Mystery and music in the anatomy museum

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Jauntily posed on a wooden baluster, the small, rickety skeleton holds a recorder in both hands, head tilted to one side as though anticipating the merry jig he is about to play. He is something of an anomaly sitting in a display case in the Harry Brookes Allen Museum of Anatomy and Pathology at the University of Melbourne. A pathological specimen, it's true, and yet one brimming with a perverse humour as he clasps the wooden recorder between the carefully articulated bones of his fingers.

He was a beggar, we have been told, who played his recorder at the gates of Notre Dame Cathedral in Paris,[1] probably during the French Revolution.[2] Living until approximately 18 years of age, he was apparently well known to the people of Paris. [3]And yet it would not have been his music that captured their attention, but rather the single, symmetrical lower leg that had supported him from birth.

Evoking the curved tail of the mythical mermaid, the skeleton's lower limbs comprise two apparently normal femurs (thigh bones) joined by a single patella (kneecap) which, in turn, connects one tibia and fibula (shinbones) and right foot. With the aid of crutches, one supposes, he would have achieved a certain amount of mobility, traversing the distance between the cathedral's gate and wherever it was he laid his head at night.

The poignant narrative of the skeleton proffers a voice after death: a sense of agency for the perpetually silenced. At the same time, it gives one an opportunity to reflect upon one's own corporeality, in the *memento mori* tradition. Beseeching us to remember that we too must die, the Latin dictum resounds in this peculiar specimen—the articulated skeleton forever poised to play on the instrument he was said to have played in life.

But what if the recorder player never existed, and his personal narrative was conceived by a preparator as part of a sales pitch or private amusement? Was he just another anonymous corpse dragged out of the River Seine? And was his left leg damaged or missing, inspiring the preparator to construct the unusual pathology we see before us?

Consider the teratological woodcut illustrations of Ulisse Aldrovandi's *Monstrorum historia cum Paralipomenis historiae omnium animalium* of 1642, where imagination and pathology collide. Amongst Aldrovandi's 'monsters' can be found the mermaid and merman, with their characteristic fused lower limbs encased in fish scales. While this half-human, half-fish creature is a mythological construct, it finds a counterpart in the rare congenital disorder, sirenomelia. Named after the mythical Greek sirens and commonly referred to as 'mermaid syndrome', sirenomelia is a gross malformation of the lower limbs, and is associated with severe anomalies including renal agenesis (undeveloped kidneys), and urogenital and gastrointestinal defects.[4]

Since sirenomelia was first described in 1542,[5] there have been several permutations of the disorder recorded. Yet as we will see, the two femurs and single lower leg exhibited in this skeleton are not a combination that has been encountered before along the spectrum of sirenomelia.

The professor

The University of Melbourne was already in its eighth year by the time it employed 38-year-old George Britton Halford as its first professor of anatomy, physiology and pathology in 1862. Described as 'one of the most distinguished experimental physiologists of the day',[6] Halford had been physician at the Royal Hospital for Diseases of the Chest, London; lecturer in anatomy at the Grosvenor Place School of Medicine; and he also ran a private practice.

Skeleton with rickets and unusual pathology of the lower limbs, preparation attributed to Jean-Joseph Sue *père*, Paris, late 18th century; bone, wood, wire, paint, resin and horsehair; 80.0 × 41.5 × 32.5 cm. Accession no. 531-008091, purchased 1862, Harry Brookes Allen Museum of Anatomy and Pathology, University of Melbourne.

Following Halford's appointment, the University of Melbourne sent him a cheque for £500 to buy books for a library and specimens for the establishment of a museum.[7] Halford and his family arrived in Melbourne on 23 December 1862. Among the specimens he brought with him was the mysterious skeleton of the recorder player.

Although the receipt has not survived, we know from Halford's writings that he bought the skeleton in 1862 through the osteology and medical equipment suppliers Messrs Raginel & Co. in London. The firm's advertisements, often distinguished by an illustration of an articulated skeleton, appeared regularly in reputable medical publications. Boasting fine-quality French human osteology, one advertisement from 1857 explains that all of Raginel's pieces were 'prepared in [the firm's] Dissection-room of Paris, by scientific men'.[8] Another proudly announces the firm's patronage by the Royal College of Surgeons.[9]

In the 19th century it was illegal to keep an Englishman's bones. As a result, skeletons were sought from France, and came at a reasonable price. An 1876 article in the *British Medical Journal* quipped that 'the foundation of every man's knowledge of the human frame is gained from Frenchmen'.[10] According to Halford's notes, Raginel & Co. bought the skeleton for him in Paris, and told him it was a preparation by the French surgeon Dr Jean-Joseph Sue *fils* (1760–1830).[11] Surely this detail would have resonated with the professor, adding value and credibility to the unusual specimen.

Sue's illustrious career included roles as *médecin-en-chef* of the Imperial Guard from 1800; professor of anatomy at the School of Fine Arts, Paris, from 1819; and membership of the Académie de Médecine from 1821.[12] He was also the father of the popular novelist Eugène Sue. He was descended from a long line of eminent surgeons: his father was Dr Jean-Joseph Sue *père* (1710–1792), professor of anatomy at the Royal Academy of Painting and Sculpture, Paris, who 'made a large collection of anatomical and pathological specimens, which his son afterwards continued',[13] although it was destroyed by fire in 1830.[14]

In April 1863 Halford announced his intention to devote 'the best years of his life to the promulgation and teaching of the sciences of anatomy and physiology'. It was his ambition that 'the medical school of Victoria should be second to none in Europe'. Yet despite this clarity of vision, Halford would prove to be somewhat of a disappointment in terms of his limited output, and had a 'research reputation less than stellar'.[15]

For reasons unknown, it was not until 1868 that Halford brought the skeleton of the recorder player to the attention of the public, presenting a talk to the Royal Society of Victoria, which formed the basis of his essay, 'On a remarkable, symmetrically deformed skeleton'. Although he expressed unequivocal interest in the skeleton, his understanding of its pathology was limited, following unsuccessful attempts to locate a similar example in other anatomical collections before leaving England. 'Short of sawing through and spoiling the preparation', he wrote, 'I have examined it as thoroughly as possible, and see no reason to believe it other than a natural deformity, and not an artificially prepared specimen'.[16]

Halford attributed the general deformity of the skeleton to rickets of childhood (which the individual had outgrown), citing 'the compressed thorax, curved spine, diminutive pelvis and curved extremities' as evidence of this. Halford reasoned that the individual most likely relied on crutches to move around, evidenced by the forward curve of the fibula and tibia, and by what he interpreted as 'large muscular impressions on the bowed humeri'.[17]

Is it possible that Halford was so immersed in the prescribed narrative of the skeleton, that he detected trauma otherwise imperceptible? In his presentation to the Royal Society, Halford reiterated the skeleton's captivating biography, and anticipated the interest, particularly internationally, it would garner. The presentation was widely reported in Australian newspapers, revealing additional details surrounding the purchase of the skeleton, as well as further biographical speculation, not included in Halford's published paper. The *Ballarat Star* reported that Halford 'had been assured (the skeleton) was put up by Sue, the father of Eugène Sue, the French author', and that it had been hidden away during the elder Sue's political troubles, 'and ultimately fell into the hands of a poor servant girl'.[18]

A case of sirenomelia?

Although Halford was unable to find a specimen exhibiting a similar pathology, he expressed a general interest in deformity and found value in Willem Vrolik's teratology atlas of 1849, *Tabulae ad illustrandam embryogenesin hominis et mammalium, tam naturalem quam abnormem*. As indicated by the brevity of Halford's essay, he resisted speculation and did not give a name to the peculiar pathology of the skeleton. In Vrolik's atlas, there are entries on sirenomelia, which is arguably the congenital disorder most closely related to the Halford skeleton's pathology. Plate 64 presents a discussion on *Monopodia sireniform*, described by Vrolik as the 'existence of only one lower extremity'.[19] Front and rear views of the skeleton of a miscarried foetus bear, at first glance, a striking resemblance to the Halford skeleton with its single, symmetrical leg. But the illustration has only one femur, one tibia and two toes. Moreover, this foetus did not survive birth,

due to severe visceral anomalies. The Halford skeleton lived until approximately 18, suggesting he did not have any of sirenomelia's severe complications.

Although Halford was advised the skeleton had reached 28 years of age at the time of death, a recent analysis of X-rays by Associate Professor Chris Briggs, consultant forensic anthropologist for the Victorian Institute of Forensic Medicine, has determined the skeleton to be around 18 years of age and of Caucasian origin.[20]

Sirenomelia is a rare malformation sequence involving the partial or complete fusion of the lower limbs, and is associated with serious urogenital, anal, lower spine, and other anomalies.[21] It occurs at a rate of 0.98 per 100,000 births,[22] with more than half of all cases resulting in stillbirth.[23] There are seven subtypes of the disorder, classified according to the fusion of bones.[24] While the foetus represented in Vrolik's text is consistent with Type VI (a single femur and tibia), the Halford skeleton does not find a counterpart. The characteristics of Type IV (partially fused femur and a single fibula) are the most consistent with his form, yet he also has a single tibia and a well-developed right foot.

Sirenomelia has also been classified into three types according to the number of feet. Vrolik's example is most consistent with *sympus apus* (the most common form of the disorder), which lacks both feet, or has a rudimentary presence of feet (in the Vrolik example, the foetus has only two toes). It is characterised by a completely fused single lower extremity with one femur, no fibulae and one or two tibia.[25] Again, this corresponds with the Vrolik example.

The Halford skeleton's lower limb is consistent with that of a 'normal' right leg, featuring a right foot with five toes. Yet while the lower limb of the Halford skeleton does not neatly fit any of the scientific classifications, variations on these subtypes have also been identified in other studies, such as a case with one femur, no fibula, partially fused tibias, and two distinct feet.[26]

What remain problematic in diagnosing the Halford skeleton with sirenomelia are the severe gastrointestinal and urogenital malformations commonly associated with the disorder.[27] As there is no description of the Halford skeleton prior to its preparation, it is impossible to know the condition of its viscera. But because he lived into adulthood, it is extremely unlikely that he had any of the severe clinical features of the disorder, which can include, but are not limited to, an imperforate anus, unilateral or bilateral renal agenesis, and absent external genitalia.

Sirenomelia in museums

While the search for a specimen similar to the Halford skeleton in other museum collections has proved futile, it has not been difficult to find examples of sirenomelia. Significantly, all recorded specimens are of foetuses, which have been preserved as wet specimens.

The Musée Testut Latarjet d'Anatomie et d'Histoire Naturelle Médicale, Lyon, holds a number of foetal 'sirens'. One specimen from 1909 features a colostomy, indicating severe visceral anomalies.[28] Wet specimen sirenomelia foetuses in the Berliner Medizinhistorisches Museum der Charité suggest *sympus apus*, being without feet or external genitalia.

The Medical Museion at the University of Copenhagen also has sirenomelia specimens. The museum's 1950 catalogue describes one dating from 1898, which was X-rayed in 1940:

> *Sirenomelus*; mother was 30-years old and gave birth in 17 hours; incomplete positioning of feet;

> 2600 g of indeterminate sex. Radius missing on both sides; right half of the pelvis and lower extremity missing. The flipper is a malformed foot with three toes.[29]

The Wellcome Museum of Anatomy and Pathology, London, has a wet specimen of the lower body of a sirenomelia neonate. It shows a typical presentation of the condition, having two femurs and tibias, and complete fusion of the centrally placed fibulas:

> the bones of the feet are very defective. There is a pronounced anal dimple, but the rectum ends blindly and the colon was grossly dilated in consequence. The external genitalia are rudimentary, but well-developed testes are present in the inguinal canals.[30]

William Edwards, curator of the Gordon Museum, London, recognises that the Halford skeleton displays clear symptoms of rickets, and believes that, while not a typical example, the skeleton 'probably does fit somewhere along the "spectrum" of Sirenomelia'.[31] On the other hand, Laurens de Rooy, curator of Museum Vrolik, Amsterdam, questions whether the Halford skeleton might be a forgery: 'The bones in individuals with rickets often get so malformed that they allow a certain "rearrangement" after death and maceration'.[32]

What is evident is that the Halford skeleton is not like anything seen by curators currently working in international anatomical museums. But while the skeleton is without comparison, the possibility remains for it to be a variation on one of the published classifications of sirenomelia. However, I will now argue that it is closer to a decorative art piece than to a pedagogical aid.

On a pedestal

The famous skeleton from 1783 of Charles Byrne, the so-called 'Irish Giant', at London's Hunterian Museum at the Royal College of Surgeons is displayed un-posed, supported by a steel rod on a flat, unadorned base, and without accoutrement. Prepared by the distinguished surgeon John Hunter, Byrne's skeleton was mounted and articulated to show his remarkable height (approximately 2.31 metres). Although ethical issues surround its display (Byrne's corpse was sold to Hunter against Byrne's wishes), the skeleton remains an important specimen, and a powerful teaching aid for understanding growth disorders.[33]

Thomas Pole's anatomical preservation and preparation manual of 1790, *The anatomic illustrator*, recognised the significance of aesthetics in the presentation of specimens. Fastidiously displayed specimens would also function as 'memorials of (the anatomist's) industry', whereby 'ornate platforms were intended to display prized corroded or dried preparations'. According to Cindy Stelmackowich, 'the elegant style of these pedestals speaks volumes about the bourgeois tastes, expectations, desires, and interests of the early nineteenth-century medical profession'.[34]

The pedestal upon which the Halford skeleton rests is a heavy wooden baluster featuring a three-sided, circular-shaped centrepiece. According to the chairman of Bonhams Australia, Mark Fraser, the baluster is baroque in style, favouring form over function, and therefore more consistent with furniture of the mid-18th, as opposed to 19th, century.[35] The baluster may not have been made specifically for this skeleton. The heavy patina is not consistent with its use as part of an anatomical display, regardless of its age, but rather suggests a former life. Distinctly ecclesiastical in style, the baluster may have formed part of an altar or pew. Moreover, the flat back suggests the baluster was originally flush with a wall. An additional wedge of wood between its cornice

and the skeleton's posterior suggests the baluster was not made for his frame.

At the intersection of art and medicine

'Medical museums today', opines Kathryn Hoffmann, 'would be enriched by breaking more of the boundaries between objects and words, bodies and narratives'.[36] The Halford skeleton, with its animated pose and musical resonance, achieves this balance on its own. Although today it is less common to encounter staged skeletons in a medical museum context, they are part of a rich, macabre history, popular in the 17th and 18th centuries.

Frederik Ruysch (1638–1731) was a Dutch anatomist and botanist who pioneered embellished anatomical preparations and miniature tableaux. Incorporating emblematic attributes and *vanitas* symbols, Ruysch's work gave the beholder 'engaging and comforting commentaries that would make the site of death less distressing'.[37] Ruysch displayed his preparations in cabinets, and at the centrepiece of each cabinet was a still-life tableau, in order to give the collection an overall aesthetic and an evocation of *memento mori*.[38] Although Ruysch's exquisite, ornate tableaux have not survived, they can be seen in the drawings he commissioned for his collection catalogues. One such illustration depicts a tableau of concretions removed from kidneys, bladders, uteruses, breasts and bones, mounded up and adorned with prepared vessels and tiny foetal skeletons.[39] The central skeleton holds a piece of damaged thighbone, which, by the sorrowful tilt of his head and articulation of his arms, is transmuted into a tiny violin.[40] He is accompanied by the phrase '*Ah Fata, ah aspera Fata!*' (Ah Fate, ah bitter Fate!).[41] Mounted on an ornate walnut pedestal, Ruysch's diorama invites the viewer to at once reflect upon mortality and laugh bitterly. For Ruysch, artist and scientist were not incompatible, 'but rather as forming two modes of a single practice, in which the gracefulness of the human arts gradually took over to embellish the godly artwork'.[42]

Hoffmann has had a long fascination with the intersection between art and medicine. She laments the tendency of medical museums in the 20th and 21st centuries to shift away from the macabre in favour of more pedagogical specimens. 'Some of the objects in anatomical collections were destroyed', Hoffmann explains:

> Among them were *memento-mori* inspired pieces whose aesthetic was judged by some museum directors to be too macabre or whimsical to fit the pedagogical objectives, collecting imperatives, or institutional and public tastes of the twentieth or twenty-first centuries. Many of the preparations of the French anatomist Jean-Joseph Sue (*père*) were destroyed.[43]

Hoffmann notes that in 18th-century France, Sue's collection included *memento mori* anatomical pieces inspired by Ruysch's preparations. While one such piece still exists in the École Nationale Supérieure des Beaux-Arts, Paris, it is not certain whether it was prepared by Sue, or acquired by him. Titled *Macabre altar*, it was probably created by Jean-Joseph Sue *père* in the second half of the 18th century.[44] Although we know that Sue's collection was carried on by Sue *fils*, I would argue that the similarity of the age of materials used in *Macabre altar* indicate that the Halford skeleton was either a preparation by, or from the original collection of, Sue *père*, as opposed to Sue *fils*. Indeed, the altar resonates with preparation of the Halford skeleton in its baroque fashion, and attempt to bring to life the mummy and the three tiny skeletons that

adorn it, in a humorous yet thought-provoking way.

Superficially, the Halford skeleton is an aesthetic and arresting piece, yet radiography readings suggest that its preparator was less than skilled:

> The metal work showing in the x-rays is normal, however there may be slightly more than would be expected in the head. Usually the metal rod which goes through the spine to hold the skeleton upright would go up through the skull to the top. It looks like the rod in this skeleton is too short and so other metal rods have been inserted to try and keep the skull from moving around.[45]

According to conservators from the Royal College of Surgeons of England, the preparatory work is slipshod, suggesting that the preparator was not highly skilled, or was unfamiliar with procedures. At the same time, if the pathology of the skeleton were faked, it would not seem credible to have been prepared by a surgeon as respected as Sue. Indeed, despite a tradition of posed skeletons adorned with symbolic accoutrements, pathological preparations should be accurate and authentic for pedagogical purposes. As a highly skilled surgeon and professor of anatomy, one would expect Sue's preparations to be precise and scientifically accurate.

Was Sue's name used by the preparator to add value to the skeleton? This is a reasonable assumption, yet research into the preparator, Messrs Raginel & Co., reveals a radical intellectual named Pierre Alfred Raginel, and a complex history set against the backdrop of the years following the French Revolution. Moreover, a possible connection to the Sue family via Sue *père's* grandson, the writer Eugène Sue, begins to emerge.

A revolutionary skeleton

Born in 1813, Raginel was the author of socialist publications, a purveyor of medical equipment and French osteology, and a preparator of osteology. In 1852 he emigrated from Paris to London, where he established the medical supply firm Raginel, Domenge & Co., which dissolved in 1855. Raginel continued the business in his own name.

Before leaving France, Raginel was a dynamic force in the Second Republic. Known as 'le citoyen Raginel', he was the author of *The Social Purpose*, a 'journal of positive philosophy and transitional means'.[47] One journal dubbed him 'the father and the author of the 1848 Republic'.[48] According to Raginel's advertisements in medical gazettes, he maintained his connection to France following his departure. Given his revolutionary past, and that he was a preparator of osteology in Paris, it seems possible that he crossed paths with the writer Eugène Sue.

Eugène Sue's birth in Paris in 1804, the year Napoléon became emperor of France, was witnessed and attested by Joséphine Bonaparte. This attestation came about following Sue's father's appointment in 1800 as *médecin-en-chef* of the Imperial Guard. Despite expectations that Eugène would become a surgeon like his forebears, he stubbornly pursued a writing career. His success with *Mysteries of Paris* (1842–3) reportedly inspired his friend Victor Hugo to proceed with *Les miserables*.[49] Both works critique the social institutions of the day and seek to give a voice to the disadvantaged and the lower classes.

Following his father's death in 1830, Eugène lived extravagantly and unapologetically, earning a reputation as a flaneur and dandy. Eight years later, he was brought to near financial ruin and was forced to sell off his houses, carriages, horses, furniture, books and objects of art.[50] At such a moment, was the skeleton of the recorder player taken out of storage and sold?

Propelled by his experiences when researching *Mysteries of Paris*, Eugène became increasingly political, driven by socialist ideals. In December 1851, opposing the coup d'état staged by Napoléon III, Eugène went into voluntary exile. Because of Eugène's family connection to Napoléon and Joséphine Bonaparte, the emperor did not include his name on the list of exiles (which included Hugo).[51] Raginel, conversely, stayed until the end of the Second Republic, describing himself on his British immigration document as 'a man of letters'.[52]

Is it possible that Eugène Sue sold the skeleton to Raginel? We have been told that it was sold during a time of political crisis for Dr Jean-Joseph Sue *fils*, but is it more likely that the skeleton was bequeathed to his son Eugène?

Raginel died in 1860, but Halford purchased the skeleton in 1862. The firm Raginel & Co. continued after Raginel's death, probably to get rid of 'the very large stock' remaining. It ran advertisements in medical gazettes until at least 1863. One advertisement from this year is written from the perspective of Raginel and boasts of a sale to the University of Melbourne: 'M. Raginel begs respectfully to inform the Medical Profession … he has already been favoured with important orders for the new Museums in Hyderabad, Melbourne etc.'[53]

An anatomist's trick?

As we have seen, it was popular in the 17th and 18th centuries to adorn anatomical preparations with elements evoking a strangely beautiful, yet disturbing, display of *memento mori*. I argue that the recorder is not only a signifier of biography, but also something of an anatomist's trick. The skeleton is missing a tibia and fibula, and the Latin word 'tibia' means 'flute' or 'pipe'. The missing tibia, in this case, becomes the tibia in the skeleton's hands.

At the same time, is the recorder also a phallic symbol? Surely this was not lost on the beholder. People with sirenomelia often lack external genitalia. If the preparator was wishing to reference or hint at such a disorder, this particular characteristic would have been known to him.

A further thought relates to the ecclesiastical style of the pedestal, evoking the biographical reference to Notre Dame Cathedral. It is possible that the mounting of the skeleton on such a pedestal was contrived to reinforce this story.

In Jacques Gamelin's *Nouveau recueil d'ostéologie et de myologie: dessiné d'après nature* (1779) is an engraving of a merry band of musical skeletons. In the centre sits the flautist, cross-legged—almost giving the impression of a single, symmetrical leg. Leaning pensively to one side as he rests from his performance, Gamelin's flautist wonders, '*O quanto ci deve dare pensiere?*' (How much must we think about it?) Like Gamelin's flautist, the Halford skeleton serves as a gentle reminder of our own corporeality, the transience of life, and its many mysteries.

The skeleton is currently undergoing computed tomography (CT) scanning at the Victorian Institute of Forensic Medicine, in an effort to deduce whether or not this remarkable specimen is indeed a genuine example of sirenomelia. But for now it remains as much of a mystery as it was to Halford over 150 years ago.

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The Harry Brookes Allen Museum of Anatomy and Pathology is primarily for the use of students studying anatomy, pathology and related subjects. Access for other students or researchers may be available upon request. The museum is open to the public on the university's annual Open Day in August. See http://mdhs.unimelb.edu.au/harrybrookesallenmuseum for details.

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