Portraits of doctors and scientists use attributes of profession and discovery to construct identities: books for learned physicians and microscopes for laboratory researchers, plants for botanists, molecules for chemists and equations for mathematicians. Such accoutrements signal a sitter's claim to fame, but the less familiar items reveal the full story only once the beholder has had the pleasure of working out what they are and why they are relevant. Portraits that include esoteric accessories may thus fashion identities for both scientific experts and their research objects. Histories of these works allow us to explore the relations.

Here I focus on embryologists and embryos, and specifically a marble bust by the Leipzig sculptor Carl Seffner of the anatomist Wilhelm His...
(Fig. 1A). Made in 1900, it stands today in the anatomical institute of his home town, Basel in Switzerland. The downcast eyes and crossed folds of the coat draw us to look at the object in his right hand (Fig. 1B). This is surely the only embryo ever sculpted in marble, and the medium contributes to a disorienting effect: the life-size His is holding not the fourth-week human specimen, which was just four millimetres across, but a highly magnified model. The work offers an intimate view of the founder of modern human embryology in the first portrait known to include a representation of an embryo. Because it was shown in contrasting settings – the His home, art exhibitions and within anatomy and embryology – it also invites us to imagine how various audiences responded to a potentially unfamiliar entity.

Human embryos link histories of pregnancy, fertility and abortion with those of anatomy, anthropology and evolution. They were first depicted realistically in late eighteenth-century Europe as part of making the new science of embryology from investigations into generation, natural histories of monsters and man-midwives’ anatomies of the gravid uterus. Earlier representations of ‘the unborn’ range from religious art displaying Christ within the Virgin Mary to midwifery manuals showing birth positions of the coming child. But progressively developing human embryos were not drawn until around 1800, when they helped to challenge traditional understandings of pregnancy as an uncertain and precarious state of which the woman concerned had privileged knowledge. Nineteenth-century anatomists improved these series, and taught medical students to visualize the complex changes through which the adult body is formed. But embryos and embryologists gained prominence only from the 1860s in debates over Darwinism, especially through the theory that we climb our evolutionary tree in the womb. From the 1880s His and his American students established human embryology as a distinct research field of gradually expanding reach. In the 1960s human reproduction entered the schools and a fetus appeared on the cover of Life magazine. From the 1970s, obstetric ultrasound became routine, anti-abortionists appropriated medical images, and human embryos from eggs fertilized in vitro were used to bypass infertility. The dominant representations of early pregnancy, embryos now also rival even genes as symbols of biomedical hope and fear.3

The making of embryological understandings depended on the production and distribution of embryo images, but to chart their rise, or question their power, we need to recover past meanings too. Historians of abortion have shown that what religious-ethical discourse presented as an unborn child, medico-legal experts understood in embryological terms and aborting women, even in the twentieth century, could see as waste that needed tipping out. For recent decades, anthropologists and sociologists have documented semantic competition and slippage between ‘embryo’, ‘fetus’, ‘abortus’ and ‘baby’ in Parliament, the media and clinics.4 Yet we need richer reconstructions, not only of meanings among different groups, but also of the structures of authority that shaped embryological views.
Embryologists have occupied a privileged position: they engaged most closely and privately with human embryos as they produced the most dependable public representations. How did they manage their own relations to their research objects, and how were these relations presented to different audiences? How, and to what extent, did their colleagues, their families and the general public associate embryos with embryologists and the other way round?

This article explores the changing status of embryos and embryologists by reconstructing the design and viewing of Seffner’s portrait of His. Direct evidence is sparse, but I argue that it was commissioned privately following intense interactions between anatomy and sculpture. Comparison with other works in light of the sitter’s achievements and commitments will bring out the significance of the contemplative pose and choice of accessory. Reconstruction of an elaborate sequence of microscopical manoeuvres will show how His produced a model embryo from a blood-clot collected by a midwife. I then turn to viewing, exploring sites of display to suggest resources for spectators and hence likely meanings, in the family portrait gallery and major art exhibitions around 1900 and among medical scientists since then. I close by considering ways of seeing the bust today, especially as an ancestor of internet portraits of embryologists in fertility clinics. The work intrigues, I suggest, because, while medium and style have dated, the accessory speaks more loudly to us now than it did to most exhibition visitors 110 years ago. This gives it a strange power simultaneously to refer to current concerns and to prompt questions about the culture in which embryological understandings took shape.

ANATOMICAL EXACTITUDE IN THREE DIMENSIONS

Around 1900, as a bust by Seffner became a standard gift from grateful students, he portrayed dozens of professors he did not know before the sittings and a few he never met. The His portrait stands out from these routine commissions: a review of the careers and approaches of sitter and artist will place His in the history of embryology and show that this bust results from close collaboration and a shared commitment to anatomical exactitude in three dimensions.

From the mid 1860s Wilhelm His-Vischer (1831-1904), professor of anatomy and physiology in Basel, researched mainly in embryology. Carved out of earlier investigations into generation around 1800, this science flourished in German university institutes, where the professors used microscopes to analyse bodies in terms of their development from simpler forms. His invented new techniques for visualizing internal structure: working on chick embryos, he introduced the first microtome, a mounted knife capable of producing serial slices, or sections, on microscope slides, and a method for reconstruction from the sections as wax models. He thus ‘gave body’ to the fragmented forms. Theoretically, His allied himself with a group of physiologists who were militantly oriented towards physics. They had
abandoned embryology as too difficult for physical methods, but he tried to explain chick development mechanically. This won him a chair of anatomy in the dynamic medical faculty of the University of Leipzig in Saxony in 1872, but put him at odds with the rising approach in embryology. He thus came to public notice as a devastating critic of Ernst Haeckel (1834-1919), the zoologist at the nearby University of Jena and the world’s leading systematizer and propagandist of Darwinism.8

From the late 1860s Haeckel taught that individual development briefly and imperfectly repeats the evolutionary development of the species, or in his jargon, ‘ontogeny recapitulates phylogeny’. With fossils in short supply, it was convenient to have embryos as proxy ancestors with which to construct evolutionary trees. By the mid 1870s most life scientists accepted that organic evolution had occurred and many admired ‘the German Darwin’ for his pioneering role. Yet Haeckel was also exceptionally controversial, even among evolutionists, not just for specific theories but also for speculation, dogmatism, anticlerical scientism and attacks on dissenting colleagues in works that addressed laypeople over the professors’ heads. In an 1875 book, His accepted evolution but argued that it could not explain embryogenesis; a rigorous explanation must look, not to the evolutionary past, but to present physiology. With the careful exactitude of his models the mark of his own public character, he also accused Haeckel of forging embryological illustrations. Haeckel ridiculed His’s approach and rebutted the charges, but Haeckel’s enemies exploit them to this day.9

In the 1880s His reformed human embryology into a more specialist field. Human ‘embryos’, as he called them until the end of the second month, when they turned into the more obviously human ‘fetuses’, were of the greatest interest. But because most preparations came from medical encounters with aborting and miscarrying women, they were also so inaccessible that embryologists had relied on chicks and domestic mammals to fill the many gaps. By making the precise degree of similarity between human and other vertebrate embryos controversial, Darwinism rendered it imperative to research humans directly. His took the lead by collecting an unprecedented number of rare preparations from the first two months of pregnancy – though none from the first two weeks was known till the mid twentieth century – and analysing them with his sectioning and modelling techniques. The reform was summarized in a ‘normal plate’, or standard developmental series, and in several sets of wax models that His presented as integral to his publications. Reproduced commercially by the Ziegler studio, they were available wherever human embryology was taught.10

By the early 1890s, then, His was one of Europe’s most eminent anatomists. He had been rector, or head, of the Universities of Basel and Leipzig, and chairman of the German Anatomical Society and the Association of German Scientists and Physicians. But he was known to the wider public primarily for his stand against, and mockery by, Haeckel. No portrait had, to my knowledge, yet been reproduced in print, and His appears to have...
been fêted only on his seventieth birthday in 1901 and death in 1904. By contrast, biographies and likenesses of the slightly younger Haeckel had been prominent since the 1870s and the bestselling anticlerical synthesis *Riddles of the Universe* (1899) made him one of the most famous – and notorious – scientists in the world.¹¹

Thirty years younger than his sitter, Carl Ludwig Seffner (1861-1932) had studied at the Leipzig Academy of Art, then trained in Berlin with Emil Hundrieser, who exemplified the Baroque-influenced naturalism of the leading nationalist sculptor, Reinhold Begas. After time in Italy, Seffner settled in Leipzig and made his name as a portraitist in this last heyday of the marble bust. By 1901 he had done nearly sixty, mostly of the local educated middle class. In the early twentieth century he would also receive important commissions for monuments to Goethe and Bach. Seffner sculpted little after 1914, and though his final work, a plaque of Adolf Hitler from 1932, was much reproduced in Nazi Germany, his artistic identity was formed around 1900.¹²

Seffner appealed through the technical mastery that captured a subject’s character by bringing details to life.¹³ He was bracketed in Leipzig with the now far more renowned symbolist painter and sculptor Max Klinger, and compared to the much grander Franz von Lenbach of Munich. The critic Ferdinand Avenarius described Seffner more realistically as ‘not a number-one man, but a very able portraitist, who in Saxony is perhaps a little overrated’.¹⁴ He produced safe, official art for the booming but stylistically conservative city of trade and industry, where little of the brilliance of the Saxon capital Dresden, let alone Munich, was reflected. A cobbler’s son, burdened by humble origins and lack of academic education even after he was granted a professorial title, Seffner aimed at artisanal perfection. He did not just purify form of neo-baroque excess, he embraced an extreme naturalism grounded in anatomical authenticity. Collaboration with His consolidated this approach.

Professors’ colleagues and students often commissioned Seffner, but an engraving was presented on His’s seventieth birthday, the obvious occasion for a public gift.¹⁵ The bust appears rather to have come out of a common project to reconstruct the face of the composer Johann Sebastian Bach. Anatomists and anthropologists – His co-founded the German Anthropological Society – fed the nineteenth century’s worship of genius with the authenticated remains of men, such as Sophocles, Mozart and Kant, whose fame outstripped the care their corpses had received. Bach spent his most productive years in Leipzig, but was not particularly celebrated until the mid 1800s. When the cult took off it became embarrassing that the city could not even show his grave. So it was convenient that in 1894 a candidate skeleton was discovered in a promising location. To help assess the bones His recruited Seffner, whom he may have known from anatomy classes for artists.¹⁶
Fig. 2. Wilhelm His and Carl Seffner identify a skull as Johann Sebastian Bach's by reconstructing his face. (A) The skull; (B) the oil painting of Bach in the St Thomas School, Leipzig; (C) the bust Seffner modelled on a cast; (D) the bust, in profile, with left half removed to show the relations of the soft parts to the bone. Photogravures by Meisenbach, Riffarth & Co. from Wilhelm His, *Johann Sebastian Bach*, Leipzig, 1895, pls II (20 × 14 cm), IV, VI (both 21 × 17 cm), VIII (22 × 18 cm).
His not only followed others in determining on cadavers the average thicknesses of the tissue on different parts of the face. He also brought in Seffner to model a face over a cast of the skull (Fig. 2A, C). Pioneering the reconstructions that are now prominent in forensics and anthropology, His had Seffner both use paintings and engravings of Bach (Fig. 2B) and respect these measurements (Fig. 2D). The city council accepted His’s argument that the skull was probably Bach’s because Seffner could model this composer – and not Handel – from the best portraits and within narrow anatomical limits. His and Seffner had worked well together. ‘The reconstruction of the head’, His explained, ‘was possible only because a sharply observing artist summarized the common and significant features of the various originals and combined them creatively into a unified whole.’

He championed Seffner for his major work, what eventually became the Bach monument in front of St Thomas’s Church. The sculptor returned the compliment by taking a scientific approach: even King Albert of Saxony was measured with callipers to achieve an ‘anatomically faithful’ likeness, though perhaps also to keep the old man awake.

Based on this mutual admiration, His or another family member probably commissioned the bust for their home in or shortly before 1897. Most of Seffner’s portraits were intended primarily for bourgeois interiors, though many ended up in universities. This one was designed to represent His’s professional identity and attainment, as he wished these to be remembered in the first place by his family, and then by colleagues and friends. But it is also about collaboration with Seffner. He and His were united by a deep interest in modelling and a striving for authenticity through exact anatomical reconstruction in three dimensions.

CONTEMPLATING AN EMBRYO MODEL

These shared commitments, and the priorities of His as sitter and patron, will explain the significance of his contemplative pose and the unprecedented use of an embryo model. Comparison with other works will further contextualize these choices. The closest are Seffner’s portraits of His’s Leipzig colleagues, notably the physiologist Carl Ludwig (Fig. 3A) and zoologist Carl Leuckart (Fig. 3B), and His’s rival (Haeckel’s ally), the comparative anatomist Carl Gegenbaur of Heidelberg. Portraits of success, they all show senior figures. Heavy coats give mass to the bodies of elderly male intellectuals, but the focus is on ‘heads of character, worked through intellectual work and experience of life, of . . . clear and firm skull formation and full of life-giving detail in the . . . muscles and skin’. The His bust similarly celebrates a leader of the educated middle class.

The sitters are all lost in contemplation, but while the rest look into space or meet the viewer’s gaze, His is looking down, and so more distanced even without the glasses he usually wore. Unlike the others, he is absorbed in a particular object, to accommodate which Seffner sculpted a half-length figure rather than the standard head and shoulders. In contrast to Begas,
Fig. 3. Portraits of His and his colleagues. (A) Carl Leuckart by Carl Seffner, 1895 (marble, 63 × 52 × 34 cm); (B) Carl Ludwig by Seffner, 1897 (marble, 52 × 55 × 30 cm); (C) the Viennese anatomist Carl Langer by Alfonso Canciani, 1903 (copper alloy, 75 × 43 × 43 cm); (D) the seventieth-birthday etching of Wilhelm His by Hans Olde, a founder of the Munich Secession, that each subscriber received in 1901 (plate 46 × 32 cm). His is shown taking a break from drawing at the microscope. The books are well bound – no author or title can be read – and what may be two model embryos stand behind and just below his right shoulder. In this print, which belonged to Werner Spalteholz, the anatomist who co-organized the gift, the bottom margin features a remarque of the Bach skull and bust.
Seffner did not generally add props that might distract from the head. But His not only holds something in his right hand, the whole work is organized around its contemplation.

Contemplation is a standard trope in portraits of thinkers, and anatomists had long been shown with symbolically significant body parts: arms, brains and especially skulls, the most obvious memento mori (Fig. 3C). But the pose was exceptional for Seffner and carried a specific meaning with respect to His. ‘Exact observation and a certain reservation in interpretation characterize his scientific oeuvre’, a Leipzig colleague wrote; ‘there was no place for vague hypotheses.’ His is immersed in something, not using it to stake a theoretical claim. He is not showing it off, but holding it close. So though the eyes and coat draw attention to his right hand, the object is not an attribute, but arranged for him. We cannot see it well unless we go near and also look down, a distinctively sculptural effect. We are invited to identify with the man in examining his work, but he claims our interest first.

This inevitably implies a contrast to Haeckel, who, though also formally sculpted several times, was more often caricatured as a showman or prophet. Opposing Haeckel remained part of His’s identity; Basel scientists praised him on his seventieth birthday for ‘expos[ing] yourself to attacks and respond[ing] to them like a man.’ But he would not have defined himself primarily against his opponent. More likely, he was warning his successors, as they tested hypotheses about the physiology of development, not to lose touch with the reconstruction and contemplation of form.

What, then, of the object His contemplates? The range of accessories used to signal identities had increased in the nineteenth century. Joining anatomists with body parts and botanists with plants, life scientists were now depicted with organisms, mathematicians with plaster models of surfaces and chemists with molecules. The British anatomist Richard Owen was painted with the pearly nautilus he had studied and photographed with the moa skeleton he reconstructed from a single bone (and with the bone). Old markers of learning accommodated newcomers: His’s official seventieth-birthday portrait shows him with a microscope against a book-lined wall (Fig. 3D). Accoutrements were rarer in busts than in paintings, reliefs or even statues, but Alfred Gilbert’s 1896 half-length bronze of Owen at the Royal College of Surgeons of England shows him looking at ‘an indeterminate specimen’ through a magnifying glass.

Objects related to embryos had occasionally been included in portraits before Seffner’s time. In the late eighteenth century man-midwives, the surgeons moving in on high-class childbirth, were the professionals most concerned with the human gravid uterus. Many portrayals avoided references that might undermine their search for respectability; in Mason Chamberlin’s widely-reproduced painting William Hunter even holds a muscle-man model so as to hide its genitals (Fig. 4A). But Joshua Reynolds’ c.1787 portrait of Hunter depicts both a model of a womb enclosing a nasciturus – one who is about to be born – and a bottle containing a hard to identify ‘uterus
opened, showing membranes and the enclosed foetus’ (Fig. 4B). A few years earlier the Göttingen man-midwife Johann Georg Roederer was engraved with his hand on a jar filled with a possibly malformed fetus, again at a very late stage. The closest precedents I have found, these portraits present the sitters as experts in the contents of the womb. But they do not show the embryos (much younger and less obviously human) on which the new embryology would focus – and hardly could have done, since anatomists represented these in any detail only from around 1800.

Even for most of the nineteenth century, when embryology flourished, embryos were not used as accessories. The most famous embryologist, Karl Ernst von Baer (1792-1876), though often pictured and sculpted, was never shown with either an embryo or the mammalian egg he discovered. Decorum may have been an issue, but it was fairly safe to show human embryos isolated from the rest of the pregnant body; the problem was more that before Darwinism few people would have recognized them. Most importantly, von Baer never held or aspired to hold office as an ‘embryologist’. This term began to enter general use around mid century, but the science was still not an independent university discipline in 1900; it was practised mainly by anatomists and zoologists. By contrast, His campaigned for institutional recognition.
A muscleman model featured in a portrait of an anatomist as long ago as 1575, but nineteenth-century scientists tended to scorn models as merely didactic or even fairground attractions. His, however, had promoted them so successfully that human embryologists were effectively publishing in wax as well as print, and he and Seffner had worked together to model Bach. His was thus comfortable to appear in marble, the highest-status medium, with – in fine-art terms – a low-status wax model. A model of a human embryo honoured his magnum opus. So, while contemplation makes a point about research style and character, His’s roles in championing wax and human embryology explain why he holds a rare model and the first known representation of an embryo in any portrait.

MAKING A MARBLE EMBRYO

The model demands the same close attention as the embryologist. For this lump of wax was one of the most laboriously constructed ‘working objects’ in all the sciences of organic form. Taking it into marble was thus only the last in a long sequence of intellectual and physical transformations that turned nondescript material into a set of vivid images.

His modelled embryos from the first two months of development. The preparations were collected in medical encounters with miscarrying or aborting women or, rarely, from a cadaver. To induce gynaecologists to ‘sacrifice’ their ‘treasures’ he granted them a kind of paternity by naming the embryos with the initial letters of their surnames – not those of the women from whose bodies they came. By contrast, Leipzig midwives provided twenty-two of some seventy-nine normal preparations, but he does not tell us their names and called their embryos by Greek letters. Since exactitude was so important to Seffner and His, he is holding a specific model. Though evidence about its identity conflicts (see below), resemblance suggests it represents ‘embryo C11’, the earliest preparation from a midwife.

Collecting involved reinterpretation. Medical men lamented lay ignorance of embryology, and neither the official discourse of unborn children and ‘fruit of the body’ nor plebeian women’s talk of ‘tipping out’ waste material owed anything to the science. For embryos from the first two months, women may have experienced only a late period. The blood-clot that His would open to reveal embryo C11 could have been collected when a midwife gave a woman something to bring her period on and she returned with the material for advice. We do not know how she interpreted the event, but His, or conceivably his supplier, was probably the first to frame the product as an embryo.

The object arrived in the Leipzig institute on a dark afternoon in November 1879 a few minutes before a lecture, so His could not examine it fresh for long. Under a low-power microscope or magnifying glass he opened the egg membranes, took a first look inside and preserved the embryo straightaway. Removing the membranes also eliminated the clearest indication of connection to the pregnant woman. At leisure, he
photographed (Fig. 5A) and drew the whole embryo, measured the length as four millimetres and estimated the age as twenty-three days, too young to determine the sex. Analysis of ‘this new precious object’ gave him, he told his physician brother-in-law, Friedrich Miescher-His, ‘great pleasure’. The ‘very well preserved homunculus’ filled ‘a yawning gap’ in his series, and in 1885 His selected it for the normal plate. He thus took material from an experience of miscarriage, abortion or illness and arranged it in a narrative of development.37

His insisted on slicing up even the rarest objects in order to see inside, but also on reconstructing physically graspable 3-D forms. So he sectioned the embryo (Fig. 5B) and drew magnified outlines of the slices on wax plates, cut them out, stacked them together and smoothed the edges to make a model. The modeller Friedrich Ziegler reproduced and sold an artistically

Fig. 5. Constructing a marble embryo α. (A) Photograph on glass by the Leipzig anatomical institute photographer, Th. Honikel; (B) sections drawn by Wilhelm His for his Anatomic menschlicher Embryonen, part 3, Leipzig, 1885, pl. VIII (detail of lithograph by E. A. Funke); (C) wax model by Friedrich Ziegler (c.10 cm high); (D) marble embryo by Carl Seffner.
coloured version of this original, one of a successful series on the first month of development (Fig. 5C). Dissecting, sectioning and modelling thus created model embryos, in every sense. A tiny uncertainty became a solid object that an anatomist could clasp (Fig. 5D).  

Sitting for Seffner a decade later, His presumably selected embryo α because it features in Ziegler’s famous series. It represents the stage – the most curled up – which other widely-distributed illustrations had made most familiar. His also chose his only commercially reproduced model that did not invoke another name to compete with his own – but perhaps he simply wanted to remember that joy. He held a wax model or a plaster copy.  

There is a complication. The plaster bust Seffner made several years before he dated the marble ‘1900’ is not extant, but a photograph, possibly the ‘large shot, which the excellent photographer [Nicola] Perscheid took in about 1897’, suggests that the plaster model was different from the marble and perhaps even schematic (Fig. 6B). That is intriguing, but does not affect the main point: bringing an elaborately constructed object and a man into the same medium, in the same neutral colour, put them on a par.  

IN THE FAMILY GALLERY  
How were embryologist and embryo seen? In the near absence of recorded responses, I shall approach likely meanings by reconstructing settings in order to suggest resources on which spectators may have drawn. Seffner’s ‘intimate’ works were said to ‘belong in the home’, and photographs place the bust in His’s study. From this inner sanctum he cultivated familial and professional identities by drawing at the microscope and writing, and collected the portraits among which, for most of the early years, the sculpture was seen. The musical and artistic family – his wife Elisabeth His-Vischer, six grown-up children, their families and the servants – were the main audience in the few years before and the decades after his death. The work was for them, to be there, in his place, when he was gone.  

The bust was displayed with family portraits ranging from the early eighteenth-century paintings around it (Fig. 7) to recent paintings and photographs of close relatives near the desk, where there are also other busts (Fig. 8). His was born into an old Basel clan of silk-ribbon merchants, the industry on which the city-state’s legendary wealth was built. A grandfather, Peter Ochs, had founded the Helvetic Republic in 1798. He became controversial in the years of restoration that followed, but His’s father changed their surname and regained a position among the wealthy patriciate. In this milieu an impressive portrait collection signalled distinction, and in 1943 many were reproduced in the Ochs-His tercentenary chronicle.  

Portraits and portraiture were unusually significant to the His family, who not only sat for others but also portrayed themselves. Wilhelm’s mother died when he was ten and his elder brother, Eduard His-Heusler, recalled their sense of consolation that the older children had persuaded her to sit for a good oil painting only a few months before. When their sister
Fig. 6. Portraits of His. (A) As rector of the University of Leipzig, 1882-3. From Eduard His, *Chronik der Familie Ochs genannt His*, Basel, 1943 (13 × 7 cm). (B) Photograph, apparently of the plaster, and probably taken by Nicola Perscheid in about 1897 (20 × 15 cm). Note as differences from the marble, for example, the folds at the bottom of His’s left sleeve and the file marks on the jacket on his left, as well as the form of the embryo. (C) Photograph, apparently of the presentation of the bust, in the main room of Seffner’s atelier, identified as similar to that in ‘Zwei Leipziger Künstlerwerkstätten’, *Ilustrirte Zeitung*, no. 3,019, 9 May 1901, p. 723 (13 × 9 cm). The five works above probably represent (from left) the physicist Gustav Wiedmann, a satyr drawing a thorn, the Bach bust, the ‘fly catcher’ and an unidentified woman. (D) Frontispiece to Wilhelm His Jr, *Wilhelm His, der Anatom*, Berlin and Vienna, 1931. Though said to be after the marble bust, the drawing (7 × 7 cm) appears to be after the photograph (of the plaster?) in Fig. 6B.
Fig. 7. Photograph of the bust, apparently the marble, with portraits of the His-Ochs and possibly also Vischer families, in His’s study, probably taken shortly after his death on 1 May 1904 (12 × 16 cm).
Antonie married Miescher and moved to Bern. Eduard copied the painting, not in his usual watercolours, but, having inherited tools and materials from his uncle, a miniaturist, on ivory. Eduard continued to make portraits as well as collect and write about art.43 As a boy, Wilhelm produced daguerreotypes of family and friends, and ‘some became valuable to the relatives... as the only portraits of the dead’.44

The pose is more modest than the works around, but the bust is more ostentatious in medium and size. It portrays the scholarly recognition that His achieved, first by sacrificing the financial rewards of following his older brothers into business,45 and second by controversially leaving Basel.46 The chronicle shows him as rector of the University of Leipzig (Fig. 6A). In the late 1920s two sons would serve as rectors in Berlin and Münster respectively. In their ceremonial finery the trio represent a lineage of intellectual attainment beyond the home town.

Yet though His became every inch the Leipzig professor, the setting also places the bust as a Basel family portrait, especially because Elisabeth appears above his desk in a Seffner relief from 1901, when she turned sixty-five (Fig. 8). His negotiated Basel citizenship for his children and returned every
summer. So, as his great grand-nephew explained, he ‘remained a loyal son of his father city’, well-off but ‘modest’ and ‘extremely simple’ in his lifestyle even after he had gained ‘a princely position of leadership in the kingdom of science’.47 True to ‘a sanctuary for intellectual practices that ran counter to the reigning orthodoxies of German scholarship’, His resisted Haeckel’s system as artificial, populist and gratuitously offensive to religion.48 His moved to a bigger, brasher city, but his values, expressed especially in opposition to Haeckel, are precisely the ‘good Basel objectivity and sobriety’, the critical faculty and commitment to authenticity, that were celebrated as characterizing the Basel scholar.49

What did it mean for a model embryo to join the family memorabilia – did it become kin? In print, His valued his most interesting ‘preparations’ as ‘treasures’ or ‘precious objects’, but described them correctly as ‘embryos’. In letters to Miescher, by contrast, he humorously and affectionately used the quaint term ‘homunculi’. They also appear as ‘little people’ and ‘a quite respectable little corps’, among whom he was most interested in ‘the very youngest Volk’.50 That His named embryos after gynaecologist donors suggests that paternity was an issue, and did not detract from his own over-arching claim. In the most direct hint of imagined kinship, he wrote about embryo M (for Miescher) as ‘the little embryo (since married into the family) that you gave me for the collection years ago’.51 Yet though it competed for attention with His’s children – he took his microscope and preparations on holiday52 – he surely did not see it as adding to his own family. It was more like an addition to the tribe this anthropologist was constructing. Nor should we make too much of the formal parallels with portraits of the His women holding infants on their laps,53 or of fathers and sons. The homunculi were intellectual offspring, not relatives.

The model embryo was nevertheless at home here. His ‘loved’ to work at the microscope in the evenings while Elisabeth or a daughter read aloud; his laboratory science relied on domestic drawing.54 In this very room he could have made the drawings from which, in his institute, the model was produced. So the family were acquainted with the embryological work and his son Wilhelm His-Astor knew it well; his own career in medical research began when his father helped him model embryonic anatomy and this led to his discovery of the ‘bundle of His’, which transmits electrical impulses in the heart.55

It may also have been from this desk (Fig. 8) that in 1874 His had told Antonie about a portrait by their brother.

A few days ago I was delighted by Eduard with a beautiful picture of Grandpapa Ochs. . . . [It] now hangs above my writing desk and is a dear memento to me. – I have in the last few days been busy with drawing portraits myself, portraits in which what matters is external resemblance. They are not, however, of worthy men or women, but of creatures that are taking their first steps on that path.56
This ‘gallery’ was of human and animal embryos for the polemic against Haeckel. His’s drawings and models were portraits because, like Seffner, he sought to bring out individual traits. He discussed (whole) embryos’ ‘specific physiognomies’ and insisted that one day embryologists would tell even individuals apart. In the family circle, then, the bust was a double portrait, of a meritorious man with (a copy of) his own portrait of a creature that had taken only the first steps.

EXHIBITED AS ART

Seffner’s work may have been intended primarily for the His home, but the plaster was also displayed in 1899 and the marble in 1901 at the major exhibitions that consolidated Seffner’s national reputation and Dresden’s as a market for art. What might the model have meant to visitors who lacked inside knowledge? Evidence is sparser than, for example, for the reception of books containing Haeckel’s pictures, but it is possible to reconstruct how viewers could have interpreted professor and model in light of the available biographies and embryological representations. The sculpted embryo contrasts instructively with more common images and the lack of direct testimony is significant in its own right.

In April 1899 the Leipzig Art Association presented the plaster of ‘our well-known anatomist’ and other works by Seffner (some visible in Fig. 6C) and Klinger. The next month these travelled to the German Art Exhibition in Dresden. Klinger and Adolf Hildebrand dominated the sculpture, but Seffner showed three stand-alone works and had a narrow side-room dedicated to ten busts and reliefs. His was here, mostly with other professors, in this Gobelin-draped showcase for the portraitist of men of knowledge. A local review argued that Seffner reflected the movement away from the idealizing imitation of the classical to the direct study of nature, from types to individuals. Opposed to Hildebrand’s abstractions for ceremonies in great halls, he was a genuine child of his time. With ‘mathematical exactitude’, the ‘intimate’, ‘modern’ busts expressed ‘our age, our sensitive, nervous receptivity, our tendency to listen in to the finest movements of the soul’. The reviewer would have liked a female portrait, but appreciated the male heads and later singled out Seffner’s Ludwig, His and King Albert as ‘master creations of characteristic forms, as subtle as [they are] full of life and unified’.

The marble was shown at the International Art Exhibition in Dresden from April to October 1901. A room of nearly forty portraits, old masters innovatively mixed with contemporary artists, was the setting for four sculptures each by Klinger and by Seffner, who contributed Queen Carola of Saxony, Bach, the retired mayor of Leipzig and His. From a distance the object in His’s hand might have looked like a coat button or clasp (Fig. 3A), but the pose invites the beholder to come closer and enjoy solving the puzzle of its, and his, identity. What clues did this setting offer?
The bust would have been labelled with a number alone and the catalogues give only titles and name, ‘Privy Counsellor Professor Dr His’. Yet many locals knew something of this ‘outstanding Leipzig personalit[y]’, whose seventieth birthday was celebrated during the 1901 exhibition. The Bach bust focused attention on his widely-reported role, and is surely why he was there, as Seffner continued to fight for the memorial commission. But His was also renowned as an embryologist, and this could have helped visitors place the model.

Present in medical illustration and ceroplastics for decades, human embryos, though still excluded from the schools, were becoming more prominent. State anatomical collections showed the academic Ziegler waxes and some opened to the public, but more people saw model embryos in the ‘secret cabinets’ of private museums, among naked and dissected bodies, obstetric operations and syphilitic genitalia. More respectably, high-circulation periodicals and encyclopaedias now pictured vertebrate embryos (Fig. 9A). So though medics still railed against lay ignorance, many visitors could have recognized the model as embryological. Few will have realized that it is greatly magnified, but most will have assumed it was human. What might they have thought next?

Embryo and fetus carried contradictory meanings. Popular embryology concentrated on individual genesis in pregnancy, but in Haeckel’s influential theory of recapitulation embryos also represented stages in the history of life on earth. In the dominantly optimistic reading they were evidence of the past and full of promise for the future. The new art-world prominence of normal and monstrous fetuses was darker. French symbolist printmakers and the English illustrator Aubrey Beardsley appropriated this flexible signifier, which had currency in Germany too (Fig. 9B). Their ‘decadent’ art used abortions to comment on the declining birth rate and degeneration, to oppose feminism and to thematize creative as well as procreative failure. The symbolist imaginary played with fantastic associations between embryos, fetuses, abortions and monsters and the associated types, from pregnant women to prostitutes, doctors to abortionists. Embryos in art galleries could further be controversial, not just for their association with sex but also for ‘anatomical literalness’ more suited to ‘medical books’.

Yet approaches to Seffner’s model were constrained by its extreme naturalism and its display as a professorial portrait by an uncontroversial artisan. This helps to explain the absence of response: the few reviews I have seen that mention the bust, and one that depicts it, do not refer to the model. Were reviewers embarrassed or avoiding scandal? Did classically-educated critics still not recognize embryos or did they deny a medical accessory any general interest?

Lay visitors could nevertheless have placed His, recognized the object as embryological, and accepted the invitation to think about their relations. They could have understood the embryo in the same frame as other Imperial German discipline-builders’ more or less esoteric research objects: Haeckel’s
Fig. 9. Contrasting representations of embryos and fetuses around 1900. (A) ‘Human Development’, one of only 80 chromolithographs introduced into the fourth edition of the encyclopaedia *Meyers Grosses Konversationslexikon* (vol. 5, Leipzig, 1890, between pages 730 and 731, 30 × 24 cm). (B) Aubrey Beardsley, ‘Incipit vita nova’, c.1893, which subverts the iconography of Madonna and child by substituting an aborted fetus for Christ, and caricatures Dante Gabriel Rossetti’s ‘Beata Beatrix’. The last figure on His’s normal plate could have shaped Beardsley’s late embryonic or fetal form: Malcolm Easton, *Aubrey and the Dying Lady*, London, 1972, pp. 179-81. Ink and Chinese white over pencil on brown paper (20 × 20 cm), from Brian Reade, *Beardsley*, London, 1967, pl. 273.
apes, anthropologist Rudolf Virchow’s skeletons and public-health official Robert Koch’s bacteria. In this frame Seffner’s bust represented an embryologist, as such, for the first time. Those who knew him as a central figure in debates over embryology could have appreciated the more subtle contrast with representations of Haeckel. So could the many more people who had heard the forgery charges, prominent again in the controversy over the *Riddles of the Universe.*

Though pathology museums featured fetuses and newborns, few visitors could assess whether such an early embryo was normal or malformed. But His clearly represented normality. He appears as the respectable opposite of the decadent stereotypes to which cultural historians have paid more attention. No disreputable abortionist with a fetus symbolizing a pregnancy cut short, he focused his benevolent gaze on a productive encounter. This embryo is a memento of life, not turned into garish chromoplastics, but preserved, like a fossil, in stone. The pose of collector and connoisseur suggests a possessive, fatherly, love. His appears as an expert on human origins, reflecting on what embryos have to teach and pondering their potential.

**IN THE DISCIPLINES**

Colleagues had not commissioned the bust; it was neither part of a campaign for the recognition of human embryology nor depicted in obituaries when His died in 1904. He was succeeded as professor of anatomy by a student of Haeckel, Carl Rabl, who was hostile to His and would hardly have welcomed a portrait. So it entered the disciplines of anatomy and embryology relatively late. By the time His’s widow moved to Basel in 1922, Rabl had died and she donated a painting to the Leipzig anatomical institute, but she kept the marble. It stood after her death in the house of their eldest daughter Marie. ‘[T]he excellent bust’ became generally known in anatomy and embryology only with the reproduction of a drawing as the frontispiece to Wilhelm Jr’s 1931 biography (Fig. 6D).

The American anatomist Franklin P. Mall started the twentieth-century centre of human embryo research, the Carnegie Institution of Washington’s Department of Embryology in Baltimore, in 1914 and celebrated his teacher His as the founder of modern human embryology. In spring 1932 the next director, George L. Streeter, who had also studied with His, received the biography from His Jr, whom he had long been pressing to donate his father’s embryological collection and scientific memorabilia for a special room. This would allow scientists to compare His’s publications with his preparations and anoint the department as the central embryological institution he had worked to set up. ‘Various portraits should be on the walls and a good photograph of the marble bust in which he is holding Br3 in his hand. The reproduction in your biographical sketch is excellent, but it would need to be larger.’
Before reading Streeter's letter, the only identification I have found in the historical record, I had reckoned embryo α the most likely model, based on resemblance and prominence. It might seem foolhardy to doubt the leading human embryologist of his day. But Br3, the third embryo from the gynaecologist Johannes Brennecke, is an obscure choice compared with one of His's most thoroughly modelled early preparations. To resolve the issue I asked Ronan O'Rahilly, who completed Streeter's work to produce the standard Carnegie stages of human development, to adjudicate between Br3 and α on the basis of copies of published drawings and of a photograph of the marble model (Fig. 1B). Professor O'Rahilly stated, also on behalf of his collaborator Dr Fabiola Müller: 'It is our opinion... that α is shown with the bust, and it belongs to Carnegie stage 13. Br3 is more advanced and probably belongs to stage 14.'

Rabl's successor refused to give Streeter the collection, so later in 1932, in an alcove off the entrance to the library, he created a "shrine" from the memorabilia His Jr could send (Fig. 10). A promised photograph of the bust never arrived, and it proved 'a drama' for His to have another taken in Basel; it is difficult for a single view to capture both the man and the detail of the model. He finally sent two prints in July 1933, and Streeter intended to add one.

Disciplinary change and His's complex reputation combined with inaccessibility to restrict use. By the 1940s, physiological experimentation on living animal embryos was dominant internationally, with an increasing focus on cells, genes and molecules, while His-style human embryology went into decline, even within the Carnegie Department. So experimental embryologists, and the 'developmental biologists' who inherited this field in the 1960s, hailed him, with reservations, as a pioneer of a mechanical approach. But they ignored his human embryology and concern with visualizing development as 'merely descriptive', and wax models were as unfashionable as marble busts. Seffner’s thus lacked appeal and visiting-card photographs were more easily available and reproduced in print.

His was viewed differently in the Basel anatomical institute, which commemorated the full range of the local hero’s work. Donated by the family after the war, the bust stood on the first-floor landing until moved to the foyer in the 1970s. Even here, the professors of anatomy favoured other portraits for their biographies of His, but the museum director selected Seffner’s work for the cover of a pamphlet in 1992.

**AMONG EMBRYOS AND EMBRYOLOGISTS TODAY**

For the first half of the twentieth century not only was the His bust little used; I know of no other portrait of an embryologist with an embryo. Even at the Carnegie Department, only the modeller appears to have been photographed with his reconstructions. The few sufficiently high-profile embryologists were sometimes depicted in articles that also showed their
Fig. 10. Photograph of the ‘shrine’ George L. Streeter erected to Wilhelm His Sr at the Carnegie Institution of Washington’s Department of Embryology, Johns Hopkins University, Baltimore, taken primarily to show Wilhelm His Jr in June 1933. Smaller portraits surround the Olde engraving (Fig. 3D), below which is a Basel view. In the cabinet are books, manuscripts, microscope slides and glass photographs, as well as instruments, including (top) His’s microscope and (bottom) his low-power drawing apparatus or ‘embryograph’ (24 × 15 cm).
research objects. But while in the 1950s molecular biologists began to pose with models of proteins and DNA, developmental biologists still sat at microscopes or with adult organisms. This changed in the 1960s and '70s when several innovations increased the prominence of human embryos and revolutionized reproduction.

Representations of human embryos and fetuses gained wide exposure in an expanded and more visually prolific mass media. In 1965 an extraordinarily successful *Life* magazine photo-essay claimed to show ‘the first portrait ever made of a living embryo inside its mother’s womb’. The subject was introduced into school biology around the same time. Crucially, while reproductive scientists had long attracted publicity, features on imminent brave new worlds now portrayed them with eggs and embryos (Fig. 11A). When embryology joined with gynaecological surgery to achieve, in Oldham in 1978, the first human birth following *in vitro* fertilization (IVF), newspaper photographs showed embryologist and gynaecologist with ‘test-tube baby’ Louise Brown (Fig. 11B). Midwives or nurses, not obstetricians, had generally appeared with newborns in medical settings; the ‘baby makers’ now took centre stage.

The routinization of assisted reproduction in the 1980s created the profession of clinical embryologist. The dominant image is a reassuring shot of a man or woman at or near a binocular microscope in a fertility clinic (Fig. 11C). The connection of microscopes to external displays makes it easy to see the person and the embryo s/he magnifies in the same view, as also in the embryologist’s panel in Wendy McMurdo’s 2002 group portrait of the team that cloned Dolly the sheep. ‘What does an embryologist really look like?’ asks an American website, and answers: ‘Embryologists look like regular people in pajamas and silly caps and masks’. Contemplation by an elderly man is replaced by the relaxed seriousness of demographically diverse team members who invite the infertile to take a detour via embryology in order to reproduce. Linguistic slippage between embryos and babies is endemic.

Two other major frames of reference owe little to embryologists directly, but have transformed visibility and meanings. First, as pregnancy was hospitalized in the mid twentieth century, intensive monitoring and heroic surgery constructed a ‘fetal patient’. By the 1980s, ultrasound scans were routine. His had been unusual in calling his drawings portraits, but now obstetric sonograms and images of early IVF embryos joined magazine photographs in making fetal and embryonic portraiture common. Second, from the 1970s antiabortionists wielded fetal images against the liberalization of nineteenth-century laws. But though abortion opponents held models (Fig. 11D), Seffner’s His is not easily co-opted for that cause. Too early for a layperson to recognize as human, the model represents a particular preparation, not a generalized icon. It does embody an aspect of the embryological tradition that has become problematic: the pregnant body is excluded while the embryo is
Fig. 11. Portraits with egg, embryo, fetus and baby. (A) Cambridge physiologist Robert Edwards portrayed on the 14 December 1965 cover of the paramedical magazine *World Medicine*, superimposed against a projected slide of a human egg. The article inside explained that ‘Culture of early human embryos is imminent’. (B) Edwards (left) and Oldham gynaecologist Patrick Steptoe (right) hold Louise Brown, *Daily Mail*, 25 Aug. 1978, p. 17 (border 30 × 25 cm). The paper had an exclusive deal with the Browns and gave the controversial event positive coverage. (C) University of South Florida embryologist Ying Ying in an online health news item, http://hscweb3.hsc.usf.edu/health/now/?p=532, 14 July 2008, accessed 7 May 2009. (D) Jack Scarisbrick, founder of the British anti-abortion organization *Life*, holding ‘a model of twin embryos in the womb’ in a ‘Joanna Coles Interview’, ‘Life, Death, and the Total Denial of Sex’, *Guardian*, 10 Aug. 1996, p. 29 (28 × 17 cm).
massively enlarged. But the disturbing effect – is that man really holding an embryo? – thematizes more than it mystifies the labour through which human embryology made its objects at a scale that can be held in the hand.

By the 1990s images that stand variously for embryo, fetus, abortus and/or baby were familiar to the general public and intensely controversial. Translucent, living, on-screen organisms are worlds away from a heavy, marble model of a dead preparation. And yet, the new images might still return the bust to life. ‘Sci/art’ exhibits may include representations of embryos, but no review would overlook one in a scientist’s hand. Seffner’s bust has gained new frames. Has it also acquired the power to throw recent images of embryos and embryologists into relief?

CONCLUSION

Reconstructing the design and viewing of Seffner’s work links important private and public worlds of science around 1900. A sculptural portrait with one of His’s own portrait sculptures, the bust embodies a shared project of exact, three-dimensional anatomy. At a time when embryos were most commonly represented in sweepingly speculative accounts of the history of life on earth, the pose radiates calm contemplation of a single specimen. His had taken a clot of blood passed by a miscarrying woman and worked this uncertain material, by cutting, drawing and modelling, into a statue that symbolizes the redefinition of pregnancy in embryological terms. Seffner gave man and embryo the same status in stone.

The resources available to viewers in a family gallery, art exhibitions and an anatomical institute suggest interpretations of this first portrait of an embryologist as such – the Basel scholar and Leipzig professor, the respectable researcher of origins, the founder of modern human embryology – that differ from the stock figures of evolutionist, abortionist and experimentalist. The marble model makes sense as ‘a precious object’, ‘a very well preserved homunculus’, ‘embryo α’, a ‘creature’ taking its ‘first steps’, an ancestor, but not as a symbolist fetus. These contrasts enrich our view of embryologists’ relations to their research objects during a crucial era in the promotion of the embryological view of life.

Yet public responses to the model were restrained. The portrait remained isolated by its private origin and initially domestic display; it was hard to depict in print and limited in its appeal within embryology. It did not inaugurate a tradition of portraying embryologists with embryos. A different one began when early human development acquired public prominence and clinical relevance between the 1960s and the 1980s. As a result, Seffner’s piece, though more distanced from us than ever in medium, style and subject, has gained a context that may render it more surprising, affecting and disconcerting than when it was made.
Nick Hopwood is Senior Lecturer in the Department of History and Philosophy of Science, University of Cambridge, where he runs a Wellcome Trust-funded programme on ‘Generation to Reproduction’. Recent work includes the co-curated online exhibition Making Visible Embryos www.hps.cam.ac.uk/visibleembryos (2008) and the co-edited special issue ‘Seriality and Scientific Objects’, History of Science 48: 3/4, 2010. He is finishing a book on Pictures of Evolution and Charges of Fraud, about how the most controversial images in the history of science became standard textbook illustrations.

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43 Eduard His-Heusler, ‘Meine Lebenserinnerungen’, pp. 36, 105-6, Ochs/His Archive F 3-16; Eduard His-[Eberle, ‘Der Miniaturmalerei Friedrich Ochs gen. His. 1782-1844’, Basler Jahrbuch, 1938; Daniel Burckhardt-Werthemann, ‘Eduard His-Heusler’, Basler Jahrbuch, 1907.

44 Wilhelm His, Lebenserinnerungen, Leipzig, 1903, p. 16.
45 His Jr, Wilhelm His, p. 75.
46 For Jacob Burckhardt’s puzzlement: Burckhardt to Rudolf Oeri, 20 May 1872, in Burckhardt, Briefe, vol. 5, Basel, 1963, pp. 163-5.
47 Eduard His, Basler Gelehrte des 19. Jahrhunderts, Basel, 1941, pp. 218, 226.
48 Gossman, Basel, p. 8 (quotation); Hopwood, ‘Pictures’, pp. 284-5.
49 His, Basler Gelehrte, p. 222.
50 His, Anatomie menschlicher Embryonen, part 1: pp. 4 (’Schatze’, ’Kostbarkeiten’), p. 116 (’Das wertvollste Praparat’); His to Miescher, 3 Nov. 1878 (’Menschlein’), 5 April 1879 (’das allerjüngste Volk’, ’ein ganz respectable kleines Corps’), 30 Dec. 1879 (’embryo a as ’Homunculus’), 21 March 1880 (’meine Homunculusarbeit’), 1 May 1881 (’einer Gesellschaft von Wachshomunculi’), 20 June 1881 (’von jüngem] Menschlein’, ’Homunculus’), Miescher Papers. ’Homunculus’, translated by ’Menschlein’, harks back to Samuel Thomas Soemmerring’s Icones embryonum humanorum of 1799: Schriften zur Embryologie und Teratologie, ed. Ulrike Enke, Basel, 2000, pp. 174-5.
51 ’Ich hatte namentlich in dieser Zeit den kleinen (seither in die Familie erheiratheten) Embryo in Arbeit, den du mir vor Jahren in die Sammlung gestiftet hast!’ His to Miescher, 3 Nov. 1878, Miescher Papers.
52 His Jr, Wilhelm His, pp. 31, 52. On fatherhood: Yvonne Schütze, ‘Mutterliebe-Vaterliebe. Elternrollen in der bürgerlichen Familie des 19. Jahrhunderts’, in Bürgerinnen und Bürger. Geschlechterverhältnisse im 19. Jahrhundert: zwölf Beiträge, ed. Ute Frevert, Göttingen, 1988.
53 For example, a photograph of Elisabeth His-Vischer with their son Hans: His, Chronik. On family portraits: Angelika Lorenz, Das deutsche Familienbild in der Malerei des 19. Jahrhunderts, Darmstadt, 1985; Kate Retford, The Art of Domestic Life: Family Portraiture in Eighteenth-Century England, New Haven, 2006.
54 His Jr, Wilhelm His, p. 52.
55 Theodore H. Bast and Weston D. Gardner, ‘Wilhelm His Jr and the Bundle of His’, Journal of the History of Medicine and Allied Sciences 4, 1949.
56 ’Vor einigen Tagen wurde ich durch Eduard mit einem schönen Bilde von Großpapa Ochs erfreut. … Das Bildchen hängt nun über meinem Schreibtische und ist mir ein liebes Andenken. – Ich habe diese Tage mich auch mit Portraitzeichnen abgegeben und zwar mit Portraits bei denen es auf äussere Ähnlichkeit ankommt. Es handelt sich aber nicht um verdienstvolle Männer oder Frauen sondern um Geschöpfe, die erst auf den ersten Stufen dahin sind.’ His to Antonie Miescher-His, 26 July 1874, Ochs/His Archive E 3-4.
57 Wilhelm His, Unsere Körperform und das physiologische Problem ihrer Entstehung. Briefe an einen befreundeten Naturforscher, Leipzig, 1874, pp. 192-206, esp. pp. 201-2. See further Hopwood, ’Producing Development’, pp. 35-6; and Hopwood, ’Pictures’, p. 294.
58 Uta Neidhardt, ’Gotthardt Kuehl in Dresden, 1895-1915’, in Gotthardt Kuehl, 1850-1915, ed. Gerhard Gerkens and Horst Zimmermann, Leipzig, 1993, pp. 58-61; Beth Irwin Lewis, Art for All? The Collision of Modern Art and the Public in Late-Nineteenth-Century Germany, Princeton, 2003, p. 118.
59 Leipziger Zeitung, no. 75, 1 April 1899, p. 1,373 (quotation); Kunstchronik 10, 1899, pp. 333-4.
60 Offizieller Katalog der Deutschen Kunst-Ausstellung Dresden 1899, 2nd edn, Dresden-Blasewitz, 1899, p. 87; Willy Doenges, ’Deutsche Kunstausstellung Dresden 1899’, Leipziger Zeitung, no. 101, 3 May 1899, pp. 1,864-5 (Gobelins).
61 Kühn, ’Carl Seffner’ (1899), 395, 397; Kühn, ’Carl Seffner’ (1911), 1,323. Seffner did represent a few women.
62 Offizieller Katalog der Internationalen Kunstausstellung Dresden 1901, 3rd edn, Dresden-Blasewitz, 1901; Neidhardt, ’Gotthardt Kuehl’, p. 59.
63 Leipziger Zeitung, no. 79, 7 April 1899, p. 1,454.
64 K–n, ’Professor Wilhelm His. Geboren am 9. Juli 1831’, Leipziger Tageblatt und Anzeiger, no. 344, 9 July 1901, p. 4,943; ’Wilhelm His’, Illustrirte Zeitung, no. 3,028, 15 June 1895, pp. 713-14.
65 Johann Sebastian Bach’s Grabstätte und Gebeine. Bemerkungen zu ihrer Wiederauffindung’, Illustrirte Zeitung, no. 2,711, 15 June 1895, pp. 713-14.
66 For example, Stephan Oettermann, ’Alles-Schau. Wachsfigurenkabinette und Panoptiken’, in Viel Vergnügen. Öffentliche Lustbarkeiten im Ruhrgebiet der Jahrhundertwende, ed. Lisa Kosok and Mathile Jamin, Essen, 1992.
67 Eduard Seidler, ‘Das 19. Jahrhundert. Zur Vorgeschichte des Paragraphen 218’, in Geschichte der Abtreibung. Von der Antike bis zur Gegenwart, ed. Robert Jütte, Munich, 1993.

68 Susan J. Navarette, The Shape of Fear: Horror and the Fin de Siècle Culture of Decadence, Lexington, 1998, pp. 60-109; Stead, Le monstre; Elizabeth K. Menon, ‘Anatomy of a Motif: the Fetus in Late 19th-Century Graphic Art’, Nineteenth-Century Art Worldwide 3:1, 2004. See further Cornelia Gerner, Die ‘Madonna’ in Edvard Munchs Werk. Frauenbilder und Frauenbild im ausgehenden 19. Jahrhundert, Morsbach, 1993, pp. 81-9, 183-6; Emily Braun, ‘Ornament as Evolution: Gustav Klimt and Berta Zuckerkandl’, in Gustav Klimt: the Ronald S. Lauder and Serge Sabarsky Collections, ed. Renée Price, New York, 2007.

69 Observer, 4 Jan. 1914, p. 6, with reference to an embryo drawing in a Jacob Epstein exhibition; Anne Middleton Wagner, Mother Stone: the Vitality of Modern British Sculpture, New Haven, 2005, pp. 51-63, 265-7.

70 The photograph: Kühn, ‘Carl Seffner’ (1899), p. 397; the bust mentioned: Leipziger Zeitung, no. 75, 1 April 1899, p. 1,373; Leipziger Zeitung, no. 79, 7 April 1899, p. 1,454; Ernst Kiesling, ‘Leipziger Kunstverein. Max Klinger und Carl Seffner’, Leipziger Tageblatt und Anzeiger, no. 178, 9 April 1899, p. 2,806. A file (01/611) in the Archiv, Hochschule für Bildende Künste Dresden collects dozens of reviews of the 1899 Dresden show; several discuss Seffner and the Leipziger Neueste Nachrichten praises the His bust. The 1901 exhibition lacks such a resource, but ‘Internationale Kunstausstellung Dresden 1901’, Leipziger Tageblatt und Anzeiger, no. 204, 23 April 1901, p. 2,980, mentions the bust.

71 For example, Christoph Gradmann, ‘Invisible Enemies: Bacteriology and the Language of Politics in Imperial Germany’, Science in Context 13, spring 2000.

72 For example, Eberhard Dennert, Die Wahrheit über Ernst Haeckel und seine Weltraßel. Nach dem Urteil seiner Fachgenossen, 2nd edn, Halle, 1901. (For the charges, see n. 9 above.)

73 The most prominent opened in Berlin in 1900: Angela Matyssek, Rudolf Virchow. Das Pathologische Museum. Geschichte einer wissenschaftlichen Sammlung um 1900, Darmstadt, 2002.

74 The story of Pygmalion and Galatea is also a possible resource.

75 Could the model near the swelling paunch have evoked the demountable wax anatomies of pregnant women that were a staple of popular anatomical museums?

76 Albert Winther’s portrait from 1898 (?). The Berlin sculptor Gustav Weidanz made the institute a bronze bust in 1957: Cornelia Junge, personal communications.

77 His Jr to Streeter, 9 July 1933, Carnegie Papers.

78 His Jr, Wilhelm His, 56. Hopwood, ‘“Giving Body”‘, p. 465, n. 7, misread the rest of this sentence; it refers to the inscription Seffner carved on His’s gravestone.

79 Florence Rena Sabin, Franklin Paine Mall: the Story of a Mind, Baltimore, 1934; Ronan O’Rahilly, ‘One Hundred Years of Human Embryology’, in Issues and Reviews in Teratology, vol. 4, ed. Harold Kalter, New York, 1988; Lynn M. Morgan, Icons of Life: a Cultural History of Human Embryos, Berkeley, 2009.

80 Streeter to His Jr, 6 May 1932 (copy), Carnegie Papers; ‘Commemorative Practices in Science: Historical Perspectives on the Politics of Collective Memory’, ed. Pnina G. Abir-Am and Clark A. Elliot, Osiris 14, 1999.

81 Wilhelm His, ‘Zur Geschichte des menschlichen Rückenmarkes und der Nervenwurzeln’, Abhandlungen der mathematisch-physischen Classe der Königlich Sächsischen Gesellschaft der Wissenschaften 13, 1886, introduces Br3 on p. 479.

82 Ronan O’Rahilly to the author, 18 April 2005. Streeter’s comment remains mysterious. The frontispiece could have confused things (Fig. 6 B, D), but he is unlikely to have treated it as sufficient for identification; he could have mis-recognized the marble from his time in Leipzig in 1902.

83 Streeter to His Jr, 4 Nov. 1932 (‘“shrine”‘), 20 June 1933 (copies); His Jr to Streeter, 17 Aug. 1932, 9 (‘drama’) and 22 July 1933, Carnegie Papers. On the shrine further: Streeter, ‘The Status of Metamerism in the Central Nervous System of Chick Embryos’, Journal of Comparative Neurology 57, 1933, p. 455.

84 Laurence Picken, ‘The Fate of Wilhelm His’, Nature 178, 1956; Hopwood, ‘“Giving Body”‘; Hopwood, Embryos in Wax, pp. 77-83; Hopwood, ‘Embryology’.

85 Wilhelm His der Aeltere, Lebenserinnerungen und ausgewählte Schriften, ed. Eugen Ludwig, Bern, 1965, p. 11; Dieter Sasse to the author, 1 Oct. 2004.
86 Gerhard Wolf-Heidegger, ‘Wilhelm His, sen.’, in Staehelin, Professoren der Universität Basel, pp. 172-3; Hugo Kurz, Wilhelm His (Basel und Leipzig). Seine Beiträge zur Weltgeltung der Anatomie im 19. Jahrhundert, Basel, 1992.

87 Cambridge embryologist J. D. Boyd was photographed in the 1950s or ’60s against fetal and embryological preparations in the anatomical museum; photograph in the professorial portrait gallery in the Anatomy School.

88 O’Rahilly, ‘One Hundred Years’, p. 95; Spencer L. Davidson, ‘The Man Who Really Slowed Up’, magazine clipping, c.1956, Carnegie Institution of Washington Archives, Embryology 3/3. Mid 1930s group shots in the seminar room show models behind; see, for example, Buklijas and Hopwood, ‘Standards: Introduction’, Making Visible Embryos (http://www.hps.cam.ac.uk/visibleembryos/s6.html).

89 Daniel Jacobi and Bernard Schiele, ‘Scientific Imagery and Popularized Imagery: Differences and Similarities in the Photographic Portraits of Scientists’, Social Studies of Science 19, 1989.

90 De Chadarevian, ‘Portrait’; de Chadarevian, ‘Models and the Making of Molecular Biology’, in Models, ed. de Chadarevian and Hopwood. I surveyed portraits of leading developmental biologists and asked around, but have not checked films, TV or medals. Only a few of the country-issue covers of the International Journal of Developmental Biology from 1989 to 2008 mix portraits and pictures of embryos: http://www.ijdb.ehu.eus/web/spcountries.php, last accessed 11 Sept. 2008. One embryologist was photographed against a book-lined wall: Jordanova, Defining Features, p. 53; another at the stereomicroscope: John P. Trinkaus, Embryologist: My Eight Decades in Developmental Biology, Alexandria VA, 2003, cover.

91 For surveys: Sara Dubow, ‘Ourselves Unborn: Fetal Meanings in Modern America’, PhD thesis, Rutgers, the State University of New Jersey, 2003; Buklijas and Hopwood, Making Visible Embryos; Morgan, Icons of Life.

92 ‘Drama of Life Before Birth’, Life 58, no. 17, 30 April 1965, p. 54; Solveig Jülich, ‘Fetal Photography in the Age of Cool Media’, in History of Participatory Media: Politics and Publics, 1750-2000, ed. Anders Ekström and others, London, 2010. On school biology: Buklijas and Hopwood, ‘Standards: Public Embryology’, Making Visible Embryos (http://www.hps.cam.ac.uk/visibleembryos/s6.4.html). A prolific producer of images, the New York gynaecologist Landrum B. Shettles, was shown against a wall of photographs of allegedly fertilized eggs: http://www.pbs.org/wgbh/americandecade/features/timeline/babies/.

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96 For example, Lisa M. Mitchell, Baby’s First Picture: Ultrasound and the Politics of Fetal Subjects, Toronto, 2001; Janelle S. Taylor, The Public Life of the Fetal Sonogram: Technology, Consumption and the Politics of Reproduction, New Brunswick, 2008; Sarah Franklin and Celia Roberts, Born and Made: an Ethnography of Preimplantation Genetic Diagnosis, Princeton, 2006, pp. 153-7; Linda L. Layne, Motherhood Lost: a Feminist Account of Pregnancy Loss in America, New York, 2003, pp. 81-143.

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