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ANATOMY LESSON PAINTINGS: A SURVEY OF PROGRESSION IN THE MEDICAL
AND ANATOMICAL FIELDS

By

Heather Reyanne Jeffery

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of Master of Arts

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Abstract

This study has emerged through a combination of art and science, visually and contextually analyzing anatomy lesson paintings as commemorations of physicians, artists, and medical and anatomical advancements. This study focuses on the works of five major artists through the Dutch Baroque and American Realist periods: Michiel Janszoon van Mierevelt, Rembrandt Harmenszoon van Rijn, Thomas Cowperthwait Eakins, Albert Sands Southworth, and Josiah Johnson Hawes. Chapter One begins with Andreas Vesalius, laying the groundwork for the depictions and spread of information for medical advances in the seventeenth and nineteenth centuries. Chapters Two and Three respectively consider depictions of Baroque and then Realist advances in the medical field. The anatomy lessons examined are considered in relation to medical knowledge at the times of their completions, the varying ways that artists handled the subject matter, and the shift from dissections for anatomical knowledge to surgeries meant to improve the lives of living patients.
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Chapter 1

Introduction

Invaluable insight into histories of peoples, periods, and places can be gained through studies of visual media. Through viewing artworks as examples of commemorative portraiture and the tracking of certain medical advances, this thesis offers a close examination of the roles of anatomy lesson paintings from the seventeenth to nineteenth centuries. Through a study of certain paintings alongside known details about advancements in the medical field, scholars can better understand how Baroque and Realist artists shaped the genre of anatomy lesson paintings in very different ways. When the format of the anatomy lesson paintings became popular in the seventeenth-century Dutch Republic, these works functioned as a form of group portraiture. As such, they importantly captured medical professionals in a teaching role. As the medical field progressed, the format and function of anatomy lesson paintings also continued to change, reflecting these advances in medicine, dissection, and surgery. While the Dutch Baroque focused on learning about the body, anatomy lesson paintings of American Realism focused on patient care. While it is not new to discuss these Baroque and Realist paintings together, nor is it new to discuss these works by way of their celebrating medical advancements, this thesis aims to consider the ways that Dutch Baroque and American Realist artists helped to shape the genre of anatomy lesson paintings. The works that will be discussed in this thesis visually record several advancements made in the medical field through early modern and modern western history, and act as commemorative portraits for the artist, physician, and medical events portrayed. This thesis demonstrates the visual commemoration of the progression of leading physicians, well-respected artists, and anatomical knowledge, focusing primarily on seventeenth- and then nineteenth-century painters such as Rembrandt Harmenszoon van Rijn, Michiel Janszoon van
Mierevelt, Thomas Cowperthwait Eakins, Albert Sands Southworth, and Josiah Johnson Hawes. The following study expands on existing research about anatomy lesson paintings by showing that, while Realist painters certainly built upon Baroque examples in painting images intended to commemorate important physicians and discoveries, anatomy lessons of American Realism show a new focus on procedures that were intended to improve the care of living patients.

**Vesalius and His Trials**

To follow the trajectory of anatomy lesson paintings from the Baroque through Realist periods, it is necessary to first consider the field of western medicine and artistic depictions of medical advances just before the start of the seventeenth century. Andries van Wesele, more commonly known by his Latin name, Andreas Vesalius, was born in Brussel in 1514. As a physician, Vesalius revolutionized studies of human anatomy and medicine. Vesalius was the first physician in history to base his understanding of human anatomy on the body itself, as determined through dissection—a practice that heretofore had not been followed by previous physicians, not even the ancient Greeks. His impressive family background in the medical world perhaps foretold his many accomplishments in the field. Vesalius came from a long line of illustrious physicians. His great-grandfather was John Whiting or Johannes de Wesalia and is recorded by the University of Louvain as a “doctor of medicine.”¹ His grandfather was Everard van Wesele, the personal doctor to Maximilian I of Burgundy, who became Holy Roman Emperor. Vesalius’s other grandfather, Eberhard, wrote a well-received commentary on the renowned ninth century Arab physician Rhazes (Abū Bakr Muhammad ibn Zakariyyā al-Rāzī) (865 – 925 CE). Finally, Vesalius’s father worked as the apothecary to Holy Roman Emperor

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¹ Jerome Tarshis *Andreas Vesalius: Father of Modern Anatomy.* (1936), 9.
and King of Spain Charles V.\textsuperscript{2} When Vesalius first began studying anatomy, he was no different from those before him; he accepted purported medical knowledge from the past. In this case, Galen of Pergamon (129 – ca. 216 CE), a second-century Greek who worked on human anatomy, was considered the most distinguished physician. However, it is believed that Galen’s theories on human anatomy were not based on human dissection, rather Barbary ape dissections.\textsuperscript{3} Regardless, his theories would continue to be praised for centuries, even as human dissections became more commonplace. In the sixteenth century, Galen was still considered the most distinguished physician on human anatomy from history. Vesalius, initially taught anatomy based on Galen’s studies, only began to question what he had learned in his own later studies, when he was finally able to dissect a body firsthand.

However, Galen’s ideas continued to plague Vesalius’s work, as he was frequently met with criticism from his professors for proving the inaccuracies in Galen’s writings, and his professors would not readily accept Vesalius’s findings. In 1530, when Vesalius was fifteen, he enrolled at the University of Louvain.\textsuperscript{4} He studied in the Castle School for three years under the traditional liberal arts education: Latin, Greek, literature, philosophy, and science. In 1533, Vesalius left the University of Louvain to pursue medical studies at the University of Paris,


which required anatomy as one of the main courses. However, Vesalius complained about his
time there, stating that they only completed three human dissections during his schooling in
Paris. Two professors who taught anatomy at the University of Paris were Jacobus Sylvius and
Johann Guinter, for whom anatomy was only a secondary field as he was primarily a scholar of
languages. Like many other sixteenth-century European physicians and professors of medicine,
Sylvius was heavily influenced by Galen’s ideas. In the preface of his highly regarded *De
Humani Corporis Fabrica*, Vesalius made it clear that he did not learn human anatomy from his
teachers:

That detestable procedure by which usually some conduct the dissection of the
human body and others present the account of its parts, the latter like jackdaws
aloft in their highchair, with egregious arrogance croaking things they have
committed to memory from the books of others.

Vesalius wrote that he could have learned more from a butcher than from the university’s
professors. However, Vesalius’s apparent lack of respect for his professors was not returned by
them. In Guinter’s 1536 *Principles of Anatomy According to the Opinion of Galen*, he directly
praised Vesalius’s talent with languages and skill in the dissection of bodies:

Recently, we discovered them after a long investigation of the parts and through
the skill of Andreas Vesalius… a young man of great promise, possessing an

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5 Bruno Splavski, Kresimir Rotim, Goran Lakicevic, Andrew Gienapp, Frederick Boop, Kenan Arnautovic.
“Andreas Vesalius, the Predecessor of Neurosurgery: How his Progressive Scientific Achievements Affected his

6 John Saunders and Charles D. O’Malley, *The Illustrations from The Works of Andreas Vesalius of Brussels* (New

7 This English translation is taken from Tarshis, *Andreas Vesalius*, 24. The original text can be found at: “Historical

extraordinary knowledge of medicine, learned in both languages (Greek and Latin) and very skilled in dissection of bodies. Vesalius’s other anatomy professor, Jacobus Sylvius, seemed to relish dissections. He was known to frequently bring human body parts to class in the sleeve of his academic gown. However, Sylvius and Vesalius did not get along, as the professor did not appreciate Vesalius working to discredit Galen, despite his being an intelligent anatomist, who was able to recognize tangible results of the dissections he performed. Yet, Sylvius, like many scholars of the period, refused to consider that Galen may have been wrong. Sylvius and Vesalius were different in other areas of their scholarship, too. Sylvius’s writings on anatomy, for example, were much more systematic than those of Vesalius. In fact, his accounting of muscles and his classification system for them is still the primary source of classifying muscles today. However, Vesalius is still considered the “father of modern anatomy.”

Proving this title, throughout his career Vesalius would establish that scientific knowledge is found by observing nature, not by reading and building on ancient books. In 1543, Vesalius compiled his anatomical findings in his book, *De Humani Corporis Fabrica*,

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10 B.W. Bakkum, “A historical lesson from Franciscus Sylvius and Jacobus Sylvius,” *Journal of chiropractic humanities, vol 18 no 1 (2011):* 96. Vesalius attended three human dissections, two of which were completed by barbers and the third he was called upon to complete himself. Later, Guinter would allow him to complete a public dissection with his help (Joffe, 38). When war broke out in Paris, Vesalius was forced to return to Belgium. This provided him with an opportunity to participate in the autopsy of an eighteen-year-old girl, who was believed to have been poisoned. Vesalius declared her death was caused by “compression of the torso,” though, resulting from wearing a corset. During this time in his career, he also removed the bones of an executed criminal from the gate of his city in Belgium because they “looked dry” and took them back home to study. He later found out there were ligaments still attached to the bones and tried to boil them in water to clean and exhibit them (Saunders and O’Malley, *The Illustrations from The Works of Andreas Vesalius*, 301).

which fully discredited Galen and revolutionized dissections, understandings of the human body, and created a new standard for medical texts to incorporate imagery and the work of artists.

**The *Fabrica* Frontispiece and the Foundations of Baroque Anatomy Lessons**

In 1537, Vesalius published his first book, *Paraphrase of the ninth book of Rhazes*, which translated the Arabic medical terms of ninth-century Persian physician Rhazes to Latin, making it more accessible to Europeans. Also, after his educational careers at the University of Louvain and the University of Paris, Vesalius continued his scholarship at what was considered the best medical school in the western world, the University of Padua in Italy.

Vesalius’s time at the University of Padua led him to take on a role as a practicing physician. Having passed his examinations with the highest honor, Vesalius was appointed to professor of surgery and anatomy, which was unheard of for someone still so young in the medical field. As a professor of surgery, he centered many of his lessons around the tenth-century Persian physician Avicenna’s (Ibn Sina) (980 – 1037 CE) well-known textbook, *The Canon of Medicine*. In his classes, Vesalius would create drawings and visual aids, which his students apparently highly appreciated. Following this success, he brought the drawings to his anatomy classes, initiating the beginnings of how anatomy is studied today in the western world. Before Vesalius’s intervention, anatomic illustrations were mostly intended for decoration and not used for teaching. Many physicians purportedly even felt that it would make their work appear childish or unprofessional, simply because Galen and other ancient physicians did not include drawings in their works. Those illustrations that were sporadically included in anatomic

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13 Ibid, 36-37.
texts were not meant to be didactic and were typically not accurate enough to provide a good visual for teaching.

Vesalius decided to improve upon earlier anatomic illustrations to create the most accurate teaching tools for his students’ educations, such as those in the previously mentioned *Canon of Medicine* and a 1491 publication by Johann de Ketham, *Fasciculus Medicinae*. In the sixteenth-century European art world, however, scientific anatomical depictions were also popular amongst the public and within artistic communities—the result of over a century of increased interests in naturalism. For example, Johannes Eichmann Dryander’s 1536 *Anatomia Capiti Humani* and Giacomo Berengarios da Carpi’s 1535 text, *Anatomia Carpi isagoge breves perluide ac ubermaine in Anatomiam humani corporis*, both reveal period interests in naturalistic anatomical depictions. Dryander was known for his anatomical work on craniums, but his 1536 publication closely followed Galenic neuroanatomy. He combined the Galenic knowledge of the brain (great vein, cranial nerves, the ephihysis, etc.) with the progression of modern anatomic knowledge.14 Vesalius even wrote about Dryander’s use of a curved saw for cutting a skull as being inaccurate.15 Though some of his findings were inaccurate, due to the influence of Galen, Dryander was still considered a respected physician, and was even appointed to a Chair position at the University of Marburg. Berengario’s book incorporated imagery of the

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dissection of human cadavers. Vesalius drew influence from Berengario’s belief in dissecting human cadavers to learn, which is demonstrated in the title page, or frontispiece, of Vesalius’s 1543 edition of his *Fabrica* (Figure 1). This image contains a depiction of an anatomical theatre in Padua. In the work, Vesalius acts as both the dissector and the teacher. Before Vesalius, when in an anatomy theatre, the praelector would only speak about what was happening, while a barber-surgeon would be performing the actual dissection. However, Vesalius moved away from this teaching method, preferring to study, cut, and teach simultaneously.

Typical of early modern dissections, the woman being dissected in the *Fabrica* frontispiece was a convicted criminal—a Paduan prostitute who attempted to avoid execution by claiming she was pregnant. After a midwife confirmed that she was not pregnant and she was hanged, the magistrate of the criminal court of the Venetian Republic authorized the depicted dissection for further verification. This mid-sixteenth-century image closely resembles the compositional format that is seen in later anatomy lesson paintings. The central figures of the work are Vesalius and the cadaver on a raised slab, surrounded by the anatomy theatre. Individuals presumably attending this dissection to learn stand throughout the anatomy theatre. The image also acts as a commemorative portrait of Vesalius. He is the central figure performing the dissection, which is importantly of a woman. Bodies of executed women were much rarer than those of men, which indicates a certain privilege on Vesalius’s part. Some have suggested...
that a posthumous portrait of Galen is even included in this scene, as the figure on the left holding a basket and looking at Vesalius.\textsuperscript{19} Galen, long held in such high regard in the medical field, is here learning from Vesalius. The \textit{Fabrica} frontispiece, like many anatomy lesson images that will come after it, blends the importance of Vesalius’s advances in the study of human dissection with the commemorative practices of portraiture.

**The Impact of Vesalius in the Art World**

Vesalius’s reputation as a physician and anatomist continued to grow, his salary was raised, he became known outside the borders of the Venetian Republic and was invited to give a series of anatomical demonstrations at the renowned University of Bologna. During these demonstrations, he purportedly clashed with the fellow professors because he insisted on doing the dissections himself instead of the traditional approach of allowing a barber-surgeon to complete the procedure. His peers and colleagues apparently viewed dissections as wastes of time, insisting that they would only prove Galen’s anatomy. Of course, Vesalius disagreed, believing that the truth of human anatomy could only come from dissecting the human body. As such, in the late 1530s and early 1540s, he began to correct three books of Galen’s: \textit{On the Dissection of Nerves}, \textit{On the Dissection of Veins and Arteries}, and \textit{Anatomic Procedures}. This endeavor was in part because a publishing company, Guinta Press, wanted new, more accessible translations of Galen’s writings.\textsuperscript{20} These corrections coincided with Vesalius’s preliminary research for his first edition \textit{Fabrica}, which would be finished in 1543.

\textsuperscript{19} “The 1543 Frontispiece of the Fabrica.” Vivitur ingenio.

\textsuperscript{20} Ibid, 43.
Vesalius’s *Fabrica* and other studies significantly changed the medical field, helping physicians to better understand how the human body worked. The text and accompanying illustrations also benefitted early modern European artists, though, who had become increasingly more dedicated to understanding the construction of the human body through the course of the fifteenth and sixteenth centuries. For his *Fabrica*, it is believed that Vesalius worked closely with Titian’s apprentices, as the author hoped to provide the most accurate anatomical drawings for students and physicians to study alongside his writings. Some drawings in his *Fabrica* included full-scale flayed human figures set against a background and posing. One image, *Humani Fabrica Liber II* (Figure 2), is of a man standing with his body flayed, showing his bones and muscles set against a backdrop of a town. Another, known as *Septimo Musculo* (Figure 3), depicts the top half of a man’s skeleton with a rope attached to the head and the bottom half showing the legs muscles leading to the feet with skin set against a backdrop of rolling hills. The body is in an arched position with the lower half of the jaw missing, perhaps illustrating a dissection practice of removing the lower jaw. All images in the *Fabrica* are accompanied by textual explanations detailing the illustrations. These theatrical illustrations also blend the early modern humanist focus on the importance of knowledge with a distinctly Baroque quality of dramatization. Vesalius’s important blending of art and science led to the eventual inclusion of anatomy lessons as part of an artist’s education in sixteenth-century art schools, such as the Florentine *Accademia e Compagnia Delle Arti del Disenio*, established by Cosimo I de’ Medici in 1563. Academies soon became the primary institutions to incorporate anatomy and set

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21 Tarshis, *Andreas Vesalius*, 63-64. However, many scholars debate whether John Stephen Kalcar, Titian himself, or Jacopo Sansovino created the illustrations.
standards for such depictions amongst artists. In the later sixteenth through seventeenth centuries, art and anatomy were seen as mutually beneficial.

Vesalius’s scholarly endeavors and his direct impacts on the art world were part of over a century of growing artistic interests in anatomical studies, though. Leonardo da Vinci (1452 – 1519) studied anatomy as an artistic approach, but also as a scientist. His participation in dissections led to numerous significant discoveries based on his findings, including understandings of the frontal sinus of the cranium, the four cavities of the heart, and the form of the cerebral ventricles. In 1506, after watching the peaceful death of a hundred-year-old man, he then dissected the body. However, Leonardo had access to human body parts before this time, acquiring his first human skull in 1489. The artist’s approach to studying human anatomy involved examining each part individually and trying to understand how the body worked from the innermost structures—the bones—outward. In his anatomical imagery, he often depicted the body’s functional layers, using what he learned from firsthand dissections and certainly laying the foundations for later studies completed by anatomists like Vesalius.

While Leonardo was interested in the construction of the human body as a humanist and scientist, he was also concerned with understand the musculature and skeletal makeup of humans to produce more accurate figures in his artworks. In a page from his notebooks, for example, his

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study of hands led to him being the first person to accurately show the bones (Figure 4). In this image, Leonardo depicts the bones of the hand in the lower left of the page, then adds muscles and tendons in the image on the lower right, adding consecutive layers of tendons in the drawings above. His notebooks include several other similar groupings of layered parts of the body. His studies of shoulder movements distinguish between simple movements requiring the use of one muscle, compound movements caused by two muscles, and those that require the use of three arm muscles (Figure 5). In this image, Leonardo draws the shoulder from different viewpoints in order to understand how the muscles and connecting tissues work. While Leonardo’s studies impacted those of Vesalius only a few decades later, his end goals differed, as Leonardo would have used his studies of anatomy to not only understand how the body functioned, but also to better his art. The artworks included in Vesalius’s texts were solely for the purposes of bettering the medical field (although they did inspire and help artists). Vesalius aimed for his artistic models to be as accurate as possible, so they could accompany the text and be used as didactic tools, working toward his ultimate goal of medical advancement.

Like Leonardo, other late-fifteenth-century artists were also increasingly interested in understanding human anatomy. In 1470, the Florentine artist Antonio Pollaiuolo (1429 – 1498) created his engraving, The Battle of the Nudes (Figure 6), which depicted ten nude figures, and became a source of study for future artists due to its capturing of muscles in movement. Pollaiuolo and Leonardo both believed that to understand the human body and how to depict it, one had to understand the bones and muscles as a foundation, an approach inspired by Leon

Battista Alberti’s *On Painting*. Pollaiuolo’s engraving set a precedent for future artists who desired to render the human body in motion accurately. In fact, Vesalius was even inspired by Pollaiuolo’s *Battle of the Nudes* for some of his anatomical images in the *Fabrica*. It is important to note, though, that Pollaiuolo studied the human body not by way of dissections but by studying living people and classical statuary. Therefore, his engraving is much more artistic and imaginative in nature.

Another artist setting the stage for the impact that Vesalius’s imagery would have in the creative world was Michelangelo di Ludovico Buonarroti Simoni (1475 – 1564). Michelangelo’s anatomical studies were primarily geared towards understanding how the muscles and bones could affect a body’s appearance. Like Leonardo, Michelangelo also performed dissections; however, his main interests were fundamentally different from those of both Leonardo and later Vesalius. Seeing himself as primarily a sculptor, Michelangelo’s interest in human anatomy only expanded as far as needed to recreate the idealized human body in art. Therefore, most of his anatomical studies seem to focus on the bones and musculature, especially those of the limbs. His *Four studies of a left leg* (Figure 7) attests to his understanding of the muscles from different viewpoints and how each muscle would affect the appearance of the leg. While Leonardo was interested in how the entire body worked, Michelangelo was more interested in how the surface contours changed appearance depending on movements.

The *Fabrica*’s employment of artworks to render the anatomy described in Vesalius’s writings as accurately as possible for doctors and surgeons then directly affected artists, as well, who began to apply what was learned from Vesalius to their art. Vesalius’s drawings

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significantly altered the future of the medical field, but he also impacted future of the art world by providing artists with texts and images that would help them to further develop their abilities in naturalistic depictions of figures. Vesalius’s impact in the western art world is first notably exemplified in the anatomy lessons of the Dutch Baroque.
Chapter II

Dutch Baroque Anatomy Lessons

The Amsterdam Guild of Surgeons was one of many elite groups that had commemorative works created during the Dutch Baroque period. The guild most notably commissioned works of group portraiture from Rembrandt van Rijn, an artist whose works contributed to major changes in the genre. Most group portraits before the influence of Rembrandt appear more static and posed. Figures would often be shown standing in formal clothes with somewhat blank expressions. Although Frans Hals is typically known for his lively characters, his relatively early painting, *The Banquet of the Officers of the St. George Militia Company* (Figure 8), painted in 1616, is a good example of the static quality of most early group portraiture. This work shows a group of officers from the St. George Civic Guard at their farewell banquet, ending their three-year tenure. The scene is supposed to represent a celebration of the guild, but the figures are all sitting or standing in fairly similar, seemingly staged poses around a table and each of the men’s faces are painted the same shade with rosy cheeks. Cornelis Cornelisz van Haarlem’s work, *The Banquet of the Officers of the St. Adrian Militia Company* (Figure 9), painted in 1583, is another example of an early static and two-dimensional group portrait. This painting is compositionally similar to Hals’s, with figures of the militia company sitting in staged poses at a table. Like Hals’s, there is a bit of apparent movement in this scene, but only in some slight differentiations in the positions of the men at the table. Some are looking directly at the viewer, others are moving their hands, and one man in the back appears to be raising a vase. However, there is no sense of emotion on the figures’ faces. The setting and event imply excitement, and some of their movements seem to reflect happiness, yet their faces show very little. Early group portraiture in the Dutch Republic often showed men sitting around a table
or standing in a staged line or formation and appearing complacent and dissociated. These portraits lacked a narrative element and fail to entice the viewer to examine the scene and contemplate the importance of the figures portrayed. The next two artists to be discussed, however, improved on the genre of group portraiture by adding crucial details meant to engage the viewer.

**Advances in Dutch Baroque Group Portraiture**

While many artists emerged during the period known as the Dutch Golden Age, two artists of particular interest to this study are the group portraitists Michiel Janszoon van Mierevelt (1566 – 1641) and Rembrandt Harmenszoon van Rijn (1606 – 1669). The height of Mierevelt’s career came several decades before that of Rembrandt, and both were known as leading artists during their lifetime. Rembrandt, building on those who came before him, was influenced by Mierevelt’s compositions. Rembrandt was known for his portraiture, but his first group portrait in 1632, *The Anatomy Lesson of Dr. Nicolaes Tulp* (Figure 10), helped to establish him as the artist who altered and enlivened the genre of group portraiture in Baroque Holland. His later 1656 group portrait, *The Anatomy Lesson of Dr. Johan Deijman* (Figure 11), highlights pivotal medical knowledge, chronicling some significant changes in the fields of anatomy and surgery. Indeed, like Vesalius’s *Fabrica* frontispiece, all the paintings to be discussed in the remainder of this thesis act as commemorative portraits of physicians that also perpetually capture changes in medical materials, tools, and other advancements in understandings of anatomical dissection. Mierevelt’s work is one of the first Dutch Baroque works to distinctly act as a commemorative portrait and display certain period anatomical techniques used for the betterment of medical knowledge.
Mierevelt, the lead painter of late sixteenth- and early seventeenth-century Delft, was commissioned around 1617 by the Surgeons’ Guild in Delft to create a group portrait, still a newly popular form of artistic commission.¹ Mierevelt was assisted by his son, Pieter, in his completion of the 1617 painting, *The Anatomy Lesson of Dr. Willem van der Meer* (Figure 12). In fact, despite its attribution to Mierevelt, a Latin inscription on the railing in the lower right corner notes that Pieter was the one to carry out the painting based on his father’s designs. This is a relatively early example of an anatomical group portrait, and it is the first painting to incorporate the *Teatro Anatomico* (anatomy theatre), an important rendering of the area where a dissection would take place.² In the painting, the figures surround a recently executed criminal whose body is displayed in the center, near the foreground of the painting. As a group portrait meant to commemorate this guild and the physician, Dr. van der Meer, the figures are all surgeons depicted in their best regalia. Typically, however, students would occupy most of the seats around the anatomy theatre, and one’s placement in the space would convey that person’s status in the guild. In Mierevelt’s work, though, the guild’s prominent surgeons all closely surround the cadaver. Nevertheless, the overall message is clear, capturing the guild’s dedication to learning and progress. Dr. Willem van der Meer stands tall in the center, frontally positioned and holding a scalpel hovering over the cadaver’s splayed abdomen. The skeletons hanging on the left side of the painting not only create an interesting compositional moment, but also reflect


a commonality found in many group portraits of surgeons’ guilds from this period, since access to corpses was uncommon.

Certain details found in this work help to convey additional information about dissection practices in the early Baroque period. While the eye is immediately drawn to the executed man with his insides open for viewing, there is also a man holding a pomander off to the side, the object being held as close as possible to the opened corpse. One might assume that this bowl was used for the collection of organs as they were removed from the body, but the pomander was used for incense as there were no vents or other techniques used for proper aeration. As the body emitted gases, an unpleasant aroma filled the space. The painting also acts as a commemorative portrait for both the physician and artist, as Mierevelt was considered a leading portrait painter of the time. Like the forthcoming discussions of other Baroque anatomy lesson paintings, this work focuses on the importance of teaching and learning about the human body through dissection, a Vesalian concept.

**Rembrandt Builds on Mierevelt: Internal and External Unity**

The compositional details of Mierevelt’s *Anatomy Lesson of Dr. Willem van der Meer* are similar to Rembrandt’s *Anatomy Lesson of Dr. Tulp.* In Rembrandt’s group portrait for the Amsterdam Surgeons’ Guild, Dr. Tulp demonstrates muscles of the forearm of a male corpse on the dissection table for seven surrounding colleagues from the guild. The surgeons in Mierevelt’s work also surround a dissected body, with two figures on the left turned to face the viewer, posed almost identically to Rembrandt’s use of two similar figures in his later painting. However, in Mierevelt’s work, no one actively looks at or even engages with the body, all turning their attention away from the body. As will be shown, Rembrandt takes a different approach, showing Dr. Tulp actively displaying the cadaver’s inner arm structure to variously attentive colleagues.
In both works, though, the corpses’ eyes are obscured—either covered by a cloth or in shadow—removing the body’s humanity.

While there are many similarities between Mierevelt’s and Rembrandt’s images, there are some key differences, as well. The dissection depicted in Mierevelt’s *Anatomy Lesson of Dr. Willem van der Meer* is in its early stages, as one can see that the body cavity has just been cut open and pulled back, but all the organs still remain intact and inside the body. Mierevelt’s painting also shows the early stages of incorporating formal internal and external unity in group portraiture, an approach for which Rembrandt ultimately is known, based on art historian and theorist Alois Riegl’s writings. Riegl sees Rembrandt’s incorporation of internal and external unity as one of the main reasons why his compositions were deemed so advanced and sought after. Internal unity is when the subjects within a painting have unifying features about them. External unity is when an outsider, such as the viewer, feels a part of the scene, but not a part of the group. Mierevelt’s painting arguably shows the same internal and external unity as Rembrandt, only to a lesser degree. Mierevelt’s figures all appear to be set up as if they are attending a lesson together, as they are dressed similarly and grouped in pairs. Although a bit staged, the surgeons nonetheless appear unified, especially when juxtaposed with the exposed corpse, who clearly does not belong in this group of guild members. Mierevelt’s painting also has external unity, as most of the figures, except for two, are looking directly out towards the viewer’s space. The viewer feels placed slightly above the scene, which might typically create a sense of a boundary. Instead, because the figures actively look at and engage with the viewer, perhaps the viewer is meant to imagine themselves sitting in a higher row in the anatomy theatre.

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especially considering the unobstructed space to “enter” the scene that the viewer is given. Even though there is a railing placed at the bottom of the painting, every figure but Dr. van der Meer and the two men holding the incense, are also behind this very same railing. The scene has external unity by making the viewer feel as though they are welcome and invited to observe, but they are not a part of the guild.

While internal and external unity can be found within Mierevelt’s painting, Rembrandt’s, *Anatomy Lesson of Dr. Nicolaes Tulp* truly exemplifies these compositional concepts. Upon encountering Rembrandt’s scene, viewers notice the men are placed together in the space, while the viewer is distinctly outside of that space—welcome to watch, yet still meant to feel as if they are not part of the group. This helps to form a sense of external unity, along with the book that appears to intrude into the viewer’s space, thereby connecting the painting to the world outside of it.⁴ A painting can only have successful external unity if it has internal unity. The members of the guild are shown variously paying attention to Dr. Tulp’s lesson and they are grouped together on a singular platform. The two men placed beside the artist’s signature are looking directly at the viewer and the first man on the left sitting down is halfway turned towards the viewer. Unlike Mierevelt’s painting, where the external unity is created by nearly all of the surgeons turning toward the viewer in a quite staged manner, Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp* makes the viewer feel as though they have just happened upon a lesson taking place, pulling some of the attendees’ attention away as a result. Rembrandt created external unity by having the viewer feel as though they have just interrupted this lesson, but Dr. Tulp does not acknowledge any disruption, focusing his gaze on the group, with his interlocutory hand turned away from the

⁴ Ibid, 3.
viewer. This strategic combination of internal and external unity helps the painting to convey a special, coveted institutional space, truly meant only for those within that profession.

**Dr. Tulp, Aris Kindt, and What Lies Under the Paint**

While the cadavers that literally take center stage in these anatomy lessons are treated largely as objects, Rembrandt’s approach to the figure is perhaps a bit more sympathetic. Interestingly, it is known that the dead man on the table was Amsterdam criminal Aris Kindt (Adrian Adriaanszoon), and that one of this man’s punishments during his lifetime was to have his arm severed for theft. A restoration of the *Anatomy Lesson of Dr. Nicolaes Tulp* occurred between 1996 and 1998 and revealed that Rembrandt originally painted Kindt without an arm.\(^5\)

Indeed, this restoration showed that Rembrandt painted gradually and made adjustments as he worked. For example, one surgeon who has been identified as Fran van Loenen was originally wearing a black hat and there was originally an anatomic illustration of an arm held by another of the surgeons. This drawing, however, was later covered and a list of names of the surgeons present at the dissection was added in its place. The most notable change was the addition of the left arm, which would have been missing from the actual cadaver.\(^6\) The restorations also showed that Kindt’s added arm was repositioned at least once and moved to a slightly lower position on the canvas, perhaps making it appear a bit closer to the viewer. These adjustments indicate a likely conversation between the artist and Dr. Tulp, as there appears to be no other reason for Rembrandt to add an arm to a cadaver that did not have one. Dr. Tulp, a renowned physician,

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certainly desired a very curated depiction of himself at work. This is, after all, a commemorative portrait of Dr. Tulp.

Interestingly, the added arm became the most prominent feature on the cadaver. In the seventeenth century, the human being was considered a divine creation with the arm often seen as symbolic of the hand of God.\(^7\) So, to understand God better, studying the human body was crucial. Both of Dr. Tulp’s hands also take center stage in the painting. One hand is holding Kindt’s arm while the other is held up for all to see. Dr. Tulp is showing the surrounding surgeons the innerworkings of the creation of God and the complexities of the hand. The focus on the arm also strengthens Dr. Tulp’s fashioning of himself in the medical field as the “Vesalius of Amsterdam.”\(^8\) Vesalius’s *Fabrica* is included in the bottom right corner of the painting and scholars of anatomy in the period would have known that, within this very text, is a portrait of Vesalius himself dissecting an arm (Figure 13).\(^9\) Rembrandt’s painting effectively connects Dr. Tulp to the groundbreaking advances made by Vesalius in the field of anatomy, reaffirming the doctor’s knowledge of real-world science and, in the hand’s symbolic connections to God, the metaphysical world of the divine.

Dr. Tulp apparently desired to be shown as competent in the skill of forearm dissection, which would typically have taken place within a couple days of death, because of the lack of ability to preserve human bodies for dissection in the seventeenth century. This forearm procedure would have been one of the last stages of a typical dissection, because the internal

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\(^8\) Ibid, 392.

organs, which decayed faster, had to be attended to first. As such, Rembrandt took some artistic liberties (as he did in simply including the arm at all), likely at the request of Dr. Tulp. The image allows viewers to focus solely on Dr. Tulp’s dissection of this arm and, in particular, on the flexor mechanism being shown on Kindt’s flayed forearm, a rare condition. \(^\text{10}\) Even though Dr. Tulp is demonstrating an important medical technique, though, only one member seems to be watching the demonstration, with a singular gaze focused on the arm. Two members in the back, as mentioned previously, look directly out towards the viewer, as though someone has just walked into the room. Three other members are looking at Dr. Tulp as he speaks, but not at the arm or the corpse. Another member, at the front, appears to be looking in the direction of the viewer, but focused perhaps on the Vesalius book. This vast variety of poses and gazes is an entirely new approach to the genre of group portraiture. The guild members in the painting are moving and engaged with their surroundings and Dr. Tulp seems so focused on Kindt’s arm and his lecture that he does notice the viewer as some of his fellow surgeons do.

Dr. Nicolaes Tulp was born in 1593 under the name Claes Pieterszoon and is responsible for many period advances in the medical field. \(^\text{11}\) He studied medicine at the University of Leiden, the same place where Andreas Vesalius began his university career. Since being a praelector for anatomy courses came with prestige, after his tenure in the surgeons’ guild, Dr. Tulp later became involved in politics and served as mayor of Amsterdam. Dr. Tulp wrote two

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\(^\text{10}\) Masquelet, “The Anatomy Lesson of Dr. Tulp,” 380.

\(^\text{11}\) Ijpma, Van de Graaf, Nicolai, Meek “The Anatomy Lesson of Dr. Nicolaes Tulp by Rembrandt (1632),” 883. After the death of one of Dr. Tulp’s children, the signboard at his house bore the symbol of a tulip, inspiring him to ultimately choose a tulip for his coat of arms and change his family name to Tulp. (N. Middelkoop, P. Noble, J. Wadum, B. Broos, “Rembrandt under the scalpel: The Anatomy Lesson of Dr Nicolaes Tulp Dissected.” Amsterdam: Six Art Promotion BV, (1998): 12.)
medical books during his life. The first was a book of medical terminology, *Pharmacopoea Amstelredamensis*, which he wrote after a plague besieged his city and many people died because of incorrectly identified medicines.\(^{12}\) Dr. Tulp’s second book was *Observationes Medical*, which catalogued descriptions of the conditions, treatments, and recoveries or causes of death for 231 of his patients.\(^{13}\) He was also the first person to accurately describe and draw the Ileocecal Valve, an important muscle in the sphincter that separates the small and large intestine, and he wrote important texts on cancer, noting the connection between tobacco use and lung disease.\(^{14}\) Dr. Tulp additionally produced medical texts on blood clots in the heart, palpitations, cerebral palsy, and a two-headed person.\(^{15}\) With all these achievements, Dr. Tulp must have felt qualified to request a commemorative portrait of himself working by the best portrait artist of the time, Rembrandt.

In Rembrandt’s painting, the contrast between the scholar, Dr. Nicolaes Tulp, and the criminal, Aris Kindt, though, is stark. Rembrandt’s work largely focuses on a criminal whose dead body is allowed to be violated for the sake of knowledge. Yet, the other primary focal figure is Dr. Tulp, who commissioned the painting and is meant to be viewed as a distinctly different figure—a well-respected doctor and member of the community, in contrast to the criminal whose corpse is the object of the lesson. Dr. Tulp was considered a well-established Doctor of Medicine and recognized as the Praelector Anatomy in the Guild of Surgeons. A harsh

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13 Ijpma, Van de Graaf, Nicolai, Meek “The Anatomy Lesson of Dr. Nicolaes Tulp by Rembrandt (1632),” 883.

14 Ibid, 883.

15 Ibid.
reality of early modern anatomy lesson paintings is that the body being dissected was typically one that society considered unimportant and vile.\textsuperscript{16} Kindt was executed by hanging for the “grave assault and battery that endangered the life of a man whose cloak he tried to take with another criminal.”\textsuperscript{17} According to Amsterdam’s Guild of records, the dissection of Aris Kindt took place January 31, 1632.\textsuperscript{18} As mentioned earlier, this painting was particularly important for Dr. Tulp because it provided a way to commemorate his achievements, place himself in league with Vesalius, and was completed by the current leading artist in Amsterdam.

**Historical Medical Advances in Rembrandt’s *Anatomy Lesson of Dr. Tulp***

A closer study of Rembrandt’s painting in conjunction with both seventeenth-century and modern medical understandings reveals that this painting captures more than a group of guild members. Like other paintings of the Baroque and Realist eras to be considered in this study, this work helps to track the historical process of medical advancement. As noted, the painting commemorates the Amsterdam Surgeons’ Guild while also highlighting the study of a distinct medical anomaly, thus informing the modern scholar that seventeenth-century surgeons were aware of differences in human anatomy.

Various art historians and medical professionals have long debated the level of accuracy in Rembrandt’s rendering of the flexor muscle, a debate which began because of the location of the muscle on the arm in the painting. Scholars have questioned whether the flexor or extensor

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\textsuperscript{18} Ibid, 115.
muscle was represented. The muscle that Dr. Tulp holds in his forceps appears to be from the lateral epicondyle, or the outside, of the humorous. However, the flexor muscles of the forearm usually originate from the medial epicondyle of the humorous, the inside of the elbow. This means the muscles attached to the lateral epicondyle are inverted in the dissected arm of Rembrandt’s painting, as they should appear on the outside of the arm. This discrepancy led scholar F. Wood Jones to propose that Rembrandt transferred the superficial flexor muscles of the right arm to Kindt’s left arm. William Heckscher, in his *Iconographical Study*, proposed that Dr. Tulp gave Rembrandt woodcuts of a dissected arm prior to the completion of the painting, because, as stated above, the arm would not be dissected first in the proper process of dissecting a body. Heckscher argues that perhaps these woodcuts of a dissected arm allowed Rembrandt to practice depicting an anatomically correct dissected arm before standing in at a full dissection. However, according to Heckscher, Rembrandt failed to properly convey this dissected arm, because the Flexor Sublimis Digitorum originates from the outside of the arm, not the inner side, as represented in the painting. Heckscher thus proposes that the representation is actually a right hand seen from above, possibly inspired by one of the woodcuts Dr. Tulp provided for Rembrandt. In 1967, Gerhard Wolf-Heidegger concluded that the flexor muscles were, in fact, represented. As one can see, decades of debate surrounding this painting from within the

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19 Ibid, 883.


22 Ibid, 50.

medical field resulted in no general agreement on which muscles were represented, let alone if they were anatomically correct. The painting has long confused medical scholars because it shows a correctly represented tendon, but in the wrong place according to standard human anatomy. However, it seems unlikely that Rembrandt would have painted without attention to accuracy, especially because it was meant to demonstrate the skill of Dr. Tulp.

Recent studies suggest a different theory about the arm in Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp* as being anatomically inaccurate. In 2007, four scholars of medicine and anatomy identified the discrepancy in Rembrandt’s works as an Accessory Abductor Digiti Minimi or AADM, a muscle that is only found in twenty-four percent of people, and thus probably would have been noticed only rarely in the already rare occurrences of seventeenth-century dissections. During a routine dissection of a middle-aged cadaver, this group noted that one of the tendons resembled the white cord in Rembrandt’s famed painting. This white cord is the same structure that scholars such as Frank F. Ijpma, William Heckscher, and Gerhard Wolf-Heidegger used to support their conclusion that Rembrandt did not render an anatomically correct arm dissection. The identification of the white cord as the somewhat rare AADM structure is further emphasized by the flexor mechanism that Dr. Tulp appears to be

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24 This group included one medical doctor, one doctor of philosophy, and two bachelor of science recipients from the Department of Surgery and the Department of Anatomy at the University of Hawaii School of Medicine. (David Jackowe, MD, Michael Moore, BA, Andrew Bruner, BA, John Fredieu, PhD, “New Insight into the Enigmatic White Cord in Rembrandt’s The Anatomy Lesson of Dr Nicolaes Tulp (1632),” *American Society for Surgery of the Hand* (2007): 1475.)

25 There were four main criteria used to determine the validity of this AADM theory. Based on analysis of the painting, Rembrandt painted the dissected arm with care and each part of the arm is clearly detailed. The cord in question is white, similar to the other tendons in the painting, indicating that the white cord is either a nerve or tendon. If this is the AADM tendon, then it must be located at the dorsomedial border of the ulna. Then, it must go along the ulnar side of the hypothenar eminence, and it has to end on the anteroulnar aspect of the proximal phalanx of the small finger. The cord must reach from just above the wrist straight to the bottom of the pinky. (For further reading, see, Ijpma, Van de Graaf, Nicolai, Meek “The Anatomy Lesson of Dr. Nicolaes Tulp by Rembrandt (1632).”)
demonstrating. His flexing of the proximal interphalangeal (PIP) joint, or pinky finger, which would be affected by the AADM, supports Rembrandt’s careful attention to rendering that part of the arm.²⁶

As stated above, when dissections took place in the early modern Netherlands, the praelectors were meant to follow a certain procedural order, with an arm dissection being one of the last steps. Because Dr. Tulp must have wanted this painting to focus on his dissection of this anomaly in the arm, only the arm has been opened, when in actuality, the entire body would have been opened by this point. It can thus be deduced that, despite the apparent reality of the scene, Rembrandt did not complete this painting as this dissection was happening. There are also no records of Rembrandt having attended a specific dissection.²⁷

Rembrandt’s Anatomy Lesson of Dr. Tulp continues to ignite debate amongst art historians and medical professionals alike. If this white cord is the AADM, this painting demonstrates for modern professionals that physicians in the seventeenth-century were aware of possible anomalies in human anatomy. This information could only be gained through observing dissected human cadavers, a practice which Vesalius had pioneered and that Rembrandt and other Dutch artists continued to capture in their anatomy lesson group portraits. The paintings to be discussed next work to further capture highly respected physicians, artists, and distinct medical progress.

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²⁶ Jackowe, Moore, Bruner, Fredieu, “New Insight into the Enigmatic White Cord in Rembrandt’s The Anatomy Lesson of Dr Nicolaes Tulp (1632),” 1472.

²⁷ Ijpma, Van de Graaf, Nicolai, Meek “The Anatomy Lesson of Dr. Nicolaes Tulp by Rembrandt (1632),” 889-90.
Rembrandt and the Fragility of Man

Rembrandt completed two known anatomy lesson group portraits in his career. In 1656, he painted his *Anatomy Lesson of Dr. Johann Deijman*, which was originally much larger, but was unfortunately damaged in a fire in 1723 and then cut down to its current size, which luckily still depicts the focal figure of the work, Dr. Johann Deijman. Utilizing sketches created by Rembrandt, art historians have been able to construct a rendition of the original painting’s likely composition. Dr. Deijman was the successor of Dr. Tulp as the Praelectore Anatomiae of the Amsterdam Surgeons’ Guild. In Rembrandt’s 1656 *Anatomy Lesson*, Dr. Deijman is shown conducting a brain dissection on another known criminal, Joris Fonteijn (“Black Jack”), who was executed after he robbed a textile store with a knife. Dr. Deijman’s dissection of Fonteijn was well documented in the guild’s anatomy book, as translated from Dutch, “On January 28th, 1656, the criminal Joris Fountain of Driest was executed by hanging and his body was handed over by the Court of Justice to the Surgeons’ Guild for anatomic dissection.” The man on the left holding the skull cap is Dr. Deijman’s assistant, surgeon Gijsbert Calkoen, whose father, Matthijs Calkoen, appeared as one of the students in the artist’s *Anatomy Lesson of Dr. Tulp*. In Dr. Tulp’s painting, though, assistants were not included, the painting instead focusing on the distinction between praelector and surgeons. Dr Deijman’s painting, therefore, seems to provide

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31 Ibid, 1.
evidence of an important new introduction to certain anatomical procedures—the training of an assistant. In conjunction with research into the early modern medical field, what might this painting tell us about the implementation of an assistant, especially in Netherlandish medical procedures? And considering the debates surrounding Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp*, is this even an accurate representation of a seventeenth-century procedure for the dissection of the brain?

Interestingly, in brain dissections of the early modern era, the head was commonly detached from the cadaver for ease of access. Yet, this painting shows the head still attached to the body. The typical process of a brain dissection consisted of separating the skin with a medial sagittal and a front incision, stripping the bone, then using a saw to remove the skull cap. The head would then be severed from the body. Vesalius even apparently favored separating the head from the body and also recommended removing the lower jaw and using a stone on either side to prevent sliding. Once the skull cap is removed, the dura mater, an outer layer of tissue protecting the brain, is visible, which then leads down to the falx cerebri, a fold of dura mater that extends between the brain’s hemispheres. The falx cerebri tapers and curves in its form, resembling a scythe (falx is Latin for sickle or scythe). In Rembrandt’s painting, Dr. Deijman is holding the falx cerebri, which means that he had to cut the dura dividing the cerebral hemisphere. Medical professionals have noted that nearly all the structures and procedures Rembrandt painted here are accurate to the dissection of a brain, but there is one discrepancy. Rembrandt’s painting shows the falx lifted and turned ninety degrees, so that it appears

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horizontal to the picture plane and spectators can observe it. In a true brain dissection, it would apparently be impossible to lift and rotate the falx as far as Dr. Deijman has in this painting.\(^{34}\) Clearly, Rembrandt uses artistic license here to highlight a particular detail that Dr. Deijman desired to have commemorated.

Nevertheless, the painting correctly depicts aspects of the process of an anatomical brain dissection. Oddly, Fonteijn’s neck is bent in an extreme angle forward, an unnatural position. However, on a body with a broken neck, this extreme angle could be achieved. Remarkably, a brain illustration (Figure 14) in Vesalius’s *Fabrica* could be a source of inspiration for Rembrandt’s depiction.\(^{35}\) While the anatomical details of Vesalius’s depiction may have influenced Rembrandt’s, though, Vesalius’s shows the cerebral spheres of the brain separated in two parts and the head severed from the body. Moreover, Vesalius would have dissected the brain last, seeing it as the most privileged part of the body and the opening of the cerebral spheres as the most important stage of a brain dissection.\(^{36}\) Yet, Rembrandt’s focus on the falx cerebri (almost certainly dictated by Dr. Deijman) may imply a deeper symbolic meaning. The scythe is commonly represented as the tool used by the personification of death, and as such, is symbolic of man’s mortality. A skeleton was frequently depicted on the medals and the official seal of the Surgeons’ Guild, and this skeleton was sometimes shown with a scythe. Whether intentional or not, this focus on the scythe form of the falx cerebri calls attention to the mortality of man and at the same time, the ephemeral nature of the procedures carried out by the Surgeons’

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\(^{34}\) Ibid, 380.

\(^{35}\) Ibid, 382.

\(^{36}\) Ibid.
Guild. Surgeons were always confronted with the fragility of life and this detail serves as a subtle reminder of the important role that the guild played for the people of Amsterdam.

Rembrandt’s anatomy lesson group portraits, along with those of his fellow artists, helped to emphasize the importance of the Surgeons’ Guild. His depictions of dissections are essentially accurate in their anatomical details, and they commemorate for posterity various growths within the medical field, but they also reveal space for enlightenment and further knowledge, core values of the Surgeons’ Guild. While Mierevelt’s, *Anatomy Lesson of Dr. Willem van der Meer* represents a new area for the instruction of dissection and other anatomical teachings, Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp* reveals early modern awareness of medical anomalies and his *Anatomy Lesson of Dr. Johann Deijman* captures an important addition that would affect future medical procedures, the use of assistants. All three paintings commemorate leading physicians, highly valued artists, and important details of a growing medical field—changes to the learning environment, growth in types of procedures performed, and adapting to increasing complications and changes in the field.

**Anatomy Lessons Decline in Popularity**

Around the beginning of the eighteenth century, however, there appears to be a gradual decline in the creation of anatomy lesson group portraits. Of course, there are still improvements and new knowledge being gained in the medical world, and some of these changes will be captured in prints and woodcuts from the following century, when copies gain popularity and spread through Europe and across the Atlantic to America. Vesalius’s *Fabrica*, which contained over two-hundred illustrations, had been published and printed in Basel by one of
the most important printers of the sixteenth-century, Johannes Oporinus. Woodcuts became the most common choice for illustrations in such texts, but they were easily copied. Vesalius’s *Fabrica* and his *Epitome* (a smaller version of the *Fabrica*) were both plagiarized multiple times over the following century. Vesalius was not the only victim of plagiarism, though, as other important anatomical texts were also copied and reproduced without permission. However, this unauthorized reprinting allowed for a vast and quick spread of medical information. As demonstrated, Rembrandt likely had access to Vesalius’s *Fabrica* and was also probably given woodcuts of a dissected arm. It seems that Rembrandt was also aware of Vesalius’s anatomical illustration of a brain dissection, as can be seen in his *Anatomy Lesson of Dr. Johann Deijman*. While in the seventeenth and eighteenth centuries, reproduced prints were the main way of spreading information, prints were also utilized in the nineteenth century. Moving into the modern era, though, it became easier for people to travel and see earlier anatomy lesson paintings in person. Further, students and artists soon had access to a new form of visual media that could assist in the spread of knowledge—daguerreotypes, an early form of photography. Expansions in the field of science coincided with expansions in more accessible forms of media.

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38 Ibid, 6.
Chapter III

American Realist Anatomy Lessons

The artistic movement of Realism began in France in the mid-nineteenth century and centered on representations of people and subject matter from life. Even though the movement started in France, its impact was far-reaching, as forms of Realism appeared in Russia, Germany, the Netherlands, and the United States. Of particular interest for this study is Realism’s iteration in America, where artists drew direct influence from their counterparts in Europe. Through reproduced prints and travels to Europe, they were also aware of and impacted by artistic depictions of medical practices created by Dutch Baroque artists. Art played an important role in the American way of life, as it had for the western European colonizers. Landscape painting and genre painting were of particular interest in the early nineteenth century, both of which influenced the rise of American Realism. This movement initially focused on genre scenes of country life, but Realist subject matter expanded to include scenes of daily life in the poorer neighborhoods of New York City. The goal was to paint life as it was, no matter the potentially unpleasant details.

The goals of American Realist anatomy lesson paintings, thus, differed from those of the Baroque, which focused on immortalizing the great physicians of the Dutch Republic, instructing, and perpetuating the knowledge of surgeons’ guilds. Since American Realism focused on showing all aspects of life without an idealizing veil, anatomy lesson paintings from this period reflect extremely accurate progress in certain medical procedures with live patients. So, while Dutch Baroque painters primarily focused on classroom application in their anatomy lessons, the American Realists dealt directly with patient care and surgeries. Nevertheless, it is possible to examine how Dutch knowledge gained from the experiences commemorated in
anatomy lesson paintings transferred to America. The focus of the following study, therefore, will be three American Realist artists: Thomas Cowperthwait Eakins, Albert Sands Southworth, and Josiah Johnson Hawes.

**Gross Clinic: New Procedures for Infection and Death Count**

Born in Philadelphia on July 25, 1844, Thomas Cowperthwait Eakins (1844 – 1916) was an American Realist painter, photographer, sculptor, and educator. Like Rembrandt, Eakins typically painted subjects from life and completed many portraits of family, friends, and prominent people in the arts, social groups, sciences, and medicine. Eakins desired to portray the human figure accurately and therefore studied anatomy, attending anatomy courses at Jefferson Medical College in Philadelphia. His admission cards to the college, signed by Dr. Joseph Pancoast and Dr. William Pancoast, can be found in the Joseph Hirshhorn Collection. Eakins’s interest in anatomy and its procedures ultimately resulted in the completion of one of his most successful paintings, *Gross Clinic* (Figure 15).

Although painted over two centuries after Rembrandt’s last known anatomy lesson group portrait and on an entirely different continent separated by a vast ocean, Thomas Eakins’s *Gross Clinic* of 1875 arguably reveals influences from and a continuation of Dutch depictions of medical studies, which would have come from his travels to Europe and by way of prints and copies through Europe to the United States. Despite its later success, the *Gross Clinic* was initially rejected for the fine arts component of the Philadelphia Centennial, a prestigious art show, which is surprising considering that the head of the Centennial Selection Committee, John Sartain, remarked that the artist was “making excellent progress” and that the *Gross Clinic* “bids

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fair to be a capital work.”\(^2\) Upon completion, though, the painting was displayed in the field hospital component of the Centennial, due to the apparent horror conveyed and its potential for causing viewers distress.\(^3\) The circumstances of the painting’s commission are uncertain.\(^4\) It was initially believed to have been commissioned by the Alumni Association of Jefferson Medical College, but the college has been unable to find documentation for this theory.\(^5\) Another theory proposed that it was painted for the faculty at Jefferson. I propose, though, that Eakins created the *Gross Clinic* to showcase his talents as an artist, to honor the scientific achievement of his home city, and for the prestigious Centennial Exposition.

A show of talent that was originally rejected later became recognized as one of the greatest American paintings ever made. After the painting was rejected from the Centennial and appeared in a model U.S. Army field hospital exhibit in 1876, one art critic wrote in the *Philadelphia Evening Telegraph*, “There is nothing so fine in the American section of the Art Department of the exhibition and it is a great pity that the squeamishness of the Selection Committee compelled the artist to find a place in the United States Hospital Building.”\(^6\) Distinctly different but obviously drawing inspiration from seventeenth-century Dutch anatomy lessons, Eakins’s work is not a demonstration of human anatomical structures on a dead criminal, but a surgery being completed on a living patient under anesthesia, which is typical of the

\(^2\) Ibid, 57.

\(^3\) Ibid.

\(^4\) Ibid.

\(^5\) Ibid, 58.

anatomy lessons painted in the American Realist period. In other words, Dutch Baroque anatomy lessons focused on teaching and instructing surgeons while working on a dead body and American Realist anatomy lessons focused on patient care and extending the life of a living person. Realist artists built on knowledge gained in the past and applied it in surgery to help living patients. Before the medical advances of the late nineteenth-century, men (usually returning from war) were frequently required to have arms and legs amputated, often risking infection from gangrene because of a lack of proper sterilization techniques and knowledge of proper operating procedures. The following paintings all capture important historical figures and moments that were meant to improve such medical procedures for living patients, but conveyed in compositions that draw distinct connections to sixteenth- and seventeenth-century imagery, such as Vesalius’s *Fabrica* frontispiece and Rembrandt’s *Anatomy Lesson of Dr. Tulp*. Of course, practitioners of medicine in the seventeenth-century Dutch Republic also hoped that their studies would ultimately help living patients, but no surgeries on living people were recorded by way of anatomy lesson paintings. Doctors in the period of American Realism built upon the knowledge gained from studies of anatomy in the centuries prior, applying that knowledge to the benefit of living patients. Works like Thomas Eakins’s *Gross Clinic* exemplify and commemorate these nineteenth-century progressions of medical knowledge, capturing it for perpetuity.

Eakins’s painting depicts leading physician Dr. Samuel Gross lecturing a group of Jefferson Medical College students in an anatomy theatre. The doctor stands slightly off center of the painting and holds a scalpel in his bloody fingers. Clinic clerk Dr. Franklin West stands slightly behind Dr. Gross in the theatre and writes on a pad of paper. A woman, who appears to
be in distress, sits to the left of Dr. Gross and is believed to be the patient’s mother. She offers an emotional contrast to the calm and professional appearance of the teacher and students. Dr. Daniel (“Apple”) stands in the lower right of the painting and holds a wooden-handled instrument in his left hand, presumably preparing to hand it to Dr. Gross, while using a tenaculum to hold open the wound with his right hand. Dr. James Barton assists Dr. Gross, as he hunches over to probe the wound with another tool. In front of Dr. Gross, another identifiable figure is Dr. Charles S. Briggs, who holds the patient’s legs in place. The anesthesiologist is Dr. W. Joseph Hearne, who stands at the head of the table and holds cloths over the patient’s face. Finally, standing in the shadows near the theatre railing on the right side of the painting is the artist Thomas Eakins, sketching the scene as it plays out before him. Eakins showing himself as present at the surgical procedure is vastly different from Rembrandt’s approach to anatomy lesson paintings. Eakins was an artist who not only studied art, but also took anatomy classes and was actually a witness to this particular operation. Rembrandt, however, had access to Vesalius’s *Fabrica* and woodcuts, but he was not present at the dissections that he depicted. Eakins’s interpretation of the *Gross Clinic* was from the viewpoint of an attendee, but for Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp* and that of *Dr. Johann Deijman*, the artist painted based on information that he was given about these events.

In the center of the anatomy theatre of the *Gross Clinic*, a young man’s femur is being operated on for osteomyelitis, an infection of the bone. Previously, this type of procedure would have required an amputation, but Dr. Gross famously developed an approach that involved

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7 “Portrait of Dr. Samuel D. Gross (the Gross Clinic),” 1.
cutting the bone open to clean out the infection.\(^8\) Eakins captures this important new medical development, just as Rembrandt captured Dr. Tulp’s study of a medical anomaly and Dr. Deijman’s removal of the falx cerebri and dissection of the human brain. Dr. Gross’s new procedure made a distinct impact in the nineteenth-century medical field, considering that in Philadelphia alone, the mortality rate from postoperative infection was 25-30\%, primarily due to amputations.\(^9\) Even though this painting was nevertheless deemed too horrific to appear in the Philadelphia Centennial, Eakins did attempt to lighten the scene by having Dr. Gross completely cover the patient, except for the wound on his leg, on which the doctor was operating.

Despite using a live patient, therefore, Eakins still portrays the figure on the table as anonymous, much like the deceased criminals at the center of Dutch Baroque dissections. However, Dr. Gross’s dealing with a living patient is emphasized by the inclusion of a grieving family member. Eakins also reminds the viewer of the living status of the figure on the table through the scene’s incorporation of blood. Dr. Gross’s hand is covered with blood, along with all the implements and tools being used. Dr. James Barton also has blood on his hand, and the wound on the young man’s leg is oozing blood—this is clearly not a cadaver. It was typical for the dead to be drained of blood before they were used in anatomy lessons. It was this level of gore that the Centennial Selection Committee claimed made the painting unfit for public display, even though it perfectly fits aims of the Realist movement. Not only does the painting convey an advanced medical procedure, but Eakins also foregrounded the tools needed for said procedure in the bottom left side of the painting. Additionally, anesthesia, likely a chemical such as ...

\(^8\) Ibid, 3.

chlorophyll, is being actively used on the patient to help provide a painless procedure, administered by way of the cloth over the patient’s face.\textsuperscript{10} The anesthesiologist then closely watched the patient for signs that they were waking and in need of a reapplication of the cloth. This detail is of particular importance, as anesthesia was still a relatively new invention at the time. Dr. Gross is shown not only embracing this new medical knowledge, but also actively practicing it.

However, the doctor was apparently not open to all new medical advances, as the painting also captures Dr. Gross’s rejection of germ theory. Dr. Gross was considered a well-respected surgeon and, in 1859, had written the most popular surgical textbook, \textit{System of Surgery}.\textsuperscript{11} Yet, he was still not convinced that germs caused infection. In mid-nineteenth-century Europe, though, it was widely accepted that germs caused disease and infection, established by the studies of French scientist Louis Pasteur (1822 – 1895).\textsuperscript{12} Pasteur suggested that disease might be controlled by exposing the wound to germ-killing agents. British-born surgeon Dr. Joseph Lister (1827 – 1912) built on to Pasteur’s theory through his studies of germs, which showed that infections were caused by bacteria fermenting. Lister showed that this fermentation resulted in human disease and the death of many patients after surgery due to sepsis and gangrene.\textsuperscript{13} Because anesthetics helped to make the process of surgery painless, surgeons began

\textsuperscript{10} Ibid, 1.


\textsuperscript{12} Kendall A. Smith, “Louis Pasteur, the father of immunology?” \textit{Frontiers in immunology} vol. 3 no 68. (2012): 5.

to attempt more complicated procedures, often unfortunately without any form of sterilization. Antisepsis is a system intended to destroy germs on the body, accompanying instruments, and surrounding areas. Asepsis refers to the maintenance of this sterile environment free of germs. Both are needed for a clean and safe surgical procedure. Addressing infection after surgery, thus, was the next logical step in the medical field.

As a result, Dr. Lister began experimenting with different ways to kill germs, and carbolic acid became the main form of antiseptic.\(^\text{14}\) Lister’s discovery of carbolic acid’s ability to destroy germs led him to develop new surgical procedures and instruments, including a carbolic hand wash, baths for instruments, and a carbolic spray for the air around the patient. This also led to improved medical instruments, as it was found that steel was easier to clean than the previously used ivory or wood instruments.\(^\text{15}\) It was not until the 1890s, however, that germ theory was widely accepted in the field.

Eakins’s painting shows Dr. Gross openly rejecting Lister’s new theory. All the doctors in the painting are dressed in black everyday attire and surrounded by people who appear similarly unprotected. This does not seem to be a sterile environment. While it appears that most of the medical instruments are steel, there is one instrument that looks to be wooden, the very one being handed to Dr. Gross. While the painting indeed captures certain medical advancements embraced by the doctor, Eakins’s *Gross Clinic* also demonstrates some surgeons’ willingness to accept some theories while still rejecting others. The painting does commemorate Dr. Gross’s


new technique for cleaning out infections of the bones, as well as Eakins’s skill as an artist. This commemoration of medical advances and new doctors will appear in other works by Eakins during his artistic career.

**Continued Medical Growth in the Agnew Clinic**

Thomas Eakins’s 1889, *Agnew Clinic* (Figure 16), follows further advancements in medical procedures. The painting was unveiled at the University of Pennsylvania’s 133rd commencement with the retirement of Dr. D. Hayes Agnew. Dr. Agnew was a respected professor and dedicated to advancing the field of medicine.  

When the painting was first unveiled, its public reception was similar to that of the *Gross Clinic*. In commentary from the *Chicago Tribune* in 1893, it was described as “a powerfully realistic portrait… revolting in its unnecessary grossness.”

The painting depicts Dr. Agnew and some of his fellow doctors performing a mastectomy in a medical theatre, a type of procedure that involves removing the breast when a cancerous or potentially cancerous mass is found. However, late-nineteenth-century understandings of cancer were based largely on theories, which ranged wildly in their levels of accuracy. In the period, many doctors believed that cancer was linked to the pathology of the feminine, as they viewed women’s bodies as more susceptible to diseases.

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that a significant percentage of cases of mammary gland cancer were diagnosed in males.\textsuperscript{19} In 1883, Dr. Agnew’s published surgical guide, \textit{Principles and Practices of Surgery}, showed an understanding that cancer started in the body, but Agnew still argued that it was a systemic disorder and that women were the cause of breast cancer.\textsuperscript{20} Along these same lines, Michel Foucault, who was a twentieth century post-structuralist philosopher who saw different social practices as expressions of systems of thought, wrote about what he called the “medical gaze.” Foucault’s “medical gaze” centered on beliefs within the medical community that described how disease manifested, which led to diagnoses based solely on knowledge of a certain ailment’s previous appearances.\textsuperscript{21} For example, breast cancer starts in the mammary gland in women, but it was believed that if a woman was taking part in more sexual activity, then her chances of developing breast cancer were higher. Women prone to female hysteria, anxiety, and nervousness were also considered more likely to develop cancer. As such, if a patient came in with all of these symptoms, the doctor would typically just diagnose her with breast cancer because he was using the “medical gaze,” which relied on previous clinical observations of a disease.

The \textit{Agnew Clinic} depicts a woman on the operating table receiving a mastectomy, but it is not a record of the first woman having a surgical procedure. In comparison with Eakins’s \textit{Gross Clinic} of only fourteen years earlier, though, this painting shows three further advancements in medical knowledge and practice: the addition of a nurse, improvements in

\textsuperscript{19} Ibid, 35.
\textsuperscript{20} Ibid.
\textsuperscript{21} For more on Foucault’s “medical gaze,” see, Michel Foucault, \textit{The Birth of the Clinic: An Archaeology of Medical Perception} (1963).
treat ing hemorrhaging, and a better sterilized operating area. Mary Clymer, whose portrait in Eakins’s painting appears to the right of the operating table, is recorded as the first trained operating nurse in Philadelphia. She kept diaries detailing operating room procedures and notes on her lectures, which provide scholars with important insight into the standard practices of nineteenth-century medicine.\(^2\) Clymer’s inclusion in the painting creates an interesting paradox, though, as she is a woman in an operating area traditionally meant only for men. The only other woman in the room is the patient whose immobile body appears violated in Eakins’s choice to expose the breast that is not being operated on. According to Clymer’s notes on operating, this procedural depiction is inaccurate, as the breast not being worked on would have been covered due to sterilization issues. Eakins took anatomy courses at Pennsylvania University and almost certainly knew this standard of operating, yet he chose to paint both of this woman’s breasts on display.\(^3\) Eakins may have left this breast exposed, however, to call attention to the source of the cancer and to demonstrate his ability to render the female nude. Nevertheless, the contrast between Clymer and the female patient is distinct. Clymer is doing her job, actively watching the procedure, and clutching a medical instrument to show she is ready to respond if needed. Forming an interesting juxtaposition with Dr. Agnew on the left side of the painting, Clymer is also the only other figure who does not sit in the audience or bend over the body, but she stands to her full height with her head held high. Dr. Agnew, however, is clearly the painting’s most important figure, as Eakins has placed him away from the others, appearing to lecture while he

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\(^2\) Mary V. Clymer, Lecture Notes, Center for the Study of the History of Nursing, School of Nursing, University of Pennsylvania. http://dla.library.upenn.edu/dla/medren/detail.html?id=MEDREN_9914651853503681. Clymer’s notes have been preserved through the Barbara Bates Center for the History of Nursing Archives.

\(^3\) Athens, “Knowledge and Authority in Thomas Eakin's 'The Agnew Clinic',” 485.
holds a medical instrument. Clymer’s alert stance and holding of a medical instrument interestingly mirrors Dr. Agnew, painting her on a nearly equal level to that of Dr. Agnew, though she still clearly acts in only a supporting role. She is the first trained assistant in a medical operating room, and Eakins has immortalized her remarkable role in the history of medical advancements. Although Rembrandt’s *Anatomy Lesson of Dr. Johann Deijman* does include an assistant, that assistant is a surgeon who acted in a helping role, which differs from Clymer, who was formally trained as both a nurse and surgical assistant—an entirely new addition to western medical procedures.

The mastectomy procedure being performed was apparently lengthy and complicated, however, advancements in anesthesia allowed for the patient to be put under for longer periods of time. For this procedure, the chest cavity had to be opened to remove the breast tissue and cancerous mass properly. However, hemorrhaging was often a problem, and this painting shows no evidence of that. Eakins’s work, therefore, informs viewers that doctors had figured out how to open the chest cavity and remove breast tissue without a patient bleeding out. Rather than large amounts of blood soaking the sheets and covering the hands of the doctors operating, viewers see what appear to be small drips of blood. There is also no visible blood on the medical instruments in the *Agnew Clinic*, while the *Gross Clinic* captured blood covering the doctor’s hands, tools, and the patient’s leg. However, like the *Gross Clinic* (but unlike works from the Dutch Baroque), the patients depicted in Realist works are alive. In the *Agnew Clinic*, as in the *Gross Clinic*, the anesthesiologist stands at the patient’s head, ready to put the cloth over her mouth to put her back to sleep if needed. Another doctor is shown checking her pulse, the nurse is watching the patient for any concerning changes, and the patient’s skin is painted with a
healthy white-pink pallor. This patient is alive. Eakins’s *Agnew Clinic*, therefore, captures the distinct medical advancement of attending to and stopping hemorrhaging.

This painting additionally represents the incorporation of asepsis or keeping an area free of germs and bacteria. The doctors no longer wear their everyday clothes, as seen in the *Gross Clinic* and in the works from the Baroque era, which hid any dirt or blood. Instead, they wear special white coats, which were only meant for medical operations and could be easily cleaned and sterilized. Stemming from a long tradition of symbolic meaning attributed to the color white, these coats also reflected purity in their color, a stark difference from the black attire worn in the *Gross Clinic*.24 The white of the doctors’ coats and the sheets that lay under the patient and cover parts of her body reflect a color long associated with cleanliness and purity, which can also be tied into the importance of the *Hippocratic Oath* that physicians take, which centers on treating patients to the best of one’s ability.25 The medical instruments in the *Agnew Clinic* also all appear to be steel, which was easier to clean and sterilize than previously used materials like ivory and wood.26 This painting shows that Dr. Agnew has conformed to sterilization techniques put forth by Joseph Lister.

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Modern concepts of science and medicine find their roots in Ancient Greece, with the physician Hippocrates (ca. 460 - ca. 360 BCE) considered the “Father of Medicine.”25 He wrote the *Hippocratic Corpus*, which contained around sixty medical treatises.25 Hippocrates’s writings would later be known as the “Hippocratic Oath,” which set a standard for medical practices through modernity. The *Hippocratic Oath* consisted of pledging to assist the sick, refraining from injustice, and keeping information about patient’s secret. According to his writings, a physician had to examine, observe symptoms, and carefully make a diagnosis, then treat the patient.

Southworth and Hawes Daguerreotypes, Anesthesia, and Longer Operations

The Gross Clinic and the Agnew Clinic both show the use of anesthesia to provide more productive and advanced patient care, even though anesthesia was only recently invented at the time of Eakins’s Gross Clinic. In addition to such medical advances, the nineteenth century saw distinct advances in visual media, particularly in the field of photography. Two expert mid-nineteenth-century daguerreotypists, Albert Sands Southworth (1811 – 1894) and Josiah Johnson Hawes (1808 – 1901), who had their own photographic firm, were asked to take pictures of surgical procedures, which needed to be completed quickly, making it difficult for painters to reproduce naturalistic depictions of these events. One of the first surgical procedures that Southworth and Hawes photographed was the first operation under ether.

Although, the first operation under ether was performed in 1846 and was not photographed, Southworth and Hawes were asked to create a staged reproduction of the event in 1847, because Hawes, while originally present at the procedure, left due to feeling sick. The resulting daguerreotype (that is, a direct positive on a light-sensitized silver plate) is known as, Recreation of First Operation with Ether (Figure 17). Although taken with a camera, the image bears resemblance to earlier anatomy lesson paintings, as it acts as a commemorative portrait for the physician, the artist, and the medical event taking place. Southworth and Hawes masterfully captured a reverence for the discovery of this substance that would drastically change the medical field. William T.G. Morton (1819 – 1868) is believed to be the first anesthesiologist to administer anesthesia to a patient, an event that occurred the previous year on October 16, 1846, which was only twenty-nine years before Eakins’s Gross Clinic was painted. Prior to this development, patients had to endure operations without the aid of anesthetics, which typically meant that procedures were completed quickly, increasingly the likelihood of complications and
medical errors. As such, doctors often reduced these possible complications by simply amputating limbs, which was considered a faster and easier operation. However, if a patient had a medical problem somewhere on the body that could not be removed by way of amputation, the patient’s ailment would generally be left untreated. Anesthesia allowed doctors to operate with fewer time constraints and without patients screaming or moving. English physician and medical historian Sir Clifford Allbutt said this of anesthesia,

> When I was a boy, surgeons operating upon the quick were pitted against each other…He was the best surgeon, both for patient and on looker, who broke the three-minute record in amputation or a lithotomy… the obvious boon of immunity from pain, Anesthetics ended slapdash surgery and gave time for the theories of Pasteur and Lister to be adopted into practice.²⁷

Anesthesia caused a patient’s normal responses to stimuli to be temporarily muted, an invaluable breakthrough for medical operations.

When Morton administered the relatively new discovery of ether as an anesthetic in 1846, it made possible an operation on a young man with a congenital vascular tumor on his neck. Dr. John Collins Warren performed this operation at the Massachusetts General Hospital and as noted, Hawes even was invited to photograph the operation. This momentous advancement in the medical field is celebrated today on October 16th as Ether Day, commemorating one of the most impactful discoveries in medicine.

When Dr. Warren first went into the operating theatre, he was apparently skeptical about the possibilities of ether. However, after the successful completion of a pain-free procedure in 1846, he famously exclaimed, “Gentlemen, this is no humbug!”²⁸ In the Southworth and Hawes


recreation, the patient is meant to be Edward Gilbert Abbott. Dr. Warren stands behind him, holding a scalpel to his neck. William T.G. Morton stands to the side of Abbott’s head, prepared to administer more ether if needed. Eight other figures surround the patient: from left to right, these figures are house apothecary John Dalton, Dr. Solomon Davis Townsend, surgeon Charles Frederick Heywood, an unknown man, Dr. Augustus Addison Gould, an attendant, Dr. Henry Jacob Bigelow, and Ebenezer Frost, a music teacher who received anesthesia for a dental extraction standing on the right in the foreground. Frost is not a doctor, but he signifies part of the history of successful operations utilizing ether. In fact, Frost’s dental procedure was carried out by Morton on September 30, 1846, just a couple weeks before Edward Abbott’s operation.29 This tooth extraction, therefore, was actually the first successful operation using ether as anesthesia. Interestingly, Ebenezer Frost’s inclusion as a curious onlooker seems to make the Southworth and Hawes daguerreotype a celebration of both successes.

In this photograph, the patient is sitting upright in a chair at the center of the image and there is no visible blood, likely because this image was taken before a cut was made. As noted above, Eakins’s Agnew Clinic also lacked much visible blood, and a photograph of the Agnew clinic reveals the same (Figure 18).30 Southworth and Hawes’s 1847 Recreation of First Operation with Ether commemorates a medical advancement that is then incorporated into both of Eakins’s anatomy lesson paintings. Staying true to historical details, this daguerreotype does

not incorporate the sterilization practices that were later established, nor the changes to a white coat color or the addition of assistants or nurses, as seen in Eakins’s *Agnew Clinic*. Southworth and Hawes’s patient is not covered in clean cloths, which would have been sprayed with antiseptics by the time the *Agnew Clinic* was painted. The area they are operating in does not adhere to Lister’s sterilized operating procedures, because these procedures did not yet exist in 1847. In comparison, thus, the *Agnew Clinic* serves as an exemplar of medical advances and successes, as it celebrates new theories, procedural approaches, and sterilization methods.

Another daguerreotype by Southworth and Hawes, *Early Operation Using Ether for Anesthesia* (Figure 19), was taken in late spring of 1847. This image captures a medical procedure actively being performed. It is the first photographic record of a medical operation in progress, as well as Dr. John Collins Warren’s last lecture. In every image discussed so far, the scenes were not captured during their respective lessons or procedures, but instead completed later (whether as paintings or photographic recreations). The event captured in *Early Operation Using Ether for Anesthesia* took place in the Boston Massachusetts General Hospital amphitheater. Dr. Warren is shown standing on the right with his hands on the patient’s thigh, an indication of the surgery that is about to be performed. Dr. Solomon Townsend stands behind Dr. Warren with his hand on his hip. This photograph was commissioned by Dr. Warren to commemorate his work in the field and to act as a record of medical advancement, the use of ether, and the use of daguerreotypes to record medical procedures. However, the composition of the photo also clearly recalls Rembrandt’s *Anatomy Lesson of Dr. Nicolaes Tulp*, most likely

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because of Dr. Warren’s own interest in the painting. He owned a full-scale replica of the painting, which was displayed prominently in the front hall of his Park Street home.\textsuperscript{32} This daguerreotype and Rembrandt’s painting both show the body being worked on in the center of the image on a raised platform, laid with the head towards the background and the feet protruding towards the viewer’s space. In both works, surgeons surround the figure, an opening in the foreground allows for viewing access, and a lead surgeon is shown lecturing. Dr. Warren’s decision to stand at the right side of the composition reflects the compositional relationship between Dr. Tulp and Aris Kindt. The scene in the photograph is also not carried out in a traditional anatomy theatre. Instead, it took place in the hospital’s dome as doctors watched from the dome’s stadium seating. This accounts for the photograph’s higher viewpoint, as Southworth and Hawes took the image from this stadium seating. The point of view, therefore, reflects the true position of an onlooker at this actual event.

Southworth and Hawes’s daguerreotypes of surgical procedures are vital in capturing medical history. Most medical photography in the nineteenth century was for the purpose of records, as physicians would use images to document the appearance of patient ailments such as rashes, burns, tumors, and the like. For example, in 1848, a dermatological daguerreotype of a burn victim’s face was published by Dr. Samuel P. Hullihen in Philadelphia’s \textit{Medical Examiner}.\textsuperscript{33} In 1865, an atlas of dermatological photographs, known as, \textit{Photographs (Colored}


from Life) of the Diseases of Skin, was published by Alexander Balmanno Squire.  

Finally, the first medical photography department in the United States was established by Oscar G. Mason in the 1860s at Bellevue Hospital in New York City. Photographs were ideal for capturing historical medical advances, while also functioning as works of commemorative portraiture, because they could capture the appearance of events and people in the moment. Although paintings could also commemorate advances and the people associated with them, artists were able to make significant changes that could affect the veracity of the moment being captured, as Rembrandt did by adding Kindt’s lost arm in his Anatomy Lesson of Dr. Tulp and by impossibly rotating the falx cerebri in his Anatomy Lesson of Dr. Johann Deijmann, and as Eakins did by incorporating the crying woman in his Gross Clinic to enhance the work’s emotional appeal and by exposing the patient’s breast in his Agnew Clinic, an artistic choice that did not reflect period medical practices. The focus on patient care that is evident in anatomy lesson paintings from the American Realist era, though, can be further highlighted using photography, as is seen in the works of Southworth and Hawes.

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Chapter IV

Conclusion

This thesis has provided a close examination of certain anatomy lesson paintings from the Dutch Baroque to American Realism, showing these works as commemorations of leading physicians, respected artists, and medical progress in the early modern and modern western world. Visual and historical analyses of each of the paintings discussed herein helped to place these works within the larger context of an expanding and progressing medical field. The medical advances captured in these images frequently built on those that came before them, which had in turn been captured by earlier artists. For example, Rembrandt’s works built on those of Mierevelt, and both were influenced by the studies and medical illustrations of the sixteenth-century physician Vesalius. By way of reproduced prints, texts, and painted copies of artworks that traveled between Europe and the United States, Eakins built upon knowledge from Vesalius, artistic inspiration from Rembrandt’s anatomy lesson paintings, and Dr. Joseph Lister’s new discoveries. Finally, the photographic works of Southworth and Hawes serve as the culmination of advances in visual media working to meet the needs of leading physicians and the faster-paced world of modern medicine.

The artworks discussed throughout this thesis catalogue pivotal advances in anatomical knowledge, practical applications of new discoveries, and the improvement of new and advancing techniques. Mierevelt was the first to visually depict an anatomy theatre, a key feature of many later anatomy lessons. Rembrandt’s Anatomy Lesson of Dr. Nicolaes Tulp displayed seventeenth-century knowledge of anatomical anomalies, while his Anatomy Lesson of Dr. Johann Deijman revealed early inclusions of an assistant in certain medical procedures and a growing depth of knowledge of how the brain is structured. The anatomical illustrations from
Vesalius’s *Fabrica* were increasingly reproduced, as it was popular for both artists and anatomists to study the text, contributing to the spread of these studies from Europe to the United States. As travel between Europe and the Americas increased in the nineteenth-century, paintings of the early modern era, like the Dutch Baroque anatomy lessons, were seen by Americans in person, as well. Prints also helped to transition the practical anatomical knowledge displayed in Baroque anatomy lesson paintings to the American Realist application of these studies of anatomy to advance surgical procedures and improve human life. As time and the medical field both progressed, Eakins’s *Gross Clinic* displayed the new discovery and use of anesthesia, while still rejecting germ theory. Then, his *Agnew Clinic* captured a distinct change, as Dr. Agnew is depicted clearly accepting the existence of germ theory. The *Agnew Clinic* also shows improvements in techniques for handling hemorrhaging during surgery, as well as a depiction of the first trained nurse/assistant. Southworth and Hawes’s daguerreotype, *Recreation of First Operation under Ether*, although created after the fact, importantly commemorates the first successful surgical procedure using anesthesia and signifies a new, faster way of capturing these historical moments.

**Further Applications**

The research conducted for this study began by questioning the state of medical knowledge before, during, and after these exemplary works were created. This endeavor aimed to further explore how these works demonstrated the growing medical knowledge of their respective places and periods. As discussed in Chapter One, the physician Vesalius is known as the father of anatomy, due to his exemplary work on human dissection which he then wrote down for future anatomists in his *De Humani Corporis Fabrica*. However, Vesalius also discredited the previous leading physician, Galen, when he pointed out the discrepancies in
Galen’s human anatomy, which was not based on human dissection. Vesalius also influenced the use of didactic illustrations in studies of anatomy, as he utilized them both in his texts and for his students in the classroom.

Chapter Two discussed Michiel Janszoon van Mierevelt’s and Rembrandt Harmenszoon van Rijn’s contributions to commemorating the leading physicians and the ever-expanding studies in the fields of anatomy and medicine through painting. Mierevelt was commissioned by Dr. van der Meer to paint his portrait in the middle of a dissection and Rembrandt was commissioned by Dr. Tulp and later Dr. Deijman to commemorate their respective times as praelector for the Amsterdam Surgeons’ Guild. In Dr. Tulp’s painting, Rembrandt even includes Vesalius’s *Fabrica*, which highlights both Rembrandt’s and Dr. Tulp’s understanding of anatomy through Vesalius’s improved findings. Rembrandt’s *Anatomy Lesson of Dr. Deijman* also shows likely influence from Vesalius’s anatomical drawings in the anatomist’s dissection of the brain.

In the late-eighteenth and nineteenth centuries, physicians gradually began to more regularly apply their anatomical knowledge gained through dissections to helping living patients. The progression from anatomical dissections to practicing more surgical procedures largely coincided with the artistic period of Realism, discussed in Chapter Three. The works by both Eakins and Southworth and Hawes discussed in this thesis display a growth of knowledge in the medical field that directly benefitted living patients. Hippocrates’s *Oath* and *Corpus* take on new meaning in relation to these Realist works, as viewers can see examples of patient care and treatment intended to improve and potentially extend life. The contrast between the dead criminals in anatomy lessons of the Dutch Baroque and the living patients in those of American Realism is pivotal for this thesis. The differing subjects and purposes of Baroque and Realist
anatomy lesson paintings cause artists to handle the compositions in very different ways, despite Realist works clearly drawing inspiration from those of the Dutch Baroque. The dead criminals found on the dissection tables of Dutch Baroque anatomy lessons had no choice in what happened to their body after death. As such, most early modern anatomy lesson paintings seem to focus solely on commemorating the leading physician and his influence, and do not typically incorporate emotion or sympathy for the deceased.

American Realist painters of anatomy lessons, though, borrow compositional tools from the early modern Dutch, but focus on both the patient and the physician. In fact, the images from the period of American Realism were no longer simply lessons, but instead surgeries and procedures intended to care for patients and improve and extend life. As such, instead of only commemorating each leading figure’s anatomical knowledge, Realist artists also represented physicians’ abilities to impart patient care. Eakins and Southworth and Hawes emphasize the living patient by including details like grieving family members, blood, the use of anesthesia (to make procedures more bearable), and physicians and nurses surrounding the body actively checking on the patient. In these works of the Realist period, the space of the anatomy theatre and those that occupy it are also represented differently. The figures in the anatomy theatres of Baroque works were all interested physicians. Other doctors are included amongst the figures in the Realist images, but additionally present are other attendees like family members and students who appear to have mixed emotions ranging from boredom to vague interest. The anatomists of the Baroque were invested in learning about the body and how it worked, while those of the Realist period used the knowledge gained from the studies of previous centuries and applied it to living patients.
Moreover, there is little evidence that seventeenth-century artists attended the dissections that they depicted. However, there is clear evidence that nineteenth-century Realist artists did attend the surgical procedures that they captured. As a result, compositional approaches to anatomy lesson paintings change from a show of second-hand knowledge to artists clearly studying and seeing the material and events themselves. However, all of the anatomical artworks discussed in this study demonstrate an understanding of anatomy that expanded over multiple centuries and across vast regions. The anatomical depictions found in works by Dutch Baroque artists such as Rembrandt were logical continuations of the attention paid to correct anatomy on the part of Renaissance artists like Leonardo and the crucial studies of the later sixteenth-century anatomist Vesalius. This thesis has analyzed the progressions of medical knowledge and approaches to commemoration in anatomy lesson paintings from the Dutch Baroque to American Realism. Ultimately, though, this study highlights different ways that artists dealt with the progressing medical field and the significant shift from anatomical study to patient care in the focus of these works.

The key discoveries and medical advances pictured throughout this study include the anatomy theatres, medical anomalies, brain dissections, various inclusions of assistants, new attention being paid to hemorrhaging, advances in understanding germ theory, sterilization and the development and first uses of anesthesia. These paintings help convey to modern historians an awareness, from the sixteenth and seventeenth centuries on, of the complexities of the body, not only commemorating the people within them, but the very foundations of modern medicine.

**Implications for the Future**

The research that this thesis takes on warrants further exploration as art historians and historians continue to expand on existing scholarship discussing the intersections of art and
science. Most of the current literature focuses on these paintings primarily from an artistic perspective, placing emphasis on what the paintings can tell us about each artist’s knowledge and understanding of the human body. However, there is a general lack of scholarship that explores how artworks like these can be used as supplementary tools for tracking medical progress. This study aims to provide a foundation for further exploration of other visual renderings of anatomy lessons that function as commemorative portraits and simultaneously show distinct advancements in medicine. As this thesis has shown, Realist artists built upon Baroque examples (which in turn had been inspired by the works of Vesalius) to create images intended to commemorate important physicians and discoveries. However, the anatomy lessons of American Realism show a new focus on procedures that were intended to improve the care of living patients. The works here discussed have all shown that artists and physicians were working together to capture important historical developments, resulting in artworks that benefitted both fields—art and medicine.
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Figures

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