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# 'The precious material': obtaining human fetal bodies for an embryological collection at Uppsala University, ca 1890–1930

Helena Franzén 

Department of History of Science and Ideas, Uppsala University, Uppsala, Sweden

## ABSTRACT

In the late nineteenth century, anatomists at Uppsala University took an interest in embryology, that is, fetal development from conception to birth. In order to conduct embryological research, fetal bodies from all stages of development were needed, but difficult to obtain. By building connections with medical professionals – such as midwives, physicians, and obstetrician-gynaecologists – who had access to pregnant and labouring women, the anatomists at Uppsala University were able to assemble the raw material for their research. However, the various professions involved, and the female patients, had different understandings of what fetal bodies meant and how to manage them. By exploring three contexts of collecting fetal bodies – miscarriages, surgeries to address ectopic pregnancy, and the birth of deviant bodies – this study draws attention to the social processes of knowledge production. It highlights the plethora of meanings ascribed to fetal bodies; underscores that these meanings were underpinned, as well as affected, by understandings of pregnancy; and argues that medical knowledge of reproduction was produced in the dynamic relations between the embryological collection and medical practice.

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## Introduction

In October 1901, in the Swedish town of Västerås, midwife Hilda Pihlgren (1873–1943) was called to the home of an unmarried woman in labour. After a few hours, Pihlgren assisted her in delivering conjoined twins, to the shock of the people present. At first, the twins were not breathing, and no attempts were made to resuscitate them. But they drew breath after a while and the local physician was called in for consultation. As Pihlgren explained in the case description she published in *Jordemodern*, the journal for midwives: 'such an uncommon malformation should not be kept from a physician, and furthermore, it was calming for me as well as the patient [the postpartum woman]'. Although the physician provided instructions for the twins' care, they died a few days later; by his request, their bodies were sent to the medical faculty at Uppsala University.<sup>1</sup> There they would be transformed from children into an object in the embryological collection at the Department of Anatomy, by means of preservation and labelling.

**CONTACT** Helena Franzén  [helena.franzen@idehist.uu.se](mailto:helena.franzen@idehist.uu.se)

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The turn of the twentieth century was the heyday of collecting fetal bodies for embryological research. Anatomists, histologists, and zoologists collected human and animal fetal bodies from all stages of development in order to investigate the processes of evolution and development, and the origins of malformations.<sup>2</sup> This work produced developmental series and norms, and embryological collections materialized embryologists' understanding and expertise.<sup>3</sup> At Uppsala University, August Hammar (1861–1946), professor of anatomy, expanded the embryological collection at the Department of Anatomy. Over the years, the collection became an important hub in the international network of embryological research centres.<sup>4</sup> During the second half of the twentieth century, however, the collection gradually became obsolete, and today it is managed by the Museum of Evolution – Uppsala University's natural history museum.

Previous historical scholarship has focused on the pioneering work of nineteenth- and early twentieth-century embryologists and especially the importance of embryological collections for the production of scientific images.<sup>5</sup> It has also emphasized the importance of infrastructures that provided material for embryological research and the social networks of collecting.<sup>6</sup> However, this strand of research has focused on the embryologists, while the contexts of collecting and the women whose pregnancies originated the specimens have received less scholarly attention. Other types of studies have highlighted these contexts and individuals, and some take women's personal writing as a key source.<sup>7</sup> In a Swedish setting, the female patients whose pregnancies contributed to the collection of fetal specimens at Lund University have been made visible through the use of sources such as patient journals. Such fetal specimens were gifted to the university by doctors practising nearby, and the female patients were often socially disadvantaged.<sup>8</sup> This strand of research has widened our understanding of embryological collections by examining their connections to society through the infrastructure of maternity care and including more actors into the analysis.

Taking a closer look at collecting in the context of maternity care can advance our understanding of the practices involved in assembling specific embryological collections. While the professionalization of midwives and the introduction of surgical interventions on pregnant women have been investigated in Sweden, so far the relation between these developments and embryologists' collecting enterprises in the decades around 1900 has not been scrutinized.<sup>9</sup> By broadening the range of relevant actors and drawing on new empirical material, fresh perspectives on this particular form of knowledge production can be uncovered.

The present paper investigates how medical knowledge of human reproduction was produced through practices of collecting and using fetal bodies, mainly from the early 1890s to 1930. By focusing on the Department of Anatomy at Uppsala University, and the role of Hammar, I show how an embryological collection became an important resource for research, education, and medical practice in Sweden. Embryological collections were dependent on access to women in all stages of pregnancy, which, especially on the early side of this period, was negotiated in the private sphere. I explore three contexts of acquiring human fetal bodies for the Uppsala collection: miscarriages, surgeries to address ectopic pregnancy, and the birth of deviant bodies. This study demonstrates that Hammar relied on a wider social network of medical professionals, who between them had different claims, interests, and conceptions of the unborn. This entailed interpretation of the materiality of entities which emanated from women's wombs, in a time

period when there was great uncertainty over how to categorize these entities.<sup>10</sup> Knowledge production is not linear, and I argue that collecting, preparing and using specimens, as well as treating pregnant women, were entangled processes that affected each other in various ways.

In order to capture this complexity, I draw on the concepts of ‘social worlds’ and ‘boundary object’. The former is a community, which shares an agenda and operates within a joint framework. The latter is characterized by interpretative flexibility, and representatives of different social worlds interacting with the object have different views of its meaning and uses. A material entity becomes a boundary object when tension arises between social worlds regarding what it is and how it should be managed.<sup>11</sup> These concepts draw attention to how different stakeholders assigned meaning to fetal bodies, within the contexts of interaction and use. The social worlds in this investigation are constituted of different (mainly medical) professionals, on the one hand: embryologists, physicians, midwives, obstetricians-gynaecologists, surgeons, pathologists, and priests. On the other hand, there are the pregnant women, positioned as patients, and thus in asymmetrical relationships to the medical practitioners.

Several types of primary sources are used in this study. First, the collection itself is preserved to a great extent and has not previously been examined in historical research.<sup>12</sup> Collection objects have been analysed with a focus on their materiality, for example preparation methods, labels, forms of display, and storage. These material traces provide clues about the origins of the objects, and how they were incorporated into the social world of embryologists. Second, archival texts such as collection catalogues and letters provide insight into the organization of the collection and the social relations that enabled the flow of fetal bodies. Third, medical publications enable me to trace how the collection affected treatments of pregnant women and contributed to new medical knowledge. By piecing together fragments from these sources, it is possible to uncover and discuss tensions around the understanding of fetal bodies in different social worlds. A methodological challenge in this study is that the voices of female patients are only accessible through – and mediated by – the accounts of medical practitioners. In response I consider the contexts when the women’s stances are made visible or not, hence attending to what was at stake and for whom.

## **The formation of the embryological collection at Uppsala University**

In early modern Europe, anatomists acquired fetal bodies – especially unusual ones – for their cabinets of curiosities, which displayed rare and wondrous things.<sup>13</sup> Obstetrical collections could also contain such bodies, used as pedagogical aids for teaching midwifery students.<sup>14</sup> At Uppsala University, there had been human fetal bodies in the anatomical collections since the late eighteenth century.<sup>15</sup> But something qualitatively new happened at the turn of the nineteenth century, when anatomists started to conceptualize fetal growth in terms of development in the sense of changing form, not only increasing size. They also took an interest in conception and the earliest phases of pregnancy. This interest in development was a theme across disciplines, including anatomy and zoology.<sup>16</sup> While some earlier collections were characterized by taxonomical use, there was now an emerging trend in analytical work, which required large series of specimens for comparative research.<sup>17</sup> Medical collections – containing

preparations of bodies, models, and instruments – became resources for cutting-edge research and education, and vital for establishing new disciplines.<sup>18</sup> The nineteenth and early twentieth centuries can thus be conceptualized as ‘the age of museum medicine’.<sup>19</sup>

Scholars interested in fetal development, as well as that of species, amassed fetal bodies of humans and animals. A goal was to ascertain, through comparison, the point when certain bodily changes occurred.<sup>20</sup> External as well as internal morphological development was examined. The research questions determined the methods of preservation and the selection of specimens. Traditionally, specimens, including fetal bodies, were either skeletonized or put in jars of spirit solutions. When histology – the study of tissues – emerged in tandem with the refinement of microscope lenses in the mid-nineteenth century, scientists turned their eyes to smaller bodily structures than before.<sup>21</sup>

Histology was introduced at the anatomical department at Uppsala University in the 1860s by Professor Edward Clason (1829–1912).<sup>22</sup> He designated a working space – the histological laboratory – and assembled equipment, such as microscopes.<sup>23</sup> Whereas Clason studied embryology abroad in 1869, he did not focus on this field when he returned to Uppsala.<sup>24</sup> However, in the 1880s, Clason re-arranged the existing anatomical collections, which had been loosely sorted according to year of acquisition and areas of the body. Clason adjusted themes and sorted fetal specimens under the heading ‘embryological preparations’. He thus created the foundation of the embryological collection further extended by Hammar.<sup>25</sup>

Hammar, who was working at the histological unit, took an interest in this field in the 1890s. After receiving his doctorate in 1892, he studied with the prominent embryologist Wilhelm His (1831–1904) in Leipzig. After his return to Uppsala, Hammar started collecting fetal bodies for embryological research, expanding the existing collection.<sup>26</sup> Upon arrival at the department, these bodies were transformed into collection objects by means of preservation, labelling, and cataloguing. Some were put in jars of liquid solutions. Others were cut into serial sections and stored in a cabinet in Hammar’s office.<sup>27</sup> These sections were fixed on glass slides intended for observation through the microscope, enabling the study of organ development.<sup>28</sup> At first, few specimens were collected, but the numbers increased steadily over the years, especially preparations for microscopic study.<sup>29</sup> In 1926, there were 143 serial-cut human fetal bodies of earlier stages of development in the collection.<sup>30</sup> Today, 120 are preserved, still in the cabinet which once stood in Hammar’s office.<sup>31</sup>

Since the preparations fixed on glass were meant for microscopic study, they were referred to as a resource of the histological unit. They were used in embryological research together with wet specimens of fetal bodies in later stages of development.<sup>32</sup> There is some difficulty in estimating how many fetal bodies of the latter type were incorporated into the embryological collection during Hammar’s career. According to the collection catalogues, there were around forty.<sup>33</sup> However, not all fetal specimens were catalogued. Today, thirty-four wet fetal specimens are still preserved.<sup>34</sup> In addition to human fetal bodies, other species were also collected for comparative research.<sup>35</sup> The overarching frame that defined the embryological collection was that the objects within it were used for embryological research and teaching, and at the same time materialized embryological knowledge of fetal development.

## Hammar's specimen supply network

Since embryologists did not have direct access to pregnant women beyond the occasional female corpse presented for dissection or autopsy, cooperation was required in order to get hold of fetal bodies. Like his colleague – and collaborator – Ivar Broman (1868–1946), professor of anatomy at Lund University and later director of the Tornblad Institute of Comparative Embryology, Hammar built a vast network.<sup>36</sup> Hammar fashioned his supply network primarily through the infrastructure of maternity care. During the period of study, the majority of the Swedish population lived in the countryside, and most childbirths took place at home. According to regulations, 'normal' labours should be supervised by a midwife, and 'complicated' ones by a physician. There were also lying-in hospitals in the bigger cities, where mainly the poor and women experiencing complications sought treatment.<sup>37</sup>

Enlisting medical professionals who interacted with pregnant and postpartum women proved a successful strategy. In 1902, Hammar reported in Uppsala University's yearbook that the department had received 'some particularly valuable contributions to the embryological material collection' thanks to 'extensive contact with a number of physicians and midwives in different parts of the country'.<sup>38</sup> This statement indicates that within medical science, it was considered prestigious and uncontroversial to receive fetal bodies into institutional collections at the time. For instance, Carl David Josephson (1858–1939) – professor of obstetrics and gynaecology at Uppsala University – gifted a fetal body of 25.5 mm in length to the Department of Anatomy in 1915. He had obtained it during a surgical procedure, probably the removal of an ectopic pregnancy.<sup>39</sup> It was photographed, the photos supplied with Josephson's name, the date received, and the circumstances (see Figure 1). Photography and other means of documentation were among the first steps in fixing the meaning of these bodies.

The body was subsequently cut into serial sections and laid out on a tray in the cabinet. This procedure was standard for the majority of the incoming fetal bodies, although their origins were not always noted. Overall, gifting specimens to institutions, and receiving acknowledgement in return, was a well-established practice.<sup>40</sup> Beyond maintaining social ties, it generated recognition for the sender, who provided valuable resources for scientific work. Prestige gained through the collections reflected back onto those who had supplied specimens.<sup>41</sup> In addition, some were granted access to the collection for research purposes.<sup>42</sup>

The participants in Hammar's supply network had various professions: physicians, embryologists, surgeons, obstetrician-gynaecologists, pathologists, and midwives.<sup>43</sup> Each of these represented a social world with its own approach to fetal bodies, rooted in its role, authority, and understanding of how fetal bodies should be managed. Some were present at women's bedsides, others received them at clinics, or examined either their corpses or parts of their bodies that had been extracted during surgery. Hammar's network mainly consisted of medical men, who in various capacities had access to female patients' bodies. Midwives were the exception, as women who managed other women's pregnancies. Yet they were structurally subordinated to obstetrician-gynaecologists and physicians.

Existing social relations were an important factor in facilitating the flow of bodies. In the early twentieth century, physicians commonly sent specimens to their *alma mater*. Former students of Clason and Hammar gifted fetal bodies to the department, having





**Figure 1.** Photographs of a fetal body in the embryological collection at Uppsala University. The body was gifted to the Department of Anatomy by Carl David Josephson in May, 1915. Museum of Evolution, cabinet Embryonala snittserier, skåp 1 Homo, tray 282. Photograph by author.

been encouraged to do so (especially for those from the earliest months of pregnancy) in future practice.<sup>44</sup> Many of those who supplied Hammar with specimens were associated with the Department of Anatomy, either as former students or as colleagues working at the Uppsala University Hospital (e.g. the obstetric and gynaecological clinics, or the pathological laboratory). Most of them were members of the Uppsala Society of Medicine, and it is likely that Hammar made informal requests to his colleagues. In order to reach members living outside Uppsala, Hammar advertised in the society journal, asking physicians to send him fetal specimens.<sup>45</sup>

While personal social ties characterized Hammar's relations with physicians, embryologists, obstetrician-gynaecologists, surgeons, and pathologists, this was not the case with midwives, with whom he did not share any professional settings. As seen in the introductory case, midwives were sometimes involved in the acquisition of fetal bodies, but physicians acted as intermediaries in sending them to the Department of Anatomy, thereby claiming credit.<sup>46</sup> To reach midwives directly, Hammar used other means. In November of 1901, he published an advertisement in *Jordemodern*, the journal for Swedish midwives, in which he asked for fetal bodies especially from the early months of pregnancy.<sup>47</sup>

Hammar thus achieved national coverage for his request, since the journal was distributed to midwives in all districts of Sweden. Midwives studied at midwifery schools at the Southern Lying-In Hospital in Stockholm, at the Sahlgrenska Hospital in Gothenburg, and in Lund. Obstetrician-gynaecologists directed these schools, and those based in Stockholm and Gothenburg belonged to Hammar's network, sending numerous

specimens over the years.<sup>48</sup> The obstetrician-gynaecologists who taught midwives were also the editors of *Jordemodern*. Thus, beyond providing Hammar with fetal bodies, they also granted him access to midwives, an essential category of medical practitioners in maternity care in Sweden during the period of study.<sup>49</sup>

While embryologists framed fetal bodies as ‘the precious material’, this conceptualization was specific to their social world.<sup>50</sup> For Hammar, it was essential to communicate his need for fetal bodies to medical practitioners with access to pregnant and postpartum women, as well as to persuade them to align with his approach to the management of these bodies. The professionals in Hammar’s supply network belonged to the same wider realm of medicine, but assigned different meanings to fetal bodies. Moreover, medical practitioners, to varying degrees, negotiated the procurement with the female patient and her relatives. Tensions between these social worlds intersected in fetal bodies, which became boundary objects.

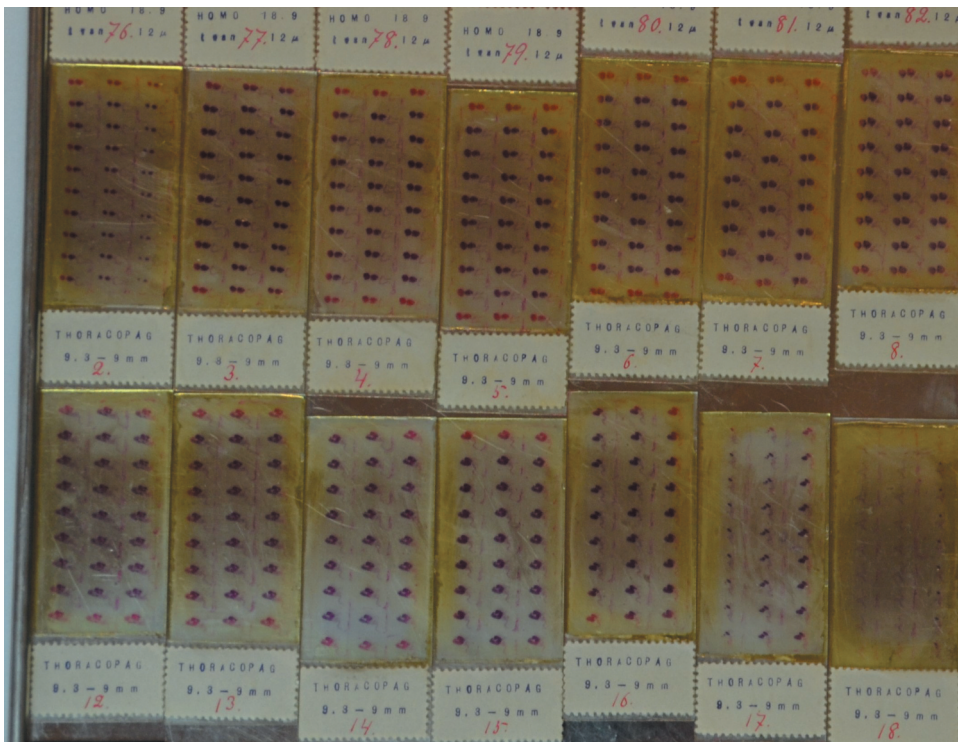
### Accessing the products of miscarriage

There is no inherent, universal understanding of the unborn.<sup>51</sup> Entities emanating from women’s wombs have historically been conceptualized in various ways – which have steered their management or disposal. Views on the matter were not necessarily unanimous, sometimes prompting tensions and conflicts regarding their fate.<sup>52</sup> In Sweden around 1900, pregnancy was an uncertain state. According to obstetrician-gynaecologists, the old notion of quickening – that the child came alive when the woman felt it move inside her – was still prevalent.<sup>53</sup> The months leading up to that moment were full of ambiguities. However, medical practitioners and common people alike saw the absence of menstruation as an indicator that a pregnancy might have commenced.<sup>54</sup>

Embryologists framed the fleshy pieces flushed out with vaginal bleeding in the early months of an assumed pregnancy as raw material for their scientific enquiries.<sup>55</sup> For instance, in October 1917, a woman who had miscarried on four previous occasions entered the gynaecological clinic at Uppsala University Hospital. She had abdominal pains and heavy vaginal bleeding. At examination, an ‘ovum was found lying in the vagina’, and was removed. It proved to contain conjoined fetal bodies that were ‘kindly presented to the Anatomical Institute for further examination’.<sup>56</sup> There they were examined by Fredrik Ysander (1891–1971), student of August Hammar, who categorized them as *thoracopagic* – joined at the chest. Their respective measurements were 9 mm and 9.3 mm in length: they were serially sectioned and incorporated into the embryological collection (see Figure 2). Ysander presented his research and demonstrated specimens at a meeting of the Uppsala Society of Medicine the following month, and published the results in the society journal in 1923–1924.<sup>57</sup> Fetal bodies emanating from a miscarriage were hence incorporated into the social world of embryologists by being transformed into collection objects and used for research whose results were made available for medical practitioners.

For obstetrician-gynaecologists and midwives, the presence of fetal bodies in bloody discharge was a diagnostic sign of a miscarriage. In this particular context, fetal bodies became a boundary object between embryologists, obstetrician-gynaecologists, and midwives. Even though these two latter professions supervised the bodies of pregnant





**Figure 2.** A selection of serially sectioned fetal body in the embryological collection at Uppsala University. They are labelled 'Thoracopag' and '9.3–9 mm'. Museum of Evolution, cabinet Embryonala snittserier, skåp 1 Home, tray 378. Photograph by author.

women, their social worlds were divided by claims of expertise, authority and space of practice. Obstetrician-gynaecologists were based at lying-in hospitals in bigger cities, whereas midwives were present in cities and rural areas, and went to women's homes. In addition, a hierarchy separated them: obstetrician-gynaecologists were specialized physicians, and physicians had claimed a position as midwives' superiors for centuries back.<sup>58</sup>

The care of miscarriages was in the midwife's tasks from the mid-1890s. In the midwifery manuals – authored by obstetrician-gynaecologists – one stated cause of miscarriages was the 'malformation' of the fetal body. Knowing the reason for a miscarriage was important, since it informed further treatment of the female patient.<sup>59</sup> Midwives were instructed to treat women with vaginal bleeding as undergoing a potential miscarriage. The presence of a fetal body indicated whether a pregnancy had occurred and had ended with a miscarriage. In cases when the woman was thought to be in the early stages of gestation, clotted blood, 'blood-livers', emanating from her body could be collected and placed in cold water.<sup>60</sup> Sometimes a fetal body was embedded in such tissues.<sup>61</sup>

Midwives had to learn how to look for fetal bodies in the early stages of development, and so images of fetal bodies along with explanations were printed in *Jordmodern* and in midwifery manuals. In turn, this knowledge about conception and fetal development built

on embryological collections and research.<sup>62</sup> In their practice, midwives encountered fetal bodies of varying sizes, and the meanings assigned to these bodies by representatives of different social worlds sometimes clashed. The distinguishing factor in the medical definitions of miscarriage and premature labour was situated in the materiality of the fetal body. Obstetrician-gynaecologists drew the line at the seventh month of pregnancy, based on the perception that a fetal entity of earlier stages of development would not survive outside the woman's body. This was thought to correspond with a fetal body about 35 cm long.<sup>63</sup> Midwives were expected to follow this guideline. From 1910 onwards, there was a newly introduced column for miscarriages to use as a checkmark in the midwife diary – the paper form in which midwives were supposed to document the care they had given.<sup>64</sup>

Whether fetal bodies should be documented, and by whom, was a recurring issue. According to regulations during the period of study, fetal bodies 50 cm long (38 cm from 1921) should be registered as children.<sup>65</sup> Another issue was their disposal. In Protestant Sweden, ecclesiastical law was not specific on this point, but those not categorized as children were not recognized as persons, and consequently not granted a burial.<sup>66</sup> Yet fetal bodies were sometimes put in small boxes and wedged into church walls or interred in the caskets of adults.<sup>67</sup> In practice, it was not self-evident where to draw the line between a non-child and a child, and this grey area gave rise to tensions.

In 1922, an anonymous midwife submitted a question to the advice column in *Jordemodern*. She asked: 'does a midwife need to report miscarriages at the parish office?' The local priest had asked whether a fetal body categorized as a miscarriage 'was allowed to disappear', and his concern had been that induced miscarriages would go undetected.<sup>68</sup> The editor, Edvard Alin (1859–1935) – who at the time also was the director of the midwifery school at the Southern Lying-In Hospital in Stockholm – replied. Referring to a priest based in Stockholm, who did not record fetal bodies less than 35 cm long, the editor stated that 'in the friendly scientific view, the boundary between "miscarriages" and children is set to 35 cm and since only children (dead and alive) are mentioned in the church books, the above mentioned procedure [to not involve the priest] has been the right one'.<sup>69</sup> The editor further stated:

The line must, by the way, be drawn somewhere. What would it lead to if a midwife were to report all miscarriages, 6–8 cm fetuses, empty eggs, and so on, which presumably would happen, if this report was to serve the moral purpose of exposing cases of induced miscarriage, which seems to be the point of the priest mentioned in the query.<sup>70</sup>

Alin belonged to Hammar's network and donated fetal bodies to the embryological collection at Uppsala University.<sup>71</sup> As highlighted earlier, Alin had an interest in providing material for embryological research, since it could generate knowledge that he might employ within the social world of obstetrician-gynaecologists. Therefore, he likely perceived priests' interest in these bodies as a threat and emphasized his own version of how their significance. The question of how to document miscarried fetal bodies was a recurring one. In 1930, a midwife wrote:

The Vicar in the parish where I serve requires a written report of fetuses which in the diary are designated as miscarriages (the length of the fetus under 35 cm, also early) to be documented in the birth record as a stillborn child. I have refused. Do I have the right to do so? What should I do?<sup>72</sup>

The editor reassured her, stating that she had the obligation not to share information about what had transpired with outsiders, but that she should record the miscarriage in her diary. As priests were framed as outsiders, they were not allowed to have a stake in the matter. Furthermore, the question of disposal was brought up by the midwife, who asked, 'is it not my obligation to attain such a fetus and leave it to the grave-digger to be laid down into a grave at a suitable moment?'<sup>73</sup> She received the answer that handing over a fetal body to the grave-digger would be to expose the woman who had miscarried, and that 'you should let your compassion with the living human speak higher than your piety with the dead potential human'.<sup>74</sup> Medical practitioners were obligated to keep information about their patients' ailments confidential from non-medical practitioners.<sup>75</sup> The editor's answer likely invoked this obligation, but at the same time, it allowed for the midwife to dispatch the fetal body to embryologists.

The examples above illuminate tensions regarding the meanings of fetal bodies, assigned to them by representatives of different social worlds, as well as conflicting views of how they ought to be managed in terms of documentation and disposal. Fetal bodies hence became boundary objects at the intersection between these social worlds. Some midwives answered Hammar's call for specimens, acquired miscarried fetal bodies and dispatched them to the embryological collection.<sup>76</sup> In doing so, they joined Hammar's network as active participants in reciprocal exchange, and by contributing to embryological research, they participated in producing medical knowledge considered useful in the social world of midwives.

In this study, it is not possible to gauge what meaning the patients – the women whose miscarriages resulted in specimens for Hammar – attached to their terminated pregnancies, and by extension the management of the entities leaving their bodies. It most likely depended on how individual women felt about their pregnancy, as well as how far along it was. It is likely that women during the period of study did not conceptualize fetal bodies from the very early stages of development as children, even though they might have considered a miscarriage the loss of a potential child, and attached grief to the event itself. Previous scholarship has highlighted that women with unwanted pregnancies often responded to miscarriages with relief or joy. This reaction could manifest as indifference to the fate of the fetal body.<sup>77</sup> Individual expectations and desires for the future likely guided specific female patients' attitude towards the disposal of the product of their miscarriages.

## Reaching into the abdomen

While the insides of dead women's bodies had been dissected and examined by anatomists since the sixteenth century, abdominal surgery was rare before the mid-nineteenth century.<sup>78</sup> When inhalation anaesthesia was introduced for surgical procedures in the late 1840s, surgeons and obstetricians ventured into the belly of living, pregnant women to an increasing degree. Interventions with the scalpel became an integral part of the emerging discipline of gynaecology, intertwined with the older discipline of obstetrics. In the 1880s, surgeries in order to terminate ectopic pregnancies started to be conducted in Sweden, albeit rarely.<sup>79</sup> The procedure was performed on the basis of a preliminary diagnosis, which could only be confirmed during or after the operation by the presence of a fetal body.<sup>80</sup> Consequently, in the social worlds of obstetrician-gynaecologists and surgeons, a fetal body in this context was a diagnostic sign.

At Uppsala University, gynaecology was merged with the older chair of obstetrics and got its first professor in 1893. While there already was an obstetrical clinic at Uppsala University Hospital, the gynaecological clinic was founded in 1896 and first located in a rented house. When the hospital building was expanded in 1903, the gynaecological clinic was moved there, adjacent to the obstetrical clinic, and got its own operating room.<sup>81</sup> Over the years, several fetal bodies were gifted to the embryological collection by representatives of these clinics, especially from Carl David Josephson.<sup>82</sup>

The processes that led to ectopic pregnancy were little known during the period of study and were an area of inquiry for obstetrician-gynaecologists, who considered it a deviant condition within their domain. In his textbook of gynaecology for medical students, first published in 1901–1902, Josephson described how the egg probably is fertilized in the fallopian tube – rooted in the embryological understanding of fetal development – and highlighted the different variations of ectopic pregnancies. He explicitly drew on his own experience, and connected the treatment of patients with observations made in connection to surgery.<sup>83</sup>

Tissues removed from patients' bodies during surgery were highly valued research material for medical professionals. In one case report, a woman entered the gynaecological clinic at Uppsala University Hospital on New Year's Eve, 1907. She was preliminarily diagnosed with an ectopic pregnancy and underwent surgery. A lump was found nested amongst intestinal adhesions, and subsequently removed. The patient survived and was discharged, while the lump was investigated and yielded a 20 cm long fetal body. Together with the lump tissue, it was sent to the pathological department for further examination. The fetal body was thereafter preserved in liquid and parts of the lump cut into sections, to be studied under the microscope, in order to answer the question of where precisely the fertilized egg had latched on and started to grow.<sup>84</sup>

It is likely that the fetal body in the example above was incorporated into either the pathological collections or the embryological. The clinics at Uppsala University Hospital routinely provided them with specimens procured from patients, in order to enable research that the clinics deemed beneficial.<sup>85</sup> Insights gained from examining residues from terminated ectopic pregnancies were hence intended to feed back into the practices of diagnosing and managing the condition. This knowledge was produced by a collaboration between medical professionals in different social worlds, with their own specific interests in the boundary object.

In order to deepen their understanding of the cases encountered in their practice, clinicians at Uppsala University Hospital, provincial physicians, and clinics at county hospitals sent material, such as tissues from assumed ectopic pregnancies in which fetal bodies had not yet been encountered, from their patients' bodies to the pathological department. When there were diagnostic uncertainties, medical practitioners were encouraged to consult a pathologist, since the core of that profession's expertise was to ascertain and expand knowledge of conditions considered pathological.<sup>86</sup> Once the Uppsala pathologist Artur Vestberg (1859–1935) had analysed the tissues he received, he passed on some fetal bodies he had found to Hammar, who attached other meaning – namely raw material for embryological research – to them, since he wanted answers to a different set of questions.<sup>87</sup>

Obstetrician-gynaecologists were reliant on embryological knowledge about fetal development in their practice. In the academic year 1915–1916, Josephson conducted research on the fetal development of internal reproductive organs, by examining specimens in the embryological collection.<sup>88</sup> He published the results in the journal of the Uppsala Society of Medicine.<sup>89</sup> Moreover, when Josephson published the second edition of his gynaecological textbook in 1922, there was a separate chapter on ectopic pregnancies, expanding on material which had appeared alongside diseases of the fallopian tubes in the previous edition. Describing abdominal pregnancy – when the fetal body grows in the peritoneal cavity – he discussed whether this particular kind of ectopic pregnancy could be primary or secondary. As a basis for reasoning, Josephson stated that when examining internal reproductive organs of fetal bodies in early developmental stages, it had been found that it was possible for an abdominal pregnancy to commence in the peritoneal cavity.<sup>90</sup> Despite the absence of an explicit reference, it is likely that this addition was based on Josephson's observations in the embryological collection.

Ectopic pregnancies were as good as certain death for a woman and fetal entity both, if left untreated. If the fetal body was removed, the female patient had a chance at survival – especially if the surgery was conducted before the growth of the fetal body caused internal haemorrhage. The consensus amongst obstetrician-gynaecologists was that even if it was left to grow, it was unlikely to reach a mature enough stage of development in order to be viable at the time of rupture.<sup>91</sup> Therefore they believed that no future life was taken when this kind of pregnancy was terminated.

While it seems that surgeons did not address the issue of asking the woman for permission to acquire the removed fetal body, they discussed the question of the patient consenting to the surgical procedure. Some women, but not all, women were reported to have consented to the operation. Previous research has shown that ideas about what constitutes consent, and its relation to information about the impending procedure, is historically and socio-culturally contingent, as well as entangled with power relations.<sup>92</sup>

Signs of ectopic pregnancy often manifested acutely, and the operation considered urgently necessary. Even though many women who underwent the procedure were reported to survive, not everyone did. Given that ectopic pregnancies were framed as a death sentence if left untreated, it is likely that the women who entered clinics with assumed ruptured fallopian tubes were operated on immediately. Incoming patients in an acute state could not easily resist treatment, and by entering the medical practitioners' realm of expertise, they could have been seen as automatically subjecting themselves to it.<sup>93</sup> There are, however, indications that those who sought care with non-acute and more diffuse symptoms had the intervention suggested to them as elective surgery.<sup>94</sup>

By the end of the period of study, the operation was considered a standard procedure. This was enabled by factors such as the establishment of clinics, treatment of patients, and research conducted by several medical professions. In this context of collecting, fetal bodies became boundary objects since they at one level were assigned specific meanings in the social worlds of obstetrician-gynaecologists and pathologists. On another level, these professions collaborated with each other and with embryologists – in this case Hammar – in order to produce medical knowledge that would benefit themselves in their professional capacity, as well as future patients.

## Managing deviant bodies

In the early modern period, it could be unclear whether entities emanating from women's wombs were human or not, but by the late nineteenth century this was no longer the case. Instead of viewing them as monsters, medical practitioners agreed on the human nature of unusually shaped bodies, but discussed them in terms of viability.<sup>95</sup> Medical practitioners in Sweden used the term 'malformations' as a yardstick, to describe bodies considered deviant from the norm. These conditions ranged from less serious – such as a cleft palate – to the life-threatening 'severe malformations', for example the absence of cranial bones.<sup>96</sup> Embryologists were interested in finding out why malformations occurred, and when they emerged during fetal development.<sup>97</sup>

In contrast, obstetrician-gynaecologists who taught at the midwifery schools used preparations of malformed newborns to illustrate potential difficulties in delivering such bodies.<sup>98</sup> Midwifery teachers asked midwives to send malformed bodies they encountered in their practice to the collections at the midwifery schools, in order to supply future students with learning material.<sup>99</sup> There was thus competition between obstetrician-gynaecologists and embryologists: both wanted to acquire malformed fetal bodies, but for different purposes.

Yet in some instances their professional interests aligned, which resulted in collaboration. In the autumn of 1917, Carl David Josephson delivered conjoined twins, who died during birth, at Uppsala University Hospital. The case was presented on 22 February 1918, at a meeting held by the obstetrical-gynaecological section of the Swedish Society of Medicine in Stockholm. This was a forum in which obstetrician-gynaecologists shared observations, demonstrated specimens which they procured from specific patient cases, and discussed related matters. Josephson emphasized the difficulty in managing the labour and diagnosed the twins with a thoracopagic malformation. The presentation was subsequently published in the society journal *Hygiea*.<sup>100</sup> Josephson's diagnosis was likely a result of knowledge gained from the research of Fredrik Ysander, who at the time was investigating the development of this particular malformation.

A few months after Josephson's presentation, Ysander lectured about thoracopagic twins for the obstetrical-gynaecological section. He referred to Josephson's presentation and stressed that little was known about the cause of this condition, or how it unfolded during fetal development. Ysander emphasized the need for more research, which required such bodies from different stages of development. At the time, there were twelve – gifted from medical professionals based in different parts of Sweden – in the embryological collection, on which Ysander conducted his research. His presentation was also published in *Hygiea*.<sup>101</sup> While it is unclear whether Josephson gifted the conjoined twins delivered in 1917 to the embryological collection, he did so with thoracopagic twins that he delivered in 1918, and they were used as research material in Ysander's doctoral thesis on this type of severe malformation. In Ysander's thesis, the women from whose wombs the fetal specimens emanated are not visible.<sup>102</sup> In contrast, Josephson described the female patient's medical history regarding previous labours and stated that there were no known malformations in her or her husband's family.<sup>103</sup> For embryologists, only the fetal body was of interest, while in the social world of obstetrician-gynaecologists the woman was also important, as their patient.<sup>104</sup>



Newborns with bodies categorized as severely malformed found their way into the embryological collection at Uppsala University throughout the period of study. In 1896, conjoined twins were born to 'a labourer's wife', procured by a physician, and dispatched to the Department of Anatomy, where they were incorporated into the social world of embryologists by being made into a collection object (see [Figures 3–4](#)). Their bodies were used as research material in order to address how, why, and when their shape occurred during fetal development.<sup>105</sup> In this study, it is not possible to gain insight into how the female patient who gave birth to the twins approached the management of their bodies. Yet the issue can be discussed in general terms.

Anatomists in Sweden had gained the right to dissect the bodies of deceased newborns born out of wedlock in the mid-eighteenth century, as a punishment for the parents' marital status: the dissection was framed by anatomists as a way to make amends.<sup>106</sup> The sources further illuminate that in practice, medical practitioners sometimes also obtained newborns with bodies deemed deviant, born to married couples. In these situations, there could be negotiations and monetary transactions.<sup>107</sup> In his annual report of 1883, Olof Söderbaum (1842–1909), provincial physician in the Sundsvall district and former student at Uppsala University, complained that he had not been able to procure the stillborn conjoined twins whom he had delivered:

As I, by the time of my journey home, had the father's permission to acquire the conjoined fetuses to dispatch them to a museum if the mother allowed, but as she at the time was considered too weak to be asked, I performed no other examination than taking the above-mentioned measurements. The mother, who had been a schoolteacher, refused firmly to give away the children, but for several weeks she let them be seen by neighbouring peasantry.<sup>108</sup>

It is likely that Söderbaum intended to send the twins to the anatomical museum at Uppsala University, since it was his *alma mater*, and doing so would have generated acknowledgement and prestige for him. The negotiation between the physician and the female patient, intersecting in the boundary object, proved unsuccessful for the physician in this case. The bodies of these twins were put on display by the postpartum woman, instead of presenting them for scientific enquiries. In the second half of the nineteenth and early twentieth centuries, bodies (dead and alive) considered deviant were put on popular display, internationally and in Sweden. Practices of display in the scientific and public spheres co-existed and to some degree overlapped. The same kinds of bodies were at the focus of attention, albeit for different purposes.<sup>109</sup> In this study, it is not possible to ascertain why this woman chose to exhibit her dead twins to the local community. The fate of deceased newborns considered severely malformed was not obvious, but up for negotiation.

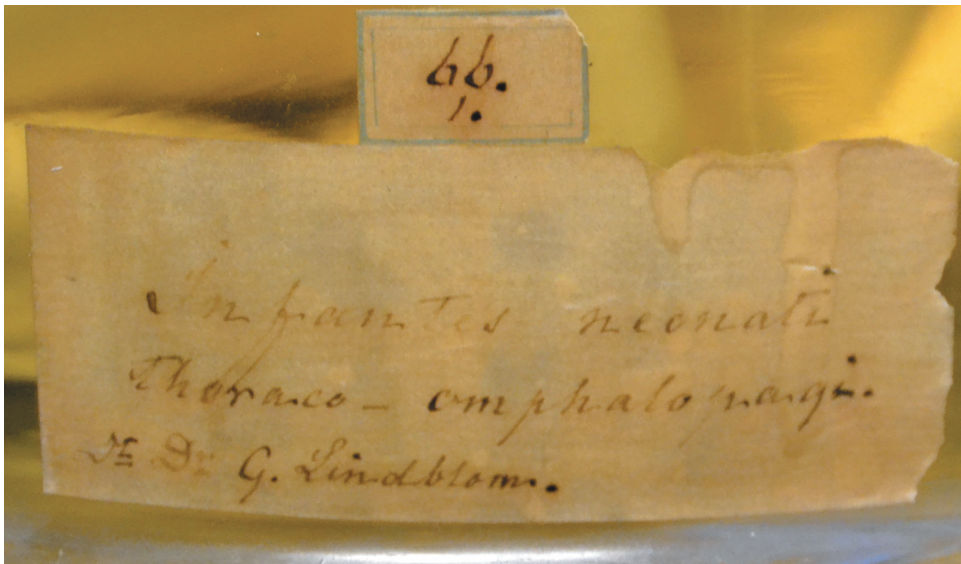
The theme of uncertainty was always present, the postpartum woman often voicing 'the anxious question after completed labour, if her child is well formed'.<sup>110</sup> It was the attending medical practitioners' duty to inspect the newborn for any malformations.<sup>111</sup> But as this question indicates, it was not the medical practitioners alone who ascribed meaning to the shape of the newborn. In June 1892, a miller's wife gave birth to a child without cranial bones, which left the brain exposed. The attending midwife put it aside on a couch and tended to the female patient. When sharing the experience with her colleagues via *Jordemodern*, the midwife expressed, 'I wished in my heart that the child would die, but it lived'. As it did live, it was cared for, yet died two days later.<sup>112</sup>



**Figure 3.** Conjoined newborn twins from the embryological collection at Uppsala University. The bodies were gifted to the Department of Anatomy by Dr. Lindblom in 1896. Museum of Evolution, the wet specimen storage. Photograph by author.

The fate of this newborn remains unknown, but some midwives sent malformed newborns to the anatomical department in Uppsala.<sup>113</sup> Those with bodies not considered viable were deeply ambiguous entities. If they were asphyxial, usually no attempts were made to resuscitate them, but if they managed to draw breath by themselves, they were cared for. When they died, conflicting ideas about the disposal could clash – the opposing parties being the female patient and her husband, and the attending medical practitioner. As shown, medical practitioners did sometimes obtain bodies of malformed newborns. But this was not always the case. The female patient and her husband could display them, or have them buried in a cemetery without letting a medical practitioner conduct an autopsy or gain access to the body.<sup>114</sup> Like miscarried fetal bodies at later stages of gestation, the management of deceased malformed newborns was a grey area, which caused uncertainty and opened up space for negotiation. Nonetheless, malformed newborns were referred to as ‘children’.

When asking midwives to send malformed fetal bodies to the midwifery teaching collection at the Southern Lying In-Hospital, the editor of *Jordemodern* stressed ‘the necessity of proceeding delicately, so that the parents’ feelings are not hurt in any



**Figure 4.** Label of the specimen in Figures 3. Museum of Evolution, the wet specimen storage. Photograph by the author.

way'.<sup>115</sup> This sentiment was emphasized in the handbook for midwives published in 1920.<sup>116</sup> It was a likely result of contemporary debates regarding anatomists' right to certain categories of deceased individuals.<sup>117</sup> Medical practitioners might not have conceptualized malformed newborns as persons, since they were not expected to survive outside the woman's body. Once incorporated into the embryological collection – the focal point of embryologists' social world – the meaning of individual fetal bodies was fixed as material for embryological research.

## Conclusion

This article has explored how medical knowledge of reproduction was produced through the expansion and uses of an embryological collection at Uppsala University, in 'the age of museum medicine'. In the 1890s, it was difficult to obtain fetal bodies, especially from the earliest stages of development, and anatomy professor August Hammar relied on broader geographical and social contexts for building the collection. Gradually, the expanding infrastructure of maternity care in the Uppsala region made it possible to acquire a larger volume of specimens closer to home. By the 1930s, the embryological collection was well established, serving as a resource for cutting-edge research and education in several disciplines and subjects.

Fetal bodies were ambivalent and multifaceted entities – boundary objects, whose significance was up for negotiation. Within the social worlds of various professions, the management and uses of fetal bodies were means of exercising authority. For instance, medical practitioners such as obstetrician-gynaecologists and midwives considered fetal bodies flushed out with vaginal bleeding as a diagnostic sign of miscarriage. In contrast, priests might frame these as deceased children, who should be documented and buried.

A woman might conceptualize the fetal body originating from her own in different ways, for example, whether she had experienced ‘quickening’. The various fates of malformed newborns also shed light on how the views of stakeholders could clash. That some women chose to bury their deceased malformed newborns, while others exhibited them for the local community, indicates that these bodies were highly ambiguous. Greater heterogeneity in attitudes towards full-term malformed newborns might have resulted from the fact that they were categorized as children due to their size, but at the same time, the management of their deceased deviant bodies was not self-evident.

The meanings assigned to fetal bodies by representatives of different social worlds were not always in conflict, however. For example, obstetrician-gynaecologists, surgeons, and pathologists all considered fetal bodies encountered while surgically removing a suspected ectopic pregnancy as a basis for diagnosis. When these bodies had served their purpose as diagnostic signs, the medical practitioners sent them to Hammar. Beyond the prestige they received in return, some wished to enable embryological research deemed fruitful for their own practice. They could also be granted access to the collection, where they could conduct research themselves. Medical knowledge was thus produced through the collection, based on asymmetrical forms of collaboration among female patients, medical practitioners, and Hammar. The female patients’ contribution was complex. They sought out medical treatment, and hence could be seen by the medical practitioners as subject to their expertise, as well as constituting a basis for that expertise. In some instances, the female patients objected to handing over fetal entities originating from their bodies; in other, they did not. Regardless, without their participation, there would be no formation of new medical knowledge of reproduction.

Once incorporated into the embryological collection, fetal bodies entered the social world of embryologists. By making these bodies into collection objects through serial sectioning or preservation in liquid solutions, embryologists were enabled to use them as material for research and education. On one level, the embryological collection materialized Hammar’s professional expertise. On another, it also materialized wider medical knowledge about reproduction. While obtained from the contexts of miscarriage, ectopic pregnancy, and the birth of deviant bodies, they also confirmed these diagnoses. In the non-linear formation of medical knowledge, the embryological collection was dependent on medical practices, while at the same time, it shaped those very practices.

## Notes

1. Original Swedish quote: ‘en dylik ovanlig missbildning borde icke undandragas en läkare, och för öfrigt var det ju lugnande såväl för mig som patienten.’ Pihlgren, “Dubbelmissbildning,” 232–3. All translations are mine.
2. Clarke, “Research Materials.”
3. Morgan, “Materializing the Fetal Body”; and Hopwood, “Producing Development”.
4. Over the years, Hammar conducted extensive correspondence with colleagues abroad. CR, G100 p:6–p:9. He also published results of research he had conducted on fetal specimens in the embryological collection in international journals. Hammar, “New Views,” 547–9.
5. Hopwood, *Embryos in Wax*; Hopwood, *Haeckel’s Embryos*; and Åhrén, “Figuring the Early Stages.”
6. Clarke, “Research Materials”; and Morgan, *Icons of Life*.
7. Withycombe, *Lost*.

8. Jülich and Tinnerholm Ljungberg, "Från medicinskt avfall"; and Jülich, "Historier kring Tornblad institutet".
9. Öberg, "Barnmorskan och läkaren"; Nilsson, "Kampen om kvinnan."
10. As Deborah Lupton has stressed, entities today called 'embryo' or 'fetus' are complex configurations. Lupton, *Social Lives*. During the period of study, these words could be used interchangeably, and full-term newborns could also be called 'fetus'. The categories were unstable, which is a core basis for this investigation but also makes the issue difficult to address. Throughout this article I use the terms 'fetal bodies' and 'fetal entities', to include all stages of development, in order to not impose meaning which might be historically inaccurate. I mostly use 'fetal bodies', to stress that the historical actors concerned themselves with the material, corporeal aspects. At the same time, I acknowledge that this choice of terms also generates consequences.
11. Star and Griesemer, "Institutional Ecology"; and Star, "This Is Not a Boundary Object."
12. However, its existence has been noted in a study about the anatomical collections at Uppsala University. Svanberg, *Människosamlarna*, appendix 4.
13. Daston and Park, *Wonders*; Knoeff, "Touching Anatomy"; and Bondestam, *Exceptional Bodies*.
14. Paulsson Holmberg, "Onaturlig födelse," chapter 4.
15. Inventory lists: UUA, Räntkammararkivet F IX, vol. 1.
16. Hopwood, "Producing Development," 33–34.
17. Pickstone, *Ways of Knowing*.
18. Alberti and Hallam, *Medical Museums*; and Åhrén, "Museerna"; Svanberg, *Människosamlarna*.
19. Reinarz, "Age of Museum Medicine."
20. Hopwood, *Haeckel's Embryos*.
21. Schickore, *Microscope*; Åhrén, "Figuring the Early Stages."
22. Hammar, *Edward Clason*, 10–13.
23. Clason, *Hur' bör man studera histologi?*
24. Clason, *Reseberättelse*.
25. Original Swedish quote: 'Embryologiska preparater', G, *Museum Anatomicum Upsaliense Catalogus Specialis VII*, 405–463. In the pre-1846 inventory lists, the specimens were sorted according to which professor had acquired them and conservation technique. UUA, Räntkammararkivet F IX, vol. 1. From 1846 until the 1880s, they were catalogued according to year of acquisition and areas of the body. Svanberg, *Människosamlarna*, 63–68.
26. Wrete, "J. August Hammar," 23–24.
27. Agduhr, "Lokaler för undervisning och forskning," 29.
28. EM, *Cabinet Embryonala snittserier*; Franzén "Att lära sig se embryologiskt."
29. EM, *Homo sapiens (Människa)*.
30. "Kungl. Universitetet i Uppsala redogörelse" (1926), 126.
31. EM, *Homo sapiens (Människa)*; EM, *Cabinet Embryonala snittserier*.
32. Original Swedish quote: "Histologiska laboratoriums materialsamling". Jakobsson, "Bidrag till kännedomen," 247.
33. G, *Museum Anatomicum Upsaliense Catalogus Specialis VII*, 405–63.
34. EM, wet specimen storage.
35. Franzén, "Att lära sig se embryologiskt."
36. For Broman's embryological research and network, see: Jülich, "Historier kring Tornblad institutet." While Hammar and Broman did not publish together, they corresponded and Hammar lent animal fetal bodies to Broman, to enable his research. CR, G100 p:1 Ivar Broman to August Hammar, 12 June 1919.
37. Öberg, "Barnmorskan och läkaren," 44–48, 104–108.
38. Original Swedish quotes: 'en del synnerligen värdefulla bidrag till den embryologiska materialsamlingen': 'i stor förbindelse hos ett antal läkare och barnmorskor i skilda delar av landet'. 'Kungl. Universitetet i Uppsala redogörelse' (1902), 69.



39. The term 'surgical' (operativt) was used without elaboration. Josephson performed operations in order to terminate ectopic pregnancies and was looking for fetal bodies during the procedure. Several specimens in the embryological collection stemmed from this kind of surgery; see for example: EM, Cabinet *Embryonala snittserier*, tray 266, photograph with text "Gåfva af Prof. G. Ekehorn okt. 1910. Menniskofoster 13.9 mm operativt efter extrauterin grav."
40. Vandendriessche, "Anatomy and Sociability."
41. Morgan, *Icons of Life*, chapter 3.
42. Such as Gustaf Ekehorn (1857–1938), surgeon at Uppsala University Hospital. He had gifted the specimen referred to in endnote 39 and published on his research conducted in the embryological collection. Ekehorn, "Om tarmlägets utveckling," 437.
43. Fifty-six individual names listed as gift-givers on photographs of fetal bodies that subsequently were serially sectioned and incorporated into to the embryological collection. EM, *Homo sapiens (Människa)*. They were based all over Sweden. Svanberg, *Människosamlarna*, appendix 4. Other medical practitioners gifted fetal bodies which were not serially sectioned, to the embryological collection, such as Oskar Efraim Lindén (1891–1955), physician at the county hospital in Gävle, who gifted a newborn with a 'severe malformation' that died during birth to the embryological collection in 1924. CR, G100 p:10 Oskar Efraim Lindén to August Hammar, 11 September 1924.
44. CR, G100 p:2 Oskar Forsell to August Hammar, 29 January 1916; CR, G100 p:4, Daniel Nordblad to August Hammar, 28 August 1920.
45. Hammar, "Upprop" a. For the similar strategy of Franklin P. Mall (1862–1917), who established the Carnegie embryo collection, see Clarke, "Research Materials," 332; Morgan, *Icons of Life*, 71–72. While Hammar and Mall both studied with His and made careers in embryology, I have not found any evidence of contact between them. Yet both had to convince medical practitioners who had access to pregnant women, of the merits of embryological research.
46. The same observation has been made in regard to fetal specimens in the embryological collection at Lund University. Jülich, "Historier kring Tornbladinstitutet."
47. Hammar, "Upprop" b.
48. "Kungl. Universitetet i Uppsala redogörelse" (1908), 78.
49. This differs from the United States, where physicians were much more involved in maternity care. Morgan, *Icons of Life*; Withycombe, *Lost*.
50. Original Swedish quote: 'Det dyrbara materialet'. Clason, "Om tillvaratagande af embryon," 123.
51. Duden, *Disembodying Women*.
52. Runesson, "Between Blood Clots and Corpses."
53. Ibid. That this notion was widespread in the period of study is mentioned in Groth and Lindblom, *Lärobok* 2<sup>nd</sup> ed., 48 and restated in later editions (1911, 1920).
54. Nyqvist, "Epidemi af missfall," 68.
55. Withycombe, *Lost*, chapter 5.
56. Ysander, "Human Double Embryo," 428–30, quote on p. 429.
57. Ibid., 430–434.
58. Romlid, "Makt, motstånd och förändring."
59. Groth and Lindblom, *Lärobok*, 2nd ed., 156–161. Original Swedish quote: "Missbildadt," p. 156.
60. Original Swedish quote: "Blod lefrar". Ibid., 160.
61. Svendsén, "Ur barnmorskepraktiken," 116.
62. Fetal development appeared in Swedish midwifery manuals throughout the nineteenth century and was discussed in increasing detail from the 1890s onwards. Groth and Lindblom, *Lärobok*, 2nd ed., 77–89; the next edition (1911) expanded this section, which reappeared in the fourth edition (1922). See also Alin, "Om människoägg."
63. Groth & Lindblom, *Lärobok*, 3rd ed., 88, 186.
64. Nyqvist, "Epidemi af missfall," 67; and Alin, "Några siffror till belysande," 420–421, 424.
65. Gyllensvärd, "Dödföddheten," 61.
66. Bergstrand, *Till frågan*, 35, 72.



67. London, "Om askegossen från Bringetofta," 53.
68. Original Swedish quote: "Behöver barnmorska anmäla missfall på pastorsexpeditionen?"; "får försvinna hur som helst". "Frågor och svar" (1922), 52.
69. Original Swedish quote: 'Man sätter där i enlighet med vänlig vetenskaplig åskådning gränsen mellan "missfall" och barn och då i kyrkoböckerna endast tala om barn (döda och levande), har man därför ansett sig hava rätt att förfara såsom nämndes'. Ibid.
70. Original Swedish quote: 'Någonstädes måste förresten gränsen dragas. Vart skulle det taga vägen om barnmorska skulle anmäla alla missfallen, 6–8 cm. foster, tomma ägg o. s. v., vilket väl borde ske, om denna anmälan skulle tjäna ett moraliskt ändamål, att uppdaga fall af fosterfördrivning, som den i frågan nämnde prästmannen tycks mena.' Ibid.
71. For instance, Alin donated fetal bodies to the department in 1901 and 1910: EM, *Homo sapiens (Människa)*.
72. Original Swedish quote: 'Kyrkoherden i församlingen där jag tjänstgör fordrar skriftlig anmälan om foster, som i dagboken betecknas som missfall (fostrets längd under 35 cm., även tidiga) för införande i födelseboken som dödfött barn. Jag har vägrat. Har jag rätt därtill? Vad skall jag göra?' "Frågor och svar" (1930), 143.
73. Original Swedish quote: 'Är det icke min skyldighet taga vara på ett sådant foster och lämna det till dödgrävaren att vid lämpligt tillfälle nedläggas i en grav?' Ibid.
74. Original Swedish quote: 'bör Ni låta ert medlidande med den levande människan tala högre än Er pietet för det döda människoämnet'. Ibid., 144.
75. Eklöf, "Läkarens ethos," 193.
76. See, for instance, EM, Cabinet *Embryonala snittserier*, tray 277, photograph with text 'Gåfva af Edla Törnblom Februari 1902 Menniskoembryo 12.2 mm.'
77. Withycombe, *Lost*, chapter 1.
78. Johannisson, *Kroppens tunna skal*, chapter 1.
79. Nilsson, "Kampen om kvinnan," 54–61, 103–105.
80. Lindfors and J:son Hellman, "Ett ovanligt fall," 135–137.
81. Nilsson, "Kampen om kvinnan," 131–135.
82. EM, *Homo Sapiens (Människa)*.
83. Josephson, *Lärobok i gynekologi a*, 320–337.
84. Lindfors & J:son Hellman, "Ett ovanligt fall," 135–161.
85. Lennander, "Från den kirurgiska kliniken," 59–60.
86. Quensel and Vestberg, "Från patologiska institutionen i Upsala," 613.
87. EM, Cabinet *Embryonala snittserier*, tray 27, photograph with text "Gåfva af Laborator A. Vestberg November 1899. Menniskoembryo 5 mm."
88. "Kungl. Universitetet i Uppsala redogörelse" (1916), 8.
89. Josephson, "Om hermaphrodismus."
90. Josephson, *Lärobok i gynekologi b*, 299–300.
91. Söderbaum, "Om tubargraviditet," 125.
92. Wilde, "Truth, Trust."
93. Ibid., 308.
94. Bauer, F. "Obstetrisk-gynekologiska sektionens förhandlingar," 341.
95. Bondestam, "Beyond the Human Fetus."
96. Original Swedish quotes: 'missbildning'; 'missfoster'. Groth and Lindblom, *Lärobok*, 2nd ed., 312–313. This definition was reprinted in subsequent editions (1911, 1920).
97. Broman, *Vidunder och missfoster*, 117–29.
98. Alin, "Missbildningar," 192–4.
99. "Gåfvor," 19.
100. Josephson, "Förlossning vid sammanvuxna tvillingar." That the birth took place in the autumn is mentioned in: Ysander "Om thoracopager," 435. On the obstetric-gynaecological section, see: Nilsson, "Kampen om kvinnan," 231–35.
101. Ysander, "Om thoracopager."
102. Ysander, *Studies on the Morphology*, 124.
103. Josephson, "Förlossning vid sammanvuxna tvillingar," 1303.

104. Lynn Morgan has argued that the women from whose wombs fetal bodies were transformed into fetal specimen were erased by embryologists. Morgan, *Icons of Life*, chapter four. While the embryologists in this study were not primarily interested in such women, for medical practitioners it was important to connect fetal specimens with patient cases of women who miscarried, had ectopic pregnancies, or gave birth to malformed bodies.
105. Original Swedish quote: 'arbetarhustru'. Sebardt, "Ett fall af toraco-omfalo-pagi," 530–51, quote on 530; G, *Museum Anatomicum Upsaliense Catalogus Specialis VII.*, no. 66 "Nyfödda barn med thoraco-omphalo-pagi, 1. Båda barnen med uttaget bålskelett och viscera."
106. Berg, *Döda kroppar*, 10–11.
107. One provincial physician was unable to buy the corpse of deceased conjoined twins, since he could not afford the price asked by the female patient and her husband. MD, search 'dubbelmissfoster', annual report from provincial physician C. Hay, Umeå district 1851, appendix A.
108. Original Swedish quote: 'Då jag vid min hemresa hade fadrens löfte att få de sammanvuxna fostren för att öfversända dem till museum, om modren tillåte det, men hon då ansågs för svag att derom tillfrågas, gjorde jag ingen annan undersökning än tog ofvannämnda mått. Modren, som dock varit skollärlarinna, nekade bestämdt att utlemna barnen, ehuru hon under flera veckor lät dem beskådas af omkringboende allmoge.' MD, search 'sammanvuxna fostren', annual report from provincial physician O. Söderbaum, Sundsvall district 1883, appendix Litt B.
109. Åhrén, "Death, Modernity," chapter three.
110. Original Swedish quote: "ängsliga fråga efter fullbordad förlossning, om hennes barn är välskapadt". Alin, "Missbildningar," 192.
111. Groth and Lindblom, *Lärobok*, 2nd ed., 135, 312.
112. Original Swedish quote: 'önskade i mitt hjärta, att barnet skulle dö, men det lefde'. Öhman, "Ur barnmorskepraktiken," 61.
113. Svanberg, "Fullgånget foster utan hjärna," 86–87.
114. Nilsson, "Ur barnmorskepraktiken," 149–50.
115. Original Swedish quote: 'nödvändigheten af att förfara med grannlagenhet, så att ej föräldrars känslor på något sätt såras'. "Gåfvor," 19.
116. Original Swedish quote: 'Barnmorskan bör alltid bevara och med föräldrarnas medgivande till läkaren så snart som möjligt överlämna alla slags missfoster'. Groth and Lindblom, *Lärobok för barnmorskor*, 4<sup>th</sup> ed., 234.
117. Berg, *Döda kroppar*, 12–13.

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## Notes on contributor

**Helena Franzén** is a PhD student at Uppsala University. Her research focuses on how medical knowledge was produced through obstetrical and embryological collections at Uppsala University.

## ORCID

Helena Franzén  <http://orcid.org/0000-0002-7191-7890>

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