

Interdisciplinary study on the role and the evolution of anatomical theatres in the modern era: the first results of the THESA Project

Uno studio interdisciplinare sul ruolo e l'evoluzione dei teatri anatomici nell'era moderna: primi risultati del Progetto THESA

EMANUELE ARMOCIDA¹, CHIARA IANESELLI², ANDREA COZZA³

¹ University of Parma; ² PhD student, IMT School for Advanced Studies, Lucca; ³ University of Padua

Background. The THESA Project (Theatre Science Anatomy) aims to focus on anatomical theatres, their role played in the history of medicine, in the evolution of modern scientific thought and in a wider social and cultural context. THESA main purpose is to conduct a comprehensive census of anatomical theatres, both extant and not, that have been active between the sixteenth and mid-twentieth centuries.

Materials and methods. The first phase of the research consists in a bibliographic and archival study of anatomical theatres, as documented in various forms of literature. A second phase of research will seek to understand what projects were actually carried out. Then a precise chronological classification will offer a panoramic overview on the development of these highly specific buildings, historically contextualised in a precise, defined milieu. The last phase of the research will consist in the intelligent and constructive synthesis of the results of research, as well as of onsite studies, in order to find unexplored connections among different anatomical theatres.

Results. The first phase has now ended. Around 50 anatomical theatres have been traced in archival studies and in bibliographic research.

Conclusion. We believe the achievement of these objectives defines the essential conditions necessary to regain full awareness of the value of anatomical theatres, and plan for new initiatives that can continue the quest for knowledge undertaken in these places in the past centuries.

Key words: THESA Project, anatomical theatres, census, history of medicine

Premessa. Il Progetto THESA (Theatre Science Anatomy) è finalizzato a studiare i teatri anatomici, il ruolo svolto nella storia della medicina, nell'evoluzione del pensiero scientifico moderno e nel più generale contesto sociale e culturale. Ha come scopo principale realizzare un completo censimento dei teatri anatomici, ancora esistenti e non, che sono stati attivi tra il XVI e il XX secolo.

Materiali e metodi. La prima fase della ricerca consiste in uno studio bibliografico e archivistico dei teatri anatomici documentati in varie forme di letteratura. Una seconda fase di ricerca cercherà di capire quali progetti sono stati effettivamente realizzati. Successivamente, una precisa classificazione cronologica consentirà una panoramica sullo sviluppo di questi edifici, e di contestualizzarli storicamente in modo preciso e definito. L'ultima fase consisterà nella sintesi intelligente e costruttiva dei risultati della ricerca, così come degli studi svolti in sito, alla ricerca di connessioni inesplorate tra diversi teatri anatomici.

Address for correspondence
Indirizzo per la corrispondenza

Emanuele Armocida
University of Parma
via Università 12, 43121 Parma, Italy
e-mail: emanuele.armocida@studio.unibo.it

Risultati. *La prima fase si è conclusa. Circa 50 teatri anatomici sono stati censiti in studi archivistici e nella ricerca bibliografica.*

Conclusioni. *Riteniamo che queste siano le premesse indispensabili per fare riacquisire piena coscienza del valore di questi luoghi, e per favorire la nascita di iniziative atte a rinnovare il percorso conoscitivo che vi si era intrapreso nei secoli passati.*

Parole chiave: *Progetto THESA, teatri anatomici, censimento, storia della medicina*

Introduction

This article aims to offer a survey on the evolution of anatomical theatres and to suggest some possible entry points to see the evolution of these particular architectural sites, pivotal for the development of modern and contemporary medicine.

Architectural sites linked to medicine represent a particularly fascinating source for what concerns the history of medicine. They offer an interdisciplinary perspective particularly rewarding, if it is true that the scenarios within which health care is developed are closely related to the more general context of society. These venues represent crossroads towards which many disciplines converge: history of medicine, sociology, religion studies, economics, architecture and history of art, among the most evident. Italian historians have always been able to contribute to the development of knowledge in this field of research and they marked important steps in gathering information. Let's just consider for example the first European Congress of Hospital History, organized by CISO (Italian Center of Hospital History), in 1960 in Reggio Emilia (Nasalli Rocca 1962).

How to keep trace of all the locations that played a crucial role in the development of medicine, how to link them, how to see their dialogue? It's always been a challenge. A great contribution to this ideal "map of medicine" is "Himetop. The History of Medicine Topographical Database" (himetop.net), a web project aimed at mapping geographically medical venues of the past (Borghi 2009).

The evolution of scientific knowledge necessarily affects the places where it is applied. The study of hospital architecture is certainly the most exceptional example. The wide hospital pavilions, useful in the 19th century, for technical-scientific knowledge of the period, today are overcome. The development of such cultural heritage is hard to manage. They are buildings destined to be demolished for making room to new builds, or to be re-used with adhibitions far from those for which they were erected. In these places it will no longer be possible to perceive the historical route, if not in a sterile manner.

However, there are architectural places that even today, centuries later, are able to keep unchanged their intrinsic function: anatomical theatres.

During Enlightenment, hospitals were defined as "machine à guérir". We could define the anatomical theatres "machine à regarder l'Homme". These temples of knowl-

edge made possible the advancement of medical knowledge and fostered scientific thought. Their architectural shapes were directly dependent on their functions: primarily venues to see well dissections. From temporary structures, risen during the 15th century they acquired a permanent dimension.

Human anatomy dissection: a cornerstone in the evolution of medicine and modern scientific thought

Human anatomy dissection represented a cornerstone in the evolution of medicine and modern scientific thought. Anatomical theatres – theatres where human dissections were performed – were built only in the late 16th century in different European cities, although their origin traces back to the 14th century when an important shift occurred.

At the beginning, the study of the body was conducted through the dissection of animals, not of human corpses, and through a commentary on the works of those who are considered founders of the discipline: in particular, Aristotle, Hippocrates and Galen.

Until the Middle Ages the anatomical texts of Galen and Hippocrates were studied in a dogmatic way. Knowledge about the structure and functioning of the human body derived from books, copied and passed from generation to generation: these writings were considered immutable and never questioned. At the beginning of the 14th century the growing universities (Bologna, founded in 1088; Padua in 1222; Messina in 1224) determined a new vision of knowledge. Mondino de' Liuzzi, a Bolognese anatomist, was the first to introduce the practice of dissection into the curriculum of medical studies in 1300 as a means of verifying texts studied during human anatomy lessons (Malomo, Idowu and Osuagwu 2006).

His original approach allowed him to write the book *Anothomia* in 1316, a truly revolutionary book for what concerns medical knowledge. The dissection on humans was a fundamental step in the history of science because it questioned the dogmatic nature of medical knowledge, and completely subverted the traditional iconography and knowledge of the human body: observation became crucial. Following the growth of dissections and the need of a proper place to perform them anatomical theatres were constructed.

Permanent anatomical theatres and the pivotal role of anatomist in its realization

Architecturally designed and conceived specially to facilitate the demonstration of animals at first, than humans, anatomical theatres are firstly mentioned in 1502 by Alessandro Benedetti. An anatomist and a humanist living in Padua, Benedetti defined the nature, structure and functioning of anatomical theatres in these words:

To this end a large space is required, which must be very well ventilated, and inside which a temporary theatre must be erected, with seats arranged in a circle (of the kind visible in Rome and Verona). The space must be large enough to contain the number of spectators and to prevent the crowd from disturbing the surgeons performing the dissections. They must be skillful, having already completed several dissections. The seats must be assigned according to rank. For this purpose, there will be only one overseer who will monitor and be available to all the spectators. There will need to be several custodians to keep away intruders attempting to enter, and two trusted treasurers who with the money collected will procure all necessary materials. For the dissection, these include razors, knives, hooks, drills and gimlets (the Greeks called them 'chenicia'), sponges with which to rapidly clear the blood during the dissection, scissors and basins; torches which must be kept ready in case darkness supervenes (Benedetti 1998).

The first permanent theatre was built in 1594 in Padua and inaugurated in early 1595: it is still perfectly preserved¹. The structure was probably conceived by Paolo Sarpi, scientist and church reformer, and by Hieronymus Fabricius ab Aquapendente, anatomist (Rippa Bonati 1989). Since then many other theatres were built, most of them between the 18th and 19th centuries, in cities with universities and hospitals, especially following the development of Positivism.

Anatomical theatres are not a uniquely Italian phenomenon; they developed following various research threads in different parts of Europe, but were probably linked to one other. Professors were indeed traveling among universities and definitely contributed to the sharing of ideas. This is evident if we just simply look at the shapes of them, the theatres of Leyden and Uppsala remind of the one in Padua. Leyden had its theatre in 1597 following the initiative of Professor Peter Pauw, who felt the need for one after studying in Padua with Fabricius. The theatre of Uppsala (built in 1662) also reminds of that of Padua. The Barber-Surgeons anatomical theatre in London was built in 1636 by Inigo Jones, the famous architect that worked for the English court (Brockbank

1968). Jones had the possibility to meet and study classical Italian art when he undertook the *Grand Tour* (the first travel in Italy between 1598 and 1603; the second between 1613 and 1614) (Worsley 2007).

Anatomical theatres also developed in France, following the early rise of medical schools in Paris and Montpellier in the Middle Ages.

Could the fervent atmosphere of exchange and collaboration that characterizes the spread of medicine in Europe create a network of anatomical theatres?

The structures of theatres could vary in accordance to the different methods of teaching anatomy in use in the different universities. There are, for example, two methods: the Vesalius method, that is focusing on a single point – professor and dissector in a single person –, and the Mondinus method, with a difference between the professor who is reading and the sector actually performing the dissection (Premuda 1993, Carlino 1999). Anatomists had a pivotal role in the establishment of anatomical theatres: using their knowledge in the research process, they helped in the definition of more functional architectures for demonstrative and experimental science.

On this regard, Antonio Scarpa (1752-1832) was an emblematic figure: he studied anatomy at the University of Padua in the oldest permanent anatomical theatre of the world, and, in 1772, Scarpa became professor at the University of Modena. Considering the architectural value of the theatre in Padua, in 1774 Scarpa invited, in the planning for the construction of the anatomical theatre in Modena, the professor of surgery of Padua, Girolamo Vandelli. He indeed asked him to send a wooden model of the theatre there.

Eventually another project, less expensive, was selected (Corradini 2015). Later, in 1783 Scarpa became professor of anatomy at the University of Pavia. In 1785 he opened the new anatomical theatre there (Belloni 1970). The semi-circular layout of the building clearly reminds of the Padua one.

The diffusion of theatres continued during the 19th century and their construction continued to be influenced by anatomists. In 1788 Sebastiano Bianchi was appointed anatomy professor in Catania and one of his major enterprises was the actual building of an Anatomical Theatre, at that time non-existent, which was built at the expense of the University, in the San Marco Hospital (it opened on April 29, 1800) (Zappalà 1834). In 1832 in Campobasso, thanks to physician Michelangelo Ziccardi (1802-1845), a theatre was designed, also to avoid the performance of medical autopsies in the streets or churches (De Rubertis 1845).

In Padua, at the entrance of the anatomical theatre a Latin inscription reads: "*Hic est locus ubi mors gaudet succurrere vitae*" ("*This is the place where death is pleased to help life*"), stressing that the study of corpses can help life, through fostering anatomical knowledge, which can then be applied to medical practice. Anatomical theatres saw their rise especially during the Humanism, with its typical anthropocentrism:

¹ It replaced a previous theatre, which, as mentioned in the memoirs of Germanic Natio, had been conceived a decade earlier as a permanent structure itself (Gamba 1986).

they represent a conjunction between the renewal of humanistic doctrines and the scientific method. The dissections that took place within their walls combined cultural, philosophical, and medical experiences. It was an artistic experience too, for the great painters and sculptors who would represent the human perfection in their masterpieces (Kennedy 1992, Casali 2012).

Anatomical theatres belong to cultural heritage from a number of perspectives, from the architectural and artistic to the scientific and anthropological (for the rituals practiced in them and for the science-religion relationship). On the one hand, anatomical theatres are part of the history of anatomy and medicine, they keep trace of the development of medical schools from their early beginnings to current times and to the evolution of scientific thought. On the other hand, they retain an undisputed artistic and architectural value, which is neither secondary to nor independent of their scientific function, but rather complementary to the activities for which the theatres were created. Moreover, anatomical theatres can be valued as crossroads for public, civic and religious authorities that gathered with the occasion of dissections, symbolizing the presence of universities in their urban contexts.

Anatomical theatres, today

Over time, due to dissections being moved to more modern buildings, often already part of hospitals, anatomical theatres lost value as “performative” spaces, acquiring instead the characteristics of historical venues.

Scientific-technological progress led the anatomists to abandon the anatomical theatres to devote themselves to the microscopic anatomy, considered more stimulating and fruitful than their macroscopic counterpart. Finally, the significant increase in the number of medical students has clearly made more complicated the public dissections for organizational reasons. The sector tables surrounded by students left the stage to frontal instruction (Rehkämper 2016). The separation in the practice of field anatomy from surgical practice has, however, allowed the emergence of new kinds of buildings: surgical theatres where not anatomy, but rather surgical operations were shown.

Only a few of the most important Italian anatomical theatres have survived and are recognized today as crucial to our heritage, like those in Padua, Bologna, Ferrara and Pavia. Others survived over time but definitely have not yet received much attention, like the ones in Pistoia, Lucca and Modena (the latter is now under renovation). Still others have disappeared, leaving only a few documents to witness their existence and their possible history, such as the theatre in Florence, with artworks of Gioacchino Masselli and Santi Pacini (Covoni Girolami 1783).

Anatomical theatres, has been highlighted, have been researched in individual terms, as in the cases of Padua

(Semenzato, Ripa Bonati, Dal Piaz 1994) or Bologna (Mascardi 2010), but no comprehensive study has been dedicated to their ensemble. We just have occasional references in medical journals or general publications. The first research that focused on different theatres was a study conducted by William Brockbank (Brockbank 1968), which has just some paragraphs for each city. A defined, inclusive chronology that also studies the ones that disappeared, or were given another function, has never been published.

The THESA Project: an interdisciplinary study of anatomical theatres

Today, most of the anatomical theatres are lost or forgotten. The THESA Project (THESA meaning THEatre Science Anatomy) was born in September 2016 and, as the name clearly suggests, it aims to focus on anatomical theatres, their roles in the history of medicine, in the evolution of modern scientific thought, and in a wider context. Its first ambition is to make a comprehensive census of Italian anatomical theatres, both extant and not, that have been active between the sixteenth and mid-20th centuries. The first phase of the research consists in a bibliographic and archival study of anatomical theatres, as documented in various forms of literature (city archives, students documents, city chronicles, travel diaries etc.). This will be followed by a second phase of research that will seek to understand what projects were actually made, and what the characteristics of anatomical theatres are. The THESA research wants to include all those sites that originally had an anatomical table placed in front of or at the center of an audience. These two distinctive features have to be considered fundamental. It is therefore excluded from research, for example, all the dissection rooms in many institutes of normal anatomy, pathological anatomy and legal medicine that do not provide any place for the public.

Next, a precise chronological classification will be carried out: an attentive study on the existing documents will offer a panoramic overview on the development of these highly specific buildings, historically contextualised in a precise, defined *milieu*. Once the general historical framework is defined, it would be important to research longer on the sources concerning the construction of each theatre. As already mentioned, the study of the archives of the cities, city chronicles, diaries of the students, laws, travellers diaries can also be investigated to point out/the social, cultural role and functioning of anatomical theatres. Once the identification and the census will be completed, we shall be able to answer the following questions:

- year of construction;
- from whom they were commissioned, what architects were involved;
- the pivotal role of anatomist in its realization;
- property;

- the specificities of the cities/universities in which they grew;
- the specificities of the location;
- construction details;
- artistic and architectural features, an art historical dimension that considers the architectural, sculptural and pictorial values;
- period of activity (until when were they used as anatomical theatres);
- what other functions, scientific or social, have played in their existence;
- current state of the structure.

The crossing of information will definitely reveal unexplored connections among different anatomical theatres, as well as the dialogues and movements of anatomists.

The last phase of the research will consist in the intelligent and constructive synthesis of the results of bibliographic and archival research, as well as on site studies.

Given the extension of the project, initially the research will be restricted to anatomical theatres in Italy, where there has been a tremendous development from early modern times to the present. The second stage of the study will focus on European theatres, including both those that have survived or been transformed to serve a different purpose, and those which have disappeared. The third stage will be devoted to theatres outside Europe. Ultimately, we will be able to make a definitive census of anatomical theatres which for more than four centuries have been the symbol of the progress of medicine, and which encompass the quest for knowledge of the human body, from a medical, philosophical and artistic perspective.

We believe that the achievement of these objectives defines the essential conditions necessary to regain full awareness of the value of anatomical theatres in both the academic and popular contexts, thus creating a fertile cultural basis for new initiatives that can continue the quest for knowledge undertaken in the past in these places. From an architectural and evocative perspective, they are and will remain places where man puts himself at the centre and at the same time observes himself: this peculiarity makes anatomical theatres extremely versatile and suitable not only for scientific initiatives, but for artistic ones, because they always have been spaces where art and science commingle.

For example *Les Gares*, a contemporary art project launched in 2014, aims to involve several European anatomical theatres. Following the knowledge of cultural spaces and cultural events, various artists were invited from time to time to think and realize a site-specific project for the theatre environment, describing first their work through an initial conference designed to illustrate the reasons and forms of exposure (Ianeselli 2016).

Such an ambitious and interdisciplinary project can only be carried out by a heterogeneous group of researchers with expertise in many different fields: history of medicine, history of the university, philosophy of science, arts, architecture,

cultural heritage, to say nothing of the correlation between the anatomical theatres and the history of dramatic theatre.

THESA Project: the current state of the art and future perspectives

To the present, around 50 anatomical theatres have been traced in archival studies and in bibliographic research (Tab. I). Currently, the THESA research group is developing an in-depth study that will allow to understand which of the theatres were in use, how were they constructed and which patterns (if so) they presented.

Bibliographic and archival research has already provided significant results in these terms: for example, the plans of Parma's anatomical theatre have been found. Its existence had been forgotten after its demolition for urban needs (Archivio di Stato di Parma 1858). By studying the maps we can imagine its forms. We can also figure how the interiors were, thanks to some paintings representing the physics and chemistry theatres interiors which were made in the same period, so we can assume they were quite similar to the anatomical theatre ones (Dall'Acqua 1997).

Equally important has been the finding in the State Archives of Vercelli of the plans of the anatomical theatre of the former hospital of Sant'Andrea in the same city (Archivio di Stato di Vercelli 1832). In fact, the ancient hospital of the city is subject of a requalification project and the research on its anatomical theatre could allow a more in depth conscious reconstruction of the environments occupied by that structure.

A precise chronological study could also help to understand the socio-political events that led to the development of the anatomical theatre, along with the anatomists who participated in the design and were directly involved in it.

From an initial analysis it can be assessed that most of the anatomical theatres were built between the 17th and the first half of the 19th century. Their distribution on the territory was conditioned by the political events of pre-unitary Italy, fragmented into many small States.

During the 18th century many governmental authorities demonstrated Enlightenment influences by contributing to the foundation of various university structures such as botanical gardens, museums and anatomical theatres. For example, anatomical theatres were inaugurated in Turin by the will of Vittorio Amedeo II and his successor Carlo Emanuele III, in Modena thanks to Francesco III d'Este, in the 1770s, and in Pavia where Joseph II of Habsburg, with his enlightened despotism, attempted to re-propose at the end of the century the reforms adopted a few years earlier in Vienna (Zocchi 2005, Cani 2015).

Extended States tend to create "cultural peripheries": places of knowledge and anatomical theatres are focused on the major cities. This is the case of the Kingdom of Naples, with the exception of Sicily that has many anatomical theatres.

Table I.
Anatomical and operating theatres so far enumerated by the THESA Project.

REGION	CITY	Anatomical theatres		Operating theatres	
		D	E	D	E
PIEDMONT	Turin	2			
	Vercelli	1			
LOMBARDY	Mantua	1	1		
	Milan	1			
	Pavia	1	1		
VENETO	Padua	2	2		
	Venice	1	1 *	1	
	Verona	1			
LIGURIA	Genoa	1			
EMILIA- ROMAGNA	Bologna	4	1	1	
	Ferrara	1	1		
	Modena	2	1		
	Parma	2	1	1	1 *
TUSCANY	Carrara	1	1 *		
	Lucca	1	1		
	Florence	1			
	Pisa	1			
	Pistoia	1	1		
	Siena	2	1		
UMBRIA	Perugia	3			
LAZIO	Rome	5	1 + 1 *		
ABRUZZO	L'Aquila	1			
	Sulmona	1			
MOLISE	Campobasso	2			
CAMPANIA	Naples	4		1	1
SICILY	Catania	2	1 + 1 *		
	Messina	1			
	Modica	1	1		
	Palermo	2			
SARDINIA	Cagliari	4	1	1	1
	Sassari	1			
<i>Total</i>		54	15 + 4 *	5	2 + 1 *

D: Theatres documented by bibliographic and archival evidences; E: Theatres still extant, as verified by THESA group at the present; *: Theatres that have strongly changed their original features.

The Roman Catholic Church, in 1824, published *Quod divina sapientia*. This bull of Pope Leone XII established that the state's primary universities, Rome and Bologna, were the only ones where to obtain the degree that allowed access to professional colleges and therefore to university education. Consequently, excluding the cities mentioned above, the anatomical theatres were annexed to hospitals and to anatomical and surgical academies, and not to the local universities, such as in Perugia. The Anatomy-Surgical Academies were structured to prepare physicians already working in the city, and also to prepare future physicians before starting the course at primary universities (Maovaz, Giambanco I, Donato et al. 2011).

In Tuscany, instead, the ups and downs of political events of the eighteenth and nineteenth centuries, involving universities, led to the proliferation of anatomical theatres.

Surveying on the territory will allow to understand what destination these theatres had, first of all if they are still

recognizable and of value today. The utility of the project has been well understood by the University of Modena and Reggio Emilia who welcomed it with enthusiasm. This university has in recent years undertaken a restoration program for Modena's anatomical theatre and intends to bring the results out its work. There are the preconditions for Modena's anatomical theatre to become the concrete prototype of the THESA mission.

At the same time research carried out on site could help to develop a network of contacts that will help to enrich the history of anatomical theatres.

On a concrete level THESA began to spread the first results with presenting its activities in journals and participating in national and international conferences². The project aims to

² In this first year of work, the THESA group submitted its re-

organize a conference devoted to the topic and to produce a monograph that can document all the Italian anatomical theatres and highlight their relationships. A collaborative perspective was offered by the Network of Universities Museums, a network approved and funded by the Ministry of University and Research, whose mission is to activate a dialogue between museums and a global context that focuses on the specific identity of their collections to promote openness to lifelong learning activities aimed at different kind of people. To characterize the project will be a series of thematic routes that will guide the user both locally, within the exhibition spaces, and on the web. In addition, the chosen themes will allow developing cultural itineraries also in the territory, with a view to collaboration and continuity with the context in which each university museum is inserted. Within this project there is an interest in promoting initiatives related to university anatomical theatres. But these are just part of it, and in the future we will try to include in larger projects also the anatomical theatres owned by health companies and other entities.

Conclusions

To the present, around 50 anatomical theatres have been traced in archival studies and in bibliographic research (Tab. I). Currently, the THESA research group is developing an in-depth study that will allow to understand which of the theatres were in use, how were they constructed and which patterns they presented.

Acknowledgements

The advancement of the THESA Project and its success is made possible thanks to the collaboration of experts of various disciplines interwoven with their knowledge. Therefore, in addition to the authors of this article, it is necessary to remember Prof. Maurizio Ripa Bonati, Prof. Luca Borghi, Dr. Chiara Mascardi, Dr. Valentina Cani co-creators of the THESA group. Then, Prof. Carlo Mambriani, Prof. Alessandro Ruggeri, Prof. Rosario Donato, Prof. Giuseppe Musumeci, Dr. Davide Orsini, Director of SMA of Siena, Prof. Elena Corradini, Dr. Laura Berardi, Dr. Italo Testa,

search to the sixth Annual Scientiae International Conference on Disciplines of Knowing in the Early Modern World (roughly 1400-1800), with the report *The art of teaching: Italian anatomical theatres as an educational tool, at the intersection of art, history, and science* (Armocida et al.); to the 9th Meeting of ISHM (International Society for the History of Medicine) with the report *On whales, chocolate and bodies. A short story of anatomical theatres in Rome* (Borghi); and to the 71st SIAI (Società Italiana di Anatomia e Embriologia) National Conference with the report Armocida, Ruggeri: *Anatomical theatre place of Knowledge - the pivotal role of anatomist in its realization*. Italian Journal of Anatomy and Embryology 2017;122(Suppl 1):15.

Dr. Marco Maovaz, Dr. Nicolò Nicoli, Dr. Marcello Trucas. All of them, in this first year of research, have collaborated by providing philanthropy with their skills and knowledge.

References

- Archivio di Stato di Parma. Mappe del patrimonio dello Stato, n. 664. *TI - Iconografia terrena del nuovo Istituto Anatomico, nonché dell'Istituto di Chimica Organica, giusto le innovazioni ed aggiunte progettate per quest'esso Istituto*. Parma: Rondani L 1858.
- Archivio di Stato di Vercelli, fondo Ospedale Maggiore, Serie Ordinati, vol. 82, già vol. 21, ordinato n. 30. *Stabilimento di Scuole Secondarie di Medicina e Chirurgia in Vercelli. Clinica e Notomia in quest'Ospedale*. 1832.
- Belloni L. *Italian medical education after 1600*. In: O'Malley, ed. *The history of medical education*. Los Angeles: University of California Press 1970, pp. 105-20.
- Benedetti A. *Historia corporis humani sive Anatomice*. Italian edition with Latin text edited by Ferrari G. Firenze: Giunti 1998, p. 85.
- Borghi L. *Web 2.0: a useful tool for the history of medicine*. Soc Hist Med 2009;22:589-95.
- Brockbank W. *Old anatomical theatres and what took place therein*. Med hist 1968;12:371-84.
- Cani V. *"Dalla cattedra all'officina": studiare medicina a Pavia nella seconda metà del Settecento*. Milano: Cisalpino Istituto Editoriale Universitario 2015.
- Carlino A. *Books of the body. Anatomical ritual and Renaissance learning*. Chicago and London: University of Chicago Press 1999.
- Casali E. *"Anatomie astrologiche". Melotesia e Pronosticazione (sec. XVI-XVII)*. In: Olmi G and Pancino C, eds. *Anatomie. Sezione, scomposizione, raffigurazione del corpo nell'età moderna*. Bologna: Bononia University Press 2012, pp. 161-83.
- Corradini E. *Nascita e sviluppo dei musei anatomici di Modena tra Settecento e Novecento: il museo ostetrico, il museo anatomico, il museo etnografico antropologico e il museo di medicina tropicale*. Med Secoli 2015;27:441-79.
- Covoni Girolami M. *Regolamento del Regio Arcispedale di Santa Maria Nuova di Firenze*. Firenze: Gaetano Cambiagi 1783, p. 25.
- Dall'Acqua M, ed. *L'ossessione della memoria. Parma settecentesca nei disegni del conte Alessandro Sanseverini*. Parma: PPS Editrice 1997, pp. 354-55.
- De Rubertis G. *Elogio accademico del defunto Michelangelo Ziccardi*. In: *Ultimi onori alla memoria di Michelangelo Ziccardi*. Campobasso: Tipografia Nuzzi 1845, pp. 51-92.
- Gamba A. *Il primo teatro anatomico stabile in Padova non fu quello di Fabri d'Acquapendente*. Atti e memorie dell'Accademia patavina di scienze, lettere ed arti 1986;99:157-61.
- Ianeselli C. *Les Gares: un catalizzatore per la ricerca nei teatri anatomici*. In: Ripa Bonati M, ed. *51° Congresso della Società Italiana di Storia della Medicina*. Siena: CLEUP 2016, pp. 357-9.
- Kennedy BP. *The anatomy lesson. Art and medicine: an exhibition of art and anatomy to celebrate the tercentenary of the Royal College of Physicians of Ireland*. Dublin: The National Gallery of Dublin 1992.
- Malomo AO, Idowu OE, Osuagwu FC. *Lessons from history: human anatomy, from the origin to the renaissance*. Int J Morphol 2006;24:99-104.
- Maovaz M, Giambanco I, Donato R, et al. *La Medicina nell'Università di Perugia*. Ann Fac Med Chir Univ Studi Perugia 2011;96-8:277-358.
- Mascardi C. *Il teatro anatomico nella cultura moderna. Storia e storie di teatro, scienza, arte e società*. Bologna: Alma Mater Studiorum Università di Bologna 2010.
- Nasalli Rocca E. *Atti del Primo Congresso Europeo di Storia Ospita-*

liera (giugno 1960). Reggio Emilia: Centro Italiano di Storia Sanitaria Ospitaliera 1962.

Premuda L. *Storia dell'iconografia anatomica*. Saronno: Ciba Edizioni 1993.

Rehkämper G. *Human dissection in medical education: more than just anatomy*. GMS J Med Educ 2016;33:Doc 68, eCollection.

Rippa Bonati M. *Le tradizioni relative al teatro anatomico dell'Università di Padova con particolare riguardo al progetto attribuito a Fra' Paolo Sarpi*. Acta Med Hist Patav 1989-90;35-6:145-68.

Semenzato C, Rippa Bonati M, Dal Piaz V. *Il teatro anatomico storia e restauri*. Limena: Offset Invicta 1994.

Worsley G. *Inigo Jones and the European classicist tradition*. New Haven and London: Yale University Press 2007.

Zocchi P. *L'antico museo anatomico dell'Ospedale Maggiore di Milano*. Storia in Lombardia 2005;2:33-57.

Zappalà I. *Necrologia del Professore Sebastiano Bianchi*. In: *Giornale del Gabinetto Letterario dell'Accademia Gioenia*. Catania: Tipografia dell'Accademia Gioenia 1834, tomo II, pp. 223-30.