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Title: Aesthesis in anatomy. Materiality and elegance in the Eighteenth-Century Leiden Anatomical Collections

Issue Date: 2012-12-18

3. Aesthesis in lace and plants

Two infant hands in jars. Lifelike in lace sleeves, two hands rise upwards in their phials, one of them holding a flimsy red piece of tissue on a string, the other lifts a vulva tied to a lacy ribbon. Another phial holds a fragment of a plant, a sole frumpy flower on one of its branches. On the bottom is a ghostly collection of white flakes.¹[Ill. 11-13] The first two preparations are on permanent display in the Leiden Museum Boerhaave and the Leiden University Anatomical Museum respectively. The last preparation, the phial with the white flakes, sits in a storage cabinet in the cellars of the Leiden University Medical Center. A first superficial description of the materiality and location of these three particular preparations raises more questions than it explains. Why do those hands look so life-like and pinkish? Why are those hands holding bits of tissue? Why the lace sleeves? What is the thing on the string? Why would one make a preparation of a child's hand holding a vulva? What are the white flakes on the bottom of the phial? Why is there a flowered branch in it? Do these preparations have something to do with one another? Do they fit into some kind of wider tradition? How did they end up in Leiden? How were they looked at when they were first made? What happened to them as time went by?

One of these preparations (the hand holding the vulva) is ascribed to the Amsterdam anatomist Frederik Ruysch (1638-1731), the other two to his student and Leiden anatomy professor Bernard Siegfried Albinus (1697-1770). Relatively much has been written about Ruysch and his collections: A.M. Luyendijk-Elshout in 1970 was the first to relate the decorations of the Ruysch preparations to contemporary *vanitas* ideas about life, death and the human body.² Art historian Julie Hansen rather anachronistically identified Ruysch primarily as an artist in a 1996 article.³ Luuk Kooijmans published an extensive biography of Ruysch in 2004 that appeared in translation in 2009, Gijsbert de Roemer explored possible theological connections

¹ LUMC catalogue numbers Abo015, Aloo09, Abo001.

² Luyendijk-Elshout 1970.

³ Hansen 1996.

in an article in the same year, and Josien Driessen van het Reve explored the faith of the Ruysch collections after they were incorporated in the St. Petersburg Kunstkamera in 1717 in an exhibition catalogue and article in 2004 and 2005 respectively.⁴ Dániel Margócsy discussed the advertisement of anatomical collections and skills by anatomists like Ruysch in 2008, and Rina Knoeff recently published an article on Ruysch' display strategies.⁵ Albinus also had his fair share of attention, mainly in the work of Luyendijk-Elshout and Punt between 1950 and 1985, yet no attempts have so far been made to understand the resemblances and differences between their preparations, nor has an object-driven analysis of the Albinus preparations been attempted before.

In this chapter I will show that the Ruysch and Albinus preparations are actually closely connected, but also distinctly different, and that a close reading of their materiality reveals even more about their make-up and meaning. First I will explore the use of coloured wax injections in anatomical preparations in this period in general, and particularly the use of red pigments. Subsequently, I will discuss the arms and the tissue they are 'holding'; then I will explore the possible uses and meanings of the lace-rimmed sleeves with which they are decorated. After that I will continue to the mysterious preparation of flakes and a branch. Finally, I will briefly discuss the reception history of these preparations in order to gain some more insight to the problems and opportunities these preparations presented and present.

Materies rubra, materies coerulea: coloured wax injections

The two arms preserved in the preparations by Ruysch and Albinus look surprisingly healthy and lifelike in their phials, with a pinkish glow – a far cry from most other wet preparations of limbs, which have become ghostly white under the influence of their preservation liquid. [Ill. 11, 13] The secret to their glow is in arterial and venal injections with a hardening wax mass coloured with red pigment. The choice of red pigments to achieve a lifelike effect and to visualise veins and arteries may seem obvious because of the apparently timeless connotations with red blood and healthy blushes, but there is more to this technique than meets the eye. As Domenico Bertolini Meli points out, 'colour is one of the most immediate sensory experiences and at the same time one of the most complex philosophical and physiological

⁴ Kooijmans 2004, 2009, De Roemer 2009, Driessen-Van het Reve 2004, 2005.

⁵ Margócsy 2008, Knoeff 2012.

problems in sense perception'.⁶ In addition, blood had diverse and changing cultural, religious, medical, and physiological meanings in the early modern period.⁷ For example, blood was not a research object in anatomy until William Harvey (1578-1657) made the discovery of the circulation of the blood in 1628.⁸ On top of these problems and developments, there exist the complex hermeneutics of colour. As we have seen previously, red was associated with hot, dry, active sulphur; the opposite of cool, wet mercury well into the seventeenth century.⁹ Moreover, the intrinsic redness of blood was actually not discovered until the late seventeenth century, and certain kinds of red pigments turned out to be more suitable for resembling blood in anatomical preparations than others.

Jan Swammerdam developed injections of anatomical preparations with hardening coloured wax in the 1660s.¹⁰ This technique enabled anatomists to create lasting preparations that showed the structures they had discovered through their injection experiments. In the initial injection experiments, all kinds of coloured fluids were used to visualize bodily structures: black, yellow, green, and even milk was used because of its clear white colour. This led Reinier de Graaf to the conclusion that all the parts of the body were coloured more or less red by the blood. Previously, it had been thought that it was the liver that changed white chyle into red blood, a vivid analogy with the process of *rubedo*, the rubification or reddening of the white matter of the Philosopher's Stone at the final stage in the *opus alchymicum*.¹¹ Descartes for example, in his 1662 treatise on man in neo-Galenic style argued that white chyle is transformed into red blood in the liver like the white juice of black grapes is turned into red wine.¹² Throughout the seventeenth century, a vivid discourse on the colour of blood emerged throughout Europe. Learned men such as Malphigi, Fracassati, Borelli, Boyle, Hooke and Lower studied the problem.¹³ But Reinier de Graaf concluded that a washed-out liver injected with milk actually turned white.¹⁴ De

⁶ Bertoloni Meli 2011, p. 118.

⁷ See i.e. Santing & Touber (eds) 2012.

⁸ Cunningham 2012, p. 196-7.

⁹ See chapter 2. Also Abraham 1998, p. 192-193 and Bucklow 2009, p. 86.

¹⁰ For a more extensive discussion of the development of techniques to create lasting anatomical preparations see chapter 2.

¹¹ Abraham 1998, p. 174-175.

¹² Bertoloni Meli 2011, p. 120-121. The *Traité de l'homme* was actually written between 1630 and 1633, but only published after Descartes' death in 1662, likely because he feared papal prosecution.

¹³ Bertoloni Meli 2011.

¹⁴ De Graaf 1668, p. 665-6.

Graaf's discovery that blood is actually red of itself and does not derive its colour from the liver gave blood a new, autonomous, life-giving status.

This distinction of the red blood as a life-giving force made red the colour of choice for the hardening injection mass for anatomical preparations in the late seventeenth and early eighteenth centuries, especially for preparations like those made by Ruysch and Albinus; preparations that simultaneously clarified anatomical structures and served as life-like preservations of entire children, extremities, and heads. Other colours were only used when two different structures otherwise hard to distinguish needed to be made visible in a preparation. For example Blankaart, in his 1695 anatomical handbook that would be reprinted well into the eighteenth century, is very brief on coloured wax injections: they should be made out of white wax, or sheep's tallow and oil of turpentine, coloured with 'any pigment you like', like filtered vermilion (red) or rust of copper (green), to distinguish between the arteries and the veins. The anatomist should make sure the mass is fluid and will flow to the smallest branches.¹⁵ That is all. No quantities, no temperatures.

Yet the obvious problem with the coloured waxy substances used for injecting anatomical preparations is that they have to solidify at room temperature in order to obtain a lasting preparation, but keeping both the preparation and the injection mass warm enough for the mass to remain fluid during injection is very difficult. As I experienced myself when trying to make a wax-injected preparation, the injection mass congealed before it could reach the smallest branches of the arteries or veins. This can to some extent be solved by adding oil of turpentine, but too much of that and the mass will not solidify at room temperature any more.¹⁶ Injecting a preparation with coloured wax in such a way that the wax reaches even the smallest veins before it hardens, thus visualizing otherwise indiscernible structures or, in the case of preparations of an entire limb, giving it a life-like, pinkish glow, is extremely difficult. Finding the right mixture of ingredients and the right temperature and pressure for injecting can only be done through endless trial and error. It is an intensely physical and sensory experience: after a couple of hours of trying to make a

¹⁵ Blankaart 1695, p. 758: "*Cerae praeparatio XXIX. Cera hoc modo praeparatur. Recipe ceram albam, cui sebum ovillum junge: hisce simul liquefactis spiritum terebintinae adde. Pigmentum adde quod lubet, ex minio, aerugine aliove colore pro re nara (distinctionis gratia inter arterias & venas) suspenditur in syndone tenui; alias materia liquefacta colari debet, quando pigmenta cerae liquefactae colari debet, quando pigmenta cerae liquefactae admiscuntur. Ne ob particulas crassas cananicoli obstruantur, atque injectio usque ad minima vascula inhibeatur.*"

¹⁶ Also see Appendix I.

wax-injected preparation, your back and arms hurt from holding the specimen and the syringe, your hands are cramped and possibly burnt from the hot wax, your eyes are strained from searching for the minuscule veins you want to fill, your sense of smell is overwhelmed by the stink of the dead body and the wax, and you feel light-headed from the fumes of heated tallow and turpentine.

Nonetheless, if an anatomist was successful in creating lasting wax-injected preparations, the results could be stunning. Ruysch was the first to successfully inject many anatomical preparations with coloured wax, and his preparations brought him financial wealth and academic and social esteem. The preparations objectified the dead body; making a preparation was making a tradable commodity, an object that could serve as a research result, a teaching aid, a moral agent, and a curiosity at the same time. Initially Ruysch had appeared unwilling to part with his recipes for preservation and injection fluids, but when he sold his cabinet to tsar Peter the Great in 1717, he included the recipes in the sale. The knowledge that Ruysch's recipes were no longer in his possession ignited an international quest for them; an indication of how highly valued they were. However, Ruysch no longer seemed to worry about it, as he had realized that it was not so much the recipes as his *skills* that were the key to his unique preparations.¹⁷ He concluded that creating injected and lasting preparations was 'a secret that only I know. Because whoever I asked, and whatever I found out, there is no one else who really can do it.'¹⁸ This illustrates the fact that making anatomical preparations rested on tacit, bodily knowledge from the early days, and that anatomists were well aware of this.

This also goes for the man who made the other preparation, that of the hand holding eyelids and a choroid membrane on a string - Bernard Siegfried Albinus (1697-1770). He was a student of Ruysch, and professor of anatomy and surgery at Leiden University from 1719-1770. The young Albinus was not at all the outgoing entrepreneur Ruysch was, but he was hungry for knowledge about the smallest structural element of the body and the source of life, and therefore followed Ruysch's example. He too vigorously explored the possibilities of the fairly new technique of vascular injection with hardening coloured substances to visualize the structures of the human body. He hoped that studying those structures through injecting would

¹⁷ On the sale of Ruysch's cabinet and the subsequent hunt for his recipes, see Kooijmans 2004, p. 318-323.

¹⁸ Ruysch quoted in Kooijmans 2004, p. 323: "...een geheim dat slechts ik alleen ken. Want wie ik er ook naar heb gevraagd en wat ik er ook over te weten ben gekomen, er is niemand die het echt kan."

help him in discovering the smallest structural elements of the body, as well as tell him more about the functions of the bodily fluids and structures like the nerves.¹⁹

In his lectures, Albinus mentioned three different substances for injecting anatomical preparations, but he never specified their composition – once again probably not because he regarded this as a valuable secret, but because he felt that it was not so much exact recipes as skills that were the key to making wax-injected anatomical preparations. Albinus mentioned red wax –*materies rubra*, *materies ceracea* or *liquor rubor*- mainly used for the injection of the arteries, and blue wax or ‘*materies coerulea*’ that he used for injections of veins.²⁰ Albinus had apparently found a mixture that overcame the difficulty of premature hardening of the wax, as he managed to inject even the smallest vascular structures through the bigger ones. Punt suggested it may have been the addition of some kind of resin, as that can still be smelled when the bottles are opened up for maintenance.²¹

Albinus never specified the red pigments he used, but according to Punt they must have been cinnabar and red lead.²² Cinnabar is a quite common, naturally occurring, pigment that can also be manufactured by reacting mercury with molten sulphur, a spectacular-looking but dangerous process that emits poisonous fumes.²³ Until the late seventeenth century, the words cinnabar and vermilion were used interchangeably, although medieval and early modern artists preferred manufactured vermilion over naturally-occurring cinnabar, as it was considered to be purer, a step higher on the ladder to perfection than cinnabar.²⁴

But if vermilion was considered to be purer than cinnabar, would Albinus, who was so fond of perfection, use cinnabar instead of vermilion? Did he indeed use only the natural pigment cinnabar and not the manufactured substance for economical and practical reasons? We will probably never know. And then there is the lead: this pigment does not occur frequently in nature, but was already produced by the Romans through calcination of white lead, and was quite commonly used as a pigment in the illumination of manuscripts in the Middle Ages and Early Modern

¹⁹ Punt 1983, p. 75.

²⁰ *Ibid.*, p. 76.

²¹ *Ibid.*, p. 76-8.

²² *Ibid.*, p. 78. Hyrtl 1865, p. 532, also concluded that Albinus never specified his injection mass.

²³ Bucklow 2009, p. 86.

²⁴ *Ibid.*, p. 86-89, 224-246.

period.²⁵ Both cinnabar and red lead were known to be toxic by the early eighteenth century.²⁶

Anatomists may have preferred red lead as a red colorant over cinnabar for both alchemical-philosophical and practical reasons. In alchemy, lead was considered a relatively heavy metal, just like mercury. The heavier the metal, the more perfect it was, with gold as the pinnacle of perfection.²⁷ One practical benefit of red lead as an injection mass may have been that its heaviness was helpful in the penetration of small veins. The other reason for choosing red lead over cinnabar may have been that unlike the latter, red lead is colourfast, does not fade in daylight, hardly dissolves in water or alcohol, and does not turn into acrid yellow fumes when heated like manufactured vermilion – a benefit for preparations injected with heated wax substances and preserved in some kind of water-alcohol solution.²⁸

Most likely, Albinus' choice of red pigments was prompted by a combination of their colour and their material qualities: the colour red was inextricably connected to qualities of hotness and wetness, as well as to blood and its possible life-giving forces. Both cinnabar and red lead were pigments that had long been known and used in both chemistry and art, they could be fairly easily obtained and they had particular qualities, such as limited solubility in the case of red lead, that made them suitable for the use in anatomical preparations that would be preserved in liquid.

What is that thing on a string? Hands holding things

Now that we know more about the inside of these preparations, we can move on to their outer material qualities. I will start with an analysis of the curious preparation of a child's arm holding a piece of tissue on a string like it is some sort of pendant.²⁹ Whether you think this preparation beautiful or horrific, or maybe both, there is more to it than meets the eye. Considering the preparation still looks life-like after almost three centuries, the anatomist did an amazing job here. Although it is difficult to tell from the picture, the close observer can see this left arm of a newborn with a lace-decorated sleeve has been stripped from its skin and nails. As for the thing on the string, it is only from very close and with considerable anatomical knowledge that

²⁵ West Fitzhugh 1986, p. 113.

²⁶ Swiderski 2008, p. 43, 165.

²⁷ Abraham 1998, p. 86-8.

²⁸ Bucklow 2009, p. 245, Gettens et al 1972, p. 59.

²⁹ LUMC catalogue number Abo015, Sandifort 1793 p.29.

the observer would be able to tell that this is a piece of the choroid membrane with iris, of which the miniscule veins have been injected with red colorant as well. But what neither the old nor new catalogue descriptions of this preparation answer are the pressing questions the physical object raises. Why would an eighteenth-century anatomist create such a preparation? Surely not merely to demonstrate his skills with the scalpel and syringe, or to create a visually arresting piece. Why a hand and an eye? And why was the skin taken off?

Albinus is probably best known for his much-copied and discussed anatomical atlas, the *Tabulae*. But as Albinus believed that man was God's supreme creature in which the *vis vitalis* or life spirit was the most forceful and perfect of all living creatures, he was striving to show this elegance and perfection in all his work. His quest can be seen in his refined injected preparations, in his selections of 'perfect' symmetrical specimens for the drawings in his anatomical atlas, and allegedly he was capable of performing dissections so precisely that not so much as a hair was misplaced, and that they equalled the etchings in Eustachio's tables in their precision.³⁰ However, the focus is now exclusively on Albinus' anatomical preparations. Trained by the illustrious professor Herman Boerhaave and the famous Frederik Ruysch, Albinus stood in a tradition which combined anatomical observation and practical experiment with reason to develop physiological knowledge. This tradition started in the sixteenth century when Andreas Vesalius (1514-1564) was the first professor of anatomy to take up the scalpel and perform dissections himself, instead of leaving the dirty work to a surgeon *prosector*. This led to the testing and adjustment of the previously dominant anatomical knowledge passed on by the Greek Galen. Anatomy was no longer primarily philosophy, but an art, which combined with physiological philosophy, gave new insights to the structure and functions of the human body.³¹ From then on, the anatomist's hands were his most important instruments, something also made clear through the iconography of the title page of Vesalius' 1543 anatomical atlas, *De humani corporis fabrica*. [Ill. 36] Yet the simultaneous quest for beauty and perfection in anatomy seems to be at its height in the work of Albinus and his contemporaries.

³⁰ Punt 1983, p. 220-222. Albrecht von Haller 1958, p. 93 notes on Albinus: "*Er zergliedert schon izt mit solcher Richtigkeit, daß kein Häärgeen versehrt wird, zeigt der Nerven Gestelle so gut, als es in Eustachio abgestochen...*".

³¹ For the differences and interconnections between anatomy and physiology in the eighteenth century see Cunningham 2002, 2003.

So what were Albinus' reasons to make this preparation of a hand with a lace-rimmed sleeve holding a piece of an eye, apart from placing himself within a tradition? Steinke has recently noted that Albinus' importance in the history of physiology is difficult to assess, as he never published any substantial work on physiology – his reputation as a physiologist rests on his lectures on 'human nature', which he delivered as an anatomy professor.³² This might be explained by the fact that for Albinus, anatomical observations and sensory experiences were the basis for physiological knowledge. When trying to answer physiological questions he primarily tried to do so by starting with anatomical analysis, that is, he studied the structures of the body *in situ*, hands-on, through dissection and preparation. Only after that he would move on to the theoretical disciplines of physiological experiment and experimental argumentation, which meant philosophical reasoning about structures and functions. This approach of old anatomy combined with old physiology, which has been vividly described by Cunningham, resulted in a world famous collection of over three hundred anatomical preparations, about 180 of which survive today.³³

Albinus' fascination with observation and sensory experience is reflected in his collection as well. Relatively few preparations were of the nerves (only 3 according to the 1793 catalogue), but those of the sensory organs, especially of eyes and skin, were numerous: about 36% of the total number of preparations. The preparations of the sensory organs and of the nerves should be considered as one collection, as to Albinus they were both parts of the same classical physiological category: the animal functions.³⁴ As appears from lecture notes taken by his students, Albinus started his lecture series on the animal functions with the physiology of the nervous system: first the brain and the nerves, then subsequently he discussed the sensory organs –the epidermis as well as the nails and hair, the tongue, nose, eyes and ears.³⁵ This collection of sensory preparations is particularly interesting to study as more than half of it has survived.

As for preparation Abo015, its significance is fourfold. First, it is an investigation of two organs of sensory perception as discussed in Albinus' lectures:

³² Steinke 2005, p. 36.

³³ Cunningham 2002, 2003.

³⁴ Albinus divided his physiological lectures after 1740 according to the classical *humores*: there were the vital functions (composition of the blood, structure and function of the heart, arteries and glands), the animal functions (nervous system, sensory organs, muscles), and the natural functions (respiration, digestion, nutrition, conception).

³⁵ Punt 1983, p. 135. Box 1742, vol II & III, p. 229-451.

the skin (touch) and the eye (sight). Second, it is an anatomical masterpiece, a demonstration of Albinus' skill and elegance. It is refined, lifelike, extremely difficult to prepare. Albinus himself could get very excited about a delicate preparation like this one, as appears from a note in a letter to his friend Robert Nesbitt, the English anatomist, in 1721. Jotted between a remark on shipped books and his farewells the young Albinus wrote:

*"I should not forget to tell you that I have [] an intact epidermis of the hand of a four month old foetus, which is very thin and very white and resembles a small glove, it has not even the size of half of the nail of my little finger."*³⁶

His pride and excitement regarding the refinement of this object are patently obvious. Third, this preparation is an allegory. As noted previously, the hand was considered the anatomist's most important instrument since Vesalius. But the hand would be lost without the eye. Sight was traditionally considered to be the highest and most reliable sense, and it was hugely important in gaining anatomical and physiological knowledge. This importance also shows from the amount of attention paid to it: almost a hundred of the two hundred and sixty pages on the animal functions in Box's lecture notes of Albinus classes are devoted to sight. Therefore, it is safe to assume that preparation A0015 was not only an investigation of two sensory organs, namely the skin, with nails attached to it, and sight, but that it was also intended as a demonstration of how to elegantly dissect the epidermis and nails, and further as an allegorical reference to anatomy's two most important senses for gaining knowledge: touch and sight. This combination of anatomical investigation and allegorical reference was not something Albinus had come up with himself. One of his teachers, Frederik Ruysch, was the actual inventor and master of the genre – and this leads us to the fourth dimension of this preparation.

Ruysch (1638-1731) started his career as an apothecary, studied anatomy in Leiden under Sylvius, and held numerous posts during his long life, such as praelector to the Amsterdam surgeon's guild, supervisor of the city's midwives, and

³⁶ Transcript of letter from Albinus to Nesbitt, 28 October 1721, in Le Fanu 1932. Translation from French mine: "Il ne faut pas que j'oublie de vous dire que j'ai [] epiderme entiere de la m[ai]n d'un foetus de 4 mois, qui tres mince & tres blanche ressemble a un petit gand, qui n'a pas la grandeur de la moitié de l'ongle de mon petit doigt."

forensic court physician. Although he never lectured in Leiden, he frequently visited the city where he had famous friends, such as Boerhaave, and adversaries –like Raulike. Leiden students like Albinus also travelled to Amsterdam to see Ruysch's private collections and to attend his lectures and anatomical demonstrations. Ruysch's enormous anatomical cabinet in his Amsterdam home, which at its heyday numbered about 2,000 preparations, contained many objects which not only testified to his anatomical inquiries and findings, but which were also allegorical masterpieces. The other preparation of a hand, the one holding the bow-tied vulva, is from his collection. It is one of the few preparations by Ruysch found in Leiden today, as his entire cabinet was purchased and shipped to Russia by tsar Peter the Great in 1717. These preparations are now housed in the St. Petersburg Kunstkamera, and many of them can be studied online today.³⁷ Thanks to Ruysch's extraordinary skills, his preparations are still there for the world to see after three hundred years.³⁸ What then, can we learn about Ruysch's intentions in both anatomical and allegorical respects, from studying this preparation?³⁹

There are many more preparations of hands in Ruysch's St. Petersburg collection and described in his *Thesaurus* that are not alone in their phials: there are children's hands holding pieces of lung, of testis, fragments of dura mater and placentas, a breast, a kidney, a foetus, the 'skeletons' of a pear and an oak leaf, a calf spleen, a small fish, a passion flower and fruit, and one is even accompanied by a scorpion.⁴⁰ It seems a collection of randomly combined objects in which the children's hands, judging by the descriptions Ruysch himself gave them, serve either as specimens of the structure of the skin or simply as a kind of display tool to present, commodify, and objectify all kinds of bodily structures and exotica. The hands, looking like they are still alive by holding out other specimens as if they are artefacts, cause this commodification and objectification: they present the specimens as if they are not body parts or botanical or zoological things, but independent objects, suitable for trade and exchange. Margócsy has also described this process in a 2008 article: Amsterdam anatomists like Ruysch 'advertised' their anatomical preparations in

³⁷ <http://www.kunstkamera.ru/kunst-catalogue/index.seam?c=RUYSH&page=1> (retrieved 5 October 2011).

³⁸ The Ruysch collections in the Kunstkamera have been lovingly restored in the past decade, but were neglected for centuries after tsar Peter the Great died.

³⁹ LUMC catalogue number A10009.

⁴⁰ See <http://www.kunstkamera.ru/kunst-catalogue/index.seam?c=RUYSH> (retrieved 3 May 2011) for the digital collections.

print.⁴¹ The strategy of commodification would continue to be used by generations of future anatomists.⁴² But why make a preparation of a hand holding a vulva? Anatomical preparations of genitals are somehow doubly disgusting: not only are they representing the incomplete, mutilated, dead body, they are also reminding us of ‘disgusting’ bodily functions, such as defecating and procreation, functions that make the body part of the cycle of life and death, of eternal recurrence.⁴³ To understand why Ruysch made this preparation and how it was looked at by his contemporaries, I will explore some other preparations of female genitals in his collection descriptions, and discuss a controversy in which he was involved.

Why would Ruysch make preparations of female genitalia anyway? The most straightforward answer is: because all his contemporaries who got the chance also did so. This may initially sound strange, but the organs of generation were still largely a mystery in Ruysch’s time, so anatomists were keen on dissecting genitals and reproductive systems, including female genitals and the uteri of pregnant women, in order to find out more about the differences between men and women and how children were conceived and developed in the womb.⁴⁴ Through such dissections, Ruysch discovered a muscle in the womb that he held responsible for the extraction of the placenta after birth.⁴⁵ His *Thesaurus* mentions numerous other preparations of the female genitals, excluding the Leiden preparation [number] discussed here. When one starts reading the descriptions Ruysch gave of these preparations, something stands out immediately.⁴⁶ Whereas for the rest of his specimens, including parts of the male reproductive system such as the testicles, Ruysch gives a description in both Latin and Dutch, in the case of preparations of the female genitalia the descriptions are only in Latin and mostly marked with an asterisk.⁴⁷ This suggests that these preparations were not meant for the eyes of the common man: he would, after all, not be able to decipher the Latin text. In Ruysch’s crowded cabinets, these preparations were situated behind other preparations or on the top shelves.⁴⁸ This apparent modesty was rather selective though, as it is only the female genitals that

⁴¹ Margócsy 2008.

⁴² See chapter 5 particularly for this.

⁴³ Miller 1997, p. 40-41, Korsmeyer 2011, p. 35.

⁴⁴ Also see Laqueur 1992.

⁴⁵ Ruysch 1725.

⁴⁶ Knoeff 2012, p. 48, 51.

⁴⁷ Ruysch 1701-1728, Vol. II, p. 44, no. 18 / Vol. III, p. 20, no. 15 / Vol. IV, p. 17, no. 62 / Vol. V, p. 35, no. 70.

⁴⁸ Knoeff 2012, p. 46-51.

are exclusively described in Latin. The inner female reproductive system, the wombs and ovaries, did get a Dutch description.

Seen in a wider context, Ruysch' cautious though rather transparent attempt to chasten his *Thesaurus* can be quite easily understood. Ruysch and some other Amsterdam physicians were also responsible for educating the city midwives, and were called upon when the midwives were confronted with cases they did not know how to deal with. Judging by a controversy that arose from Ruysch's involvement in such a difficult birth, discussions of the nether regions of the female anatomy were both the object of fierce skirmishing between surgeons and physicians, as well as the topic of gossip and laughter for the common man. It all started with an anonymously published 1677 satire attacking Ruysch and two other obstetricians in their alleged maltreatment of a woman suffering from a severely ruptured perineum, followed by a pamphlet attacking Ruysch published by a certain Paulus Pijl, who, according to a small book in defence of Ruysch, was actually a certain Jan Coendering. Pijl/Coendering's most remarkable accusation was that Ruysch was 'trespassing on the domain of women.'⁴⁹ This illustrates that it was still a commonly heard idea outside the medical faculties that the secrets of the female body and the practice of obstetrics should remain exclusively among women and in the hands of midwives.⁵⁰ No wonder Ruysch was cautious when it came to describing preparations of female genitals.

The Ruysch preparation kept in Leiden of the hand with the vagina hanging from its perky bow-tie would likely to have been considered a bit racy by eighteenth-century visitors to an anatomical collection, even though Ruysch might not himself have thought it to be offensive. This is one of those preparations where the addition of lace and ribbons does not really seem to make it any less horrid, a topic I will focus on in the next section. The fact that it is not described in Ruysch's *Thesaurus* and ended up in Leiden suggests that it may well have been a gift –wanton or otherwise– to one of his Leiden friends, who also probably did not keep it on display for all his visitors to see. In fact, its history in Leiden is rather unclear.⁵¹ But as Albinus studied with Ruysch, and because the trip from Leiden to Amsterdam and vice versa was

⁴⁹ Anonymous, 1677. This controversy is discussed in more length in Kooijmans 2009, p. 109-132.

⁵⁰ Also see Park 2006, p. 177-120.

⁵¹ I have not found any references to this preparation dated before 1952.

made frequently by anatomy professors, there is a fair chance Albinus saw this preparation in Ruysch's collection.⁵² There he must also have seen the other preparations in which Ruysch combined hands with human tissue, naturalia, and exotica, and took them as an inspiration for his own preparation of a hand holding a choroid membrane: a classier and more allegorical combination than that of hand and vagina.

In addition, Albinus' preparation refers to a discussion about the structure of the eye in which Ruysch had an important part. This becomes clear from a short chapter in Albinus' *Academicarum Annotationem*, a collection of notes on his research that he published towards the end of his life (1754-1768), when his sight started to fail him and by when most of his preparations must have been made already.⁵³ In four pages, Albinus explains that repeated dissection and injection of the membranes of the eye has led him to the conclusion that the membrane named *Tunica Ruyschiana* by Ruysch is actually nothing more than a part, a lamina, of the choroid membrane already described by others before him. However, Albinus quickly states that Ruysch should still be acknowledged for discerning this particular part of the choroid membrane.⁵⁴ What Albinus first mentioned in writing in 1768 he had probably been telling his students for years when showing them the preparation of the child's hand with the choroid membrane.

By creating a preparation that referred both the anatomist's two most important senses and to a contemporary research topic – the anatomy of the eye – Albinus made a preparation that confirmed his reputation as one of the great anatomists of his time. Moreover, with the delicate removal of skin and nails from the arm and the intricate preparation of the eye membrane, Albinus grasped the opportunity to both place himself within the tradition of Ruysch, and to distinguish himself with his historical awareness, good taste, refinement and elegance.

Faith and fashion: lace

It has become clear that the lace-rimmed hands have multiple meanings, yet what I have not discussed so far are the actual sleeves themselves. De Roemer has touched

⁵² Kooijmans 2004, p. 363-365.

⁵³ Punt 1983, p. 11.

⁵⁴ Albinus *Academicarum Annotationum* 1768 (vol. VII), chapter IV, p. 39-42. In fact, Ruysch would indeed get credited for his discovery: now normally referred to as the ciliary vessels, the *Tunica Ruyschiana* is still mentioned in brackets in the 2005 pocket edition of *Gray's Anatomy*. (Leonard & Gray 2005, p. 183)

upon Ruysch's visual and textual references to the 'embroidery' and 'fabric' of the human body in his 2009 article. As embroidery was a virtuous, industrious craft that often used valuable materials like gold thread and silk, it was something an anatomist would gladly associate himself with.⁵⁵ A reference by Ruysch to Psalm 139 indicates that he thought of his preparations as combinations of man-made and God-made fabric.⁵⁶ Ruysch indeed created preparations in which pieces of preserved human tissue are clear stand-ins for embroidery, such as when he puts a square of it in the hand of the skeleton of a foetus that holds it up to its eyes as a handkerchief. But the iconographic function of the handkerchiefs held by the skeletons is different from that of the sleeves and collars covering stumps. For example, whereas the first is natural human tissue referring to, or representing man-made tissue, the latter is artificial tissue *not* representing or referring to human tissue. These covers are apparently just that, *covers*, and they only occur in 'natural' places, such as around wrists, ankles, and necks. Genitals or internal organs are sometimes suspended from, but never decorated with, lace themselves.

Moreover, lace is something different than embroidery, and the sleeves of the two preparations under discussion here are not embroidered, but rimmed with strips of lace. The most straightforward explanation for the presence of lace trimmings and ribbons would be that they are simply additional signs of elegant anatomy. They certainly fulfil a role in this respect. After all, elegance has the twofold meaning of precision and refinement on the one hand and good taste on the other. The production of lace, though a fairly common activity in an early eighteenth-century household, certainly requires precision and refinement, just like the creation of the injected anatomical preparations these laces are rimming.⁵⁷ In addition, the 'sleeves' on these preparations are of course actually a kind of napkin bandage; wrapped around the part where the hand or arm has been severed from the rest of the body, thus covering up a probably rather unsightly stump. Hence they fulfil a purpose which we have seen is an essential part of aesthesis: they regulate the core disgust evoked by the sight of severed body parts by covering up the most vivid reminder of that separation.

⁵⁵ De Roemer 2009, p. 11-13.

⁵⁶ *Ibid.*, p. 12.

⁵⁷ Kraatz 1989, p. 55-9, 187-8.

Ruysch was not secretive about using decorations to avoid disgust at all. In his *Thesaurus Anatomicus* he wrote that he had tried ‘to improve the horrible sight of dissected and severed parts with adequate decorations to such an extent that they would not discomfort the eyes, nor cause any scares or disgust’, and ‘to take away the disgust, as man is naturally afraid of dead bodies and their parts’.⁵⁸ This is a tactic that is found in preparations of human anatomy during the entire eighteenth century, although by the last decades the covers are mostly crude linen bandages instead of these lacy affairs [Ill. 14]. Moreover, any moral disgust aroused by the sight of a child’s severed limb in a phial might be tempered by a lace-rimmed sleeve. It hints at a certain modesty and sophistication, and it seems to have done the trick for most of the visitors to the Ruysch collections. The young German lawyer Zacharias Conrad von Uffenbach for example, visited in 1711 and describes the preparations as ‘delicate’ and ‘beautiful’ in his travel diary.⁵⁹

However, there is more to these lace-rimmed sleeves than their instrumentality in defying disgust. Although they certainly were the result of aesthesis, ideas about elegance and beauty were undeniably influenced by fashion. This already shows from the numbers. Albinus’ sleeved arm was the only lace-decorated preparation among the three hundred-plus preparations in his collection, whereas Ruysch’s preparation 4070-13 is one of fifty-four lace-rimmed preparations of human anatomy in the St. Petersburg Kunstkamera – still only about seven percent of the total if we take the current, digitized collection as representative, but significantly more than the sole Albinus preparation with lace. There are a lot of arms, hands, and feet, mainly of infants and young children, and even a number of heads, all adorned with sometimes rather elaborate lace sleeves, trousers, hats, and collars. This is less surprising when viewed against the background of the fashion of the second half of the seventeenth and the first half of the eighteenth centuries. The lace on the preparations is so-called bobbin lace, which was relatively easy to make. [Ill. 37] The technique allowed only for rather simple patterns and fairly small strips of lace to be made, but was popular in all of Europe for centuries because of its light, frothy appearance.

⁵⁸ “...om ’t afschuwelijk gezicht der ontlede en afgesnede delen met welgepaste cierzelen zodanig te verbeteren, dat het de ogen niet mishage, nog enige schrik en walging veroorzaken zal (...)”. Ruysch quoted in Driessen-Van het Reve 2006, p. 127, and “Ik doe het om den mensch alle afkeer te benemen, die dog van nature anders gewoon is een schrik te hebben voor dode menschen, en hare delen.” Ruysch 1744, p. 1000.

⁵⁹ Von Uffenbach 1754 Vol.3, p. 384, 640.

Interestingly, profuse lace adornments of the dark, gloomy clothing fashionable in the late seventeenth century were also worn by men and children, at least in equal measure to women. In some areas, lace was even primarily a sign of masculinity [Ill. 38, 39]. This explains the profuse lace decorations on Ruysch's preparations: they do not just cover up unsightly stumps, they also commodify the preparations into fashionable, desirable objects. Around 1720, exactly when Albinus was coming of age, this started to change.⁶⁰ Although men would continue to wear lace cravats and cuffs for much of the eighteenth century, they were much more subdued and a far cry from the elaborate adornments of the seventeenth century – and that is reflected in anatomical preparations, where we find no lace decorations whatsoever after the 1720s. Now it was the women who wore much more lace, as its qualities, such as suppleness and softness, became more and more associated with femininity. Eventually, the new simplicity that became fashionable with the advent of Romanticism by the late eighteenth century would mean that lace would almost completely disappear from fashion.⁶¹ These developments are reflected in both anatomist portraits and their preparations: in the course of the century, both anatomists and preparations become dressed more soberly [Ill. 11, 13, 14, 41, 59].

This poses one more question. Was the use of lace in anatomical preparations a particular early eighteenth-century Dutch trait? To my knowledge, Ruysch's collection is the earliest in which so many wet preparations have been preserved; as Ruysch was one of the godfathers of wet anatomical preparation techniques there simply is nothing from the same period to compare it to. In Albinus' collection, we see that the use of lace is already an exception. The only remaining anatomical collection from the same period which is more or less comparable to the Albinus collection in terms of numbers and the skill with which it was assembled is that of the London-based Scottish anatomist John Hunter. But although these two men were contemporaries and skilled anatomists, Hunter's collection contains no such thing as lace-rimmed preparations. In the context of political history, this makes perfect sense though. England was never much of a centre of lace production, and importing and even wearing lace was forbidden in England for much of the eighteenth century in attempts to protect the country's own cloth production.⁶² Moreover, a collection like

⁶⁰ Kraatz 1989, p. 34-107.

⁶¹ *Ibid.*, p. 34-107.

⁶² Earnshaw 1985.

Clemente Susini's late eighteenth-century wax anatomical Venuses reflect the decline of lace as an important fashion element in the second half of the eighteenth century.⁶³ [Ill. 42] Although the waxes have been donned with real hair and pearl necklaces, and are resting on pink and white satin cushions rimmed with tassels, not a strip of lace is to be found here.

It can be concluded from the discussion above that although in the Ruysch preparations that had embroidery-like tissue in them, such as the skeletons carrying handkerchiefs, there were religious and symbolic connotations, the practice of wrapping stumps in 'natural' places with lace-rimmed sleeves and collars had primarily another aim and was strongly influenced by contemporary fashion. The use of 'sleeves' and covers as such continued throughout the eighteenth century and served the same purpose all along: it was meant first and foremost to take away the source of much possible visceral disgust in the people who saw these preparations. Yet the addition of lace rims reflects local fashion, and with that, changing ideas on elegance and beauty. The covers of stumps in the Leiden collections, first decorated with lace, but later on made of plain fabric, hid the proof of what the spectator still knows is there, but at least is not confronted with directly: that these are severed body parts of dead people.

Botanical symbols: plants in preparations

From the previous section, it can be seen that Ruysch's and Albinus' aesthesis was decisive for the way their preparations looked. Understanding the preparations as the result of anatomical investigations and demonstration of anatomical and physiological knowledge is relatively easy. However, understanding their symbolic and natural philosophical meaning, the tacit contemporary knowledge they represent, requires more in-depth investigation and interpretation. This is also true for the other two preparations discussed in this chapter: the ones in which human anatomy is combined with a plant. The preparation in which the human specimen has been reduced to a pile of white flakes on the bottom of the flask is the more arresting of the two. What were those flakes before, and why is the preparation still in a storage room? Preparation Abo001, another creation of Albinus, unfortunately fell

⁶³ For the decline of lace in fashion see Kraatz 1989, p. 80-2. For more information on wax modelling and Clemente Susini, see i.e. Maerker 2005, 2011, Messbarger 2010.

apart somewhere in the past six decades. It is (or maybe I should say was) described in the 1945 catalogue as follows:

*“Entire epidermis of a child’s hand, removed from the hand like a glove. Tied and hung from a sprig of Aster Africanus. (...) Unique and wonderful preparation!”*⁶⁴

Once again, an anatomical masterpiece, morbid but beautiful. And once again, pressing questions remain unanswered by textual description of the preparation. Why did Albinus make a separate preparation of the epidermis? And why hang it from a sprig of Aster Africanus or, as we know it, purple groundsel, and not simply from a horsehair, as was common? According to Pole’s anatomical handbook, preparations of the cuticle of the hand or foot were so light that they barely needed suspension; when suspended, Pole warned, they would easily tear when the glass was turned.⁶⁵ Albinus’ teacher Ruysch made at least two glove-like preparations of the skin of a hand as well. He writes of three preparations made of one hand: the hand itself, and two preparations of layers of skin. One was a preparation that not only contained the skin of the hand, but also an exotic oily plant from Ceylon, and its ‘long yellow fruit’.⁶⁶ The other must have been miniscule, as it was the epidermis of the hand of a four-month old foetus, similar to the preparation Albinus mentioned in his letter to Nesbitt. The preparation is only mentioned briefly in Ruysch’ *Thesaurus*, and appears not to have been attached to a plant.⁶⁷ It appears that for Ruysch the main purpose of these preparations was to show his skills and knowledge of the

⁶⁴ Transcriptie kaartstelsel museum: “*Volledige opperhuid van een kinderhand, als een handschoen van de hand verwijderd. Dichtgebonden en opgehangen aan een takje Aster Africanus. Helaas is de opperhuid en het proximale deel doorgescheurd. Overigens uniek en prachtig praeparaat!*”

Bijzonderheden: Aster Africanus zie: Leon Plukenes *Phytographia* part. I, tab. 15, fig. 4, 1769. Ingeschreven door J. Dankmeijer; 1945. Sandifort, E.:1793: *Museum Anatomicum I:Acad. Lugd. Bat.*: pag.29: beschrijving. Epidermis manus infantis, Ethanol 80%.

⁶⁵ Pole 1790, p. 97-8.

⁶⁶ Ruysch *Thesauri* 1726, vol. 9, p. 9, no. 62: “*Phiala, in qua continentur in liquore Foetus humani brachium, vitae specimen repraesentans; huic a latere adsita est ejusdem manus epidermis & corpus reticulare cheirothecam apprime repraesentans, ne unguibus quidem ademptis. Hocce objectum adspicientium oculos allicit, & visui gratiam conciliat. Plantula apposita est balsamina, mas Zeylan. Fructu longo flavo.*”

⁶⁷ Ruysch, *Thesaurus* III, p.46: “*LVI: Een vlesje met heldere vogt waarin te zien is het Opper-velleke van een handje van een onvolldrage vrugdje van ontrent 4 Maanden dragts, 't welk een kleen Handschoentje komt te verbeelden.*”

world.⁶⁸ He may have had some additional iconographic motive as well: taking off one's gloves and handing them over to someone else was traditionally a symbolical gesture of parting with one's possessions, and in seventeenth-century portrait painting, holding luxurious gloves was a symbol of power and riches.⁶⁹

But although some of Albinus' preparations appear to resemble those made earlier by Ruysch, there are important differences between the two men and their work. Both Ruysch's work and personality were marked by the large scale, the grand gesture, a certain drive to amaze and entertain. He liked to brag about how he was a man of practice, not much interested in books.⁷⁰ Albinus however, although he did publish an anatomical atlas and also had a big collection in which he showed off his refined anatomical skills, was much more private and cautious. He certainly did not publish popular tour guides to his collections – in fact, he housed his collection separated from the collection in the anatomical theatre, away from the general public- nor did he create any preparations that were aimed primarily at communicating *vanitas* and showing of his skills, like Ruysch sometimes did.⁷¹ If Albinus made a preparation Ruysch-style, he did so because it conveyed symbols, showed his skills *and* contributed to his anatomical and physiological investigations. With Ruysch the anatomical importance of his preparations sometimes appears to be no more than a footnote, whereas with Albinus, there is more balance between refined presentation and conveying knowledge. So although the idea of a glove-like preparation of the hand may have come from Ruysch, Albinus only used it because it fitted in with his research and his quest for beauty and elegance in equal measure.

As I noted before, much of Albinus' research was concerned with the sensory organs, including the skin. In order to find a satisfying answer to the question of why this elaborate skin preparation was made, we have to study Albinus' theory and research of the nervous system and the sensory organs more thoroughly. Although Albinus never extensively published on physiology, he did perform anatomical experiments to answer physiological questions, about which he gave lectures. Hence

⁶⁸ Pole 1790 p. 97-8 mentions that a glove- or sock-like preparation of the hand or foot of a child is not that hard to make: after a period of maceration of the body part in water, the cuticle can supposedly be easily pulled off, washed out and suspended. Yet Pole wrote a century after Ruysch first made these preparations, and from the admiring comments of visitors and students it appears this was not commonly known among anatomists in the early eighteenth century.

⁶⁹ See i.e. <http://www.christies.com/features/2010-june-the-subtle-iconography-of-georg-pencz-782-1.aspx>, <http://www.dutchpaintings.com/moreelse.html> (both last retrieved 22 June 2012)

⁷⁰ Ruysch Thesaurus III, p. 46.

⁷¹ For the housing of the Albinus collection see Huisman 2009, p. 108.

we know he was primarily concerned with the physiological subjects of the ‘liquidum nerveum’ and the functioning of the nerves and sensory organs, particularly the skin. Through experimenting, mainly with injections, he eventually reached the conclusion that there was no such thing as a ‘liquidum nerveum’, and that the ‘animus’ or spirits were the cause of voluntary motion. The seat of the spirits, he argued, was the cerebrum. However, he failed to identify the material transmission of spirit to the muscles and thus the cause of automatic movements.⁷² Still, Albinus thought that the sense of touch was likely to be the most closely connected to the nervous system, as this sense can only discern the tactile qualities of an object when it is in direct contact with the body. This led him in his lectures to first moving on to the sense of touch after he discussed the brain and the nerves.

According to Albinus, the sense of touch was thus divided into two classes: the internal and external sense. The animus or spirit, memory and the will moved the internal sense of touch. The external sense of touch was moved through the impulses received by the external sensory organs of skin, tongue, nose, eyes, and ears.⁷³ The skin or epidermidis, as well as the nails and hairs connected to it, were a continuing source of fascination to Albinus. His elaborate skin preparations showed that the skin consists of different layers, and in his lectures he used the glove-like preparation of the skin of the hand to argue that the upper layer of the skin was actually insensible, just as the nails, and that the external sense of touch was situated in the lower layers of the skin.⁷⁴ This explains why Albinus chose to remove the epidermis and nails from the child’s hand in the first preparation and make the second one. What this does not explain though, is why he chose to make the second preparation the way he did: with a piece of plant for suspension.

Collecting plant species, both local and exotic, was very popular in the seventeenth and eighteenth centuries. Plants were commodified, both used in medicine and sold as rarities to the rich for their ornamental gardens.⁷⁵ From the

⁷² Punt 1983, p. 81.

⁷³ Box 1742, vol. II, p. 282: “*De Tactu... hois dividitur in 2 Classem, alii interni, alii externi, internis pendentes ab animo, et memoria et voluntas, externis, q p [quam posset] organe externe afficuntur, apparet ssa [sensa] interna obstinere ad nervos, d. [dixi(t)] externa...*”

⁷⁴ Box 1742, vol. II, p. 292: “*Demonstrabo nunc chirothecam epidermidis detractam integre con communibus (=coib) pilis atque unguibus. Praeteream noto hanc epidermidem nullam habere sensae tactum, nam ubi densa se potest deradi sine dolore.*” In the margin Box has described the preparations Albinus used to illustrate his argument. Here it reads: “*Praepar. Chiroteca Epidermidis de fotu [ganens]*”, which translates as ‘Preparation of a glove of epidermis detracted through heating’

⁷⁵ See i.e. Cook 2007, ch. 8.

eighteenth century onwards, the creation of taxonomic systems became increasingly important. Plants could simultaneously be rarities, symbols, and drugs. Combining preparations of human anatomy with pieces of plants thus fitted in with the early eighteenth-century epistemic culture of anatomy, and it was something Albinus must also have picked up from his teacher. Ruysch, who had started his career as an apothecary and was therefore familiar with many kinds of indigenous and exotic plants, frequently used sprigs of plants as suspension and support in preparations. At first sight, Ruysch's motives for doing so seem purely practical. For example, in his description of a preparation of a piece of negroid skin, he states that the twig he used in it serves to push the preparation against the glass of the phial:

*“Phial filled with liquid, in which are part of the epidermis and Malphigian body of a negro, and to which is added (...) a twig of the rarest and smallest thistle of Alpinus, (which presses the object against the glass).”*⁷⁶

Yet why would Ruysch mention so explicitly that the twig was of ‘the smallest thistle of Alpinus’? He used that particular plant more than once as well, as appears from a description and drawing of one of his preparations published after his death: here a ‘bird from Ceylon’ is positioned on ‘the smallest thistle of Prosp. Alpinus’.⁷⁷ [Ill. 40] For the learned man of the seventeenth century there would have been no doubt: the repeated use of the smallest thistle, described by the Venetian Prosper Alpinus (1553-1617) in his book on the healing plants of the African continent, was a reference to the African, or more generally exotic, origins of these specimens.⁷⁸ *De Medicina Aegyptiorum* was first published in Venice in 1591, but was reprinted well into the eighteenth century. It was a standard work that a wealthy former apothecary like Ruysch very likely knew and of which he probably even kept a copy in his personal library.

Similarly, Albinus' choice of a sprig of *Aster Africanus* as a suspension was certainly no coincidence. This becomes clear when we look up the plant in contemporary botanical handbooks, such as William Curtis' 1792 *The Botanical*

⁷⁶ Ruysch *Thesauri* 1724, vol. 10, p. 1-2: “VI. Phiala liquore repleta, & in ea portio epidermidis & corporis reticularis Malphicii, ex Aethiopiassa: & ut illa melius in conspectum venirent, ramum rarissimi cardui minimi Alpini (qui objectum ad vitri parietem premit) addidi.”

⁷⁷ Ruysch, 1744, p. 1276: “De I. Fig. van de I. Tafel. Verbeelt ons een droog glas, waar in een Ceylons vogeltje gevonden werd, zittende op de kleinste distel van Prosp. Alpinus.”

⁷⁸ Alpinus 1718 (1591), p.180.

Magazine [Ill. 43]. He lists the synonyms for *Aster Africanus* and starts his article on it with the words:

*'Linneaus has given to this charming annual the name of elegans, on account of the great **beauty of its flowers**, the florets of the radius being of a most brilliant purple, and those of the disk bright yellow.'*⁷⁹

Linneaus (1707-1778) was a contemporary of Albinus, and the two met when Linneaus visited Leiden, where he published his 1735 *Systema Naturae*.⁸⁰ In his quest for beauty and elegance, Albinus chose a sprig of *Aster Africanus*, alias *Senecio Elegans*, the plant with the beautiful flowers, to mount this exceptional preparation. The glove-like epidermis of the hand, with its delicate, transparent fingers flaring out like the elongated, pointy petals of *Senecio Elegans*, hung in its phial like a beautiful flower on a stem. If anything, this preparation is the materialization of eighteenth-century aesthesis: it is both the result of the practical hands-on investigation of the senses, something which can only be done through sensory perception, and of seeking beauty and perfection in nature and sensory experience. The latter is largely tacit and only to be found in the materiality of the preparation itself: only the informed contemporary observer would notice and understand the reference to the beauty of the flowers and the name of *Senecio Elegans*.

From show-pieces to obscurity and back

Certain types of preparations enjoyed popularity throughout the eighteenth century, such as delicate epidermis preparations. In the 1799 catalogue of the Middelburg physician and collector Evert van Visvliet for example, we also find a 'sock-like' preparation of the foot of a child.⁸¹ The addition of naturalia and artificialia to preparations of human anatomy quickly disappeared though. The informed contemporary observer must indeed have understood and appreciated the references made through the use of lace and plants. However, it appears such references quickly became irrelevant, even if the preparation itself was still appreciated. More than a

⁷⁹ Curtis 1792, p. 238, hyphen mine.

⁸⁰ That Linnaeus and Albinus met appears from letters like one written by Albrecht von Haller to Linnaeus while he was in Leiden, asking him to give Albinus a sample of a plant. (Von Haller, 14 April 1737, The Linnaean correspondence, linnaeus.c18.net, letter L0182.)

⁸¹ Visvliet 1799, p. 176, no. 17.

century after Ruysch sold his collection to tsar Peter the Great, preparations with similar decorations were no longer made, but some still found their way into the Leiden anatomical collections. These preparations appear to have been valued in varying ways by the late eighteenth and early nineteenth-century keepers of the Leiden anatomical collections, father and son Eduard and Gerard Sandifort. Eduard Sandifort (1742-1814) was appointed as praelector of anatomy and surgery in October 1770 and shortly afterwards, in May 1771, was extraordinary professor for these subjects.⁸² After the purchase of the Albinus collection in February 1772, he was made ordinary professor and ordered by the university curators to write a report on how the collections should be housed and used.⁸³ He was also asked to make a catalogue of the anatomical collections, including the recently acquired Albinus collection. This catalogue, with an extensive foreword, appeared in two volumes in 1793. His son Gerard (1779-1748), appointed professor of anatomy in 1801, published a third volume covering the most important acquisitions since 1793, namely the collections of Bonn and Brugmans, which appeared in 1827. From the way father and son described the collections, it appears the importance and understanding of aesthesis in anatomy was diminishing after the turn of the century. Yet as will be seen from the following chapters, it is too easy to say aesthesis was replaced by a separate realm of the aesthetic, or that the quest for beauty disappeared from anatomical discourse entirely.

Eduard Sandifort, in his preface to the first two volumes of the *Museum Anatomicum* in 1793, notes that the collection of Wouter van Doeveren contained a number of Ruysch preparations, and although he does not mark them out in the list of preparations, he is keen on using appreciative adjectives in his descriptions. ‘Nitidissimi’, meaning very elegant or pretty, and ‘perfectissime’ are among his favourites. Interestingly, a glove-like preparation like the one Albinus described to Nesbitt, and that Ruysch described shortly in his *Thesaurus* as ‘the epidermis of the hand of a premature foetus of about four months carriage, which depicts a small glove’, seems to resurface in the van Doeveren collection as ‘Epidermis both perfectly intact and stripped from the cubit, from the hand of a four month old fetus’.⁸⁴

⁸² Molhuysen 1923, vol. VI, p. 66, 71.

⁸³ *Ibid.*, p. 78.

⁸⁴ Ruysch, *Thesaurus* III, p.46: "LVI: Een vlesje met heldere vogt waarin te zien is het Opper-velleke van een handje van een onvoldrage vrugtje van ontrent 4 Maanden dragts, 't welk een kleen

Another preparation in the van Doeveren collection, that is likely to be a preparation made or inspired by Ruysch, is the hand of a newborn child, stripped of the epidermis, holding a piece of wax-injected placenta.⁸⁵ In iconography and preparation technique, this specimen resembles the Ruysch collections much more than any of the things van Doeveren had made himself.⁸⁶ So even though Sandifort did not individually identify these preparations as possibly having been made by Ruysch, he did acknowledge their presence in his foreword, and described them with appreciation.

Something similar goes for the Albinus collections. The Albinus cabinet was purchased by Leiden University after Albinus' death in 1770 for a substantial sum, and extra cabinets were ordered for the display of the preparations by his successors, his brother Frederik Bernhard and Eduard Sandifort. More than twenty years after his death, the Albinus collection was still praised by Sandifort senior as a treasure. Sandifort recounted how the twenty-two year old Albinus lectured on anatomy in perfect Latin, illustrating his lectures with beautiful anatomical preparations that 'did not even scare the most sensitive onlookers'.⁸⁷ Sandifort was also very protective of the Leiden anatomical collections, in particular the Albinus preparations. According to the travel diary of the English botanist and founder of the London Linnean Society James Edward Smith, who visited Leiden in 1786, Sandifort was even ridiculously overprotective. Smith wrote:

*"Professor Sandifort shewed me the Anatomical Theatre, and the preparations of Albinus; the latter can be seen in his presence only. Among them are some fine things, particularly the preparations relating to the progress of ossification in the foetus, a favourite subject of Albinus; but on the whole this collection will bear no comparison with either of the Hunterian Museums. In it are a few pieces prepared by Ruysch, so celebrated in his time, which are so bad, that no London anatomist would deign to keep them."*⁸⁸

Handschoentje komt te verbeelden." / E. Sandifort 1793, Vol I. p. 104, No. XCIV. "Epidermis, ab utroque cubito atque manu foetus quadrimestris perfectissime detracta & illaesa."

⁸⁵ E. Sandifort 1793, Vol I. p. 103: "LXXIV. Cutibus & manus extrema infantis recens nati, a quibus, detracta epidermide, cutis rubet, maculis adinstar exanthematum apparentibus. Parte cutis ablata conspiciuntur musculi. Manus tenet portionem placentae, cujus vasa optime sunt impleta."

⁸⁶ See chapter 4 for more preparations by Van Doeveren.

⁸⁷ Sandifort 1793, Vol I., preface p. XXIV.

⁸⁸ Smith 1793, vol. 1, p.15.

From the early nineteenth century, the attitude towards the old Albinus and Ruysch preparations appears to have changed quickly in Leiden too. Preparations made by or in the tradition of Ruysch and Albinus were still incorporated in the collections in the early nineteenth century, but now the reasons for doing so appeared to have to do less with appreciation for particular predecessors and their skills and methods, and more with practical considerations. For example, a preparation of a child's arm decorated in Ruyschian style was probably included in the nineteenth-century Leiden anatomical collections because it was an easy and harmless way to get a good example of a severe smallpox case. [Ill. 15] The preparation of the arm and hand of a child is covered in smallpox marks, injected with red wax, decorated with a lace-rimmed sleeve, and accompanied by two sprigs of a plant.⁸⁹ It came with a part of the cabinet of the deceased Amsterdam anatomy professor Andreas Bonn (1738-1818), bought by Leiden University in 1822.⁹⁰ There is a fair possibility that this is actually a Ruysch preparation: the abundant pox marks make it unlikely that this is an Albinus preparation and the type of lace used on the sleeve is, as we have seen previously in this chapter, typical for the early eighteenth century. Finally, the iconography and materiality of the combination of wax injections, lace-rimmed sleeve, and plants points in Ruysch's direction.

Obviously Bonn could not have known Ruysch personally (Ruysch died seven years before Bonn was born), but as they both spent most of their career in the same Amsterdam anatomical circles, it is not unlikely a preparation by Ruysch was at some point given to, or bought by, Bonn. Another possibility is that the preparation was in the collection of the Amsterdam Surgeon's Company, the seller of the Bonn collection, and was for some reason listed as part of that collection. We will probably never know, as there are few records left of the transaction. Either way, the preparation ended up in Leiden in 1822 through the purchase of a part of the 'Bonn' collection. According to Gerard Sandifort, the University did not purchase the entire Bonn collection, as not all of the preparations were useful. In the preface he states:

⁸⁹ G. Sandifort, MA III, p. 354: "*CCCXXXVI. Brachium dextrum infantis, qui variolis laboravit; cernuntur recentes cicatrices variolarum. Arteriae sunt impletae unde parum rubet cutis.*"

⁹⁰ According to Elshout 1952 p. 88 the Bonn cabinet was purchased in 1819, but the university archives only contain documents that register the purchase in the year 1822 (AC2/228 uitgaand 1822, AC2/162-180: No. 161; 22 okt / 25 okt., No. 107, 2 November 1822).

“...of anatomical preparations, only those should be kept which were destroyed or damaged by time or accidents in other collections, and which are missed, and moreover, those which add to an already present series of preparations and which are considered useful to clarify science; equally from the pathological preparations only those preparations were kept that added to our collection and showed the traces of disease in parts of the body.”⁹¹

The rest of the Bonn preparations, physiology and pathology specimens, mainly of diseased bones, were shipped off to Ghent in Belgium. In the listing of preparations in the *Museum Anatomicum*, the preparation is described as ‘The right arm of an infant, who battled the pox; freshly wasted scars are to be seen. Arteries are injected red and so can be seen a little in the skin.’ So the importance of this preparation for the Leiden collection becomes clear: it was about the relatively fresh pox scars that could be seen on it. No mention is made of the lace-rimmed sleeve and the pieces of plant that accompanied this specimen in its phial. Although it is not unlikely that at least some learned men in the early nineteenth century still easily grasped the meaning of such additions, they were not deemed worth mentioning – or removing, for that matter. In the course of the nineteenth century, the appreciation of the scientific community for elaborately decorated preparations such as Ruysch’s would only diminish further.⁹² New ideas about scientific standards rendered them archaic and obsolete, something discussed by Hieke Huistra elsewhere.⁹³ His work did remain a source of inspiration for artists and writers though, as an Italian dialogue on the experience of dying between ‘Ruysch and his death’ from 1827, and a 2008 Dutch novel inspired by Ruysch and his work, show.⁹⁴

Nowadays, the Ruysch and Albinus preparations are once again considered top pieces by their home institutions, the St. Petersburg Kunstkamera and the Leiden University Anatomical Museum and Museum Boerhaave. Recent events have made it clear that these collections will always thread the fine line between elegance and disgust, but it is exactly that slightly ambivalent nature which makes them such fascinating material.

⁹¹ G. Sandifort 1823, *Introductio* p. 2.

⁹² Hendriksen, Huistra & Knoeff 2013 (forthcoming).

⁹³ For more on this topic see Huistra 2013 (forthcoming).

⁹⁴ Leopardi 1827, p. 163-171, Rascha Peper, *Vingers van Marsepein*, 2008.

Conclusion

From this material and contextual analysis of the Albinus and Ruysch preparations it appears that aesthetics pervaded all their work. On the one hand, without continually explicitly stating so but with subtle visual references, Ruysch and Albinus continuously sought to express beauty and elegance in their work, fighting possible responses of disgust with elegance and demonstrations of skill. On the other, they both strongly believed that anatomy and physiology can only be known through hands-on experience, experiment and sensory perception. To some extent these epistemic parameters led to similar visual features in their preparations: practical skill and sense of style were used to cover nasty stumps with fashion-conscious, 'naturalistic', and elegant lace-rimmed sleeves; exotic plants were used as suspension and reference to the sophistication and erudition of the makers; and body parts were combined in such a way that an extra layer of meaning was literally added to the preparations.

Yet although closely connected in their material and visual language, the preparations of Ruysch and Albinus are also distinctly different in certain respects. Both anatomists used their practical skills and sense of perfection to create stable, tradable commodities from otherwise perishable, evanescent human bodies, but Ruysch did this in a much more mercantile spirit than Albinus. Aesthetics led Ruysch to publish and make preparations even of subjects that were potentially scandalous, such as the external female genitalia. For Albinus, it meant studying nervous impulses and the nervous system extensively – which to him included the sensory organs. The differences in decoration and display between the Ruysch and Albinus preparations can partly be explained by their respective personalities, but more importantly they reflect changing fashions, both in epistemology and society more generally. In the case of the lace decorations the changes are very literally related to popular dress; when it comes to the use of plants as symbols it is more about epistemic fashion. Although aesthetics as such, the quest for beauty and the emphasis on practice and sensory experience, did not change much, ideas of what was beautiful and elegant did. These changes can help explain why aesthetics was rather stable throughout the long eighteenth century, but that the objects that resulted from it can seem so vastly different.

The close reading of the materiality of these preparations and their reception history has also confronted us with another pressing issue. In order to truly grasp the

beauty of these preparations, we have to get an idea of what beauty was to the eyes of their original beholders. That can only be done through combining an analysis of contemporary discourse with studying their materiality. The fact that a precious preparation, such as that glove-like hand, has deteriorated beyond repair in the past decades, in spite of huge curatorial efforts to maintain objects like these, is a vivid reminder of the reality that these preparations will not last forever. Fewer will remain over the years, making it increasingly difficult to retrieve and understand their original context and meanings. Although no image can ever replace the physical object, having images of disappeared objects is better than not having any visual documentation of them at all. Rather than letting historical anatomical collections quietly wither away, we should try to document them and learn from them while we can. The virtual Ruysch museum project of the *Kunstkamera* is a wonderful example of how this can be done.

Finally, notwithstanding their turbulent reception history and the ongoing moral and conservation issues these collections will stir up, the specimens that now constitute the eighteenth-century Leiden anatomical collections tell an extraordinary tale: that of a combined quest for beauty and perfection in anatomical and physiological knowledge through experiment and observation. These preparations are the result of aesthesis, which combined observation and hands-on experiment with a largely tacit search for beauty and perfection. By analysing their materiality, that knowledge can be accessed once again, in a way that would be impossible with text as our only source. As will appear in the subsequent chapters, although aesthesis would play an important part in the making of anatomical preparations in Leiden throughout the entire eighteenth century, the idea of what was a beautiful, perfect, elegant preparation certainly did change.

