PREPARATIONS ON THE MOVE

Cover design: Stephan Petermann

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The Leiden Anatomical Collections in the Nineteenth Century

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My last thanks are to Thijs Kinkhorst. His eye for quirky detail makes him my all-time favourite proofreader.

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List of Abbreviations

AC2	Leiden University Governors papers, 1815–1877 (*Archief van Curatoren, Universiteit Leiden, 1815–1877*)
AC3	Leiden University Governors papers, 1878–1953 (*Archief van Curatoren, Universiteit Leiden, 1878–1953*)
ASF	Leiden University Senate and Faculty Archives (*Archieven van Senaat en Faculteiten Universiteit Leiden*)
BA	Burial Act (*Begrafeniswet*, 1869)
BPL	Leiden University *Bibliotheca Publica Latina* collection
HEA	Higher Education Act (*Wet tot Regeling van het Hooger Onderwijs*, 1876)
LUMC	Leiden University Medical Center
ML	Medical Laws (*Geneeskundige Wetten*, 1865)
RCS	Royal College of Surgeons (of England)
RCSE	the archives of the Royal College of Surgeons of England
RDHE	Royal Decree on Higher Education (*Organiek Besluit Hoger Onderwijs*, 1815)
Reg. 1879	Regulations on the management and use of the collections, institutions and teaching aids at the State Universities (*Reglement op het beheer en het gebruik der verzamelingen, inrigtingen en hulpmiddelen voor het onderwijs aan de Universiteiten des Rijks*, 1879)

In the footnotes, organizations that are the authors of cited works are identified by the common abbreviated form of their names; full names can be found in the bibliography entries.

Note on Translations

Unless stated otherwise, all translations are my own. Transcriptions of the foreign-language texts that I have quoted in English can be found in Appendix II.

Prologue

In this book, death is not the end. It is not even the beginning – we enter the story weeks, months, years after the body went cold. It is the nineteenth century, the age in which institutional medical collections flourished, and anatomists have already dissected the body, turned parts of it into anatomical preparations and added these preparations to their institutions' collections. These collections often contained thousands of body parts. Injected vessels, macerated bones, bottled organs, some stuffed animals – medical institutions kept them all. And they still do. In many present-day medical faculties, historical anatomical collections linger. Contrary to most other nineteenth-century university collections, these have never been replaced or thrown out, and they did not end up in public museums for the history of science and medicine. What makes anatomical collections different? Why were they not discarded, but kept? Did they continue to be used in teaching? Did medical researchers hold on to them to learn more about the human body? Were they, perhaps, some sort of tourist attraction? Could they be a status symbol? And when did they finally lose their use – if ever? This book will answer these questions by exploring the trajectory of anatomical preparations *after* they entered (institutional) collections.[1] To do so, it will closely investigate one of these collections: the nineteenth-century Leiden anatomical collections.

Today, historical anatomical collections pose several management problems, not just in Leiden, but in other medical institutions as well.[2] I want to point out two of them.[3] First, the question how and to what extent these collections should be presented to the general public; second, the question where these objects belong, in medical faculties or in historical museums.

In Leiden, the collections are hard to access these days. They are housed in the Anatomical Museum in the Leiden University Medical Center (LUMC), which is open to the general public two weekends a year only.[4] This is, at least partly, due to moral concerns, as is implied in the following quotation from two Leiden medical professors involved in the management of the Anatomical Museum:

> A collection of human material has a morally complex nature, and normative demands are made with regard to managing and displaying such a collection. For example, the material is

[1] On the lives of objects after they enter a collection, see also Alberti 2005a.

[2] Throughout Europe, many historical anatomical collections are still kept in medical institutions, not in museums for the history of science and medicine. As this book shows, this is because they continued to be useful in medical research and teaching for a long time. As this book also shows, these collections are often invisible to non-medical audiences, which makes it hard to provide an overview. At the moment, a European anatomical collections network is being established, see Corradini and Bukowski 2012.

[3] These are not the only two. Another recurring issue, for example, is individuals or groups claiming the return of their ancestors' body parts. I do not discuss these requests and the debate on how to deal with them in this book, but for the position of the Leiden University Medical Center on returning human remains from their collection, see Engberts and Hogendoorn 2010.

[4] LUMC, 'Anatomisch Museum'

usually not freely accessible to the public.[5]

Many anatomical collections are more accessible than Leiden's, but on average medical museums are much harder to enter than for instance art museums. The debate on whether or not this is a good thing is ongoing. Everyone agrees that we should decide carefully on whether or not to display (human) anatomical preparations, especially because it is almost never clear whether or not the people involved gave permission for keeping, let alone openly displaying, their remains. Nonetheless, some argue that preparations can teach us about our body and our history, both medical and cultural (in the case of anthropological remains, our colonial history in particular). The general public should therefore be able to come and see historical anatomical collections. Others argue for a more restrictive access policy, often because they consider this the only way to respectfully deal with these human remains. Other things that may factor into their decision are personnel and financial matters, and the wish to allow students to use the collections in relative peace and quiet.[6] Those in favour of restricted access are usually willing to admit students and medical researchers to the collections, because they can use the collections to enhance medicine; lay visitors, who come 'just' to look at the preparations, are believed to have (almost) no place in the medical institutions' anatomical museums. Sometimes only a particular kind of preparations is kept away from the public, for instance pathological ones, because they would be too disturbing to look at, or fetal preparations, which, especially in the US, attract controversy because they are linked to the abortion debate.[7]

A second issue involved in the management of historical anatomical collections is the question about where they belong. As said above, the collections are often housed in medical institutions – but would they not find a better home in museums for the history of science and medicine? In 2012, several historians (myself included), artists and museum curators have expressed their fears about the future of collections housed in medical institutions in the Leiden Declaration on Human Anatomy/Anatomical Collections.[8] They fear that the collections in these institutions might not always receive proper care, especially if institutions no longer use their collections in teaching or research. Yet, even if the

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[5] Engberts and Hoogendoorn 2010, 26

[6] For more extensive overview of the debate on whether or not to display (and keep) anatomical collections, see Alberti 2011, 196–213, which focuses on the UK. For (medical) historians on different sides in the debate see for example Hendriksen 2012, 196–198 and Morgan 2009, 224–246 (both in favour of opening up anatomical collections), and MacDonald 2006, 183–189 and Richardson 2000, 416–418 (both more critical on displaying (and keeping) anatomical preparations). Specifically on display of anthropological preparations, see for instance Van Duuren 2007, and Fabian 2010, 217–220. Medics often 'voice' their opinions by either allowing or refusing lay visitors to their institutions' anatomical collections. Last, although he does not display a historical collection, it has become impossible to ignore Gunther von Hagens when discussing issues on displaying human remains. No historical collection attracts as much controversy and outrage as his full-body plastinates, positioned as if engaging in activities usually reserved to the living – including playing poker, riding horses and having sex. Literature on the debate surrounding Von Hagens is rich, see for example Bogusch, Graf and Schnalke 2003; and Jespersen, Rodriguez and Starr 2009.

[7] On the restricted display of fetal preparations in the US, see Morgan 2009, 224–246.

[8] The declaration is available at <http://www.hum.leiden.edu/research/culturesofcollecting/news-events/leiden-declaration.html>; see also Knoeff 2012.

collections are not in use, medical institutions are not always willing to part with them: there seems to be a tendency to keep them inside the medical faculties, more than, for example, physics laboratories hold on to their nineteenth-century instrument collections.

This book does not solve today's problems, but it does (help to) explain why they exist. All issues described are related to the capacity of anatomical collections to remain useful in medical research and teaching for a long time. That is why they linger in medical institutions instead of being moved to historical museums. It is also, as we will see, why lay visitors disappeared from the Leiden anatomical collections, which happened in the nineteenth century. How, then, can we explain this prolonged use in research and teaching? It is not self-evident, and even in the history of medicine it is not always acknowledged. This book suggests that, to fully understand it, we need to adjust our ideas about anatomical collections. Anatomical collections are still often seen as static entities, intended to be classified and arranged by their curators, and to be looked at from a distance by their audiences. I propose that we should see them as 'dynamic' entities, meaning that they were not just meant to be looked at, but also to be actively used.[9] The preparations in the collections could be methodically arranged and viewed together, but they could also be taken out of the arrangement (and often out of the museum) to be handled individually. Preparations were constantly on the move: from storage box to dissection table to glass jar to anatomical museum to lecture hall to laboratory bench to demonstration table to students' hands and back again. And they not only moved around, they also changed: preparations were taken out of their jars to be re-examined, reinterpreted and even redissected. Anatomical collections were full of life – that is this book's main message.

To get this message across, I will analyse how the nineteenth-century Leiden anatomical collections were used by four different groups: students, researchers, lay visitors and university governors. Of course, not everything that applies to Leiden, applies to the many other nineteenth-century institutional anatomical collections as well – not even to the other Dutch ones. However, many of the practices and developments I discuss *did* take place in other places as well, sometimes later, and often earlier than in Leiden. I will demonstrate this throughout the book with examples from other European collections, both continental and British.[10] The book's main insight – that anatomical collections should be seen as

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[9] Sam Alberti has also used the term 'dynamic entity' to describe anatomical collections, but his use of the term differs from mine. For him, seeing a collection as a dynamic entity means seeing it as 'a set of relations (between patients, practitioners, collectors, curators, and audiences) enacted through material (including not only body parts but also models, pictures, and texts).' (Alberti 2011, 7) This might indeed be a useful way of viewing anatomical collections, but it is not what I propose here. I have nonetheless decided to use the term 'dynamic entity' because it clearly constrasts my view with the 'static' view and because Alberti does not use the term extensively or systematically in his book, so this footnote should be enough to avoid confusion.

[10] I selected these examples partly based on availability of secondary literature and primary sources, which means that some not very well documented collections may have received less attention than their historical relevance justifies. To a certain extent, this goes for the collections of the other Dutch universities, Groningen and Utrecht, but I have tried to include examples from them as much as possibles. Having said this, I have no reason to assume my main conclusions would have differed if I had been able to take these collections fully into account.

dynamic entities – can be applied not only to other places, but also to other periods, as will be demonstrated in the epilogue.

Having made clear what this book is about, I have three things left to do before we move on, or rather back, to nineteenth-century Leiden. I must first clear up a common misconception about anatomical collections, define some key terms and provide an overview of the structure of this book. That is what the remainder of this prologue will do. Once it is done, the story of the nineteenth-century Leiden anatomical collections can begin.

Anatomical collections in nineteenth-century medicine

In history of medicine, the nineteenth century is famous for two things: the birth of the clinic and the rise of the laboratory. However, it was just as much the age in which institutional anatomical collections flourished – a fact often overlooked by historians of medicine focusing on the aforementioned birth and rise.[11] At best, historians have simply neglected nineteenth-century anatomical collections, as is witnessed by general overviews of the period, such as introductory textbooks to the history of medicine.[12] At worst, they explicitly state that anatomical collections became redundant and were replaced by hands-on learning, clinical teaching and laboratory research.[13] In the last decade, anatomical collections have become an increasingly popular topic of historical research, and historians like Erin McLeary and Samuel Alberti have clearly shown that anatomical collections did not disappear but were used in medical research and teaching throughout the nineteenth century.[14] So much so, that Jonathan Reinarz has suggested renaming the century 'the age of museum medicine'.[15] Which would not solve the problem, of course: it only turns it around by overrating museums and neglecting not only the clinic and the laboratory, but also collections outside museums. The question is not: clinic and laboratory *or* collections? It is: how could the old collections function in new spaces like the clinic and the laboratory?[16]

In these new spaces, practices like bedside teaching, dissecting, practical training and experimenting took centre stage. It has often been assumed that anatomical collections were of no use in these practices because preparations supposedly are static objects that are not to be touched, handled, dissected or experimented on. Similar statements have been made

[11] As has been noted before. See in particular Pickstone 2000, 73.
[12] See for example Bynum et al. 2006; Bynum and Porter 1993; Jackson 2013.
[13] See for example Wachelder 1992, 100–102 on the Dutch situation.
[14] McLeary 2001, Alberti 2011. On nineteenth-century anatomical collections, see also Burmeister 2000, Close Koenig 2011, Fröber 2003, Matyssek 2002, Reinarz 2005 and Sappol 2004. On anatomical collections before and after the nineteenth century, see for example Angel 2012, Chaplin 2009, Hallam 2013, Hendriksen 2012, Jones 2002, Margócsy 2011, Morgan 2009, and Schultka and Neumann 2007.
[15] Reinarz 2005.
[16] An answer to this question also contributes to solving a problem raised by Nicholas Jardine: to what extent were the new laboratory practices extensions and transformation of existing practices like 'the practices of the anatomy theatre and its preparation room' – which included building and using collections for research and teaching. (Jardine 1992, 318)

about other types of collections, in particular natural history collections.[17] Scholars have also formulated the argument in more general terms by claiming that collections lost their prominence due to a new style of thinking, or way of knowing. Collecting, arranging and classifying, as they have stated, was surpassed by experimenting. The former combination of practices goes by different names; I will call it a 'museological' way of knowing, because it is often, although not necessarily, connected to museums. In museological ways of knowing, objects are collected for the 'whole' of the collection; here, the added meaning objects acquire in a collection is considered essential to producing knowledge.

The argument for the decreasing importance of anatomical collections in medicine may seem reasonable and convincing, but there is one problem: anatomical collections did not disappear. On the contrary, their numbers exploded. In Leiden thousands of preparations were added to the university collections, and serious amounts of time, money and space were invested in the collections. The same happened in other European cities.[18]

Two things are important in understanding how anatomical collections could flourish in the age of the clinic and the laboratory. First, museological ways of knowing never disappeared. John Pickstone, A.C. Crombie and Chunglin Kwa have all written about ways and styles, and they carefully avoid the claim that new ways of knowing fully replaced old ones.[19] When new ways of knowing appeared, old ones remained in use, although they might become less prominent – a subtlety that unfortunately often gets lost when other researchers apply the work of Pickstone, Crombie and Kwa. Furthermore, Pickstone has argued that early in the nineteenth century a whole series of disciplines emerged for which a museological way of knowing was central.[20] One of the areas of study that employed this way of knowing was comparative anatomy. Comparative anatomists compared the structures of different animals, including man. We tend to think of their work as part of natural history or, later, of biology. However, almost all medical collections in nineteenth-century Europe contained animal preparations. Comparative anatomy was an essential part of nineteenth-century medicine, something I will return to in more detail in chapter 2. Since comparative anatomy belonged to medicine, the museological way of knowing underlying it did so as well. This explains in part why anatomical collections remained relevant in nineteenth-century medicine.

But it is not the full story. Collections were used outside comparative anatomy and similar ('museological') fields. The Leiden physiological laboratory, for example, housed a collection, although the new physicalist orientation transformed physiology into a discipline based on an experimental way of knowing. This brings us to the second of the two

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[17] Lynn Nyhart has written about the view that laboratories replaced museums in natural history, and why this view is wrong. (Nyhart 1996, 435–429)

[18] See the literature mentioned in note 14 above. For an impression of nineteenth-century Dutch collections outside Leiden, see *Binnenste buiten* 2010, Haneveld 1978a, Le Grand 2001, De Rooy and Van den Boogaard 2009, and SAE 2006.

[19] Pickstone 2000, Crombie 1994, Kwa 2011

[20] Pickstone 1994

important things mentioned above: collections are not bound to museological ways of knowing. Pickstone addresses this issue briefly, explaining that experimental styles of biology and medicine needed data that had to be collected and stored.[21] However, it is not clear why these data collections needed in the new medicine should also include collections of anatomical preparations – at least, not as long as we consider collections static entities. As soon as we start seeing anatomical collections as dynamic, it becomes clear immediately. Preparations could be touched, handled, dissected and experimented on – just what the doctor ordered in the new, hands-on practices in the laboratory and the clinic. Therefore, the preparations and the collections they constituted fitted perfectly within the new, experimental way of knowing.[22]

Together these two observations – museological ways of knowing did not disappear and collections are not bound to museological ways of knowing – explain why anatomical collections flourished in what is often seen as the age of the clinic and the laboratory.

Collections, museums, cabinets

Many of the handling practices took place outside museums; what is more, certain types of collections never even made it into a museum. Therefore, we need to be careful in our use of the terms 'museum' and 'collection'. Often, even in the history of anatomical collections, the two terms are used interchangeably. Yet collections and museums are not one and the same, nor are they inextricably linked. As mentioned above, nineteenth-century anatomical collections were used regularly in spaces other than museum buildings. To grasp this, we need to separate both concepts and use them carefully. This is tricky, not in the least because our nineteenth-century actors often use these words (together with 'cabinets') ambiguously. To avoid confusion between analytical concepts and actors' categories, I will use this section to explain how the words 'collection', 'museum' and 'cabinet' were used in nineteenth-century Leiden and to define how I use the terms in this book.

In nineteenth-century Leiden four different words were used to describe the anatomical collections and the buildings and institution that housed them: *verzameling*, *collectie*, *kabinet* and *museum*. *Collectie* and *verzameling* are synonyms; *verzameling* was used more often in the nineteenth century. I translate both words as 'collection'. As I understand the concept, a 'collection' is a large amount of material entities, gathered and kept together. The entities have been consciously selected (by the 'collector' – this can be a human being or an institution) because they possess a certain value. This distinguishes a collection from other large amounts of objects: objects in a collection are selected for a reason. Reasons for selecting objects for a collection vary widely: it can be because they are rare, because they are of artistic or historical importance, or because they can be used for a certain purpose.

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[21] Pickstone 2000, 75–76

[22] Collections used in non-museological ways of knowing are valued *not* primarily for the 'whole', but for their individual parts.

Whatever the reason, all objects in a particular collection are selected for that reason. Hence, objects in a collection always tend to resemble each other: they all share the characteristics connected to the reason for which they were selected.

When an object first enters a collection, it changes. Being part of a collection adds a new layer of meaning to the object. In the collection the object is part of a 'whole'.[23] This whole is more than the sum of its parts. A collection's value, in other words, is not simply the added value of its objects; it is more. Yet – and this is crucial – this 'more' is not necessarily the purpose or reason for bringing together the parts, for collecting the objects. Body parts, for example, are not necessarily collected to be part of an orderly arranged anatomical museum collection – a setting which, as we will see, values the whole over the parts. There is another, more prosaic reason for collecting them: bodily material is scarce. You need to catch it while you can and then store it away for future use. This future use does not always depend on the extra meaning body parts gain from belonging to a collection. Note that the extra meaning nonetheless exists: the body parts constitute a collection, and hence they have to be stored and arranged, and they are placed together – these things alter their meaning and add value. However, the added value can be unintended, or at least the (future) use does not require it.

Kabinet and *museum* are more ambiguous words than 'collection'. Nineteenth-century actors used them inconsistently. In 1864 the *Nieuw woordenboek der Nederlandsche taal* ['New dictionary of the Dutch language'] defined *museum* as follows:

> Museum, n.[neuter] ([pl.] …ea), building —, institution dedicated to art or science; art cabinet, cabinet (mainly) of objects of natural history etc.[24]
>
> (Museum, o. (...ea), gebouw —, instelling aan kunst of wetenschap gewijd; kunstkabinet, kabinet (voornamelijk) van voorwerpen der natuurlijke historie enz.)

Museum could refer to a collection or to the institution housing the collection (both meanings are implied in *kabinet* in the second part of this definition), but it could also mean 'building or institution dedicated to art or science'.[25] This building or institution did not need to own a collection, nor did it need to be open to visitors. Towards the end of the nineteenth century this meaning disappeared: in 1908 the lemma *museum* in the *Woordenboek der Nederlandsche taal* (*WNT*, 'Dictionary of the Dutch Language'), calls it 'now obsolete in our language'.[26] In the period discussed in this book, however, *museum* was still regularly used in this way. In England this use seems to have disappeared before the nineteenth century already: the *Shorter Oxford English Dictionary* (*SOED*) claims it was last used this way in

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[23] On what it means for an object to be part of a collection, see for example Pearce 1992.
[24] Calisch and Calisch 1864, 813
[25] For lack of a better word, I use 'science' to translate the Dutch *wetenschap*, although the latter has a broader meaning. It is similar to the German Wissenschaft
[26] *WNT* <http://gtb.inl.nl>, s.v. 'museum' (accessed 18 March 2013)

the late eighteenth century.[27] Nonetheless, 'museum' remained an ambiguous term in nineteenth-century English: like the Dutch equivalent, it was used both for a collection and the institution housing this collection.

'Museum' still carries this double meaning, as the definition in the *Oxford English Dictionary* (*OED*) reveals:

> A building or institution in which objects of historical, scientific, artistic, or cultural interest are preserved and exhibited. Also: the collection of objects held by such an institution.[28]

These days, 'museum' can refer to a building, to an institution or to the collection housed within this building or institution. Without further explanation, the term quickly becomes confusing when used to discuss the relationship between museums and collections. Therefore, when I use 'museum' as an analytical category, it *never* refers to a collection. Also, again to avoid confusion, whenever possible I use 'museum' to refer to the institution and 'museum building' to refer to the structure housing this institution.

With these modifications, I have reduced the *OED* museum definition to: 'an institution in which objects of historical, scientific, artistic, or cultural interest are preserved and exhibited.' Exhibition is crucial in museums. The objects in a museum (i.e. the museum collection) are *on display*. They are meant to be observed by an audience. However, this audience does not necessarily refer to 'the general public': it may consist of, for instance, students or researchers instead of lay visitors. Scholars regularly assume that being open to a broad audience (more or less anybody who can afford the entrance fee) is a key characteristic of a museum. As Mieke Bal summarized it, 'What is a museum for if not for [lay] visitors?'[29] Indeed, most present-day museums are open to non-specialist visitors, but some institutions – and anatomical museums are among them – are called 'museums' and yet have a restricted access policy. The Leiden Anatomical Museum offers a case in point, as do the Wellcome Museum of Anatomy and Pathology at the Royal College of Surgeons of England and the Gordon Museum of Pathology at the King's College medical campus, both in London. All three of them are described as 'museums' and yet they are only open to specialist visitors: medical students or researchers.[30] In the nineteenth century, museums with restricted access were more common – in fact, the idea of a museum as an institution open to all only emerged in this century;[31] hence the changing meaning of the term during this century. So, when I use the term 'museum', I refer to an institution where exhibiting is central, but where the audience did not necessarily consist of non-specialists.

Kabinet, which I translate as 'cabinet', was used even more ambiguously than *museum* in the nineteenth century. It could refer to an institution housing collections, to a building,

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[27] *SOED* 6th ed., s.v. 'museum'. On early modern use of the term 'museum' and its French equivalent '*muséum*', see Findlen 1989 and Lee 1997.
[28] *OED* 3th ed., <http://www.oed.com>, s.v. 'museum' (accessed 18 March 2013)
[29] Bal 1996, 208
[30] RCS, 'Information for visitors'; KCL, 'The Gordon Museum'; LUMC, 'Anatomisch Museum'
[31] Bennett 1995

room or cupboard in which collections were kept, or to a collection itself. All uses were common in Leiden. Regularly, multiple uses occurred in the same text, even if this text was a national law.[32] I do not use 'cabinet' as an analytical category. Quotations from primary sources aside, it only appears in this book as part of the proper name 'Anatomical Cabinet' (*Anatomisch Kabinet*), which I use to denote a particular Leiden institution. In the nineteenth century, this institution was known under many names, for instance Anatomical Cabinet, Anatomical Museum, Cabinet of Anatomy and Anatomical-Physiological Cabinet. To keep things as clear as possible, I consequently use 'Anatomical Cabinet', from time to time shortened to Cabinet (with a capital C). The Anatomical Cabinet housed the university's principal anatomical collections.

This brings me to the last word that needs clearing up before we move on to the position of collections in nineteenth-century medicine: 'anatomical'. I use it broadly, which means that 'anatomical collections' contain not just preparations of 'general' or 'healthy' anatomy, but also of pathological and comparative anatomy, both macroscopic and microscopic. 'Comparative anatomy' can mean many things, but we will come to that later (in the chapter on researchers). For now, it should be interpreted as involving the comparison of human and animal structures. In other words: 'anatomical collections' contained animal preparations as well. Lastly, in this book I am primarily concerned with anatomical collections of *preparations*, not of *models*, which, as we will see in chapter 2, are definitely not the same thing.[33]

Four audiences and an epilogue: the structure of this book

This book asks what happened with prepared body parts after they were added to the nineteenth-century Leiden anatomical collections. How were they used? The short answer is: in multiple ways. The collections had many audiences, and each of them used the collections in its own way. Therefore, the four chapters in this book each centre on a different audience: first students, then researchers, followed by lay visitors, and, to conclude, university governors. Each audience used the collections differently, but they all have in common that they should be understood as active *users*, not as observers or passive

[32] See for example the 1815 Royal Decree on Higher Education, which will be discussed in (much) more detail further on in this book. (RDHE 1815)

[33] On anatomical models, see Alberti 2009a, Hopwood 2002, Hopwood 2007, Maerker 2011, Mazzolini 2004, Messbarger 2010, Pirson 2009, Schnalke 2004. Also not the same are, or at least were, *preparations* and *specimens*. Nowadays, the word 'specimen' is often used to denote preserved body parts, but in the nineteenth century, this was not the case. The exact usage is hard to pinpoint, but it seems that roughly, 'preparations' were preserved body parts whose making involved dissection, whereas 'specimens' were things like stuffed animals, displaying the outside of the body. See Chaplin 2009, 101–102 on the early modern use of both terms, which does not differ much from its nineteenth-century counterpart.

recipients.[34] This does not mean the audiences could alter the collections as they saw fit. As we will see, both non-medical audiences stopped using the collections in the second half of the nineteenth century because they were no longer able to interpret them, to relate to them, or to present them as they wished.

The first two chapters discuss medical audiences: students and researchers. Together, they flesh out the view of anatomical collections as dynamic entities. Chapter 1 shows how students *handled* preparations instead of just looking at them, as well as how this made preparations relevant in all teaching spaces, not just in museums. Chapter 2 analyses how researchers not only handled preparations, but handled *the same* preparations for decades on end, continuously reinterpreting them. I use the work of philosopher and historian of biology Hans-Jörg Rheinberger to explain how preparations enabled this reinterpretation.

These chapters serve to show not only *how* students and researchers used preparations, but also *that* they used them the whole period of the nineteenth century. Therefore, the chapters have no strict periodization within the nineteenth century. This is completely different in the last two chapters, on the non-medical audiences of lay visitors and university governors. Here, the nineteenth century is strictly separated into two parts: before and after 1860, the year in which the university's main anatomical collections moved to a new location, an educational complex including teaching laboratories for the natural sciences. The move was a consequence of the prolonged use of the collections in research and teaching.

Chapter 3 shows that after the move the anatomical collections ended up in a location that was hard to approach and into an arrangement that was hard to interpret without a medical background. Therefore, lay visitors disappeared from the Anatomical Cabinet. In chapter 4, we see that the university governors also stopped using the collections. Before the move, they had employed the collections as a status symbol, because they embodied the university's glorious past. But in the new arrangement, the preparations lost the connection to their eighteenth-century makers and therefore, their use as a status symbol.

The book ends with an epilogue in which I reflect on the usefulness of seeing anatomical collections as dynamic entities not just in nineteenth-century Leiden but in other times and places as well, including our own.

But for now, we leave the twenty-first century and go back to the early nineteenth, where our story begins properly, with a severed head.

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[34] In recent history of science, audiences are usually understood in this way – as active users, appropriating collections (or, for instance, books, scientific instruments or theories) and adding their own experiences, knowledge and ideas. See also Secord 2004. On understanding (lay) audiences of specifically anatomical collections as active users, see Alberti 2007 and Knoeff 2011.

Chapter 1. Take the Lid off before Use

How students handled anatomical preparations

One of the most famous gothic stories in Dutch literature centres on a Leiden medical student and his finest anatomical preparation. The story starts in the depths of a stormy night. The student, as pale as the moonlight, breaks into the anatomy building. With a smelling bottle he revives the body of a hanged man in order to steal the man's head while it – he? – is still alive. The student quickly connects the head to a complex of bottles, pouches and wires. He then gags this living preparation, brings it to his room and stores it behind his bookcase. Late at night, when no one will come, the student takes out the head. He interrogates it; he microscopically examines the tears it sheds out of despair. One night, the head bites the student's finger, just as the police arrive at his door. The student pulls the head from the apparatus to release his finger and jumps through the window. The head was found dead on the floor the next morning; the student was never seen again. The only trace is a mysterious book, present in some old libraries: *Caput sedes animi. Disquisitio, qua probatur artem fungi posse vice corporis, dummodo caput supersit* ['The head as seat of the soul. An investigation, with which it is proven that art[1] can execute the duty of the body, as long as the head is still alive']. The author remains unknown until today.

The story was written by Alexander Verhuell (1822–1897). It first appeared in the Leiden student almanac of 1847; it has been reprinted ever since.[2] Although Verhuell suggests the story was set long before his time,[3] it reflects nineteenth-century medical research questions and practices – and their ultimate, often feared consequences.[4] Many other gothic horror stories did so as well: Mary Shelley's *Frankenstein* of course, but also the work of Jules Janin and Georges Balzac, from whom Verhuell borrowed several motives.[5] Galvanism and mesmerism are just two of the contemporary theories that informed these writings. Among the reflected practices are body snatching and dissecting, but also student use of anatomical preparations – the subject of this chapter. Verhuell's student engaged with his treasured head just like other medical students at the time worked with their preparations: in an active, hands-on and emotionally detached manner, question-driven, outside the medical museum.

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[1] *Ars*, art, can be interpreted as either 'the art of medicine' or '(the result of) human or technical skill, as opposed to nature'.

[2] Verhuell 1847a. The most recent reprint I have found was De Wijs, Van Boven and Praamstra 2010, 101–108. Other reprints include Verhuell 1853, 96–107; Bervoets 1983, 7–13; Van Zonneveld 1983, 160–166; Hermans and Van Zonneveld 1985, 53–57; Appel and Ross 2007, 616–621.

[3] Bervoets 1982, 33

[4] On public fears of medical practices see for example Richardson 2000; Richardson 2006; Stern 2006.

[5] Jan Bervoets has discussed the influence of Janin and Balzac on Verhuell's work. Bervoets 1982, 32–33. Marshall 1995 is a good starting point into the research done on gothic horror and the history of anatomy. Like most of this research, it focuses on Frankenstein. See also Morton 2002, 82–89.

Most works on nineteenth-century medical education ignore the use of anatomical preparations in teaching.[6] It is regularly stated or implied that the dissection hall and the teaching laboratory made anatomical teaching collections redundant. This view has been challenged by scholars like Erin McLeary, Samuel Alberti and Jonathan Reinarz. They have convincingly argued that the medical museum and its anatomical collections remained of major importance in teaching throughout the nineteenth century, at least in the US (McLeary) and the UK (Alberti, Reinarz).[7] This chapter builds on their work. Extension of the work of Alberti, McLeary and Reinarz is worthwhile for two reasons. First, they focus on the Anglo-Saxon world: hence, analysing the Leiden teaching practices adds to their work geographically. Second – and more importantly – McLeary, Alberti and Reinarz pay only limited attention to the handling practices mentioned above. Since they focus on *museum* collections, student use of anatomical preparations *outside* the museum falls beyond their scope. Yet, non-museum use encompassed most of the handling practices. We will see that students needed preparations to learn their basic anatomy, become familiar with rare pathological conditions, study phenomena invisible in a fresh corpse, answer research questions, and get used to working with dead bodies. To achieve these goals, students actively engaged with anatomical collections – instead of just looking at the preparations, they *handled* them. Collections were not static entities meant to be viewed from a distance; they were dynamic, to be used in a hands-on manner. Once we start seeing anatomical collections and the preparations they contain in this way, we can begin to appreciate how they remained in use in nineteenth-century teaching practices, even though these practices themselves changed.

I will first discuss nineteenth-century Dutch medical education and then demonstrate how students worked with anatomical collections not just in the museum, but also in the lecture room, the dissection hall, the clinic and the laboratory. I will then analyse the differences between display collections and handling collections.

Nineteenth-century medical education

On Tuesday 20 August 1833, medical student Jan Bastiaan Molewater (1813–1864) started a diary.[8] He chose that particular day because he was 'in a fairly calm, diligent mood and reasonably pleased with myself'.[9] That did not happen very often, at least not on the days he wrote in his diary. Many of the entries are self-reproachful. Despite recurring resolutions, Molewater is not able to get out of bed early, study as planned and stop sleeping with the

[6] Examples of standard works that neglect medical museums and anatomical collections are Bonner 1995; Ludmerer 1985; Nutton and Porter 1995. On the lack of attention for anatomical museums and collections, see also Reinarz 2005, 149; McLeary 2001, 6–11; Pickstone 2000, 73.
[7] McLeary 2001; Alberti 2011; Reinarz 2005
[8] The diary is kept in the city archives in Rotterdam (Dagboekje van J.B. Molewater [Diary of J.B. Molewater], 1833–1835, Rotterdam, Stadsarchief, 328/56); it has also been published (Molewater 1999). On Molewater see also Calkoen 2012, 399–403
[9] Molewater 1999, 23 (entry 20 August 1833)

mysterious L. J. He was, in other words, a typical student,[10] and his diary might give us an idea of how medical students learned medicine on the days they managed to get out of bed early enough to make it to class.

Molewater arrived in Leiden in June 1830 to study law, but switched to medicine in 1831. This made him one of the 129 students at the medical faculty in 1831.[11] Leiden was one of three Dutch universities at the time alongside Groningen and Utrecht. All three had medical faculties, but it is hard to compare the number of students at these faculties given our lack of reliable numbers for Groningen and Utrecht before 1846. From 1845–46, however, the government's estimated number of students per faculty is more or less trustworthy and shows that the total number of medical students between 1845–46 and 1875–76 varied roughly between 200 and 300 (the total number of Dutch students grew from 1214 to 1684 in this period). About half of these students studied in Leiden.[12] After 1876, student numbers went up, but Leiden's share went down after a fourth university was founded in Amsterdam.

All of these students had similar curricula; Molewater took the same classes as students in Groningen and Utrecht. The university curricula were prescribed in detail in the Royal Decree on Higher Education (1815). This law regulated Dutch higher education until 1876, when the Higher Education Act was issued. The decree stated which courses were obligatory, but also what 'material assistance' should be present at the universities.[13] With respect to medical teaching, it prescribed a collection of medical books in the library, an academic hospital for clinical teaching, a collection of surgical and obstetrical instruments (both contemporary and historical), and collections of anatomical, pathological, physiological and comparative-anatomical preparations.[14]

Studying medicine at the university was the only way to become a physician. Surgeons, pharmacists and midwives were trained outside the university as well, but to become a physician, one had to be a *medicinae doctor* – a title that could only be acquired at a university. Until 1865, *medicinae doctors* could start practicing immediately, but that changed under the new medical laws, which required an additional practical exam outside the university. The 1865 medical laws and the subsequent Higher Education Act of 1876 reflected new ideas on how medicine should be taught.[15] In the preceding decades, hands-on experience became more important, as the obligatory practical exam shows. This meant that students spent more time in the dissection hall and the clinic. Furthermore, the

[10] On life as a nineteenth-century student, see Otterspeer 2005, 174–205.
[11] Blanken 1869, 115. The total number of students at Leiden University in 1831 was 742. Although it is difficult to determine nineteenth-century student numbers, Blanken is a reasonably reliable source for Leiden University. (Jensma and De Vries 1997, 129–151, 370)
[12] Jensma and De Vries 1997, 188–190, 234. The percentage of medical students in Leiden (as part of all medical students) varied between 40 and 60 percent.
[13] RDHE 1815, section 'vijfde titel'
[14] RDHE 1815, art. 169, 177, 180
[15] ML 1865; HEA 1876

methods and theories of the natural sciences were beginning to gain importance.[16] The new 'scientific medicine' was based on physical and chemical theories; students had to learn these theories and they had to learn them by doing, as was common in the natural sciences. This led to the advent of the teaching laboratory.

None of these changes did away with the need for anatomical teaching collections, in constrast to what has often been suggested in general works on the history of medicine and medical education. If anything, anatomical teaching collections became even more important: more money was invested, new housing was built and the collections grew ever larger, not just in Leiden, but throughout Europe and in the US as well.[17] This may come as some surprise. What role could collections play in hands-on, dynamic teaching environments like the clinic, the dissection hall and the laboratory? Wasn't their use limited to the static teaching museum? I will demonstrate that collections were part of all medical teaching spaces – not just the museum, but also the lecture hall, the dissection hall, the laboratory and the clinic. We will follow the students through these spaces to see how and why they engaged with anatomical collections.

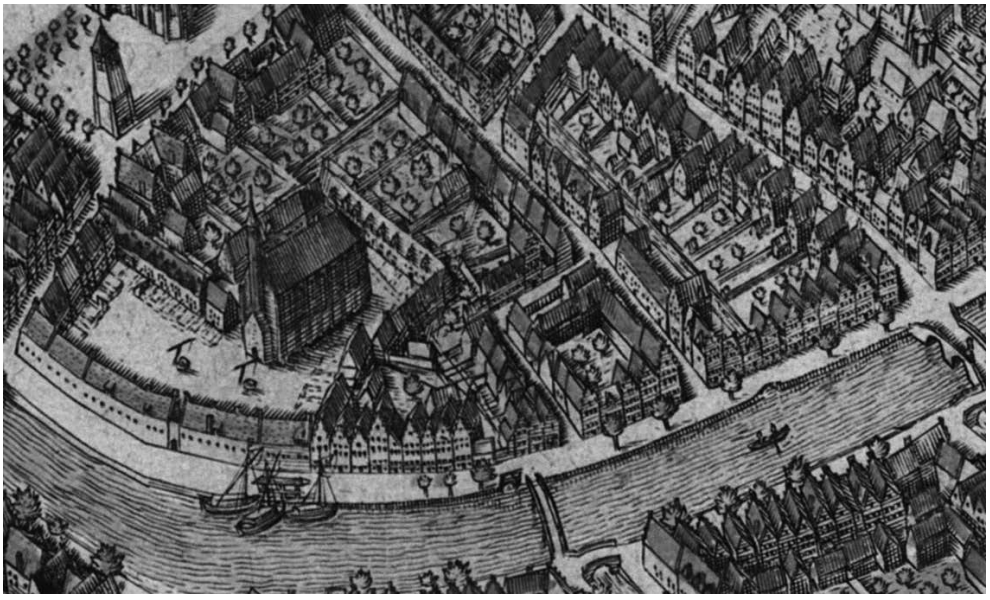

Figure 1. The Faliede Bagijnkerk (which housed the Anatomical Cabinet until 1860), c. 1600.

[16] Van Lieburg 1995
[17] Alberti 2011; McLeary 2001; Pickstone 2000, 73; Reinarz 2005

Anatomical collections in the museum

The Anatomical Cabinet held the largest anatomical collections in Leiden. It was housed in the Faliede Bagijnkerk (Church of the Faille-Mantled Beguines) at the Rapenburg. The anatomy department started using the church in 1594, when Pieter Pauw initiated the building of an anatomical theatre in the choir of the church. The front was used by the fencing school, the mathematics school (which offered practical, Dutch-language mathematics classes for engineers) and the university library. In 1644, the English Church began using the part that had once been the fencing school. Preparations were on display in the theatre (only during summer, when no dissections took place), in the hallway and even above the entrance, where two built-in whale bones could be seen.[18] The institution was extended twice in the eighteenth century. The first extension was in 1725, when Albinus was given permission to lecture in what became known as 'the auditorium'. He had to share it with the school for mathematics and the church council, but it was adapted to his needs with the addition of a small anatomical theatre. The second extension was in 1772, after the university bought Albinus' private collection from his widow and extra space was needed to house the collection. Anatomy acquired part of the room used by the English Church.

The Cabinet was enlarged once again between 1819 and 1822. The entire ground floor of the church and a newly built extension were now used by the anatomy department. Figure 2 shows the Cabinet as Molewater knew it. It had two lecture rooms (both equipped with an anatomical theatre), a dissection hall, a professor's room, a room for the prosector and a room for the anatomical collections. The room with the anatomical collections was the largest, measuring 22 metres long by 10 metres wide and 6 metres high. The collections were divided over ten oak-coloured cupboards: one in the middle (13 metres long, 3.25 metres high), eight smaller ones against the long side walls and one custom-made for the Albinus collection against the inner wall that separated the collections room from the dissection hall.[19] The cupboards were separated by a lot of empty space, which allowed people to easily walk through the room and observe the preparations. This suggests that the room was not just intended to store the collections, but also to display them. Indeed, when preparations were placed on the shelves, they were said to be 'exposed'.[20] Thus, the Cabinet contained a museum room: a place where collections were exhibited for one or more audiences.

[18] Witkam 1968, 22
[19] Witkam 1968, 66–67
[20] Annual report of the Anatomical Cabinet 1856–57, AC2 271. Other annual reports use similar terms.

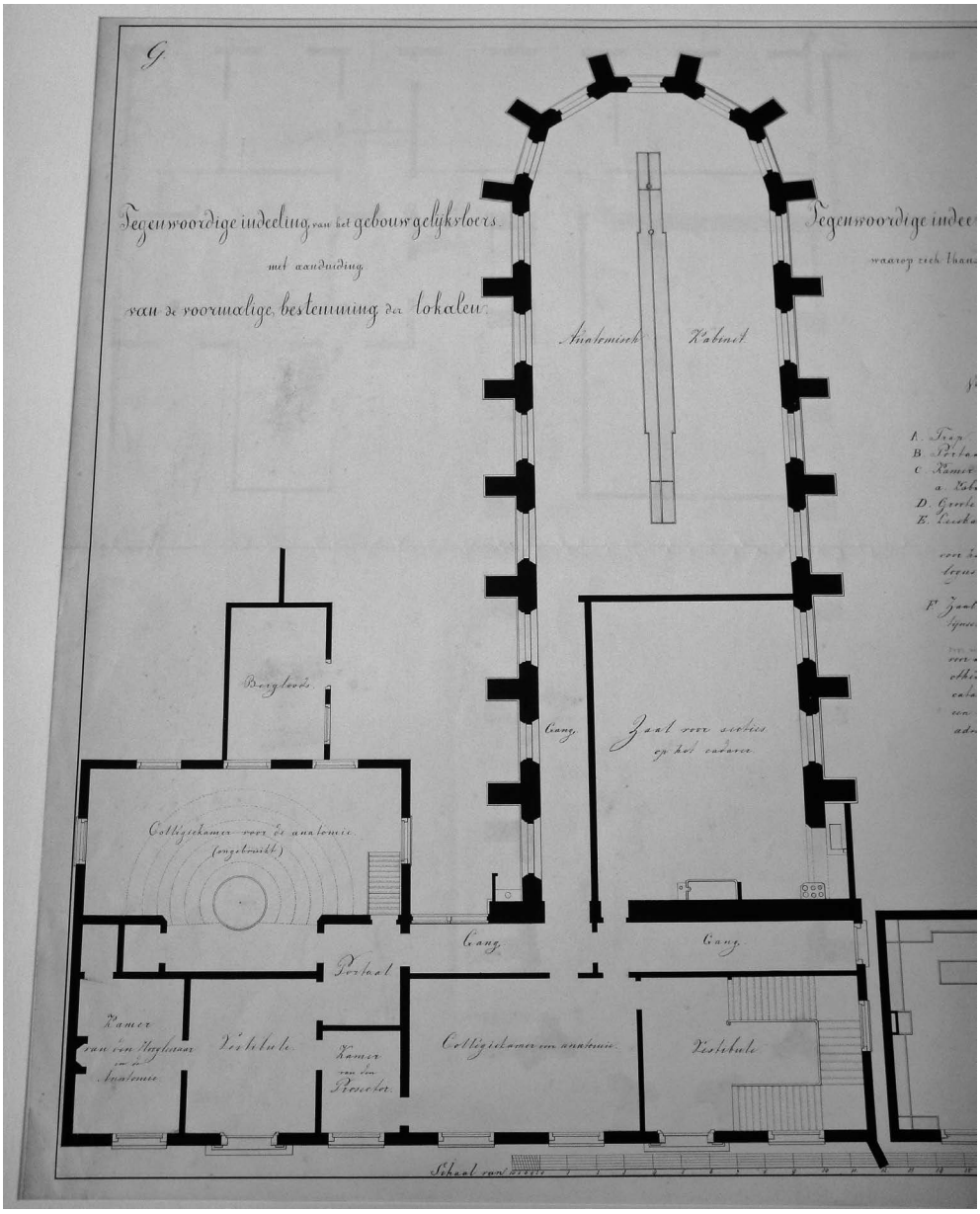

Figure 2. Floor plan of the Anatomical Cabinet after the 1819–1822 renovation. The collection room and the dissection hall are in the old church; the remaining rooms are in the newly built extension.

Students formed one of the intended audiences. They could enter the museum for free. It was one of several museums and collections connected to the university and open to students.[21] The anatomical museum was most relevant to medical students, but the natural history museum could be of interest as well. Molewater refers to the latter in his diary:

> On walks it always bothers me that I am not particularly acquainted and familiar with dear Mother Nature. When I am back in Leiden, I must by all means put some work into an entrance ticket for the museum.[22]

'The museum' is the National Museum for Natural History, the best museum for discovering Mother Nature. Although the anatomical museum also offered several animal displays, these preparations only included the inside of animals; to study their outsides – most useful on a walk – one had to visit the natural history museum. To do so, Molewater had to, as he writes, 'put some work into' an entrance ticket. Students could only gain free entrance by acquiring a ticket from museum staff member J. A. Susanna; they had to visit his home before they could visit the museum.[23] Furthermore, the museum was only open three hours a day, four days a week. By comparison, the anatomical museum was much more accessible. Students could visit the collections every day except Sundays.[24] Tickets were unnecessary. Students could simply go to the Cabinet and knock the door, after which the custos would let them in. If the custos was not there, students could find him in his house, next to the Cabinet.

In 1860, the Cabinet moved to a newly built educational complex, which it shared with the physics and chemistry teaching laboratories. After the move, the anatomical collections became much harder to access for lay visitors,[25] but students still had few problems getting in. Students had many of their lectures in the new complex, which meant they were taught in the vicinity of the museum. The new arrangement of the collections was hard to interpret for lay visitors, but it was tailored to students, and hence, if anything, the move made the museum *more* accessible to them. Having said this, museum curator Halbertsma did cut down opening hours after the move: students could now visit the museum four instead of six days a week.[26] The opening hours of the dissection hall, on the other hand, were extended. Apparently, it became more important that students practiced dissecting and somewhat less important that they visited the anatomical museum. Note, again, that this did not mean that anatomical *collections* lost their importance – they were used outside the museum as well.

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[21] See the student almanacs for a full list. The almanac of 1835, for example, lists the University Library, the Museum of Natural History, the Museum of Antiquities, the Cabinet of Plaster Casts and Prints, the Anatomical Cabinet, the Cabinet of Agriculture, the Hortus Botanicus and the Bibliotheca Thysiana. (LSC [1834], 78–79)
[22] Molewater 1999, 45 (entry 15 April 1835)
[23] LSC [1834], 78
[24] Opening hours and access guidelines can be found in student almanacs. See for example LSC [1838], 122.
[25] Huistra 2010
[26] LSC [1859], 66

Other Dutch universities had similar arrangements, although opening times varied: near the end of the century, the collections in Groningen were accessible one hour a week only.[27] But students at all universities could visit an anatomical museum by themselves and use its collections to help them study medicine. However, that students *could* visit anatomical museums does not imply they actually *did*. It is unknown whether and how often Leiden students actually studied the museum collections. Molewater does not mention them in his diary. The Cabinet's annual reports, which regularly indicate the use of the collections in lectures, never mention students coming to the museum. And it seems that students were not very fond of the university's museums in general. The student almanac of 1862 states:

> As usual, the various museums were hardly ever visited by students, [but] frequently by strangers.[28]

Unfortunately, we cannot be sure that 'museums' here includes the anatomical museum, because the almanac consequently calls it a 'cabinet', reserving the term museum for other collecting institutions. But this does tell us something about the students' attitude towards voluntary museum visits.

Few sources explicitly state that the students were expected to come at all – an exception is the recommendation of one of the early educational reform committees, the Van Swinden committee, in its 1809 report:

> Such a cabinet [a cabinet containing objects useful for courses in anatomy and physiology] needs … to be open every day on appointed hours, in order for the students in medicine to have free access to it so as to become more familiar with all the parts [of the body].[29]

The recommendation never made it into official law, but the extensive opening hours published in the student almanacs suggest that professors indeed expected students to visit the museum ('cabinet' in the quotation). What could students gain from these visits? Again, I found very few nineteenth-century Leiden sources that explicitly answer this question. However, research done on medical museums in other countries – where the discourse on the museum's educational use seems to have been more explicit – reveals how the museum may have helped students learn medicine.[30]

First, studying museum collections was an excellent way to gain knowledge of the human anatomy. Second, the museum not only transferred knowledge, it also trained the scientific eye. In the museum, students learned how to observe. Both goals could also be acquired by other means: students could learn their anatomy by reading books or by taking lectures; and atlases trained the scientific eye just as the museum did.[31] But the museum had several advantages. For one, the knowledge was displayed through preparations, which were

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[27] See for the Utrecht collections for example USC [1864], 33; see for Groningen GSC [1884], 45.
[28] LSC [1861], 192
[29] Van Swinden et al. 1809, 118
[30] McLeary 2001, 19–72; Alberti 2011, 164–193
[31] Daston and Galison 1992

considered more 'real' and more attractive to students than drawings. This goes for anatomical preparations demonstrated in lectures as well. However, in the museum, the preparations could be observed as part of a large and ordered system of display; something that was more difficult in the lecture hall.[32]

Erin McLeary describes what she calls the 'museum method' of learning medicine extensively in her unpublished PhD thesis on US medical museums between 1860 and 1940.[33] She shows how the medical museum was used in education, but she also stresses *that* it was used, and that it remained in widespread use until at least the Second World War – much longer than is often thought. This applies to the Netherlands as well. In the first decades of the twentieth century, several Dutch anatomists published on their institutions' teaching museums, for example in the journal *Methods and Problems of Medical Education*. They indicate that the museums were intended for self-study by students.[34]

After the Second World War, medical museums became less prominent in medical education, but they never completely disappeared.[35] In Leiden, the present-day anatomical museum is still first and foremost intended as a teaching museum.[36] It is housed inside the educational building; the arrangement has been chosen so as to be of the most use to medical students and special audio tours are offered to assist students on their visits. However, that students are welcome and expected does not necessarily imply that they actually come – not now and not in the nineteenth century. But for nineteenth-century students, never visiting the anatomical museum did not mean never engaging with anatomical collections, for students encountered preparations all the time, in almost all of their teaching spaces.

Anatomical collections around town

The Anatomical Cabinet housed the largest anatomical collections in nineteenth-century Leiden, but by no means the only ones. The academic hospital held a pathological anatomy collection. The medical laboratories established in the second half of the century stored preparations as well. The physiology laboratory (founded in 1866) collected microscope slides;[37] the pathological anatomy laboratory (1885) received pathological-anatomical preparations from the Cabinet.[38] The zootomical laboratory (1876) was not strictly medical, but its comparative-anatomical collection was regularly used in medical teaching. All of these collections were institutional, owned by the university.

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[32] Carin Berkowitz has argued that preparations in the lecture hall were also part of a visual system of display. (Berkowitz 2012) Berkowitz writes on Britain in the late eighteenth and the early nineteenth century, but it applies to nineteenth-century Leiden (and other places) as well. However, these visual systems of display were much smaller than the museum systems.

[33] McLeary 2001

[34] See for example Wijhe 1909; Reddingius 1914; Barge 1925; Van den Broek 1930.

[35] See for example Edwards and Edwards 1959; Bozman 1958; and Hackett 1954.

[36] Borgonjen 2007, 28

[37] Heynsius 1869, 5

[38] Annual report of the Anatomical Cabinet 1884–85, AC3 1553

In general, collection ownership shifted from private to institutional in the nineteenth century, but the shift was by no means absolute.[39] Institutional collections were known before 1800, certainly in Leiden, where the university had already built a significant collection in the seventeenth century. Nonetheless, in the early modern period, many Leiden professors used their private collections for teaching. The balance shifted after the university acquired the Albinus collection in 1772. In the decades that followed, the Leiden institutional collections expanded rapidly, and university teaching increasingly relied on them. Yet, private collections never completely disappeared.

At least three nineteenth-century Leiden medical professors built a significant personal collection. Jacobus Broers, professor of obstetrics and surgery between 1826 and 1847, owned a collection of pathological preparations. After his death, the preparations were added to the hospital collection.[40] Gerard Suringar, professor of pathology from 1843 to 1872, also owned a pathology collection. In 1866, he donated over 800 of his preparations to the university.[41] The governors expressed their gratitude with an inscribed silver vase and the preparations were added to the Anatomical Cabinet.[42] Both Suringar and Broers probably stored their preparations at home. This is less clear with Hidde Halbertsma, professor of anatomy and physiology between 1848 and 1865. He built a private collection in the first years of his professorship,[43] but this collection may very well have been housed in the Anatomical Cabinet, of which Halbertsma was the curator.

Some students probably also owned small anatomical collections. Figure 3 is a drawing by Alexander Verhuell (the author of this chapter's opening story). The drawing, made for the student almanac, is titled 'Het gevaar van een medicus op kamers te hebben' ['The danger of having a medical student in lodgings'].[44] We see a shocked landlady who discovers that the student is dissecting a human leg under her roof. The landlady enters his room carrying a tray with a bottle that seems to contain alcohol, probably at the student's request – although she may have misinterpreted his reasons. It is surprising that she had not caught him before, considering the collection of preparations already present on top of his cupboard. Another drawing by Verhuell entitled 'Een medicus die stil geniet' ['A medical student who quietly enjoys himself'], shows a similar image, minus the landlady and with a more central collection of preparations (figure 4).[45] Both drawings are satirical, so we cannot take them as conclusive proof, but at least they indicate that stories circulated on medical students making and storing preparations in their rooms.

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[39] See Alberti 2005b on collection ownership in the UK.
[40] Annual report of the Anatomical Cabinet 1850–51, AC2 270
[41] The preparations are described in Suringar 1866a.
[42] *Leydsche Courant* 1867
[43] Halbertsma to governors 14 March 1852, AC2 116, 59
[44] Verhuell 1882, plate 29
[45] First appeared in Verhuell 1847b.

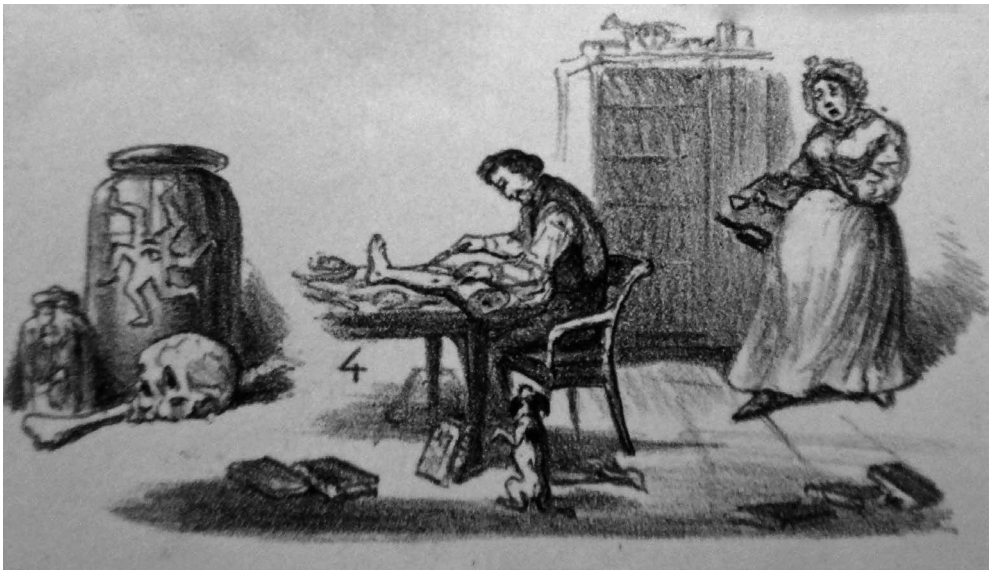

Figure 3. 'The danger of having a medical student in lodgings', by Alexander Verhuell.

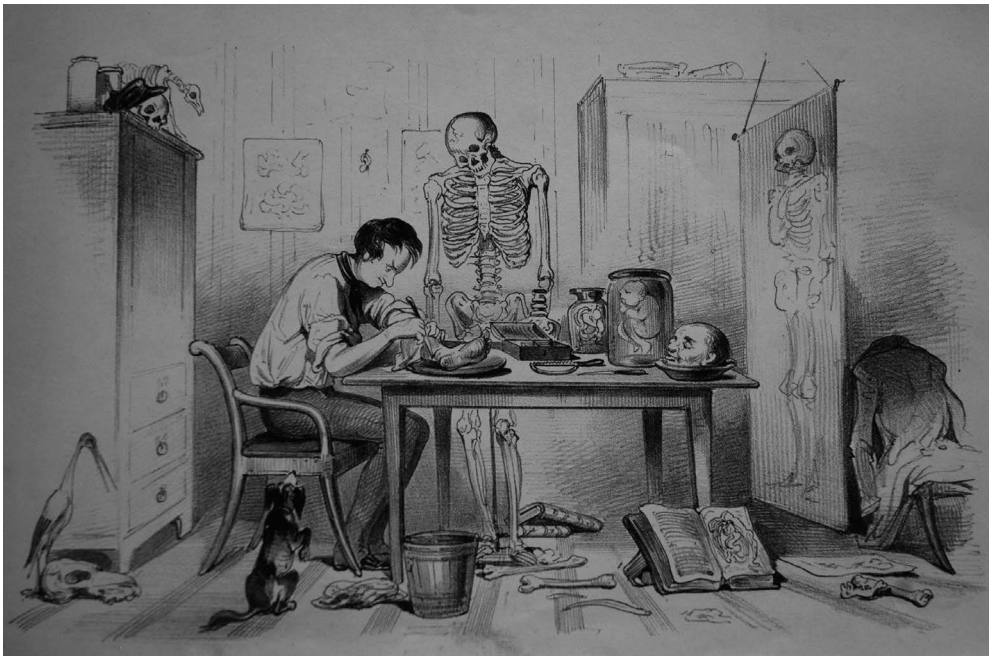

Figure 4. 'A medical student who quietly enjoys himself', by Alexander Verhuell.

What is more, anatomy handbooks regularly recommended that students build their own collections. Take, for example, the handbook that Molewater used: Georg Hildebrandt's *Handbuch der Anatomie des Menschen*.[46] Molewater used the fourth edition (1830–1832), which had been heavily edited by German anatomist Ernst Heinrich Weber. In his preface, Weber advises students on how to study anatomy. One of his recommendations:

> Every student must try to provide himself with the bones of the human body, even if they are to be collected from graveyards.[47]

Other handbooks that recommend collections are less explicit about where students should obtain their preparations, but almost all of them state that bones – or a complete skeleton, if possible – should be the first thing students acquire. This is probably because bone preparations were relatively easy and cheap to preserve, since they required neither glass nor alcohol. Students could then extend their collections with wet preparations, if possible. Some authors explicitly recommend this; others, like Weber, do not.[48]

We do not know whether Molewater indeed owned a collection, but we do know that he dissected at home. This practice was not new in the nineteenth century; students in the early modern period did so as well.[49] From Molewater's diary it seems that students could easily acquire animals for dissecting. Molewater's first attempt at practicing 'anatomizing' failed: 'I have received my calf's eye, but unfortunately I lack good scalpels.'[50] But only two days later he tells us how he dissected a tortoise together with his friend Karel Giltay.[51] Giltay, who at that time had just finished his medical studies, handled the knife more often: a few days earlier he showed Molewater the internal organs of a two-headed goat.[52] It is possible that Molewater and Giltay kept preparations of the organs after these dissections.

A university town like Leiden housed dozens of collections, both private and institutional. Most of these were *not* museum collections like the one in the Leiden Anatomical Cabinet. The collections in the hospital, the laboratories and professor's houses were not for display. Rather, these were handling collections.

Collections for display, collections for handling

In 1909, anatomy professor Jan Willem van Wijhe spoke at the opening of his new anatomical laboratory at the University of Groningen. He told his audience:

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[46] Molewater mentions the book in his diary: Molewater 1999, 45 (entry 15 April 1835), 47 (entry 16 April 1835).
[47] Hildebrandt 1830, xi
[48] For handbooks that do suggest students should make and keep wet preparations, see Hunter 1784, 110; South 1825, xix; Hyrtl 1865, 40, 577.
[49] Some students from the early modern period also built their own collections. The later Utrecht professor Jan Bleuland (1756–1813), for example, started his famous comparative anatomyl collection in the first year of his studies in Leiden. (Van der Knaap [2001], 13)
[50] Molewater 1999, 50 (entry 17 April 1835)
[51] Molewater 1999, 52 (entry 19 April 1835)
[52] Molewater 1999, 48 (entry 16 April 1835)

> In an anatomy laboratory there are at least two collections of preparations, i.e. the one exposed in the museum and the lecture collection. The preparations from the lecture collection are used regularly and are often taken out of the jars, from which their appearance, of course, suffers, and so they are not suitable to be exposed.[53]

Van Wijhe's laboratory was new, but his distinction between collections was not – it was a common distinction throughout the nineteenth century. We also find it, for example, in Joseph Hyrtl's *Handbuch der praktischen Zergliederungskunst* ('Handbook of Practical Anatomy', 1860). The *Handbuch* was translated into Dutch by the Utrecht professor Jacobus Schroeder van der Kolk and the Leiden prosectors (and later professors) Johannes Boogaard and Teunis Zaaijer. From the introduction:

> Preparations, kept in spirits of wine, yet taken out of this for demonstration so as to look at them more carefully, usually are not part of the showpieces in anatomical museums, but are kept in the side rooms of laboratories, so-called 'hand museums'; these contain objects which are used often and are subject to a certain change.[54]

Hyrtl called them 'hand museums'; Van Wijhe, 'lecture collections'. The terms 'tank specimens' and 'store preparations' were also used.[55] Whatever they were called, these collections and preparations were intended to be *handled* – as opposed to collections that were intended to be *displayed*. And this handling, as Van Wijhe and Hyrtl indicate, usually involved taking the preparations out of their jars.

Since handling preparations were meant to be removed from their jars, they required different preparation techniques than display preparations. For one thing, they had to be robust enough to be handled. Corrosion casts, for instance, were rarely used in handling collections. To make a corrosion cast, the vessels are first injected and the preparation is then soaked in chemicals that slowly destroy the flesh. The resulting cast shows the vessel system in great detail, but is also very fragile – too fragile to be touched. However, no nineteenth-century technique resulted in preparations so robust that they could be handled for years on end (as is the case nowadays with plastinates). Preparations in handling collections therefore had to be replaced regularly, which is why Hyrtl described the hand museums as 'subject to a certain change'. But although damage was unavoidable in the end, some techniques could withstand more handling than others, and these were preferred for handling collections.

The main technical difference between handling and display preparations, however, was not found in the techniques used to dissect and preserve the tissue, but in the techniques

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[53] Wijhe 1909, 14–15

[54] Hyrtl 1865, 30

[55] 'Tank' (or 'hand') specimens was used in medical museums in the US, see McLeary 2001, 38n36, 95–96, 196; 'store preparations' (or 'store specimens') was used at the Royal College of Surgeons in London, see for example William Clift, 'Memoranda concerning the sale of old and duplicate specimens of Natural History and Anatomical Articles by the British Museum to the Royal College of Surgeons in London, in the Year 1809', May 1835, RCSE MS0007/1/2/2, 11; and the annual report of the conservator to museum committee 1876–77, 2 July 1877, RCSE RCS-MUS/8/2/1.

used to close the container holding the tissue. The closing technique has to slow down evaporation of the preserving fluid as much as possible. The best way to do this is to seal the lid, preferably airtight. Materials used for sealing included pig's or bullock's bladder, wax, lead and tin foils. But these sealing techniques cannot be used in handling collections: when a jar is sealed, it is too cumbersome to open it and remove the preparation. It is possible, and it was done sometimes (more often for research than for teaching), but it took a lot of time and effort. Therefore, handling collections used different closing techniques, which rendered the jar not only as airtight as possible, but also easy to open, close, and open again. Hyrtl, for instance, used stoppered bottles.[56]

Hyrtl wasn't the only one who used stoppered bottles. Diaries and reports from curators and students at the Royal College of Surgeons in London (RCS) reveal that stoppered bottles were regularly bought and used at the College as well.[57] One needs to look at archival material to discover this; although many nineteenth-century preparations are still part of the College's collections, the ratio of sealed to stoppered bottles is misleading. The vast majority of the remaining preparations are mounted in sealed jars, suggesting that the nineteenth-century collections were largely display collections. This is not true, as follows from references to stoppered bottles in the diaries (and even more so from the explicit remarks on handling preparations that can also be found in the archival material, which will be discussed in greater detail in the chapter on researchers). It only appears that way because the stoppered bottles were less likely to survive over time than the sealed ones. This applies not just to the RCS collections, but to most anatomical collections. This has two reasons. First, because they were not as airtight as sealed bottles, the fluid evaporated more quickly, which made the preparations more prone to decay. And second, handling collections were not intended to be kept forever: they were used, touched, handled, or even cut up – all practices that shortened their lives considerably. But if you look closely at the nineteenth-century collections that still exist, both at the RCS and elsewhere, you will find some remaining stoppered bottles in all of them. Ironically, they turn out to be the hardest to open nowadays, making it difficult to top them up. The problem is probably that part of the preparation has dissolved in the fluid, and when that fluid evaporates, the tissue sticks between stopper and bottle: it becomes 'human glue', according to the present-day head of the RCS conservation unit.[58]

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[56] For larger preparations, he suggests glass vessels with removable lids. (Hyrtl 1865, 30)
[57] See for example Diary William Clift 1838, RCSE MS0007/1/4/2/29, 3 May, 5, 17, 31 October, 8 December 1838; Diary William Clift 1839, RCSE MS0007/1/4/2/30, 24 June 1839; Quekett Diaries, 1840–1848, RCSE MS0027, 28 February, 30, 31 July, 1 Augustus 1845; Student Diary Henry Carter, 1853–55, RCSE MS0134, 12th week (1853).
[58] Cooke 2011

In addition to stoppered bottles, screw-top bottles were also used – in storerooms one sometimes encounters preparations in recycled pickle jars, with labels still present.[59] We can see examples of both in the Leiden collections, and we know from the collection reports that a third storage method was used as well. In his 1851–52 annual report, curator Halbertsma complained that the large vessel and nerve preparations (which did not fit in glass bottles) were stored in wooden containers, while tight-closing tin tanks would lead to a smaller loss of spirits and hence lower costs.[60] Metal or wooden containers were of course useless for display collections: neither tin nor wood is transparent, which is quite inconvenient if you want to look at the preparations from a distance. For handling preparations, on the other hand, these chests and boxes are convenient. They were cheaper than glass, less fragile, and they could be acquired in much larger sizes. This was useful for storing large preparations, but also for storing multiple preparations together, thereby saving expensive preparation fluid.

The Leiden collection reports never explicitly stated that preparations shared a container, but we know it was common in other places. The RCS storeroom catalogues, for instance, list jars with multiple preparations on almost every page.[61] Another example can be found in the travel diary of the Utrecht student Christiaan Tilanus. In 1820, he visited the anatomical collection in Heidelberg together with his fellow students Peter de Fremery and Jacob Broers (who would later become a professor of obstetrics and surgery in Leiden). Tilanus wrote:

> That this collection is constructed not only as a collection, but also to provide a significant number of objects for teaching is proven by the nerve preparations which Mr Tiedemann demonstrated to us. These preparations were perfectly made and contained the nerves of the upper and lower limbs and those of the larger cavities. All nerves were clearly visible in their mutual relations to the neighbouring parts, blood vessels, muscles, etc; all of these preparations were stored in a large chest fitted with tin on the inside, with wine-spirit, in which they all were soaked, and even the upper ones could never decay in this habitus.[62]

Tilanus distinguishes between two types of preparations: those intended to be part of the collection (the display collection), and those intended for educational use (the handling collection). The ones intended for educational use were stored in wood, not glass, and in several layers. To use them, the wooden box had to be opened and the preparations removed in order to be studied (and handled).

All of these closing techniques – stoppers, screw-tops and boxes – made it easy to remove the preparations from their containers on a regular basis. The next question is: what

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[59] See for example Lynn Morgan's description of an embryo collection in a storeroom at Mount Holyoke College (South Hadley, Massachusetts); Morgan encountered not only reused mayonnaise jars but also '[a] jar that had once contained eight pounds of Kraft fresh-chilled grapefruit sections [and] now was packed with eight topsy-turvy fetuses in various states of deterioration'. (Morgan 2009, 1)
[60] Annual report of the Anatomical Cabinet 1851–52, AC2 270
[61] See, for exampl,e Hillman 1841a and Hillman 1841b.
[62] Deelman 1920, 65

happened to the preparations after they were taken out? How, why, when and where were they handled?

Active observation in the lecture hall

Molewater regularly missed lectures; as we know, getting up in time was not one of his qualities. On 13 October 1834, for example, he writes, 'Gotten up too late to go to Sandifort.'[63] Gerard Sandifort was his anatomy professor. When Molewater skipped his lectures, he not only missed Sandifort's dictation, but also an opportunity to handle preparations. Preparations were a standard pedagogical tool in medical lectures, as illustrated by this quotation from one of Sandifort's collection reports:

> [The collection of the *Museum Anatomicum*] is being employed daily in giving lectures both on anatomy and physiology of Man in healthy and diseased condition, as well as on comparing Man and the Animals, so young students enjoy all its uses.[64]

Sandifort's remark demonstrates that he was not the only professor using preparations. Professors teaching pathology and comparative anatomy also employed them. Other primary sources reveal that preparations were frequently and widely used in lectures. For instance, the obituaries of Leiden professors Halbertsma and Zaaijer praised the way they used preparations to illustrate their lectures.[65] Another example is comparative anatomy professor Jan van der Hoeven, who wrote:

> In my … lectures on comparative anatomy, I constantly used preparations from the Anatomical Cabinet, which then had to be transported to my lecture room at my request.[66]

Van der Hoeven referred to the collections housed in the Anatomical Cabinet. These are also the collections Sandifort alluded to in the quotation from his collection report. I discussed the Cabinet's collections above as museum collections (collections intended for display), but they were more than that alone: they also doubled as handling collections. The cupboards containing the collections opened easily.[67] When needed during lectures, the preparations were simply taken off the shelves and transported to the lecture rooms down the hall. (In the early twentieth-century pathology laboratory, a special elevator was installed to transport preparations from the laboratory's museum to the lecture room.)[68] The Cabinet collection, of course, was not the only handling collection. When lectures took place in the

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[63] Molewater 1999, 44 (entry 13 October 1834)
[64] Annual report of the Anatomical Cabinet 1835–36, AC2 270. Teaching use is mentioned almost every year in Sandifort's annual reports on the Cabinet.
[65] Koster 1866, 43; Quant 1903, 1; Daniëls 1902–03, 172
[66] Van der Hoeven to governors, 6 January 1859, AC2 127, 5
[67] Witkam 1968, 67
[68] Annual report of the pathological-anatomical laboratory 1904–05, AC3 1560

university hospital, the collection housed there was used instead.[69] Sometimes professors used their own preparations in class, if the Cabinet did not offer what they needed.

After arriving in the lecture hall, preparations were often removed from their jars and passed around (sometimes preparations were displayed on a table in the front, so the students could study them afterwards). It was commonly felt that out of their jars, preparations best helped students to learn about the body.

The first reason for this was that it was easier to observe the preparations outside their containers. Students could get a close look at them and the view was not distorted by the glass or the fluid. Hyrtl writes:

> When one takes preparations out of the spirit, one can examine them more closely than is possible in the jar, where one thing is covered by another.[70]

In this particular quotation, Hyrtl deals with nerve preparations.[71] When a nerve preparation hangs suspended in a jar it is impossible to get a good view of all the nerves due to the multiple layers of tissue. However, when the preparation is taken out of the jar, you can look at it from all sides and angles and, using your fingers or a pair of tweezers, pull away the upper nerves to get a good look at the ones below.

Getting a closer look was not the only advantage of taking the preparations out of their containers. It also allowed students to use more senses – not only sight, but also touch and smell. This was an advantage because it allowed them to observe more phenomena, but also because it was thought that using more senses made it easier to remember what was learned. Furthermore, it allowed students to train all of these senses – an important aspect of the practical teaching methods that became more important as the century progressed.

Handling preparations outside their jars had one major disadvantage: the preparations inevitably became damaged. The techniques used were meant to withstand touching, but none of them could do so forever. Especially not when the audience included students like the ones Scottish anatomist Robert Knox encountered:

> So far as my own observations go, I am quite certain that few preparations can be entrusted into the hands of students.[72]

Because of his experiences, Knox hesitated to let students handle his preparations, although he hoped that his book would help them see the error of their ways:

> A knowledge of this [preparation techniques explained in the remainder of the book], instead of it apparently giving pleasure to many to twist off a toe or finger [of (part of a) skeleton], will

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[69] Annual report of the medical faculty 1850–51, Nosocomium, AC2 270; Annual report of the academic hospital 1859–60, AC2 271

[70] Hyrtl 1865, 430

[71] Hyrtl was not the only author who pointed out that nerve preparations had to be examined outside their jars, see for example Lauth 1839, 510.

[72] Knox 1836, 3

> give them real pain from perceiving that they have seriously and permanently injured an anatomical preparation.[73]

The Leiden archives make no mention of students intentionally destroying preparations, but damage occurred nonetheless. The 1892–93 report of the Leiden pathological anatomy lab reads:

> From time to time, pathological-anatomical preparations kept in spirits become unusable, sometimes because the spirits destroy the characteristics of preparations, but also when the preparations are used for teaching almost 200 students. Every suitable opportunity was used to replace these unusable preparations with new ones.[74]

The writers of the report, unlike Knox, did not blame students in the least for spoiling the preparations. It was simply seen as daily wear and tear, and the simple solution was to replace the damaged ones with new preparations. Hyrtl's textbook also displays this unconcerned attitude. Hyrtl considered the damage and loss of preparations due to handling unavoidable and recommended building a substitute collection for the most fragile preparations:

> I am in the habit of stocking up duplicate copies of all ligament preparations; of everything that relates to elucidating important parts of the theory of the senses, of the theory of the intestines, and of the nerves.[75]

For many nineteenth-century anatomy teachers, the advantages of handling preparations outweighed the disadvantages. Handling was a natural part of practical teaching; passing preparations around for students to touch and handle forced them to use – and thereby train – as many of their senses as possible. Viewing the preparations from a distance could never achieve the same goal.

Of course, handling preparations was not the only method used in practical teaching. Dissecting was another one. Students were increasingly stimulated and expected to dissect by themselves. After Halbertsma extended the opening hours of the dissection hall in 1849, students could practice every day instead of a few hours a week – an opportunity they gratefully seized.[76] But the increased opportunity for dissecting did not imply a decrease in handling preparations. Figure 5 illustrates the continued importance of preparations in teaching. The photograph dates from the end of the nineteenth century and shows anatomy professor Zaaijer giving a lecture – or posing as if he is. He is surrounded by teaching tools including, at the left side of the table, preparations ready to be handled.

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[73] Knox 1836, 3
[74] Annual report of the pathological anatomy laboratory 1892–1893, AC3 1556
[75] Hyrtl 1865, 30
[76] LSC [1849], 108

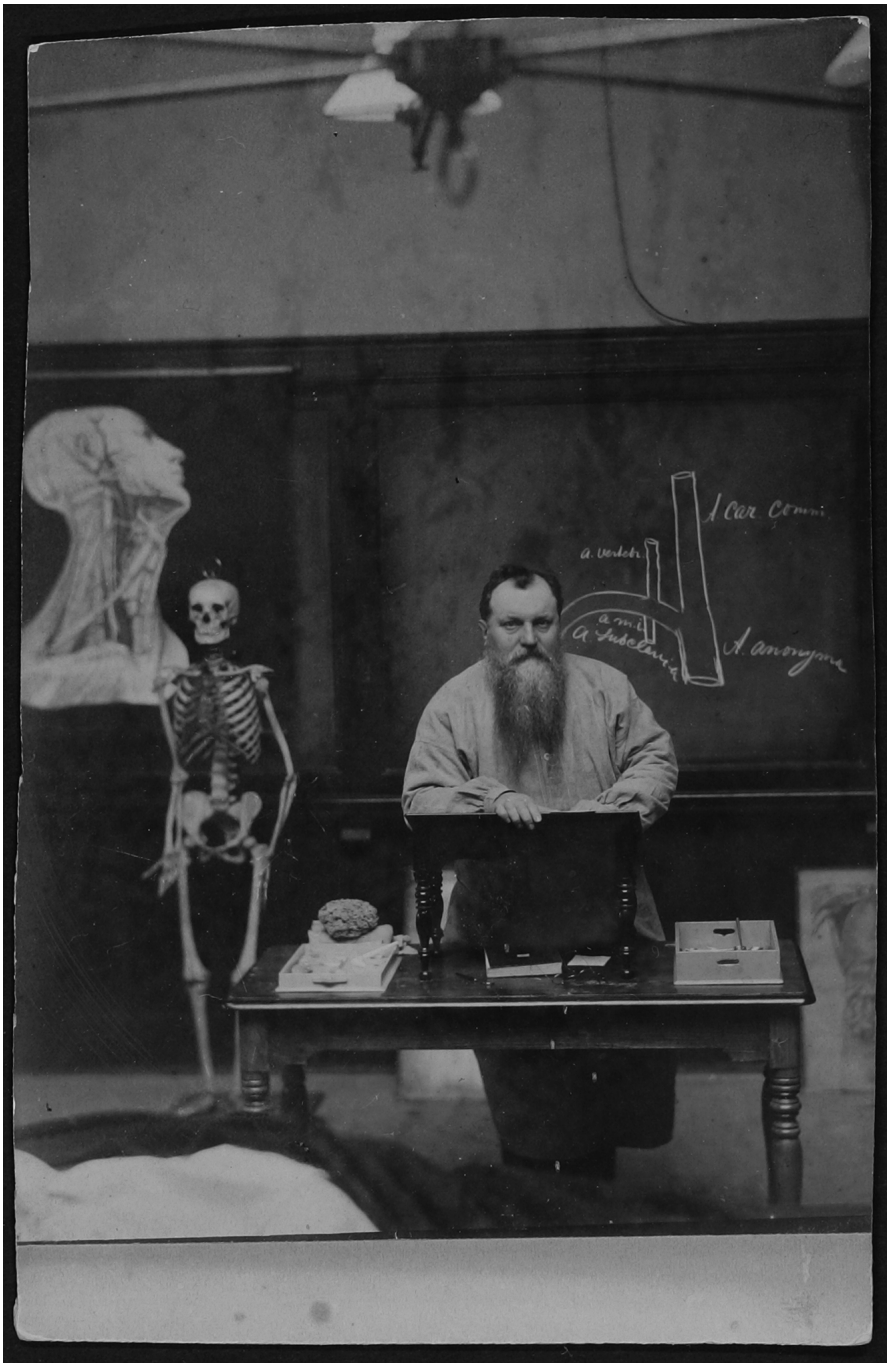

Figure 5. Professor Zaaijer in the lecture hall, surrounded by teaching aids – including, on the table, preparations.

Observing preparations as closely and with as many senses as possible did not become redundant when students dissected more often. On the contrary, preparations remained essential to learn about the body for several reasons. First of all, students needed to have at least some knowledge about the body before they entered the dissection hall. Corpses were too valuable for students to be cutting into them without any prior knowledge. They had to have at least some idea of what they were doing, where they had to cut, and what they were supposed to see inside the body. Opinions varied on how much prior knowledge students needed before starting to dissect.[77] Hyrtl advised to commence cutting as soon as possible when learning general anatomy; but he made sure that he always discussed the theory *before* students observed parts in the corpse.[78] Students had to wait longer in the pathological anatomy classes in Leiden: in their first year, they were given a general overview with the help of preparations; it was not until the higher years that they learned through dissection.[79]

Used in this way, preparations prepared students for dissecting. But they could also supplement the learning done at the dissection table. Preparations displayed knowledge about the body that could not be transmitted through a dissected corpse. For example, students used pathological preparations to learn about diseases and malformations; the limited supply of bodies made it unlikely that students observed more than a few pathological conditions during their dissections.

Nowadays, preparations are still used in this way, especially in training specialists. Tropical medicine is an example. Pelvic malformations caused by rachitis, osteological tuberculosis and polio regularly occur in third world countries, but are completely absent in the Western hospitals where tropical medicine is taught. So, for instance in Groningen, tropical doctors in training practice delivering babies using nineteenth-century preparations of pelvic malformations.[80]

Furthermore, preparations were used to demonstrate peculiar characteristics that were not *visible* during dissection. Hyrtl refers to this when he writes:

> Instructive lectures on the anatomy of the heart can only be given with the help of preparations in which all details that cannot be observed properly in fresh hearts have been clearly revealed.[81]

Small vessels are an example of anatomy invisible to the naked eye. To observe them properly, one has to make injection preparations.[82] In an injection preparation, the previously emptied vessels are injected with a fluid foreign to the body. Many different recipes for injection fluid were used in the nineteenth century, but all of them had the same purpose: to make even the smallest vessels visible to the naked eye. The fluid solidified after

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[77] Buklijas 2005, 108
[78] Hyrtl 1865, 10–11
[79] Annual report of the Anatomical Cabinet 1872–73, AC2 273
[80] Erkelens 2006, 42
[81] Hyrtl 1865, 270
[82] See for example Voorhelm Schneevogt 1847, 315 – note that Schneevogt stresses that students have to have an image of the 'natural state' (i.e., the anatomy of the fresh body) before they start working with injection preparations. This prevents them from getting the wrong ideas on what is and is not visible in the body itself.

injection and filled the vessels, making them larger, and hence easier to observe. Of course, the small vessels could also be seen through a microscope, but a microscope only shows a small part of the whole at a time, making it hard to get an overview of the relationship and connections between the different vessels. Injection preparations were the preferred method of providing a complete picture.[83] Students also injected vessels during dissection, but this required a considerable amount of time and skill. Therefore, students generally used injection preparations to investigate the build-up of the body's vessels.

These three reasons – students needed to be prepared, the available bodies did not show everything (in particular, not all pathologies) that students were required to learn, and some things could not be seen in a freshly dissected corpse – explain why dissecting alone did not suffice when studying anatomy. Handling preparations was essential. But the reverse was also true: handling preparations was necessary but not sufficient – it needed to be complemented with dissecting. To become good doctors, students needed to visit the dissection hall as well as the lecture room; and working in the dissection hall required engaging with anatomical preparations, as we will see in the next section.

Making preparations in the dissection hall

In the lecture room, students handled preparations in the simplest way: touching them without altering them. In the dissection hall, they did something more complex: they *made* anatomical preparations. Dissecting a body and creating a preparation were closely connected. Take the following remark from the medical faculty's 1850–51 annual report:

> Concerning the material subsidies for the teaching of anatomy and physiology Professor Halbertsma remarked that the number of bodies at his disposal for the practical training in anatomy, although anything but big, was sufficient for the meagre number of students that participated. This outcome would, however, not have been possible, had some students not concentrated on making delicate vein and nerve preparations, on which, on account of preserving them in spirits, they could work for a reasonably long time.[84]

Apparently, students made their own preparations in the dissection hall – and they could work on them for prolonged periods. The close connection between dissecting and making preparations also follows from practical anatomy handbooks: often student dissection manuals included guidelines on making (and keeping) preparations.[85]

Dissecting sometimes involved a complete body, but more often it meant working with individual body parts. These were easier to distribute among students and easier to store in between sessions. They were also easier to acquire. Bodies were never abundant, something that became painfully clear to Molewater when he wanted to take the exam for surgical

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[83] Zaaijer 1866, 22–23

[84] Annual report of the medical faculty 1850–51, AC2 270

[85] See for example Hildebrandt 1830–1832; Hyrtl 1865; see also Hyrtl's summaries of the best-known anatomy handbooks, Hyrtl 1865, 40–49.

doctor in 1851. Molewater had graduated as a *doctor medicinae* in 1840, but when he applied for a job as hospital director he was asked to become a *doctor chirurgiae* as well. This required no additional courses, but a practical session was part of the exam, and Molewater had to bring his own corpse. Apparently, he had trouble finding one and wrote to the Leiden surgical professor F. W. Krieger (1805–1881) for help. Krieger replied:

> People in Leiden are just as unwilling to go *ad patres* for the benefit of a surgical exam as people in Rotterdam, Americans, &c. are, in other words, we do not have a cadaver available either. … If you have the opportunity to acquire a cadaver, or part of it, in the meantime [i.e. before the exam], bring it hither; apropos! Would [doctor] Schneevogt not be able to help you? What if you wrote him that you need a lower limb for your surgical exam, and asked him to send such a *pars cadaveris* to the local anatomy hall before Tuesday?[86]

Krieger suggested that Molewater ask for a leg if he was unable to find a complete body, which suggests that limbs were easier to come by than whole corpses. This is not surprising. Most bodies have two arms and two legs, but only one abdomen. Hence, if a body is used for a demonstration, in all likelihood at least one arm and one leg will be left over. Furthermore, arms and legs could be taken not only from the dead, but also from the living: amputated limbs probably ended up in the dissection hall. This is at least suggested by the lists of available bodies: more than once, they referred to both full bodies and some additional limbs that had been acquired.[87]

Students could be working on a single part for weeks on end. In between sessions, the unfinished preparations had to be stored so that the tissue neither decayed nor became too fixated to work with. Hyrtl advised to keep the objects in fresh water as long as possible, and eventually replace the water with an alcohol solution.[88] Zinc tanks were considered the best containers. Preferably, these had ledges that could support a draining grid, because:

> Every practised anatomist knows from experience how inefficient and unpleasant it is to transfer still dripping preparations to the dissection table which soon becomes a quagmire; and how much alcohol gets lost in the process.[89]

Furthermore, students had to be protective of the body parts they were working with. In 1861, London student Shephard Taylor wrote in his diary:

> Nearly lost my part, an unscrupulous individual having temporarily appropriated it in consequence of there being no card attached to it.[90]

Finished student preparations were sometimes added to university collections. In Vienna, Hyrtl selected the most beautiful ones and displayed them with their makers'

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[86] Krieger to Molewater, 13 December 1851, Rotterdam, Stadsarchief, 328/51

[87] See for example annual report of the medical faculty (teaching) 1858–59, AC2 271; annual report of the Anatomical Cabinet 1862–63, AC2 271; annual report 1876–77, AC2 273.

[88] Hyrtl 1865, 27–29

[89] Hyrtl 1865, 29

[90] Taylor 1927, 23 (entry 24 January 1861); see also Taylor 1927, 21 (entry 15 January 1861) and Taylor 1927, 24 (entry 1 February 1861).

names, so as to inspire other students.[91] Pieter Harting, who studied in Utrecht in the 1820s, recalled in his memoirs how some student preparations were added to the university collections – the ones for which the students had taken an extraordinary amount of time and care.[92] Finished preparations may also have been taken home by students. I have not found explicit references to this for Leiden, but it happened in other places. Taylor even described in his diary how a competition for interesting body parts took place in the London dissection hall he worked in:

> Some individuals seeming to take an interest in Cross' and my specimen of left carotid artery coming off from the innominate artery, we thought proper to anticipate their kind intentions by removing it ourselves to a place of safety. We therefore tossed up for it, when, as usual, I was on the unlucky side, and Cross carried off the prize.[93]

Students made preparations for various reasons. In their early years, it was a way to learn anatomy and to practice their dissection technique. At the end of their studies, it could be part of their dissertation research; the preparations were then needed to answer particular research questions. In the course of the century, microscopic preparations were increasingly in demand. A typical example of the way students worked with microscopic preparations can be found in the dissertation of the Leiden student Johannes Niermeyer. Niermeyer was a student of Theodorus MacGillavry, pathology professor from 1888 to 1905. In his neuropathological dissertation Niermeyer examined the nervous system of a tetanic rabbit. He referred to other anatomists who had explained the difficulties of discovering tetanus on fresh coupes, and he discussed in great detail how he created microscopic preparations as part of his research.[94]

Whatever the preparations were inteded for, students could not make them without 'raw material'. Preparations required bodies. One of the key suppliers of these bodies was a space students visited regularly: the academic hospital.

The academic hospital

Medical teaching was founded on bodies. Without bodies, anatomical demonstrations, student dissections, post-mortems in pathology classes, demonstrating and practicing surgical procedures and building anatomical teaching collections could not take place. Professors regularly complained about a lack of bodies. Take, for example, the following quotation from the 1852–53 annual report, which contains not just a complaint, but also a possible solution:

> This year, 14 bodies were available for anatomical demonstrations and the students' practical anatomy training. Although this number was slightly larger than last year, it can still be called

[91] Hyrtl 1865, 40
[92] Harting 1878, 31
[93] Taylor 1927, 78 (entry 29 January 1862)
[94] Niermeyer 1879

> small because of the larger demand that existed due to the increased number of students, and it is to be hoped, also for the teaching of anatomy, that the establishment of a city hospital will lead to some improvement.[95]

Apparently, more hospital beds were desirable because they would lead to more deceased patients, and hence, more bodies for teaching. This does not mean that every deceased patient was dissected; permission had to be sought from the family of the deceased, as was established by law in 1869, and seems to have been common practice long before that.[96] The hospital was not the only source of bodies: Leiden made, or tried to make, arrangements with various prisons as well.[97] All in all, some ten to twenty bodies became available for anatomical dissections in Leiden each year.[98] Ten times this amount was available for post-mortem examinations.[99] During a post-mortem, the body was not completely dissected, but cut open to the extent necessary to establish the cause of death. Usually the prosector or professor handled the knife, but sometimes students were allowed to as well.[100] If the relatives of the deceased gave permission, the diseased organ or tissue was removed from the body, after which it was turned into a preparation for the university collections.[101]

The hospital was an important source for the Leiden anatomical collections. Hospital bodies varied more than prison bodies: the hospital offered both genders, all ages, and a wide range of pathologies, while the prison supplied mainly men of the crime-committing age. Hence, preparations made using hospital cadavers were more likely to fill a gap in the collection. In other words: when students followed their professor on hospital rounds they were looking not only at patients, but also at possible dissection material. Students realized this, as Molewater's diary shows:

> This morning, I visited the practical classes, including surgery, for the first time [this academic year] and I saw all kinds of miseries. Among other things, a *pièce de caractère* in which man cut an insignificant figure. A very poor woman lying in bed with two small children, twins, to whom she recently gave birth, both barely 1 foot long, and whose little cadavers had already been promised to young men by [pathology professor] Broers, in order to be put in spirits. Meanwhile, these moral creatures were still alive, and the mother heard without any sorrow that they would die because she could not provide for them anyway.[102]

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[95] Annual report on the teaching in the medical faculty 1852–53, AC2 270, B.I.a.
[96] BA 1869, art. 1; Verwaal 2010, 23–24
[97] See for example annual report of the Anatomical Cabinet 1862–63, AC2 271; annual report of the Anatomical Cabinet 1866–67, AC2 272.
[98] Annual reports of the Anatomical Cabinet, medical faculty and university 1851–78, AC2 270, AC2 271, AC2 272, AC2 273
[99] Annual reports of the Anatomical Cabinet, medical faculty and university 1851–78, AC2 270, AC2 271, AC2 272, AC2 273
[100] Annual report of the university 1857–58, AC2 271
[101] Annual report of the medical faculty 1851–52, AC2 270; annual report of the university 1856–57, AC2 271
[102] Molewater 1999, 81 (entry 30 September 1835)

The twins were still alive, but Molewater and the other students already knew they would end up in preparation jars within a few days or weeks at most. While the mother seemingly accepted their death 'without any sorrow' and the students who were promised the bodies possibly looked forward to it, Molewater struggled with the knowledge. He was neither the first nor the last medical student to have such feelings, but he would need to find a way to deal with them if he wanted to become a doctor. He would have to learn what has been variously called 'dispassion', 'clinical detachment', 'detached concern', 'medical gaze' and 'necessary inhumanity'.

The last phrase, 'necessary inhumanity', was coined by William Hunter in a famous quotation from one of his lectures:

> It is dissection alone that can teach us, where we may cut the living body, with freedom and dispatch; and where we may venture, with great circumspection and delicacy; and where we must not, upon any account, attempt it. This informs the head, gives dexterity to the hand, and familiarizes the heart with a sort of necessary inhumanity, the use of cutting instruments upon our fellow-creatures.[103]

Hunter presents dissection as a way of learning the 'necessary inhumanity' good doctors need to do their job. Indeed, the dissection hall has often been pointed out as the place where students learn 'dispassion' or 'detached concern'.[104] However, dissection in and of itself is something one needs to be eased into – something William Hunter was well aware of, as historian Lynda Payne has pointed out. She cites Hunter's warning not to let students dissect unprepared, because this 'might even create disgust to a study from which [they] ought to receive pleasure and advantage'.[105]

The disgust that might result from dissection was twofold. Utrecht professor Cornelis Pruys van der Hoeven, who studied in Leiden, summarized the issue in a metaphor:

> studying corpses, to which feelings and smell have to become inured, just as soldiers [have to become inured] to fire and gun smoke[106]

Pruys van der Hoeven explains that students had to train two things: their smell and their feelings. This corresponds to two forms of disgust students had to overcome: material and moral. Material disgust is a direct, physical reaction to unpleasant, dirty – disgusting – smells or sights. Moral disgust is a struggle with the transgression of social norms. Primary sources sketch the disgusting elements of dissection in all their glory. Our London student Taylor, for example, wrote in November 1861:

> Contrived to remove the intestines from my subject without letting out their contents, an accident that would have won for me the execration of all my fellow-students and perhaps have

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[103] Hunter 1784, 67

[104] Not just in Hunter's days, but ever since – see for example Good and Good 1993, 94–97 on the twentieth century.

[105] Hunter 1784, 108. See also Payne 2007, 111.

[106] Pruys van der Hoeven 1866, 16

> subjected me to a reprimand from the Demonstrator of Anatomy for my carelessness or want of dexterity in the business.[107]

The contents of a corpse's intestines typically cause material disgust. Moral disgust occurs when the student realizes he is actually cutting up another human being – not some 'object'. Taylor again:

> Post-mortem examination of a remarkably fine and good-looking girl, who had died of typhoid fever. It made me feel quite sad to see her dead body lying on the post-mortem table, and I could not help but think, if she had a lover, how broken-hearted he must have felt at her untimely death.[108]

Hyrtl vividly describes how hard it can be to overcome this disgust; to learn to work on the dead:

> The uncommonness of anatomical practices, the cheerlessness of the surroundings, the seal of death that impresses every human being, [these three things] convince even insensitive people at their first visit to our mortuaries … that anatomy possesses no aesthetic side. The first impression it makes on us is cold and serious; there is no cheerful muse greeting us on this gloomy threshold; it is the hand of death which waves us in. How many turn around each year, having looked around in this room [the dissection hall] for the first time, [this room] where only he can feel himself at home whose will [has] the power, whose inclination is profound, and whose selfishness is able to make the sacrifice which anatomy requires from each young person who devotes himself to its practice.[109]

How did medical students prepare for the dissection hall, which, as Hyrtl put it, was 'no Eden'?[110] Pruys van der Hoeven explained the practice in Leiden:

> We too started early with human skeletons and human bones. This is how we were prepared for the study of corpses.[111]

Handling preparations – bone preparations in this case – helped the students get used to the smell and the emotional impact of working with dead bodies. Leiden was not the only place where preparations were used to ease students into dissection: it was also one of Hunter's solutions. Payne has described how he let preparations circulate during his lectures to prepare students for dissection.[112] Like Robert Knox, Hunter did not fully trust his students: before handing them the preparations, he warned them not to press or bend them and informed them of his expectation that none of the preparations would be 'injured, or destroyed'.[113] He also carefully instructed them on which part of the preparation to examine, which according to Payne helped reduce the potential impact of the preparations.

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[107] Taylor 1927, 67 (entry 12 November 1861)
[108] Taylor 1927, 131 (entry 10 February 1863)
[109] Hyrtl 1865, 36–37
[110] Hyrtl 1865, 12
[111] Pruys van der Hoeven 1866, 16
[112] Payne 2007, 111
[113] Hunter 1784, 112

For although preparations may seem less disgusting than complete, decaying bodies, this is not necessarily the case. Preparations had to be carefully selected if used to help students overcome the disgust of dissection, because they can very well evoke that same disgust.

McLeary describes how many early twentieth-century American students disliked the demonstration of preparations because, as two of their teachers put it, 'They are offensive alike to the senses of sight, smell and touch and only the brave or case-hardened person can profit by viewing them.'[114] In addition to this material disgust, preparations can also cause moral disgust. This is particularly true for full body preparations – like Gunther von Hagens' plastinates – and for preparations of body parts closely connected to human identity – like the head or, in our days, the brain.[115]

Not all preparations are less disgusting than dissection room corpses, but some of them are and these preparations helped students ease into dissection. Whether or not a preparation evoked disgust depended not solely on its subject matter, but also on the way it was made. Smelly, materially disgusting preparations could easily be avoided by employing proper techniques. Dry preparations in particular were a safe choice, which is probably why Pruys van der Hoeven's teachers started with bones. Technique, or how a preparation is made, is also important when it comes to moral disgust. Marieke Hendriksen has shown that eighteenth-century Leiden anatomists considered it important to make their preparations as skilfully and elegantly as possible, because this was a way to deal with the disgust these objects might otherwise evoke.[116] In this respect, mid-nineteenth-century Leiden professor Teunis Zaaijer did not differ from his predecessors. The following quotation is taken from his inaugural lecture:

> Once an anatomist has at his command all means which are offered by technique, something that usually happens only after a lot of practice and effort; and if he is convinced of the necessity of an almost excessive care for purity and pulchritude, [then] an anatomical preparation becomes a painting in his hands, [a painting] on which he depicts the anatomical relations, and *[then] he overcomes the disgust* which anatomy has to evoke if it is practised in another way.[117] (my italics)

Zaaijer acknowledged the fact that anatomy is likely to evoke abhorrence, but he thinks this abhorrence can be overcome when an anatomist carefully and with great skill creates a preparation. The preparation then becomes a 'painting' demonstrating knowledge about the body. These were also the preparations that could help students overcome the disgust they felt when first working with (parts of) dead people.

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[114] Robertson and Lundquist 1934, cited in McLeary 2001, 204
[115] Hirschauer 2006; Hoskins 1989; Zwijnenberg 2011
[116] Hendriksen 2012, 105–134
[117] Zaaijer 1866, 23

Redissecting preparations in the laboratory

Molewater never entered a laboratory as a student, for the medical teaching laboratory was only born in the second half of the nineteenth century. In Leiden, the first one opened in 1865, shortly after the new physics and chemistry teaching laboratories were founded (1859), which were almost as important to medical students as the anatomy, pathology and physiology laboratories. Inside the laboratories, students were encouraged to do their own research, especially towards the end of their studies when writing their dissertations. In this research, they often used preparations – not only recent and freshly made ones (as mentioned above), but also old ones, which they redissected to answer their research question.

Preparations from the university's handling collections (and possibly also from the students' private collections) were used as empirical material. This was not only done by doctoral students, but also by 'real' researchers, who reinterpreted the preparations as new ideas found their way into medicine. This reinterpretation of older preparations will be discussed in more detail in the chapter on researchers.

One example of a preparation dissection by a student can be found in the dissertation of Hugo Heller. Heller, a student of Zaaijer, wrote his dissertation on *hygroma colli cysticum congenitum*, a malformation of the neck. After he reviewed earlier discussions on the pathology, he turned his attention to an embryo from the Anatomical Cabinet that displayed this malformation. He described his examination of the preparation, which involved a redissection:

> After making a cross incision through the skin only ... I loosened the skin with the four flaps so far as was necessary in order to see the boundaries of the tumour ... Under the chin is an opening in the septum, giving access to a hole which was originally covered by membrane … which in the course of dissection came off together with the skin.[118]

Clearly, not much was left of the original preparation in the end, because Heller finally decided to open the chest as well as the tumour by 'splitting the tongue and lower jaw'.[119]

Heller's example is rather extreme given that he cut up the original preparation in its entirety. While he was by no means the only student working on preparations from the collections, most tended to leave at least part of the original preparations untouched. A survey of all dissertations listed in the most recent (and most complete) bibliographical work on Zaaijer shows that nine out of ten named doctoral students worked with preparations.[120]

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[118] Heller 1881, 33

[119] Heller 1881, 36

[120] Wallé 2007, 176–177. As noted in the preface of this volume, the list of PhD students is by no means complete. This also follows from the fact that during Zaaijer's professorship (1865–1902) 455 dissertations were produced in the medical faculty (Van Lieburg 1987, 12; Van Lieburg's numbers end in 1899, three years before Zaaijer's death, meaning that the exact number was slightly higher than 455), and we have no reason to assume that Zaaijer's share was much less than that of the other professors. (In 1865, the medical faculty had seven professors; in 1902, ten.) Yet, although the selection is small, the all-but-one score strongly suggests that a significant part of Zaaijer's doctoral students engaged with anatomical preparations, either by redissecting old ones or by making new ones.

At least six of them used existing preparations in their research. In half of these cases, students used macroscopic preparations to make microscopic ones – something that also happened often in pathological anatomy dissertations written under the supervision of Zaaijer's colleagues. Gerardus Couvée was one of the students who transformed (part of) a macroscopic preparation into a microscopic one.[121] He wrote his dissertation in 1900, but worked on a big toe amputated in 1888 and stored in alcohol in the pathology laboratory ever since. The toe contained both a tumour and an interesting pigmentation. To investigate them, Couvée wrote, 'several pieces had been cut off the preparation hardened in alcohol'.[122] Next, he coloured the pieces, after which they were ready for microscopic investigation.

In general, students working on microscopic preparations used fairly recent material – at most one or two decades old. Some students, however, also used much older preparations. For instance, W. Dominicus, Pieter Koning and Anne Leendert Erkelens researched skulls from the Anatomical Cabinet, including some of the skulls collected by eighteenth-century anatomists Sebald Justinus Brugmans (Dominicus and Koning) and Bernhard Siegfried Albinus (Erkelens).[123] Although they did not alter the skulls in any way, they re-examined and reinterpreted the skulls using new instruments and medical ideas, thereby showing that preparations were not solely intended to be looked at, but also to be handled.

Conclusion

Nineteenth-century medical students used anatomical collections in all of the teaching spaces they entered. In doing so, they used their hands: they removed preparations from their jars, they observed them with as many senses as possible, they made their own preparations and they redissected old ones. This helped them learn about the body, master anatomical techniques, answer research questions and overcome the disgust involved with dissection. Anatomical teaching collections have long been neglected in the history of medicine, and when they are discussed, most of the attention goes to museum collections used hands-off. Yet, to understand why they remained in use throughout the nineteenth century, we need to focus not on museum collections, but on handling collections. These collections fitted seamlessly with the new practical teaching, and students encountered them everywhere, from the lecture hall to the laboratory.

In Leiden, movability between the two types of collections was substantial: the university's largest collection, the one in the Anatomical Cabinet, basically doubled as both a display and a handling collection. In other spaces, the two types were more separated. In the Royal College of Surgeons in London, for example, only the store collections were

[121] Other examples are Karel Haverkorn van Rijsewijk and Rodolphe Josselin de Jong, both students of Zaaijer's colleague Siegenbeek van Heukelom, professor in pathological anatomy. Haverkorn van Rijsewijk 1900; Josselin de Jong 1895

[122] Couvée 1900, 16

[123] Dominicus 1878; Erkelens 1902; Koning 1877

handled; preparations in the museum collection were intended to stay in the jar when used for teaching.[124]

Whether intended for hands-on or hands-off use, there was a more fundamental distinction between display and handling collections. Even the preparations in display collections could be removed from their containers to facilitate observation. However, after removal, these were observed (either by eye or by hand) *as part of the museum display*. In the museum, the individual preparation, whether inside or outside the jar, gained its meaning from its place in the arrangement of the collection as a whole. McLeary writes:

> The nineteenth-century medical museum aimed to demonstrate on its shelves the order of the human body and the diversity of disease. This aim was accomplished through complementary, interlocking means. The *physical arrangement* of the medical museum was intended to convey through its spatial arrangement medical knowledge about human (and sometimes comparative) anatomy and pathology. The *specimens* which were placed in this spatial arrangement were intended to provide the student with a simple and sure mechanism for acquiring and retaining knowledge, and the museum as a whole was meant to provide a sensory experience that would stimulate the mind and communicate knowledge more surely to the student than lectures, books, or pictures.[125]

Display collections were arranged according to a certain classification on the shelves in a museum, so that students could carefully observe them as part of this order. Handling collections were also arranged according to a certain classification; sometimes even the same classification as used in the museum. However, when handling collections were used, individual preparations were taken out of the classification and transported to another learning space. The arrangement of the collections was not part of the teaching practice in which these collections were used. When the parts of these collections (the individual preparations) were used, they were separated from the whole both spatially and intellectually. The 'whole' was *not* the reason the preparations in handling collections had been collected, as opposed to the preparations in display collections.

Preparations in handling collections were collected and kept for more prosaic reasons than creating a whole that was more than the sum of its parts. These reasons concerned the practical problems of anatomical research and teaching. Anatomy – whether general, descriptive, pathological, topographical, comparative, microscopic, early modern, nineteenth-century or present-day – is about bodies. Working with bodies comes with two major practical limitations. First, bodies decay more quickly than they can be dissected. Second, they are scarce and their arrival is unpredictable. Bodies cannot be ordered, at least

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[124] Richard Owen, 'Report to the Board of Curators of the Museum of the Royal College of Surgeons On the Museum d'Anatomie Comparée in the Garden of Plants, Paris', September 1831, RCSE MS0025/1/4/1, 1, p. 6–8

[125] McLeary 2001, 29

not the human ones (with obscure exceptions like the Burke and Hare murders); [126] animal bodies are often easier to come by, as long as the animal you are after is not too exotic.

Anyone teaching or researching anatomy has to find a way to overcome decay and make bodies available evenly over time. A common solution is to preserve the material when it comes available and to store it somewhere safe for future use. This is still done: in Leiden's anatomy skills lab – as the present-day dissection hall is called – students work with bodies that are often several years old. Preserving tissue (as microscopic slides, as a complete body, or as something in between) is a necessary step in researching and learning about the body: it is the only way to assure the availability of empirical material when you need it. When the pieces of preserved material – the preparations – are stored together, a collection is born. Making and collecting anatomical preparations should therefore not only be seen as an end in itself, but also as a means to overcome the limited availability and quick decay of human and (to a lesser extent) animal bodies – to 'alter time's … movement', as Harold Cook has put it.[127] With display collections it is an end; with handling collections it is a means.

The difference between collecting as a means and collecting as an end, between a focus on the parts and a focus on the whole, is not only relevant when looking at the use of anatomical collections in learning and teaching, but also when looking at the use of these collections in research – to which we now turn.

[126] Rosner 2010
[127] Cook 2002, 241

Chapter 2. Make Do and Mend

How researchers used old collections in new medicine

18 July 1819. Dusk. Leiden professor Sebald Justinus Brugmans had been working all day in the botanical garden and the natural history cabinet. Suddenly, his chest hurt and his stomach cramped. At first, a simple blood-letting seemed to solve the problem. But the stomach cramps soon returned, and soon grew worse. Gastroenteritis, the diagnosis said, followed by gangrene. Four days after he had felt the first pain, the professor died.[1] He was survived by the roughly four thousand anatomical preparations he had acquired during his lifetime.

Brugmans' death marked the beginning of his collection's life in print. Brugmans used his preparations primarily during his classes: just like his contemporaries, he valued teaching more than research.[2] Of course, research was done, but the results were often communicated solely through teaching – 'publish or perish' was a phrase yet to be coined. Medical historian Antonie Luyendijk-Elshout extensively studied the eighteenth-century Leiden anatomical collections, but she found not a single publication in which Brugmans mentioned his collection. From this she concluded, 'To Brugmans, these preparations have probably seldom served for detailed study.'[3] Maybe to Brugmans the preparations indeed didn't, but to his successors, they certainly did. Nineteenth-century researchers regularly used the Brugmans collection in their publications, as this chapter will show. They also used the collections of Johannes Rau, Bernhard Siegfried Albinus and Andreas Bonn – all anatomists who lived and worked decades before the researchers discussed in this chapter.

The nineteenth-century researchers relied primarily on the old, mostly early modern collections. In 1850, the Anatomical Cabinet housed approximately 8000 preparations, of which around 7500 had been created before 1815.[4] New preparations were added, but the

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[1] Sandifort 1827, xxiv
[2] Theunissen 2000, 42
[3] Elshout 1952, 107
[4] These numbers are rough estimates because no complete catalogues or inventories were kept. I have based the number of 8000 on the four volumes of the main catalogue *Museum Anatomicum* (7382 preparations, all made before 1815) and an estimate of the amount of preparations acquired in the first half of the nineteenth century. In addition to the Brugmans and the Bonn collection (both catalogued in the *Museum*), three major collections were acquired: Jacobus Rocquette's (doctor and lecturer in Haarlem; collection acquired in 1818); Ledeboer's (first name and occupation unkown; collection acquired before 1827); and, in 1837, Simon du Pui's (Leiden professor). Du Pui's collection contained 76 preparations (Elshout 1952, 24–25). The sizes of the other two collections are unkown. Gerard Sandifort considers them less important than the Brugmans and Bonn collections (Sandifort 1827, Praefatio, 3–4), which suggests they were smaller. Therefore, I've estimated them to contain a few hundreds of preparations. The annual reports regularly mention individual preparations being added to the collections; in my estimate, 250 in total. Note that my numbers might be too high because some preparations are listed twice in the *Museum* (though other descriptions probably included multiple preparations) and because part of the preparations described in the *Museum*'s first two volumes were destroyed by an explosion in 1807. However, even if the numbers should be lower, my claim that most of the preparations were made before 1815 still holds true.

majority of these came from estates, meaning even many 'new' acquisitions were made by anatomists from earlier generations. Some researchers had private collections, but they usually added preparations to these collections with an eye on teaching, not research, as teaching was the main source of income for most researchers. Furthermore, these were small compared to the university collections. For most of their collection use, Leiden researchers had to make do with collections created by their predecessors, as had many other nineteenth-century researchers.[5]

This required some mending, for nineteenth-century medical research differed profoundly from its eighteenth-century predecessor. It entailed new disciplines, such as comparative anatomy, pathological anatomy, and developmental embryology.[6] Also, the old disciplines of anatomy and physiology transformed completely.[7] The emerging and changing disciplines used different spaces, like the laboratory and the clinic; different methods, like microscopy; and different concepts, like the cell.[8] All of these changes reached Leiden as well, although often later than they reached many other places.[9] None of the changes did away with the need for collections, but all of them put new demands on the collections. And yet, old collections continued to be used in the new medicine.

Apparently, the same preparations could be used in research for a long time. This chapter analyses the nineteenth-century afterlife of the Brugmans collection to understand how this prolonged use was (and still is) possible. To do so, we must first grasp how anatomical preparations functioned in medical research. It is tempting – and not unusual – to view preparations as end products in the making of knowledge. A preparation then displays a fact about the human body. Its role is to communicate that fact and to back up an anatomist's statement of that fact. Preparations can indeed function like this, but it is not their only use. The previous chapter demonstrated that preparations were not as static as they may seem nowadays: they were dynamic objects that moved around and were handled outside their jars. Nineteenth-century students handled preparations to learn anatomy, train their senses and get used to working with dead bodies. Nineteenth-century researchers handled preparations to produce knowledge. (As we have seen, in the second half of the nineteenth century doctoral students sometimes handled preparations in this way as well –

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[5] At the other Dutch universities, the situation was similar to the one in Leiden: nineteenth-century Utrecht researchers used the preparations of Jan Bleuland (1756–1838); in Groningen, researchers relied on the collection of Petrus Camper (1722–1789). Outside the Netherlands, institutional collections were often built around former private collections (see for example Alberti 2005b on British collections); these private collections had regularly been created in the eighteenth-century. Of course, new preparations were created as well – at the Royal College of Surgeons in London, for example, thousands of preparations were produced in-house during the nineteenth century. In Leiden, however, this was not the case: annual reports show that usually, less than ten freshly made preparations were added to the collections.

[6] On comparative anatomy see Nyhart 1995. On pathological anatomy see Maulitz 2002. On embryology see Hopwood 2009.

[7] Cunningham 2002, 2003

[8] On the rise of the laboratory in medicine, see Cunningham and Williams 1992. On the birth of the clinic, see Ackerknecht 1967 and Foucault 1976. On the growing importance of microscopy see Schickore 2007. On the construction of cell theory see Harris 1999.

[9] Beukers 1983, 1984

they wandered in that grey area between student and researcher.) In their handling, researchers reinterpreted and even redissected older preparations. It is therefore misleading to view preparations as end products alone. They were never finished; they were used not just to *display*, but also to *produce* knowledge. However, it would be equally misleading to view them as instruments or as unfinished raw materials – this would ignore their use as evidence, as communicative devices. In the act of research, preparations played a peculiar double role. They were both finished and unfinished; a representation of ready-made knowledge and raw material for new facts; and, if you want, artefacts and naturalia.

I use the work of Hans-Jörg Rheinberger, historian and philosopher of the biological sciences, to understand the double role preparations play in research. Rheinberger's analytic arsenal will not only be part of this chapter, but will also return in later chapters. I will therefore discuss Rheinberger's ideas on anatomical preparations in some detail in the first section of this chapter. Afterwards, I will sketch the background of the Brugmans collection and explain how it ended up in the Anatomical Cabinet. I will then demonstrate how nineteenth-century researchers (re)used Brugmans' preparations in various fields of study: physical anthropology, pathological anatomy, and, to conclude, comparative anatomy.

Preparations: made of what they represent

A preparation can be understood as a stabilized version of a (no longer) living thing and as such, it belongs to what Rheinberger calls 'epistemologica': 'material things rendered permanent in various ways that play a part in knowledge production by enabling facts to be exposed and elucidated.'[10] Here, we see the first of the preparation's two roles: the preparation as an end product, as a demonstration of a fact. Other types of epistemologica, like anatomical models, graphs and drawings, can also demonstrate facts.[11] Yet preparations also play a second role, one that is much harder to take on for other epistemologica: they can be used to produce new facts, instead of demonstrating existing ones. To understand why preparations can be used in this way, and why other epistemologica cannot (or only to a very limited extent), it is useful to compare anatomical preparations with anatomical models.

Models and preparations are similar in that they both *represent* a particular object of inquiry. Yet they are also fundamentally different because preparations are a very peculiar kind of representation. Rheinberger argues that 'normal' representations have two defining characteristics.[12] The first is a change to a different medium: an anatomical model is made of wax, papier-mâché or plastic, while its object is made of human tissue. The second is a rule (or set of rules) that maps the object to the medium. Preparations are atypical because

[10] Rheinberger 2010, 233–234

[11] Rheinberger does not explicitly state that graphs and drawings are epistemologica (he does for models, see e.g. Rheinberger 2010, 234), but I understand them as such.

[12] Rheinberger 2003, 9–10. Rheinberger uses philosopher of science Bas van Fraassen's definition of representation in his argument.

they lack the first characteristic. Although they are representations, they are not made of a different material than their objects. A kidney preparation does not, like a model, consist of wax or papier-mâché – it consists of *kidney*. Preparations are *made of what they represent*, which is what enables them to take on their second role: that of an unfinished product, empirical material, used to answer questions other than those they were made to answer.

Rheinberger refers to this capacity when he writes: 'the essence of organic preparations qua knowledge objects resides in this material complicity [being made of what they represent], which ensures their duration and the permanent possibility of their epistemic recall.'[13] Rheinberger's observation is crucial because it pinpoints *why* the Brugmans preparations could be reused again and again. This might not be immediately clear because, unfortunately, the observation is also rather dense. But think about what it takes for seemingly finished made-objects to be reused in producing new knowledge as happened to the Brugmans preparations in the nineteenth century. Most of all, they need to enable reinterpretations. Both preparations and models are created with certain questions, or at least vague ideas, in mind. Their makers create them to generate new knowledge relating to these questions or ideas (or, in the case of preparations intended solely for teaching, to demonstrate known facts). But as time goes by, (new) researchers start working with different questions and different ideas. For example, instead of wanting to describe a tumour macroscopically, they want to understand it on a cellular level. To answer the new questions, they need to either make new preparations and models, or reinterpret the old ones. Sometimes, a reinterpretation is as easy as writing a new label – when renaming a species, or reclassifying a plant, for example. But often, a reinterpretation is more complex and requires new empirical data: extra information that is not directly offered by the object. Take the tumour-example: a cell-theory related reinterpretation requires the tumour's microscopic structure, but neither a macroscopic preparation nor a macroscopic model represents this structure.

When it comes to such complex reinterpretations, preparations have an advantage over models: they are more likely to contain the required information because they are made of what they represent. Both models and preparations contain information, and both may contain more information than strictly required for the purpose they were made for. But models only contain information *added* by the modeller, while preparations contain all information *not taken away* by the prosector. Therefore, models only contain information that was accessible to their maker. For example, nineteenth-century papier-mâché models of snails *never* contain the snail's DNA structure because the molecular level was inaccessible to the dissecting and model-making instruments of the day. A nineteenth-century alcohol preparation of the same snail, on the other hand, *does* contain its DNA structure. The preparation maker did not have access to it, but he did not need to: the structure was nevertheless included in his material. Therefore, with the preparation it is possible to 'go

[13] Rheinberger 2010, 238

back' to the 'original' object of inquiry (the snail) and extract the DNA structure at a later date. None of this is to say that reinterpreting models is impossible; it only is much harder.

The 'going back' to the object of inquiry is what Rheinberger calls 'epistemic recall'. Rheinberger proves his epistemic recall in theory; using the example of the Brugmans collection, I will demonstrate how it worked in practice. For it was the continuous reinterpretation of preparations that kept Brugmans' collection useful for medical research throughout the nineteenth century.

Brugmans and his collection

Sebald Justinus Brugmans (1763–1819) collected his first naturalia in his parents' backyard, which he explored for shells and stones as a child.[14] He continued building collections for the rest of his life. When he studied in Groningen, he collected stones in areas surrounding the city; this collection formed the empirical foundation of his first doctoral dissertation, in philosophy, which he completed in 1781.[15] For his second doctorate, in medicine, he studied several years in Leiden. During that period, he assisted Leiden professor Dionysius van de Wijnpersse in ordering the natural history collection of the deceased medical professor Wouter van Doeveren (1730–1783).[16] Brugmans received his medical degree in 1785 from the University of Groningen.[17] Soon after, he was appointed professor in Franeker. He left a few months later, after having been offered a position in Leiden. The Leiden governors appointed him as a professor at the philosophy faculty, where he taught courses on botany, mineralogy and zoology. However, Brugmans was not satisfied with this position and longed for a professorship in the medical faculty. After some lobbying, he succeeded in 1791. This displeased the other medical professors, who feared they would loose students, and hence money, to Brugmans.[18] Brugmans' teaching was widely praised; he was said to speak appealingly and without notes. To illustrate his lectures, he built a collection of anatomical preparations – the same collection we will follow in this chapter.[19]

Brugmans remained a professor in Leiden until his death in 1819, but he regularly took on activities outside the university as well. He advised subsequent governments of very different political leanings on health issues. He led the national Military Medical Services for twenty years; advised on cattle plague; and contributed to a national pharmacopoeia,

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[14] Biographical information on Brugmans can be found in the many obituaries that appeared after his death, partly listed in Wallé 2007, 130–131. Most extensive are the ones by H. C. van der Boon Mesch and Abraham Capadose, written after a prize essay competition organized by the Holland Society of Sciences. (Van der Boon Mesch 1825; Capadose 1825) For a more recent interpretation of Brugmans' life, see De Jonge 1999 and De Jonge 2001. Brugmans' correspondence has been described in Van Heiningen 2008.

[15] Brugmans 1781

[16] Sandifort 1827, xiii

[17] Brugmans 1785

[18] De Jonge 1999, 10

[19] The collection is catalogued in Sandifort 1827 – more on that below. For a list of visitor reports and other literature on Brugmans' collection, see Engel et al. 1986, 46. Also useful is the description by Cornelis van der Klaauw: Van der Klaauw 1930.

the *Pharmacopoea Batava*.[20] His work on the battlefields and in military hospitals offered him ample opportunities to collect pathologies and foreign skulls. Possible sources for his animal preparations included the animals he dissected during his research on the cattle plague as well as the animals kept in the university's botanical garden.[21] Furthermore, several of Brugmans' relations – including Georges Cuvier, but also his subordinates in the Military Medical Services – sent him skulls, bones, fossils and other objects, sometimes fully prepared.[22]

In 1817, Brugmans offered his collection to the university, 'on the reasonable condition of compensation'.[23] The immediate cause for Brugmans' offer – and for the university governors' acceptance – was the 1815 Decree on Higher Education, which obliged all universities to own several types of anatomical preparations.[24] Among these were comparative anatomy preparations, which were lacking in the Leiden University collections but well represented in Brugmans' collection. Around half (2093) of Brugmans' 4081 preparations were comparative anatomical; just over a fourth (1154) were pathological; the remaining ones were mainly natural history objects (635) and fossils (141).[25] Because of the large number of comparative-anatomical preparations, the governors were keen on acquiring the collection. They agreed with Brugmans on a 'compensation' of thirty thousand guilders to be paid in six annual installments.[26] However, Brugmans died two years into the agreement, Brugmans, which prompted his widow to reopen the negotiations. She secured an additional four thousand guilders for herself, because of the new preparations made by Brugmans that had not been included in the first deal, and because she also offered the collection cupboards to the university.[27] In November 1819, the university officially owned Brugmans' collection.

The governors appointed Gerard Sandifort, curator of the Anatomical Cabinet, as supervisor of the Brugmans collection and asked him to catalogue it.[28] Sandifort replied with caution: he admitted that a catalogue would enlarge the collection's value, but explained that cataloguing would be difficult and time consuming.[29] He was willing to invest the required time, but asked for two things in return. First, he wanted to keep teaching the

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[20] Brugmans et al. 1805

[21] Van der Klaauw 1930, 50–51

[22] De Jonge 1999, 46. Sandifort 1827 sometimes names donors in the descriptions, but mostly he keeps silent about the objects' provenance.

[23] Brugmans to governors, 4 April 1817, AC2 70, 56

[24] RDHE 1815, art. 177

[25] Of course, the numbers depend on how you divide the different preparations into categories. I've taken the numbers from Van der Klaauw 1930, which is based on Sandifort 1827. Note that the pathological preparations contain a lot of animal preparations as well. Also, the comparative-anatomical preparations include foreign (human) skulls, which could equally be considered as a separate category.

[26] Minutes governors, 22 May 1817, AC2 3, fo. 87^{V}

[27] C. M. van Dam (widow to Sebald Brugmans) to governors, 14 October 1819, AC2 72, 131; Minutes governors, 25 October 1819, AC2 5, fo. 197; Minister of Education to governors, 6 November 1819, AC2 72, 141

[28] Minutes governors, 27 November 1819, AC2 5, fo. 211^{r}

[29] Sandifort to governors, 2 December 1819, AC2 72, 149

comparative anatomy classes; second, he wanted the comparative anatomy part of the collection housed within the Anatomical Cabinet. It went without saying that preparations of general and pathological anatomy would be added to the Cabinet, but the preparations of comparative anatomy would be useful in the university's natural history cabinet as well. Sandifort admitted this, but he claimed that they were better suited to the Anatomical Cabinet because of their ultimate aim of illustrating the structure and functions of the human body. When the governors ultimately decided on the fate of the comparative anatomy preparations in the Brugmans collection on 30 September 1820,[30] Sandifort had already finished half the catalogue, which consisted of descriptions based on Brugmans' labels and Sandifort's own investigations.[31] The governors allowed him to keep all comparative anatomy preparations, as he wanted, but decided that the natural history preparations were to be housed in the new National Museum for Natural History, into which the university's natural history cabinet had been incorporated.

Obviously, the new museum collected natural history objects, but what exactly are these? And how do they differ from comparative anatomy objects? A letter by Sandifort helps answer these questions. On 21 October 1820, he wrote the governors about the Brugmans preparations he intended to transport to the Museum for Natural History:

> Since Your Highly-Learned Dignitaries demand that all objects that do not directly belong to the collection of comparative anatomy, but are more related to natural history, are added to the Cabinet of Natural History, I will not fail to deliver to this Cabinet all objects kept in liquor, including the collection of shellfish, as instructive as extensive, &c.; the dried or stuffed animals; all fossil bones; and, further, one specimen of every skeleton and animal head we have in duplicate; I hope this meets your intentions.[32]

To Sandifort, natural history objects were whole-body preparations of animals (either stuffed, dried or in fluid), animal bones and skeletons, and fossils. Sandifort's definition matches the one found in a Ministerial Decree issued two months later, on what the Museum for Natural History should and should not collect:

> 2. In this museum, animal species (with the exception of man) and their complete or partial skeletons will be brought together and kept, and, further, fossils and minerals.
>
> 3. No preparations of the individual animal organs, neither pathological nor physiological, belong to the scope of this Cabinet.[33]

The museum was allowed to collect complete animals, animal skeletons, fossils and minerals; these were considered to fall under the header of natural history. Preparations of animal organs, however, were not added to the museum, as they were not considered to

[30] Minutes governors, 30 September 1820, AC2 6, fo. 80
[31] Sandifort to governors, 29 September 1820, AC2 73, 124
[32] Sandifort to governors, 21 October 1820, AC2 73, 142
[33] 'Extract, uit het Register der Handelingen en Resolutien van den Minister, voor het Publieke Onderwijs, de Nationale Nijverheid en de Kolonien', No 3, 31 December 1820, cited in Gijzen 1938, 17

belong to the realm of natural history, but to that of comparative anatomy. Their home was the Anatomical Cabinet, at least until around 1860. At this point, curator Hidde Halbertsma used the Cabinet's move to rearrange and reclassify the preparations and to get rid of the preparations he deemed irrelevant for medical research and teaching. Among other things, he disposed of part – but not all – of Brugmans' comparative anatomy preparations. They were moved to the Museum for Natural History, of which the collecting order had been legally enlarged in 1859.[34]

These days, the collection is distributed among various institutions. Three Leiden museums house most of the remaining preparations: the university's Anatomical Museum, Naturalis (the successor of the National Museum for Natural History), and Museum Boerhaave, a museum devoted to the history of science and medicine.[35] The segmentation of the collection started, as we have seen, quickly after its acquisition. Historian Hans de Jonge has condemned the governors' decisions:

> Due to mismanagement by the Leiden university governors, who had no idea what kind of collection they had acquired, the collection fell apart as early as 1820 … The governors made the tragic decision to divide the Brugmans collection between both institutions [Museum for Natural History and Anatomical Cabinet] … The governors did not understand that the division completely negated the fundamental principle of the collection, the comparison of skeletons and organ systems throughout the animal series right to man.[36]

De Jonge implies that the governors should have preserved the collection according to Brugmans' 'original' intentions. He interprets their failing to do so as born of ignorance. However, De Jonge does not take into account that the governors did not acquire the Brugmans collection because they wanted to preserve material heritage, but because they believed the professors could use the preparations for teaching and research. (That said, the governors were keen on using the anatomical collections, including Brugmans', as status symbols because of their connection to the past, as we will see in the chapter on governors.) The professors indeed could but their ideas on research and teaching differed from Brugmans'. They therefore required a reinterpretation of his collection. Splitting up the collection was part of this reinterpretation, and as such, it reflects not a lack of insight, but changing ideas on research and teaching. Brugmans' preparations were flexible enough to be adapted to these changing ideas, mainly because they – like all preparations – were made of what they represented. In the following sections I will discuss the reuse of Brugmans' preparations in three medical disciplines: physical anthropology, pathological anatomy and comparative anatomy. We will see how researchers extracted new information from the preparations and how the preparations remained relevant in medical research throughout the nineteenth century.

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[34] Van der Klaauw 1926, 12
[35] De Jonge 2001, 6
[36] De Jonge 2005, 197

Physical anthropology

Physical anthropology has been defined as the study of the similarities and differences between the bodies of groups of people.[37] It focuses mainly on differences in the structure of the body. Researchers used two ways to establish these differences: they measured and compared either the bones of the dead or the bodies of the living. The former is called craniology or craniometry; the latter, anthropometry. In the nineteenth century, both were tied to medicine. Their practitioners were usually trained as medical men and published in medical journals; the required collections were, at least in the early days, housed in medical institutions. Here, I focus on craniometry because this approach relied heavily on anatomical collections.

In the Netherlands, craniometry became a well-defined area of study in the middle of the nineteenth century. Until 1900, Leiden was the field's main centre, with first the Anatomical Cabinet and then, from 1880 onwards, the Ethnographical Museum as the leading institution.[38] Leiden professors Teunis Zaaijer and Jan van der Hoeven belonged to the first practitioners. They were 'armchair anatomist-anthropologists'.[39] They did not go out into the field, but relied completely on the skulls and bones already present in their local collections. They used whatever materials came to them – either from overseas or from the past. In the early days in particular, they relied on older preparations: the Anatomical Cabinet received very few new anthropological preparations between 1835 and 1860.[40] Among these older preparations were the anthropological objects from the Brugmans collection.

As mentioned above, Brugmans collected foreign skulls on battle fields. He also received skulls (and other bones) from overseas through his connections in the military. How did he incorporate these objects in his collection? In 1817, Brugmans sent a description of his collection to the Leiden governors, as part of his offer to sell the collection. The description reveals that he had classified osteological preparations from foreign countries in a separate category, subdivision 14, which he described as follows:

> Changes in the normal condition and the resulting forms of the animal species. Especially of Man due to climate, way of life, etc. – This includes an extraordinarily rare and important series of approximately 120 human skulls from many different regions, all of them arranged according to their geographical locations, starting with the North Pole and ending with the Equator – Casts of faces of various nations are added to this, etc.[41]

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[37] I took most of the general information on physical anthropology in this section from Fenneke Sysling's overview of early Dutch physical anthropology (Sysling 2013, 1–84).

[38] Sysling 2013, 51–78. Around 1900, physical anthropology's momentum would move again, this time to Amsterdam – with the university's anatomical collections and the newly founded Colonial Institute (1910) as its loci.

[39] Sysling 2013, 23

[40] Teunis Zaaijer, 'Katalogus der ras-schedels, bekkens en skeletten in het Anatomisch Kabinet der Rijks-Universiteit te Leiden', 1893, Leiden, LUMC, archives Anatomisch Museum (no inventory number), p. 11. After 1860, import from overseas grew quickly. See Sysling 2013, 53–58.

[41] Brugmans to governors, 4 April 1817, AC2 70, 56

Brugmans was interested in 'changes in the normal condition' because these could help understand the way nature worked.[42] With regard to the taxonomy of men, Brugmans thought there existed one human race (consistent with his strong belief in the unity of nature), which could be divided in five sub-races, as had been argued by German researcher Johan Friederich Blumenbach.[43] Variations occurred due to external influences – 'climate, way of life, etc.'. Studying these variations would lead to a better understanding of how nature worked in 'normal' cases. Hence, to better understand the formation of the five sub-races, it was helpful to study skulls from different nations (and thus, influenced by different external factors). In Brugmans' days, studying skulls usually meant describing individual skulls and using these descriptions to uncover similarities and differences between 'races'.[44]

The physical anthropologists of the second half of the nineteenth century rejected the descriptive approach of Brugmans' time. Instead, they aimed to create a 'scientific' discipline. They believed conclusions should be based on a large number of precise, numerical measurements – a demand that fitted the rise of statistics and the emergence of the idea of scientific objectivity in that period.[45] The anthropologists built on Adoplhe Quetelet's idea of *l'homme moyen*, the average man. Quetelet, a Belgian astronomer, pioneered the use of statistical methods in the social sciences in the 1830s and 1840s.[46] He focused not on the individual and the particular, but on the whole and the average; a practice that was followed by researchers in many fields, including anthropology. The new 'scientific' approach forced the Leiden armchair anthropologists to get up, take up their measuring rods and reinvestigate the old Brugmans preparations.[47] Brugmans' labels and Sandifort's descriptions alone did not suffice.

Jan van der Hoeven was among the first Leiden researchers to apply quantitative methods to Brugmans' preparations. In 1842 he published his book *Bijdragen tot de natuurlijke geschiedenis van den Negerstam* ['Contributions to the Natural History of the Negro Race']. The natural history of the human race, Van der Hoeven explained, was part of the larger science of anthropology. Its two main areas of research were the differences between man and the other animals and the differences among men, in particular between the different human races. Van der Hoeven focused on the latter. He thought comparing the skulls of different races would prove particularly useful.[48] Therefore, his book contained a comparison of 'Negro' and 'European' skulls. The comparison was quantitative and based

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[42] Brugmans to governors, 4 April 1817, AC2 70, 56
[43] De Jonge 2001, 22; De Jonge 1999, 41–44
[44] Sysling 2013, 14–15
[45] Sysling 2013, 16. On the rise of statistics in general see Porter 1986. On the rise of statistics in Dutch medicine see Klep and Kruithof 2008. On scientific objectivity, see Daston and Galison 2007.
[46] Vanpaemel 2002
[47] Elshout claims that Brugmans measured his skull preparations, but it is unclear what her source is (Elshout 1952, 107). She refers to a catalogue on racial skulls by Sandifort (Sandifort 1838–1843), which does indeed contain some measurements of some Brugmans' skulls, but Sandifort nowhere writes that Brugmans himself made this measurements. It seems more likely that Sandifort did this – especially because the measurements are lacking in the earlier-published *Museum Anatomicum* (Sandifort 1827, 1835).
[48] Van der Hoeven 1842, 5

on averages, not individual cases: measurements and statistics, the foundations of nineteenth-century physical anthropology. The average dimensions of the 'Negro skulls 'resulted from a detailed investigation of ten skulls from the Anatomical Cabinet, all of them part of the Brugmans collection. Van der Hoeven admitted that ten was a small number and perhaps not enough to yield significant results.[49] He explained why he decided to publish his findings anyway: he hoped his first results would stimulate other people to collect measurements as well.

Van der Hoeven had carefully measured all ten Brugmans skulls, even though he had already published measurements of some of them before.[50] His new measurements had yielded more accurate numbers, something he considered important. He presented his results in a table.[51] For each skull, he provided twelve different dimensions, including the height and length of the skull, the width of the occipital hole, and the largest distance between the zygomatic arches. He subsequently took the averages of these dimensions and compared them to averages of dimensions of European and Chinese skulls. He defended his method as follows:

> We partly agree with those who think that this average measure is something imaginary. But it is imaginary in the same sense as the average temperature, the average barometric pressure, etc. are. And meanwhile, the physicists will not give up these imaginary things; [because] they have learned too many fine and useful things from them. I hope that in natural history of man we will follow our scientific friends in this regard. For more on such research methods, I refer to the penetrating writings of Quetelet.[52]

He stressed the value of averaging and he invoked Quetelet to strengthen his claim – in other words, he was a typical 'scientific' anthropologist.

Van der Hoeven was a professor of natural history at the faculty of natural sciences. The Anatomical Cabinet was part of the medical faculty and was managed by the professor of anatomy. How did Van der Hoeven gain access to the Brugmans skulls? In his book on the 'Negro race', he wrote:

> The Negro skulls which I have examined for this piece all belong to the collection of Professor Brugmans, which is now in Leiden University's museum of anatomy. The highly-learned Mr Sandifort opened this collection for my research with a willingness for which I want to thank him publicly.[53]

Van der Hoeven thanked Gerard Sandifort for his cooperation. As a curator of the Anatomical Cabinet, Sandifort had to follow the regulations outlined in the 1815 Royal Decree on Higher Education (RDHE). The decree prescribed in detail which professor was

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[49] Van der Hoeven 1842, 25
[50] Van der Hoeven 1842, 'Voorberigt' (unnumbered page)
[51] Van der Hoeven 1842, 30
[52] Van der Hoeven 1842, 36–37
[53] Van der Hoeven 1842, 26. Other institutional collections, both inside and outside Leiden, were used in research as well. See for example Swaving 1861, 285 (a skull from the *Bataafsch Genootschap*, Batavian Society).

in charge of which collection. For the Anatomical Cabinet, the anatomy professor was appointed.[54] Other professors could borrow objects from the collections for teaching and research purposes with the permission of the managing professor.[55] The RDHE regulations regarding collections were replaced in 1879, when a new decree governing the management and use of 'collections, institutions and teaching aids' in higher education was issued.[56] Again, borrowing objects from the collections was explicitly allowed, as was removing them from the buildings they were kept in, with the prior consent of the responsible official.[57]

Researchers not only had access to institutional collections, but also to private collections. The 1862 dissertation of Teunis Zaaijer offers an example.[58] Zaaijer examined two female East-Indian pelvises from the collection of the academic hospital. He compared them with five other pelvises. Four of these belonged to the collection of Amsterdam anatomist Willem Vrolik, who had sent them from Amsterdam to Leiden at the request of Zaaijer's supervising professor, Abraham Simon Thomas.[59] Apparently, collectors were willing to send preparations to other cities to facilitate research.

The fifth comparative preparation Zaaijer used came from the Anatomical Cabinet. It belonged to the Brugmans collection. Sandifort described it in the *Museum Anatomicum*, the Cabinet's catalogue, as 'pelvis of an adult Javanese woman, the bones artificially connected'.[60] He most likely based his description on a label or an inscription written by Brugmans, for it is unlikely he would have connected the preparation to Java if he had encountered the pelvis without any description. According to the present-day database of the Anatomical Museum, the pelvis bears the following inscription: 'pelvis feminae adultae javanensis' (pelvis of an adult Javanese woman).[61] This might very well be Brugmans' own inscription. Sandifort's modified description of the Javanese pelvis was further extended by Zaaijer. He explained that the bones were held together with metal wire (copper, according to the present-day database). More importantly, just like Van der Hoeven did with the skulls, Zaaijer introduced a quantitative description of the pelvis: he measured twenty dimensions, including the depth of the pelvis at its sides, the width of the pubic arc and the length of the sacrum. He did the same with the other pelvises he examined and, again like Van der Hoeven, he compiled his results into a table to facilitate comparisons.[62]

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[54] RDHE 1815, art. 178
[55] RDHE 1815, art. 200
[56] Reg. 1879
[57] Reg. 1879, art. 6 and art. 7
[58] Another example can be found in Hidde Halbertsma's article on the third joint on the occipital bone – Halbertsma used skulls from the private collections of both Van der Hoeven and Cornelis Swaving. (Halbertsma 1865, 222) Swaving himself used skulls from other private collections in his work, see for example Swaving 1861, 278.
[59] Zaaijer 1862, 11
[60] Sandifort 1827, 109 (object 1860). The Latin reads: 'Pelvis ossa artificialiter nexa foeminae [*sic*] adultae javanensis'.
[61] In the database, the preparation can be found as number Af0168.
[62] Zaaijer 1862, table after p. 30

The reinterpretation of Brugmans' anthropological preparations did not stop with Van der Hoeven and Zaaijer. Although new colonial skulls arrived in large numbers from the 1860s onwards, researchers continued to use skulls from the Brugmans collection. An example of this can be found in the 1877 dissertation of Pieter Koning, one of Zaaijer's students. Koning examined Chinese skulls, and although the majority of the sixty-seven skulls he measured had been acquired in recent years, he also used older skulls, including two from the Brugmans collection.[63]

All anatomist-anthropologists working on the Brugmans skulls extracted new information from them. Or, in Rheinberger's terms: they moved back from the epistemologicum, the stabilized object, to the original object of inquiry. This was easy because the skulls were made of what they represented. With other epistemologica, the epistemic recall would have been more troublesome: for instance, it would not have been possible if they would have had recourse to the drawings of the skulls only, such as those published in the fourth volume of the *Museum Anatomicum*. However, many of the measurements would have been possible with plaster casts. Although these are not made of what they represent, they have all of the necessary information (in this particular instance and in aid of this particular quantitative research question). In the next section, on pathological anatomy, we will encounter different types of reinterpretations, which neither drawings nor three-dimensional models would have allowed.

Pathological anatomy

In 1855, Leiden professor Hidde Halbertsma published a treatise on the pathological anatomy of teeth.[64] In his research, he used at least ten dental preparations from the Brugmans collection. He described them microscopically – something he could do only after partly dissecting the preparations, as he explicitly acknowledged:

> In a few very limited places, the structure of these globes [the *globuli dentis*, thought to be involved in the production of dentine, a component of teeth] presents itself differently than it does in by far the biggest part of the cross section *from which I have ground microscopic slides*.[65] (my italics)

Halbertsma depicted and described what he saw through his microscope – and, in doing so, reinterpreted a macroscopic pathological preparation on a microscopic level. This practice was not unusual in the mid nineteenth century and was caused by a shift in pathological theories.

Until the 1750s medics largely understood disease in terms of Hippocratic interpretations of the movement of fluids through the body. Various theories abounded, but all of them highlighted the build-up and balance of bodily fluids. Moreover, disease was

[63] Koning 1877, 6–7
[64] Halbertsma 1855
[65] Halbertsma 1855, 14

understood holistically, affecting the body as a whole. This changed when a new idea of disease arose: disease as a *localized* entity, caused by changes in a specific body part. Italian anatomist Giovanni Battista Morgagni advocated this new view early on. In 1761, two years before Brugmans was born, Morgagni published his magnum opus: *De sedibus et causis morborum per anatomen indagatis* [*The Seats and Causes of Diseases, Investigated by Anatomy*]. Soon after, the localized view of disease became widely accepted and Brugmans adopted it as well. Take, for example, his ideas on cancer, summarized by Abraham Capadose in his 1825 eulogy:

> [Brugmans'] explanation of the origin of cancers also belongs to the propositions with which Brugmans tried so vigorously to refute the principles of so-called humoralists; he understood them [cancers] not as already present in the blood before the vessel system was reached (as was still claimed by the learned Van Gesscher and many distinguished medical men), but as preceded by a peculiar change in the vessels and other solid parts.[66]

According the Brugmans, the cause of cancer was not to be found in one of the humours (here: blood), but in a specific body part: the vessels (or another solid body part, depending on the type of cancer). Note that humoralists did not deny that vessels were affected in the case of cancer. But they interpreted the damage as a *consequence* of the disease, not as its *cause*. In their eyes, the cause was to be found in the humours. As a result, the diseased body part, as a mere consequence, was not their first concern.[67] In the eyes of Brugmans and other followers of Morgagni, to understand disease one had to study its loci: the diseased body parts. These body parts could be found in pathological collections – a new phenomenon. Until then, anatomists primarily collected preparations of the normal (or even the perfect) body. Malformed and diseased body parts were collected from time to time, but mainly as a contrast to the healthy body, not because they were considered interesting in themselves.[68] With the localized view of disease, researchers required preparations of pathological body parts – the question now was: which body parts , and how should they be described?

For Morgagni, disease was primarily localized in *organs*. In the nineteenth century, however, the loci of disease would become even smaller.[69] In the early nineteenth century, following the work of the Frenchman Xavier Bichat, pathologists shifted their focus from organs to *tissues*. Soon after, in the 1830s and 1840s, the microscope became popular in medicine, leading to a cellular approach to pathology in the second half of the nineteenth century. Researchers now localized disease in *cells*; and they described it microscopically.

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[66] Capadose 1825, 602. Unfortunately, we have to rely on Capadose's report of Brugmans' ideas in this area, because Brugmans himself, again, did not publish them.
[67] Note that many different kinds of humoralists existed – most of them with more complex ideas on disease than Capadose suggests in his eulogy. He tends to oversimplify the view of the humoralists in order to sharpen the contrast between them and Brugmans.
[68] On the changing position of pathological preparations in the Leiden collections, see Hendriksen 2012, 105–134.
[69] On the development of pathology in the nineteenth century, see Maulitz 2002.

The changing loci did not end the need for pathological collections.[70] After all, diseases were still linked to specific body parts. Furthermore, we should understand the shifts to smaller loci not so much as replacements but as additions; the 'larger' seats remained important as well, but they were supplemented by descriptions on 'smaller' levels.[71] Hence, older, macroscopic preparations still had their use, but they had to be supplemented by microscopic preparations and descriptions of the same diseases. Often, existing preparations were used for conducting microscopic research because it took a lot of time and effort to build a pathological collection from scratch (there are many diseases, and most bodies, which were scarce already, tend to display only one of them).

The microscopic reinterpretation of macroscopic preparations was, of course, not limited to Leiden. The nineteenth-century pathological catalogues of the London Royal College of Surgeons, for example, mention the microscopic re-examination of older preparations,[72] as do the annual reports by the college's museum curator, for example from 1890–91:

> Advantage has been taken of the opportunity presented by the re-mounting of many old preparations to make microscopic sections of all growths not previously examined.[73]

Here, we do not know what 'old' means, but an early twentieth-century case at the college shows that such reinterpretation was done even with preparations made 150 years earlier. In 1909, curator Arthur Keith received, as he put it, 'permission to cut Hunterian free martin [*sic*] specimens'.[74] A freemartin is a specific type of hermaphrodite: the female calf of a mixed cow twin. John Hunter studied the freemartin in the late eighteenth century.[75] In the early twentieth, Keith wanted to revisit Hunter's freemartin preparations. Hunter had based his ideas mainly on external investigations of the preparation, but Keith wanted to investigate them microscopically and describe them on a cellular level.[76] Afterwards, he reported back to the Hunterian Trustees (who had granted him permission):

> The specimens you have given me the privilege of examining have been preserved – some of them at least – for over 140 years. It is not necessary to allude to the advantage of being able to verify and augment observations made after so long an interval. The state of preservation of the specimens is so good that there is every reason to believe that some future investigator, in the light of further progress in our knowledge, may still be able to glean fresh information from a re-examination of these specimens.[77]

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[70] On pathological collections in the nineteenth century, see Alberti 2011.
[71] Maulitz 2009, 369
[72] See for example Paget 1885, preface and individual object descriptions (e.g. number 3589, p. 29).
[73] 'Annual report of the conservator to the museum committee', 29 June 1891, p.2, RCSE RCS-MUS/8/2/2
[74] Arthur Keith Journals, Vol.1, 1908–09, RCSE MS0018/3/1/3, 4, 9 February 1909
[75] Hunter 1786, 46–62
[76] Minutes of the Hunterian Trustees, 10 February 1909, RCSE RCS-MUS/1/1/3
[77] Minutes of the Hunterian Trustees, 10 November 1909, RCSE RCS-MUS/1/1/3

Keith's investigation was by no means the first time Hunterian preparations were re-examined; it happened throughout the nineteenth century in order to update catalogue descriptions, and often this re-examination required redissection.[78]

Nineteenth-century researchers were not afraid to cut into old preparations, even if these had been made by famous anatomists like John Hunter.[79] Or by Sebald Justinus Brugmans, for that matter – as is evident from Halbertsma's research on teeth. And Halbertsma was not alone in dissecting Brugmans' preparations: Jan Nicolaas Bogtstra and Johannes Boogaard did so as well, about a decade after Halbertsma's work on teeth. They researched a malformation of the skull, for which they used several skulls from the Anatomical Cabinet. Boogaard, Bogtstra's supervisor, wrote an article about this, in which he stated:

> Dr Bogtstra described five skulls from the Leiden University Anatomical Cabinet [in his dissertation]. All of these skulls were sawn through vertically, close to the median plane, in order to simplify the investigation.[80]

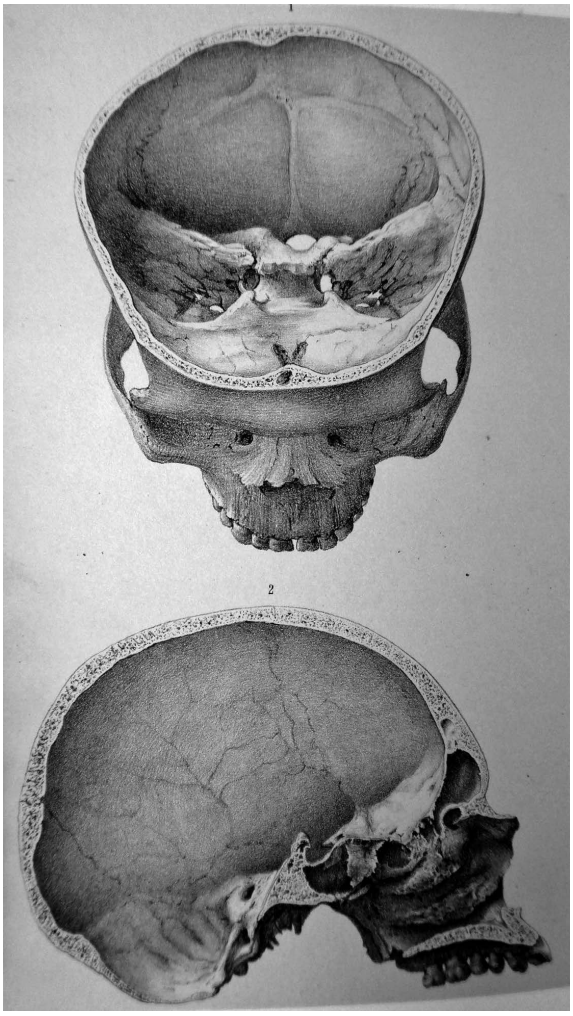

Figure 6. Skull from the Brugmans collection depicted in Jan Bogtstra's dissertation (1864).

[78] See for example Cobbold 1866, p. iv.
[79] Note that Arthur Keith, in the end, reported to the Trustees that he had managed to re-examine the Hunterian free martin preparations without damaging them (Minutes Hunterian Trustees, 10 November 1909, RCSE RCS-MUS/1/1/3) – usually, this was not the case when preparations were reinterpreted microscopically.
[80] Boogaard 1865, 86

Of the five skulls referred to here, two were from the Brugmans collection.[81] At least one of these was sawn through not once, but twice. This follows from figure 6, which displays an illustration from Bogtstra's dissertation, later reprinted in Boogaard's article. The skull depicted above and below is the same, according to the caption.[82] It was the skull of a Spanish man, collected by Brugmans. The illustrations were made by Leiden illustrator Hoffmeister, who constructed them according to photographs made of the skulls. The drawings show that Bogtstra and Boogaard must have sawn through the skull both vertically and horizontally – otherwise Hoffmeister would not have been able to draw both sections. Note that he still had to combine two photographs for at least one of the illustrations. If the skull had been sawn through vertically first, the photograph taken after that (of one of the resulting halves) could serve as basis for the illustration below. To subsequently create the figure above, it is necessary to saw both the left and the right half into two, take two photographs from the resulting lower quarts, and then combine them into one horizontal cross section.

The re-examinations described in this section are possible only with preparations, not with models or any other epistemologicum. The other epistemologica lack the required information (usually: the microscopic structure) necessary for reinterpreting because they are not made of what they represent. Preparations are, which makes them remarkably flexible. This flexibility enabled them to remain useful in medical research for a long time, but it had a downside as well: it limited the availability of preparations for *other* users – including researchers outside the medical faculty, as we will see in the next section.

Comparative anatomy

As mentioned above, even after Halbertsma's clean-up in the 1860s, the Anatomical Cabinet still contained animal preparations from the Brugmans collection. This might seem surprising given that Halbertsma only kept the preparations he deemed useful for research and teaching. Why, one might wonder, would *animal* preparations be of use when learning about *human* medicine? Before answering this question I will first give an example of how medical professors used the comparative anatomy preparations from the Brugmans collection in their research just like they used the pathological and the anthropological ones.

Halbertsma himself provides one such an example. In 1864, he wanted to prove that 'abnormal hermaphroditism' existed among fish.[83] According to Halbertsma, abnormal hermaphroditism involved hermaphroditism without the possibility of self-fertilization. He proved his claim by describing instances of this abnormal hermaphroditism in several species. For one of the species – the bass – Halbertsma used a Brugmans preparation to

[81] Bogtstra 1864, 10–11. After Bogtstra had finished his dissertation, Boogaard found three more skulls with the same malformation, which he also re-examined. All three of them belonged to the Brugmans collection. (Boogaard 1865, 92–93)
[82] Bogtstra 1864, 37
[83] Halbertsma 1864

prove his point.[84] He included an illustration of it (see figure 7). The drawing shows four of the fish's internal organs: the soft roe, the hard roe, the intestinal canal, and the straight intestine. Halbertsma explained that the liver was not visible in the illustration because it was located behind the bowels and the abdominal wall.[85] However, when he argued that this preparation was an example of abnormal hermaphroditism, he also wrote about the bass's liver, calling it a 'very easily recognizable liver'.[86] This would suggest that he could see it. But if the liver was hidden from normal view, as the illustration shows, it implies that Halbertsma opened the jar and took out the fish to pull away either the bowels or the abdominal wall so he could see the liver. Furthermore, he offered precise measurements of the organs, which would have been difficult had the preparation remained safely in the jar.[87]

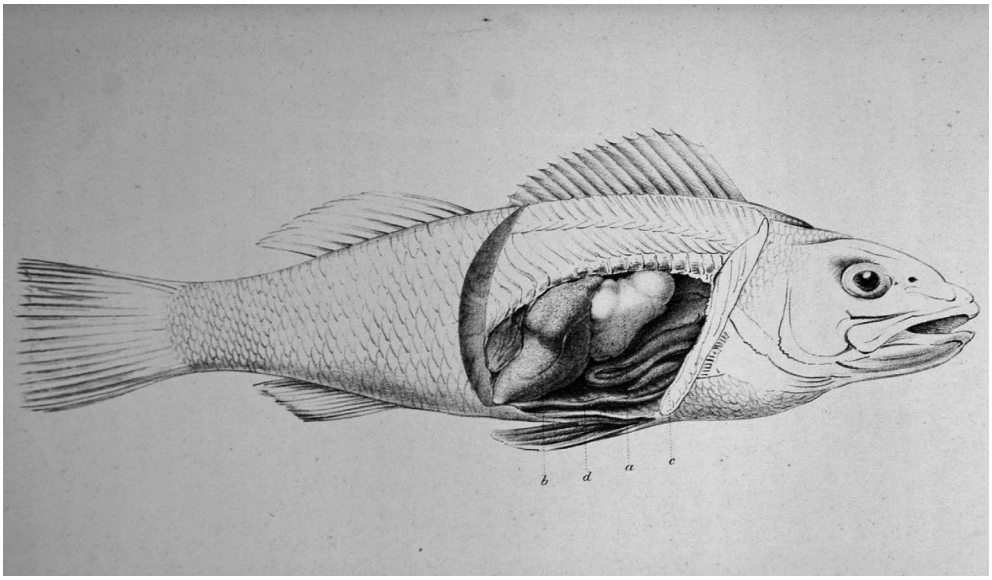

Figure 7. Wet preparation of a bass from Brugmans' collection reused by Halbertsma in his article on hermaphroditism.

Animal preparations were kept and (re)used in other medical institutions as well. All Dutch universities had comparative anatomical preparations in their medical collections, as they were required to according to the 1815 Decree on Higher Education.[88] Medical institutions in other European countries owned animal preparations as well: the Royal College of Surgeons in London, for example; the medical faculty at the University of

[84] Halbertsma 1864, 173–175. The preparation was listed in the Sandifort 1827, 31; object number 395 of '*Pars prior*' of the *Brugmansiana*. The present-day catalogue number is Af0055.
[85] Halbertsma 1864, 178
[86] Halbertsma 1864, 174
[87] Halbertsma 1864, 173–174
[88] RDHE 1815, art 177

Vienna (where the proper location of the collections was a matter of fierce debate); and the medical faculty at the University of Berlin. In nineteenth-century Europe, all significant medical collections kept animal objects alongside human preparations.[89]

Comparing the anatomical structures of different animals was a regular method used to answer questions about human anatomy and physiology in the nineteenth century.[90] This method was not new; it was common in the early modern period as well. In fact, it was the main reason Brugmans offered for building his comparative anatomy collection. In 1807, he explained the ideas behind his collection in a memorandum:

> The undersigned [Brugmans] [has] devoted himself to building, with high costs and much work, a rather extensive collection for the benefit of his classes in natural history, in particular the ones on comparative anatomy; in order to be able to substitute to a certain extent, in 2 or 3 branches of science, for what is missing in the academic collection, so as not to keep his audience ignorant of the advances that were made in the natural history in particular as subsidiary science to the anatomy and physiology of man, by so many famous men all over Europe in the last few years.[91]

Brugmans stated he had built his collection in particular for his classes in comparative anatomy. In these classes, he wanted to focus on these developments of natural history (of which he considered comparative anatomy to be part) that assisted the anatomy and physiology of man. In other words, his collection was primarily intended not to understand animals, but to teach medical students about the human body. I would therefore refer to Brugmans' comparative anatomy as a 'medical' comparative anatomy.

Until around 1800, this was the only kind of comparative anatomy around.[92] However, in the early nineteenth century, Georges Cuvier (1769–1832) almost single-handedly introduced a new kind: 'zoological' comparative anatomy.[93] Like medical comparative anatomy, zoological comparative anatomy had as its main method the

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[89] For the composition of the College's collection, see its many nineteenth-century catalogues (e.g. RCS 1833–1840); on its animal preparations, see also Jacyna 1983 and Desmond 1989 – although both of them seem to consider them an anomaly, and not a common feature of medical collections at the time; a recurring problem in the historiography of nineteenth-century anatomical collections. On animal preparations in British medical collections in general, see Alberti 2011, 57. On comparative anatomy in Vienna, see Buklijas 2005, 146–151. On the collections in Berlin (including that of Rudolf Virchow), see Matyssek 2002, 53; and Virchow 1901 (reprinted in Matyssek 2002, 141−158), in particular the included floor plan of the university's new pathological museum. On animal preparations in German medical collections see also Nyhart 1995.

[90] In her book on the study of form in nineteenth-century Germany, Lynn Nyhart has shown how morphology – a combination of comparative anatomy, embryology and histology – was part of both the medical and the zoological faculties at the German university. She argues that morphology's position within the German medical faculties changed: the new physicalist physiologists disapproved of morphology; the field then found a new home in the anatomy departments. (Nyhart 1995) Laurens de Rooy has shown that Dutch anatomists also embraced the study of animal structure in the nineteenth century. He argues that Dutch anatomy used evolutionary morphology, of which comparative anatomy was part, to escape from the crisis that had hit the discipline in the 1860s. (De Rooy 2011)

[91] Brugmans, 3 March 1807, in a memorandum attached to the report 'Verslag van den Senaat aan Curatoren over het aantal studenten en het gegeven onderwijs' (13 March 1807), cited in Molhuysen 1924, 90*

[92] On this kind of comparative anatomy in the eighteenth century, and in particular on why it cannot be considered an independent discipline, see Cunningham 2010, 295–359.

[93] A helpful introduction to Cuvier's ideas is Farber 2000, 37–45.

comparison of animal structures. However, its aim was different: it did not try to answer research questions on human anatomy and physiology. Instead it focused on zoological questions; in particular, it aimed to discover the laws of animal organization.

Natural history professor Jan van der Hoeven, whose work on 'Negro skulls' has already been discussed, was a practitioner of this new, zoological comparative anatomy. At least, he tried to be – but several obstacles prohibited him from practicing this new discipline as he wanted. A year before his death, he wrote:

> As early as 1829 I pressed the university governors to establish a cabinet of comparative anatomy; I continued to do so until 1861, when I was treated in a way that made me cease my efforts once and for all. I set great store by a collection of comparative anatomy, but even greater store by my independence, and I'd rather abandon my favourite idea than desperately beg for something that science can claim legitimately.[94]

The quotation reveals the main obstacle Van der Hoeven encountered: he lacked a comparative anatomy collection. (It also reveals that the relationship between Van der Hoeven and the university governors was tense to say the least – they continuously refused his requests and finally, in 1861, relocated part of the Brugmans preparations without consulting him.) Like pathological anatomy and physical anthropology, comparative anatomy (whether zoological or medical) was a collection-based research area.[95] If Van der Hoeven wanted to practice it, he needed access to a proper collection. The only comparative anatomy collection present in Leiden at the time (Van der Hoeven was a professor from 1826 to 1868) was the Brugmans collection, which was still largely housed in the Anatomical Cabinet. The anthropological collection was also located in the Cabinet and, as we have seen, Van der Hoeven could easily use preparations from this collection. So what was the problem with the comparative anatomy collection? Could Van der Hoeven not have done the same – simply borrow the preparations he needed? The answer is no. Van der Hoeven was trying achieve something different: instead of answering research questions (as with his anthropological work), he aimed to establish an independent research field – a new discipline, one might say.

Van der Hoeven's ambition to establish (zoological) comparative anatomy as an independent area of study was clearly expressed in his 1867 article 'Over den aard en het doel der vergelijkende ontleedkunde, en over hare hulpmiddelen te Leiden' ['On the Nature and the Purpose of Comparative Anatomy, and on its Resources in Leiden'].[96] In the opening paragraph, he announced his intention to increase comparative anatomy's reputation in the Netherlands, which, so he stated, is sadly wanting.[97] He also repeatedly stressed that comparative anatomy needed to be independent of medicine. His ambition also follows from his attempts to recruit practitioners. No discipline without practitioners,

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[94] Van der Hoeven 1867, 664
[95] Pickstone 1994, 117
[96] Van der Hoeven 1867
[97] Van der Hoeven 1867, 657

and Van der Hoeven hoped to create them by tempting medical students into comparative anatomy, as he revealed in his letter to Collot d'Escury:

> It is bound to work; the zeal of many for this field of study [natural history based on comparative anatomy] will be aroused and the science will attract more and more practitioners.[98]

Collections are useful tools in discipline formation. Frances Larson has shown how the acquisition of the Pitt Rivers collection laid the foundations for the discipline of anthropology at Oxford University.[99] The collection visibly demarcated the boundaries of the young discipline.[100] Furthermore, the presence of the collection forced the university's administrators to allocate funds to anthropology: they could not let the prestigious collection deteriorate. An independent comparative anatomy collection, managed by Jan van der Hoeven, could have improved the position of comparative anatomy in Leiden in a similar way. It would have provided Van der Hoeven with some financial backing from the administrators as well as a collection space, which could have been used for research. Furthermore, the collection in itself, with its thousands of preparations would have been a strong, visible presence of the discipline. Once big enough, a collection can gain a kind of momentum that turns it into a self-fulfilling prophecy. Cuvier employed his comparative anatomy collection in this way. He admitted: 'I succeeded in making my collection so important that soon nobody dared to oppose its further enlargement.'[101]

Van der Hoeven wanted a collection to establish comparative anatomy as an independent field of study. While the Brugmans collection contained over two thousand comparative anatomy preparations, it could not fulfil this role. There were two problems. The first, which related to the collection's contents, could have been overcome, had it not been for the second: the prolonged use of the collection in the medical faculty.

Let us look at the contents first. Brugmans built his collection in aid of his medical teaching. How did this intention materialize in his collection? Which animal structures are needed to learn about the human body? According to Brugmans, and almost everyone else, structures of the animals closest to humans: the vertebrates. Within the vertebrates, mammals were considered the most useful. Indeed, in Brugmans' collection, vertebrates in general and mammals in particular are best represented. Almost all of the comparative anatomy preparations involve vertebrates, with only 71 invertebrates.[102] Moreover, more than half of all objects stem from mammals (1198), of which almost a third are human preparations. This made the collection useful in medical teaching, as was happily acknowledged by medical professor Gerard Sandifort:

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[98] Van der Hoeven to Collot d'Escury, 21 January 1829, AC2 607E
[99] Larson 2008
[100] On collections as tools in boundary work see also Whitehead 2009; Alberti 2009b.
[101] Flourens 1856, 183; translation taken from Outram 1984, 176. On Cuvier's use of his collection to make comparative anatomy visible, see Outram 1984, 175–180
[102] Van der Klaauw 1930, 52

> If one takes a look at the sketch outline of this collection, drawn up by the late professor Brugmans himself … it will soon become clear … that from the very beginning the intention behind the collection was to gain more knowledge about the structure and the actions of the human body, and all of professor Brugmans' classes on comparative anatomy also had this intention … In the present-day state of this science [physiology] it is not possible to explain the various functions of the parts of the human body without resorting to comparative anatomy, it being the rich resource for physiological knowledge of the human body.[103]

Van der Hoeven, on the other hand, was not all that happy about the composition of the Brugmans collection. In his eyes, a comparative anatomy collection aimed at medical teaching could never suffice when teaching of the new and 'real' comparative anatomy. He argued that a professor in zoology and comparative anatomy could not be expected to make do with the medical faculty's comparative anatomy collection, just a chemistry professor could not be expected to borrow the preparations he needed from the professor in materia medica.[104] In his letter to governor Collot d'Escury, Van der Hoeven referred to the difference between both types of collections:

> a collection of comparative anatomy as appendage to a cabinet of human anatomy and physiology, no matter how excellent, never *could*, nor *should*, be arranged like a collection of comparative anatomy in explanation of zoology. The last, however much it is instrumental in general physiology because of the joint ties that connect all sciences, has to have an extensiveness which also has a completely independent tenor.[105]

Medical comparative anatomy collections required only preparations that would help answer questions about human anatomy and physiology. A zoological comparative anatomy collection needed much more. According to Van der Hoeven, the aim of zoological comparative anatomy was to formulate 'a theory of animal forms', that is, an explanation of why animals (including man) are built the way they are. This explanation could be achieved by comparing the structures of different animals, for this would result in a classification of 'all typical varieties'.[106] To formulate a theory of animal forms, comparative anatomists had to study *all* types of animals, not just the vertebrates. This was the 'extensiveness' Van der Hoeven referred to; an extensiveness that the Brugmans collection lacked due to its limited number of invertebrates.

Although the Brugmans collection itself was unsuitable for researching and teaching the new zoological comparative anatomy, it could have been a foundation for a collection that was suitable. And Van der Hoeven wanted it to be, as he made clear in his continuous requests for a separate comparative anatomy collection.[107] In 1859, for example, he proposed to merge the Brugmans collection (that is, the comparative anatomy part) with his

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[103] Sandifort to governors, 2 December 1819, AC2 72, 149. In the first sentence, Sandifort refers to the report Brugmans sent to the governors when he offered them his collection.
[104] Van der Hoeven to Collot d'Escury, 21 January 1829, AC2 607E
[105] Van der Hoeven to Collot d'Escury, 21 January 1829, AC2 607E
[106] Van der Hoeven 1867, 16
[107] On these requests, see Van der Klaauw 1926, 10–12 and De Jonge 2005, 185.

private collection. Together, the collections would form the starting point for an institutional comparative anatomy collection, which, in time, could be extended further. The governors refused all of his requests and Brugmans' preparations remained in the Anatomical Cabinet. That is, until 1861, when the governors transferred part of the comparative anatomy preparations from the Cabinet to the Museum for Natural History – all behind Van der Hoeven's back.[108] In the Museum the preparations were even harder to access for Van der Hoeven than in the Cabinet because of his fierce conflict with the museum director, Hermann Schlegel.[109] The governors' move proved too much for Van der Hoeven – he gave up his thirty-year quest for an independent comparative anatomy collection. During that quest, Van der Hoeven had never understood – or so he claimed – why the Brugmans preparations had been placed in the Cabinet to begin with. He called this 'inexplicable'.[110] But from our perspective, it seems quite simple. Eighteenth-century comparative anatomy preparations belonged in a nineteenth-century medical collection because animal preparations were widely used in nineteenth-century medicine and because old preparations, being made of what they represented, could easily be adapted to new research questions.

Van der Hoeven never established the independent comparative anatomy collection he desired. The Brugmans collection had the wrong composition, but that problem could have been overcome – if it had not been for the second problem: the collection's location in the Anatomical Cabinet. As long as the collection was housed in the Cabinet, Van der Hoeven could never exert the necessary influence to alter its contents. Nor could the collection play its required role of independent visible presence of the new research area, zoological comparative anatomy. Before Van der Hoeven could use the Brugmans collection to demarcate comparative anatomy, he had to gain control over it. He tried to do so, more than once, but failed. In the end, part of Brugmans' comparative anatomy preparations ended up in the Museum for Natural History; many remained in the medical faculty's Anatomical Cabinet throughout the nineteenth century. The Cabinet's curators, all medical professors, did not feel the need to dispose of them because they continued to be useful in medical research and teaching. Since they enabled reinterpretation quite well, the preparations could be adapted to changing practices and theories, not only in comparative anatomy, but, as we have seen, in other areas of study as well.

Conclusion

For nineteenth-century researchers, preparations were flexible objects. They are made of what they represent and thus enable, in Rheinberger's terms, epistemic recall. This helps to explain their prolonged use. But we should not forget that, although they are made of what

[108] Van der Klaauw 1926, 11–12
[109] More on the disturbed relations between Van der Hoeven and Schlegel in De Jonge 2005.
[110] Van der Hoeven 1867, 663

they represent, preparations are *made* nonetheless – preparations are *not* naturalia. And thus, their reinterpretation is not limitless.

Rheinberger points to reinterpretation's limits when he claims that epistemic recall is easier with herbarium plants than with macroscopic preparations because herbarium plants have been manipulated less.[111] It is undoubtedly true that macroscopic preparations contain a fair amount of manipulation: a kidney preparation is not *solely* made of kidney, but also contains materials like injection mass and preparation fluid, and a great deal of work. And indeed, this may complicate their reinterpretation. Part of the information present in the raw material inevitably gets lost in the making – or the keeping. Hidde Halbertsma discovered this when working on the hermaphrodite bass. Halbertsma was unable to complete his reinvestigation because the preparation fluid had affected the fish's organs:

> In our preparation, it could, to our regret, no longer be demonstrated how the seed was ejected, because the deeper-lying organs were in a softened condition and hence the probable *vas deferens* could no longer be detected.[112]

Present-day biologists also encounter such problems when attempting to extract DNA from (early twentieth-century) preparations stored in formaldehyde, which is much less DNA-friendly than alcohol.

The nineteenth-century afterlife of the Brugmans collection has shown that reinterpreting macroscopic preparations is very well possible – but it also has its limits. Yet, the possibilities were large enough to keep medical researchers using the Brugmans preparations throughout the century. This sometimes excluded researchers outside the medical faculty, as was the case with Jan van der Hoeven. It excluded other user groups as well, ones not involved in research practices: the lay visitors and the university governors – and it is to them that we now turn.

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[111] Rheinberger 2010, 238. Herbarium plants are one of the four types of preparations Rheinberger distinguishes. The other three are: anatomical preparations, microscopic preparations and chromatograms. Chromatograms reveal (and simultaneously *are*) the components of molecules; the most famous example are the DNA barcodes. They are iconic of twentieth-century molecular biology (and twenty-first-century crime shows), but of no concern to us here. 'Anatomical preparations' to Rheinberger are human or animal preparations visible to the naked eye. Note this differs slightly from my usage. For me, 'anatomical preparations' can include microscopic preparations as well; I use 'macroscopic preparations' to define the objects Rheinberger calls 'anatomical preparations'.
[112] Halbertsma 1864, 174–175

Chapter 3. Dead Body in the Closet

How lay visitors disappeared from the Leiden Anatomical Cabinet

Let me offer you some practical advice: never marry off your daughter to an old man she detests, however rich he is. It will leave you with nothing but monstrous grandchildren. This rule-of-thumb was known in the early nineteenth century already; its proof could be found in the Leiden Anatomical Cabinet. In the Cabinet, the product of such a marriage was on display: the preparation depicted in figure 8. The child, a boy, was the son of an exquisitely beautiful woman who had been forced by her parents to marry a senile usurer. The usurer horrified the girl, but he was wealthy and therefore pleased the parents. The marriage was as short as it was unhappy: seven short months after the ceremony, the woman and her baby died in child birth. Their child did not look like a child, but like an old man. And not just any old man – he was a perfect miniature image of his father, in every wrinkle, as was explained on a tablet hanging next to the preparation that was made of the boy.[1]

Figure 8. The son of a beautiful woman and a senile usurer, depicted in the Museum Anatomicum.

[1] *Billets* 1818, 51–52

The tale on the tablet helped early nineteenth-century lay visitors of the Cabinet to make sense of the preparation. For them, the preparation functioned as marriage advice. Nowadays, for the modern viewer, this is no longer the case. Although doctors still believe that old fathers increase the risk of malformed children,[2] the preparation of the wrinkled boy can no longer be used to warn lay visitors of this risk. This has two reasons. First, visting the Leiden anatomical collections has become very difficult for those who are not (future) doctors. And second, even if you would get into the Anatomical Museum and find the preparation (now in storage), you would not learn about its parents. There is no tablet, label or guide telling the tale, and the object description in the museum's database does not mention it either. Not only has the preparation become almost unreachable for lay audiences, it has also been detached from the original marriage story.

The Leiden anatomical collections have lost their accessibility – and they are not the only ones. Many present-day institutional anatomy collections that are open to the public in principle can be quite hard to access in practice. They are often housed in university hospitals and laboratories, spaces that are more difficult to enter than the average art museum. Furthermore, preparations are regularly presented in a medical context: no stories about unhappy marriages to which the casual visitor can easily relate. How did anatomical collections end up in such closed spaces, detached from everything but medical information? This chapter provides an answer to this question by using the example of Leiden University's main anatomical collections, those in the Anatomical Cabinet. I intend to show how they have changed from approachable to closed, from interpretable to unintelligible, and from popular to rarely visited. These changes are tied to the collections' move and rearrangement in 1860. But move and rearrangement were not the ultimate causes: they were themselves consequences of changing practices and attitudes in medicine, as we will see.

The Anatomical Cabinet until 1860: open to all

Like all proper tourist destinations, mid-nineteenth-century Leiden had a beaten track. Dutch author Nicolaas Beets (1814–1903) sketches a lively image of this track in his *Camera Obscura* (1851):

> On this rainy October day, Hildebrand could be seen running through Leyden's streets together with a stranger, on their way to visit first the dead animals in the museum for natural, and then the dead pharaohs in the museum for unknown history; and to subsequently take a look at Anatomy's little children who never lived, and then at the portraits of dead professors who will live forever in the senate hall … In order to establish some variety, we subsequently visited the Burcht [a fortress], which is a corpse itself, occupied by the Romans in earlier times; ADA; and the chamber of rhetoric to which so many geniuses belonged. To conclude we went and saw Mr

[2] Kong et al. 2012; see also for example Orioli et al. 1995 and Tolarova et al. 1997.

> Siebold's Chinese and Japanese furniture, and finally we reposed at the student association building Minerva.[3]

Many of the sights mentioned were linked to the university: the Senate Hall and the Anatomical Cabinet of course, but also the Museum for Natural History, the Museum of Antiquities and Minerva, the student association building. To its visitors, Leiden was first and foremost a university town (just as it was to its inhabitants, for that matter).

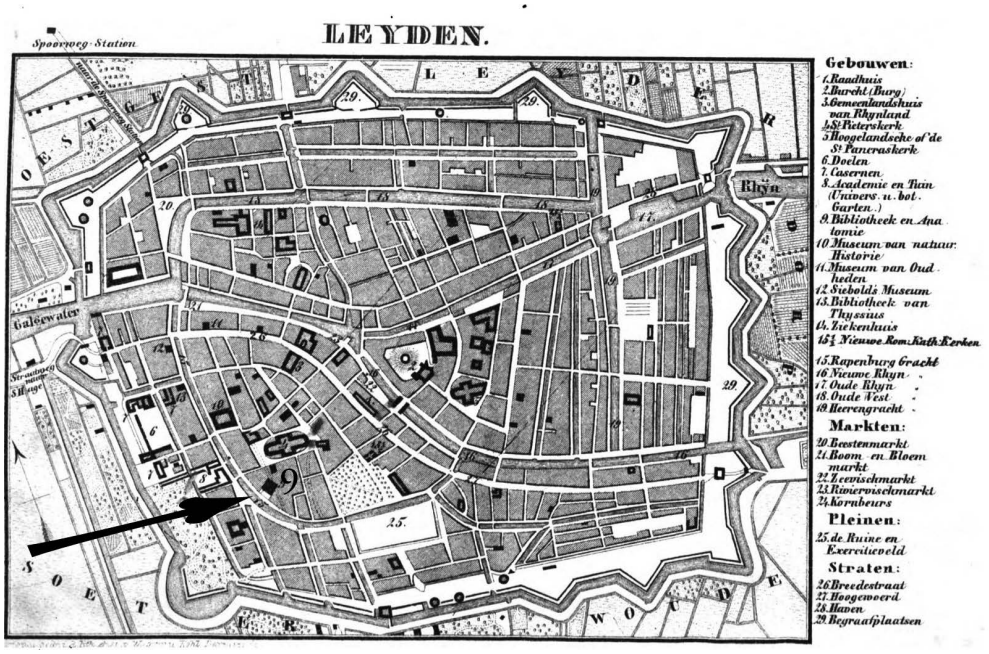

Figure 9. Mid-nineteenth-century map of Leiden from the Baedeker travel guide, with the Anatomical Cabinet (nr. 9).

The university-related sights were all located in each other's vicinity, on or near Leiden's prettiest canal: the Rapenburg. Figure 9 is a travel guide map showing Leiden's main landmarks. Number 9 is the old Faliede Bagijnkerk (Church of the Faille-Mantled Beguines), which housed the Anatomical Cabinet until 1860. The Cabinet shared the building with the university library, as it had from the late sixteenth century onwards. To us, the combination of books and bodies might seem peculiar, but back then, it was not unusual. In the Netherlands, the anatomy departments at the universities of Groningen, Franeker and Harderwijk also shared a place with the library.[4] The reasons were partly practical: a lack of space forced young universities to combine diverse institutions. But this was not the full story, because as the universities grew, and more space became available,

[3] Hildebrand 1851, 116–117
[4] Zuidervaart 2007, 15–16

nobody felt the need to separate anatomy from library – at least not until halfway through the nineteenth century.

Until around 1850, the Leiden curators considered the combination of anatomy and library as natural. The early modern Leiden anatomical collections, anatomical theatre and university library were also closely intertwined with the botanical garden and its collection of rarities. A striking example of how books and bodies belonged to the same category is the American crocodile which appears between books on one of the library's lists of aquisitions.[5] The crocodile and other natural-historical and anatomical objects belonged to the 'book of nature'. Nature was considered one of the two books of God. As we read in the *Belydenisse des gheloofs* ('Confession of the Faith', 1619 edition), one of the documents that founded the Dutch reformed doctrine:

> We know Him by two means. Firstly by the creation, maintenance and reign of the whole world, since the world is before our eyes as a wondrous book, in which all creatures big and small are as letters which give us to behold the invisible things of God … Secondly, He makes himself known even clearer and more fully by His holy and divine word.[6]

Anatomical collections were considered a chapter in the book of nature, as were other types of collections of natural objects – not just in Leiden, but across Europe.[7] An example of the extensive use of the metaphor is the following quotation by Robert Hooke. Hooke, curator of the London Royal Society's collections from 1662 to 1703, wrote:

> It were therefore much to be wishht [*sic*] for and indeavoured [*sic*] that there might be made and kept in some Repository as full and complete a Collection of all varieties of Natural Bodies as could be obtained, where an Inquirer might … peruse, and turn over, and spell, and read the Book of Nature, and observe the *Orthography*, *Etymolgia*, *Syntaxis*, and *Prosodia* of Nature's Grammar, and by which, as with a Dictionary, he might readily turn to find the true Figure, Composition, Derivation, and Use of the
>
> Characters, Words, Phrases and Sentences of Nature written with indelible, and most exact, and most expressive Letters, without which Books it will be very difficult to be thoroughly a *Literatus* in the Language and Sense of Nature.[8]

Both nature and Bible could be 'read'; both were objects of exegesis. Anatomists researching preparations and philologists analysing manuscripts carried out the same activity: they deciphered a text. Of course, their reading methods differed. Instead of literally reading the words, anatomists handled and redissected their texts – the book-of-nature metaphor does not contradict the hands-on use of anatomical preparations. But whereas reading methods differed for both types of books, organizing methods were similar. Both preparations and publications (as well as manuscripts) had to be described, classified,

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[5] Jorink 2006, 287

[6] Bakhuizen van den Brink 1976, 73; translation taken from Huisman 2009, 57–58.

[7] On the book-of-nature metaphor in the Dutch Republic, see Jorink 2010. On the use of metaphor by early modern Leiden anatomists, see Huisman 2009.

[8] Hooke 1705, 338

accessioned, placed and catalogued.[9] Together, the idea of the book of nature and the similar ordering practices made the combination of library and anatomy natural to Leiden University's governors and curators.

For tourists, the combination of library and Anatomical Cabinet was convenient: they could visit two major sights in one building. And, even more convenient, the building was located in the town's centre, making it easy to reach. It was also easy to enter. Figure 10 shows the front of the building after the renovations of 1819–1822. Behind the left door was the Anatomical Cabinet; behind the right door were stairs leading up to the library.

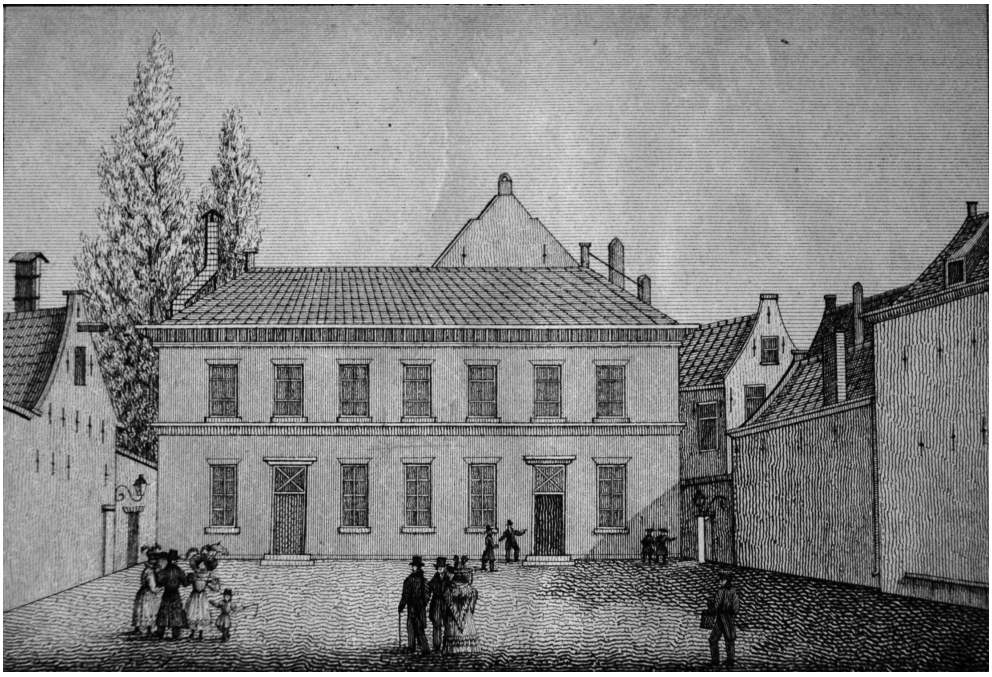

Figure 10. Entrance to the Anatomical Cabinet in the Faliede Bagijnkerk.

In 1850, both doors opened for attendees of the fifth Dutch rural-economical congress, which took place in Leiden. At the request of the congress organizers, the university governors had requested all collection conservators to grant congress participants 'free access'.[10] However, they did not specify what they meant by 'free': free as in free speech

[9] For seventeenth- and eighteenth-century catalogues of the Anatomical Cabinet, see Witkam 1980. Seventeenth-century library catalogues are listed in *Leidse universiteit* 1975, 141–142.
[10] Minutes governors, 8 February 1850, AC2 36, p. 14

or free as in free beer – as software developer Richard Stallman likes to put it.[11] Anatomical curator Halbertsma, slightly irritated by the demand, wrote to the governors to request clarification:

> I have to honour of letting Your Highly Esteemed Dignitaries know that the Museum Anatomicum is open to all and on every day. I call it 'free entrance' if a Cabinet can be visited by ringing at its door or by reporting to the custos, who lives right next to the building, and so I state that I do not understand what purpose the proof of attendance of the Rural-Economical Congress should serve.
>
> However, if the organizers of the above-mentioned Congress understand 'free entrance' as not paying 10 or 25 cents to the custos, I feel obliged to stand up for his interests. Tips from visitors to the Museum Anatomicum are a substantial part of his income, and hence it would be an unpleasant disappointment if they were withheld from him on this occasion, especially if one realizes that the congress participants will not hesitate to spend considerably higher sums of money on less scientific purposes during the three conference days.[12]

Halbertsma suggested placing a box at the entrance to the Cabinet, so that every congress visitor could donate a small amount. But within a few days, he withdrew this proposal and asked tthat he governors act as if they had never received his letter.[13] For our purposes here, the withdrawal is irrelevant. Whatever happened in the end during the rural-economical congress, the letter reveals what the daily routine was: the Anatomical Cabinet was open to all, at a small cost. Opening hours were wide: Halbertsma writes it was open 'on every day'. We cannot be completely sure this included Sundays: according to the student almanacs, the Cabinet was closed on Sundays. During opening hours, one could gain access by simply ringing the bell, or, if nobody answered, by knocking on the door of the neighbouring house where the custos lived. Recommendation letters and prior arrangements were unnecessary: Halbertsma stated in his letter that he did not understand what purpose the congress pass would serve, since the Cabinet was open to all anyway. It had always been that way: from their foundation in the late sixteenth century onwards, the Leiden anatomical collections had been a major tourist attraction, easy to access.[14]

Rina Knoeff has described the early modern Leiden anatomical collections as 'visitable', a notion she has borrowed from Bella Dicks.[15] A visitable place is, as Dicks puts it, 'somewhere to go'.[16] It is a *destination* – and that is indeed what the old Cabinet was. To become a destination, or to be visitable, a collection needs to be accessible in more than one sense. It needs to be both *approachable* and *interpretable*. An approachable collection is a

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[11] The ambiguity nowadays no longer exist in Dutch – the word '*vrij*' (which was used by the governors) nowadays is equivalant to the French '*libre*', referring to 'free as in free speech'; for 'free as in free beer' (the French '*gratuit*'), the word '*gratis*' is used.
[12] Halbertsma to governors, 4 April 1850, AC2 113, 81
[13] Halbertsma to governors, 4 April 1850, AC2 113, 81 (remark written on the letter)
[14] Knoeff 2011
[15] Knoeff 2011; Dicks 2003
[16] Dicks 2003, 1

collection that is easy to enter, which was the case with the pre-1860 Leiden anatomical collections. As we will see, they were also interpretable, which means that visitors could easily engage with them and make sense of them. I chose the word 'interpretable' to denote this kind of accessibility because it indicates visitor agency more clearly then, for example, 'intelligible'. Visitors did not just passively take in what was told to them; they actively constructed their own interpretation, as we will see now.

One such visitor was an anonymous British military man who wrote about the Cabinet in one of his letters home. These letters were later published under the title *Billets in the Low Countries, 1814–1817*. He recalls the above-mentioned story about the monstrous child of the beautiful woman and the old usurer. Moreover, he adds his own experience with the preparation in the Cabinet. His account shows that he was both physically and emotionally close to the preparation.

The military man tells us that 'by means of a glass you can trace every wrinkle, and verify every property of age'.[17] Apparently, visitors were invited to come close and engage with preparations, in this case to verify for themselves that it had indeed all the characteristics of an elderly man. This put them close to the preparation physically, albeit not as close as researchers and students, who could remove such preparations from their jars. We do not know whether visitors were allowed to handle preparations the way students and researchers did. It is not unthinkable: it happened earlier, and in other places. Rina Knoeff has argued that in the seventeenth-century cabinet of Amsterdam anatomist Frederik Ruysch, visitors may have been allowed to touch and hold anatomical preparations.[18] A nineteenth-century example can be found in mid-nineteenth-century Vienna. Here, comparative anatomy professor Carl Brühl lectured to a broad audience, including many women. Brühl let them handle preparations, as the following reports from the *Wiener Medizinische Wochenschrift* demonstrate:

> Some of the ladies, who until now had been satisfied only with the finest perfumes, heroically ignored completely the alcoholic stench of a brain of a fellow human being hardened in the strongest alcohol, to be able to scrutinize its complex surface more accurately with their own delicate fingers.[19]

And, a year earlier:

> At last the most delicate ladies held the human brain parts in their hands as courageously as any medical student.[20]

Collection visitors are not passive recipients of information; they actively interpret what they see (and touch, and smell, and hear). They add their own knowledge and experiences to the presented objects – something Samuel Alberti has called 'the museum

[17] *Billets* 1818, 52
[18] Knoeff (forthcoming)
[19] 'Professor Brühl's' 1866, 116; translation taken from Buklijas 2005, 155
[20] 'Notizen' 1865, 508; translation taken from Buklijas 2005, 155

affect'.[21] The author of *Billets*, for example, first describes the preparation of the monstrous child, then tells the story of the marriage, and finally reflects upon this story and the preparation, creating his own interpretation:

> This corporeal resemblance of the father, in the shape of this little prodigy, seems to have been flung upon the world by indignant nature to shame those who would defeat her purposes by a rebellious opposition to her laws. … It would certainly serve as a clue to ascertain why matrimony is so often the source of misery. Some blame fortune, others destiny; but all forget the share which policy has in the contrivance.[22]

The author used his ideas on nature and marriage to make sense of the preparation. But he was only able to do so because he had been offered the story about the parents of the monstrous child. That story enabled him to engage with the preparation not just physically (by looking at it closely), but also emotionally.

Early modern visitors of the Leiden collections engaged with the preparations in similar ways as the author of *Billets*. They interacted with the preparations both physically and emotionally, but they were only able to do so because of the stories offered to them by the collection's catalogue and tour guides.[23] The stories made the preparations interpretable. Take for example the skeletons in the anatomical theatre. Without context, skeletons were not very interesting preparations – they could be seen everywhere, and they all looked alike. Visitors needed a point of departure to interpret each skeleton individually. In Leiden, the skeletons were made sense of through the crimes committed by the people they had once been. These crimes were even narrated in the collection's catalogue, which listed for example 'the Sceleton of an Asse upon which sit's a Womam [*sic*] that Killed her Daughter'; 'the Sceleton of a Man, sitting upon an ox executed for Stealling of Cattle'; and 'a young thief hanged being the Bridegom whose Bride stood under the gallows, very curiously set up in his ligiments'.[24] The crimes individualized the skeletons. Furthermore, many of the skeletons carried banners with Latin phrases like *Nascentes morimur* (From the moment we are born, we die), *Nosce te ipsum* (Know thyself), and *Mors ultima linea rerum* (Death is the final limit of all things). In this context, it became possible for visitors to interpret the otherwise very similar (and rather boring) skeletons in an individual and exciting way.

In short, from the late sixteenth to the early nineteenth century, the Leiden anatomical collections were both approachable and interpretable: visitors could easily enter the building, they could get physically close to the preparations, and they could relate to the preparations emotionally and intellectually – although lay visitors had no medical knowledge, it was easy for them to make sense of the preparations.

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[21] Alberti 2007
[22] *Billets* 1818, 52–53
[23] Knoeff 2011
[24] Blancken 1697, 4, 5, 10

This made the Cabinet remarkably accessible compared to other types of collections at the time. In his canonical book *The Birth of the Museum*, Tony Bennett describes early modern collections as 'socially enclosed spaces to which access was remarkably restricted'.[25] This view of collections as 'remarkably restricted' in no way fits the early modern Anatomical Cabinet. This can partly be explained because Bennett writes about European collections in general and British collections in particular, and understandably pays no attention to the specifics of the Dutch situation, which seems to have been quite different: most types of collections were more open than the ones Bennett describes.[26] But even for Dutch standards, the Anatomical Cabinet was remarkably open. Many of the (privately owned) art collections in the Republic were open to a select audience only.[27] And collections accessible to wider audiences often had more limited opening hours than the Anatomical Cabinet. In 1774, stadtholder William V opened his collections to the public, but not every day, and only between eleven and one o'clock.[28] Furthermore, gaining access was often more difficult than simply ringing the bell: in Teylers Museum (founded in 1784), for example, every visitor required a billet – and approval – from the board of trustees beforehand.[29]

Interestingly enough, the anatomical collections in Leiden were not the only ones open to a broad audience. Other Dutch cities with accessible anatomical collections (often housed in anatomical theatres) included Amsterdam, Delft, Dordrecht, Rotterdam, Utrecht, Franeker and Middelburg.[30] Outside the Low Countries, accessible anatomical collections could be found in Copenhagen, Altdorf, and Oxford, among others.[31] Their accessibility seems remarkable when considered from the history of collections, but it becomes understandable once we look at them as part of the history of anatomy. The discipline of anatomy welcomed non-medical audiences long before universities started building significant anatomical collections, at its public dissections. The first European public dissection we know of took place in 1316 – almost 300 years before Pieter Pauw acquired some bones and began the Leiden collections, and approximately 350 years before anatomists developed techniques to create long-lasting fluid preparations.

Public dissections attracted people with diverse backgrounds: not just physicians, surgeons and medical students, but also laymen, including many dignitaries. The non-medical attendees had no trouble understanding what was going on: the public dissection

[25] Bennett 1995, 92–93
[26] Tibbe and Weiss 2010
[27] Bergvelt 2005, 345
[28] Bergvelt 2005, 346
[29] Janse 2010, 12
[30] Rupp 1990, 264 (Amsterdam, Delft); Zuidervaart 2009, 78 (Dordrecht, Rotterdam); Zuidervaart 2009, 79–109 (Middelburg – although it seems as if only local visitors came to see the collections, as opposed to the other collections, which attracted foreign tourists as well); Engel et al. 1986, 88, 279 (Franeker, Utrecht; see also the remainder of this volume for visitor reports of other collections).
[31] MacGregor 2007, 161–162

was not so much a medical event as a religious ritual and a moral-philosophical lesson.[32] The audience was meant to marvel at the make-up of the human being, the Creator's masterpiece. They were, in other words, reading a chapter from the book of nature. They also participated in a ritualistic public punishment. Often, the body lying on the table was a convicted criminal: public dissection after death was considered an extra punishment.[33] The strong religious and moral message of public dissections made them understandable and attractive to non-medical audiences.[34] In a similar way, early modern anatomical preparations were not exclusively about bodily structures, but also about the workings of the soul, about morality and about biblical lessons – things that mattered to wider audiences than just medical students and professors. Anatomical collections were part of the public, moral, and religious anatomy, and as such, it is not surprising that they were easily accessible to a wide range of audiences.

Towards the end of the eighteenth century, however, this public, religious anatomy started disappearing.[35] This was part of a larger transformation of the discipline of anatomy taking place in the decades around 1800. Medical historian Andrew Cunningham recently discussed the transformation from what he calls 'old' to 'new' anatomy.[36] He lists six of the major changes: the growing importance of physics and chemistry; the birth of experimental physiology; the formation of comparative anatomy as an independent discipline; the birth of the clinic and the accompanying change of pathology; the disappearance of the 'soul' as an organizational principle; and, most important here, the disappearance of public dissections. The disappearance of the public dissection – or, as Cunningham puts it, the sacred ritual – is obviously related to the disappearance of the lay visitors from the Anatomical Cabinet, but they are not one and the same. The closing-off of the Anatomical Cabinet happened about half a century later than the disappearance of the public dissection. The public anatomical theatre was demolished during the renovations of 1819 to 1822. By then, the anatomical collections still functioned as a tourist attraction, as we saw above and as follows from the visitor reports we have from this period.[37] Lay visitors did not disappear until the second half of the century. This gap between the disappearance of public dissections and the closing-off of anatomical collections is visible not just in

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[32] On public dissection as a religious ritual, see Cunningham 2001. On public dissection as a moral-philosophical lesson see Rupp 2002, which focuses on the Dutch anatomical theatres.
[33] On public dissections as punishment, see Sawday 1996, 54–84.
[34] Dissections could have more functions than being a religious ritual and a moral-philosophical lesson: they also enhanced the status of the city and the university, and their strict regulations disciplined the audience. (On status, see for example Ferrari 1987; on the disciplining of specifically medical students, see Klestinec 2011.) However, these functions do not concern us here, because they were not so much what made the event understandable to a wide audience as well as what made it attractive to a small group of organizers. To conclude, a remark of caution: not all these interpretations of public dissections are applicable Europe-wide. On this, see in particular Klestinec 2011, in which she convincingly argues that the famous Padua theatres need a different interpretation than the ones usually offered by historians of medicine.
[35] Cunningham 2001
[36] Cunningham 2010, 361–389. See also Cunningham 2003.
[37] Engel et al. 1986, 156

Leiden, but in other places as well. Cunningham has shown that public dissections disappeared throughout Europe between 1780 and 1830.[38] In Britain, as in Leiden, it was not until about fifty years later that anatomical collections became increasingly closed off from the public eye.[39] The gap between both disappearances suggests that, although the disappearance of the public dissection and the decreasing accessibility of anatomical collections are no doubt related, we need separate explanations for both developments. While these explanations will undoubtedly share many, or most, elements, the relative weight of these elements will differ.

Cunningham lists four developments probably related to the ending of the sacred ritual: the secularization of the world-view; the replacement of natural philosophy by secular sciences; the rise of expertise in the sciences; and the disappearance of other types of public events, in particular public executions. All but one of them can be dated to around 1800. Only the rise of expertise took place several decades later, roughly in the second half of the nineteenth century. The rise of expertise is the most important element in the disappearance of visitors from university collections – the other three are part of the explanation as well, but carry a smaller weight. What was this rise of expertise? Cunningham summarizes it as 'a new profession of men of science, or scientists, with the university as the prime domain of making new knowledge, especially the research laboratory, where the general public were not allowed'.[40] It involved a new attitude: producers of natural knowledge came to see themselves as 'scientists' and as professionals – distinguishing themselves, in the process, from 'amateurs' and laymen. It also involved a new space: the research laboratory. And with the research laboratory came the teaching laboratory; practical training became increasingly important. The new spaces and the new attitude reached Leiden in the middle of the nineteenth century – and they required a move and a rearrangement, to which we now turn.

1860: From the library to the laboratory

The ceiling of the Cabinet's collection room was also the floor of the university library – a fact that hadn't received much attention until the early 1850s, when this construction started to cause trouble. The ceiling sagged under the weight of the library's books. Two iron pillars prevented a collapse, but the situation was less than ideal.[41] Furthermore, as if an imminent collapse wasn't enough, curator and professor Hidde Halbertsma faced more architectural problems. The Cabinet was also unfit for teaching (experimental) physiology. Halbertsma was responsible for the physiology course, holding the chair in anatomy and physiology, which would not be divided into two chairs until after Halbertsma's death in 1865. In his

[38] Cunningham 2001
[39] Alberti 2011, 169–174
[40] Cunningham 2010, 389
[41] Annual reports of the Anatomical Cabinet 1850–51 and 1852–53, AC2 270

1851–52 annual report, Halbertsma elaborated on one of the problems he encountered in teaching physiology:

> At the moment, both lecture rooms available to me are amphitheatrical [the students were seated in a half-circle] and therefore they can be considered less suitable for physiology lectures. With the present layout, listeners at the front regularly turn their backs on the Professor, which, in my opinion, cannot have a particularly positive effect on their attention, especially because more difficult subjects have to be clarified with the help of hand-made drawings on the blackboard.[42]

Apparently, the problem of students looking the other way does not arise in anatomy lectures; unfortunately, Halbertsma does not explain why. It is possible that it relates to the nature of physiological experiments. Physiology lectures required both demonstrations and drawings on the blackboard to understand the experiments. Unlike anatomical demonstrations, physiological experiments cannot easily be interrupted and continued, meaning that students had to look at the blackboard, the demonstration table and Halbertsma at the same time. It might very well be that the amphitheatrical layout prohibited this, for example if the demonstration table stood inside the half-circle that seated the students and the blackboard was positioned more to the side, (almost) outside the half-circle. We do not know this for sure, but what we do know is that Halbertsma claimed he lacked a decent classroom for his physiology lectures. Furthermore, the Anatomical Cabinet did not contain a teaching laboratory, which was also essential for teaching physiology, as Halbertsma stated repeatedly in his annual reports.[43]

Neither the amphitheatrical arrangement in the lecture rooms, nor the absence of a physiological teaching laboratory bothered Halbertsma's predecessor, Gerard Sandifort. And yet Sandifort, like Halbertsma, taught both anatomy and physiology. However, he did so in a completely different way, as is illustrated by the course descriptions in the *series lectionum*. Sandifort's course was described as 'Physiologiam, anatome comparata illustratam'; Halbertsma's as 'Physiologiam, experimentis et observationibus microscopicis illustratam'.[44] Sandifort taught 'old physiology' (a theoretical, philosophical discipline, based on the study of form, best transmitted through Latin lectures illustrated by anatomical material); Halbertsma taught 'new physiology' (an experimental discipline in which the working of the body was explained with help of physical and chemical processes instead of morphology, best transmitted through a combination of lectures and practical training in microscopic observations and (animal) experiments).[45] Hence, Sandifort required nothing more than an amphitheatrical lecture room, whereas Halbertsma required a lecture room

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[42] Annual report of the Anatomical Cabinet 1851–52, AC2 270

[43] See for example the Cabinet's annual reports of 1853–54 and 1855–56, AC2 270.

[44] Beukers 1984, 93

[45] For the differences between 'old' and 'new' physiology, see Cunningham 2002 and Nyhart 1995, 67–80. For the differences between Halbertsma's and Sandifort's teaching methods, in particular their (non-)use of the microscope, see Beukers 1983.

with a blackboard to draw the chemical and physical processes in the body, a room where students could train with microscopes, and a teaching laboratory where students could perform experiments themselves.

Halbertsma was not the only Leiden professor dissatisfied with his teaching facilities. Petrus Rijke (physics) and Anthony van der Boon Mesch (chemistry) also complained to the governors.[46] As in medicine, teaching laboratories were becoming more and more important in physics and chemistry. (In fact, the teaching laboratories in the natural sciences had been an example for the educational reformers in medicine.)[47] Both departments had spaces for practical training, but these were ill-equipped and too small. Both Rijke and Van der Boon Mesch repeatedly asked for new laboratories from 1846 onwards. Van der Boon Mesch was backed up by his students (in 1851 and 1852) and by a group of Leiden citizens, including several industrialists (in 1851).

At first, the governors refused the professors' requests, but after several years, they gave in.[48] To solve all problems at once, they planned a new building to house physics, chemistry and anatomy. Anatomy would be separated from the library and merged with the natural sciences. This shift dovetailed with the changes that the discipline of anatomy had undergone: the book-of-nature metaphor had lost ground, and physics and chemistry had become ever more important in its practice. The governors had chosen the Ruïne (the Ruins), as location for the new building. In 1807 an exploding powder ship had swept away all buildings in this area. The university had made its first plans to build on this spot soon after, but none of them had been carried out (although the first stone for one of them had been placed).[49] In 1854 the university governors sent their new proposal to the responsible minister. The minister agreed on the need for a new building, but rejected the governors' plan because of the estimated costs: 200,000 guilders. He asked government architect Henri Camp to create a new, cheaper design. In 1857 Utrecht contractor Van Berkum drove the first pile into the ground, and the building was completed some two years and several financial drawbacks later.[50] In 1859, the physics and chemistry departments moved in, followed by anatomy in 1860.

[46] Otterspeer 1992, 119–123
[47] Wachelder 1992, 97–103
[48] Otterspeer 1992, 122
[49] Huizinga 1925, 24–26
[50] *Het physisch, chemisch, anatomisch en physiologisch laboratorium te Leiden* 1859, 64

Figure 11. The new teaching complex for physics, chemistry and anatomy.

Halbertsma was pleased with the Anatomical Cabinet's new home. In his first annual report after the move he wrote:

> Although not yet everything in the present complex meets the demands that we believe to be justified, for now, we are glad about the major improvement as a result of the move. These improvements concern in particular the lecture rooms, the dissection hall, the workrooms, the arrangement of the cupboards, the lighting, not to mention many other things, which are out of place in a report like this one and which I discussed in more detail when I had the honour of inaugurating the academic year on the new premises on October 1st, 1860.[51]

As Halbertsma noted, the new building was not perfect – for example, it would take until 1866 before a proper physiological laboratory was added to the site – but all in all, it was much better than the old one.

Yet, not everybody considered the new housing as successful as Halbertsma did. The 1860 student almanac posed the following rhetorical question in its description of the building:

> This building as it is seen from the outside, with its humble façade, with its ridiculous, ambiguously spherical back part, with its little garden divided in four beds, with its wooden fences – do we not have to call it, from an architectonic point of view, a *monstrum horrible visu*?[52]

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[51] Annual report of the Anatomical Cabinet 1860–61, AC2 271. Unfortunately, I have not been able to locate any sources that tell us more about the contents of the opening lecture Halbertsma refers to.
[52] LSC [1859], 164

The students not only criticized the architecture; they also judged the anatomy section too small.[53] Indeed, a few years later, an additional gallery had to be added to one of the collection rooms to accommodate the newly acquired Suringar collection.[54] And not long after that, in the 1870s, lack of space once again became a problem: the asnnual report of 1883–84 states that students 'had to seat themselves on the stairs and even on the edge of the sink'.[55] Several extensions were added in the 1880s to accommodate the growing anatomy department – meanwhile, physics professor Kamerlingh Onnes slowly took over the main building.[56]

Another group of users that probably had mixed feelings about the Cabinet's new location were the lay visitors. Unlike the students, they did not explicitly voice their concerns, which is not surprising considering that they were a far more heterogeneous and far less (or rather, not at all) organized group. Instead of criticizing the new space in writing, the visitors voted with their feet: after the move, visitor numbers seem to have dropped sharply. Unfortunately, this decrease is impossible to prove with numbers. The only quantitative records we have are after 1860 – and their accuracy is questionable. Nonetheless, several reasons make it safe to assume that the Anatomical Cabinet was visited much less after it moved from the library to the laboratory.

Let us take a closer look at the numbers we do have. These are the name counts from the only known visitor book of the Anatomical Cabinet, which starts in September 1860, directly after the move. The problem with visitor books is that it is hard to estimate what percentage of visitors actually signed them. It was by no means always the case that every visitor signed his (or, occasionally, her) name. This is demonstrated for example by the register of visitors kept between 1805 and 1932 at the Royal College of Surgeons in London (RCS). It lists less than a hundred names for the entire nineteenth century, whereas other sources reveal that the period between 1815 and 1830 alone saw over 25,000 visitors – and the annual number of visitors would only rise as the century progressed.[57] In the case of the RCS, the lack of representation in the register is immediately clear from its name: 'Register of illustrious and distinguished visitors'.[58] Only the highest visitors were allowed to sign it: page after page it lists princes, dukes, bishops and ambassadors. The register served to enhance the collection's status, not to meticulously record its visitors. This type of visitor book was not uncommon at the time, but other, more inclusive ones were used as well. However, these were not always more representative, as follows from the visitor books at the

[53] LSC [1860], 226–227
[54] Annual report of the Anatomical Cabinet 1867–68, AC2 272
[55] Annual report of the Anatomical Cabinet 1883–84, AC3 1553
[56] Van Delft 2005, 178–189
[57] Visitors numbers for the RCS museum can be found in the triennial reports of the boards of curators (RCSE RCS-MUS/8/3/1), the minutes of the museum committee (summarized in Keith 1908), the minutes of the Hunterian Trustees (extracts published in Negus 1966), and 'normal' visitor books (RCSE RCS-MUS/6/1).
[58] 'Register of illustrious and distinguished visitors', 1805–1932, RCSE RCS-MUS/6/2/1

Rijksmuseum in Amsterdam. In 1879, 36,218 people visited the Rijksmuseum in Amsterdam, but only 2923 of them are listed in the visitor book.[59] The problem here was not that people were not allowed to sign, but that they weren't obliged to – and, as you may know from personal experience, many people simply walk right by.

The Cabinet's visitor book was probably not very exclusive, as it was signed by a range of different visitors, both Dutch and foreign, doctors and non-doctors, the latter including Leiden professors from other faculties and several members of Halbertsma's family. More often than not, people signed without a title, even if they did possess one: another indication the book was not initially intended as a status symbol. It seems as though all Cabinet visitors were allowed to sign their name. Nonetheless, the number of visitors listed is limited. In the early 1860s, twenty to forty people visited each year (with a peak of eighty-four visitors in 1863). From 1865 numbers dropped to an average of four visitors a year. After 1877, no more names were added, although the book still held 203 empty pages. These are negligible amounts compared to those in the visitor books of other collections at the time – recall for example the 30,000 plus visitors to the Rijksmuseum. There is no reason to assume that visitors were less inclined to sign a visitor book in the Cabinet than they were in other museums and collections. Hence, we can assume that visitor numbers in the Cabinet were low compared to other collections at the time.

Furthermore, if a visitor book had been kept *before* 1860, it would also have contained more names – even if only a small number of visitors had signed their names. Although we have no visitor numbers, we can roughly estimate the order of magnitude with the help of numbers we do know: visitors to one of the other Leiden collections, the Museum of Antiquities. This museum opened in 1838 and in its first year it received 3000 visitors.[60] Since the Anatomical Cabinet was one of the main attractions in Leiden, we can safely assume that its visitor numbers were as least as high as those of the Museum of Antiquities, which means it is not unlikely that the Cabinet received thousands of visitors each year. In other words: around a dozen a day. Even if only one percent of these visitors signed a visitor book, it would contain ten to hundred times as many names as the visitor book starting in 1860. This means that the Cabinet's visitor numbers after the move were low not only compared to contemporary collections, but also compared to the old Cabinet. Laymen no longer visited the collections.

The disappearance of lay visitors from the Leiden Anatomical Cabinet contrasts with the nineteenth-century rise of the 'exhibitionary complex', in which more and more collections became publicly accessible.[61] Part of the new exhibitionary complex were popular anatomical museums, by which I mean not just anatomical collections open to a wide

[59] Nys 2012, 74
[60] Halbertsma 2003, 145–147
[61] Bennett 1995

audience (like the early modern Leiden collections), but a specific, nineteenth-century kind of anatomical museum. Popular anatomical museums emerged around 1830 (both in Europe and in the United States); they were a commercial enterprise; they were aimed at a broad, non-medical audience; and they displayed both wax models and preparations of the human body.[62] Their owners claimed a noble cause – to educate people about their bodies – but from the 1850s onwards, they cooperated with quack doctors to try and sell to their visitors as many cures, effective or not, as possible. This posed a threat to the medical profession, which started campaigning against the popular museums. In England, medics succeeded in shutting down most popular museums and exhibitions with the help of the Obscene Publications Act (1859). It was not hard to build an obscenity case against a popular anatomical museum – sex and crime were well-represented – but the most pressing concerns of many medical professionals probably did not relate to morality as much as it did to a potential loss of income and a wish to monopolize medical knowledge.[63]

Leiden never had a permanent popular anatomical museum, but the town was visited by traveling exhibitions. Local newspapers announced them:

> On the Bloemmarkt ['Flower market', a street in Leiden] in this town, a tent is being built for the Anatomical Museum of Dr P. Spitzner from Paris. The museum contains 6000 wax objects, representing complete bodies, human body parts, pathologies, etc. Judging from its extensiveness, the collection will exceed in importance many others of this kind, well-known to us from fairs. The low entrance fee will certainly tempt many to come and see the collection. The museum will be open for a few days only, starting this Tuesday.[64]

This was written in 1885. The phrase 'well-known to us from fairs' reveals that Leiden regularly hosted popular anatomical exhibitions at this time. The size of the Spitzner collection was considered remarkable, but the type of collection had been seen before. The success of the popular exhibitions (not only in Leiden, where they kept returning, but also throughout Europe) demonstrates that lay visitors did not turn away from the Leiden Anatomical Cabinet because they had lost interest in (representations of) the human body. They still wanted to see anatomical objects, but they preferred popular anatomical collections above the Cabinet (and other institutional collections).

Visitors were not actively refused in the new Cabinet; lay people were still allowed to visit the collections, as the visitor book shows. However, being open to a general public does not in itself turn a place into a destination: it is a necessary, but not a sufficient condition. A visitable collection requires more: the building needs to be approachable; the objects inside need to be interpretable. Popular anatomical museums and exhibitions met these requirements – they had to in order to make a profit. Until around 1850, the Anatomical Cabinet had met them as well, but in the second half of the nineteenth century, the Cabinet

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[62] On popular anatomical museums in the US, see Sappol 2004. On popular anatomical museums in the UK, see Burmeister 2000; Bates 2008.
[63] Burmeister 2000; Bates 2008
[64] *Leidsch Dagblad* 1885, 2

lost both its approachability and its interpretability. The remainder of this chapter explains how that happened.

A less approachable building

Visitors wanting to enter the new Anatomical Cabinet had to overcome several hurdles. First of all, they had to walk a bit further. Before the move, the collections had been located in the centre of Leiden, close to other major sights. The Academy Building and the botanical garden could be found across the canal. The laboratory complex was situated somewhat further away from the town's centre, with few other attractions nearby, let alone, as had been the case with the library, in the same building. Of course, a longer walk was not insurmountable, but it did pose a barrier for visiting.

Moreover, visitors encountered several challenges upon arrival at the Ruïne. In particular, they had to reach the entrance – which was not as trivial as it seems. Even the Cabinet's personnel struggled with it from time to time, as Halbertsma explained to the governors in 1861:

> Amongst the things urgently needing improvement in the new building at the Ruïne (anatomy department) are in the first place the entrances. These are faulty, both at the front and at the back, and hence, from time to time, the personnel belonging to my department has to cross the grounds of the wings or climb over the fence in order to get inside.[65]

The building stood on an enclosed area. The fence had four gates, but apparently the one leading to the anatomy department did not always open easily, forcing Halbertsma's employees – and potential visitors – to put in some extra effort. Although the fence wasn't necessarily high, it made visiting the collections that much more difficult. And before visitors even discovered that the anatomy gate stuck, they had to locate it. Finding the front gate was easy enough, but this gate was exclusively intended for use by the physics and chemistry laboratories (although Halbertsma's staff sometimes used it as well, if all else failed). The Anatomical Cabinet was located at the rear of the building or, as the student almanac put it, the 'ridiculous, ambiguously spherical back part',[66] which meant that visitors had to find their way around the building, into the Zonneveldsteeg (Zonneveld alley). Again, not insurmountable, but the backdoor was less welcoming than the front entrance, especially when it rained. Halbertsma again:

> At the back of the anatomical cabinet, at the gate leading to the Zonneveldsteeg [Zonneveld alley], is a small street, which is separated from the main street by a wide strip of soil, covered with coarse sand. After heavy rain, large puddles of water remain in front of this small street, which makes it impossible to properly enter the garden behind the anatomical cabinet through the gate.[67]

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[65] Halbertsma to governors, 18 January 1861, AC2 131, 33
[66] LSC [1859], 164
[67] Halbertsma to governors, 15 March 1864, AC2 137, 71

All in all, finding your way in was much harder than it had been in the Faliedebagijnkerk. For more than two centuries, visitors had simply entered the Anatomical Cabinet through a clearly recognizable front entrance, facing Leiden's main canal. Now, they had to find their way to the back alley, wade through the puddles, pray that the gate would open (or climb over the fence), walk up to the building, and knock on the door. If the custos didn't answer they had to turn around, conquer fence and puddles again, find the custos's house in the Zonneveldsteeg, and hope that the gate would still open when they returned. But the trouble did not end there: even if visitors gained entrance to the building, it was hard to find the collections. These were located in four rooms on the top floor, instead of in the main room on the ground floor, as had been the case in the old Cabinet.[68]

In reaction to Halbertsma's complaints, the situation improved a little: the governors ordered the inspector of the university buildings to fix the gates and they asked the city of Leiden to pave the gap between the alley and the gate.[69] But the new Cabinet never became as approachable as the old one had been. Not just because the somewhat distant location and the backdoor entrance continued to make it unwelcoming, but also because of a feature not yet mentioned: the closed atmosphere of the building itself, which stemmed from its main function as a teaching laboratory.

A laboratory is a 'closed space'. This is reflected in its architecture (it was no coincidence the building was fenced in), but also in its atmosphere. A laboratory – whether for teaching or for research – is a strictly regulated environment with a clear target audience: students and professors. Even if other audiences are allowed in (which often they are not), lay people will in general be hesitant to enter a laboratory. The strict and numerous regulations – do not touch this, do not use that, wear white coats – create an intimidating atmosphere that scares off most potential visitors. The collection rooms themselves did not necessarily look 'laboratory-like', but they were nevertheless located in a building that was known first and foremost as a *laboratory* building and as such had a closed atmosphere. This closed atmosphere became more dominant towards the end of the century, as the building increasingly transitioned into a research laboratory. Again, this contrasted with the old Cabinet. Here, the collections had been housed in and around an anatomy theatre (until 1819), together with a library, in a (former) church. All three spaces had open atmospheres: the theatre as the location of public dissections; the library as a tourist attraction; the church as God's temple. These open atmospheres reinforced each other as well as the open character of the anatomical collections.

Together, the relatively remote location, the sticking gate, the puddles and the closed atmosphere made the new building much less approachable than the old one. But if a visitor did manage to reach the entrance, he or she would be let in; lay people were not explicitly refused. However, few people went to the trouble because once they got in, they

[68] Annual report of the Anatomical Cabinet 1871–72, AC2 273
[69] Halbertsma to governors, 18 January 1861, AC2 131, 33 (governors' decision added to the letter; on the gate); governors to Halbertsma, 30 April 1864, ASF 461, 112 (on the paving)

were confronted with collections that were not very attractive to them because they were rather hard to interpret without prior medical knowledge. This was a consequence of the rearrangement that accompanied the move, a rearrangement we will now take a closer look at.

A less interpretable arrangement

Although Halbertsma did not turn down visitors, he did keep some preparations away from them. He was ashamed of the condition of the preparations:

> I may say the same [being in need of new fluid] of many preparations which are already listed in the Catalogue of the Museum Anatomicum, and hence were already present when I arrived here; they have been taken off the shelves for now, so as not to offend [people giving] nasty and critical looks, and now they are being thirsty in a hidden corner.[70]

After his appointment in 1848, Halbertsma found many of the preparations to be in bad shape. Many of the wet preparations had dried out; most of the skeletons suffered from damp.[71] And not only the state of the individual preparations bothered Halbertsma; he was also dissatisfied with the composition, classification and arrangement of the collections as a whole. Determined to solve these problems, Halbertsma asked the governors for extra money and set to work together with his newly appointed prosector Johannes Boogaard. In the mid-1850s, they had topped up the fluids, relabelled the jars, cleaned the skeletons and varnished the bones.[72] They decided to wait a few more years before they started rearranging the collection: the first plans for the move had materialized, and Halbertsma felt it would be a waste of time to move the objects around only to do it all again in a few years time.

In the old system, preparations were by and large arranged by their makers. Halbertsma proposed instead to classify them systematically, by separating general anatomy, pathology and comparative anatomy, and then organizing the objects according to organ system within these categories. He intended to follow the system used at the Royal College of Surgeons in London, the catalogues of which he acquired in the academic year 1854–55 through the Dutch ambassador in Britain.[73] The new classification system was put to use after the move.[74] Preparations deemed irrelevant in the new system were discarded; the remaining ones were put in their proper place on the shelves. Describing the preparations anew was also part of the job, but with thousands of preparations and little time at hand, it

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[70] Annual report of the Anatomical Cabinet 1851–52, AC2 270
[71] Annual report of the Anatomical Cabinet 1851–52, AC2 270
[72] Annual report of the Anatomical Cabinet 1853–54, AC2 270
[73] Annual report of the Anatomical Cabinet 1854–55, AC2 270. The catalogues were added to the university library, see Inventory University Library, AC2 338.
[74] Halbertsma started (but never finished) making a catalogue in which he implemented this classification system. This catalogue has been lost for several years; fortunately, it has reappeared in the Leiden University Library – unfortunately, this happened in the last stages of preparing this manuscript, and I have not yet been able to investigate it.

would take over thirty years and another two curators before this would be more or less completed.

Halbertsma made all these changes with a clear aim in mind: he wanted collections fit for research and teaching. After a visit to the Anatomical Cabinet, the university Senate summarized Halbertsma's intentions as follows:

> The director [of the Anatomical Cabinet, i.e. Halbertsma] is always inspecting and repairing the existing preparations, and separating the ones without use. … Rightly, with regard to extending the collection it is not so much his intention to give the cabinet an appearance which amazes the general public or less experienced visitors because of its curiosities, but rather [it is his intention] to possess a collection of objects useful and indispensable for teaching and research.[75]

Halbertsma considered it impossible to reach out to the audiences of students, researchers and lay visitors simultaneously, and he chose the former two over the latter. This brings us to a major difference between Halbertsma and his predecessors. In the early modern period, the Leiden anatomical collections catered to students, researchers *and* lay visitors simultaneously. Preparations were presented in such a way that lay visitors could easily relate to them, but that did not mean the collections were not suitable for research and teaching. The religious and moral issues that appealed to non-medical audiences were also an integral part of the discipline of anatomy. Of course, anatomists also investigated more specialist questions on bodily structures and functions. They used anatomical collections for these investigations as well, and although this use did not add to the accessibility of the collections to a wider audience, it did not threaten it either – the different uses simply co-existed.

As mentioned above, religion and morality disappeared from anatomy after 1800. Yet the Cabinet's first nineteenth-century curator, Gerard Sandifort, continued the early modern exhibition practices. It was during his rule that the anonymous English visitor read the tablet on the unhappy marriage and traced the wrinkles on the monstrous child afterwards. Other travellers who visited the Cabinet in Sandifort's days mentioned similar interpretable preparations in their reports. For example, around 1805 Benjamin Silliman was shown a monstrous birth preserved in a large glass jar whose mother had visited it annually for the last nineteen years.[76] Jean Duchesne, who visited in the 1830s, wrote about the head of a giant called Cajanus.[77] Not only Cajanus' head could be seen, but also some of his clothes. We know this because another traveller, Karel van Wildenstein, felt the need to tell us that Cajanus' slipper was absent during his visit, as was 'the shoe of the infamous farmer of Lekkerkerk'.[78] We would not recognize slippers and shoes as an anatomical object, nor would nineteenth-century anatomists. They were not meant to demonstrate a

[75] Senate to governors, 1 February 1854, AC2 119, 138
[76] Silliman 1812, 164
[77] Duchesne 1834, 268
[78] Van Meerten 1829, 304

fact about the human body, but they made the collections more interpretable to lay visitors. As did the fact that Cajanus had a name, and was not just one of many giants, but a unique personality – with his own slippers, which also helped visitors imagine how huge Cajanus' feet must have been.

Sandifort did not change the collections' composition or the preparations' descriptions because he was satisfied with the collections as they were. In his annual reports, he describes the collections as rich and the condition of the preparations as good, and he never complains about the facilities. An example from the 1837 report:

> the anatomical-physiological-pathological cabinet, which has already acquired such an extensiveness that it is able to rival foreign cabinets of this kind both in usefulness for the sciences [*wetenschappen*; similar to the German *Wissenschaften*] and in the way in which the preparations are displayed[79]

As this phrase shows, Sandifort was also interested in collections useful for research ('usefulness for the sciences'). And the chapter on students has shown he regularly used the collections in teaching. Yet to him, use in research and teaching did not exclude a presentation strategy appealing to lay visitors as well. He would be the last curator for whom this was the case: his successors, starting with Halbertsma, thought it impossible to combine the interests of students, researchers and lay visitors. They considered collections attractive to lay visitors 'unscientific', as becomes apparent from the inaugural lecture of Teunis Zaaijer, the Cabinet's last nineteenth-century curator. He became a curator in 1877, but was appointed as a professor in anatomy twelve years before that. In his inaugural lecture, he fiercely criticized Holland's most famous early modern anatomist: Frederik Ruysch. According to Zaaijer:

> [Ruysch has] shown, through the layout of his collections, that he missed the true method, the right scientific genius; he made anatomy, as it were, a fashionable product for the great of the earth.[80]

Like Halbertsma, Zaaijer suggests that one could *either* be 'scientific' (and thus useful for research and teaching) *or* please the lay public (in this case 'the great of the earth') – but not both. In Zaaijer's eyes, Ruysch had chosen the latter, and this annoyed him:

> Anatomy owes Ruysch some important improvements, but we cannot get away from the conviction that, through using a better method, such a long and productive life, almost all of it in good health, could have given us more fruits for our science [of anatomy].[81]

Other nineteenth-century anatomists criticized Ruysch in similar ways. Joseph Hyrtl, for example, stated that the fame of Ruysch's collection was mainly due to 'curiosities' and

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[79] Annual report of the Anatomical Cabinet 1837, AC2 270
[80] Zaaijer 1866, 19. It is possible that the word 'great' (*grooten)* is a nod to Peter the Great, the most famous visitor of Ruysch's collection.
[81] Zaaijer 1866, 20

had little to do with his scientific merits, 'which indeed weren't very high'.[82] Zaaijer and Hyrtl were right insofar that Ruysch's collection offered entertainment for lay (even noble and royal) audiences as well, but they forgot that Ruysch also actively used his preparations in teaching and research. To Ruysch and other early modern anatomists, this was a natural combination. To Zaaijer, Halbertsma and their contemporaries, it was an impossible one.

The Leiden curators felt obliged to choose between students and researchers on the one hand, and the lay public on the other. Being university professors, they chose the former. From 1879 onwards they were even required to do so by law:

> He [a person managing a university collection] allows visitors in the collection as long as this does not cause any trouble for its [the collection's] intended use. As soon as teaching concerns or the institution's interests prohibit it, visitors are refused.[83]

This is one of the articles in the 1879 decree on the management and use of collections in higher education. It applied not only to anatomical collections, but to all university collections. The strict separation of 'scientific' and lay audiences was part of the nineteenth-century rise of expertise.[84] This rise was not limited to anatomy, or medicine, but present in all the sciences. Scientists acquired authority in society, but not without effort. To create and maintain their status as experts, they had to demarcate themselves from 'amateurs' – which is how that word acquired the negative connotation it carries today. An effective way of doing this was to label themselves as 'scientific' and everyone else as 'amateurs', and then present the two categories as mutually exclusive. Books, exhibitions and other works on natural knowledge aimed at 'amateurs' were called 'popular science', where 'popular' had a negative connotation, 'non-scientific'.[85] As a result it was no longer possible for, say, a collection to be 'popular' and 'scientific' at the same time.

Now that the curators, in their academic ambition to be scientific, were focusing exclusively on students and researchers, the anatomical collections became hard to understand for lay visitors. The curators no longer made an effort to help them relate to the preparations and without it visitors could no longer interpret these preparations. As we have seen, visitors made sense of a preparation by adding their own stories and knowledge to them, but they were only able to do so if they had a point of departure to which they could tie them. Before 1860, these points of departure had been abundant; after 1860, they disappeared. The new Cabinet's anatomical preparations, being part of a university collection, were specialized by nature. Since anatomy had lost its religious and moral aspects, the preparations were now solely intended to teach and research the structure of the body. This made them hard to understand for people without medical knowledge. They needed tales on tablets or stories told by guides in order to see more than just shelves full of medical objects – to see the son of a senile usurer; a stillborn baby still visited by its mother;

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[82] Hyrtl 1865, 528
[83] Reg. 1879, art. 8
[84] Alberti 2005b, 152; Alberti 2007, 380; McLeary 2001, 260–270
[85] Topham 2009

the head of famous giant; and the skeletons of criminals. But the curators made no effort; and the religious and moral issues had left the discipline of anatomy. Hence, late nineteenth-century visitors were confronted not with interpretable preparations, but with collections they could hardly relate to.

We can quite accurately reconstruct what the few remaining visitors would have encountered when they entered the rooms that housed the anatomical collections in the new building. This can be done with help of a hand-written inventory that lists the preparations by cupboard. Zaaijer compiled the inventory; he sent it to the governors in January 1893.[86] Of course, between 1860 and 1892 the collections were regularly extended, which means not all preparations mentioned in the inventory will have been visible throughout the period. Furthermore, at two points in time large parts of the collections were removed: in 1861, part of the Brugmans collection was moved to the natural history museum, and in 1885 many of the pathological preparations went to the new pathology laboratory. But we have no reason to assume that the way the (remaining) preparations were shelved changed much. Except for the addition of a galley in 1867–68, no extensions or changes in the collection rooms are mentioned in the annual reports – whereas changes in other anatomy rooms are discussed in some detail.

According to the 1892 inventory, four of the Cabinet's rooms were dedicated solely to the collections: rooms 9 to 12. (Some of the other rooms, like the preparation room and the curator's office contained preparations as well; they were not included in the inventory.)[87] Room 9 was the most varied and contained wet and dry preparations of comparative anatomy, developmental history and human anatomy. The room contained ten large cabinets and twelve smaller ones, most of them with over a hundred preparations. Cabinet IV, for example, contained 252 fluid preparations on human anatomy: 80 on skeletal development; 55 of skin, nails and hair; 41 of the senses; and 76 of the digestive system.[88] None of these were likely to have been of much interest to lay visitors. Moreover, even if they would have been able to understand the preparations of the digestive system, one or two would have been more than enough. Visitability was certainly not aided by having 76 preparations of the same kindw. The most interpretable preparation in this room – and in the Cabinet as a whole – was probably the 'mice orchestra'. The orchestra was an impressive piece of handiwork by the Dutch doctor E. J. van der Mijle. Van der Mijle had collected enough mice skeletons to put together a miniature orchestra, which he then donated to the Anatomical Cabinet. In the accompanying letter, he stated his intentions:

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[86] Teunis Zaaijer, 'Inventaris der verzameling in het Anatomisch Kabinet van de Rijks Universiteit te Leiden', 1892, Leiden, LUMC, archives Anatomisch Museum (no inventory number); a copy of this catalogue (without some of the remarks written in the margin) can be found in the archives of the university governors: AC3 1772.

[87] A separate catalogue of the wet preparations in the preparation room exists, but it is not dated. 'Katalogus spiritus-prepar. kast prepareerkamer', Leiden, LUMC, archives Anatomisch Museum (no inventory number)

[88] Teunis Zaaijer, 'Inventaris der verzameling in het Anatomisch Kabinet van de Rijks Universiteit te Leiden', 1892, Leiden, LUMC, archives Anatomisch Museum (no inventory number), p. 3

> I hope that the gloominess connected with anatomical cabinets will disappear because of the musician's tones being in tune and because of their truly musical touch in handling their instruments; and [I hope] that the visitor, nervously melancholic because of various unpleasant sensations, will return to his previous cheerful mood.[89]

If used in this way, the orchestra would make the collections more visitable. However, the piece was placed on top a large cabinet, not a place where it would easily catch a visitor's eye – apparently, the preparation was not judged as core scientific business and the Leiden curators could not really be bothered with uneasy-feeling visitors.

Room 10 and 12 were largely filled with anthropological skeletons and skulls. Until 1885, room 10 had housed the pathological preparations as well. When these had moved to the pathological laboratory, part of the anthropological preparations from room 12 (which suffered from a lack of space) was rehoused. Room 10 also contained some 'ordinary' skeletons. According to the inventory:

> The skeletons are marked A to V; on the skulls have been written the sex and, wherever possible, the age.[90]

Twenty-two skeletons, but none of them held banners warning that life was short. Nor were they individualized by tales of the crimes they had committed. Instead, they were nameless, reduced to their sex and, where possible, their age. To the non-medical gaze, all of them would have looked the same.

The remaining room, room 11, contained twenty-four cabinets (twelve large, twelve small), all of them filled with teratological preparations. If a mother wanted to visit her misborn child, she would come to this room. But she might not be able to get as close to the child as she could have in the old Cabinet. We do not know to what extent lay visitors in the new Cabinet were allowed to come close to, or even touch, the preparations – but the policy was probably more restrictive than it had been in the old Cabinet. At least, that is what we see in other anatomical collections at the time: handling by lay visitors was being increasingly discouraged, or even explicitly prohibited.[91]

We have seen how lay visitors disappeared from the Leiden Anatomical Cabinet. They left not because they were explicitly sent away, but because the preparations ended up in a laboratory complex that was hard to approach, and in a 'scientific' arrangement that made them hard to interpret without prior medical knowledge. These were all consequences of changing practices and attitudes in medicine.

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[89] Van der Mijle to Leiden professors, 1870, ASF 461

[90] Teunis Zaaijer, 'Inventaris der verzameling in het Anatomisch Kabinet van de Rijks Universiteit te Leiden', 1892, Leiden, LUMC, archives Anatomisch Museum (no inventory number), p. 34

[91] Alberti 2011, 181

Epilogue: the afterlife of the monstrous child

What happened to the monstrous infant of the beautiful young woman and the ugly old man, the child with which we started this chapter? As said, the wrinkled child was most likely among the preparations that were moved to the new pathology laboratory in 1885. Two facts support this claim. First of all, the preparation as it is today carries a label from the pathology laboratory, which indicates the laboratory possessed it at some point. Second, the preparation is not listed in the extensive catalogue of teratological preparations in the Anatomical Cabinet that was compiled in 1910, meaning it was no longer at the Cabinet at that time.[92] Unfortunately, we cannot look the preparation up in the pathology lab's collection catalogue as the label has become illegible over time. The catalogue is concise, with the preparations being described in one or two words.[93] Several of these words would have fitted the monstrous child: 'monstrum' or 'foetus', for example. But most likely it was described as an 'anencephalus'. In an anencephalus, (part of) the skull is missing, and the brain is absent or deteriorated; this is the major malformation the preparation shows. Whether the preparation was moved to the pathological laboratory, or remained in the new Cabinet, it was this malformation that would have been used to characterize it – not the story of its parents.

These days, the monstrous child is housed in the Anatomical Museum of the Leiden University Medical Center. It is still hard to interpret: it carries an illegible label and the museum database describes it as 'anencephalus and rachischisis'.[94] It is also hard to approach: it rests in a drawer in one of the museum's storage rooms, in the basement of a medical teaching building. It has never been as accessible as it was before 1860. The same goes for most of the Leiden anatomical preparations – even the ones exhibited in the museum itself. According to its website, the museum is intended for (future) medical students and their teachers; its collections can also be used in medical research. Twice a year, the museum opens its doors to the 'general, interested public'.[95] But even on these two days, the museum is not exactly accessible: the building is hard to approach and its collections are hard to interpret. The museum is housed in the university hospital teaching building, a closed space located at the university's Bio Science Park. From the outside, visitors would never guess that the building hides a museum inside – and even though it is located close to the front entrance, it is hard to find upon entering.[96] Clear signs are lacking; the entrance is located in a dead end; and the glass door has been made non-transparent. Moreover, once inside, the preparations are hard to interpret for lay visitors. Touch screens offer information about individual objects, but the texts speak to a specialist audience,

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[92] T. E. van der Guyten, 'Catalogus van het Anatomisch Kabinet te Leiden' 1 October 1910, Leiden, LUMC, archives Anatomisch Museum (no inventory number)

[93] 'Notulenboek Pathologie', Leiden, LUMC, archives Anatomisch Museum (no inventory number)

[94] In the online catalogue, a 'dr. De Koning' is mistakenly named as donor of the preparation. (<http://catalogue.leidenuniv.nl>, search for 'Pe0050') In the museum database, this mistake has already been corrected.

[95] LUMC, 'Anatomisch Museum'

[96] Sometimes temporary signs are placed on the days it is officially open to the general public.

containing more medical Latin than Dutch. The guides are medical students; their tours are hard to follow without medical knowledge.

The Leiden collections are not the only anatomical collections that are open to lay visitors in theory, but rather hard to get into in practice. The most extreme case is probably the National Medical Museum in Washington, which is not located at the National Mall, like all other national museums, but on an in-use army base in the suburbs. More often, public anatomy museums are housed in (teaching) hospitals far away from the city centre (and therefore also from other tourist attractions). Think about Museum Vrolik in Amsterdam, the Museum Bleulandinum in Utrecht, the Medizinhistorisches Museum der Charité in Berlin, and the Musée Dupuytren in Paris. I do not want to want to suggest in any way that these museums are closed to the public – they are not. In fact, most of them can be qualified as more open than the Leiden Anatomical Museum. Visitors do enter. But these anatomical museums are nowhere near as accessible as the average museum due to their distant location, which is often paired with a presentation directed more at medical students than at lay visitors. Anatomical collections ended up at these locations (and in these arrangements) because they remained relevant in medical research and teaching throughout the nineteenth century, and beyond. Hence, the medical faculties took them wherever they went – far away from other tourist destinations, both in distance and in style.

Had all anatomical collections lost their (medical) use in the nineteenth century, more of them might have ended up in easily accessible spaces. Not as medical objects, illustrating the structure of the body, but as historical artefacts, telling us about cultures past. This happened to a small part of the Leiden collections: the historical preparations now on display in Museum Boerhaave. Yet most preparations resisted such historization. They lost their connection to the past, just as they lost their stories – as we will see, much to the dismay of our next audience: the university governors.

Chapter 4. Adieu Albinus

How the university governors lost their status symbol

Leiden University is proud of its past. Its website devotes a large section to the university's history. Part of it describes the nineteenth century, when, so it is claimed, the Royal Decree on Higher Education (1815) declared Leiden University 'the prime university, "with a primary claim in subsidies and salaries"'.[1] The quotation may seem to be another example of being proud of your past, but it is not. I would rather describe it as hanging on to a history that never happened. The university's claim is false: the sentence cited was not part of the Decree. It was in the draft version, but King William I deleted it because the sentence did not fit within his unifying policy.

Leiden's hanging on to and embellishing the past is nothing new: the nineteenth-century university governors already used the university's past to position Leiden above the other Dutch universities. One of their main tools was the anatomical collections, which they used to create a connection to the past, in particular to the eighteenth century. In this period, Leiden was without a doubt the best university in the Netherlands and one of the top universities in Europe. The medical faculty was responsible for a large part of the fame, with celebrated professors like Herman Boerhaave and Bernhard Siegfried Albinus and with the well-known Leiden anatomical collections. But all of this changed in the nineteenth century – ironically, for a large part due to the just-mentioned Royal Decree on Higher Education (RDHE). For, no matter what the university website suggests today, the decree did not confirm Leiden's top position; it threatened it. Not just because the decree refused to call Leiden the 'prime university', but because it damaged one of the university's major status symbols: the anatomical collections.

In this chapter, I will first show how the decree made the anatomical collections both less adequate and less unique. I will then analyse the governors' reaction to the threats posed by the decree. The governors tried to prevent a loss of status using two strategies. On the one hand, they renewed the anatomical collections to fulfil the demands posed by the decree. On the other hand, they used the university's glorious past, embodied in the eighteenth-century part of the collections, to position themselves above other universities. The strategies are potentially conflicting because they require the collections to be both up-to-date and historical. Yet, as we will see, in the first decades of the nineteenth century, the university governors managed to combine both strategies. However, things changed in the second half of the century, in particular after the move and rearrangement of 1860. I will argue that, because of the prolonged use of the collections in research and teaching, the preparations lost the connection to their makers. This made it impossible for the governors

[1] LEI 2010, section 'Rijksuniversiteit'

to continue using them to build a connection to the past – and just like the lay visitors, by the end of the nineteenth century they had stopped using the anatomical collections.

The Netherlands and Leiden in the early nineteenth century

In December 1794, French general Jean-Charles Pichegru got lucky. Until then, French troops aiming to invade the Dutch Republic had been stopped by the quintessential Dutch defence: water – in this case, the rivers Maas and Waal, hard-to-cross natural barriers. Pichegru, who led the troops, was wondering what to do next when a sharp frost descended. And stayed. Two days after a cold Christmas, the French troops marched over thick ice into the Republic: the start of what would become known as *de Franse tijd*, the French period. The period, which ended in 1813, was characterized by governmental changes. In early 1795, the Batavian Republic was established as a sister republic of France. In 1806, the French turned the new Republic into the Kingdom of Holland and Napoleon Bonaparte appointed his younger brother Louis as king. Napoleon had a habit of putting family members in charge of vassal states. It guaranteed direct influence for him and held up a varnish of independence and legitimacy.[2] In this case, the plan backfired. Just four years after Louis' crowning, Napoleon felt forced to invade the kingdom to reclaim his power. His brother had systematically put the Dutch interests above the French – he even used the Dutch version of his name, Lodewijk. In particular, Louis refused to acknowledge Napoleon's demands for money and soldiers. As a result, Napoleon annexed the kingdom as part of the French Empire. After the defeat of Napoleon, the European powers redrew the European borders. In northwest Europe, they created a buffer against France: the Kingdom of the Netherlands, which included what we now know as the Benelux countries. The son of the last stadtholder became the ruler of the new country and, in 1815, the first Dutch king: William I.

William's kingdom had been designed on the drawing board. Parts of it had cooperated before, but this cooperation had always been rather loose. In the Dutch Republic, which consisted roughly of the new kingdom's northern provinces, most business had been done locally. The new country was diverse – it was characterized by its differences, not its similarities.[3] First of all, the same rivers that had slowed down Pichegru divided the country into two regions: the North and the South. There was hostility between the regions; the South – justifiably – felt looked down upon by the North. Another geographical division accompanied by differences was that between the cities and the country. Furthermore, the population was also divided religiously. Protestants and Catholics stood against each other (or rather: Protestants stood above Catholics); and within the Protestant churches, bitter conflicts regularly occurred, resulting in a wide range of denominations. Last, wealth and

[2] Aerts 2004, 47–48
[3] De Rooy 2002, 15–36

income inequality and class consciousness had grown stronger after the economic decline in the second half of the eighteenth century.

Despite all these differences, William was determined to turn all parts into a unitary state.[4] To do so, he pursued a policy that was both centralizing and unifying. He centralized government to such an extent that he made many decisions by himself, including detailed ones; he dealt with everything.[5] The parliament had little control over him and, therefore, over the country. His attempts to unify the kingdom included making Dutch the national language (at the expense of French, the main language in the some of the southern provinces). His aim to unify was also visible in his economic policy and his educational policy, including the Decree on Higher Education.[6] William, who liked to think of himself as *landsvader*, 'the father of the nation', aimed to love all of his children equally.

But some of his children considered themselves more equal than others – and amongst them were Leiden University's governors. They were neither used to nor fond of being unified. After its foundation in 1575, the university quickly gained an international status. Its anatomical theatre, botanical garden and library attracted students and scholars from all over Europe, as did professors like Pieter Pauw (1564–1617), Carolus Clusius (1526–1609) and Joseph Scaliger (1540–1609). Leiden University was a centre of excellence in Europe, and it remained so until the late eighteenth century. In 1765 the *Encylcopédie* even declared it the first (i.e. the best) university in Europe:

> The university of Leiden is the first of Europe. It seems that all famous men in the republic of letters went there to let it flourish from its establishment until our days.[7]

Leiden's top position materialized itself in its collections. The anatomical theatre had contained a small collection of anatomical objects since the late sixteenth century. In the eighteenth century, the collection received important extensions. Early in the century, Leiden anatomy professor Johannes Rau (1668–1719) bequeathed his preparations to the university. The governors happily received them and asked the new anatomy professor Albinus to catalogue the collection. Albinus managed the university's collections, but he also built a large private collection, which he used in his research and teaching. In 1771, a year after Albinus' death, the university acquired this collection as well. The governors asked two medical professors, Eduard Sandifort and Frederik Bernard Albinus (Bernhard's brother), to write a report on the Albinus collection. The professors did as they were asked, and took their chance to ask the governors for some additional money. They intended to reorganize the older anatomical collections exposed in the Anatomical Theatre, which, in their eyes, had been neglected. They wrote:

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[4] On William's unifying policy, see Vosters and Weijermars 2011.
[5] Luiten van Zanden and Van Riel 2000, 206
[6] On William's economic policy, see Luiten van Zanden and Van Riel 2000, 109–203. On his educational policy, see De Wolf 1983 (on education in general), and Groen 1987–88 and Roelevink 1992 (on the universities in particular). On his cultural policy, including his use of museums as unifying instruments, see Pots 2000, 59–84.
[7] Jaucourt 1765, 451

> The costs [of reorganizing the anatomical collections displayed in the Anatomical Theatre] are slight compared to the honour this university would gain from it, because the university would be able to pride itself not only on an excellent library, an outstanding [botanical] garden, [and] a splendid Cabinet of Natural Curiosities, but also on an Anatomical Theatre adorned with cabinets of two famous professors [Rau and B.S. Albinus] and many other exquisite things, which would make it stand out above all others.[8]

The professors hardly exaggerated when they claimed that the reorganized anatomical theatre supplemented with the collections of Rau and Albinus would be better than 'all others', certainly not if by 'all others' they meant the other *Dutch* anatomical theatres. There was no way the four other Dutch universities – Groningen, Utrecht, Harderwijk and Franeker – could compete with Leiden.[9] At the end of the eighteenth century, Leiden found itself in a comfortable position. But things were about to change.

The nineteenth century brought several problems for Leiden and its anatomical collections. The first arrived on a Monday morning, on 12 January 1807.[10] A powder ship berthed in Leiden's main canal, the Rapenburg, where it would remain until that afternoon. Around four o'clock, the crew started making dinner. It seems that they did not pay enough attention to the fire during cooking, because at 16.15 exactly, the ship, carrying 18,500 kilograms of gun powder, exploded. Over 200 buildings were blown away.[11] Approximately 150 people died, including two university professors. All of the university's main buildings and many professors' houses were located on the Rapenburg; several of them were damaged or destroyed. As for the anatomical collections: the collection built by Wouter van Doeveren suffered the most damage. Leiden University had a lot of repairing to do.

The university was generously assisted by King Louis Napoleon. His behaviour after the gun powder disaster became a standard example of how he was much more concerned with his citizens than his brother, Napoleon Bonaparte, wanted him to be.[12] Louis arrived in Leiden only a few hours after the disaster. He stayed all night to help and offered a reward for every living person extracted from the ruins. The next day he received a delegation of university administrators to ask what the university needed. The administrators had their priorities straight: the first thing they asked for was not money, building materials or replacements for lost collections, but a new title[13] – a clear indication of how the university stood on status. The Leiden governors had long been convinced that they deserved a special title and had tried to get one before: in 1800 they had asked to become the 'National

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[8] F. B. Albinus and Eduard Sandifort, 'Rapport over het kabinet van Albinus', 7 November 1771, cited in Molhuysen 1923, 18*

[9] This was reflected in student numbers: Leiden had (many) more students than the other universities, although the differences became smaller towards the end of the eighteenth century. Furthermore, Leiden attracted more international students than the other universities. (Zoeteman 2011, 186–289)

[10] Otterspeer 2005, 209

[11] Knappert 1906, 23

[12] Van der Burg 2007, 107

[13] Otterspeer 2005, 210

Batavian University'. The responsible government official had acknowledged their reasons, which he had summarized as:

> the height [being the National Batavian University] … for which it was originally meant and to which it became entitled at the time both because of the renown that it had acquired throughout the learned world and because of the most precious collections brought together there.[14]

The governors felt they deserved a special title because of their fame and their precious collections, which included the anatomical collections. This shows that in their eyes, the collections were directly related to their status. The 1800 attempt failed,[15] but after the gun powder incident, Louis could not refuse the request. Leiden received the epithet '*Universitas Regiae Hollandiae*'. The governors were very pleased, as the minutes of their meeting on 4 February 1807 revealed:

> [The governors have been told that] the University [*Hoogeschool*] of Leiden will take the name Royal University [*Koninklyke Universiteit*] of Holland; and …. that the necessary steps will be taken to add the utmost lustre and the greatest fame to it …, [and the governors are] imbued with understanding of the enormous value of the boon that His Royal Majesty has given to the university, which now becomes superior to all other academies of the Kingdom and is able to flourish and shine in all the lustre for which it was originally established, and which it has deserved and kept up throughout its existence.[16]

According to the governors, the university was 'superior to all other academies [universities] in the Kingdom'. The university had lost people and buildings, but the new title, and the status that came with it, added a silver lining to the first cloud in the nineteenth-century sky.

Leiden's position was further enhanced a few years later. After Napoleon had annexed the Kingdom of Holland, he restructured Dutch higher education in an Imperial Decree (1811). His centralized and hierarchical educational system left no room for the five different universities that co-existed in the Dutch Republic. Napoleon closed two of them: Harderwijk and Franeker. Leiden and Groningen remained fully functional, but were integrated into the Université Impériale. Utrecht, Leiden's main rival, was downgraded to an *école sécundaire;* its entire staff becoming subordinate to Leiden University's Senate. The Utrecht rector was outraged about being turned into a 'servant of the Leiden rector'.[17] Many students left Utrecht because the new *école sécundaire* was not allowed to confer doctoral degrees. Student numbers dropped from almost 200 just before the downgrading to 140 a year after.[18] Most of the remaining students were theologians, because they did not need the doctoral decree. The medical faculty had only 12 students left in 1813; in that

[14] Minutes governors, 1 February 1800, cited in Molhuysen 1924, 131
[15] Otterspeer 2005, 210
[16] Minutes governors, 4 February 1807, cited in Molhuysen 1924, 312–13
[17] Cited without a source in Kernkamp 1936, 379
[18] Jamin 2001, 104

same year, Leiden had 81 medical students.[19] Leiden had a clear advantage over its chief competitor, Utrecht.

Yet, they would soon lose this advantage. In 1815, a new problem arrived: the Royal Decree on Higher Education.

The Royal Decree on Higher Education (1815)

The Royal Decree on Higher Education was an excellent example of William's policy: it both centralized and uniformed higher education. It centralized it by shifting power from a local level (the university governors) to a national one (the Ministry of the Interior and thus the king).[20] This shift had been started in the Batavian Republic.[21] William extended the national structures the French had created. The RDHE replaced the Imperial Decree of 1811. The 1811 decree, issued by Napoleon, was based on a report by Jean-François Noël and Georges Cuvier.[22] We met the latter as the main father of zoological comparative anatomy; he was also a political advisor. Cuvier and Noël had written the third report on Dutch higher education in five years. The two earlier reports appeared in 1807 (committee led by Johan Meerman) and 1809 (committee led by Jean Henri van Swinden).[23] To prepare the 1815 decree, a fourth committee was established, chaired by Frans Adam van der Duyn van Maasdam. This committee proposed to reverse several French measures; in particular, they wanted to return power to the local governors.[24] However, the king refused this part of their proposal, and the organizational structure of the final decree resembled the one introduced by the French: very centralized.

The decree not only centralized higher education, it also made it more uniform. It did so in several ways. The first was that all universities were considered equal. The decree reinstalled Utrecht as a university. Franeker and Harderwijk became *athenea* (higher education institutes ranking below the universities), meaning that the Netherlands now had three universities: Leiden, Utrecht and Groningen.[25] Leiden was given more professors than the other two and these professors earned a higher salary. However, no difference was made in rank: Leiden lost its official title. Historians, especially those writing the history of Leiden

[19] Visser 1996, 51; Blanken 1869, 79
[20] Jensma and De Vries 1997, 79–80; Otterspeer 2005, 75–77; Roelevink 1992–93, 13
[21] Sluijter 2004, 59–61; Aerts 2004, 52–53
[22] Cuvier and Noël [1811]
[23] Meerman 1807; Van Swinden et al. 1809
[24] Roelevink 1992–93
[25] In 1816 a similar Decree on Higher Education was issued on the Southern Netherlands. Again, three universities were established: Ghent, Leuven and Liège. These universities were part of the Netherlands until 1830, when Belgium seceded – Williams attempt to unite the North and the South had not been very successful. In the 14 years the southern universities were part of the Netherlands, the northern universities, including Leiden, did not pay much attention to them – which is why I leave them out of the discussion here; Leiden was not at all worried about losing its status to these universities.

University, have sometimes claimed otherwise.[26] They quote from the draft version, which indeed declared Leiden to be the 'prime university' of the Netherlands.[27]

'Prime university' replaced '*Universitas Regiae Hollandiae*', the title Leiden had received after the gunpowder disaster. Of course, the governors had hoped for the continuation of their official status as premier university of the Netherlands. And their chances had seemed good. One of the most influential members of the decree's preparatory committee, Jan Melchior Kemper, was a prominent Leiden professor; the committee chair, Van der Duyn van Maasdam, was a Leiden university governor between 1813 and 1848.[28] It was probably Kemper and Van der Duyn van Maasdam who succeeded in getting the primary status in the draft version of the decree. The other universities successfully opposed this decision upon which the king removed it from the final decree.[29] This must have been painful for Leiden, because they assumed they had a special relationship with King William. After all, his ancestor William of Orange had founded the university in 1575. But the king was not interested in special relationships and prime universities. What he wanted was, as we have already seen, uniformity.

The second way in which this uniformity was created was by the detailed rules all universities had to follow. All universities had to teach the same courses. Furthermore, all university collections became similar because they had to comply with the standards dictated in the decree. One of the decree's seven sections was devoted to 'material assistance for academic teaching'.[30] It prescribed which material assistance should be present – including several collections, a library, a chemistry laboratory and an observatory. Furthermore, it contained instructions on who were responsible for these objects and how they should be managed. With regard to medical teaching, it prescribed an academic hospital and collections of medical books, surgical and obstetrical instruments, and anatomical preparations.[31] Article 178 specified the contents of the collections with anatomical preparations:

> At all universities there will be cabinets of anatomical, physiological and pathological preparation and objects, for assistance and advancement of the teaching of anatomy, medicine, surgery and obstetrics; to these cabinets will also be added such preparations of *anatome comparata*, as can serve to elucidate the knowledge of the human body.[32]

This requirement and the policy William based on it threatened the Leiden anatomical collections, because it made them both less adequate and less unique.

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[26] See for example Otterspeer 1992, 5 and Calkoen 2012, 190. However, I am not the first to point out that the RDHE provided all three universities with equal rank, see Van Berkel 1985, 103–104.
[27] Roelevink 1992–93, 26–27; De Geer van Jutphaas 1869, 232–233
[28] De Geer van Jutphaas 1869, 216; Otterspeer 1985, 244
[29] De Geer van Jutphaas 1869, 220
[30] RDHE 1815, section 'vijfde titel'
[31] RDHE 1815, art. 169, 177, 180
[32] RDHE 1815, art. 177

The 1815 decree made Leiden's anatomical collections less adequate. Although the university possessed a rich anatomical collection, it did not fulfil the decree's demands. In their first annual report after the decree, the governors admitted their collections were incomplete:

> The cabinets for the advancement of the teaching of anatomy, medicine and obstetrics are to varying degrees equipped with anatomical, physiological and pathological preparations and objects – although not in the amount required, and the name of Albinus, whose cabinet belongs to the possessions of the university, may lead one to suspect much; we would however not honour the truth if we would assure your Excellency [the Minister of Education] that Leiden reaches the standards of science in this respect, and that there are no needs, even more so because the *Anatome Comparate*, valued properly by the Royal Decree, leaves much, if not everything, to be desired.[33]

According to the governors, the main problem was the lack of comparative anatomy preparations. Indeed, the university collections contained hardly any of these preparations when the decree was issued. The contents of the university collections in 1815 roughly coincide with the preparations described and depicted in the first two volumes of the collection catalogue *Museum Anatomicum Academiae Lugduno-Batavae*.[34] These volumes were published in 1793 and the university did not acquire many new preparations between then and 1815. The volumes list around 2500 preparations.[35] Most of them are general-anatomical, some are pathological, very few are comparative-anatomical. The Albinus collection, for example, contains 752 preparations, of which only 66 are listed as animal preparations.[36] The collection of Wouter van Doeveren consists of 441 preparations, only 15 of which are animal preparations.[37] Even if we consider all of these animal preparations comparative-anatomical, which is debatable, the number of comparative anatomy preparations in the university collections was small.[38]

It is not surprising that eighteenth-century anatomists like Albinus and Van Doeveren included few comparative-anatomical preparations in their collections: comparative anatomy wasn't introduced in Dutch university teaching until the end of the eighteenth century. Sebald Justinus Brugmans was the first Leiden professor to teach comparative anatomy. As we saw in the chapter on researchers, he built an impressive anatomical collection, which included at least two thousand comparative-anatomical preparations. He

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[33] Annual report of the university 1815–16, AC2 270

[34] Sandifort 1793a and 1793b

[35] It is hard to say what the exact number of preparations is: some descriptions deal with more than one preparations, and some preparations are listed twice. So the numbers should be taken with some caution, but they do provide a rough indication.

[36] Sandifort 1793a, 65–69, 88–90

[37] Sandifort 1793a, 111. On Van Doeveren's animal preparations, see also Hendriksen 2012, 107–110. Note that it is unclear how many of Van Doeveren's preparations were still present in 1815; the collection had been damaged in the gun powder disaster.

[38] Part of the animal preparations should probably be listed as natural-historical, that is, preparations that show the outside of the animal (like stuffed animals, or whole animals on fluid) instead of its internal structures.

used the collection in his teaching. Brugmans was appointed professor in Leiden in 1785; in 1815, his collection had more or less reached it full size. Thus, when the RDHE was issued, a large comparative anatomy collection was available for teaching Leiden (medical) students. However, this collection was *private*; it was not owned by the university, but by Brugmans, an individual professor. Hence, the governors could not claim to fulfil the demand, even though the students probably didn't notice a lack of comparative-anatomical preparations.

During the early modern period, most (anatomical) collections were privately owned; Leiden's large institutional collections were an exception. But what had been exceptional before became standard in the nineteenth century, when collection ownership shifted from private to institutional.[39] The Dutch government encouraged institutional collections: they were not just made obligatory in the RDHE, but, as we will see, the king also actively assisted the universities in acquiring the required collections. It also seems that the government tried to discourage professors, curators, and other people working with institutional collections from building private collections. The RDHE did not mention them, but an earlier educational report explicitly stated that the 'usefulness' of professors' private collections would become 'more general' if these collections were to become university property. This report advised the king (Louis Napoleon) to buy these collections and donate them to the universities, which, as we will see, is exactly what William would later do.[40] Much later, in 1859, the government would explicitly prohibit the directors and the staff of the Museum for Natural History to build their own collections.[41] Such explicit rules were likely intended to avoid a conflict of interest: if museum staff had their own collections, they might be tempted to use resources that belonged to the museum, in particular incoming dead animals. Yet, this most likely is not all there is to it: there are multiple reasons why the government would consider institutional collections of a more general usefulness than private collections. Institutional collections bring continuity: collections no longer disappear when a professor moves to a different university, or dies. Institutional collections let the government have more control over what exactly is *in* the collections. And institutional collections can be made equally accessible to *all* professors, not just to the owner of the collection. Think of the Brugmans collection: when it was still private, it was located in Brugmans' house, and it was entirely up to Brugmans if he wanted to let other professors use his preparations. As soon as it became institutional, its use was regulated by the decree, which clearly stated that all professors were allowed to borrow preparations from the collections. There was still only one curator, but he had to follow the

[39] This means neither that private collections disappeared, nor that 'private' and 'institutional' were the only two useful categories – there was a wide range of ownership constructions, all of them in use throughout the nineteenth century. See Alberti 2005b.
[40] Van Swinden et al. 1809, 118–119
[41] Van der Hoeven 1860, 16

rules, and if he didn't, his colleagues could go to the governors who had the power to overrule him – they were ultimately responsible for the management of the collections.

The Brugmans collection's presence in Leiden was not enough to fulfil the decree's demands because it was not *owned* by the university. In other words, after the decree was issued, Leiden's collections suddenly looked (and were) deficient. Since the collections were a major status symbol, it was painful that the decree made them inadequate. But Leiden still had one major advantage: they owned a collection, which was more than the other universities could say. Neither Groningen nor Utrecht possessed anatomical preparations in 1815. However, Leiden's advantage was soon to disappear. Only a year after the decree was issued, Utrecht acquired the Bleuland collection. This was a high-quality collection, with many comparative-anatomical preparations.[42]

Utrecht received the collection from William I. It was the first, but by no means the only anatomical collection he had donated to a university. Between 1815 and 1835 he bought at least seven collections and divided them between Leiden, Utrecht, Groningen and Ghent.[43] (Ghent was one of the southern universities that were part of the Netherlands until 1830, when Belgium seceded.) These donations suited William's unifying policy – and with his habit of occupying himself with detailed decisions.

William's donations made Leiden's collections less unique. What was worse, their main rival Utrecht now owned something Leiden lacked: a comparative anatomy collection. The governors felt overtaken. Both inadequacy and lack of uniqueness posed a threat to the status of their collections. How did they deal with this?

Strategy one: (claim to) comply with the standards

To understand what the governors did, we first need to take a closer look at who they were and what they wanted. Like all universities, Leiden had five governors who administered the university and were appointed by the king. Each university also had a senate, an assembly of professors, but their role was mainly advisory; ultimately, the governors decided what happened.[44] The governors' responsibilities included implementing the educational laws, managing the finances and caring for buildings and collections. In the first half of the nineteenth century, the most influential governors in Leiden were chairman Frans Adam van der Duyn van Maasdam (governor from 1815 to 1848), Hendrik Collot d'Escury (governor from 1815 to 1844), and Frans Godert Lynden van Hemmen (governor from 1823 to 1845).[45] Both Van der Duyn van Maasdam and Lynden van Hemmen were members of the committee that drafted the 1815 decree.

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[42] Van der Knaap 2001, 13–17

[43] Haneveld 1978b

[44] The university administration was regulated in the RDHE. (RDHE 1815, section 'zevende titel') On the actual administrative practices resulting from the decree, see Dorsman 2008.

[45] Otterspeer 2005, 77. For a full list of nineteenth-century governors, inside and outside Leiden, see Jensma and De Vries 1997, 75–126.

The governors had a clear idea what their main task should be. In 1822, they wrote to the minister:

> To the obligations which have been imposed on us belongs also in particular the promotion of everything which could serve to maintain the university's fame.[46]

'To maintain the university's fame' was indeed one of the tasks assigned to the governors in the Royal Decree.[47] But it was the last task in a list of seven, which does not particularly justify singling it out as the most important task the governors had. And yet, the Leiden governors claimed time and again that retaining, or boosting, the fame of the university was their main concern.[48]

The anatomical collections were a means to this end. To use them as such, Leiden needed to convince others they were superior. To communicate this message it was neither necessary nor sufficient to own the best collection. But it would make the job easier, which is why the governors set out to complete their collection. Every year some preparations were added, but the two most important extensions were the Brugmans and the Bonn collection. The Brugmans collection was acquired in 1819. As we have seen, half of the approximately 4000 preparations concerned comparative anatomy; the other half concerned pathology and natural history. Three years after the Brugmans collection, the university acquired the preparations of Amsterdam anatomist Andreas Bonn (1738–1818).[49] Bonn's collection was bought by the king and then donated to Leiden University on the condition that preparations already present in the Leiden collections would be sent on to other universities.[50] Gerard Sandifort assessed the preparations.[51] He selected 737 preparations for the Leiden collections; the remaining ones were sent to the University of Ghent. Most of the Bonn preparations added to the Leiden collections involved general anatomy or pathology; some involved comparative anatomy. Sandifort was particularly pleased with the pathology additions, specifically the monsters and the pathological bone preparations.[52]

After the acquisition of the Bonn collection, the university collections fully complied with the standards set in the Decree on Higher Education. The Brugmans collection solved the lack of comparative-anatomical preparations; the Bonn collection added pathological preparations, which had also been under-represented in the eighteenth-century collections.

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[46] Governors to Minister of Education, 17 January 1822, AC2 228, 5

[47] RDHE 1815, art. 234

[48] See for example annual report on the university collections 1821–22, AC2 228, 90; governors to Minister of Education, 28 January 1823, AC2 229, 9; annual report of the university 1822–23, AC2 229, 57.

[49] It is often stated that the Bonn collection was acquired in 1819, just like the Brugmans collection. (See for example Elshout 1952, 88; Museum Boerhaave 2000,6.) However, the university archives clearly show this did not happen until 1822; see for example the letter of the Minister of Education to the governors, 22 October 1822, AC2 76, 162.

[50] Minister of Education to governors, 22 October 1822, AC2 76, 162

[51] Gerard Sandifort, 'Rapport aan curatoren over het Museum Anatomicum Andreae Bonn, voor het Theatrum Anatomicum der Leidsche Hoogeschool aangekocht', 1823, BPL 1807; Sandifort to governors, 21 March 1823, AC2 77, 40

[52] The Leiden part of the collection is catalogued in Sandifort 1827.

The governors now needed to tell the rest of the world their collections were up to standard: the collections would lose their fame (or would not regain it) as long as people thought they were inadequate. Leiden used various channels to communicate this message.

The first involved the university's annual reports. These reports were sent to the Minister of Education, who then used them to write the constitutionally required 'Report on the State of Education in the Netherlands'.[53] This report was sent to parliament and was also published in the *Staatscourant* ('Government Gazette', the official publication containing laws and governmental announcements) to inform the public.[54] Usually, the universities also received a copy of the report. Hence, the contents of the Leiden annual reports mattered: their claims could potentially reach a much wider audience than just the minister and his staff. Thus the readers of the reports included politicians, governors at other universities, and, in the case of the *Staatscourant*, informed (and probably influential) members of the public – all of whom the Leiden governors would gladly remind (or convince) of their university's top position. Indeed, the annual reports regularly stressed the high quality of their anatomical collections. For example, after the acquisition of the Brugmans collection they wrote:

> With regard to the acquisitions which this university made in the past year, should in the first place be mentioned the so precious collection of the late professor Brugmans, with which the university acquired, in particular in the field of comparative anatomy, a collection which is not only able to compete with other collections of this kind in our fatherland, but may also exceed, in quality as well as in number, all other collections of this kind, both inside and outside our fatherland; and which just as much does honour to the excellent talents of its previous owner (who unfortunately for science died before his time), as it enlarges and extends the fame and lustre of this university.[55]

They only just claimed their comparative anatomy collection was good; they claimed it was the best, and, as such, that it would enlarge the university's fame.

The annual reports were not the only place the governors boasted about their collections. The reports could reach politicians and administrators, but they would never be read outside the Netherlands. Yet, the governors wanted to claim international fame as well. A collection catalogue would be an excellent means to this end, as curator Gerard Sandifort explained to the governors:

> It would be no less glorious for this university, if it would become widely known how the already renown collection, consisting of individual cabinets of professors Rau, Albinus, van Doeveren and others, again has been enlarged and become more suitable for teaching all parts of anatomy with this [collection of Brugmans].[56]

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[53] The full titles of these reports vary; between 1816 and 1857–58, they were called *Verslag nopens den staat der hooge, middelbare en lagere scholen in het Koningrijk der Nederlanden*.
[54] Jensma and De Vries 1997, 54
[55] Annual report of the university 1819, AC2 226, 9 January 1820, 3
[56] Sandifort to governors, 21 January 1823, AC2 77, 10

The governors, susceptible to Sandifort's arguments, decided to indeed publish a new catalogue.[57] Its target audience was 'the learned world';[58] it was written in Latin and could therefore be read throughout Europe. The catalogue described both the Brugmans and the Bonn collection. In the preface, Sandifort wrote:

> The collection [of the Anatomical Cabinet] has been enriched and adapted to the present-day state of science [*disciplinae*] … Our museum has acquired very important additions because the collections of both Brugmans and Bonn have been bought.[59]

Brugmans' and Bonn's collections had 'adapted' the university's anatomical collections 'to the present-day state of science'. Sandifort did not specify what this 'present-day state of science' was, but this becomes clear from his descriptions of the new collections. On the Brugmans collection:

> Brugmans … left behind a collection of preparations, by which anatomy and pathology are elucidated in many ways.[60]

And on the Bonn collection:

> Bonn's collection should be praised no less, in the first place because of its pathological part.[61]

Apparently, 'present-day state of science' meant: a sufficient number of comparative and pathological anatomy preparations – exactly what was new in the Decree on Higher Education.[62] The catalogue showed that Leiden's anatomical collections were up to date.

But other Dutch universities had up-to-date collections as well, thanks to William's donations. Utrecht had the Bleuland collection, rich in comparative anatomy; Groningen had the collections of Petrus Camper, Pieter de Riemer, and Gerbrand Bakker, all of high quality as well. The Leiden anatomical collections were no longer inadequate, but they were still not unique – much to the dismay of the Leiden governors, who did not want to settle for anything less than excellence. Complying with the decree's standards was not enough; they had to find a way to put themselves *above* the other universities, instead of next to them.

Strategy two: continue the past into the present

The Leiden governors had to find a way to distinguish themselves from the other universities. The distinction they came up with was Leiden's glorious past, which they used as a claim to fame. The following quotation by the governors illustrates their strategy:

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[57] Governors to the Minister of Education, 28 January 1823, AC2 229, 9
[58] Sandifort 1827, Praefatio, 4
[59] Sandifort 1827, Praefatio, 3
[60] Sandifort 1827, Praefatio, 3–4
[61] Sandifort 1827, Praefatio, 5
[62] Of course, an international audience would not have known about the RDHE and its demands – but they would know that comparative and pathological anatomy had become important disciplines in medicine; and that a proper anatomical collection contained preparations from both of these fields. Furthermore, the catalogues were read inside the Netherlands as well; parts of the preface may have been intended mainly for a national audience.

> It is known to Your Excellency [Minister of Education] that Leiden University has been famous for over a century, mainly for the medical studies, and that the fame, which Boerhaave acquired, *has continued to endure until our time*.[63] (my italics)

They suggested that nothing had changed since the heyday of the medical faculty and its anatomical collections: the faculty and the collections were just as famous now as they had always been. The governors tried to continue the past into the present.

They used the past rhetorically, a common strategy in the Netherlands of the nineteenth century. Roughly speaking, this can be done in two ways: normalization and dramatization, as Nicholas Jardine referred to them in his analysis of the rhetoric of the laboratory revolution.[64] In both cases, the aim is to justify a practice or a state of affairs – for example, laboratory-based medicine, or Leiden's position as the first university of the Netherlands. In the case of normalization, the justification consists of presenting the aim or practice as a natural development in a long tradition. Dramatization, on the other hand, is justifying something by presenting it as a revolutionary break with the past. The Leiden governors used normalization, not dramatization: they justified Leiden's supposed status as the first university by presenting it as the natural continuation of history.

But how does one do this? How to continue the past into the present? The first step is to adapt the past: you need to create an image of the past that resembles the image you want to create in the present. This may take some effort. The Royal College of Surgeons in London, for example, needed years to position John Hunter as 'the first scientific surgeon' – a necessary step to use Hunter's collections to position themselves as his heir, and hence, as scientific themselves (which in turn would make them more 'gentlemanly').[65] In Leiden, however, creating the right image was not hard. The governors needed an image in which the university had a high rank, and in which the anatomical collections were excellent. This was the standard image of the university's position in the eighteenth century, so the governors only had to remind their audience of that history.

Such reminders were made almost every time the governors mentioned the anatomical collections. Usually they were short and often they contained Albinus' name. An example can be found in the quotation used above: when the governors explained to the Minister of Education that their collections did not comply with the standards of the RDHE, they slipped in the name of Albinus. ('The name of Albinus, whose cabinet belongs to the possessions of the university, may lead one to suspect much.')

Something similar happened in the 1830 collection report:

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[63] Governors to Minister of Education 17 January 1822, AC2 228, 5
[64] Jardine 1992, 314
[65] Jacyna 1983 shows how the College used the annual Hunterian Orations to turn Hunter into the first scientific surgeon.

> The collection of anatomical preparations, with which the cabinets of Albinus, Brugmans and others have been placed, constantly prove[s] to meet with admiration from many local and foreign scholars.[66]

Recalling past glory, however, is not sufficient to continue the past into the present. Since past glory is in the past, the governors needed to make it believable that nothing had changed. They had to connect the past to the present – the second step in the rhetoric of normalization. The connection constructed by the governors started with a material link: the anatomical collections themselves. Obviously, the collections had a connection to the past, since the preparations *were from the past*. The argument ran as follows: the collections were famous in the past, they continued to exist into the present, hence, their fame should continue to exist into the present as well.

Subsequently, this relation was reinforced with the help of other links. Elements surrounding the collections – like its curator or its catalogues – were connected to the past as well.

Some quotations from the annual reports demonstrate how the governors used the collection curator to strengthen the connection to the past. As mentioned above, Gerard Sandifort was curator at the time the Royal Decree was issued. He had succeeded his father Eduard in 1799.[67] The father-son relation was an excellent means to connect the nineteenth to the eighteenth century. Consider the following phrase:

> [the anatomical collections,] being put under special supervision of the decent son and worthy successor of the great Sandifort[68]

The governors wrote this in 1819, when Gerard had been a curator for twenty years. Yet, he was still not called by his own name, but described as 'decent son and worthy successor of the great Sandifort'. Eduard was a well-known curator and his collections were famous. By stressing Gerard was his son, the governors tried to associate that fame with their collections. This was strengthened by the addition 'worthy successor', which implied that Gerard had inherited his father's qualities. This suggestion can be found in other collection reports as well, for example:

> the praiseworthy professor Sandifort …, who keeps the collection in the best condition on the heels of his worthy father[69]

Another means to link the past to the present was the new collection catalogue, mentioned above. It was named *Museum Anatomicum Academiae Lugduno-Batavae. Volumen tertium*, to make clear that it was a sequel to *Museum Anatomicum Academiae Lugduno-Batavae. Volumen primum* and *Volumen secundum*, both published in 1793. This was decided although the plan differed from the earlier catalogues. These had described all preparations present in

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[66] Annual report of the university 1829–30, AC2 270
[67] Sandifort 1827, x
[68] Annual report of the university 1817–18, AC2 226, 8 Janaury 1819, 4
[69] Annual report of the university 1819, AC2 226, 9 January 1820, 3

the collections, but the third volume would describe only Brugmans' collection. It would therefore have been reasonable to present it as a single collection catalogue, not as a sequel to the earlier museum catalogues. However, by doing this anyway, the governors again linked the present to the past.

Eventually, the catalogue did contain both the Brugmans and the Bonn collection. This was against the governors' plans, but the minister refused to pay for the catalogue if the Bonn collection was not included.[70] The governors may have intended to exclude the Bonn collection because it did not help establish a connection to Leiden's past. Bonn was an anatomist in Amsterdam, and that was where he built his collection. Thus his collection was associated with another town. Brugmans, on the other hand, was very much related to eighteenth-century Leiden, where he had been a famous professor. This made his collection an excellent means to continue the past into the present.

Leiden distinguished itself from other universities by stressing its glorious past and continuing that past into the present through the collection, its curator and its catalogues. This worked because, unlike Leiden's collections, the collections in Utrecht and Groningen were not employed to embody a glorious past. The Camper collection in Groningen stemmed from the second half of the eighteenth century and was therefore not much younger than the Albinus collection. However, although Camper was famous, Groningen University itself did not have much status nationally, let alone internationally, at the time. Whereas the Albinus collection permitted Leiden to associate itself with a period in which it had been 'the first of Europe', the Camper collection linked Groningen to a time when it had only been one of the four 'other' Dutch universities. The Bleuland collection in Utrecht was younger than both the Albinus and the Camper collections. It was built during the French rule, one of the worst periods in the university's history – Utrecht University had almost ceased to exist. This was not exactly a period the university wished to remember. Furthermore, neither Groningen nor Utrecht owned significant anatomical collections before the Royal Decree had been issued. (The collections Groningen and Utrecht acquired were from the eighteenth century, but as *institutional* collections they were new.) Leiden did, which made it easier to position the present-day anatomical collections as a continuation of the past.

Utrecht's and Groningen's collections did not offer them a status-enhancing connection to the past – and they were well aware of this. Consider the following quotation from a letter from the Utrecht governors in which they thanked the king for the Bleuland collection:

> We feel ourselves obliged to show Your Majesty our appreciation of and our great gratitude for this important and precious gift [the Bleuland collection], which, being a token of Your Royal generosity, will serve as a lasting ornament for this university and [which] will contribute, we

[70] Sandifort to governors, 11 May 1823, AC2 77, 63

> believe, quite a lot to its [the university's] usefulness and flourishing. It has even more value to this university, because it [the university] completely lacked such a collection, and building such [a collection] would have taken a lot of time, effort and money.[71]

The governors bluntly acknowledged that their university completely lacked an anatomical collection. Instead of presenting the acquisition of the new anatomical collection as a continuation of the past, they presented it as a radical breach with the past. Leiden presented the Brugmans collection as an addition to the already existing collection. They considered their collection cumulative; it continued throughout time, and hence, its status should continue throughout time. Utrecht, on the other hand, presented the Bleuland collection not as an addition or a continuation, but as a new beginning – the Utrecht governors were not normalizing, but dramatizing. They admitted that their anatomical collections had been useless before, but now, things would change: the university would start to flourish.

The other Dutch universities did not use the history of their anatomical collections to increase their present-day status. Outside the Netherlands, however, several institutions used rhetorical strategies similar to those of the Leiden governors. Rebecca Messbarger has written about anatomical collections in eighteenth-century Bologna.[72] The city administrators, led by Archbishop (and future pope) Prospero Lambertini, wanted to restore the city's prestige and tried to do so by creating a new anatomy museum. The museum contained mainly wax models, newly made. The collection itself was not historical (unlike the Albinus collection), but it was explicitly intended to refer to the public dissections that had made Bologna famous in the seventeenth century. Although the collections themselves were not from the past, they did in a certain way embody that past – and by presenting them as a continuation of the past, the Bologna administrators hoped to restore the city's former glory. Another example of presenting anatomical collections as a continuation of the past can be found in London. In the nineteenth century, the Royal College of Surgeons used the eighteenth-century Hunter collections to increase their nineteenth-century status. As stated above, they had turned John Hunter into the father of scientific surgery, and subsequently, they used his collections to present themselves as his sons. They suggested that they were simply continuing his work, for example by claiming that they used Hunter's original arrangement.[73] That they indeed did so is unlikely, because much was unknown about Hunter's original arrangement – but admitting this would not have been helpful in presenting the collection as a continuation of Hunter's work, and the college administrators therefore failed to mention this.

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[71] Governors to King, 4 November 1816, Utrecht, Utrechts Archief, 59/37, 320
[72] Messbarger 2010, 1–51
[73] See for example RCS 1818, 3.

Preparations disconnected from their makers

The Leiden governors combined two strategies to use their anatomical collections as a status symbol. On the one hand, they extended the collections to comply with the standards set in the RDHE and made sure everybody knew about these extensions. On the other hand, they suggested that nothing had changed since the eighteenth century. They had to combine both strategies to distinguish themselves from the other universities. Up-to-date collections were necessary, if only because they had to follow the law. But they were not sufficient: due to William's unifying policy, the other Dutch universities owned high-quality collections as well. To distinguish themselves, the Leiden governors had to connect their collections to their glorious past. The governors had to simultaneously distinguish themselves from and connect themselves to the eighteenth-century collections. This seems conflicting, yet in the first decades after the decree the governors managed to combine both strategies quite well. But as the century progressed, this changed. The collections came to resist the double meaning; they could no longer be both contemporary and historical. Medical research and teaching kept changing, and the anatomical collections could remain up-to-date only if they changed as well – but this meant becoming increasingly separated from their past. The preparations lost the connection to their makers and as a result, the governors could no longer present them as a continuation of the past. Therefore, they could no longer use the collections as a status symbol, for they needed the historical meaning to do so.

The preparations were detached from their makers just as they were detached from the (moral) stories that had made them interpretable to lay visitors. Without the stories, it became hard for lay visitors to use the collections; without the connection to their makers, it became hard for university governors to use the collections. And, as with the disappearance of the moral stories, the 1860 move and accompanying rearrangement were pivotal in the disconnection of the preparations and their makers.

In the first half of the nineteenth century, users of the Anatomical Cabinet could easily find out which anatomist had made a particular preparation. All they had to do was read the label. Both Eduard and Gerard Sandifort wrote three things on their labels: a description of the object, the name of the maker,[74] and the catalogue number.[75] The catalogue number referred to the descriptions in the four volumes of the *Museum Anatomicum*. In these volumes, father and son Sandifort described collections from different makers (collectors) separately. A skull collected by Brugmans was described in the part on dry preparations in the Brugmans collection; a similar skull collected by Bonn was described in a different section, together with the other skulls from the Bonn collection. However, it is possible that both skulls were nonetheless placed next to each other on the shelves of the Cabinet's cupboard – we do not know to what extent the classification system used in the catalogues was reflected in the preparations' actual arrangement. In his preface to *Museum*

[74] Strictly speaking, they used not the name of the maker, but of the collector – but in eighteenth-century private collections, these two roles usually coincided.
[75] Elshout 1952, 11

Anatomicum 3, Gerard Sandifort seems to suggest that the collections were at least partially combined:

> When the Museum was enlarged so splendidly, it had to be rearranged and reordered; since it was made up of separate collections, of Rau, Albinus, Van Doeveren, Ledeboer, Rocquette, Brugmans and Bonn, it had to get its own proper ordering and, as it were, face and character. And thus I put together everything that had been separated until then and I made sure that, while everything ran according to an uninterrupted system, each preparation had a number and name of the collection from which it was taken.[76]

The 'uninterrupted' system was *not* the classification system used in the catalogue – that was clearly divided. Each collection had its own classification system, more or less systematically; the classification system of different collections employed different categories. But if it was not the classification system that was 'uninterrupted', than it had to be the system in which the preparations are arranged ('*disponendum*'). Yet, even in this 'uninterrupted' arrangement, the individual collections remained recognizable, so Sandifort claims. Travel reports show that visitors indeed distinguished between preparations made by different anatomists. Take for example the travel report by Wilhelm Horn, a German doctor. Horn offers a detailed four-page list of objects visible in the Anatomical Cabinet. This is part of it:

> Many vessel injections by Albinus – A single preparation by Ruysch, an injected child's head. Next, many preparations together, of Bonn, Brugmans, Sandifort and Rau. – Injected organs of all kinds. – Stones, bladders, in particular by Van Doeveren: lymph-vessels, spleens, livers; injected.[77]

Horn suggests that he had seen several injection preparations from Albinus combined; that preparations made by Bonn, Brugmans, Sandifort and Rau were also combined; and that he could identify the preparations' makers. Other visitor reports also regularly list individual collections,[78] showing that the visitors had at least learned that the Cabinet housed collections from various anatomists. We do not know whether these collections were kept strictly separate – probably not, considering Sandifort's remark. But even if they were combined to a certain extent, the connection between the preparations and their makers was clear: in the catalogue, on the labels and possibly (partly) in the actual arrangement.

After 1860, the clues that connected the preparations and their makers would disappear. As we have seen, curator Halbertsma used the move to the laboratory complex to rearrange the collections completely. The individual collections were now fully integrated, both in their actual arrangement and in the classification system.[79] Skulls were put with skulls; hearts with hearts; ears with ears – regardless of who made them, if they displayed

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[76] Sandifort 1827, Praefatio, 4
[77] Horn 1831, 360
[78] See for example Van Meerten 1829, 304; MacGregor 1835, 168; Guislain 1842, 91.
[79] The 1892 inventory of Zaaijer, discussed in the previous chapter, listed the preparations by cupboard, and shows that classification system and arrangement coincided.

the same body part, organ system or disease, the preparations were put together. The catalogues of Halbertsma (1860s) and Zaaijer (1892) did not even mention Albinus, Brugmans, Bonn and the other Leiden anatomists.[80] Nor did the new labels: they contained a description and a catalogue number, but no makers or collectors.

The individual behind the collections had become unrecognizable. This posed a problem to the governors: without a connection to the past, the collections could not function as a status symbol. So, in the second half of the nineteenth century, the normalizing rhetoric disappeared from the governors' references to the anatomical collections. This did not mean the university stopped using its past to increase its present-day status. Consider for example what happened after the 1865 medical laws, which stressed the importance of practical teaching. Leiden felt somewhat threatened by these laws. In response, they (more in particular: medical professor Gerard Suringar) constructed an image of the famous Boerhaave as the first practitioner of bedside teaching, and then connected that image to the present. In so doing, they suggested that at the Leiden medical faculty, theoretical medicine and practical teaching had long been, and would continue to be, combined.[81]

The lost connection between preparations and makers would later also pose a problem for medical historians. The rearrangement – and the relabelling in particular – had made it rather hard for them to find out who made what. Understandably unhappy about all the tedious work they had to undertake, they were keen to find someone to blame. Their eyes landed on the collection curators from the second half of the nineteenth century, Hidde Halbertsma, Johannes Boogaard and Teunis Zaaijer. The authors of a historical article on the Leiden anatomical collections stated in 1934:

> Lack of historical awareness, typical of the second half of the nineteenth century, and in addition lack of space in the institute in which anatomy was housed from 1859 until 1923 [the authors incorrectly date the 1860 move in 1859], resulted in a constant decrease of the contents of the old cabinets, which would not have happened in case of greater care and inclination for these things. Part of the preparations were not only transferred to new jars or remounted, but, in these ahistorical times, old labels were also removed and all traces of the provenance of the preparations were destroyed. … Because of these museological errors, the preparations lost their distinctive historical value.[82]

The authors, D. C. Geyskes and Cornelis van der Klaauw, accuse the three curators of 'museological errors' and claim that these 'errors' stemmed from a lack of historical

[80] Zaaijer does single out a preparation made by Ruysch, though. (Teunis Zaaijer, 'Inventaris der verzameling in het Anatomisch Kabinet van de Rijks Universiteit te Leiden', 1892, Leiden, LUMC, archives Anatomisch Museum (no inventory number), p. 6) The classification system used by Halbertsma is described in Elshout 1952, 11. Halbertsma's catalogue has been lost for several years; fortunately, it has reappeared in the Leiden University Library – unfortunately, this happened in the last stages of preparing this manuscript, and I have not yet been able to investigate it.

[81] Knoeff 2010, 269–279; see also Suringar 1866b and Suringar 1866c.

[82] Geyskes and Van der Klaauw 1934, 181–182

awareness supposedly common in the second half of the nineteenth century. However, as we saw above, the university kept using its past – proving they had at least some sort of awareness of its history. The three curators all valued the past in one way or another. Zaaijer demonstrated in his inaugural lecture that he was well aware of the history of anatomy.[83] Boogaard chaired the committee that erected a statue for Boerhaave. And Halbertsma treasured a microscope made by Van Leeuwenhoek, on whose research he wrote his dissertation.[84] They were not a-historical men. Yet, they were also not *primarily* concerned with the historical value of the preparations. However, this is not, as Geyskes and Van der Klaauw put it, a 'museological error'. On the contrary, one could say. Halbertsma and his successors rearranged, reclassified and relabelled the preparations because they wanted them to be of better use for the museum's[85] primary purpose: teaching and research. They adapted the collections to changes in medical practices and theories, which was enabled by the preparations' flexibility for reinterpretation.

The preparations were reused in research and teaching; and they were arranged, classified, and labeled in a way most helpful to their new use. Unfortunately for the governors (and for future medical historians), the connection to the makers disappeared in this process. Since that connection was essential for Leiden's ability to distinguish itself from the other Dutch universities, the governors stopped using the anatomical collections as a status symbol. In the twentieth century, the connection was in some cases restored – and part of the collections once again became a status symbol, not for the university as a whole, but for the medical faculty.

The Leiden anatomical collections in the twentieth century

In 1932, two men asked the Leiden University Fund for money to clear out an old cabinet.[86] The men were J. A. J. Barge, Leiden anatomy professor, and C. A. Crommelin, the director of the new Dutch Historical Science Museum (*Nederlandsch Historisch Natuurwetenschappelijk Museum*, founded in 1931). The cabinet formerly belonged to the Albinus brothers and contained some 800 wet preparations from the 'old' Leiden anatomical collections.[87] The preparations were retrieved from the basement of the Anatomical Cabinet when the anatomy department moved to a new laboratory in 1923. It is unknown when, why and by whom they were put in the basement, but it seems safe to

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[83] Zaaijer 1866

[84] Johann Czermák, who visited the Leiden collections in 1850, described how Halbertsma showed him the Leeuwenhoek microscope. (Czermák 1879, 174) For Halbertsma's dissertation: Halbertsma 1843.

[85] I write 'museum' because Geyskes and Van der Klaauw used that word, but 'collections' would be better suited here: the Cabinet's preparations, of course, were not just for display in the museum, but also for handling in other research and teaching spaces.

[86] Geyskes and Van der Klaauw 1934, 182–183; Elshout 1952, 2. Note that in this section, I use the ambiguous word 'cabinet' instead of the clearer 'cupboard'; I do this because of the historical connotation of the word cabinet – as will soon become clear, the historical character of the cupboard intended here is pivotal.

[87] Geyskes and Van der Klaauw 1934, 183. Elshout 1952 uses two different numbers: approximately 800 (Elshout 1952, 3) and approximately 750 (Elshout 1952, 10).

assume that it was related to the lack of space in the museum rooms upstairs.[88] However, that the preparations were moved to the basement does *not* mean they were considered useless – after all, they were *kept*, not thrown away, even though the glassware probably could have been put to good use elsewhere. Nonetheless, it seems likely they were used less frequently than the preparations upstairs, especially considering the neglected condition they were found in, in 1923. It is entirely possible that they were stored for future use by researchers or students, much like the store preparations in the Royal College of Surgeons, which could remain in the stores for decades until a new research question, or technique, made them relevant again.

Whatever the reason these preparations ended up in the basement, once they got out, they received quite some attention. In two restoration projects, the majority of these wet preparations were reconnected with their makers. The first project took place in the 1930s, with the money Barge and Crommelin had requested from the Leiden University Fund. It was carried out by D. C. Geyskes, an assistant at the zoological laboratory, who was supervised by C. J. van der Klaauw, the deputy director at the Dutch Historical Science Museum. The project aimed to catalogue the preparations and to report on their condition. Geyskes and Van der Klaauw found 353 preparations carrying legible labels.[89] The majority of these labels were added by father and son Sandifort, but they also found preparations with labels from later nineteenth-century curators, suggesting that at least part of the preparations had spent some time in the Cabinet's museum upstairs before they were moved to the basement.[90] In the end, they managed to match 271 preparations to a specific description in the *Museum Anatomicum* and 17 to one of the collections described in the *Museum*, but not to a specific description. The preparations returned to in the Albinus cabinet and arranged according to collector. A conservation report was written, but no work was done on the preparations themselves (this had never been the intention of the project, probably because it would take too much time and money). Hence, the preparations were in bad shape when they were taken out of the cabinet again, during the Second World War, when they were moved to – again – the basement for safekeeping. Antonie Luyendijk-Elshout, later professor of medical history, described them as follows:

> Clearing out the mahogany cabinet resulted in a mournful spectacle. Eight hundred dirty jars, many of them with mouldy contents, had to be stored in the basement of the Anatomical Laboratory. Many preparations had gone dry; many old phials had cracked and were weather-

[88] This is also suggested by Geyskes and Van der Klaauw 1934, 182.
[89] For a detailed description of the results, see Geyskes and Van der Klaauw 1934.
[90] Even the preparations with the Sandifort labels were not necessary put in the basement immediately after the move; the reclassification of the collection was only completed at the end of the nineteenth century, until then, the museum probably still contained preparations with old labels. Elshout wrote she had found at least eight different types of labels, several of them from the second half of the nineteenth century, and some from an exhibition held in 1915. (Elshout 1952, 11)

> stained. The corks had fallen into the jars; of many beautiful intestine preparations, only a turbid mass at the bottom of the cylindrical jars could be seen.[91]

After the war, Luyendijk-Elshout set to work: she restored preparations, topped them up and relabelled them. She also created a new cataloguing system for the Anatomical Museum, which is still in use today. Furthermore, she painstakingly compared the preparations from the Albinus cabinet to the descriptions in the *Museum Anatomicum* and matched 451 preparations, 180 more than Geyskes and Van der Klaauw. She also found 78 preparations described elsewhere (for example, in the Suringar catalogue). Still, 220 preparations remained disconnected from their makers. That is, 220 preparations of the ones in the Albinus cabinet – for many of the eighteenth-century preparations never ended up in that cabinet. The *Museum Anatomicum* described almost two thousand wet preparations, so some twelve hundred must have ended up elsewhere. Part had no doubt been damaged or destroyed (for example, during the gunpowder disaster); part had been moved to the laboratories of physiology and pathological-anatomy and to the Museum for Natural History; and part remained tucked away in the other collections in the anatomical laboratory. Geyskes and Van der Klaauw wrote:

> Without a doubt, many preparations in the new section of the collection of the new Anatomical Institute stem from the old cabinets. It is virtually impossible to find out for sure.[92]

Something similar also holds true for the dry preparations: completely absent in the Albinus cabinet, yet abundant in the *Museum Anatomicum*. In the second half of the twentieth century, when the full Anatomical Museum was catalogued (much of the work was done by Elshout), many dry preparations were reconnected to their makers as well – often, their names had been written *on* the preparations, solving the problem of labels becoming illegible or getting lost. Many others, however, were entered in the catalogue as 'from unknown origin'.

In the second half of the twentieth century, part of the eighteenth-century preparations were put on display in Museum Boerhaave, the successor of the Dutch Historical Science Museum. But most of them remained in the medical faculty's Anatomical Museum, where they can still be found. And, just as two hundred years ago, the preparations create a status-enhancing link to Leiden's glorious past. And again, Albinus takes centre stage. He greets us outside the building: next to entrance, above the bicycle stands, we see a gigantic poster of an engraving from Albinus' famous anatomical atlas *Tabulae sceleti et musculorum corpris humani*. It has a Seneca quotation as its caption: *Non scholae sed vitae discimus* (We do not learn just for school, but for life).

Inside, we find Albinus' old cabinet – like the nineteenth-century governors, the twenty-first-century medical administrators use not just the preparations themselves, but elements surrounding the collections as well. On the wall adjacent to the cabinet we find

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[91] Elshout 1952, 3
[92] Geyskes and Van der Klaauw 1934, 182

portraits of famous Leiden anatomists. And then, of course, there are the preparations themselves: Albinus', Bonn's, Brugmans' – all reminding us of Leiden's glorious past. It's almost as if history is repeating itself – but there are two major differences, both consequences of the prolonged use of the anatomical collections. First, nowadays it is the medical centre for which the old collections are a status symbol, not the university as a whole. This is because the collections retreated into the medical faculty in the second half of the nineteenth century; they are out of reach for (the successors of) the university governors, accessible to administrators in the medical centre only. And second, in the nineteenth century, all of the thousands of preparations on display connected the present to the past; in the twenty-first, this number has dwindled to a few hundred – the other eighteenth-century preparations have had to bid a final adieu to their maker.

Figure 12. Entrance to the Leiden University Medical Center's teaching building.

Epilogue

We have seen how students, researchers, lay visitors and university governors used the nineteenth-century Leiden anatomical collections. Let us now turn to the final audience: historians. That is, twenty-first-century historians, one of whom in particular. How have I used the collections, and what might other historians gain from this use? And, besides morbid anecdotes, does it offer anything to non-historians? In other words: what does this book contribute to our present-day understanding of (historical) anatomical collections?

All four chapters have presented new insights on how different audiences used anatomical collections in the nineteenth century. The chapter on students demonstrated how anatomical preparations were *handled*, not just looked a, and that this happened in all medical teaching spaces, not just the anatomical museum. In the subsequent chapter, we discovered that researchers also used their preparations lids-off and hands-on. Moreover, they continued to use old collections for a long time, of which the nineteenth-century afterlife of the Brugmans collection was an example. I have argued that the continuous reinterpretation of old preparations was enabled by a particular feature of preparations: they are made of what they represent. The chapter on lay visitors explained how and why the nineteenth-century path of the Leiden anatomical collections differed from most other types of collections: instead of moving from closed to open, they changed from open to closed – or rather, from easily accessible to hard to approach and interpret without medical knowledge. And finally, the chapter on the university governors demonstrated how the Leiden governors used the collections to connect their present to the university's glorious past – until the preparations lost the connection to their makers, a development that shows that anatomical preparations resist historization more than most other objects do.

Collected together, the four chapters build a book – this book. And I'd like to think that this book, like a proper collection, is more than the sum of its parts; that, if read from beginning to end, it permits its audience – that would be you – to acquire a knowledge of anatomical collections that transcends the insights offered in the individual chapters. If this is indeed the case, I believe that this knowledge can be summarized in two sentences. First: in the nineteenth century, medical audiences continued to use anatomical collections and non-medical audiences stopped using them. And second: these developments are causally related to each other and to the specific properties of anatomical preparations. In this epilogue I intend to reveal this causality by weaving the individual chapters into one story.

The focal point of this story is the Anatomical Cabinet's move to the laboratory complex at the Ruïne in 1860. This move (and the accompanying rearrangement) formed the turning point for non-medical audiences. Afterwards, they could no longer continue to use the collections as freely as they did before. The lay visitors had a hard time even entering the new Cabinet: its location was distant, its building unwelcoming, and its over-all atmosphere closed. Moreover, the rearrangement made it hard for them to interpret the

collections. The stories about unhappy marriages, committed crimes and famous giants had been replaced with 'scientific' anatomical and pathological descriptions. And not just these stories disappeared – the preparations also became detached from their makers. The governors could no longer use them as a status symbol because they lost their link to the past. Anatomical preparations resist historization, a disadvantage not just for the governors, but also for the lay visitors because it is a common path along which objects from institutional collections end up on public view.

But there is more to the move than its consequences, in particular: its causes. Why were the anatomical collections rehoused to a laboratory complex they shared with the natural sciences? The answer to that question is not obvious, especially not if you started this book by reading the epilogue. The move of the anatomy department as a whole should not surprise anyone with minimal knowledge about nineteenth-century science and medicine. It fits perfectly with the well-known rise of the laboratory, birth of scientific medicine, and growth of practical teaching. But why did the department take all of its anatomical collections with it? Why not leave them behind, throw them out, send them away? For often the nineteenth-century rise of the laboratory is presented as not just a rise, but a replacement: the lab instead of the museum; experimenting instead of collecting. In this image, taking the anatomical collections with you to a laboratory building, and into the new scientific medicine, seems insensible. However, as the first two chapters have shown, this image is wrong. Plain wrong. This has been said before by Samuel Alberti, Erin McLeary, Jonathan Reinarz and others. However, besides being wrong, the image also appears to be rather persistent, and hence, I say it again: anatomical collections did not disappear in the nineteenth century – they flourished. The rise of the laboratory did not do away with the need for collections, for two reasons. First, the lab did not *replace* the museum – it supplemented it. And second, collections were not tied to the museum – they were used in many spaces and, if you will, in many ways of knowing.

Why then is this incorrect image so persistent? It seems to me that the present-day presentation of historical anatomical collections misguides us. The few collections that are easily accessible to the lay public (and that includes us historians) all display inertia. We see body parts safely sealed away in glass jars, neatly arranged on shelves, enclosed in glass cases. The average public anatomy museum screams: do not touch. This has given us the idea that anatomical collections are static entities, that the preparations they contain are finished objects, and that audiences are only meant to gaze at preparations from a safe distance. We find it hard to imagine this could have ever been otherwise. Indeed, it is hard to imagine an anatomical collection as a lively, bustling, dynamic place if you are standing, say, in the Hunterian Museum's crystal gallery, awing the stilled lives surrounding you. But we should not just imagine what might have been while looking at the past's material remains; we should, instead, combine these remains with other historical sources to construct the most plausible story about what actually happened back then – as I have aimed to do in this book. The first two chapters of this book tell us that, in the nineteenth

century, anatomical collections were not static. They were moved around, rearranged, extended. Their contents changed continuously, not just through the acquisition of new preparations, but also through the use, and subsequent damage, of existing ones. Preparations were meant to be *used*, and reused, and used again; reinterpreted; redissected. Lids were taken off jars; body parts were taken out of the fluid, passed around the class, cut up and put under the microscope. Anatomical collections and the preparations they contained were dynamic entities. Once we understand them as such, it becomes clear that they were not threatened by the laboratory, practical teaching or scientific medicine.

The chapters on students and researchers have shown how both of these audiences used the collections in an active way. They make it understandable why the anatomy department held on to its thousands of preparations throughout the century. The first chapter has shown how anatomical collections suited practical teaching. The collections were needed in the teaching laboratories as empirical material: the students required preparations to redissect or to experiment on. And the collections were also essential to prepare students for their practical training in the dissection hall. Handling preparations helped them learn their facts and overcome their fears – steps that had to be made before students could start dissecting. None of these functions lost their relevance as the century progressed, hence the collections were needed just as much in the new building as they had been in the old.

Yet, the continuous need for anatomical preparations does not fully explain why the anatomy department took *all* of its collections with it, including many eighteenth-century preparations. These preparations were made in answer to earlier ideas on the body and disease – how could these old parts be used in a new medicine, with its own theories? This was clarified in chapter 2, where it was shown that researchers could continuously reinterpret preparations, because preparations were made of what they represented. The new classification system, adopted after the move, would never have worked if the preparations had not enabled reinterpretation – they needed to be reinvestigated, redescribed and reinterpreted in order to be adapted to the new system. In addition to researchers, students also benefited from the flexibility of the preparations: their professors could easily use the old collections to teach them new medicine. Reusing old collections was not just convenient, it was necessary. Preparations were not only made of what they represented, they were also made of scarce materials. The supply of bodies (and the available time) was nowhere large enough to create new collections from scratch every time medical theories changed, especially not when it came to pathological preparations. Hence, researchers and teachers had to make do and mend with the old preparations available, This is why the anatomy department took all of its collections with it to the new building.

But with all of the preparations needed in the new building, and all of them allowing reinterpretation and rearrangement, they became inaccessible and unusable for the non-medical audiences. The ease with which the preparations could be reinterpreted, in other words, was a blessing for researchers and students, but a curse for non-medical audiences.

The latter lost the collections – and they never really got them back. Today's collections are open to lay visitors in principle, but very hard to access in practice. And rather than university governors employing the collections as status symbols, only senior hospital staff members can use the collections to show the continued excellence of the medical curriculum.

I have focused on the nineteenth-century Leiden anatomical collections, but the dynamic view of anatomical collections and preparations can and should be transported to other times and places as well. It may even offer insights into other types of collections, in particular natural history collections.

Throughout the book, I have slipped in examples from anatomical collections outside Leiden, most of them in Western Europe, some in the United States. These examples served to show that other collections were used in similar ways as the Leiden ones. Of course, many local differences exist. For example, the chapter on students made mention of Scottish anatomy teacher Robert Knox, who hesitated to let students handle preparations. From what I have seen, it seems that other British anatomy teachers shared his concerns and were more reluctant than their continental counterparts to let their students handle preparations. Further research is needed to identify and explain such differences; comparative histories would be particularly useful for this. In the case of British medical teachers, I would suggest their hesitance relates to the British educational system, which had many private anatomy courses and few institutional ones. Because they were 'on their own', anatomy teachers had limited money and means to build collections; probably more limited than their continental counterparts. At the same time, an insufficient collection immediately implied loss of income: students would turn to other, better-equipped teachers. No collection, no income; and hard-to-acquire preparations: no wonder the Brits were afraid of handling damage, and tended to keep students from touching their precious preparations.

Several of my examples on handling practices outside Leiden came from secondary literature. In the last decade, nineteenth-century anatomical collections have received a fair share of attention in the history of science and medicine. Some of the studies mention student handling and researcher reinterpretation, but only in passing – they usually do not take the dynamic, hands-on character of collection and preparation use as a basic principle for *all* of their research on the collections. Yet, as I have argued, these practices are crucial to not only acknowledging, but also *understanding* the continued use of anatomical collections in research and teaching and, subsequently, its decreasing use by non-medical audiences, This applies not only to Leiden, but to other cities as well.

In particular, the active handling and continuous reinterpretation by researchers should be taken as fundamental. Even more so than student handling, it can be assumed to transcend local differences. The reason is that these practices stemmed for a large part from the material properties of preparations. As I explained above, their reuse was enabled by the preparations being made of what they represented; and forced by the preparations

being made of scarce material. (Note that the scarcity, as hypothesized above, might have limited student handling in some cases.) Preparations have these material properties regardless of the time and place in which they were made – although the availability of raw material may vary between countries and centuries, an abundance of body parts of all varieties and pathologies can be found nowhere but in utopias (or, if you think about possible causes for that abundance: dystopias). Hence, historical research on anatomical collections should in general assume that these collections and the preparations they contain are dynamic entities; this should be a starting point of the research.

The idea of a collection as a dynamic entity holds not just for places other than Leiden, but also for periods other than the nineteenth century – which brings us to the relevance of all this to non-historians. Thinking about anatomical collections and preparations as dynamic helps us become aware of the fact that they are still being created. When we think about anatomical collections as body parts rendered permanent, put in jars, displayed in glass cases, we tend to assume that their heydays are over. However, medical professionals still collect bodily tissue – and lots of it. Tissue banks, collections of frozen embryos and commercial cell lines are just a few examples. Often, these collections contain material taken from people still alive, which comes with a whole new range of issues, in particular issues of ownership. We can get an impression of these issues from a passage in Nicole Krauss' first novel, *Man Walks into a Room*. The man in the title is Samson Greene; at three-quarters into the story, he walks into a laboratory room to reclaim his brain tumour. The following dialogue unfolds:

> [The lab technician] backed up against the counter. 'We don't keep it that long,' she whispered.
>
> 'What do you mean you don't keep it? Why don't you keep it?'
>
> 'The tissue disintegrates. We throw it away after a few weeks. We keep a small piece in paraffin. And the slides, those we keep. Those we keep, basically, forever.'
>
> Samson struggled with the idea of his tumor disposed with the rest of the hospital's bloody trash, bone chips and butchery, used syringes and cruddy bandages. … But there were the slides … and he would have to content himself with those.[1]

Samson settles for the slides:

> 'Give me my slides,' he repeated.
>
> She had wet, black pupils, the eyes of a small woodsy animal. Her teeth were large. When her mouth was at ease the front teeth strayed rabbitlike below the upper lip.
>
> 'I can't', she said, the lip quivering.
>
> 'But you can,' he assured her … 'They belong to me.'[2]

[1] Krauss 2007, 186–187
[2] Krauss 2007, 187

Krauss shows that ownership problems come not only with keeping, but also with throwing away bodily material: Samson is disappointed when he finds out his tumour was considered waste. But he regains himself and manages to convince the technician – or rather: to scare her enough – to give him 'his' slides back. In real life, things are not always settled that easily; rules are often murky, but it generally seems to be the case that, once you've left a piece of your body in the hospital, it is very hard to get it back – or to get a share of any profit that is made from it afterwards.[3]

Of course, historical anatomical collections differ in various respects from these contemporary ones. Nevertheless, some of the insights we gained from studying the Leiden collections can be usefully transferred to tissue banks and the like. For the preparations in these new collections are still made of what they represent; and hence, they can be reinterpreted again and again. This is an important observation in these cases. Once we realize this, we become more aware of how tempting it is for medical professionals to collect as much bodily material as possible: it is scarce, and you never know when it might come in handy. And even if it is not used, it is kept. It lingers in hospitals and laboratories, waiting for new research questions or new instruments that make it needed. These objects hardly ever turn useless – we need to understand that to grasp how unlikely it is that these collections will ever disappear. As Krauss' lab technician puts it:

'And the slides, those we keep. Those we keep, basically, forever.'

[3] A great deal of literature is available on these issues. I have found Dickenson 2009 to be a good starting point. See Lawrence 1998 for a historical introduction. See Skloot 2011 for a case study of the HeLa cells (cancer cells taken without consent from an Afro-American woman), which have been turned into a cell line stil widely used in biomedical research. See Geesink and Steegers 2009 for an overview of (the lack of) regulations on use and ownership of bodily material in the Netherlands.

Appendix I. Curators of the Leiden Anatomical Cabinet, 1799–1902

1799–1848	Gerard Sandifort (1779–1848)
1848–1865	Hidde Halbertsma (1820–1865)
1865–1877	Johannes Boogaard (1823–1877)
1877–1902	Teunis Zaaijer (1837–1902)

Appendix II. Quotations

Prologue

Note 5
Een collectie van humaan materiaal heeft een moreel complex karakter en aan het beheren en exposeren van een dergelijke collectie worden normatieve eisen gesteld. Zo is het materiaal meestal niet zonder meer toegankelijk voor publiek.

Chapter 1. Take the Lid off before Use

Note 9
in een tamelijke kalme werkzame stemming en redelijk met mij zelven tevreden

Note 22
[het] hindert … mij altijd op wandelingen dat ik zoo weinig met de lieve Moeder Natuur bekend en vertrouwd ben. Als ik weer in Leiden ben moet ik toch vooral werk maken van een toegangskaartje tot het museum.

Note 28
De verschillende musea werden als gewoonlijk door studenten weinig, door vreemdelingen veel bezocht.

Note 29
Een zoodanig kabinet [a cabinet containing objects useful for courses in anatomy and physiology] behoorde dan … alle dag op vastgestelde uren open zijn, ten einde de studenten in de geneeskunde er vrijen toegang kunnen hebben, om er alle de deelen te beter van te leeren kennen.

Note 47
Jeder Studierende muß sich die Knochen des menschlichen Körpers zu verschaffen suchen, sollten sie auch nur aus den Begräbnissen gesammelt werden.

Note 53
Er zijn in een anatomisch laboratorium ten minste twee verzamelingen van praeparaten, n.l. de in het museum tentoongestelde en die der collegeverzameling. De praeparaten van de collegeverzameling worden geregeld gebruikt en dikwijls uit de flesschen genomen waaronder hun uiterlijk natuurlijk lijdt, zoodat zij niet geschikt zijn om te worden tentoongesteld.

Note 54
Voorwerpen, welke in wijngeest bewaard, doch voor demonstratie er uit genomen worden,

ten einde ze naauwkeuriger te kunnen bezigtigen, maken gewoonlijk geen deel uit der pronkstukken in anatomische musea, maar worden in de bijlocalen der laboratoria, zoogenaamde 'handmusea', bewaard; deze bevatten voorwerpen, die veel gebruikt worden en aan eene zekere verwisseling onderhevig zijn. (Dutch translation, Hyrtl 1865)

Gegenstände, welche in Weingeist aufbewahrt, zur Demonstration aber herausgenommen werden um genauere Besichtigung zu erwecken, bilden gewöhnlich keine Schaustücke anatomischer Museen, sondern werden in Nebengemächern der Laboratorien, songenannten 'Handmuseen', welche Alles enthalten, was häufig gebraucht wird, und einem gewissen Wechsel unterliegt, zur Benützung bereit gehalten. (Original German, Hyrtl 1860, 33–34)

Note 62
Dat deze verzameling niet alleen als verzameling is daargesteld, maar ook om een genoegzaam getal voorwerpen tot onderwijs voorhanden te hebben, bewijzen de zenuwpraeparaten, die de Hr. Tiedemann ons hier aantoonde. Deze praeparaten dan waren uitmuntend vervaardigt en bevatten der zenuwen de onderste en bovenste ledematen en die der grote holtens. Alle zenuwen waren in hunne onderlinge betrekking tot de nabijliggende deelen, bloedvaten, spieren, etc., ten duidelijkste zigtbaar; alle deze praeparaten waren in een groote kist, van binnen met tin beslagen, met wijngeest bewaard, waarmede zij allen doortrokken waren, en ook de bovenste konden in deze habitus nimmer bedreven.

Note 63
Te laat opgestaan om naar Sandifort te gaan.

Note 64
[The collection of the *Museum Anatomicum* is] dagelijks gebezigd bij het houden der collegien zoo van ontleed en natuurkunde van den Mensch in den gezonden en in den zieken staat, als bij die der vergelijking van den Mensch en Dieren, zoodat de Studeerende jeugd van [haar?]zelve in alle mogelijke nut geniet

Note 66
Bij mijne ... lessen over de vergelijkende Anatomie heb ik steeds van de preparaten van het Anatomisch Kabinet gebruik gemaakt, die dan op mijne aanvrage, naar mijne Collegiekamer moesten worden overgebragt.

Note 70
Wanneer men de praeparaten uit den spiritus neemt kan men ze naauwkeuriger bekijken, dan dit in de flesch, waar het eene door het andere bedekt wordt, mogelijk is. (Dutch translation, Hyrtl 1865)

Die Herausnahme der Präparate gestattet eine genauere Besichtigung derselben, als sie im Glase, wo Eins das Andere deckt, gestattet ist. (Original German, Hyrtl 1860, 481–482)

Note 74
Pathologische-anatomische praeparaten op spiritus worden van tijd tot tijd onbruikbaar, somtijds omdat de spiritus het karakteristiek van het preparaat doet verloren gaan, maar ook als de praeparaten dienst doen bij het onderwijs van bijna 200 studenten. Van elke gunstige gelegenheid werd gebruikt gemaakt om onbruikbaar geworden preparaten door nieuwe te vervangen.

Note 75
Ik ben gewoon om van alle band-praeparaten, van alles wat betrekking heeft om gewigtiger punten uit de leer der zintuigen op te helderen, uit de leer der ingewanden en der zenuwen dubbele exemplaren in voorraad te houden. (Dutch translation, Hyrtl 1865)

Ich plfege alle Bänderpräparate, alle Darstellungen von wichtigeren Demonstrationsobjecten aus der Sinneslehre, aus der Splancho- und Neurologie, in Doubletten vorrähtig zu halten. (Original German, Hyrtl 1860, 34)

Note 81
Leerrijke lessen over de anatomie van het hart, kunnen alleen met behulp van praeparaten worden gegeven, aan welke alle die bijzonderheden duidelijk aan het licht zijn gebragt die aan versche harten niet behoorlijk kunnen waargenomen worden. (Dutch translation, Hyrtl 1865)

Lehrreiche Vorträge über die Anatomie des Herzens können nur unter Verwendung von trockenen und feuchten Herzpräparaten gegeben werden, an welchen alle jene Attribute des Herzens in's rechte Licht gesetzt sind, die am frischen Herzan nicht ganz deutlich zur Anschauung gebracht werden können. (Original German, Hyrtl 1860, 300)

Note 84
Wat de materieele subsidien voor het onderwijs in de Aantomie en Phijsiologie betreft merkt de Hoogleeraar Halbertsma op, dat het aantal lijken, dat hem voor de praktische oefeningen in de ontleedkunde ten dienste stond, hoewel alles behalve groot te noemen, echter voldoende is geweest voor het matige getal studenten, dat daaraan deel genomen heeft. Deze uitkomst heeft echter niet verkregen kunnen worden, dan door de bijzonderheid, dat sommige studenten zich op het vervaardigen van fijne vaat- en zenuwpraeparaten hebben toegelegd, die in spiritus bewaard wordende, hen in staat gesteld hebben om zich gedurende geruimen tijd met een en hetzelfde praeparaat bezig te houden.

Note 86
De Leijdenaars zijn even onwillig om ten behoeve van een Chirurgisch examen ad patres te gaan dan de Rotterdammers [Molewater lived in Rotterdam], Americanen, &c, met andere woorden, wij hebben ook geen cadaver disponibel. … Hebt gij intusschen [before the exam] nog gelegenheid om een cadaver of gedeelte machtig te worden, bezorg het dan herwaarts; a propos! Zou [doctor] Schneevogt u niet kunnen helpen? indien gij hem eens schreeft dat u

eene bened. extremiteit voor uw chirurgisch examen nodig hebt, en hem verzocht een zoodanig pars cadaveris voor dinsdag te zenden, naar het locaal der anatomie alhier?

Note 89
Hoe ondoelmatig en onaangenaam het overdragen van nog druipende praeparaten op de spoedig tot een modderpoel geworden disseceertafel is; hoe veel spiritus hierbij te loor gaat, weet ieder praktisch anatoom bij ondervinding. (Dutch translation, Hyrtl 1865)

Wie unbequem und unangenehm das Uebertragen triefender Präparate auf den bald zu einer Lache gewordenen Secirtisch ist, wie viel Spiritus dabei verloren geht, kennt jeder praktische Anatom aus Erfahrung. (Original German, Hyrtl 1860, 32)

Note 95
Voor het houden van anatomische demonstratiën en de praktische ontleedkundige oefeningen der studenten waren in deze cursus 14 lijken beschikbaar. Wel was dit getal iets grooter dan in het vorige jaar, de meerdere behoeften echter die bij het toenemend aantal studenten bestond maakte dat het nog steeds gering te noemen is, en ook voor het onderwijs in de ontleedkunde is het te hoopen dat door het tot stand komen van een stedelijk ziekenhuis hierin eenige verbetering zal koomen.

Note 102
Hedenmorgen bezocht [ik] voor het eerst weer de praktische collegia, ook de chirurgie en zag allerlei ellendigheden. Onder anderen een pièce de caractère waarin de mensch een nietig figuur maakt. Eene zeer arme vrouw in bed met twee kindertjes, tweelingen waarvan zij onlangs bevallen is, ieder ongeveer 1 voet naauwelijks lang, en wier cadavertjes door Broers [pathology professor] reeds bij voorraad aan jongelieden beloofd waren om ze op sterk water te leggen. Ondertusschen leefden die zedelijke wezens nu nog en de moeder ... hoorde zonder eenige smart dat ze wel sterven zouden, want zij kon ze toch niet onderhouden.

Note 106
lijkenstudie, waaraan het gevoel en de reuk zich moeten gewennen, gelijk de soldaat aan het vuur en de kruitdamp.

Note 109
Het ongewone der anatomische werkzaamheden, het ongezellige der omgeving, dat op ieder mensch indruk makende zegel des doods, overtuigen zelfs den ongevoeligen, bij eene eerste bezoek in onze lijkenkamers … dat de anatomie geen aesthetische zijde bezit. De eerste indruk, dien zij op ons maakt, is koud en ernstig; geen vrolijke muse begroet ons op dezen duisteren drempel; – het is de hand des doods, die ons wenkt om in te gaan. Hoe veelen keeren er jaarlijks om, nadat zij voor den eersten maal in dit vertrek [de ontleedzaal] hebben rondgezien, waar hij zich alleen kan te huis gevoelen, wiens wil die kracht, wiens neiging zoo innig is, en wiens egoisme tot die opoffering instaat is, welke de ontleedkunde

van ieder jong mensch vordert, die zich aan hare beoefening toewijdt. (Dutch translation, Hyrtl 1865)

Die Neuheit der anatomsichen Beschäftigung, das Unheimliche der Umgebung, die auf jedes Menschenherz Eindruck machenden Embleme des Todes, lassen es selbst dem Gefühllosen beim ersten Besuch unserer Leichenstätten … inne werden, dass die Anatomie keine ästhetische Seite hat. Der erste Empfang, den sie uns bietet, ist kalt und ernst; keine heitere Muse begrüsst uns an dieser düsteren Schwelle, – est ist die Hand des Todes, die uns zum Eintritt winkt. Wie viele kehren alljährlich um, nachdem sie zum erstenmal in diese Räume beglickt, die nur Heimath werden können demjenigen, dessen Wille jene Kraft, dessen Hingebung jene Innigkeit besitzt, und dessen Egoismus jener Entsagung fähig ist, die die Anatomie von jedem ihrer Jünger fordert. (Original German, Hyrtl 1860, 41)

Note 111
Ook wij begonnen al vroeg met het menschelijk geraamte en menschenbeenderen. Zo werden wij voorbereid voor lijkenstudie

Note 117
Heeft de ontleedkundige eenmaal, gewoonlijk echter niet dan na veel oefening en inspanning, te beschikken over al de middelen, die de techniek hem aanbiedt; is hij daarbij doordrongen van de noodzakelijkheid eener bijna overdreven zorg voor reinheid en zindelijkheid, dan wordt het anatomisch praeparaat onder zijne hand een schilderij, waarop hij de ontleedkundige verhoudingen afmaalt, dan overwint hij den afkeer, dien de ontleedkunde, op eene andere wijze beoefend, noodzakelijk moet te weeg brengen.

Note 118
Na het maken van eene kruissnede alleen door de huid …. heb ik de huid met de vier gemaakte lappen zoover losgepraepareerd als noodig was om de grenzen van den tumor te kunnen overzien … Onder de kin bevindt zich eene opening in den wand, die toegang geeft tot de holte, die oorspronkelijk met een gladden wand is bekleed geweest, daar de huid met dien wand geheel was vergroeid, zoo is bij het afpraepareren der huid de wand der holte daaraan blijven zitten

Note 119
een overlangsche snede met splijting van de tong en de onderkaak

Chapter 2. Make Do and Mend

Note 3
In de tweede plaats hebben deze praeparaten voor Brugmans waarschijnlijk zelden tot détailstudie gediend.

Note 23
op billijke voorwaarde van schadevergoeding

Note 32
Daar UEGA verlangt dat alle voorwerpen welke niet regtstreeks tot de verzameling van de Vergelijkende ontleedkunde behooren, maar meer tot de Natuurlijke Historie betrekking hebben, worden gevoegd bij het Kabinet van de Natuurlijke Historie, zal ik niet in gebreken blijven om in den tijd alle voorwerpen van dieren in liquor bewaart, waaronder de zo leerzame als uitgebreide collectie van Schelpdieren &c; de gedroogde of opgezette dieren; alle fossile beenderen; en verder van alle sceletten en koppen van dieren, welke dubbel zijn één exemplaar aan voornoemd kabinet aftegeven, waarmede ik hoop aan de intentie van UEA te voldoen

Note 33
2. In dit Museum zullen bijeen gebragt en bewaard worden de Diersoorten, (de mensch uitgezonderd) en derzelver geheele of gedeeltelijke Skeletten, voorts Fossilia en Delfstoffen
3. Geene, het zij pathologische hetzij phijsiologische praeparaten van de bijzondere organen der dieren, behooren tot den Omvang van dit Kabinet

Note 36
Door wanbeleid van de Leidse curatoren – die geen idee hadden wat voor soort collectie zij in huis gehaald hadden – was de verzameling al in 1820 uit elkaar gevallen. … de curatoren [namen] het dramatische besluit om de collectie Brugmans over beide instellingen [natural history museum and Anatomical Cabinet] te verdelen. … De curatoren begrepen niet dat de grondgedachte van de collectie – de vergelijking van skeletten en orgaanstelsels door de gehele dierlijke serie heen tot de mens toe – door deze opdeling volledig te niet gedaan werd.

Note 41
Veranderingen in den normalen toestand en daaruit voortkomende gedaante der diersoorten. Vooral van den Mensch door Klimaat, levenswijs, enz. – Hiertoe behoort onder anderen een ongemeen zeldzame en belangrijke rei van omtrend 120 menschenschedels uit veele verschillende gewesten, alle gerangschikt naar derzelver Geographische legging, beginnende met de Noordpool en eindigende met den Equator – Afgietsels van aangezichten van verschillende natien zijn hierbijgeplaatst, enz.

Note 52
Meenen eindelijk sommigen, dat die gemiddelde maat iets denkbeeldigs is, wij stemmen het gedeeltelijk toe. Maar zoo is dan ook de gemiddelde temperatuur, de gemiddelde barometerstand enz. iets denkbeeldigs. En ondertusschen zullen de physici zich dat denkbeeldige niet laten ontwringen; zij hebben er te veel schoons en nuttigs uit geleerd. Ik hoop, dat wij in de natuurkennis van den mensch onze wetenschappelijke vrienden in dit opzigt zullen navolgen. Overigens verwijze ik voor dergelijke methode van onderzoek naar de scherpzinnige geschriften van Quetelet.

Note 53
De Negerschedels, die ik tot mijn tegenwoordig opstel onderzocht, behoorden alle tot de verzameling van den Hoogleeraar Brugmans, die zich thans in het Museum der ontleedkunde van de Leidsche Hoogeschool bevindt. De Hooggeleerde Heer Sandifort heeft met eene bereidwilligheid, waarvoor ik hem opentlijk wensch dank te zeggen, deze verzameling tot mijn onderzoek opengesteld

Note 56
verzamelingen, inrigtingen en hulpmiddelen voor het onderwijs

Note 65
Op eene enkele zeer beperkte plaats doet zich de bouw dezer kogels [the *globuli dentis*, thought to be involved with the production of dentine, a component of teeth] anders voor, dan op het verreweg grootere gedeelte van de dwarsche doorsnede, waaruit ik mikroskopische plaatjes geslepen heb.

Note 66
Onder de stellingen waardoor Brugmans zoo krachtdadig de leer der zoogenoemde humoralisten heeft trachten omver te werpen, behoort ook zijne verklaring van het ontstaan van den kankers, welken hij niet, als reeds in het bloed aanwezig zijnde, eer dat het vaatgestel werd aangedaan, (zoo als toen nog door den geleerden Van Gesscher en vele voorname Geneeskundigen gesteld werd), beschouwde, maar veronderstelde dat eene eigenaardige verandering in de vaten en overige vaste deelen, het ontstaan van de kanker vooraf ging.

Note 80
Dr. Bogtstra beschreef vijf schedels uit het Anatomisch Kabinet der Leidsche Hoogeschool [in his dissertation]. Alle deze schedels werden, om het onderzoek gemakkelijker te maken, digt bij het mediane vlak verticaal doorgezaagd

Note 86
zeer goed herkenbare lever

Note 91
de ondergetekende [Brugmans] [heeft] zich beijvert om ten dienste zijner lessen over de Natuurlyke Geschiedenis, bijzonder voor die over Vergelijkende Ontleedkunde, eene vrij uitgestrekte verzameling met veele kosten en arbeid bij elkander te brengen, ten einde dus enigszins in 2 of 3 takken der wetenschap te kunnen suppleren, hetgeen bij het Academisch Cabinet ontbreekt, om zijne toehoorders niet onkundig te laten van de vorderingen, welke in de Natuurl. Historie bijzonder als subsidiaire wetenschap van de Ontleed- en Natuurkunde van den mensch beschouwd in de laatste jaren door zo veele beroemde mannen in geheel Europa gedaan is.

Note 94
Reeds in 1829 heb ik op de oprigting van een kabinet van vergelijkende anatomie bij de Curatoren der Hooge School aangedrongen; ik heb daarmede aangehouden tot 1861, toen ik op eene wijze behandeld ben, die mij nu alle verdere pogingen voor goed heeft doen staken. Ik stel hoogen prijs op eene verzameling van vergelijkende ontleedkunde, maar ik stel nog hoogeren prijs op mijn zelfstandig karakter, en wil liever mijn lievelingsdenkbeeld laten varen, dan bedelen als voor eene gunst, om iets, dat de wetenschap als haren regtmatigen eisch mag doen gelden

Note 98
Het kan niet missen of de ijver van velen voor dit vak van studie [natural history based on comparative anatomy] zal opgewekt worden en de wetenschap zal meer en meer beoefenaars winnen.

Note 103
Indien men een oog slaat op de schets van deze Verzameling, door wijlen den Hoogleeraar Brugmans zelve opgemaakt ... zal gemakkelijk uit beide die stukken blijken, dat de geheele aanleg van deze Verzameling van den beginnen af geweest is om daarvoor het maaksel en de verrichtingen van het menschelijk lichaam zo veel te beeter te leeren kennen en alle de lessen over de Anatome Comparata van wijlen den Hoogleeraar Brugmans hebben immers ook altoos die strekking gehad ...
In de tegenwoordige Staat dezer Wetenschap is het ook niet mogelijk de onderscheidene functien der deelen van het menschelijke lichaam te verklaren, zonder tot de anatome comparata zijn toevlugt te neemen, zijnde deze de rijke hulpbron tot de natuurkundige [fysiologische] kennis van het menschelijk lichaam.

Note 105
[Hierbij moet wel in het oog worden gehouden, dat] eene verzameling van vergel. ontleedk. als aanhangsel van een kabinet van menschelijke anatomie en physiologie, hoe voortreffelijk ook, nooit ingerigt kan zijn, noch behoort te zijn, zoo als eene verzameling van vergel. ontleedkunde ter opheldering der dierkunde. De laatste [verzameling ter opheldering der dierkunde], hoezeer ook dienstbaar aan algemeene physiologie ... [door de gemeenschappelijke band, welke alle wetenschappen verbindt] moet eene uitgebreidheid hebben, welke tevens eene geheel afzonderlijke strekking heeft.

Note 112
Hoe het zaad zich naar buiten heeft moeten ontlasten, liet zich aan ons praeparaat tot ons leedwezen niet meer aantoonen, daar de dieper gelegen organen der buikholte in verweekten toestand verkeerden en dus van het vermoedelijke vas deferens niets meer viel te ontdekken.

Chapter 3. Dead Body in the Closet

Note 3

Op dien regenachtige octoberdag zag men Hildebrand met een vreemdeling door Leydens straten hollen, om eerst de doode beesten in het museum van natuurlijke, en daarna de doode Farao's in het museum van onbekende historie te gaan aanschouwen; vervolgens een blik te werpen op de kindertjens die nooit geleefd hebben der Anatomie, en daarna op de portretten der doode professoren die eeuwig leven zullen op de senaatskamer … Om een weinig verscheidenheid daar te stellen, bezochten wy daarop de Burcht die zelf een lijk is, vroeger bewoond door de Romeinen, ADA, en die Rederijkerskamer waarvan zoo vele geniën lid waren. Ten slotte zagen wy ook nog den sineeschen en japanneeschen inboedel by den heer Siebold, en rustten eindelijk uit in de societeit Minerva.

Note 6

Wy kennen Hem door twee middelen. Ten eersten door de schepping, onderhoudinge ende regeringhe der geheele werelt: overmist de selve voor onsen ooghen is als een schoon boec, in welcke alle schepselen, groote ende cleyne, ghelijck als letteren zijn, *Die ons de onsienlicke dinghen Gods gheven te aenschouwen,* {*namelijck sijn eeuwighe Moghentheyt ende Godtheyt*, als d'Apostel *Paulus* seght. Rom. 1, 20, welcke dinghen alle ghenoechsaem zijn om de menschen te overtuyghen ende haer alle onschult te benemen.} Ten tweeden geeft hij Hem-selven ons noch claerder ende volcomelijcker te kennen door sijn heylich ende Goddelic woort

Note 12

Ik heb de eer, U.H.E.A. kennis te geven, dat het Museum Anatomicum dagelijks voor een ieder geopend is. Ik noem het *eenen vrijen toegang*, wanneer men een Cabinet kan bezigtigen, door aan het gebouw te bellen of zich bij den custos te vervoegen, die allernaast dit gebouw woont, zoodat ik verklare, niet te begrijpen waartoe het bewijs van Lidmaatschap van het Landhuishoudkundig Congres moet dienen.

Zoo echter het Bestuur van bovengemeld Congres door vrijen toegang verstaat: het niet betalen van 10 of 25 centen aan den custos, dan zie ik mij verpligt, in het belang van dezen mijnen custos op te treden. De fooijen afkomstig van de bezigtigers van het Museum Anatomicum maken een wezenlijk gedeelte uit van de revenues van de custos, zoodat het eene onaangename teleurstelling zoude zijn, ze hem bij deze gelegenheid te ontnemen, vooral wanneer men bedenkt, dat de H.H. Leden van het Congres niet zullen aarzelen, aanmerkelijker sommen aan minder wetenschappelijke doeleinden, gedurende de drie dagen van de bijeenkomst, te besteden.

Note 19

Manche, bisher nur mit den feinsten Parfums zufriedene, Dame hat mit wahrem Heroismus den Alkoholgeruch eines im stärksten Weingeist erhärteten Gehirns ihres Mitmenschen ganz unbeachtet gelassen, um die vielsagende Oberfläche eines solchen Gehirns mit ihren zarten Fingers genauer prüfend betasten zu können.

Note 20
und dass zulest die zartesten Dames mensliche Gehirntheile so tapfer in die Hand nahmen, wie irgend ein Candidatus medicinae.

Note 42
thans [zijn] beide mij ter dienste staande localen amphitheaters gewijs … gebouwd, en [kunnen] dus voor het houden van een Collegien gelijk voor Physiologie minder geschikt … geacht worden. Bij de thans bestaande inrigting keeren de toehoorders die vooraan zitten, den Hoogleeraar veelal den rug toe, wat mijns bedunkend niet zeer gunstig op de aandacht kan werken, vooral naar [?] dien moeijelijkere onderwerpen door uit de hand op het bord ontworpenen teekeningen moeten worden opgehelderd.

Note 51
Ofschoon nog niet alles in het tegenwoordige emplacement beantwoordt aan de eischen, die wij meenden te mogen stellen, verheugen wij ons aanvankelijk over de groote verbetering, die deze verplatsing ten gevolge heeft gehad. Deze verbetering betreft voornamelijk de gehoorzalen, de sectiezaal, de werkkamers, de inrigting der kasten, het licht, om niet te spreken van zoovele andere zaken, die in een rapport als het onderhavige minder op hare plaats zijn en waarover ik breedvoeriger handelde toen ik de eer had de lessen in het nieuwe locaal in het jaar 1860 op den eersten October te openen.

Note 52
Moet het gebouw uit een architectonisch oogpunt beschouwd, het gebouw zoo als het zich van buiten voordoet met zijn nederigen voorgevel, met zijn bespottelijk, tweeslachtig, bolvorming achterdeel, met zijn in vier vakken verbedeeld tuintje, met zijn houten hek en hekjes, niet als een *monstrum horrible visu* worden aangemerkt?

Note 55
waren genoodzaakt op de treden van den trap, zelfs op de randen van den gootsteen plaats te nemen.

Note 64
Op de Bloemmarkt alhier is men bezig met het bouwen van eene tent, welke dienen moet om het Anatomisch Museum van dr. P. Spitzner, uit Parijs, te bevatten. Het museum bestaat uit 6000 wassen voorwerpen, voorstellende geheele lichamen, deelen van het menschelijk lichaam, ziekteverschijnselen enz Deze verzameling zal, te oordeelen naar de uitgebreidheid, vele dergelijke, ons van kermissen welbekend, in belangrijkheid overtreffen. De laag gestelde entreeprijs zal zeker velen uitnoodigen om deze verzameling te gaan zien. Het museum wordt a.s. Dinsdag voor slechts eenige dagen geopend.

Note 65
Onder de zaken, welke aan het nieuwe gebouw op de Ruine (afdeeling Anatomie) dringend voorziening vereischen, behooren in de eerste plaats de toegangen. Zoowel aan de voor als

achterzijde zijn dezelve gebrekkig, dat het personeel tot mijne afdeeling behoorende van tijd tot tijd genoodzaakt wort, het terrein der vleugels te overschrijden of over het hek te klimmen, ten einde binnen te komen.

Note 66
bespottelijke, tweeslachtig bolvormige achterdeel

Note 67
Aan de achterzijde van het anatomisch kabinet bij de poort, die in de Zonneveldsteeg uitkomt, bevindt zich een klein straatje, dat door eene breede strook grond, met grof zand bestrooid, van de groote straat gescheiden wordt. Bij overvloedige regen blijft het water in groote plassen voor genoemd straatje staan, waardoor het onmogelijk wordt om op eene behoorlijke wijze door de poort in den tuin achter het Anatomisch kabinet te komen.

Note 70
Hetzelfde [being in need of new fluid] mag ik beweren van vele praeparaten, welke reeds vermeld staan in den Catalogus van het Museum Anatomicum, en dus reeds voor mijne komst alhier aanwezig waren; deze zijn voorhands uit de kasten genomen om geenen aanstoot aan nijdige en critiserende blikken te geven en nu in een verborgen hoek dorst te lijden.

Note 75
Met den grootsten ijver en de meeste zorgvuldigheid houdt de directeur [Halbertsma] zich steeds bezig de aanwezige praeparaten na te zien en te herstellen, en het onnutte af te zonderen … Met regt is het minder zijn oogmerk bij de uitbreiding den verzameling aan het kabinet een voorkomen te geven, dat door het buitengewonen der zaken het groote publiek of min ervaren bezoekers verbaast, als wel eene verzameling te bezitten van zaken, nuttig en onontbeerlijk voor het onderwijs en de wetenschap.

Note 79
het anatomisch-physiologisch-pathologisch kabinet, het welk reeds zoo eene groote uitgestrektheid heeft, dat hetzelve met de buitenlandsche kabinetten van dien aart, zoo in nuttigheid voor de wetenschappen als de wijze waarop de preparaten ten toon gesteld zijn, kan wedijveren

Note 80
[Ruysch heeft] door de inrigting zijner verzameling getond, dat hij de ware methode, den echt wetenschappelijken geest miste; hij maakte de ontleedkunde als het ware tot een mode-artikel van de grooten der aarde.

Note 81
De ontleedkunde heeft aan Ruysch enkele belangrijke aanwinsten te danken, maar wij kunnen ons niet losmaken van de overtuiging, dat met eene betere methode een zóó

langdurig en zóó werkzaam leven, bij eene bijna voortdurend ongestoorde gezondheid, meer vruchten voor onze wetenschap had kunnen opleveren.

Note 83
Hij [a person managing a university collection] laat bezoekers toe in de verzameling, wanneer dit voor het gebruik waartoe zij bestemd is geen bezwaar doet ontstaan. Zoodra het belang van het onderwijs of der inrigting het verbiedt, wordt bezoek geweigerd

Note 89
Door de zuivere toonen en echt musikalen tact der musikanten om hunnen instrumenten te handteeren hoop ik, dat het sombere aan een anatomisch kabinet verbonden meer zal vervallen en den bezoeker, zenuwachtig gedrukt door de verschillende onaangename gewaarwordingen, in zijne vorige opgeruimde stemming zal terugbrengen.

Note 90
De skeletten zijn gemerkt van A tot V; op den schedel zijn het geslacht en zooveel mogelijk de leeftijd vermeld

Chapter 4. Adieu Albinus

Note 1
'de eerste universiteit … "met voorrang in subsidiën en tractementen"'

Note 7
L'académie de Leyde est la premiere de l'Europe. Il semble que tous les hommes célebres dans la république de lettres, s'y sont rendus pour la faire fleurir, depuis son établissment jusqu'à nos jours.

Note 8
de kosten daarvan [reorganizing anatomical collections in the Anatomical Theatre] [zijn] gering … ten opzigte van de eer, die daaruit zoude voortvlooeyen voor deeze Academie, als konnende zich dan beroemen niet alleen op eene uitmuntende Bibliotheek, voortreffelyken Tuin, fraay Kabinet van Natuurlyke Zeldzaamheden, maar ook van een Theatrum Anatomicum, vercierd met de Kabinetten van twee beroemde Hoogleeraren [Rau and B.S. Albinus] en vele andere treffelyke zaaken, die hetzelve boven alle andere doen uitmunten

Note 14
die hoogte … waartoe dezelve oirspronkelik bestemd en indertijd zoo door de vermaardheid, welke dezelve in de geheele geleerde weereld verkreegen heeft, als door de kostbaarste verzamelingen, welke aldaar zyn byeengebragt, geregtigd is geworden

Note 16
[The governors have been told that] de Hoogeschool van Leyden den naam zal aannemen

van Koninklyke Universiteit van Holland; en … dat de nodige maatregelen zullen worden genomen, om haar den meesten luister en den grootsten roem bij te zetten …, [the governors are] doordrongen van het gevoel der uitnemende waarde der weldaad door Zijnen Koninklyke Majesteit in deze aan de Hoogeschool geschonken, als welke daardoor boven alle andere Academien van het Rijk verheven en in staat gesteld wordt om voortaan en voor altoos door geheel de geleerde wereld in al dien bloei en luister te schitteren, waartoe dezelve oorspronkelyk is aangelegd en welke zy gedurende haar geheel bestaan … heeft verdiend en staand gehouden.

Note 17
dienstknecht van den Leidschen Rector

Note 30
materiële subsidiën van het akademische onderwijs

Note 32
Er zullen aan elke der hooge scholen, tot ondersteuning en bevordering van het onderwijs in de ontleedkunde, geneeskunde, heelkunde en vroedkunde, kabinetten zijn van anatomische, physiologische en pathologische praeparaten en voorwerpen, waarbij ook zoodanige praeparaten van *anatome comparata*, welke tot opheldering van de kennis van het menschelijk lighcaam kunnen dienen, zullen gevoegd worden.

Note 33
De kabinetten tot bevordering van het onderwijs in de ontleedkunde, genees, en vroedkunde zijn of meerder of minder van Anatomische, Physiologische en Pathologische praeparaten en voorwerpen voorzien – doch niet in die hoeveelheid, welke vereischt wordt en de naam van Albinus, wiens kabinet tot de Akademische bezittingen behoort, moge veel doen vermoeden; wij zouden echter den waarheid geen hulde doen, zoo wij uwe Excellentie verzekerden dat Leyden te dezen opzigten op de hoogte der Wetenschap is, en dat de behoeftes niet van aanbelang zijn, te meer daar de Anatome Comparate bij het Organiek Besluit in hare waarde geschat nog zooveel, zoo niet alles te wenschen overlaat.

Note 46
Onder de verplichtingen, welke ons zijn opgelegd, behoort ook wel voornamelijk de behartiging van alles het welk zou kunnen strekken tot handhaving van de roem der hooge school.

Note 55
Onder de aanwinsten welke deze hoogeschool in het afgelopen jaar gedaan heeft, mag in de eerste plaats genoemd worden het zoo kostbaar kabinet van wijlen den hoogleraar Brugmans, waardoor deze hoogeschool, vooral in het vak van vergelijkende ontleedkunde eene verzameling heeft mogen verkrijgen, welken niet alleen met andere dergelijke verzamelingen in ons vaderland kan wedijveren, maar welke zoo in naauwkeurigheid als uitgebreidheid, misschien alle andere dergelijke verzamelingen, zoo in als buiten ons

vaderland overtreft en welke de uitnemende talenten van den, voor de wetenschappen helaas te vroeg gestorven vorige eigenaar geen minder eer aandoet, als de roem en luister dezer hoogeschool daardoor wordt vermeerderd en uitgebreid.

Note 56
Niet minder roemrijk zoude het voor deze Hoogeschool zijn, indien algemeen bekend werd hoedanig de reeds alomme zo vermaarde verzameling, bestaande uit de afzonderlijke kabinetten van de Hoogleeraaren Rau, Albinus, van Doeveren en anderen, door deze nog op nieuw … [is?] vermeerdert, en tot het onderwijs in alle de vakken van de ontleedkunde geschikter was geworden.

Note 59
haec etiam supellex aucta, et praesenti disciplinae conditioni accommodata est … Accessiones vere isignes nactum est Museum nostrum, emtis cum Brugmansianis, tum Bonnianis copiis.

Note 60
Brugmansius … thesarum reliquerat praeparationum, quibus Anatomia comparata et Pathologia multis partibus illustrarentur, [quem nunc Regiae liberalitate acceptum refert Museum nostrum]

Note 61
Non minoribus laudibus praedicanda est Bonnii collectio, in primis in parte Pathologica.

Note 63
Het is Uwe Excellentie [Minister of Education] bekend dat sedert meer dan een eeuw de Leydsche Hooge School beroemd is geweest vooral voor de studie der medicijnen, en dat de roem, welke Boerhaave verworven heeft, is blijven voortduren tot op onzen tijd.

Note 66
De verzameling van anatomische praeparaten, waarbij de kabinetten van Albinus, Brugmans en anderen geplaatst zijn, blijken steeds de bewondering van veele in en uitlandsche geleerden weg te dragen.

Note 68
[de anatomische collecties,] onder het speciaal toeverzicht van den zedigen zoon en waardigen opvolger van den groten Sandifort geplaatst

Note 69
de verdienstelijken hoogleraar Sandifort ..., welke op het voetspoor van zijne, waardigen vader, deze verzameling in de beste orde onderhoud

Note 71
Wij vinden ons gedrongen om aan Uwe Majesteit onze erkentelijkheid en onzen gevoeligen

dank te betuigen voor dit aanzienlijk en kostbaar geschenk [the Bleuland collection], hetwelk als blijk van Uwe Koninklijke milddadigheid tot een blijvend sieraad zal verstrekken voor deze Hoogeschool, en tot derzelver nut en bloei, zoo wij vertrouwen niet weinig zal toebrengen. Hetzelve heeft nog te meerdere waarde voor deze Hoogeschool, daar aan dezelve eene diergelijke verzameling geheel ontbrak, en eene dusdanige niet dan na langen tijd en met groote moeite en kosten zoude hebben kunnen bijeengebracht worden.

Note 76
Tam splendide locupletatum cum esset Museum, idem de integro disponendum et ordinandum erat; quippe quod e diversis collectionibus, Ravii, Albini, Doeverni, Ledeboerii, Rocquettii, Brugmansii, Bonnii, constans, suum etiam et proprium ordinem et veluti faciem habitumque referre oportebat. Itaque quae separata hucusque, ea confundere institui, et persici hoc, ut omnia uno neque interrupto ordine decurrant, singulis tamen praeparatis addito numero et nomine ejus collectionis, ex qua quidque prosectum esset.

Note 77
Viele Gefässeinspritzungen von Albinus – Ein einziges Präparat von Ruysch, ein eingespritzter Kindskopf. Dann viele Präparate zusammen von Bonn, Brugmanns [*sic*], Sandifort und Rau. – Eingespritzte Eingeweide aller Art. – Steine, Blasen, besonders von van Doweren: Saugadern, Milzen, Lebern; eingespritzt.

Note 82
Das Fehlen historischen Interesses, welches der zweiten Hälfte des 19. Jahrhunderts eigen war und dazu Platzmangel im Institut, in welchem die Anatomie von 1859–1923 [Geyskes and Van der Klaauw dated the 1860 move in 1859] untergebracht war, haben zur Folge gehabt, dass der Bestand der alten anatomische Kabinette ständig zurückging, was bei grösseren Sorgfalt und Neigung für diese Dinge nicht der Fall gewesen sein würde. Ein Teil der Präparate ist nicht nur in neue Flaschen überführt oder neu afmontiert worden, man hat sogar auch in dieser unhistorisch fühlenden Zeit die alten Etiketten entfernt und alle Spuren der alten Herkunft der Präparate vernichtet. … Durch diesen museumstechnischen Fehler haben diese Präparate ihren eigentümlichen historischen Wert verloren.

Note 91
De ontruiming van de mahoniehouten kast leverde een droevig schouwspel op. Achthonderd vuile flessen, vele met beschimmelde inhoud, moesten in de kelders van het Anatomisch Laboratorium worden opgeborgen. Vele praeparaten stonden droog, vele oude fiolen waren gebarsten en verweerd. De kurken waren in de flessen gevallen, van vele fraaie darmpraeparaten zag men slechts een drabbige massa op de bodem van het cylinderglas.

Note 92
Ohne Zweifel stammen viele Präparate in der neuen Abteilung der Sammlung des neuen Anatomischen Institutes aus den alten Kabinetten. Es ist praktisch unmöglich, diese mit Sicherheit herauszufinden.

Bibliography

Manuscript sources

Leiden University Library, Special Collections

Archief van Curatoren, 1815–1877 (AC2)
Archief van Curatoren, 1878–1953 (AC3)
Archieven van Senaat en Faculteiten (ASF)
Bibliotheca Publica Latina (BPL)

Leiden University Medical Center, Anatomical Museum archives

'Katalogus spiritus-prepar. kast prepareerkamer', no date
'Notulenboek Pathologie', no date
Teunis Zaaijer, 'Inventaris der verzameling in het Anatomisch Kabinet van de Rijks Universiteit te Leiden', 1892
Teunis Zaaijer, 'Katalogus der ras-schedels, bekkens en skeletten in het Anatomisch Kabinet der Rijks-Universiteit te Leiden', 1893
E. van der Guyten, 'Catalogus van het Anatomisch Kabinet te Leiden', 1 October 1910

Royal College of Surgeons of England, Archives (RCSE)

RCS-MUS/1/1/3, Hunterian Trustees Minute Book, Vol. 3, 1900–1959
RCS-MUS/6/1, Visitor books for the Royal College of Surgeons' Museums
RCS-MUS/6/2/1, Register of illustrious and distinguished visitors, 1805–1932
RCS-MUS/8/2, Annual Reports of the Conservator to the Museum Committee, 1863–1958
RCS-MUS/8/3/1, Reports from the Board of Curators, 1800–1822
MS0007/1/4/2, Diaries William Clift, 1811–1842
MS0007/1/2/2, Purchasing Collections and Specimens, William Clift, 1806–1841
MS0018/3/1, Papers relating to the Hunterian Museum, Arthur Keith, 1909–1934
MS0027, John Thomas Quekett papers, 1840–1848
MS0134, Henry Vandyke Carter papers, 1853–1855
MS0025/1/4/1, Reporting to senior management, Richard Owen, 1831–1852

Stadsarchief, Rotterdam

328, Families Molewater en Rose

Utrechts Archief, Utrecht

59, Archief van het College van Curatoren van de Rijksuniversiteit te Utrecht, 1815–1954

Legislation

'Organiek Besluit Hoger Onderwijs', 2 August 1815 (RDHE 1815)

Medical Laws (*Geneeskundige Wetten*), 1 June 1865 (ML):

'Wet regelende het geneeskundig staatstoezigt'

'Wet regelende de voorwaarden tot verkrijging der bevoegdheid van geneeskundige, apotheker, hulpapotheker, leerling-apotheker en vroedvrouw'

'Wet regelende de uitoefening der geneeskunst'

'Wet regelende de uitoefening der artsenijbereidkunst'

'Wet tot vaststelling van bepalingen betrekkelijk het begraven van lijken, de begraafplaatsen en de begrafenisregten', 10 April 1869 (BA)

'Reglement op het beheer en het gebruik der verzamelingen, inrigtingen en hulpmiddelen voor het onderwijs aan de Universiteiten des Rijks', 31 December 1879 (Regl. 1879)

'Wet tot Regeling van het Hooger Onderwijs', 28 April 1876 (HEA)

Printed sources

Dutch surnames containing particles like *van, der* and *de* are indexed under the main component, meaning that, for example, 'De Rooy 2011' is alphabetized under R, not D.

Ackerknecht, Erwin H. (1967), *Medicine at the Paris Hospital, 1794–1848* (Baltimore: Johns Hopkins University Press)

Aerts, Remieg (2004), 'Een staat in verbouwing. Van republiek tot constitutioneel koninkrijk, 1780–1848', in: Remieg Aerts et al., *Land van kleine gebaren. Een politieke geschiedenis van Nederland 1780–1990* (4th edn, Nymegen: SUN), 11–95

Alberti, Samuel J.M.M. (2005a), 'Objects and the Museum', *Isis*, 96: 559–571

——— (2005b), 'Owning and Collecting Natural Objects in Nineteenth-Century Britain', in: Marco Beretta (ed), *From Private to Public. Natural Collections and Museums* (Sagamore Beach: Science History Publications), 141–154

——— (2007), 'The Museum Affect. Visiting Collections of Anatomy and Natural History', in: Aileen Fyfe and Bernard Lightman (eds), *Science in the Marketplace. Nineteenth-Century Sites and Experiences* (Chicago: University of Chicago Press), 371–403

——— (2009a), 'Wax Bodies. Art and Anatomy in Victorian Medical Museums', *Museum History Journal*, 2: 7–36

——— (2009b), *Nature and Culture. Objects, Disciplines and the Manchester Museum* (Manchester: Manchester University Press)

——— (2011), *Morbid Curiosities. Medical Museums in Nineteenth-Century Britain* (Oxford: Oxford University Press)

Angel, Gemma (2012), 'The Tattoo Collectors. Inscribing Criminality in Nineteenth Century France', in: *Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritiek*, 9.1: *Präparate* (Berlin: Akademie Verlag), 29–38

Appel, René and Ross, Tomas (eds) (2007), *De beste spannende verhalen uit Nederland en Vlaanderen* (Amsterdam: Uitgeverij 521)

Bakhuizen van den Brink, J.N. (ed) (1976), *De Nederlandse Belijdenisgeschriften* (Amsterdam: Ton Bolland)

Bal, Mieke (1996), 'The Discourse of the Museum', in: R. Greenberg, B.W. Ferguson, and S. Nairne, *Thinking About Exhibitions* (London: Routledge), 201–218

Barge, J.A.J. (1925), 'University of Leiden Department of Anatomy', *Methods and Problems of Medical Education*, 3: 99–108

Bates, A.W. (2008), '"Indecent and Demoralising Representations". Public Anatomy Museums in Mid-victorian England', *Medical History*, 52: 1–22

Bennett, Tony (1995), *The Birth of the Museum. History, Theory, Politics* (London: Routledge)

Bergvelt, Ellinoor (2005), 'Tussen geschiedenis en kunst. Nederlandse nationale kunstmusea in de negentiende eeuw', in: Ellinoor Bergvelt, D.J. Meijers, and M. Rijnders (eds), *Kabinetten, galerijen en musea. Het verzamelen en presenteren van naturalia en kunst van 1500*

tot heden (Zwolle: Waanders), 343–372

Berkel, Klaas van (1985), *In het voetspoor van Stevin. Geschiedenis van de natuurwetenschap in Nederland, 1580–1940* (Meppel: Boom)

Berkowitz, Carin (2012), 'Systems of Display. The Making of Anatomical Knowledge in Enlightenment Britain', British Journal for the History of Science, published online 12 September 2012 <http://dx.doi.org/10.1017/S0007087412000787>

Bervoets, Jan (1982), 'Alexander VerHuell en zijn fantastische verhaal "No. 470, Hoogewoerd"', *De Revisor*, 9 (2): 30–36

——— (ed) (1983), *Nederlandse gruwelverhalen uit de negentiende eeuw* (Utrecht: Veen)

Beukers, Harm (1983), 'De beginjaren van de microscopie aan de geneeskundige faculteiten te Utrecht en Leiden', *Tijdschrift voor de geschiedenis der geneeskunde, natuurwetenschappen, wiskunde en techniek*, 6: 65–81

——— (1984), 'Groei en ontwikkeling. De Leidse faculteit der geneeskunde in het derde kwart der negentiende eeuw', in: Willem Otterspeer (ed), *Een universiteit herleeft* (Leiden: Brill), 76–102

Billets in the Low Countries, 1814–1817. In a Series of Letters (1818) (London: Stockdale)

Binnenste buiten, de mens ontleed. 12 februari 2010 tot 24 januari 2011 (2010) (Groningen: Universiteitsmuseum Groningen)

Blancken, Gerard (1697), *A Catalogue of All the Cheifest Rarities in the Publick Theater and Anatomie-Hall, of the University of Leyden* (Leiden: Hubert van der Boxe)

Blanken, G.H. (1869), *Het aantal studenten aan de Hoogeschool te Leiden van 1775 tot en met 1868* (Leiden: Steenhoff)

Bogtstra, Jan Nicolaas (1864), *De schedel met ingedrukte basis* (Leiden: Hazenberg)

Bogusch, Gottfried, Graf, Renate and Schnalke, Thomas (eds) (2003), *Auf Leben und Tod. Beiträge zur Diskussion um die Ausstellung "Körperwelten"* (Darmstadt: Steinkopff)

Bonner, Thomas Neville (1995), *Becoming a Physician. Medical Education in Britain, France, Germany, and the United States, 1750–1945* (Oxford: Oxford University Press)

Boogaard, Johannes A. (1865), 'De indrukking der grondvlakte van den schedel door de wervelkolom, hare oorzaken en gevolgen', *Nederlands tijdschrift voor geneeskunde*, 9: 81–108

Boon Mesch, H.C. van der (1825), 'Lofrede op Sebald Justinus Brugmans', *Werken der Hollandsche Maatschappij van Fraaije Kunsten en Wetenschappen*, 7: 197–360

Borgonjen, Renée (2007), 'Onderwijs op sterk water. Het Anatomisch Museum in Leiden door ZEE – grafisch en architectonisch ontwerpen', *de Architect. Interieur*, 24: 28–29

Bozman, C.A. (1958), 'Planning and Setting Out a Modern Medical Museum', *The Medical Press*, 3 September 1958, 842–846

Broek, A.J.P. van den (1930), 'The Institute of Anatomy, University of Utrecht', *Methods and Problems of Medical Education*, 16: 131–137

Brugmans, Sebaldus Justinus (1781), *Dissertatio physico mineralogica inauguralis de lapidibus et saxis agri Groningani* (Groningen: Doekema & Muller)

——— (1785), *Dissertatio de puogenia, sive mediis quibus natura utitur in creando pure* (Groningen: Doekema)

Brugmans, Sebald Justinus et al. (1805), *Pharmacopoea Batava* (Amsterdam: Johannes Allart)

Buklijas, Tatjana (2005), 'Dissection, Discipline and Urban Transformation. Anatomy at the University of Vienna 1845–1915' (unpublished doctoral thesis, University of Cambridge)

Burg, Martijn Jacob van der (2007), 'Nederland onder Franse invloed. Cultuurtransfer en staatsvorming in de napoleontische tijd, 1799–1813' (unpublished doctoral thesis, University of Amsterdam)

Burmeister, Maritha Rene (2000), 'Popular Anatomical Museums in Nineteenth-Century England' (unpublished doctoral dissertation, Rutgers University)

Bynum, William F. et al. (2006), *The Western Medical Tradition, 1800 to 2000* (Cambridge: Cambridge University Press)

Bynum, William F. and Porter, Roy (eds) (1993), *Companion Encyclopedia of the History of Medicine*, 2 vols (London: Routledge)

Calisch, Isaac Marcus and Calisch, Nathan Salomon ([1864]), *Nieuw woordenboek der Nederlandsche taal* (Tiel: Campagne), available at <http://www.dbnl.org>

Calkoen, Godert Theodoor Allard (2012), 'Onder studenten. Leidse aanstaande medici en de metamorfose van de geneeskunde in de negentiende eeuw (1838–1888)' (unpublished doctoral thesis, Leiden University), available at <https://openaccess.leidenuniv.nl/handle/1887/20129>

Capadose, Abraham (1825), 'Lofrede op Sebald Justinus Brugmans', *Werken der Hollandsche Maatschappij van Fraaije Kunsten en Wetenschappen*, 7: 363–605

Chaplin, Simon (2009), 'John Hunter and the "Museum Oeconomy" 1750–1800' (unpublished doctoral thesis, University of London)

Close Koenig, Tricia (2011), 'Betwixt and Between. Production and Commodification of Knowledge in a Medical School Pathological Anatomy Laboratory in Strasbourg (mid-19th Century to 1939)' (unpublished doctoral thesis, Université de Strasbourg), available at <http://scd-theses.u-strasbg.fr/2323>

Cobbold, Thomas S. (1866), *Catalogue of the Specimens of Entozoa in the Museum of the Royal College of Surgeons of England* (London: Hardwicke)

Cook, Harold J. (2002), 'Time's Bodies. Crafting the Preparation and Preservation of Naturalia', in: Pamela H. Smith and Paula Findlen (eds), *Merchants and Marvels. Commerce and Representation of Nature in Early Modern Europe* (London: Routledge), 223–247

Cooke, Martyn (2011), Interview by author, London, 11 April 2011

Corradini, Elena and Bukowski, Marek (2012), 'Proposed European Anatomical Collections Network', *University Museums and Collections Journal*, 5: 119–132, available at <http://edoc.hu-berlin.de/docviews/abstract.php?id=39599>

Couvée, G. (1900), *Pigmentatie der epidermis bij melanosarcoom* (Leiden: Brill)

Crombie, A.C. (1994), *Styles of Scientific Thinking in the European Tradition*, 3 vols (London: Duckworth)

Cunningham, Andrew (2001), 'The End of the Sacred Ritual of Anatomy', *Canadian Journal of Medical History*, 18: 187–204

——— (2002), 'The Pen and the Sword: Recovering the Disciplinary Identity of Physiology and Anatomy Before 1800. I: Old Physiology – the Pen', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 33 (4): 631–665

——— (2003), 'The Pen and the Sword: Recovering the Disciplinary Identity of Physiology and Anatomy Before 1800. II: Old Anatomy –the Sword', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 34 (1): 51–76

——— (2010), *The Anatomist Anatomis'd. An Experimental Discipline in Enlightenment Europe.* (Farnham: Ashgate)

Cunningham, Andrew and Williams, Perry (eds) (1992), *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press)

Cuvier, Georges and Noël, J.F.M. ([1811]), *Rapport sur les établissemens d'instruction publique en Hollande et sur les moyens de les réunir à l'Université Impériale* (Paris: Fain)

Czermák, Johann (1879), *Gesammelte Schriften*, i (Leipzig: Engelmann)

Daniëls, C.E. (1902–03), 'Levensbericht van T. Zaaijer', *Handelingen en mededeelingen van de Maatschappij der Nederlandsche Letterkunde te Leiden* 1902–1903: 155–176

Daston, Lorraine and Galison, Peter (1992), 'The Image of Objectivity', *Representations*, No. 40: 81–128

——— (2007), *Objectivity* (New York: Zone Books)

Deelman, H.T. (1920), *De Geneeskunst Voor Honderd Jaren. Ontleend Aan Het Dagboek-reisjournaal Van C.B. Tilanus* (Haarlem: F. Bohn)

Delft, Dirk van (2005), *Heike Kamerlingh Onnes: een biografie. De man van het absolute nulpunt* (Amsterdam: Bert Bakker)

Desmond, Adrian (1989), *The Politics of Evolution. Morphology, Medicine, and Reform in Radical London* (Chicago: University of Chicago Press)

Dickenson, Donna (2009), *Body Shopping. Converting Body Parts to Profit* (Oxford: Oneworld Publications)

Dicks, Bella (2003), *Culture on Display. The Production of Contemporary Visitability* (Maidenhead: Open University Press)

Dominicus, W. (1878), *Ontleedkundige aantekeningen betreffende het achterhoofdsbeen* (Leiden: Somerwil)

Dorsman, Leen (2008), 'Slaapmutsen en ornamenten? Over het bestuur van een universiteit in de negentiende eeuw', *Studium*, 1: 32–46

Duchesne, Jean (1834), *Voyage d'un iconophile. Revue des principaux cabinets d'estampes, bibliothèques et musées d'Allemagne, de Hollande et d'Angleterre* (Paris: Heideloff et Campé)

Duuren, David van et al. (2007), *Physical Anthropology Reconsidered. Human Remains at the Tropenmuseum* (Amsterdam: KIT)

Edwards, J.J. and Edwards, M.J. (1959), *Medical Museum Technology* (London: Oxford University Press)

Elshout, Antonie M. (1952), *Het Leidse kabinet der anatomie uit de achttiende eeuw. De betekenis van een wetenschappelijke collectie als cultuurhistorisch monument* (Leiden: Universitaire Pers Leiden)

Engberts, Dirk and Hogendoorn, Pancras (2010), 'Een onrustig bezit', *Vitrine. Magazine voor museumbezoekers*, 23 (7): 26–27

Engel, Hendrik (1986), *Hendrik Engel's Alphabetical List of Dutch Zoological Cabinets and Menageries* Pieter Smit, A.P.M. Sanders, and J.P.F. Veer (eds), (2nd edn, Amsterdam: Rodopi)

Erkelens, Annee Leendert (1902), *Retentio dentium* (Leiden: IJdo)

Erkelens, Helma (2006), *Oefening baart kunst. Verloskundig onderwijs in de 19e eeuw* (Groningen: Universiteitsmuseum Groningen)

Fabian, Ann (2010), *The Skull Collectors. Race, Science, and America's Unburied Dead* (Chicago: University of Chicago Press), available at <http://public.eblib.com/EBLPublic/PublicView.do?ptiID=602613>

Farber, Paul (2000), *Finding Order in Nature. The Naturalist Tradition from Linnaeus to E. O. Wilson* (Baltimore: Johns Hopkins University Press)

Ferrari, Giovanna (1987), 'Public Anatomy Lessons and the Carnival. The Anatomy Theatre of Bologna', *Past & Present*, 117: 50–106

Findlen, Paula (1989), 'The Museum. Its Classical Etymology and Renaissance Genealogy', *Journal of the History of Collections*, 1: 59–78

Flourens, P. (1856), *Recueil des éloges historiques lus dans les séances publiques de l'Académie des Sciences*, i (Paris: Garnier)

Foucault, Michel (1976), *The Birth of the Clinic. An Archaeology of Medical Perception* (London: Tavistock)

Fröber, Rosemarie (2003), 'The Anatomical Collection in Jena and the Influence of Carl Gegenbaur', *Theory in Biosciences*, 122: 148–161

Geer van Jutphaas, B.J.L. de (1869), 'De regeling van het hooger onderwijs in Nederland in 1814', *Nieuwe bijdragen voor regtsgeleerdheid en wetgeving*, 19: 212–273

Geesink, Ingrid and Steegers, Chantal (2009), *Nader gebruik nader onderzocht. Zeggenschap over lichaamsmateriaal* (The Hague: Rathenau Instituut), available at <http://www.rathenau.nl/publicaties.html>

Geyskes, D. and Klaauw, C.J. van der (1934), 'Der heutige Zustand der anatomischen Kabinette früherer Jahrhunderte in Leiden', *Janus: Archives internationales pour l'histoire de la médecine et pour la géographie médicale*, 38: 1–14

Gijzen, Agatha (1938), *'S Rijks Museum van natuurlijke historie, 1820–1915* (Rotterdam: Brusse)

Good, Byron J. and Good, Mary Jo DelVecchio (1993), '"Learning Medicine". The Constructing of Medical Knowledge at Harvard Medical School', in: Shirley Lindenbaum and Margaret M. Lock (eds), *Knowlegde, Power and Practice. The*

Anthropology of Medicine and Everyday Life (Berkely: University of California Press), 81–107

Le Grand, John (2001), *Anatomisch Museum* (2nd edn, Groningen: Faculteit der Medische Wetenschappen, Rijksuniversiteit Groningen)

Groen, M. (1987), *Het wetenschappelijk onderwijs in Nederland van 1815 tot 1980. Een onderwijskundig overzicht*, 2 vols (Eindhoven: Eindhoven University of Technology)

GSC (Groninger Studenten Corps Vindicat atque Polit) ([1884]), *Groninger Studenten Almanak Voor Het Jaar 1885* (Groningen: Van Boekeren)

Guislain, Joseph (1842), *Lettre médicale sur la Hollande, adressé à MM les membres de la Société de Médecine de Gand* (Gand: Gyselynck)

Hackett, Cecil John (1954), 'The Undergraduate Teaching Medical Museum', in: *Proceedings of the First World Conference on Medical Education, London 1953* (London: Oxford University Press), 529–537

Halbertsma, Hidde Justusz. (1843), *Dissertatio historico-medica inauguralis de Antonii Leeuwenhoeckii meritis in quasdam partes anatomiae microscopicae* (Deventer: De Lange)

——— (1855), *Bijdrage tot de ziektekundige ontleedkunde der tanden* (Amsterdam: Van der Post)

——— (1864), 'Normaal en abnormaal hermaphroditismus bij de visschen', *Verslagen en mededeelingen der Koninklijke Akademie van Wetenschappen. Afdeeling natuurkunde*, 16: 165–178

——— (1865), 'De derde gewrichtsknobbel (condylus tertius) van het achterhoofdsbeen', *Nederlandsch tijdschrift voor geneeskunde*, 9: 222–227

Hallam, Elizabeth (2013, forthcoming), *The Anatomy Museum. Death and the Body Displayed* (London: Reaktion Books)

Haneveld, G.T. (1978a), *Bijdrage tot de geschiedenis der pathologische anatomie: Utrecht in de eerste helft van de negentiende eeuw* (Amsterdam: Ronald Meesters)

——— (1978b), 'Koning Willem de Eerste en de anatomische collecties', in: *Acta octavi conventus historiae scientiae medicinae matheseos naturialumque excolendae Bergae ad Zomam, a.d. septimum-, sextum-, quintum decimum kalendas apriles MCMLXXVII*, ii (Amsterdam: Meesters), 83–90

Harris, Henry (1999), *The Birth of the Cell* (New Haven: Yale University Press)

Harting, Pieter (1878), *Voorheen en thans, 1828–1878. Herinneringen, opmerkingen en wenken door een oud-student* (Utrecht: Greven)

Haverkorn van Rijsewijk, Karel Theodoor (1900), *Myocarditis tuberculosa* (Rotterdam: De Jong)

Heiningen, T.W. van (ed) (2008), *The Correspondence of Sebald Justinus Brugmans (1763–1819)*, Tools and Sources for the History of Science in the Netherlands, 1 (The Hague: Dutch History of Science Web Centre), available at <http://www.dwc.knaw.nl/literatuur/tools-sources>

Heller, Hugo (1881), *Over hygroma colli cysticum congenitum* (Leiden: Van Doesburgh)

Hendriksen, Marieke (2012), 'Aesthesis in Anatomy. Materiality and Elegance in the

Eighteenth-Century Leiden Anatomical Collections' (unpublished doctoral thesis, Leiden University)

Hermans, Tilly and Zonneveld, Peter van (eds) (1985), *Leiden. Het land der letteren* (Amsterdam: Meulenhoff)

'Het physisch, chemisch, anatomisch en physiologisch laboratorium te Leyden' (1859), *Nederlandsch Magazijn,* 1859: 64

Heynsius, A. (1869), 'De inrichting van het physiologisch laboratorium', *Onderzoekingen gedaan in het physiologisch laboratorium der Leidsche Hoogeschool*, 1: 1–13

Hildebrand (Nicolaas Beets) (1851), *Camera obscura* (3rd edn, Haarlem: Bohn)

Hildebrandt, Georg Friedrich (1830), *Handbuch der Anatomie des Menschen*, i: *Allgemeine Anatomie* Ernst Heinrich Weber (ed), (4. Ausg, Braunschweig: Schulbuchhandlung)

Hillman, William Augustus (1841a), *Catalogue of Specimens of Mammalia and Birds in Store-Bottles (Upper Store-Room, No. 2). Royal College of Surgeons, London.* (London: Taylor)

——— (1841b), *Catalogue of Specimens of Invertebrata in Store-Bottle (Upper Store-Room, No. 3). Royal College of Surgeons, London.* (London: Taylor)

Hirschauer, Stefan (2006), 'Animated Corpses. Communicating with Post Mortals in an Anatomical Exhibition', *Body & Society*, 12 (4): 25–52

Hoeven, Jan van der (1842), *Bijdragen tot de natuurlijke geschiedenis van den negerstam* (Leiden: Luchtmans)

——— (1860), *Berigt omtrent het mij verleende ontslag als opperdirecteur van 's Rijks Museum van Natuurlijke Historie te Leiden* (Amsterdam: J. H. Gebhard)

——— (1867), 'Over den aard en het doel der vergelijkende ontleedkunde, en over hare hulpmiddelen te Leiden', *Nederlandsch tijdschrift voor geneeskunde*, 11: 657–65

Hooke, Robert (1705), *The Posthumous Works of Robert Hooke, M.D.S.R., Geom. Prof. Gresh. &c. Containing His Cutlerian Lectures, and Other Discourses Read at the Meetings of the Illustrious Royal Society ... Publish'd by Richard Waller, R. S. Secr.* (London: Smith and Walford)

Hopwood, Nick (2002), *Embryos in wax. Models from the Ziegler studio, with a reprint of "Embryological wax models" by Friedrich Ziegler* (Cambridge: Whipple Museum of the History of Science)

——— (2007), 'Artist Versus Anatomist, Models Against Dissection. Paul Zeiller of Munich and the Revolution of 1848', *Medical History*, 51: 279–308

——— (2009), 'Embryology', in: Peter J. Bowler and John V. Pickstone (eds), *The Cambridge History of Science*, vi: *The Modern Biological and Earth Sciences* (Cambridge: Cambridge University Press), 285–315

Horn, Wilhelm (1831), *Reise durch Deutschland, Ungarn, Holland, Italien, Frankreich, Großbritannien und Irland; in Rücksicht auf medicinische und naturwissenschaftliche Institute, Armenpflege u. s. w.*, i (Berlin: Enslin)

Hoskins, Janet (1989), 'On Losing and Getting a Head. Warfare, Exchange, and Alliance in a Changing Sumba, 1888–1988', *American Ethnologist*, 16 (3): 419–440

Huisman, Tim (2009), *The Finger of God. Anatomical Practice in 17th-Century Leiden* (Leiden:

Primavera Pers)
Huistra, Hieke (2010), 'Weg met pottenkijkers! Hoe het publiek verdween uit het Leids anatomisch kabinet', *Negentiende Eeuw*, 34: 193–208
Huizinga, Johan (1925), 'De academische gebouwen', in: *Pallas Leidensis MCMXXV* (Leiden: Van Doesburgh), 19–36
Hunter, John (1786), *Observations on Certain Parts of the Animal Oeconomy* (London)
Hunter, William (1784), *Two Introductory Lectures, Delivered by Dr. William Hunter, to His Last Course of Anatomical Lectures, at His Theatre in Windmill-Street* (London: Johnson)
Hyrtl, Joseph (1865), *Handboek der praktische ontleedkunst als leidraad bij de anatomische oefeningen en tot het vervaardigen van praeparaten*, translated by Johannes Boogaard and Teunis Zaaijer (Schiedam: H.A.M. Roelants)
Jackson, Mark (ed) (2013), *The Oxford Handbook of the History of Medicine* (Oxford: Oxford University Press)
Jacyna, L.S. (1983), 'Images of John Hunter in the Nineteenth Century', *History of Science*, 21: 85–108
Jamin, Hervé (2001), *Kennis als opdracht. De Universiteit Utrecht, 1636–2001* (Utrecht: Matrijs)
Janse, Geert Jan (2010), 'Out of Curiosity and for Instruction', in: Marjan Scharloo (ed), *Teylers Museum. A Journey in Time* (Haarlem: Teylers Museum), 11–29
Jardine, Nicholas (1992), 'The Laboratory Revolution in Medicine as Rhetorical and Aesthetic Accomplishment', in: Andrew Cunningham and Perry Williams (eds), *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press), 304–323
Jaucourt, Louis de (1765), 'Leyde, Lugdunum Batavorum', in: Denis Diderot and Jean le Rond d' Alembert (eds), *Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers, par une société de gens de lettres* ix (Paris: Briasson; David; Le Breton; Durand), 451–452, available at <http://encyclopedie.uchicago.edu>
Jensma, Goffe and Vries, H. de (1997), *Veranderingen in het hoger onderwijs in Nederland tussen 1815 en 1940* (Hilversum: Verloren)
Jespersen, T. Christine, Rodriguez, Alicita and Starr, Joseph (eds) (2009), *The Anatomy of Body Worlds. Critical Essays on the Plastinated Cadavers of Gunther von Hagens* (Jefferson, NC: McFarland)
Jones, Nora L. (2002), 'The Mütter Museum. The Body as Spectacle, Specimen, and Art' (unpublished doctoral dissertation, Temple University)
Jonge, Hans de (1999), 'Sebald Justinus Brugmans (1763–1819)' (unpublished master's thesis, Leiden University)
——— (2001), *Gids bij de tentoonstelling "Het vergeten fenomeen. Sebald J. Brugmans, 1763–1819: verzamelaar tussen koning, keizer en universiteit"*, edited by Tim Huisman (Leiden: Museum Boerhaave)
——— (2005), 'Macht, machinaties en musea. Jan van der Hoeven, Hermann Schlegel en hun strijd om het Rijksmuseum van natuurlijke historie te Leiden', *Bijdragen en*

mededelingen betreffende de geschiedenis der Nederlanden, 120: 177–206

Jorink, Eric (2006), *Het "Boeck der Natuere". Nederlandse geleerden en de wonderen van Gods schepping 1575–1715* (Leiden: Primavera Pers)

——— (2010), *Reading the Book of Nature in the Dutch Golden Age, 1575–1715* (Leiden: Brill)

Josselin de Jong, Rodolphe (1895), *Cirrhosis hepatis* (Leiden: IJdo)

KCL (King's College London), 'The Gordon Museum of Pathology – Contact Us' <http://www.kcl.ac.uk/gordon/contact.aspx>, accessed on 2 March 2013

Keith, Arthur (1908), *Abstract of Minutes of the Museum Committee, Royal College of Surgeons of England from 1800–1907* (London)

Kernkamp, Gerhard Willem (1936), *De Utrechtsche universiteit, 1636–1936*, i: *De Utrechtsche academie, 1636–1815* (Utrecht: Oosthoek)

Klaauw, C.J. van der (1926), *Het hooger onderwijs in de zoölogie en zijne hulpmiddelen te Leiden. Een historische schets naar aanleiding van het 50-jarig bestaan van het tegenwoordige zoölogisch laboratorium* (Leiden: Sijthoff)

——— (1930), 'Een verzameling uit den eersten tijd van de vergelijkende ontleedkunde (de collectie Brugmans)', *De Natuur*, 50: 49–53, 73–78, 97–101, 122–126

Klep, Paul M.M. and Kruithof, Brand (2008), 'The Rise of Quantification and Statistics in Dutch Medical Research (1850–1940)', in: Ida H. Stamhuis, Paul M.M. Klep, and Jacques G.S.J. van Maarseveen (eds), *The Statistical Mind in Modern Society. The Netherlands 1850–1940*, ii: *Statistics and Scientific Work* (Amsterdam: Aksant), 11–37

Klestinec, Cynthia (2011), *Theaters of Anatomy. Students, Teachers, and Traditions of Dissection in Renaissance Venice* (Baltimore: Johns Hopkins University Press)

Knaap, Emilie C. van der ([2001]), 'Prof. dr. Jan Bleuland (1756–1838) en het Museum Bleulandium' (unpublished master's thesis, Utrecht University)

Knappert, Laurentius (1906), *De ramp van Leiden, 12 januari 1807, na honderd jaar herdacht* (Schoonhoven: Van Nooten)

Knoeff, Rina (2010), 'Boerhaave at Leiden: *Communis Europae praeceptor*', in: Ole Peter Grell, Andrew Cunningham, and Jon Arrizabalaga (eds), *Centres of medical excellence? Medical travel and education in Europe, 1500–1789* (Farnham: Ashgate), 269–286

——— (2011), 'The Visitor's View. Early Modern Tourism and the Polyvalence of Anatomical Exhibits', in: Lissa Roberts (ed), *Centres and Cycles of Accumulation in and Around the Netherlands* (Berlin: Lit Verlag), 155–176

——— (2012), 'From Where I Sit. Remembrance of Medicine Past', *Times Higher Education Supplement* (published online 5 July 2012) <http://www.timeshighereducation.co.uk/420434.article>, accessed 18 March 2012

——— (forthcoming), 'Kiss of Death. The Dealings of Frederik Ruysch's Anatomical Workshop'

Knox, Frederick (1836), *The Anatomist's Instructor, and Museum Companion. Being Practical Directions for the Formation and Subsequent Management of Anatomical Museums.* (Edinburgh: Black)

Kong, Augustine et al. (2012), 'Rate of De Novo Mutations and the Importance of Father's Age to Disease Risk', *Nature*, 488: 471–475

Koning, Pieter (1877), *Beschrijving van Chineesche schedels* (Leiden: Van der Hoek)

Koster, Willem (1866), 'Levensbericht van Hidde Justuszn. Halbertsma', *Jaarboek van de Koninklijke Akademie van Wetenschappen*, 38–55

Krauss, Nicole (2007), *Man Walks into a Room* (London: Penguin Books)

Kwa, Chunglin (2011), *Styles of Knowing. A New History of Science from Ancient Times to the Present* (Pittsburgh: University of Pittsburgh Press)

Larson, Frances (2008), 'Anthropological Landscaping. General Pitt Rivers, the Ashmolean, the University Museum and the Shaping of an Oxford Discipline', *Journal of the History of Collections*, 20: 85–100

Lauth, Ernest (1839), *Handboek der practische ontleedkunde*, translated by H.A. Schreuder, ii (Leiden: Van den Heuvel)

Lawrence, Susan C. (1998), 'Beyond the Grave. The Use and Meaning of Human Body Parts, a Historical Introduction', in: Robert F. Weir (ed), *Stored Tissue Samples. Ethical, Legal, and Public Policy Implications* (Iowa City: University of Iowa Press), 111–142

Lee, Paula Young (1997), 'The Musaeum of Alexandria and the Formation of the *Muséum* in Eighteenth-Century France', *Art Bulletin*, 79: 385–412

LEI (Leiden University) (2010), 'Metamorfose (1776–1876)', (updated 18 May 2010) <http://www.over.leidenuniv.nl/historie/metamorfose.html>, accessed 20 February 2013

Leidsch Dagblad (1885), 'Gemengd nieuws',13 April 1885, p. 2

Leidse universiteit 400 (1975) (Amsterdam: Rijksmuseum Amsterdam)

Leydsche Courant (1867), 'Binnenlandsche berigten', 11 October 1867, p. 1

Lieburg, Mart J. van (1987), 'De medische promoties aan de Nederlandse universiteiten (1815–1899)', *Batavia academica. Bulletin van de Nederlandse Werkgroep Universiteitsgeschiedenis*, 5: 1–17

——— (1995), 'De natuurkundige staatsexamens voor medische studenten en de constructie van een natuurwetenschappelijke basis voor de artsenopleiding tussen 1865 en 1880', *Gewina*, 18: 139–180

LSC (Leidsch Studenten Corps) ([1834]), *Studenten-almanak voor het jaar 1835* (Leiden: Herdingh)

——— ([1838]), *Studenten-almanak voor het jaar 1839* (Leiden: Herdingh)

——— ([1849]), *Studenten-almanak voor het jaar 1850* (Leiden: Gerhard)

——— ([1859]), *Leidsche studenten-almanak voor 1860* (Leiden: Engels)

——— ([1860]), *Leidsche studenten-almanak voor 1861* (Leiden: Engels)

——— ([1861]), *Leidsche studenten-almanak voor 1862* (Leiden: Engels)

Ludmerer, Kenneth (1996), *Learning to Heal. The Development of American Medical Education* (Baltimore: John Hopkins University Press) (first published in 1985)

Luiten van Zanden, Jan and Riel, Arthur van (2000), *Nederland 1780–1914. Staat, instituties en economische ontwikkeling* (Amsterdam: Balans)

LUMC (Leiden University Medical Center), 'Anatomisch Museum' <https://www.lumc.nl/home/0003/71210065101221/90331050631221/>, accessed 2 March 2013

MacDonald, Helen (2006), *Human Remains. Dissection and Its Histories* (New Haven: Yale University Press)

MacGregor, Arthur (2007), *Curiosity and Enlightenment. Collectors and Collections from the Sixteenth to the Nineteenth Century* (New Haven: Yale University Press)

Macgregor, John (1835), *My Note Book*, i (London: John Macrone)

Maerker, Anna (2011), *Model Experts. Wax Anatomies and Enlightenment in Florence and Vienna, 1775–1815* (Manchester: Manchester University Press)

Margócsy, Dániel (2011), 'A Museum of Wonders or a Cemetery of Corpses? The Commercial Exchange of Anatomical Collections in Early Modern Netherlands', in: Sven Dupré and Christoph Lüthy (eds), *Silent Messengers. The Circulation of Material Objects of Knowledge in the Early Modern Low Countries* (Berlin: Lit Verlag), 185–215

Marshall, Tim (1995), *Murdering to Dissect. Grave-robbing, "Frankenstein" and the Anatomy Literature* (Manchester: Manchester University Press)

Matyssek, Angela (2002), *Rudolf Virchow, das pathologische Museum. Geschichte einer wissenschaftlichen Sammlung um 1900* (Darmstadt: Steinkopff)

Maulitz, Russell C. (2002), *Morbid Appearances. The Anatomy of Pathology in the Early Nineteenth Century* (Cambridge: Cambridge University Press)

——— (2009), 'Pathology', in: Peter J. Bowler and John V. Pickstone (eds), *The Cambridge History of Science*, vi: *The Modern Biological and Earth Sciences* (Cambridge: Cambridge University Press), 367–381

Mazzolini, Renato G. (2004), 'Plastic Anatomies and Artificial Dissections', in: Soraya Chadarevian and Nick Hopwood (eds), *Models. The Third Dimension of Science* (Stanford: Stanford University Press), 170–206

McLeary, Erin Hunter (2001), 'Science in a Bottle. The Medical Museum in North America, 1860–1940' (unpublished doctoral dissertation, University of Pennsylvania)

Meerman, J. (1807), *De commissie tot de formatie der Openbare en Koninklijke Hooge schoolen, en de aanmoediging van de wetenschappen en der geleerden aan Zijne Majesteit den Koning* (The Hague)

Meerten, A.B. van (1829), *Reis door het Koningrijk der Nederlanden en het Groothertogdom Luxemburg, voor jonge lieden*, v (Amsterdam: Schalekamp en Van de Grampel)

Molewater, Jan Bastiaan (1999), *"Hoe zal het met mij afloopen". Het studentendagboek 1833–1835 van Jan Bastiaan Molewater*, edited by Henk Eijssens (Hilversum: Verloren)

Molhuysen, P.C. (1923), *Bronnen tot de geschiedenis der Leidsche Universiteit*, vi: *10 Febr. 1765–21 Febr. 1795* (The Hague: Nijhoff)

——— (1924), *Bronnen tot de geschiedenis der Leidsche Universiteit*, vii: *23 Febr. 1795–30 Dec. 1811* (The Hague: Nijhoff)

Morgan, Lynn M. (2009), *Icons of Life. A Cultural History of Human Embryos* (Berkeley: University of California Press)

Morton, Timothy (ed) (2002), *A Routledge Literary Sourcebook on Mary Shelley's "Frankenstein"* (London: Routledge)

Negus, Victor (1966), *History of the Trustees of the Hunterian Collection* (Edinburgh: Livingstone)

Niermeyer, Joh. Hendr. Ant. (1879), *Neuropathologische onderzoekingen* (Leiden)

'Notizen' (1865), *Wiener Medizinische Wochenschrift*, 15 (29): 507–508

Nutton, Vivian and Porter, Roy (eds) (1995), *The History of Medical Education in Britain* (Amsterdam: Rodopi)

Nyhart, Lynn K.(1995), *Biology Takes Form. Animal Morphology and the German Universities, 1800–1900* (Chicago: University of Chicago Press)

——— (1996), 'Natural History and the "New" Biology', in: Nicholas Jardine, James A. Secord, and Emma C. Spary (eds), *Cultures of Natural History* (Cambridge: Cambridge University Press), 426–443

Nys, Liesbet (2012), *De intrede van het publiek. Museumbezoek in België 1830–1914* (Leuven: Universitaire Pers Leuven)

Orioli, I.M. et al. (1995), 'Effect of Paternal Age in Achondroplasia, Thanatophoric Dysplasia, and Osteogenesis Imperfecta', *American Journal of Medical Genetics*, 59: 209–217

Otterspeer, Willem (1985), 'Vereenvoudiging en bezuiniging. Een negentiende eeuwse discussie over taakverdeling en concentratie', in: Fr. van der Meer (ed), *Universiteit in beweging. Een aantal beschouwingen bij gelegenheid van het 410-jarig bestaan van de Rijksuniversiteit te Leiden* (Leiden: Rijksuniversiteit Leiden), 239–261

——— (1992), *De wiekslag van hun geest. De Leidse universiteit in de negentiende eeuw* (The Hague: Stichting Hollandse Historische Reeks)

——— (2005), *Groepsportret met dame*, iii: *De werken van de wetenschap. De Leidse universiteit, 1776–1876* (Amsterdam: Bert Bakker)

Outram, Dorinda (1984), *Georges Cuvier. Vocation, Science, and Authority in Post-revolutionary France* (Manchester: Manchester University Press)

Paget, James (1885), *Descriptive Catalogue of the Pathological Specimens Contained in the Museum of the Royal College of Surgeons of England*, iv: *Morbid Conditions of the Urinary Organs, of the Nervous System and Organs of Special Senses, of the Generative Organs and Breast, and the Anatomy of the Stumps* (2nd edn, London: Churchill)

Payne, Lynda (2007), *With Words and Knives. Learning Medical Dispassion in Early Modern England* (Aldershot: Ashgate)

Pearce, Susan M. (1992), *Museums, Objects and Collections: A Cultural Study* (Leicester: Leicester University Press)

Pickstone, John V. (1994), 'Museological Science? The Place of the Analytical Comparative

in Nineteenth-Century Science, Technology and Medicine', *History of Science*, 32: 111–38

——— (2000), *Ways of Knowing. A New History of Science, Technology and Medicine* (Chicago: University of Chicago Press)

Pirson, Chloé (2009), *Corps à corps. Les Modèles anatomiques entre art et médecine* (Paris: mare & martin)

Porter, Theodore M. (1986), *The Rise of Statistical Thinking, 1820–1900* (Princeton: Princeton University Press)

Pots, Roel (2000), *Cultuur, koningen en democraten. Overheid & cultuur in Nederland* (Nymegen: SUN)

'Professor Brühl's erste diesjährige Sonntagsvorlesung, abgehalten im Sammlungssaale des zootomischen Universitäts-Institutes. (Nach einer revidirten stenographischen Aufzeichnung.)' (1866), *Wiener Medizinische Wochenschrift*, 16 (7): 115–117

Pruys van der Hoeven, Cornelis (1866), *Akademieleven* (Amsterdam: Van der Post)

Quant, C.A.J. (1903), 'In Memoriam T. Zaaijer', *Studenten Weekblad Minerva*, 27 (29): 1

RCS (Royal College of Surgeons of England), 'Information for Visitors to the Wellcome Museum of Anatomy and Pathology' <http://www.rcseng.ac.uk/museums/wellcome/information-for-visitors>, accessed 2 March 2013

Reddingius, R.A. (1914), 'Het pathologisch-anatomisch laboratorium', in: Is. van Dijk et al. (eds), *Academia Groningana, MDCXIV–MCMXIV. Gedenkboek ter gelegenheid van het derde eeuwfeest der Universiteit te Groningen* (Groningen: Noordhoff), 500–511

Reinarz, Jonathan (2005), 'The Age of Museum Medicine. The Rise and Fall of the Medical Museum at Birmingham's School of Medicine', *Social History of Medicine*, 18: 419 –437

Rheinberger, Hans-Jörg (2003), 'Präparate – "Bilder" ihrer selbst. Ein bildtheoretische Glosse', in: *Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritiek*, 1.2: *Oberflächen der Theorie* (Berlin: Akademie Verlag), 9–19

——— (2010), *An Epistemology of the Concrete. Twentieth-Century Histories of Life*, translated by G.M. Goshgarian (Durham: Duke University Press)

Richardson, Ruth (2000), *Death, Dissection and the Destitute. The Politics of the Corpse in Pre-Victorian Britain* (2nd edn, Chicago: Chicago University Press)

——— (2006), 'Human Dissection and Organ Donation. A Historical and Social Background', *Mortality*, 11: 151–165

Robertson, H.E. and Lundquist, Richard (1934), 'The Preparation of Pathologic Specimens for Exhibition Purposes', *Bulletin of the International Association of Medical Museums*, 13: 31–32

Roelevink, J. (1992), '"Eenen eik, die hondert jaren behoefde, om groot te worden." Koning Willem I en de universiteiten van het Verenigd Koninkrijk', in: C.A. Tamse and Els Witte (eds), *Staats- en natievorming in Willem I's koninkrijk, 1815–1830* (Brussel: VUB-Press), 286–309

——— (1992–93), 'Het rapport van de commissie Van der Duyn van Maasdam over het hoger onderwijs uit 1814', *Batavia academica. Bulletin van de Nederlandse Werkgroep Universiteitsgeschiedenis*, 10: 1–61

Rooy, Laurens de (2011), *Snijburcht. Lodewijk Bolk en de bloei van de Nederlandse anatomie* (Amsterdam: Amsterdam University Press)

Rooy, Laurens de and Bogaard, Hans van den (2009), *Forces of Form* Simon Knepper, Johan Kortenray, and Anton Moorman (eds), (Amsterdam: Amsterdam University Press)

Rooy, Piet de (2002), *Republiek van rivaliteiten. Nederland sinds 1813* (Amsterdam: Mets & Schilt)

Rosner, Lisa (2010), *The Anatomy Murders. Being the True and Spectacular History of Edinburgh's Notorious Burke and Hare and of the Man of Science Who Abetted Them in the Commission of Their Most Heinous Crimes* (Philadelphia: University of Pennsylvania Press)

Rupp, Jan C.C. (1990), 'Matters of Life and Death. The Social and Cultural Conditions of the Rise of Anatomical Theatres, with Special Reference to Seventeenth-Century Holland', *History of Science*, 28: 263–87

——— (2002), 'Het theatrum anatomicum: publiekscommunicatief fossiel of "archetype"', *Gewina*, 25: 191–209

SAE (Stichting Academisch Erfgoed) (2006), *Medisch erfgoed* [website] <http://www.medischerfgoed.nl>, accessed 8 March 2013

Sandifort, Eduard (1793a), *Museum Anatomicum Academiae Lugduno-Batavae*, i (Leiden: Luchtmans)

——— (1793b), *Museum Anatomicum Academiae Lugduno-Batavae*, ii (Leiden: Luchtmans)

Sandifort, Gerard (1827), *Museum Anatomicum Academiae Lugduno-Batavae*, iii (Leiden: Luchtmans)

——— (1835), *Museum Anatomicum Academiae Lugduno-Batavae*, iv (Leiden: Luchtmans)

——— (1838–43), *Tabulae craniorum diversarum nationum*, 3 vols (Leiden: Luchtmans)

Sappol, Michael (2004), '"Morbid Curiosity". The Decline and Fall of the Popular Anatomical Museum', *Common-Place* [online journal], 4 (2) <http://www.common-place.org/vol-04/no-02/sappol/>, accessed 8 March 2013

Sawday, Jonathan (1996), *The Body Emblazoned. Dissection and the Human Body in Renaissance Culture* (London: Routledge)

Schickore, Jutta (2007), *The Microscope and the Eye. A History of Reflections, 1740–1870* (Chicago: University of Chicago Press)

Schnalke, Thomas (2004), 'Casting Skin. Meanings for Doctors, Artists, and Patients', in: Soraya Chadarevian and Nick Hopwood (eds), *Models. The Third Dimension of Science* (Stanford: Stanford University Press), 170–206

Schultka, Rüdiger and Neumann, Josef N. (eds) (2007), *Anatomie und Anatomische Sammlungen im 18. Jahrhundert* (Berlin: Lit Verlag)

Secord, James A. (2004), 'Knowledge in Transit', *Isis*, 95: 654–672

Silliman, Benjamin (1812), *A Journal of Travels in England, Holland, and Scotland, and of Two Passages over the Atlantic, in the Years 1805 and 1806*, ii (2nd edn, Boston: T. B. Wait)

Skloot, Rebecca (2011), *The Immortal Life of Henrietta Lacks* (London: Pan Books)

Sluijter, Ronald (2004), *"Tot ciraet, vermeerderinge ende heerlyckmaeckinge der universiteyt". Bestuur, instellingen, personeel en financiën van de Leidse universiteit, 1575–1815* (Hilversum: Verloren)

South, John (1825), *The Dissector's Manual. A New Edition, with Additions and Alterations* (London: E. Cox)

Stern, Megan (2006), 'Dystopian Anxieties Versus Utopian Ideals. Medicine from Frankenstein to the Visible Human Project and Body Worlds', *Science as Culture*, 15: 61–84

Suringar, Gerard Conrad Bernard (1866a), *Pars supellectilis anatomicae, sive Catalogus speciminum pathologico-anatomicorum, quae in usus privatos a se collecta, praeparata et ordine disposita, Academiae Leidensi vivus* (Leiden: Drabbe)

——— (1866b), 'De Leidsche geneeskundige faculteit in het begin der achttiende eeuw. Boerhaave en zijne ambtgenooten', *Nederlands tijdschrift voor geneeskunde*, 10: 1–39

——— (1866c), 'Het theoretisch-geneeskundig onderwijs van Boerhaave. De klinische lessen door hem en zijn ambtgenoot Herman Oosterdijk Schacht gegeven', *Nederlands tijdschrift voor geneeskunde*, 10: 199–225

Swaving, Cornelis (1861), 'Eerste bijdrage tot kennis der schedels van volken in den Indischen archipel', *Natuurkundig tijdschrift voor Nederlandsch Indië*, 23: 241–289

Swinden, J.H. van et al. (1809), *Vertoog over de universiteiten, met betrekking tot het stelsel van openbaar onderwijs, en tot alle de inrigtingen die tot hetzelve, middellijk of onmiddellijk behooren* (Amsterdam)

Sysling, Fenneke (2013), 'The Archipelago of Difference. Physical Anthropology in the Netherlands East Indies, ca. 1890–1960' (unpublished doctoral thesis, VU University Amsterdam)

Taylor, Shephard (1927), *The Diary of a Medical Student During the Mid-Victorian Period, 1860–1864* (Norwich: Jarrold)

Theunissen, Bert (2000), *Nut en nog eens nut. Wetenschapsbeelden van Nederlandse natuuronderzoekers, 1800–1900* (Hilversum: Verloren)

Tibbe, Lieske and Weiss, Martin (eds) (2010), 'Druk bekeken. Collecties en hun publiek in de negentiende eeuw', special issue, *De negentiende eeuw*, 34 (3)

Tolarova, M.M. et al. (1997), 'Birth Prevalence, Mutation Rate, Sex Ratio, Parents' Age, and Ethnicity in Apert Syndrome', *American Journal of Medical Genetics*, 72: 394–398

Topham, Jonathan R. (2009), 'Introduction to Focus. Historicizing "Popular Science"', *Isis*, 100: 310–318

USC (Utrechtsch Studenten-Corps) ([1864]), *Utrechtse studenten almanak voor het jaar 1865* (Utrecht: Van Schoonhoven)

Vanpaemel, Geert (2002), 'Het getal regeert de wereld. Adolphe Quetelet en de wetten van de samenleving', in: Frans van Lunteren, Bert Theunissen, and Rienk Vermij (eds), *De opmars van deskundigen. Souffleurs van de samenleving* (Amsterdam: Amsterdam

University Press), 45–57
Verhuell, Alexander (1847a), 'No. 470, Hoogewoerd. Eene legende', in: *Studenten-almanak voor het jaar 1847* (Leiden: Gebhard), 152–160
——— (1847b), *Zoo zijn er! Studentenschetsen* (Arnhem: Gouda Quint), available at <http://www.geheugenvannederland.nl/?/nl/items/GAL01:10>
——— (1853), *Schetsen met de pen* (Amsterdam: Gebhard)
——— (1882), *Eerste en laatste studentenschetsen* (Arnhem: Gouda Quint)
Verwaal, Ruben (2010), 'Sane and Morbid Anatomy. The Studies and Specimens of Professor Jan Bleuland' (unpublished master's thesis, Utrecht University)
Virchow, Rudolf Ludwig Karl (1901), *Das neue Pathologische Museum der Universität zu Berlin* (Berlin: Hirschwald)
Visser, Robert Paul Willem (1996), 'Jan Bleuland (1756–1838). Hartstochtelijk verzamelaar', in: Hervé Jamin (ed), *Zes keer zestig. 360 jaar universitaire geschiedenis in zes biografieën* (Utrecht: Universiteit Utrecht), 47–55
Voorhelm Schneevogt, Gustaaf Eduard (1847), review of Carl Rokitansky, *Handboek der bijzondere ziektekundige ontleedkund*e, transl. and ed. by Jac. Moleschott, in: *De Gids*, 1847, 312–337
Vosters, Rik and Weijermars, Janneke (eds) (2011), *Taal, cultuurbeleid en natievorming onder Willem I* (Brussel: Paleis der Academiën)
Wachelder, Joseph (1992), *Universiteit tussen vorming en opleiding. De modernisering van de Nederlandse universiteiten in de negentiende eeuw* (Hilversum: Verloren)
Wallé, Dalila (2007), *Leiden Medical Professors 1575–1940* (Leiden: Museum Boerhaave / Leids Universitair Medisch Centrum)
Whitehead, Christopher (2009), *Museums and the Construction of Disciplines. Art and Archaeology in Nineteenth-Century Britain* (London: Duckworth)
Wijhe, Jan Willem van (1909), *Onderwijs en laboratorium bij de ontleedkunde* (Groningen: Wolters)
Wijs, Ivo de, Boven, Erica van and Praamstra, Olf (eds) (2010), *Het gruwelkabinet. Dertien horrorverhalen uit de negentiende eeuw* (Amsterdam: Athenaeum-Polak & Van Gennep)
Witkam, H.J. (1968), 'Over de anatomieplaats, de Albinussen en de Sandiforts' (unpublished typescript, Leiden)
——— (1980), *Catalogues of All the Chiefest Rarities in the Publick Anatomie Hall of the University of Leyden* (Leiden)
Wolf, H.C. de (1983), 'Bibliografie. Onderwijs en opvoeding in de Noordelijke Nederlanden', in: D.P. Blok (ed), *Algemene geschiedenis der Nederlanden,* xi (Weesp: Fibula-Van Dishoeck), 392–393
Zaaijer, Teunis (1862), *Beschrijving van twee vrouwenbekkens uit den Oost-Indischen archipel* (Leiden: Van Doesburgh)
——— (1866), *Het gewigt eener doelmatige ontleedkundige techniek* (Leiden: Hazenberg)
Zoeteman, Martine (2011), *De studentenpopulatie van de Leidse universiteit, 1575–1812. "Een volk op zyn Siams gekleet eenige mylen van Den Haag woonende"* (Leiden: Leiden University

Press), available at <https://openaccess.leidenuniv.nl/handle/1887/16453>

Zonneveld, Peter van (1983), *De ontslapen geliefde. Verhalen uit de Romantiek* (Amsterdam: Bakker)

Zuidervaart, Huib J. (2007), 'Academische schouwplaatsen en hun collecties. Het begin van de Nederlandse universitaire verzamelingen', in: Tiny Monquil-Broersen (ed), *Universitaire collecties in Nederland. Nieuw licht op academisch erfgoed* (Zwolle: Waanders), 11–20

——— (2009), 'Het in 1658 opgerichte "Theatrum Anatomicum" te Middelburg. Een medisch-wetenschappelijk en cultureel convergentiepunt in een vroege stedelijke context', *Archief. Vroegere en latere mededeelingen voornamelijk in betrekking tot Zeeland*, 2009: 73–140

Zwijnenberg, Robert (2011), 'Brains, Art and the Humanities', in: Francisco Ortega and Fernando Vidal, *Neurocultures: Glimpses into an Expanding Universe* (Frankfurt am Main: Peter Lang), 293–310

Samenvatting (Summary in Dutch)

Preparaten in beweging. De Leidse anatomische collecties in de negentiende eeuw

In dit boek analyseer ik het gebruik van de Leidse anatomische collecties in de negentiende eeuw, om zo beter te begrijpen wat er gebeurt met anatomische preparaten nádat ze toegevoegd zijn aan institutionele collecties.[1] Dit biedt inzicht in de herkomst van hedendaagse problemen rondom historische anatomische collecties, zoals de vraag of en hoe ze aan het algemene publiek getoond moeten worden, en de vraag waar ze thuis horen: in een medische omgeving of in een wetenschapshistorisch museum. In vier hoofdstukken bespreek ik vier verschillende groepen gebruikers van de Leidse collecties: studenten, onderzoekers, (leken)bezoekers en universiteitsbestuurders. Samen laten de hoofdstukken twee dingen zien: dat medische gebruikers de collecties de hele negentiende eeuw bleven gebruiken, terwijl niet-medici ophielden de collecties te gebruiken; en dat deze beide ontwikkelingen gerelateerd waren aan elkaar en aan de materiële eigenschappen van anatomische preparaten.

Hoofdstuk 1 beschrijft hoe medische studenten de collecties gebruikten. De studenten werkten op verschillende plaatsen met de collecties, niet alleen in het museum, maar ook in de collegekamer, de snijzaal, het academisch ziekenhuis en het laboratorium. De preparaten hielpen de studenten om anatomische kennis te verwerven, maar ook om te wennen aan het werken met dode lichamen. De studenten hanteerden de preparaten actief: ze haalden preparaten uit hun pot, raakten ze aan, bekeken ze van dichtbij, knepen er in en roken er aan. Ook prepareerden de studenten zelf, en soms ontleedden ze bestaande preparaten opnieuw. Al deze activiteiten pasten goed bij het nieuwe, praktische onderwijs dat opkwam halverwege de negentiende eeuw. Anatomische collecties bleven dan ook de hele eeuw lang een belangrijk onderwijshulpmiddel.

Niet alleen studenten, ook onderzoekers gebruikten de preparaten actief, zo laat ik zien in hoofdstuk 2. Ze haalden droge preparaten van de plank en natte preparaten uit de pot voor metingen, experimenten en (her)ontledingen. Daarbij gebruikten ze regelmatig achttiende-eeuwse preparaten, ook al waren die gemaakt door anatomen met totaal andere ideeën over ziekte, gezondheid en het lichaam. De onderzoekers pasten de oude preparaten aan aan nieuwe theorieën en technieken, bijvoorbeeld door macroscopische preparaten microscopisch te onderzoeken. Ik analyseer dit hergebruik met behulp van een observatie

[1] Ik gebruik 'anatomie' in de brede zin van het woord. Dat betekent dat 'anatomische collecties' bestaan uit zowel preparaten op het gebied van de algemene of 'gezonde' anatomie, als preparaten op het gebied van de pathologische en de vergelijkende anatomie. Daarnaast bedoel ik met 'anatomische preparaten' zowel macroscopische als microscopische preparaten.

van biologiefilosoof Hans-Jörg Rheinberger: preparaten zijn gemaakt van wat ze representeren. Deze eigenschap maakt preparaten erg flexibel. Onderzoekers kunnen voortdurend 'teruggaan' naar het oorspronkelijke materiaal, wat met bijvoorbeeld anatomische modellen onmogelijk is. Daardoor zijn preparaten relatief eenvoudig opnieuw te interpreteren. Oude preparaten bleven daardoor lang in gebruik, ook al veranderde de geneeskunde. Ik laat dit zien door de collectie van de achttiende-eeuwse Leidse anatoom Sebald Justinus Brugmans te volgen na zijn dood in 1819. Brugmans' opvolgers bleven zijn preparaten gebruiken, in verschillende vakgebieden – ik bespreek de fysische antropologie, de vergelijkende anatomie en de pathologische anatomie.

Dat de collecties in gebruik bleven in onderzoek en onderwijs betekent niet dat er niets veranderde. In 1860 verhuisde de anatomie van de oude Faliede Bagijnkerk, waar ook de universiteitsbibliotheek zat, naar het nieuwe onderwijscomplex op de Ruïne, waar ook de laboratoria voor natuurkunde, scheikunde en fysiologie gehuisvest waren. De verhuizing paste bij veranderingen in medisch onderwijs en onderzoek: de natuurwetenschappen werden steeds belangrijker in de geneeskunde – zowel hun theorieën als hun (experimentele) methoden. De anatomische collecties verhuisden mee naar de Ruïne: laboratoria en collecties, experimenteren en verzamelen sluiten elkaar, anders dan vaak gesuggereerd wordt, niet uit. Hoofdstuk 1 en 2 laten zien dat anatomische collecties *dynamisch* zijn: ze zijn niet bedoeld om van afstand naar te kijken, maar om actief te gebruiken; ze zijn voortdurend in beweging; en ze worden steeds opnieuw beschreven en geïnterpreteerd. Daarom pasten de Leidse collecties prima in de nieuwe laboratoriumomgeving. Maar in die omgeving raakten ze wel buiten bereik van niet-medische gebruikers, zo laat ik zien in de hoofdstukken 3 en 4.

Hoofdstuk 3 beschrijft hoe lekenbezoekers na de verhuizing niet langer naar de Leidse collecties kwamen. Tot dan toe waren de collecties een toeristische attractie geweest, al in de vroegmoderne tijd trokken ze veel bezoekers. Iedereen die dat wilde, kon de collecties bekijken. De opstelling was ook voor niet-medici interessant: verhalen over de herkomst van de preparaten, en over de mensen die ze ooit geweest waren, maakten de preparaten begrijpelijk voor iedereen. Na de verhuizing verdwenen deze (vaak morele) verhalen, omdat de conservatoren ze begonnen te beschouwen als 'onwetenschappelijk'. Dit maakte het lastig de preparaten te interpreteren zonder medische kennis. Daar kwam nog bij dat de nieuwe locatie lastig toegankelijk was voor bezoekers: het gebouw lag verder van het centrum, de ingang lag verder van de straat en de laboratoriumomgeving had een gesloten karakter. Door deze ontwikkelingen verdwenen de lekenbezoekers, niet omdat ze expliciet geweigerd werden, maar doordat de collecties voor hen nu lastig te bereiken en moeilijk te begrijpen waren. In veel steden, waaronder Leiden, is dit nog altijd zo. Veel historische anatomische collecties zijn blijven hangen in ziekenhuizen en laboratoria. Vaak zijn deze collecties in theorie wel open voor bezoekers, maar in praktijk een stuk lastiger toegankelijk dan bijvoorbeeld kunstmusea.

Hoofdstuk 4 bespreekt de curatoren, bestuurders van de universiteit. In de vroege negentiende eeuw gebruikten zij de anatomische collecties als statussymbool, vooral de collectie van de beroemde achttiende-eeuwse anatoom Bernhard Siegfried Albinus. Met zijn collectie konden de curatoren een band creëren met het roemrijke verleden van de universiteit. Zo kon Leiden zich onderscheiden van de andere Nederlandse universiteiten, die in de negentiende eeuw op medisch gebied niet langer voor Leiden onderdeden, maar een minder imposant verleden hadden. Deze strategie vereiste echter dat de preparaten herkenbaar waren als gemaakt door Albinus – en die herkenbaarheid verdween door de voortdurende herinterpretatie van de preparaten. Na de verhuizing werden de collecties opnieuw geordend. Daarbij werden verzamelingen van verschillende makers samengevoegd. De preparaten werden opnieuw beschreven, hun makers werden niet langer duidelijk vermeld en zo raakten de objecten hun geschiedenis kwijt. De curatoren konden de collecties niet meer gebruiken om de universiteit te verbinden met het verleden, en de collecties verloren hun functie als statussymbool.

Zowel de curatoren als de bezoekers konden de collecties niet langer gebruiken zoals ze wilden. Ze werden gehinderd door veranderingen in locatie, opstelling, ordening en classificatie van de collecties. Die veranderingen kwamen voort uit het vóórtdurende gebruik van de preparaten door studenten en onderzoekers. Dat voortdurende gebruik kunnen we alleen begrijpen als we anatomische collecties zien als dynamisch: uit de pot, in de hand, flexibele objecten. In de epiloog betoog ik dat het dynamische beeld van anatomische collecties niet alleen zinnig is voor negentiende-eeuws Leiden, maar ook voor andere plaatsen en tijden – waaronder het hier en nu. Nog altijd wordt er veel menselijk materiaal verzameld, in bijvoorbeeld commerciële cellijnen, verzamelingen bevroren embryo's en weefselbanken. Materiaal in deze collecties komt vaak van nog levende mensen. Zij weten lang niet altijd dat 'hun' lichaamsmateriaal wordt bewaard en gebruikt. Regels over wie eigenaar is van het materiaal en wie er geld aan mag verdienen zijn vaak onduidelijk. Natuurlijk verschillen deze collecties op allerlei manieren van historische collecties, maar er zijn ook overeenkomsten. Zowel hedendaagse als historische anatomische collecties zijn dynamisch en bevatten objecten die gemaakt zijn van wat ze representeren. Het opgeslagen lichaamsmateriaal van nu kan, net als de negentiende-eeuwse Leidse preparaten, steeds opnieuw gebruikt worden. Dit maakt het verleidelijk voor medici om zoveel mogelijk lichaamsmateriaal te verzamelen: het is schaars en het kan altijd van pas komen, nu of later. Dit inzicht helpt ons te begrijpen hoe onwaarschijnlijk het is dat collecties menselijk materiaal ooit uit de geneeskunde zullen verdwijnen.

Curriculum Vitae

Hieke Martine Huistra was born in Buitenpost, the Netherlands, on Thursday 15 April 1982. Between 1994 and 2000, she attended the Stedelijk Gymnasium in Leeuwarden. She then moved to Utrecht to study physics. In 2006, she graduated *cum laude* for her physics bachelor, with a minor in philosophy; in 2008, she completed the master 'History and Philosophy of Science' (again *cum laude*) with a thesis on the gas discharge tube collection of science museum Museon. During her studies, she worked as a guide and content developer at the historical observatory Sonnenborgh. In December 2008, Hieke started her PhD research at Leiden University. She worked on the nineteenth-century Leiden anatomical collections, as part of the NWO programme 'Cultures of Collecting. The Leiden Anatomical Collections in Context'. Early 2011, she spent three months as a research affiliate at the Wellcome Centre for the History of Medicine in London. So far, she has published two articles, a book chapter and several book reviews. Another book chapter and an article are forthcoming. Since April 2013, Hieke works as a post-doctoral researcher at Utrecht University. She now investigates Dutch ideas on health and illness in the twentieth century. Her new project belongs to the NWO-Horizon programme Translantis, which uses digital humanities methods to analyse the role of reference cultures in public debates.