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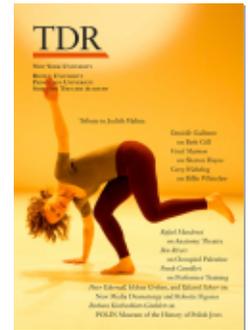
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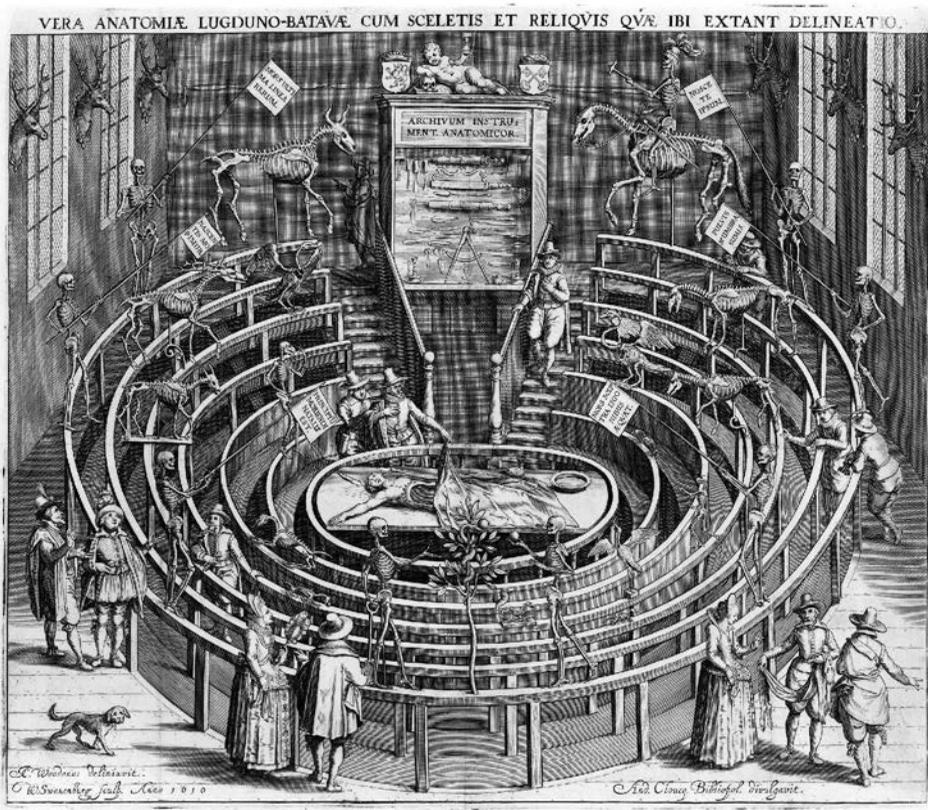
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Of the Eye and of the Hand

Performance in Early Modern Anatomy

Rafael Mandressi

translated by Elizabeth Claire



Staging Anatomy

The history of the theatre belongs to the history of knowledge, and anatomy plays an important role in the history of the stage.¹ These two assertions are linked. In order to demonstrate the correlation, it is necessary to point out that anatomy, a knowledge based in practice, can and should be considered as coming into existence through performance. One could go so far as to say that anatomy is the performance of knowledge *par excellence*. If the notion of performance

1. This article was originally presented in French at the conference "Performance: théâtre, anthropologie," organized by Christian Biet and Georges Vigarello in 2011 at the École des hautes études en sciences sociales, Paris.

is useful and generally illuminating for the history of science,² if the bodies of anatomy's scientists, their gestures, their actions, are the fundamental ingredients in the production of knowledge, then anatomy as a discipline (beginning in the Middle Ages and continuing throughout the Renaissance and up through at least the beginning of the 19th century) displays these elements in a most obvious, explicit, and organized fashion. In early modern Europe, it is in large part thanks to the study of anatomy that theoretical discourses on the role of the senses in the acquisition of knowledge were elaborated in relation to the creation of specific spaces of public demonstration— anatomy theatres. In the anatomy theatres, sequences of precise actions were followed and a very detailed organization of materials was established creating a *mise-en-scène*, or what the Italian anatomist Alessandro Benedetti (d. 1512) called the *horridum spectaculum* ([1502] 1514:25v).

My point of departure for studying anatomy as a mechanism of knowledge production based in performativity concerns how knowledge is acquired via the senses. Sensoriality was constructed as fundamental to anatomical knowledge, and the way in which anatomists formulated this exigency gave birth in the Renaissance to what I call the “sensorial program” of anatomy (Mandressi 2003, 2005, 2008). There were consequences of this sensorial program for the practice of dissection, its various modes of organization, and the function of anatomy theatres. I argue for a link between the development of anatomy theatres and dramatic theatres in the 16th century as evidence that the practice of public dissection in these anatomy theatres impacted the development of many of the characteristic features of the occidental stage.

With Ocular Hands

In his *Commentaria* on the medieval *Anathomia* of Mondino de' Liuzzi, published in 1521, the surgeon and anatomist Jacopo Berengario da Carpi (d. 1530) alerts his reader: “that it is no longer believed possible to acquire this discipline [of anatomy] uniquely by oral instruction

2. See the “Focus: Performing Science” section of the review *Isis* (Moris 2010:775–828).

Figure 1. (facing page) The anatomical theatre of the University of Leiden depicted in the beginning of the 17th century. Engraving by Willem Isaaczoon van Swanenburgh (1580–1612), drawing by Jan Corneliszoon van't Woudt (d. 1615), printed by Andries Cloucq in Leiden, Netherlands, 1610. (Courtesy of Wikimedia Commons)

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or via written media, because in this instance vision and touch are in fact indispensable”³ (Berengario da Carpi 1521:6v). Such is the methodological leitmotif proclaimed by anatomists from the beginning of the 16th century. The new anatomy they intended to develop and which rapidly became a central underpinning of intellectual knowledge in Europe, remaining so until the century of Enlightenment, was edified through sensorial perception. The acquisition of knowledge about the body thus required a convergence of vision and touch, of the eye and the hand. The adoption of a sensorial methodology in anatomical practice, attributing a decisive role to observation, to the autopsy—seeing with one’s own eyes—and the exhortation to no longer be satisfied with mere book learning and with knowledge based on writings of the Classical authors, was justified by Renaissance anatomists who drew on arguments from the most significant of these authors, Galen. According to Galen, writing in the 2nd century, the truth had to be sought out not in books but in bodies. Only direct observation could offer reliable information: “he who wishes to contemplate the works of nature should not rely on anatomical texts, but should refer to his own eyes” (1854:174).

Promoting sensual experience as a means of acquiring knowledge did exist in medieval anatomical practice. Recourse to dissection at the end of the 13th century was perhaps its most eloquent form of expression, although the practice of dissection in this period mainly functioned as a verification of the written word. It was not until the 16th century that promoting the wisdom of the senses became programmatic: “Sensorial experience is my guide,” declared Berengario da Carpi, for whom the “sensual evidence” (*teste sensu, visus testificatio*) is the only real proof of the accuracy of anatomical knowledge in anatomy: “anatomia non notat insensibilia,” he wrote (Berengario da Carpi 1521:427v). Twenty years later, the Flemish anatomist Andreas Vesalius (1514–1564) published a significant treatise titled *De humani corporis fabrica* (1543), the preface to which claims the arrival of a new anatomy founded on manual virtuosity and visual intelligence. The eyes, the “fidelissimus” eyes, were also for the French physician Charles Estienne (d. 1564) what guaranteed the accuracy of knowledge (Estienne 1545:343). William Harvey (1578–1657) did not publish his celebrated work *Exercitatio anatomica de motu cordis et sanguinis in animalibus*, until his theory of “the movement of the heart and the circulation of the blood” had been confirmed “per autopsiam” in front of his colleagues at the Royal College of Physicians (Harvey 1628:5–6). One must conduct research, wrote the physician Jean Riolan, the younger (1580–1657), with “ocular hands” (Riolan [1648] 1653).

Tirelessly proclaimed for decades, and despite being enunciated more radically than it was put into practice, this “sensorial program” nevertheless led to crucial innovations in the study of anatomy. Despite the epistemological limits of the enterprise—access to “nature” was in fact impossible without recourse to books (Mandressi 2003:109–18; Mandressi 2005)—the desire to satisfy the practical requirements of autopsies, the imperative to respond, led practitioners to imagine difficulties and seek solutions that generated one of the most interesting and fecund issues in the historical elaboration of anatomical science: sensorial perception was granted a central status in the operation of knowledge.

It is important to recall the distinction between public and private dissections as it concerns the respective contexts of anatomical research, teaching, and demonstration. Private dissections, those most frequently practiced and sometimes realized outside of the institutional frameworks regulated by universities, concerned not only teaching but also research, if one understands by this the acquisition as well as the transmission of knowledge. In contrast, the “public anatomies” had nothing to do with research; no exploration of the cadaver took place, it was rather a simple exposition of a confirmed expertise, a rendering and making visible of past explorations. These anatomy lessons, which served the purpose of instruction, nonetheless exceeded a purely ped-

3. *Anathomia* is a dissection manual edited in Bologna by Mondino de’ Liuzzi in 1316. Printed for the first time in Pavia in 1478, the work saw 49 editions in four different languages and several European countries throughout the first half of the 16th century.

agogical context, as they were addressed to an audience much more vast than students of anatomy. The public face of dissections were in fact exhibitions, complete with a prefatory lecture, intended to expose anatomical knowledge to the eyes of anyone who wished to have access to information about the structure and the organization of the human body.

This explains their affiliation with “demonstration,” what one could characterize as a dramatization of knowledge. The open cadaver, offered up for view to a large and diverse audience, was likewise at the center of a *mise-en-scène* of the sensorial program itself. Concretized through gestures in a performance, this event expressed via the empire of the senses the arrival of a new order in anatomy with the re-centering of the source of knowledge from text to body. For both these levels of demonstration, *to demonstrate* meant *to show*: to show knowledge, to show how to access knowledge, to show the body and the science it revealed, to expose publicly the anatomical apparatus, to render visible its new methods, its powerfulness, its accomplishments, and its ambitions. Public dissections were moments of exhibition and of celebration. They were also moments of validation where demonstrating meant proving. This third level of demonstration as the administration of proof also depended on the fundamental principles of the sensorial program. Again citing Berengario da Carpi and his use of the notion of “evidence” and of the verdict of the senses, scientific affirmations about the existence of parts of the body that could not be seen were to be rejected—“non potest probari ad sensum.” If Berengario was one of the first to develop a truly methodological system around what he called “*anatomia sensibilis*,” others before him had already insisted on the crucial role of perception in the practice of anatomy (see French 1985). Take for example the anatomist Alessandro Benedetti. In the final chapter of his treatise *Historia corporis humani sive anatomice*, published in Venice in 1502, Benedetti wrote an elegy to dissection (*De laude dissectionis*) in which he urges his readers to apply themselves in the contemplation of the works of nature, letting nature’s organization unfold before their eyes; he warns that being persuaded by written evidence without observing things oneself frequently led to error ([1502] 1514).⁴ Benedetti’s book was conceived to accompany the anatomical demonstrations realized by its author; this explains the abundant use of terms relating to vision, and discussion of a spatial organization intended to optimize perception that was, in and of itself, the most eloquent symbol of the significance of the visual: the anatomy theatre. *Theatron*, the place from which one sees.

Chapter 1 of *Anatomice* contains the first description of this type of space and indicates how to set up a collapsible wooden theatre like the one Benedetti had commissioned, probably in Venice, at the end of the 15th century (Ferrari 1998:11–12). According to Benedetti’s description, the anatomy theatre should be erected inside an ample, well-ventilated space, with seating arranged in the form of a circle, a style that could be found at that time in Rome or in Verona (*quale Romæ ac Veronæ cernitur*); in other words, an amphitheatre that should be sufficiently large to hold spectators and to ensure they wouldn’t disturb the work of the anatomists. The seats should be assigned according to the rank of the observers (*pro dignitate*). There was to be a manager charged with overseeing and arranging everything, as well as several guards to keep out undesirables, and two confidential *questores* who, with the money they collected from spectators in advance of the demonstration, were to procure that which was necessary for the dissection. Torches were to be prepared for nighttime. The cadaver was to be placed in the center, on an elevated bench, in a well-lit spot appropriate for the dissector ([1502] 1514:7r). In this theatre occurred the anatomy “spectaculum” during which any erroneous affirmations would, according to Benedetti, be revealed by the dissection.

After Benedetti, descriptions of the anatomy theatres become common in anatomy treatises. These descriptions correspond perfectly to actual existing amphitheatres, but they could also be considered purely normative descriptions of such spaces, that is to say, anatomy theatres as they

4. I am here paraphrasing the 1514 edition published in Paris.

ought to be conceived and equipped. As such, Vesalius states that he had amphitheatres installed in Bologna and in Padua that resembled those represented in the frontispiece of *De humani corporis fabrica* (Vesalius 1543:548), whereas the Florentine physician Guido Guidi (1509–1569), in a book written around 1560 but not published until 1611, describes an octagonal amphitheatre that was never actually constructed (1611:12–13).

In Paris, there was no particular space dedicated to dissections in the medical schools; however, the Parisian Charles Estienne set aside two chapters of his *De dissectione* (XL and XLI) for the description of one. He speaks of a theatre with an open roof, over which Estienne suggests draping a waxed canvas cloth in the form of a tent, in order to protect the spectators from the sun and the rain, while also allowing for “the voice of he who explains the parts of the body [...] to avoid being lost in the air.” The structure, writes Estienne, should be constructed out of wood, in the form of a semi-circle, with three stories, or at least two, a gallery at each level and benches of at least two and a half feet in height; the spectators would be seated according to a hierarchical order, organized according to their distance from the cadaver because, as he takes pains to detail, those seated in the lower bleachers “will see much more easily than those high up.” The lower bleachers should be reserved for masters; behind them would be seated the Bachelors students, then the medical students, surgeons, and finally all those “who would be pleased to contemplate the works of nature.” The cadaver should be placed on a rotating table, resting on a single wooden leg, and placed at the front of the theatre—the reference to the place where the spectators are located is again evoked here as “the place from whence one sees”; more precisely, the dissection table should be found in the place where “the ancient Greek and Romans situated their stage.” The doctor in charge of the dissection who was to “interpret what one should see, would be sitting in front of the table facing the spectators”; the dissectors would be at his side, also facing the spectators before whom they would operate. Everything was organized according to the visibility of the action: dissection was all about showing. Thus, in the middle of the theatre and next to the dissecting table there was to be a beam affixed to the ground, on top of which another perpendicular beam was attached to form a cross onto which the cadaver could be tied with bands, allowing it thus to be raised in order to “show the exact position of each body part.” In addition, if one judged necessary to show a specific body part in greater detail—the brain or the heart, for example—these parts would be extracted, carried to the highest bleachers and shown up close to the spectators sitting there (Estienne 1545:347–48).

If an anatomy amphitheatre did not yet exist in Paris at the time of Charles Estienne, one had been constructed at the Faculty of Medicine in Montpellier as early as the 1550s. Félix Platter (1536–1614), who was a student at Montpellier, writes in his journal on 14 November 1552 that in the “old amphitheatre” someone dissected the body of a boy who had died from an abscess in his chest; according to Platter, a new amphitheatre had been built in 1556. On 6 February of that year, he writes, “one signals an anatomy session” during which the body of a young girl and that of a woman were dissected at the same time, under the direction of Guillaume Rondelet (1507–1566), Chancellor of the Faculty (Platter and Platter [1892] 1995:30, 126–28). As in every other anatomy theatre referred to thus far, the theatre in Montpellier was collapsible. They were set up especially for the public dissections that took place once annually for between two and three weeks during the cold season. Then, beginning in the 1580s, permanent amphitheatres began to be constructed: in Padua in January 1584; the Casa de anatomía in Zaragoza in 1586, next to the hospital Nuestra Señora de Gracia; in Leiden in 1593 at the initiative of anatomist Pieter Paaw (1564–1617).

The construction of the anatomy theatre of Padua is associated with the name of Girolamo Fabrici d'Acquapendente (1533–1619), professor of anatomy and surgery from 1565 to 1613. The amphitheatre of Fabrici, reconstructed in 1594, was a wooden structure able to seat approximately 200 spectators in five levels. Its elliptical form had been inspired by a study of the eye, quite probably suggested to Fabrici by the theologian Paolo Sarpi, the anatomist's friend and a patient of his after he had been targeted in an assassination attempt in 1607, a few months

following his excommunication. Sarpi, interested in logic, mathematics, chemistry, magnetism, and optics (Sosio 2006), worked with Fabrici on his anatomical research of the eye between 1581 and 1584, in the years immediately preceding the construction of the first permanent anatomy theatre. In 1592, when the theatre needed to be rebuilt, Fabrici returned to the task, still in consultation with Sarpi's ideas.

A coincidence in timing corresponds to a coincidence in form: one finds in the architecture of the anatomy theatre the composition of circles and ellipses also present in the illustrations of the anatomy of the eye in *De visione, voce, auditu*, published by Fabrici in 1600. Paolo Sarpi is cited in this work, and his contribution is foregrounded; the theologian's concepts were transmitted by the anatomist to the architect—perhaps Dario Varotari (1539–1596)—who was thus inspired for his project in which the smallest concentric elements are constructed in the form of a near-ellipse, the largest in the form of a large circle. Fabrici made his theatre into a “place where one sees,” a concrete metaphor for vision. In Padua, one dissected *inside an eye*, in a perception machine, an observatory for the fashioning of the body that permitted countless spectators to participate in confirming visual experience as the keystone to anatomical knowledge. Sensual apprehension was concretized and made into action in an *ad hoc* space, which served to show but also to demonstrate the vigor of the new science.

Materia theatri

Towards the middle of the 16th century, a young Italian bookseller, Giovanni Andrea dell'Anguillara (d. ca. 1572), who wrote, translated, summarized, and printed books in order to sell them to readers who could pay the price of a private copy, decided to apply the same principles of production to theatrical representations. This mechanism of financing the printing of the books, i.e., selling individual copies to readers instead of requiring the author or his patron to foot the bill, translated—in the case of the theatre—into selling reservations or entrance rights to individual theatre-goers. This meant not only that one could finance the creation of the show, but it also allowed one to earn a profit. Thus dell'Anguillara in 1549 became the director of a paying theatre in Rome installed at the Palazzo Colonna.

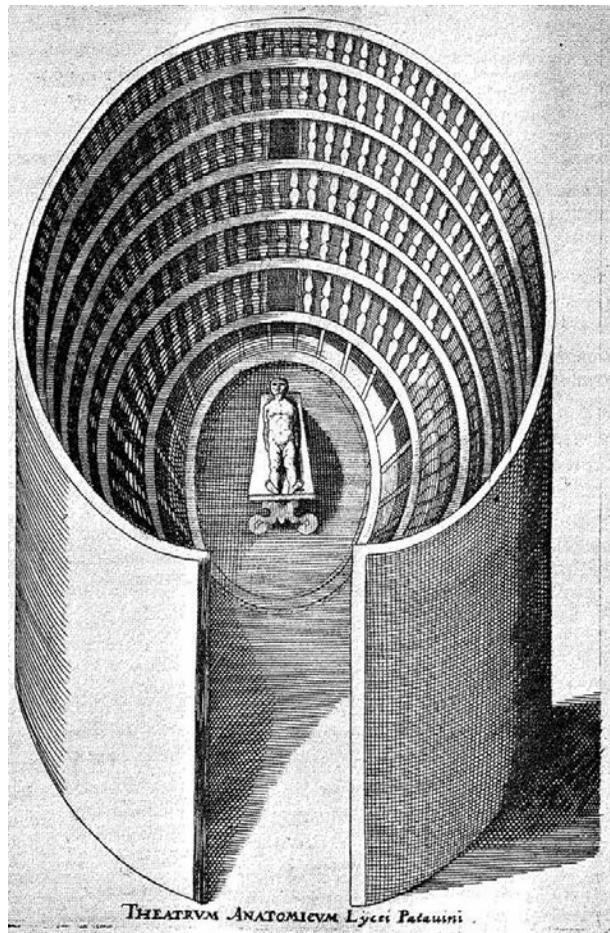


Figure 2. *The anatomical theatre of Padua as depicted in Gymnasium patavinum by Giacomo Filippo Tomasini (1595–1655). (In Tomasini 1654:74)*

“Selling theatre” was a novelty in an era where companies of professional actors were just beginning to come into existence (Taviani and Schino [1982] 1992:355–57). It is possible that dell’Anguillara was not the very first to engage in this type of commerce, but what does seem certain is that it was around this time that the initiative to open theatre performances to a paying audience began. If we take into account Benedetti’s mention in *Anatomice*—first published in 1502—of the presence in the anatomical theatres of *quæstores* charged with collecting money, it becomes clear that the practice of paying for seats to observe the public anatomy demonstrations preceded similar practices in the performing arts by about half a century.

This is just one of many elements that would suggest a heritage linking the practices of the dramatic theatres back to those of earlier anatomy theatres. Public dissections were expressly conceived to attract numerous spectators; their success, including their financial success, depended largely upon the size of the audience. In the Netherlands in the 17th century, “as entertainment the anatomies vied with the sermons of the great preachers, with the arrival of ships with merchandise from the West and East Indies, with the colorful *entrées* of Princes. Above all else, the function of the anatomies might be compared with that of the performances of the *organ toccatas* and *fantasias* of Jan Pietersz Sweelinck and his school” (Heckscher 1958:28). These public anatomy performances were “festivities” (*circenses*), earning an average profit of about 200 *florins*. A portion of the money paid for a sumptuous banquet for the members of the surgeons’ guild followed by a torchlight parade (32–33).

William Heckscher undoubtedly goes a bit too far in making the comparison to the theatre when he compares the public anatomies to a drama in three interconnected acts: the solemn public execution of the criminal, his anatomical dissection equally public and solemn, and the guild banquet that followed, crowned by the nocturnal parade. Nevertheless, each “act” does consist of very regulated ceremonial procedures, carefully prepared and executed according to precise protocols, and in spaces especially organized to exhibit the action in question. For our purposes, let it suffice that Benedetti considered the public anatomies a “*materia theatrali, digna spectaculo*” ([1502] 1514:5v).

The spectacular dimension of the anatomy lessons is reaffirmed by the construction of permanent amphitheatres such as those in Padua and Leiden. For purely practical reasons, including the short duration and seasonal schedule of the activities, the very existence of such buildings might seem difficult to justify. However, while their use was discontinuous, it was nonetheless periodical, marking the definitive incorporation of public dissections into the calendar of local festivities. The function of the permanent amphitheatres was in this sense highly symbolic, and accounted for the importance that the anatomy lessons had acquired as events impacting urban life. These structures were signs of the prestige and scientific vigor of the universities. They were also places of celebration.

Ties with the spectacle of theatre were inevitable: the Renaissance witnessed the transition from “presentational spaces” to “theatrical space” (Cruciani 1994:34). The “presentational spaces” were at first temporary, set up in the rooms of the *palazzi* or on the plazas adapted for the occasion with the help of provisional stages and sets—*picturate sceneæ*—painted in perspective. Thus in 1513, the architect and painter Girolamo Genga (1476–1551) transformed the salon of the ducal palace of Urbino into a theatre; in the same year, a rectangular theatre made of wood was erected on the plaza of the Capitol in Rome; in Florence, Giorgio Vasari (1511–1574) began working in 1547 on a theatre in the Hall of the Five-Hundred of the Palazzo Vecchio. Permanent theatres appeared in the second half of the 16th century, and more specifically in the 1580s: for example, the Teatro Olimpico of Vicenza (1585), begun by Andrea Palladio (1508–1580) for the Accademia degli Olimpici, and completed by Vincenzo Scamozzi (1552–1616); or the theatre *all’antica* of Sabbionetta (1590), also by Vincenzo Scamozzi. The dates should be considered in relation to the inauguration of the first permanent amphitheatre in Padua in 1584.

At the same time when this transition from “presentational space” to “theatrical space” was occurring, a parallel transition occurred in which the “space for dissection” became what one might call the “place of anatomy.” The anatomical amphitheatre was indeed a “theatre” in the sense that it was a place “where one sees,” intended for an audience, and organized spatially and functionally with this purpose in mind. Moreover, it was a place where the event—that which one went to see—was something extraordinary, severed from the quotidian. The amphitheatres were theatrical spaces and the public anatomy lesson—Benedetti said it very well—was “theatrical material” defined by the presence of spectators. Spectators played a decisive role and it is thus natural that we should take an interest in them. Charles Estienne was preoccupied by them, as he knew full well the spectators determined the success of the anatomical demonstrations, and that “a public spectacle is never perfect unless everything belonging to the theatre is correctly arranged.” One must, for example, guarantee visibility, because “that which is exhibited in the theatre appears much more excellent and natural when the spectators can all see equally well.” Another crucial aspect was that each spectator should be able to leave independently without incommoding others, this being, according to Estienne, one of the major guiding principles with regard to “all of the things one proposes to the people” (Estienne 1545:347).

Aside from Estienne’s concern about managing his audience and overseeing the proceedings of the spectacle, he considered that the public anatomies were part of a series of events that should be offered to “the people” (*vulgo proponenda*). That is to say, he placed an emphasis on the importance of a heterogeneous audience, not limited to doctors and students, which included people from outside the university milieu. Félix Platter reports that at the 14 November 1552 dissection of the boy who died from the abscess in his chest, in addition to students “there were many from the nobility and the bourgeoisie in the audience, and even a



Figure 3. *The Teatro Olimpico of Vicenza, built in 1585 in Italy. (Photo by Frode Inge Helland, 1968; courtesy of Wikimedia Commons)*



Figure 4. *The anatomical theatre of Padua, built in 1595, remains standing today at the University of Padua, Italy. (Photo by Marco Bisello; courtesy of Wikimedia Commons)*

number of *demoiselles*, despite it being an autopsy of a man. There were even some monks in the audience” ([1892] 1995:30).

Far from being the exception, the composition of the assembly he describes reflects a common situation. Aristocrats, local notables, members of the church, and the curious came regularly to anatomical amphitheatres, where the dissection sessions attracted crowds. The audience was particularly large for demonstrations of female corpses. In December 1659, the son of Guy Patin (1601–1672), Dean of the Faculté de Médecine in Paris, practiced a female dissection before “such a large number of spectators, that in addition to the theatre, the courtyard itself was entirely full of people” (Patin 1707:421). The “beautiful demonstration,” to quote the French surgeon Pierre Dionis (1643–1718), of the “generative parts of the woman,” attracted the curiosity of spectators, an excusable eagerness, according to the anatomist, “as much because anatomies of women were rarer than those of men, as because there is nothing more natural in a man, than to wish to know where and how he was formed” (1694:281).

As such, revenues were considerably higher for the female anatomies: in Amsterdam, the dissection of a female cadaver could bring in an “exceptionally elevated” sum, more than 300 florins, that is to say more than 50 percent over and above the average revenue (Heckscher 1958:32). In the *Malade imaginaire* (*The Imaginary Invalid*) of Molière, the young doctor Thomas Diafoirus offers his fiancée Angélique a copy of his thesis, defended “against the circulators”—partisans of William Harvey’s theories about the circulation of the blood—and he invites her to attend a female dissection, “one of these days to come and to see, to amuse yourself,” he says. And the servant Toinette approves, “The entertainment will be agreeable. Some men offer a comedy to their mistresses, but offering a dissection is something again more gallant” (Molière 1673:59).

Thomas Diafoirus was “a bit of a stupid suitor, but who conformed to custom,” notes Philippe Ariès; “the anatomy lesson, so often reproduced in the engravings and paintings of the 17th century, was, like dissertation defenses and the college theatres, a grand social ceremony where all of the city came together, with masks, refreshments and amusements” (Ariès 1977:75). The same year that *Malade imaginaire* premiered (1673), Louis XIV ordained that anatomy demonstrations should occur “for free and with open doors” in the Jardin du Roi (King’s Garden), in an amphitheatre he “had constructed for this purpose; and that the subjects necessary for these demonstrations were to be delivered to his Professors, who were to be given precedence over all others” (Dionis 1694). The task of demonstrator was entrusted to Pierre Dionis, who occupied the post for eight years, until 1680 when he was nominated First Surgeon to the Dauphine. The number of spectators, recalls Dionis, “was as high as four or five hundred people,” which was proof that these demonstrations “did not displease, and that they were useful to the public” (1694:Preface). Guillaume Lamy (1644–1683), who went to the Jardin du Roi to listen to his adversary Cressé—the two men maintained a lively polemic with interposed anatomical texts—recounts how he was only able to hear the lecture of his rival, because “numerous scoundrels from the Faubourg district, attracted by the vain curiosity of seeing a body dissected, prevented honest men from getting a place” (1675:120).

Anatomy had become an object of social consumption beginning in the 16th century, but in the France of Molière and Dionis it provoked an infatuation unprecedented not only among the nobility but also among the “scoundrels of the Faubourg.” However, it was within the aristocratic and high societies that a singularly rapacious interest in anatomy materialized. The case of the anatomist Guichard-Joseph Duverney (1648–1730) is in this sense emblematic. Charged with teaching anatomy to the Dauphin of France, “his successes in Paris had brought him to the court, and he returned to Paris with that brilliant *je ne sais quoi* that comes only from being at court,” wrote Bernard de Fontenelle, Perpetual Secretary of the Académie des Sciences (Fontenelle 1740:440). In 1679, Duverney would replace Pierre Dionis as demonstrator at the Jardin du roi. He placed the anatomical exercises, again in the words of Fontenelle, “on a footing where they had never before been. One experiences with astonishment the crowd

of students who go there, and we counted in one single year the attendance of at least 140 foreigners” (1740:441). In 1681, the death of an elephant in the menagerie of Versailles offered Duverney the occasion to dissect it publicly, collaborating with the academician Claude Perrault (1613–1688) who was responsible for describing the animal’s principal body parts. This was a great event, attended by a number of spectators, including “the king who did not disdain being present,” according to the description in the registers of the Académie Royale des Sciences. Perrault, himself a doctor and member of the Academy since its founding in 1666, died of an infection after having dissected a camel at the Jardin du Roi a few years after his collaboration with Duverney.

Manipulations

Theatrical, festive, and fashionable, anatomy was disseminated socially: through discourse, through behavior, through images, each subtended by the same appetite to see. It is worth repeating here that for nearly half a millennium the public dissections served as the *pièce de résistance*, the epitome of the cultural and enterprising knowledge known as anatomy. The opening up of human cadavers before a large and mixed audience, all in the name of science, expressed the multiple dimensions of a discipline that discovered its accomplishments in performance. Imagining the anatomy lesson as a performance implies taking an interest in the spaces in which the anatomies were held and, as discussed above, their relationship to spaces of theatrical representation. It also means taking into consideration the proceedings of the dissections, including the activities, rhythms, and sequences of actions, the objects employed and their functions.

Let us first recall the change in how dissections were organized, a change that occurred in the first half of the 16th century. Formerly, the tasks were divided among three individuals: the master, who from high up on his pulpit read and explained the written thoughts of medical authorities—essentially Galen; a demonstrator, who—often holding a pointer—indicated to the audience the parts of the body to be observed in relation to the explanations of the master; and a *prosector*, who was in charge of preparing and incising the cadaver. This tripartition is what is most often represented in the dissection scenes that illustrate books, and in works of art such as the bronze relief of Donatello (d. 1466) portraying the miracle of the miser’s heart in the high altar of the basilica of Saint-Anthony of Padua: the cadaver is in the center, surrounded by an agitated and curious audience, and the anatomist conducts the operations but does not actually dissect with his own hands. The frontispiece image of Andreas Vesalius’s *De humani corporis fabrica* shows an entirely different scenario, in which the anatomist opens a female cadaver with his own hands (Vesalius 1543). A crowd surrounds him, while he makes his incision, showing and explaining at the same time. We can deduce that in the 1540s the separate functions that had formerly been shared by three individuals came to be reunited in the figure of a single protagonist. Images like this frontispiece of Vesalius’s treatise, as well as the one from *De re anatomica* (1559) by Realdo Colombo (d. 1559) or *The historie of man* (1578) by John Banister (d. 1610), as well as many others, while focusing attention on the physical manipulation of the cadaver, translate even more radically than their predecessors the principles of the “sensorial program” of Renaissance anatomy.

In public dissections, these manipulations followed an order defined in the Middle Ages, available already in the *Anathomia* of Mondino de’ Liuzzi, written in 1316. The dissection of the body took place in four major phases corresponding respectively to the three “stomachs,” inferior, middle, and superior—the abdominal, thoracic, and cranial cavities—and then the extremities of the body. One began with the inferior stomach, because those parts of the body rotted the most quickly and it was consequently necessary to dispose of them first. Then came the middle stomach followed by the superior stomach and, once all their encompassing parts had been examined, it was possible to dissect the extremities. Each time, one began at the body’s surface in order to access its depths, describing the structures that were unveiled as the



Figure 5. The frontispiece of Andreas Vesalius' *De humani corporis fabrica* shows a public dissection in an ideal amphitheater, rather than depicting an actual one. The engraver is unknown, probably the Flemish artist Jan Steven van Calcar (d. 1545–46). (In Vesalius 1543)

procedure gradually descended into the body's interior. In order to realize these operations, anatomists used a series of instruments, the principal ones being, of course, knives, razors, and other blades. In order to properly cut the segments, wrote André Du Laurens (1558–1609), one must have available the appropriate instruments, notably "razors of all kinds": large, small, mid-sized, straight and curved, oblong, pointy, of varying lengths, made of bronze, silver, lead, as well as wood and ivory (Du Laurens 1600:22). The anatomist, Estienne clarifies, must know how to use these instruments with the dexterity necessary to allow him to turn lightly and easily from the cutting to the blunt side, this last serving to "separate the skin," whereas the handle of the knives was used to divide the muscles and the membranes (Estienne 1545:344).

In addition to tools for cutting, it was necessary to come equipped with straw-stuffed pillows to bolster and elevate the body; thread and needles ("large and slender, straight and curved") to connect the blood vessels; a large mallet to divide the cartilage from certain bones; saws, hooks, or forks for taking out the membranes; a trephine, catheters, and probes; nozzles and bellows for inflat-

ing the lungs (Estienne 1545:344–46). These last instruments were used in what Jean Riolan called "pneumatic anatomy," an operation "that is executed by blowing into the little vessels and in the hidden parts" that the small scissors and the scalpel cannot reach, and which is "necessary in order to seek out the conduits, or communications connecting the parts to one another." Pneumatic anatomy required not only the use of cannula of varying diameters, made of silver, horn, or feathers, but also curved needles to seize the vessels and thread them, as well as hooks for hoisting up membranes (Riolan [1648] 1653:753ff).

From 14 to 28 January 1540, Andreas Vesalius gave a series of anatomical demonstrations in Bologna, where he had been invited by several students. Reviewing the notes taken by one of the attending students, Baldasar Heseler, we learn that on 22 January, the anatomist showed them the dissection of a brain: after having sectioned the cranium, he removed the

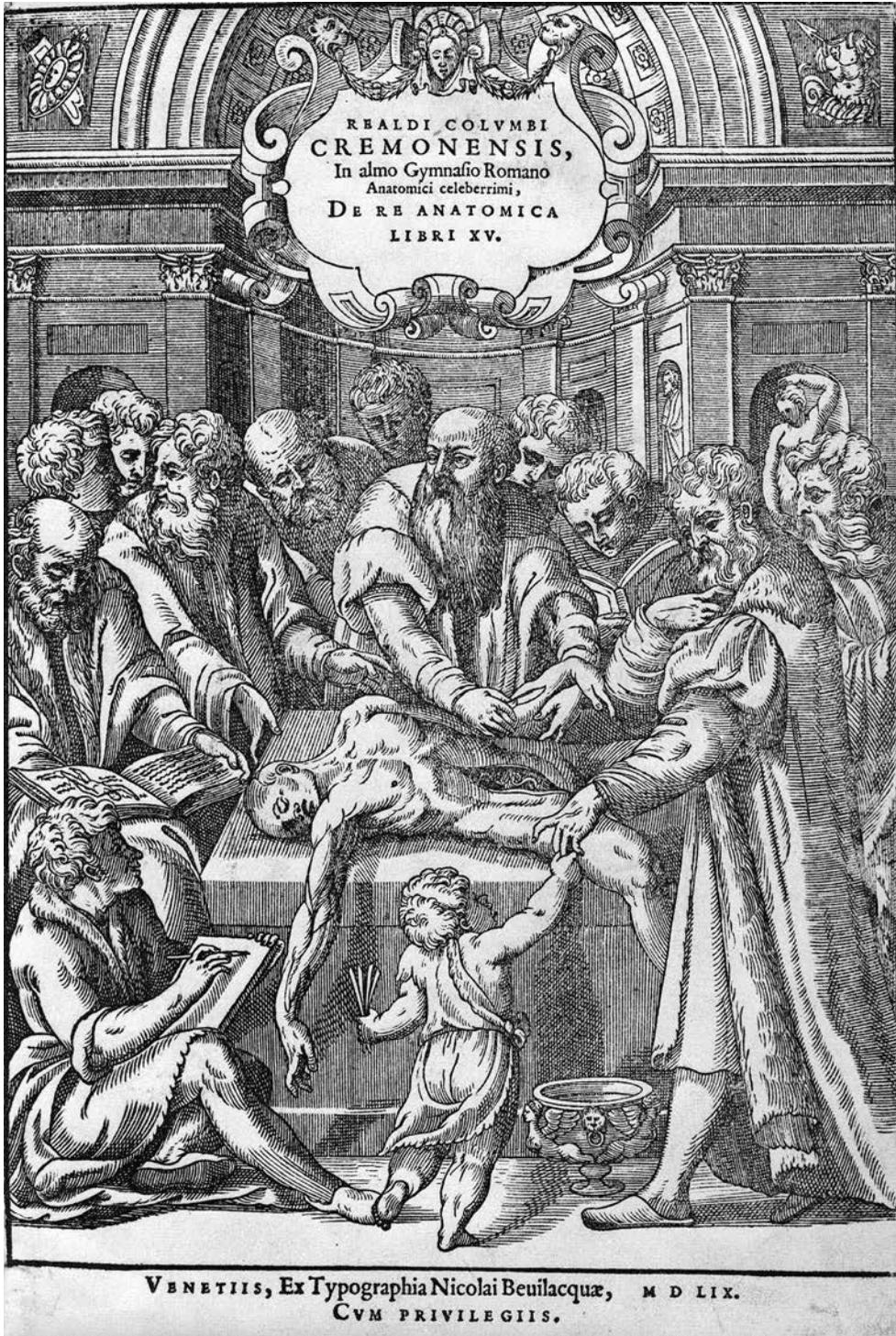


Figure 6. The frontispiece of Realdo Colombo's *De re anatomica*. The engraver is unknown, possibly Paolo Veronese (1528–1588). (In Colombo 1559)

calvaria (outer skull), exposing the *dura mater* (membrane covering the brain), which he perforated in order to introduce a *calamus* (hollow tube, often the base of a quill) and thus inflate it. Membranes such as the *dura mater* or hollow organs like the stomach could be detached and dilated or returned to their supposedly original form with the exhalation of the technician (Heseler 1959:218–20). The most important element, no matter what demonstrative action used, remained the hand—a virtuosic manual dexterity sometimes requiring that the hand itself be naked. Thus Vesalius, in his dissection of the brain before Heseler and his comrades, exposed for view several cerebral structures with the sole use of his own fingers. At another moment in the dissection, for example, he seized an intestine with his left hand in order to unroll it entirely, right down to the rectum, which he then took up with his right hand in order to pull it fully out of the corpse (222). The Parisian doctor Jean Fernel (1497–1558) describes the anatomist’s involvement more delicately when he says that one must use the tips of the fingers to remove the grease that surrounds the blood vessels in a fatty corpse (1542:172).

In fact it was necessary for the anatomist to manipulate the flesh in the strict sense of the word, quite literally to get his hands dirty in order to promote the activity of perception. However, due to the dangerous nature of the cadaverous material, it was important to do so with prudence. This lent significance to specific gestures and specific objects employed. The cleanliness of the cadavers was essential, according to Joseph Lieutaud (1703–1780), who recommended “never to leave them with the intention of taking them up again, unless one had washed and dried them well”; he adds that it can be useful to employ *eau-de-vie* in “rinsing all the exposed parts from time to time, not to mention the perfumes and other little applications that can prevent major illnesses” (1777:2). Two centuries earlier, Félix Platter used vinegar to combat fetid odors, and Charles Estienne recalls that during the dissections one must not forget the incense that saves spectators from corrupted vapors (1545:344). It was necessary to make available sponges for absorbing any liquids that might escape from the cadaver and pails to dump out the liquids; and baskets to collect the examined body parts that had been separated from the cadaver: the viscera, the portions of muscle tissue, the tongue, fat, bits of the brain, an eye. These tools made up the dissector’s arsenal and were also employed by his assistants, who were responsible for, among other things, the preparation of the cadaver that needed to be shaved, rinsed, and washed. Once the audience was seated, the assistants would light the candles as the anatomist made his entrance into the amphitheatre. Before the demonstrations began, music was performed, this tradition being established, for example, in Padua in 1597.

And now we come to the cadaver itself. Certain anatomists, explained Charles Estienne, preferred to keep it upright or to hang it from a small beam, attaching it with strips of cloth that allowed the anatomist to easily turn the cadaver from one side to another. However for Estienne, such a position was unsatisfactory. Better to dissect the body with it lying down on a wooden table, this being the choice of most anatomists. Yet, Estienne is careful to state that the body must be in a position where the head and the anterior part of the thorax were “more elevated and exposed,” as if the body were semi-erect (*semierectus*). To achieve this, one had to connect the cadaver to the table, which for this reason would have openings on the top and on the bottom, allowing the arms and legs of the body to be attached with bands to the table. In addition, the table would have been situated on a central, pivoting leg, allowing for the table itself to be turned. Also required was a little space behind the operators—the “proscenium,” writes Estienne—where one placed all the instruments needed during the dissection (1545:348). Let us examine in detail one of these instruments: the sponges, destined as Jean Fernel explained, to “absorb [...] all the blood that drained from the parts hidden in the interior of the stomach,” as well as to “dry entirely all of the body” (1542:171, 173). More than a simple question of maintaining cleanliness, this was fundamentally about eliminating any corporeal fluids that risked obscuring the view of the solid body parts, thus interfering with their examination. One must show. One must see. Everything was thought out and planned in order to serve the viewer, to allow him to see the body’s solid parts. The reference to liquids and the inclusion of sponges and buckets in the inventory of instruments accounts for the particular selectivity of the ana-

tomical gaze, a gaze that did not fall indiscriminately upon just any object, but which was guided by the performance in which it played a part.

Evidence

Anatomical demonstration, in all of its varying meanings—exhibiting, proving—required witnesses. Imagery of the anatomy theatre places the witness in the thick of the action. Visual affirmations of the tactile served as the foundation of the anatomical method. By generating a whole rhetoric of images by which an immediate apprehension of corporeal reality was offered up to the sensorial experience of the spectator, scientists in the anatomy theatre revealed their wish to abolish the distance that had separated them from the nature they examined. Ocular verifications and, according to Estienne sometimes even tactile verifications, were solicited from the audience who measured the exactitude and truthfulness of the anatomical descriptions.

Moreover, witnesses appear not only in the images of the anatomy theatre, they are also cited in the texts. Colombo, for example, names dozens of them in his book. Thus a certain Martinus Aromatarius was a witness to the dissection of the body of an individual known as Lazare “the glass eater” (*Lazarus vitri voracis*), who was incapable of distinguishing bland, bitter, sweet, or acrid, a characteristic explained by showing how the fourth pair of cranial nerves, instead of going towards the tongue and the palate, returned towards the occipital region of the brain (Colombo 1559:264). Much more prestigious witnesses were cited in the recounting of the autopsy of Ignatius de Loyola that Colombo performed in Rome in 1556; the founder of the Society of Jesus, the Jesuits, had innumerable little stones in his body (*lapides innumerabiles*): in the kidneys, the lung, the liver, and the vena cava. “I extracted them with my own hands [...] as you yourself were able to see, Jacopo Bono, with your own eyes,” writes the anatomist addressing himself directly to one of his colleagues, a professor of botany at the University of Rome (1559:266). Colombo also recounts other anatomical experiments, like the vivisection of a pregnant dog, by which he purports to have demonstrated the existence of love in nature: the animal, who died when the anatomist sliced open her uterus, was nonetheless more preoccupied with taking care of her offspring than dealing with her own wounds. Colombo writes that if one were to harm one of her pups, she would bark and yelp, but if someone approached her, she stayed silent, licking her pup with *magna pietate*. This was proof of the incredible charity shown by parents to their children, and a “remarkable example” of the great love of animals for their young, which Colombo demonstrated in a public theatre, in Padua, to the great admiration of the spectators.⁵ Prestigious viewers observed the demonstration with “summa voluptate”: the “Most Illustrious” Rainuzio Farnese, a Venetian prior who later became Cardinal of Sant’Angeli; Bernadro Salvati, Prior of Rome; Alvisé Ardinghelli, Bishop of Fossombrone; and Archbishop Gianbattista Orsino, to cite only the ecclesiastics.

The list of the names of witnesses invoked by Colombo in his text includes physician friends of the author, such as Antonio Musa Brasavola from Ferrara, Antonio Fracanzano from Bologna, Bartolomeo de Stradella from Pisa, Giunio Paolo Crasso from Padua, and Giovanni Bertone, a doctor at the hospital of the *Incurabili* of Rome. Other friends sometimes well placed and benefiting from a certain notoriety were also listed, including Gianbattista Mazzolari, Prefect of the Academy of Pisa, or Francesco Frigimeliga, an important member of the Pope’s entourage. And finally, philosophers such as Bernardino Telesio completed the network of notables mobilized by Colombo in service of the credibility of his statements. A few decades later, in the preface to his treatise on the circulation of blood, William Harvey addresses himself to Doctor Argent, president of the British College of Physicians, and to other doctors “Collegiis suis,” recalling that his theory had been confirmed in front of them, that they had “seen” his dissections

5. “Quem naturæ amorem, atque adeo parentum in liberos incredibilem charitatem in publicis theatris maxima spectatorum admiratione sæpius ostendi” (Colombo 1559:258).

and had attended his numerous “ocular demonstrations” (*ocularibus demonstrationibus*), organized with the aim of refuting errors and bringing truths to light, “ad sensum.” In sum, these were trustworthy witnesses, “fide dignos testes.” Correct assertions about the movement, pulse, action, and utility of the heart and the arteries will receive their confirmation in my book, writes Harvey; those that are false will be rectified by anatomical dissection, multiple experiments and by diligent observation (Harvey 1628:5–6).

Witnesses, experiments, sensoriality, and demonstration are the performative tools on which reposed, in this initial modernity, the investment in the body as an object of science. Performance is here an intellectual technique.

Demonstrative Tactics

Space, action, time, instruments, and bodies made an ensemble of conditions for the anatomical enterprise to develop from its initial practice of dissection in Europe during the last decades of the 13th century. The discipline gave itself much more than just a context and material support by which to conduct its project of knowledge invention. The very structure of knowledge itself and the modalities of its production were intimately linked to these objects, sequences, and modes of operating. The elements that composed the anatomical project were inseparable, mutually defining and fueling one another’s progress. The techniques, to use the term in its broadest sense, filled a demonstratively tactical role.

In effect, from “inflatable anatomy” to the constitution of a set of instruments, or to the position of the cadaver in the anatomical theatre, each element and each gesture had the objective of showing, bringing to light, elevating, unveiling, opening, deploying, and exposing the forms, textures, colors, and situations of the body. This explains, for example, the introduction of a “new osteology,” whereby one “shows the bones of the cadaver when they are still attached to one another,” this method being combined with the ordinary or traditional osteology, “which teaches by showing dried and prepared bones, that have already been boiled.” The import of the new osteology, according to Jean Riolan, was in part that “the external form, and the qualities of the bone are shown much more clearly using the cadaver, rather than prepared bones, which can lose many of their qualities by being boiled” ([1648] 1653:583–84). In drying them, confirms Jacques-Bénigne Winslow (1669–1760) in the 18th century, one modified the color, and might also diminish the volume and change the form, even if such alterations had less effect on bones than on cartilage (1732:114–15).

Even so, the linear sequences—from the surface towards the interior, from the bottom towards the top of the body—and the progression from the cutting up, to the extraction and then to the final discarding of the body parts, corresponded to a logic of fragmentation, of dismemberment, based on an analytical principle by which comprehending an object required its decomposition into segments. At the end of the Middle Ages and especially beginning with the Renaissance, anatomy rapidly insinuated itself as a veritable “science of the body,” by establishing an epistemological order that granted the human body, as a theoretical entity or, if we prefer, as an object of knowledge, an ensemble of specific traits that were essentially solid, intelligible in terms of decomposition-composition, described by a narrative sequence, and projected into spatial and visual legibility. This conception is the fruit of a gnoseological intention—particularly the requiring of direct sensorial input as a necessary condition for knowledge—as well as a methodological choice.

Anatomy, in short, was a practice. The numerous and relevant innovations introduced by anatomy in the regimes of knowledge production had an operational dimension and a material basis that were both of crucial importance: the technical solutions adopted and practiced in the realization of the anatomical work contributed in a decisive and permanent fashion to the construction of knowledge about the body, the origins of which can be located in the scalpel, an instrument that sculpted and fleshed out the paths to knowledge, as well as the anatomy

theatres, synthesizing and generalizing the performativity of the practice of anatomy, which was inscribed in gestures and offered up to the naked eye. The solidarity between action, vision, and science, while offering a particularly spectacular approach to scholarship, promoted embodiment as the key to attaining knowledge, thus establishing a new foundation for scholarly understanding that would last for centuries.

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