Frederik Ruysch (1638-1731), Guichard Joseph Duverney (1648-1730), Herman Boerhaave (1668-1738), and Marie François Xavier Bichat (1771-1802) interpreted the cavernous bodies of the penis and urethra as consisting of a loose and elastic spongy tissue (non vascular) arranged in several cells into which, during erection, blood is poured from the arteries, and from which it is afterwards removed by veins (cellular theory) (7).

On the contrary, the surgeon John Hunter (1728-1793), who also dealt with the concept of angiogenesis (8), in *Observations on certain parts of the animal oeconomy* observed that cavernous bodies were not spongy or cellular (9).

Accordingly, other authors, including Georges Cuvier (1769-1832), Friedrich Tiedemann (1781-1861), Bartolomeo Panizza (1785-1867) and Ernst Heinrich Weber (1795-1878), also recognized the vascular nature of the cavernous tissue (10). In particular, Pierre Augustin Béclard (1785-1825) provided the following definition of the erectile tissue:

The erectile, cavernous or spongy tissue consists of endings of blood vessels, especially vein roots, which, instead of having capillary tenacity, are more extensive, are very extensible, and united with many nervous nets (11).

In this crucial period, when both vascular and cellular texture theories concerning the penis structure were still coexisting, the controversy between Alessandro Moreschi and Paolo Mascagni's pupils for the priority of the discovery of the vascular nature of spongy bodies strongly rose (Tab. 1).

Protagonists of the controversy

Three figures were mainly involved in the controversy about the priority of the discovery of the vascular nature of human erectile tissues of genitals. The anatomists who claimed the priority of such a discovery were Tommaso Farnese, on behalf of late Paolo Mascagni, and Alessandro Moreschi.

Paolo Mascagni was born in Pomarance (Pisa) on January 25th, 1755. He studied medicine at the University of Siena where he graduated in 1778. Thanks to his mentor Pietro Tabarrani, the anatomical research became his main field of studies. He won great fame with masterpieces dedicated to the first complete description and illustration of the lymphatic system and became president of the *Accademia dei Fisiocritici*, deserving the title of *prince of anatomists*.

In 1784 he published *Prodrome d'une ouvrage sur le système des vaisseaux lymphatiques*. Then, in 1787 he

Table 1. Chronological and comparative list of publications and events referring to Paolo Mascagni and Alessandro Moreschi.

Year	Paolo Mascagni	Alessandro Moreschi
1785	Targioni Tozzetti stated that Mascagni performed the injections in urethral vessels since 1785.	
1787	Mascagni published *Vasorum lymphaticorum corporis humani historia et ichnographia*.	
1795	Mascagni published *Vasorum lymphaticorum historia seu totius operis pars prima*. Mascagni's observations, now dated back to 1795.	
1805	Most of the other witnesses remember to have participated in a similar demonstration during a lecture by the master in 1805.	
1809	Mascagni demonstrated the vascularization of urethra to Cuvier, organizer of the schools in the French Empire who was visiting Florence. Farnese's *Elogio* reported the date 1809, because it was the most univocally recognized.	
1810		Moreschi demonstrated the vascularization of the urethra in Bologna.
1812	Mascagni obtained his best anatomical model of urethra.	
1815		In August the scientific community recorded the discovery of Moreschi, dated December 1810.
1815	Mascagni died.	
1816	Farnese published *Elogio del celebre anatomico Paolo Mascagni toscano.*	
1817	Antommarchi published *Osservazioni intorno all'elogio del celebre Paolo Mascagni divulgato da Tommaso Farnese*.	
1817		Moreschi published *Cenni preliminari intorno alla scoperta della struttura vascolare del corpo dell'uretra e della ghianda* and *Commentarium de urethrae corporis glandisque structura.*
1818	Farnese published *Note addizionali del Dottore Tommaso Farnese al suo elogio di Paolo Mascagni.*	
1819	Antommarchi published *Prodromo della grande anotomia. Seconda opera postuma di Paolo Mascagni.*	
1821	Second edition of the *Prodromo della grande anatomia* was published by Farnese.	
1826		Moreschi died.

published the complete work in Latin and new insights into the lymphatic system were published in 1795 (12). In that period, Mascagni collaborated with Clemente Susini (1754-1814), at the Museum of La Specola in Florence, for the realization of anatomical wax models, now including the lymphatic vessels.

In his life he was professor of anatomy in Siena, Florence and Pisa. Besides the anatomical lessons, Mascagni was concerned with the ultimate preparation of the anatomical tables. Mascagni also conceived the idea to realize an ambitious dream of the anatomists: a complete and life-sized illustration of the human body. Nevertheless, political events delayed his purposes and upset his life. Unfortunately, he died on October 19th,1815 and his work was published posthumously (13-16).

Alessandro Moreschi was born in Milan on 1771 and studied in Pavia where he graduated in 1795. In 1802, thank to the Napoleonic decree date December 25th, he moved to Bologna where he taught Comparative Anatomy and Physiology. On July 20th 1803 he went back to Pavia. Again, on October 2nd 1804 moved to Bologna, where he remained until 1813 as a teacher of Human Anatomy. He was Rector of the university in the academic year 1809-1810.

During his stay in Bologna, he decided to separate the Ceroplastic Laboratory from the Anatomical Cabinet, giving life to a real museum collection in this university for the first time. Moreschi has shown to be attentive to the role of demonstration in anatomy with wax moulages and other types of preparations, helping to make the Bologna school important in this area. In anatomy his most remembered studies are those on the nature and function of spleen and urethra. Moreschi died on August 3rd,1826 (17,18).

Tommaso Farnese, a Mascagni's pupil, was essential in generating the dispute between his late master and Moreschi. He was born in Perugia on November 7th, 1780. He graduated in medicine in Bologna and moved to Florence, where he assisted Mascagni in the anatomical activity. In 1810 he moved to Milan, where he became a famous surgeon and for this he was invited in Russia. Then, he left Milan on September 22nd, 1828 to reach Vienna and finally Saint Petersburg but he was suddenly taken ill. In the spring of the next year he moved to Kazan, but during his travel he died before reaching Moscow on May 4th,1829 (19).

The controversy, first act. Farnese attributed the discovery of the venous plexuses of the urethra to Mascagni and Moreschi disputed against him on that subject

In *Elogio del celebre anatomico Paolo Mascagni toscano*, published in 1816, Farnese underlined merits and innovations of Mascagni in anatomy and physiology. In particular, among the most important discoveries, he attributed to his mentor the concept of continuity between arteries and veins and the description of intricate *venous plexuses*, this term replacing the previous and misleading name of spongy body attributed to the inner part of penis. This discovery, dated back to 1809, was made possible also by his ability to make wax injections in small-caliber vessels (20).

One year later Farnese's opinions were contested. In 1817 Francesco Antommarchi, one of the three Mascagni's anatomical dissectors in Florence, published *Osservazioni intorno all'elogio del celebre Paolo Mascagni divulgato da Tommaso Farnese* and he dated to 1795 Mascagni's discovery (21).

But in the same year, 1817, another figure entered officially the discussion and this time claiming for the priority of that discovery: Alessandro Moreschi. Indeed, this anatomist published *Cenni preliminari intorno alla scoperta della struttura vascolare del corpo dell'uretra e della ghianda creduta sin qui spugnosa o cellulosa ed osservazioni sull'Elogio del cel. Anatomico Paolo Mascagni, divulgato dal sig. Tommaso Farnese, Dottore in Medicina e Chirurgia, ecc* (22). As suggested by the title, there is a brief scientific description of his work on urethra and a polemical essay against Farnese.

In his book Moreschi also reported the record of his anatomical observations entitled *De penitiori urethrae corporis glandisque structura recens detecta*, already read on August 3rd 1815 at the *Istituto di Scienze, Lettere ed Arti* and published on August 11th, 1815 in the *Giornale Italiano*.

Furthermore, at the end of 1817, Moreschi hastened the publication of his anatomical work, solemnly written in Latin, *Commentarium de urethrae corporis glandisque structura*, another report read at the *Istituto di Scienze, Lettere ed Arti* on August 17th 1815 (23).

The text was well organized into 51 points, with 3 plates referring to urethral structure and including 3, 2 and 8 figures, respectively. Interestingly, drawings were realized by Filippo Bedettio in Bologna in 1811, and by Ignazio Altimo in Milan in 1817. In particular, table II depicted the pelvic region, with detailed figures concerning the *corpus urethrae vasculosum* (Fig. 1). At the end of the book, Moreschi dealt with blood vessels in spleen and pregnant uterus.

Moreschi also stated that he promptly included anatomical preparations referring to the new discovery. They were available to the students of the University of Bologna from 1810 to 1815. Some of the models were shown to the famous anatomist Antonio Scarpa

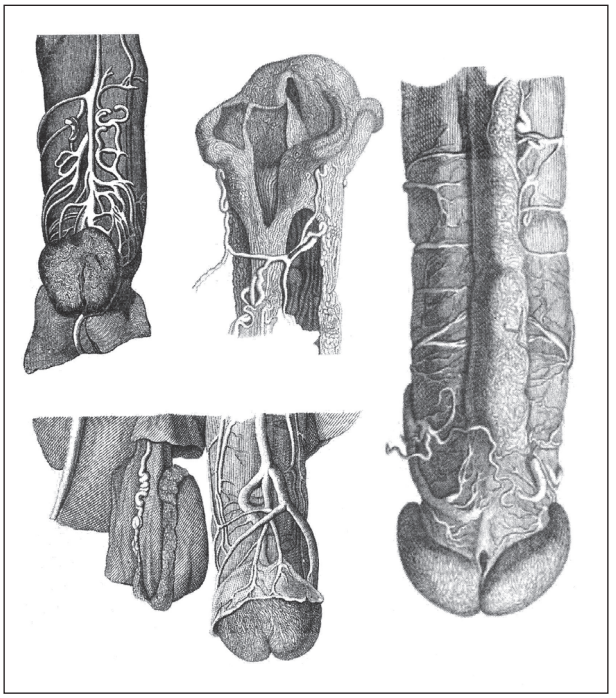

Figure 1. Some pictures taken from *Commentarium de urethrae corporis glandisque structura* by Alessandro Moreschi (1817).

(1752-1832) and were appreciated by him when Moreschi was hired by the University of Pavia in 1813 (22).

In 1817 Moreschi's research appared in two parts in *Annali Universali di Medicina* (24,25). Moreschi disputed various parts of Farnese's version. He was pitiless towards the fact that two Mascagni's pupils, Antommarchi and Farnese, reported so different dates concerning the Mascagni's discovery of the vascular structure of penis: 1795 and 1809, respectively. Furthermore, in a letter reported by Moreschi, professor Ottaviano Targioni Tozzetti (1755-1826) indicated the date 1785 and announced the publication of Mascagni's anatomical plates in the *Prodromo della grande anatomia*.

So, Moreschi also wondered why Mascagni supported the old cellular theory in his famous work on lymphatics, published two years later:

With microscopic observations and injections one demonstrates that arteries continues into veins and this is very evident. At the same way, one shows that they end into the cells that constitute the spongy tissue of clitoris and penis, and that the corresponding veins originate from the same cells. But the force of the heart moves the blood from arteries into cells and veins, and one can say that arteries continue directly into veins, merely through a dilation between them (26).

Moreschi concluded by stating that, although Mascagni has published many studies, no one of these supported the vascular theory of the urethra before 1810 and the Tuscan anatomist has not even claimed the paternity of the discovery after Moreschi broke the news to the scientific press in 1815. Indeed, Moreschi wrote that the discovery was made by him in Bologna in the presence of dr. Francesco Mondini (1786-1844), and doctor Tommaso Farnese, who was amazed and declared that Mascagni considered the two cavernous bodies of the penis as venous plexuses, but that no exclusive effect had ever been obtained on the body of the urethra. In a letter dated December 13th 1816, Moreschi's pupil Francesco Mondini confirmed that version (22).

The controversy, second act. Farnese's response to Moreschi's accusations

Farnese promptly replied to Antommarchi and Moreschi with *Note addizionali del Dottore Tommaso Farnese al suo elogio di Paolo Mascagni in risposta ai due scritti critici del Sig. Dottore Francesco Antommarchi e del Sig. Cavaliere Alessandro Moreschi* (27).

The dynamics of this controversy is typical of a classical spy story. Indeed, Farnese admitted to be aware, since the time of the *Elogio* writing out, of the Moreschi's reports dating back to the summer of 1815, but he provided another version about facts. According to him, the meeting was in September 1810. Farnese attended the Bologna anatomy cabinet when Moreschi, after a poorly achieved preparation, accidentally observed the real vascular structure of the urethra. Seeing him perplexed about the incident, Farnese informed him that Mascagni had already discovered the infinitesimal clusters of veins in the spongy body of the urethra and of the glans, and that he had called them venous plexuses. The discovery was made possible thanks to a technical precaution: injecting two substances of different colours into the venous and arterial vessels. Finally he informed him that Mascagni gave a demonstration to Mr. Cuvier the previous year.

Moreschi retried the operation on the horse's penis, but failed.

When Farnese went back to Florence, he informed his master about the meeting in Bologna with Moreschi. Farnese was oppressed by a sense of guilt for his incautious performance, but Mascagni knew how difficult was that injection and laughed at that episode.

To corroborate his version, Farnese included eight letters testifying that Mascagni injected venous vessels of the penis in the first decade of the nineteenth century. The witnesses were: Giovanni Battista Bellini, Pietro Betti, Paolo Casini, Cosimo Lazzerini, Paolo Francesco Acerbo, Enrico Acerbi, Antonio Targioni Tozzetti (1785-1856), Antonio Serantoni (1780-1837). The most important perhaps was the latter (who wrote on July 20th 1817) because he realized Mascagni's anatomical plates.

Among the letters the most complete chronological reconstruction, instead, is described by Antonio Targioni Tozzetti, who stated that Mascagni performed the aforementioned injections since 1785, most of the other witnesses remembered to have participated in a similar demonstration during a lecture by the master in 1805, and all of them confirmed that in the autumn of 1809 Mascagni illustrated the vascularization of urethra to Cuvier, zoologist learned in comparative anatomy, organizer of the schools in the French Empire who was visiting Florence. Farnese's *Elogio* reported the date 1809 because it was the most univocally recognized. Farnese reported that Cuvier made the same discovery, but in animals. Then, the two anatomists congratulated for having demonstrated the same structure in different experimental conditions, without claiming. According to Farnese, Mascagni had not yet published the discovery, because he wanted to be completely sure to demonstrate it.

One criticism raised by Moreschi was the fact that Mascagni did not respond to Moreschi's publications of the summer of 1815. But Mascagni was rather ill at the time, and perhaps he did not have time to consult the scientific literature, and on 19th October he died.

Nonetheless, in support of Moreschi, in 1818 an anonymous A.M. published in the Nuova *Biblioteca analitica di scienze lettere ed arti* a reply letter to Farnese. Two aspects are interesting. First, for the first time in this diatribe the copyright is claimed for those who first published a scientific discovery without giving too much importance to the observation date.

Second, an excerpt of a letter written by Cuvier on February 15th 1818 was including, where he thanked Moreschi for having given him a copy of his work, adding that he found it very interesting and decisive: … *permettez moi de vous remercier à mon tour de l'exemplaire que vous m'avez destiné, ainsi que de la manière honorable dont vous avez bien voulu parler de mes foibles travaux sur l'objet que vous traitez di profondement. Tout ce que j'ai vu depuis dans mes dissections me confirme dans l'opinion que vous défendez, et je suppose qu'elle n'éprouvera plus de contradictions* (28). A reply to those *Osservazioni* came to the defence of Mascagni in *Lo Spettatore*, where the letter of Cuvier was considered to be a common courtesy and not a response with scientific contents (29).

The controversy, third act. The posthumous works of Mascagni and the absence of protest by Moreschi

At the time of publication of the famous works on lymphatic vessels, it seemed that the real inner structure of penis was not completely clear to Mascagni. He suspected continuity between veins and arteries but, failing to prove it, confirmed the cell theory (30).

In 1816 a Mascagni's pupil, Giovanni Battista Bellini (1793-1853), translated into Italian the 1795 Latin edition of that work. In the chapter dealing with the anatomical question concerning the continuity between arteries and veins, Bellini wrote a very long and detailed note on this item (31). In the second edition of this translation, published in 1820, Bellini added further considerations to that note, taking now into account also the overt dispute between Moreschi and Farnese.

Bellini explained in detail the questions that led Mascagni to demonstrate the venous plexus of the urethra. He sensed that using corpses of children, the injected substances filled the vessels better because in the young the valves present in the veins are not yet functioning. Bellini wrote that the discovery took place at the end of 1795 and, in 1805, when he had them drawn, he called venous plexuses to replace the ancient name spongy body of the urethra (32).

Apart from his masterpiece on lymphatic vessels, Mascagni aimed to write a more comprehensive illustrated textbook, including both gross anatomy and microscopic observations. This project was not realized, but Mascagni's pupils organized plates and writings of their master and published posthumously three important works.

Two works were cured by Francesco Antommarchi (33-34). The latter work, published in 1819, was the famous *Prodromo della grande anatomia* and included macroscopic and microscopic observations of different parts of the human body, as well as comparative notes with plants and animals. Procedures and techniques were also illustrated. In the chapter II of this *Prodromo*, dealing with blood vessels, an accurate description was dedicated to the structure of erectile tissues. Since the dispute with Moreschi was known, again there is a chronological reconstruction of the facts. It is consistent with that provided by Bellini, even if Antommarchi given the first observations of the plexus to 1787.

The *Prodromo* was provided with a volume apart, including 20 plates realized by Antonio Serantoni. In particular, plate VII of this volume depicted male and female organs, and a plaster cast of spongy bodies of the urethra was shown (35) (Fig. 2). Some of these figures were also present in the *Note addizionali* by Farnese.

A second edition of the *Prodromo della grande anatomia* was published by Farnese. Plates and their captions were published apart. Only seven figures referred to the structure of penis, with detailed captions. In particular, a note underlined the dispute with Moreschi and the importance of the sophisticated technique adopted by Mascagni (36).

The vascular structure of penis was illustrated and described also in the posthumous Mascagni's

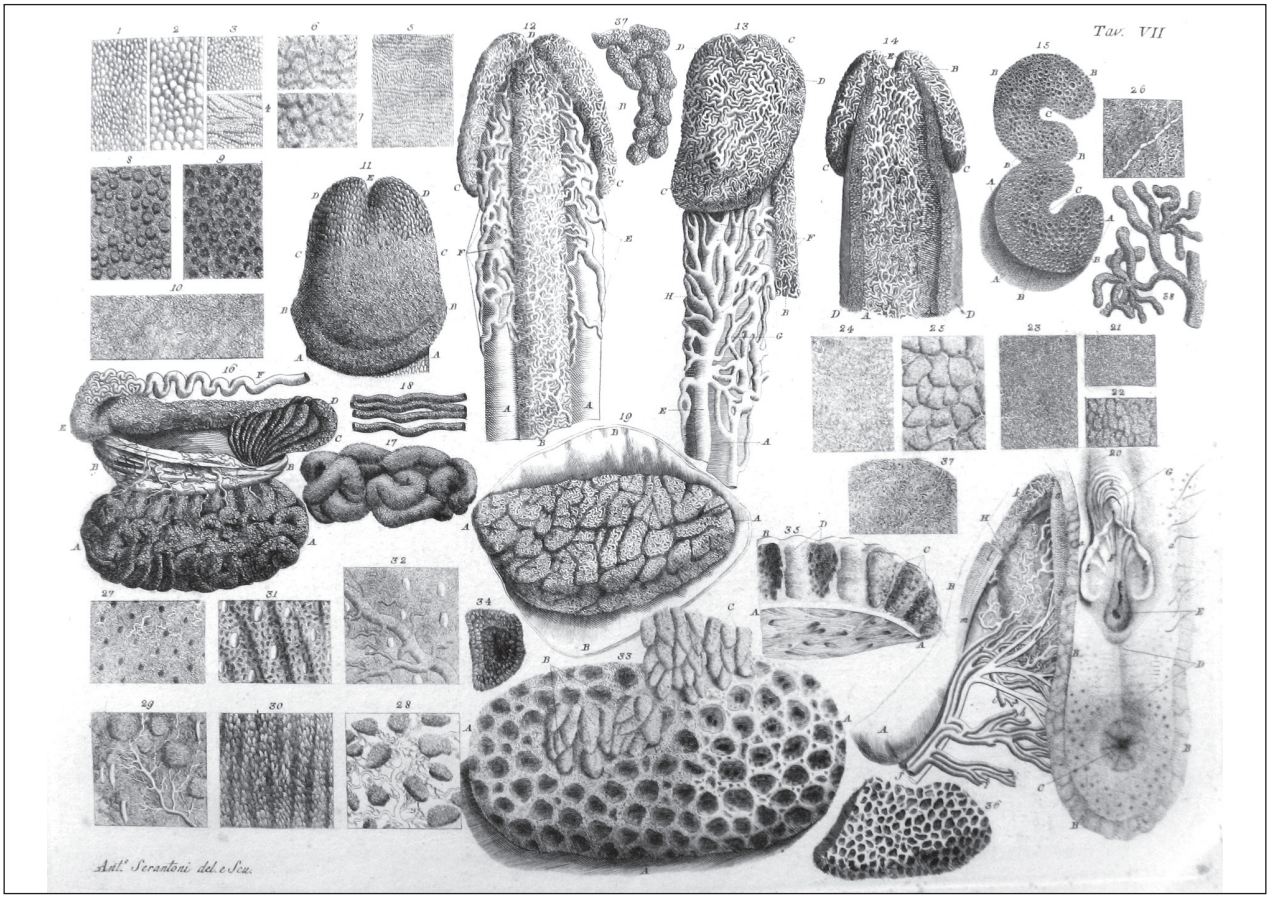

Figure 2. Plate VII taken from *Tavole figurate di alcune parti organiche del corpo umano, degli animali e dei vegetabili, esposte nel Prodromo della grande anatomia di Paolo Mascagni* by Francesco Antommarchi (1819).

Figure 3. Stratum Primum Tabula Specialis III taken from *Anatomia Universa* by Paolo Mascagni (1823-1831).

Anatomia Universa (37), edited by Mascagni's friends Andrea Vaccà Berlinghieri, Giacomo Barzellotti and Giovanni Rosini (Fig. 3), and in a cheaper edition of the Mascagni's anatomical atlas in Italian, with small-sized colour and black and white plates realized by Antonio Serantoni in 1833. In this work, new drawings were added. *Tavola particolare X* and *XII* of Plate XVII provided more informative details of the inner structure of penis (38).

Moreschi died in 1826. He and his pupils never again officially countered the clarifications that supporters of Mascagni gave to the facts.

The opinion of the scientific community

A large part of the testimonies collected so far were admittedly from pupils or collaborators of Moreschi or Mascagni, then it is difficult to evaluate the impartiality of their points of view. An impartial judgment could be sought in scientific societies chronicles, particularly foreign ones, and in the opinion of medical historians.

In the literature of that time, different opinions emerged. The *Biblioteca Italiana o sia Giornale di Letteratura Scienze ed Arti* a balanced comment on the *Note addizionali* by Farnese appeared in 1818, with a slight propensity to favour Mascagni's merits without doubting the good faith of Moreschi (39).

But historically, *this journal* was an Austrian pro-government journal, subject to censorship and propaganda. Therefore, in light of these considerations, it is not surprising that the article paved the way also in favor of Moreschi.

On *Medico-Chirurgical Transactions,* in 1819, the demonstrator of anatomy John Shaw (1792-1827) stated that he knew Moreschi's work and that he had a conversation with Antommarchi, but he does not quote Mascagni (40). Then, he realized that Italian anatomists did not extend their observations to the membranous part of the urethra. For this reason, he considered himself the first to demonstrate the vascular structure of this tract of the urethra, as also affirmed in a manual for the Student of Anatomy published in London and in the United States (41).

In 1824 *The Journal of Foreign Medical Science and Literature* published a very long a detailed review about Moreschi's *Commentarium* (42). This commentary really sang Moreschi's praises and never mentioned Mascagni. In that year the same text was published also in *The Edinburgh Medical and Surgical Journal* (43).

In 1825 the famous anatomist Johann Friedrich Meckel (1781-1833) published, with Jourdan and Breschet as co-authors, *Manuel d'anatomie générale, descriptive et pathologique*, a textbook then translated into many languages and distributed in English-speaking countries. Introducing the chapter dedicated to the anatomy of the urethra, he mentioned the work by Moreschi in the first note, as if it was the main and primary one, while Mascagni was not cited (44).

Mascagni was praised in the *New-York Medico-Chirurgical Bulletin* (1831) (45), and under the heading *erectile tissue* of *The Cyclopaedia of Anatomy and Physiology*, edited by Robert Todd (1809-1860), both Mascagni's and Moreschi's works were mentioned as important steps in this field of research. However,

Moreschi's contribution and illustrations deserved a particular attention (46).

In his *Storia della medicina*, Francesco Freschi (1851) clearly attributed to Moreschi the discovery of the vascular nature of erectile tissues. He also stated that the anatomists Antonio Scarpa and Giovanni Antonio Palletta had the same opinion (47). This appears unlike, since Farnese (1816) dedicated his *Elogio* just to Palletta. Furthermore, in a letter without date addressed to Bartolomeo Panizza, Scarpa wrote: *Read the* Elogio of Mascagni *by Farnese at page 48 and you will find the confirmation of Moreschi's robbery. Anyway, Scarpa wanted further data form Panizza before releasing a final opinion on that matter* (48).

Conclusions

It is hard to decide the winner of this controversy. Probably as early as 1787 Mascagni began to have a correct view of the vascular anatomy of the urethra, different from the cell theory, but he had not published the discovery, because he wanted to be completely sure to demonstrate it. The certain demonstration was made possible by the improvement of the technique: different coloured injections were needed to distinguish arteries and venis and the procedure was better on corpses of young people.

The general accuracy of Mascagni's description has been since confirmed by the researches of Moreschi. The latter was the first to publish an accurate work on this discovery in 1815. Until 1815, nothing similar is described in the journals of the scientific societies, and in the publications of Mascagni the urethra does not.

One criticism raised by Moreschi was the fact that Mascagni did not respond to Moreschi's publications of the summer of 1815. But Mascagni was rather ill at the time, and perhaps he did not have time to consult the scientific literature, and on 19th October he died.

On the other side, Mascagni's works were mainly published posthumously and after the beginning of the dispute and in these books the real vascular nature of the urethra is clearly described, but we do not have objective elements to evaluate exactly when the observations (and what was really observed) were made. We must trust Mascagni' pupils reports who have admitted that the cellular texture theory was initially accepted. It is also true that neither Moreschi nor his pupils have ever told back to the clarifications made by Farnese in 1818 or criticized the posthumous publications of Mascagni.

For this reasons, as far as the opinion of the scientific community is concerned, we must consider that many Italian and international authors have attributed to Moreschi the discovery of the venous circulation of the urethra because they found only the well organized publications by him. On the contrary, those who explored historical aspects of the matter were able to appreciate Mascagni's work, as well.

The illustrations reported in Mascagni's and Moreschi's works really provided a vascular structure of the urethra. However, especially for microscopic details, we must consider that photos were not available. So, we have excellent drawings, then a mere interpretation of the real picture. Furthermore, the concept of microscopic examination is simply related to fine details, but we do not have histological preparations showing the vascular structure of urethral spaces, as in modern slides. Indeed, rather than microscopy, injection techniques and cast models were able to help our anatomists to understand the vascular nature of the urethral spongy tissue.

From the anatomical point of view to Moreschi the following merits are recognized**:** 1) That the glans consists of arteries and a very great number of minute veins, which pour their blood into the cutaneous dorsal vein; 2) That the urethra, and especially its posterior part, may in like manner be shown to consist of numerous minute veins, which terminate in a posterior branch of the dorsal vein, and communicate with the veins of the bulbous portion of the urethra; and, 3) That in the cavernous bodies, though also receiving blood-vessels, these are much less numerous, and are chiefly derived from the urethral vessels (49).

The History of Medicine teaches us to reflect on the past, on what has been done and what what we can do in the future, thus changing our behavior. The correct analysis of the past of medical science allows us to understand the progressive stages of medicine, helping to integrate and complete the preparation of those who will dedicate themselves to the medical profession (50,51). It is important to shed light on scientific disputes to allow history to tell the true course of

events, recognizing to the scientists of the past their real merits and encouraging future doctors to intellectual honesty.

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