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Early Modern Art and Science: Simulation of Dissections in the 16th Century Fugitive Sheets

Abstract: During the 15th century the study of anatomy became a part of art education. With the rise of anatomy as a branch of medicine, artists began to play an important role in the process of anatomical research, creating graphic representations that served as powerful transmitters of knowledge. Among these, the most exquisite were anatomical fugitive sheets, the volumetric, three-dimensional representations of human anatomy. The layering, overlapping, of human organs, enabling one to manipulate them according to need, serves as simulation of the strategies of opening of human body during anatomical dissections. The artists-illustrators of these processes introduced new didactic interactive methods into acquisition and transfer of knowledge. In close cooperation with scientists, they found ways to translate information into recognizable and accessible models, endowing them with cognitive structure, as in anatomical atlases by Andrea Vesalius, *De humani corporis fabrica* (1543), and Johann Remmelin, *Catoptri Microcosmici* (1609).

Keywords: Early modern art and anatomy; simulation of anatomical dissections; graphic prints; fugitive sheets; Andrea Vesalius; Johann Remmelin.

In the world we live in we are becoming increasingly aware of the interplay of art and science. They intersect to help us comprehend and explain the world around us, exploring, studying and interpreting its phenomena, and we tend to attach this characteristic to the contemporary world witnessing the rise of engineering and art design, explorations of bio artists, and similar. Recent trends in the history of science reveal the long history of the relationship between art and science: the (pseudo)scientific features of art, on one hand, and (pseudo)artistic features of science, on the other. All this is reflected in the relationship between medicine and visual arts, which share the interest in human body: medicine in its health and the preservation of health; art in its formal appearance as a reflection of artistic skill and the formal language of art, serving as metaphor, personification, carrying social, political, general cultural meanings, etc.

In this paper we shall touch upon the early modern representation of the human body based on anatomical research, which became normative in 15th century art practice, and that reached its full potential in graphic prints; that is in anatomical

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fugitive sheets of the 16th and the early 17th centuries. Anatomical drawings resulted from the research in art, and their use in anatomical atlases allowed three-dimensional representations of human anatomy, specially created to display internal organs and structures with hinged flaps that enabled viewers to observe the body in various stages of dissection. We admire Leonardo's famous anatomical sketches, but the representations of anatomy gained their exquisite expressions in Andrea Vesalius' *De humani Corporis Fabrica* (1543), and Johann Remmelin's *Catoptri Microcosmici* (1609), anatomical atlases. Their skilled artists-illustrators rejected the old models of schematized two-dimensional images and introduced complex volumetric representations characterized by immediacy. With formal layering of these representations, achieved by specific overlapping of constituent parts of the body, the illustrators introduced new didactic and interactive methods into the process of acquisition, documentation and communication of knowledge. In close cooperation with scientists, the illustrators found ways to translate information into recognizable and accessible models, endowing them with cognitive structure. With this kind of visualization of knowledge, which was also a result of the technological revolution (the invention of movable type), the artists also created the dynamic interactive patterns that could be manipulated according to need.[1]

Direct observation (*autopsia*, *ad vivum*), coupled with scientific experimentation, was rising in Renaissance Europe and the resulting images ensured wide circulation of knowledge playing an important role in the articulation of new forms of scientific research, observation, and documentation. Renaissance scientists understood observation as description (in words and images), but also as a method of surpassing of individual characteristics of natural phenomena as well as of creation of cumulative epistemological images, which could mobilize the senses and imagination alike (understanding the image as a copy of an original and as its replacement).[2]

The 16th century was the century of anatomy,[3] which developed from Medieval typology based on the division into five main anatomical systems in the human body

[1] Alpheus Hyatt-Mayor, *Prints and People: A Social History of Printed Pictures* (New York: Metropolitan Museum of Art, 1972); Lorraine Daston, ed., *Biographies of Scientific Objects* (Chicago: University of Chicago Press, 2000); Suzane Karr Schmidt, *Altered and Adorned: Using Renaissance Prints in Daily Life* (Chicago: The Art Institute of Chicago, 2011), 49–72.

[2] Michael Baxandall, *Giotto and the Orators: Humanist Observers of Painting in Italy and the Discovery of Pictorial Composition 1350–1450* (Oxford: Oxford University Press, 1971); Sachiko Kusukawa, "The Uses of Pictures in the Formation of Knowledge: The Cases of Leonhard Fuchs and Andreas Vesalius," in *Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe,* ed. Sachiko Kusukawa and Ian Maclean (Oxford: Oxford University Press, 2006), 73–96; Lorraine Daston and Elizabeth Lunbeck, *Histories of Scientific Observation* (Chicago: University of Chicago Press, 2011), 27; Axel Fliethmann and Christine Weller, *Anatomy of the Medical Image: Knowledge Production Land Transfiguration from the Renaissance to Today* (Leiden-Boston: Brill, 2021), 9–17; Pamela H. Smith, "Science on the Move: Recent Trends in the History of Early Modern Science", *Renaissance Quarterly*, 62, 2 (Autumn 2009): 345–375.

[3] Devon L. Hodges, *Renaissance Fictions of Anatomy* (Amherst: The University of Massachusetts Press, 1985), 89-106; Nancy G. Siraisi, *Medieval and Early Renaissance Medicine: An Introduction to Knowledge and Practice* (Chicago: Chicago University Press, 1990); Domenico Laurenza, *Art and Anatomy in Renaissance Italy: Images from a Scientific Revolution* (New York: The Metropolitan Museum of Art, 2012), 5; T. V. N. Persaud, Marios Loukas and R. Shane Tubbs, *A History of Human Anatomy* (Springfield, Ill: Charles S. Thomas Publishers Ltd., 2014), 3–97.

(skeletal, nervous, arterial, muscular, and venous). Medieval representations of human anatomy were valuable educational means, but they were simple, canonical and schematic. Although they might have been based on closer anatomical inspections, their formal characteristics do not reveal any close observation. They are found in manuscripts as drawings that, later on, could have been translated into graphic prints. They were still current during the 15th century, showing simple anatomy, bodily fluids, astral influences on limbs or organs, or the most vulnerable spots on the human body that may cause lethal bleeding, and similar.[4]

However, before early modern artists assumed the roles of illustrators of anatomical atlases, working with doctors anatomists, they were guided by the need for imitation of nature that gained its complete expression in the Renaissance art theory of Leon Battista Alberti, and in the artworks by Leonardo, Raphael, and Pollaiuolo, to name a few.[5] Artists were urged to act as scientists who were to discover, learn, and understand the natural laws in order to imitate nature, as true empiricists. Studying anatomy was probably one of the most challenging engagements of early modern artists: Leonardo was the most famous, but others (such as Agnolo Bronzino, Alessandro Allori, Michelangelo, etc.) also produced anatomical drawings that served purely artistic needs and that were more precise and convincing than the ones created for medical use by contemporary medical scientists. The representations of anatomy produced by artists served purely artistic needs although they were more precise and more convincing than the ones created for medical purposes.[6] The required accuracy and precision in the representation of the material world in early Renaissance led artists toward the empirical research of every natural form, especially of the human body and its anatomy,[7] bringing the revolution in art practices and scientific research by binding together the normative and the descriptive.[8] Both Renaissance anatomists and artists looked at and represented the body in its materiality: opening of the body was not only medical, but also artistic activity, because the understanding of its working was supposed to ensure the credibility of an image.[9] However, the artistic visual

[4] James Akerman, "The Involvement of Artists in Renaissance Science," in *Science and Arts in the Renaissance*, ed. John W. Shirley and F. David Hoeniger (Washington: Folger Shakespeare Library, 1985), 94–129; Nancy G. Siraisi, *Medieval and Early Renaissance Medicine: An Introduction to Knowledge and Practice* (Chicago: University of Chicago Press, 1990), 48–63; Mario Biagioli, *Galileo's Instruments of Credit: Telescopes, Images, Secrecy* (Chicago: University of Chicago Press, 2006), 143–150; Raphael Cuir, *The Development of the Study of Anatomy*, 32–65; Laurenza, *Art and Anatomy*, 6–10.

[5] Laurenza, *Art and Anatomy*; James Akerman, "Early Renaissance Naturalism and Scientific Illustration," in *The Natural Sciences and the Arts*, ed. Allan Elenius (Uppsala: Upsalla University 1985), 1–17.

[6] Alpheus Hyatt Mayor, *Artists and Anatomists* (New York: Metropolitan Museum of Art, 1984); Pamela H. Smith, "Artists as Scientists: Nature and Realism in Early Modern Europe", *Endeavour* 24, 1 (2000): 13–21; Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004); Laurenza, *Art and Anatomy*.

[7] Erwin Panofsky, "Artist, Scientist, Genius: Notes on the Renaissance Dammerung," in *The Renaissance: Six Essays*, Wallace K. Ferguson et al. (New York: Harper and Row Publishers Inc., 1963), 121–183.

[8] Angelina Milosavljević, "Direrov 'Nosorog'. Normativni i deskriptivni potencijal likovne predstave," *Phlogiston* 25 (2017): 63–82.

[9] These were, most probably, not used in the workshops for art education.

logic lead from invisible to visible, from inside out, from skeleton to skin – the logic of an anatomist went into the opposite direction. Nevertheless, their goals were similar – epistemic and epistemological, aiming towards the production of knowledge.[10]

The urge to study nature and man (meaning, human body, human actions and emotions), and to represent them with the utmost possible realism and vividness, was advertised by art theorists – Alberti in the first place in his treatise *On Paining* (although, the first traces may be found – at least in theory – already at the end of the 14th century in Cennino Cennini's *Treatise*). Alberti advised artists to study human body, bones and flesh, in order to render their compositions with realism and plausibility, and to achieve beauty and harmony. They were to study and draw them as they appear in nature, outside the confines of the workshop tradition.

> In the composition of members care should be taken above all that all the members accord well with one another. They […] accord well […] when in size, function, kind, colour and other similar respects they correspond to grace and beauty. For, if in a picture the head is enormous, the chest puny, the hand very large, the foot swollen and the body distended, this composition will certainly be ugly to look at. So one must observe a certain conformity in regard to the size of members, and in this it will help, when painting living creatures, first to sketch in the bones, for, as they bend very little indeed, they always occupy a certain determined position. Then add the sinews and muscles, and finally clothe the bones and muscles with flesh and skin. I see, there will perhaps be some who will raise as an objection something I said above, namely, that the painter is not concerned with things that are not visible. They would be right to do so, except that, just as for a clothed figure we first have to draw the naked body beneath and then cover it with clothes, so in painting a nude the bones and muscles must be arranged first, and then covered with appropriate flesh and skin in such a way that it is not difficult to perceive the positions of the muscles. As Nature clearly and openly reveals all these proportions, so the zealous painter will find great profit from investigating them in Nature for himself. Therefore, studious painters should apply themselves to this task, and understand that the more care and labour they put into studying the proportions of members, the more it helps them to fix in their minds the things they have learned.[11]

Alberti's was not a self-sufficient scientific precept, but it aimed at precision, clarity, truth in the representation of proportional and beautiful human body. This beauty, grace, proportion, stance all'antica and clarity are the characteristics of Early

[10] Miodrag Šuvaković, *Epistemologija umetnosti ili o tome kako učiti učenje o umetnosti* (Beograd: Orion Art, 2008).

[11] Leon Battista Alberti, *On Painting*, No. 36, trans. Cecil Grayson (Penguin Books, London, 2004), 72.

Modern anatomical drawings, defying the introduction of nature as the artists' ultimate guide.[12]

The absolute expression of the tendency to achieve the (objective) truth in art, were Leonardo's anatomical drawings. He believed that theory and practice work together, and he insisted on the sense of sight, which provides the immediate articulation of natural forms and their direct communication via visual representations. He also believed in the necessity of anatomical knowledge that would allow the representation of the movements of the body and the soul (and to achieve the already mentioned grace):

> It is indispensable to a Painter who would be thoroughly familiar with the limbs in all the positions and actions of which they are capable, in the nude, to know the anatomy of the sinews, bones, muscles and tendons so that, in their various movements and exertions, he may know which nerve or muscle is the cause of each movement and show those only as prominent and thickened, and not the others all over [the limb], as many do who, to seem great draughtsmen, draw their nude figures looking like wood, devoid of grace; so that you would think you were looking at a sack of walnuts rather than the human form, or a bundle of radishes rather than the muscles of figures.
>
> The painter who is familiar with the nature of the sinews, muscles, and tendons, will know very well, in giving movement to a limb, how many and which sinews cause it; and which muscle, by swelling, causes the contraction of that sinew; and which sinews, expanded into the thinnest cartilage, surround and support the said muscle. Thus he will variously and constantly demonstrate the different muscles by means of the various attitudes of his figures, and will not do, as many who, in a variety of movements, still display the very same things [modelling] in the arms, back, breast and legs. And these things are not to be regarded as minor faults.[13]

It is believed that Leonardo's drawings were the results not only of the spirit of the time, but mainly of his association and collaboration with the physician and anatomy professor Marcantonio della Torre. The absolute symbiosis of scientific research and the art of drawing pervaded Leonardo's opus, and it seems to apply especially to the studies of human anatomy full of detail, based on numerous dissections during which he gradually entered the secrets of the human physical existence, striving to represent the structure of human body clearly and synthetically. These drawings served as replacements for sculptural models, and he used them in his artworks on

[12] These are very interesting features of the Early Modern anatomical drawings and composite models, but they cannot be elaborated here.

[13] *The Literary Works of Leonardo da Vinci Compiled and Edited from the Original Manuscripts by Jean Paul Richter*, Vol. 1, Nos. 488–489 (London: S. Low, Marston, Searle & Rivngton, 1883), 245.

one hand. On the other, he demonstrated the potentials and importance of drawing, the graphic sketch, for communication and dissemination of knowledge. They went hand in hand with the artist's written descriptions – image and text together.

During dissections, one cannot see what a drawing, a sketch, a synthesis of many individual specimens, can communicate.[14]

> You who say it is better to see a dissection than to see these drawings would be right, if it were possible to see all those things which in such drawings are demonstrated in a single figure. In [dissection], with all your ability, you will not see nor obtain knowledge of more than a few vessels; to obtain a true and full knowledge I have dissected more than ten human bodies, destroying all other organs, and taking away in its minutest particles all the flesh which was to be found around the vessels without causing them to bleed, except for the imperceptible bleeding of the capillary vessels. And one single body was not sufficient for enough time, so that it was necessary to proceed little by little with as many bodies as would render a complete knowledge. This I repeated twice in order to observe the differences.[15]

Artists could experience horror during dissections, Leonardo warned, that could avert them from the unpleasant sights.

> Though you may have a love for such things, you will perhaps be impeded by your stomach; and if this does not impede you, you will perhaps be impeded by the fear of living through the night hours in the company of quartered and flayed corpses, fearful to behold. And if this does not impede you, perhaps you will lack the good draughtsmanship which such a depiction requires; and even if you have skill in drawing, it may not be accompanied by a knowledge of perspective; and if it were so accompanied, you may lack the methods of geometrical demonstration and of calculating the forces and strengths of the muscles; or perhaps you will lack patience so that you will not be diligent.[16]

Drawing is a static medium, and it allowed Leonardo to show the arrested movements of the dissected bodies, arranged in sequences. If he was to represent muscles of an

[14] Leonardo da Vinci, *Notebooks*, trans. Irma Richter (Oxford: Oxford University Press, 1952): 143–144; Martin Kemp, "From Mimesis to Fantasia: The Quattrocento Vocabulary of Creation, Inspiration and Genius in Visual Arts," *Viator* 8 (1977): 347–398; Hyatt Mayor, *Artists and Anatomists*; Leonardo da Vinči, *Traktat o slikarstvu* (Beograd: Miodrag Dramičanin, 1988), 96–134, 291; Luca Antoccia et al., *Leonardo: Art and Science* (Firenze: Giunti Gruppo Editoriale, 2001); Raphael Cuir, *The Development of the Study of Anatomy from the Renaissance to Cartesianism. Da Carpi, Vesalius, Estienne, Bidloo* (Lewiston: The Edwin Mellen Press, 2009), 76–80; Leonardo da Vinči, *Izum nenadmašnog majstora. Istraživanja iz medicine* (Beograd: Bukefal, 2016).

[15] Martin Clayton and Ron Philo, *Leonardo da Vinci: Anatomist* (London: Royal Collection Enterprises Ltd., 2012), 18–19.

[16] Ibid., *Leonardo da Vinci: Anatomist*, 29.

arm, he needed to sketch them in several positions. The 16th century brought the dynamic (as much as they could be) forms of the representation of anatomy, the overlapping images of human anatomy. Despite the horror caused by the cut and opened cadavers, there were artists who participated in anatomical research, contributing with their inventions to the rise of medicine, certainly acquainted with the Leonardo's specific enterprise. The humanist interests of anatomists, on the other hand, and their growing detachment from the medieval scholastic models brought the necessity to merge the two practices – artistic and scientific. Anatomists used the skills and carefulness of artists who produced truthful and convincing representations, and who showed great invention in the creation of anatomical atlases, as their artisanal skills were coupled with the command of media and of book design.[17]

The formal and functional potentials of graphic art, of prints, allowed them to assume the character of medium for documentation of empirical research and creation of dynamic, interactive, designs for the acquisition of knowledge. They gained their extremely interesting expression in the representations of human anatomy – the interactive overlapping images, fugitive sheets, which revealed the anatomical structure of the human body. They were produced in great numbers and enabled the circulation of knowledge, playing a significant role in articulation of new forms of scientific research.

New images of human anatomy were supposed to enable (at least, it seemed that the new graphic technologies could support this) as realistic as possible renderings of organs, and systems that are really interconnected, and for this purpose were created the *montage* overlapping images, which note the state of things. To see, to represent, to assemble the body in its entirety, it was to be divided into constituent parts, and to be divested of every traditional metaphorical meaning, and the absolute reality of the physicality of the human body proclaimed.

The earliest known example of the innovative interactive volumetric overlapping anatomical images, fugitive sheets, which imitate the process of dissection, appeared already in 1538–39.[18] These were the woodcut plates with the representations of female and male anatomy created by German artist and printer Heinrich Voghterr. He glued the hand-colored representations of the inner organs one on top of another (24 in sum) that served as illustrations of the text surrounding the figures. These woodcut prints had wide circulation and their buyers/owners/users cut and glued together the details themselves, thus enabling an extraordinary interactivity of these virtual models, which were at the same time touched and looked at – a kind of

[17] Panofsky, "Artists, Scientist, Genius"; Martin Kemp, "A Drawing for the Fabrica and Some Thoughts upon the Vesalius' Muscle-Men," *Medical History* 14 (1970): 277–288; Idem, "From Mimesis to Fantasia"; Akerman, "Early Renaissance Naturalism and Scientific Illustration"; Martin Kemp, "Temples of the Body and Temples of the Cosmos: Vision and Visualization in the Vesalian and Copernican Revolutions," in *Picturing Knowledge, Historical and Philosophical Problems Concerning the Use of Art in Science*, ed. B. S. Baigrie (Toronto: University of Toronto Press, 1996), 40–85; Andrea Carlino, *Paper Bodies: A Catalogue of Anatomical Fugitive Sheets, 1538–1687* (London: Wellcome Institute, 1999); Laurenza, *Art and Anatomy*.

[18] Let us mention the 1522 anatomical atlas by Jacopo Berengario da Carpi of Bologna, in which the represented bodies are 'taking off' the parts of skin in order to show the muscle structure and organs, with little detail. A little bit later, in 1541, Hans Baldung Grien produced similar anatomical drawings of the dissection of skull. There are a number of early 16th century anatomical atlases in which illustrators used Leonardo's drawings.

practical epistemology that was not the result of purely academic knowledge, but of the close medical research.[19]

In 1543, a humanist and a doctor, professor at the University of Padua, and Charles V's court physician, Andreas Vesalius, published his treatise *On the Fabric of the Human Body* (*De humani corporis fabrica*) illustrated by an artist from the School of Titian, or by the German artist Johannes Stephanus of Calcar.[20] Vesalius understood the importance and the didactic potentials of visual representations and explained that he:

> […] incorporated pictures of the various organs so true that they seem to set a dissected body before the eyes of those who study the works of Nature.[21]

This was done because the images contribute to understanding as they represent the order of things better than spoken words.

> […] do they not place the object itself before the eyes more clearly than even the most explicit language?[22]

Vesalius' graphic bodies, as they appeared in his book are enlivened by taking various gracious poses *all'antica*, imitating ancient sculptural models.[23] Understanding the potential of the visual experience, Vesalius produced a summary of the *Fabrica*, its shorter version, *Epitome*, created in the same year by an unknown artist.[24] It was designed for medical students and contained individual plates with the representations of the anatomy of the human body, which could be cut out and assembled according to the need, and glued to more solid surfaces, as a variant of pop-up images. The conception of Vesalius' visual representations in his anatomical atlases owed to his conviction that one can also learn from books, that it is not necessary to attend live dissections if a student is prevented to do so, and that books and visual representations can quite successfully stand for direct experience.[25]

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[19] Andrea Carlino, *Paper Bodies. A Catalogue of Anatomical Fugitive Sheets, 1538–1687* (London: Wellcome Institute, 1999), 47–73, Suzanne Karr Schmidt, "Printed Bodies and the Materiality of Early Modern Prints," *Art in Print* 1, 1 (2011), http://artinprint.org/article/printed-bodies-and-the-materiality-of-early-modern-prints/, acc. April 20, 2018; Pamela Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004), 18–30, 36, 82–90, 94–127; Nancy G. Siraisi, *Medieval and Early Renaissance Medicine: An Introduction to Knowledge and Practice* (Chicago: University of Chicago Press, 1990), 48–73.

[20] They were attributed to Titian and were published as his "Notomie" (anatomical drawings; the 1670 and 1685 Bologna editions can be found at https://archive.org/search?query=notomie+di+titiano).

[21] Cuir, *The Development of the Study of Anatomy*, 26. Let us note that Vesalius was strongly influenced by the contemporary humanist tradition and was acquainted with Leonardo's artistic research.

[22] Ibid., 27.

[23] Andrea Vesalii Bruxellensis, *De humani corporis fabrica libri septem* (Basileae: Ex officina Ioannis Oporini 1543), https://archive.org/details/gri_33125008502920, acc September 9, 2023

[24] Charles David O'Malley, *Andreas Vesalius of Brussels 1514–1564* (Berkeley: University of California Press, 1964), 123–127.

[25] Jacqueline Vons, "L'Epitome, un ouvrage méconnu d'Andre Vésale (1543)," *Histoire de Sciences Médicales* 40, 2 (2006): 177–189.

This is an important point of departure for Vesalius, and anatomists in general, and it concerned Leonardo's research process (*autopsia*), on one hand, and anatomical illustrations as such, on the other. While Leonardo insisted on the immediacy of the epistemological image, anatomists like Vesalius were concerned solely with the accuracy of illustrations. As Alex Fliethmann notes:

> The difference between Leonardo and Vesalius could be summarized as follows: while Vesalius uses the illustration to establish anatomy as a new master discipline in medical discourse, Leonardo uses anatomy to make a case for visual knowledge to be accepted as superior to the written word. In Leonardo's paragone the image overall is portrayed as a form of knowledge in its own right; in Vesalius's anatomy the image is an auxiliary means, which has to correspond to the "proper" anatomical truth of the human body. Vesalius's understanding of the image is focused on representation, Leonardo's on constructedness.[26]

The illustration of the "proper" anatomical truth of the human body was achieved in the fugitive sheets mentioned above, mostly as individual plates. The interactive overlapping images in the context of book design appeared at the beginning of the 17th century, in Johann Remmelin's *Mirrors of the Microcosm*, 1609.[27] Throughout this book, the bodies open and flip in order to illustrate the basic systems of the human body and to expose its interior and the disposition of its organs. Remmelin also produced a short version of the manuscript, similar to the Vesalius' *Epitome*, with individual graphic prints. His collaborator was Lucas Killian, painter and graphic artist from Augsburg. They developed the existing tradition, the examples set by Vesalius and Voghterr in their interactive images, and perfected it in such way to create composite, *montage*, representations in the book itself that open in various directions, with the layers that are so fine that they are almost unnoticeable. Lucas Killian signed himself as "sculptor", which sheds new light on the conception of the forms of these didactic representations in terms of volumetric three-dimensional creations. Transformed into two-dimensional graphic medium this interactive form that suggests three-dimensional bodies brings together the experiences of painting and sculpture.[28]

The representations of anatomy were not created as artworks to be looked at and admired for their artistic values, or as superb inventions. They were didactic and normative as much as descriptive.[29] They did not represent individual examples of the

[26] Axel Fliethmann, "Pathologies of Imagination and Medical Visual Culture in Early Modern Europe," in *Anatomy of the Medical Image: Knowledge Production and Transfiguration from the Renaissance to Today*, ed. Axel Fliethmann and Christine Weller (Leiden and Boston: Brill, 2021), 68–69.

[27] Rosemary Moore, "Productive Cuts in Johann Remmelin's Mirrors of the Microcosm," in *Paper Cuts: The Production of Knowledge in Early Modern Anatomical Prints* (Ph.D. Dissertation, Department of History of Art, UCL, March 2016), 149–192, online edition https://archive.org/details/ldpd_11497246_000/page/n85/mode/2up, acc. September 9, 2023.

[28] Suzan Karr Schmidt, *Altered and Adorned: Using Renaissance Prints in Daily Life* (Chicago: The Art Institute of Chicago, 2011); Idem, "Printed Bodies".

[29] We may think about the institutionalization of the human body in art and medicine respectively.

phenomena, but the cumulative results of numerous dissections during which the fine fabric of human body was to be documented, understood, and communicated. For us, they bear witnesses to the tendencies to reach the absolute, written in the process of their production: the *how* of the creation of an image as directly related to the chosen medium which *mediates* its content.[30] And the *how* is revealed in the sequential Renaissance sketches as much as in the overlapping images of the anatomic fugitive sheets.

References

Alberti, Leon Battista. *On Painting*. Translated by Cecil Grayson. London: Penguin Books, 2004.

Akerman, James. "Early Renaissance Naturalism and Scientific Illustration." In *The Natural Sciences and the Arts*, edited by Allan Ellenius, 1–17. Uppsala: Uppsala University, 1985.

Akerman James. "The Involvement of Artists in Renaissance Science." In *Science and Arts in the Renaissance*, edited by John W. Shirley and F. David Hoeniger, 94–129. Washington D.C: Folger Shakespeare Library,1985.

Antoccia, Luca et al. *Leonardo: Art and Science*. Firenze: Giunti Gruppo Editoriale, 2001.

Appadurai, Arjun, ed. *The Social Life of Things*. Cambridge: Cambridge University Press, 1986.

Baxandall, Michael. *Giotto and the Orators: Humanist Observers of Painting in Italy and the Discovery of Pictorial Composition 1350–1450*. Oxford: Oxford University Press, 1971.

Belting, Hans. *An Anthropology of Images: Picture, Medium, Body*. Princeton and Oxford: Princeton University Press, 2011.

Biagioli, Mario. *Galileo's Instruments of Credit: Telescopes. Images, Secrecy*. Chicago: University of Chicago Press, 2006.

Carlino, Andrea. *Paper Bodies: A Catalogue of Anatomical Fugitive Sheets, 1538–1687*. London: Wellcome Institute, 1999.

Catani, Marco and Stefano Sandrone. *Brain Renaissance from Vesalius to Modern Neuroscience*. Oxford: Oxford University Press, 2015.

Clayton, Martin and Ron Philo. *Leonardo da Vinci: Anatomist*. Royal Collection Enterprises Ltd., London, 2012.

Cuir, Raphael. *The Development of the Study of Anatomy from the Renaissance to Cartesianism: Da Carpi, Vesalius, Estienne, Bidloo*. Lewiston: The Edwin Mellen Press, 2009.

Daston, Lorraine, ed. *Biographies of Scientific Objects*. Chicago: University of Chicago Press, 2000.

Daston, Lorraine and Elizabeth Lunbeck, eds. *Histories of Scientific Observation*. Chicago: University of Chicago Press, 2011.

[30] Arjun Appadurai, "Introduction: Commodities and the Politics of Value," in *The Social Life of Things*, ed. Arjun Appadurai (Cambridge: Cambridge University Press, 1986), 3–63; Hans Belting, *An Anthropology of Images: Picture, Medium, Body* (Princeton and Oxford: Princeton University Press, 2011), 10–11.

Eisenstein, Elizabeth L. *The Printing Revolution in Early Modern Europe*. Cambridge: Cambridge University Press, 2005.

Fliethmann, Axel and Christine Weller, eds. *Anatomy of the Medical Image: Knowledge Production and Transfiguration from the Renaissance to Today*. Leiden and Boston: Brill, 2021.

Hyatt Mayor, Alpheus. *Prints and People: A Social History of Printed Pictures*. New York: Metropolitan Museum of Art, 1972.

Hyatt Mayor, Alpheus. *Artists and Anatomists*. New York: Metropolitan Museum of Art, 1984.

Karr Schmidt, Suzanne. *Altered and Adorned: Using Renaissance Prints in Daily Life*. Chicago: The Art Institute of Chicago, 2011.

Karr Schmidt, Suzanne. "Printed Bodies and the Materiality of Early Modern Prints," *Art in Print*, 1,1 (May-June 2011) Accessed April 20, 2018, http://artinprint.org/article/printed-bodies-and-the-materiality-of-early-modern-prints/. Accessed on September 9, 2023.

Kemp, Martin. "A Drawing for the Fabrica and Some Thoughts upon the Vesalius' Muscle-Men," *Medical History* 14 (1970): 277–288.

Kemp, Martin. "From Mimesis to Fantasia: The Quattrocento Vocabulary of Creation, Inspiration and Genius in Visual Arts," *Viator* 8 (1977): 347–398.

Kemp, Martin. "Temples of the Body and Temples of the Cosmos: Vision and Visualization in the Vesalian and Copernican Revolutions," In *Picturing Knowledge, Historical and Philosophical Problems Concerning the Use of Art in Science*, ed. B. S. Baigrie, 40–85. Toronto: University of Toronto Press, 1996.

Kusukawa, Sachiko and Ian Maclean, eds. *Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe*. Oxford: Oxford University Press, 2006.

Laurenza, Domenico. *Art and Anatomy in Renaissance Italy: Images from a Scientific Revolution*. New York: The Metropolitan Museum of Art, 2012.

Leonardo da Vinci. *Notebooks*, ed. I. A. Richter. Oxford: Oxford University Press, 1952.

Леонардо да Винчи. Трактат о сликарству. Београд: Миодраг Драмичанин, 1988.

Leonardo da Vinči. *Izum nenadmašnog majstora. Istraživanja iz medicine.* Beograd: Bukefal, 2016.

Leonardo da Vinci. *The Literary Works of Leonardo da Vinci Compiled and Edited from the Original Manuscripts by Jean Paul Richter*. London: S. Low, Marston, Searle & Rivngton, 1883.

Милосављевић, А. "Диреров 'Носорог'. Нормативни и дескриптивни потенцијал ликовне представе," *Phlogiston* 25 (2017): 63–82.

Moore, Rosemary. *Paper Cuts: The Production of Knowledge in Early Modern Anatomical Prints*, PhD diss., University College London, 2016.

O'Malley, Charles David. *Andreas Vesalius of Brussels 1514–1564*. Berkeley: University of California Press, 1964.

Panofsky, Erwin. "Artist, Scientist, Genius: Notes on the Renaissance Dämmerung," In *The Renaissance: Six Essays*, Wallace, F. et al., 121–183. New York: Harper and Row Publishers Inc., 1963.

Persaud T.V.N., Marios Loukas and R. Shane Tubbs, *A History of Human Anatomy.* Springfield, Ill: Charles S. Thomas Publishers Ltd., 2014.

Pomata, Gianna and Nancy G. Siraisi, eds. *Historia: Empiricism and Erudition in Early Modern Europe*. Cambridge, Mass: MIT Press, 2005.

Remmelin, Johann. *Kleiner welt spiegel, das ist, abbildung göttlicher schöpffung an dess menschen leib mit beygesetzer schrifftlicher Erklärung so wo zu Gottes Weissheit als dess menschen selbst erkandtnuss dienend*. Gedruckt zu Augspurg, durch Johann Schultes, in Verlegung Johann Gorlin, Burger und Buchhändlers in Ulm. Im Jahr Christi. M. DC. LXI. https://archive.org/details/ldpd_11497246_000. Accessed on September 9, 2023

Siraisi, Nancy G. *Medieval and Early Renaissance Medicine: An Introduction to Knowledge and Practice*. Chicago: University of Chicago Press, 1990.

Smith, Pamela H. *The Body of the Artisan: Art and Experience in the Scientific Revolution*. Chicago: University of Chicago Press, 2004.

Smith, Pamela H. "Artists as Scientists: Nature and Realism in Early Modern Europe", *Endeavour* 24, 1 (2000): 13–21.

Smith, Pamela H. "Science on the Move: Recent Trends in the History of Early Modern Science" *Renaissance Quarterly*, 62, 2 (2009): 345–375.

Šuvaković, Miodrag. *Epistemologija umetnosti ili o tome kako učiti učenje o umetnosti.* Beograd: Orion Art, 2008.

Vesalii Bruxellensis, Andrea. *De humani corporis fabrica libri septem*. Basileae: Ex officina Ioannis Oporini 1543. https://archive.org/details/gri_33125008502920. Accessed on September 9, 2023

Vons, Jacqueline. "L'Epitome, un ouvrage méconnu d'Andre Vésale (1543)." *Histoire de Sciences Médicales* 40, 2 (2006): 177–189.

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