

MERMAIDS UNCOVERED

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Introduction

Many museums and private collections in the UK, Europe and America hold cultural artefacts commonly referred to as mermen or 'feejee mermaids'. Most have poor locality information, but are associated with Asia and particularly with Japan. Perhaps as a result of their poor provenance it is unusual for such specimens to be interpreted with stories from their culture of origin and they are usually discussed on the basis of their authenticity, or lack thereof. They are commonly identified as hoaxes constructed from monkeys attached to fish, largely on the basis of supposition influenced by historical narratives (Overmeer Fisscher 1833, Timbs 1867). The most infamous example of such a specimen is the eponymous Feejee Mermaid, exhibited by master showman P.T. Barnum from 1842 until it was likely destroyed in a museum fire between 1865 and 1880 (Bondeson 1999).

Unfortunately, the notoriety of the Feejee Mermaid was a product of clever and deliberate obfuscation and manipulation of facts (or 'humbug') propagated by Barnum (Cook 2001), which created an aura of mystery and confusion around feejee mermaids as objects. Lack of honest depictions of, and information about, the Feejee Mermaid has allowed speculation that some mermaid figures, such as the specimen at the Peabody Museum (Levi 1977), or the example discovered in a domestic attic in Southend (Anon. 1988) may be Barnum's noteworthy specimen. Such claims are ill-founded (Nickell 2005) and blur distinctions between different specimens. With such a background of inveterate misinformation, it is little wonder that museums interpret and care for their feejee mermaids on the unchallenged understanding that they are taxidermy chimeras.

Modern analytical approaches and interdisciplinary collaborations provide a means for testing such received wisdom and challenging interpretations. In this article the authors report outcomes from such an approach, to mermaid specimens held by the Horniman Museum and Buxton Museum & Gallery, stimulated by the 'Object in Focus' loans project run by the Horniman Museum (see Meehitiya 2013). This MLA (and later Arts Council England) funded project was intended to provide access to objects in the Horniman collection that were underutilised, by loaning them to other organisations with a display case and interpretation that could be developed in collaboration with external partners.

Archival research

Both the Buxton and Horniman specimens were identified as transfers from the Wellcome Institute, prompting Ross MacFarlane to search in the archives of the Wellcome Library for information about mermaids acquired by Sir Henry Wellcome and their subsequent dispersal. Wellcome amassed over a million objects in his lifetime (Skinner 1986) and due to the scale of the collections they describe, the papers are not catalogued to object level. This means that to trace the details of an object, one must know the Wellcome accession number.[1]

How Wellcome's collection was amassed has been the focus of a number of detailed studies (Skinner 1986, Larson 2009), and interesting relationships existed between Wellcome, key members of his staff and auction houses, where a large amount of his

collection was purchased. Of particular note is Stevens' of Covent Garden, London, who pioneered the selling of 'ethnological' items, including the mummy of Queen Nefertari, other mummies from around the world, tsantas and indeed mermaids. Part of the large and complex body of materials which document Wellcome's collection are auction catalogues dating from the period in which Wellcome was collecting and which allow the original auction listing for specimens to be traced.

The documentation relating to the acquisition of the Buxton mermaid indicated that it was one of a number of items that the Wellcome Institute transferred to other museums in 1982. They had originally given two mermaid specimens to the Horniman Museum, but correspondence held by Derbyshire Museums Service (DMS) indicated that the Horniman transferred one to Buxton Museum (via the DMS schools' loans service) in 1988, where it was documented as 'archaeology' with the DMS number A331 and displayed undisturbed for the next 22 years.

The Buxton mermaid (Wellcome number A67128) original Wellcome inventory card reads: 'EMBALMED MERMAID In glass case (belonged to the Colonial Surgeon Mr Graham of Sierra Leone, Luc. Nat.) Case 21 1/2" high 15" diameter Bought of: St 574/4/XII/1928 Value: £8 10 0' The 'St' indicating that it was purchased at Stevens' allowing cross-referencing with the auction catalogue detailing the sale on 4th December 1928, where the specimen was listed as 'An embalmed mermaid (belonged to the Colonial Surgeon, Mr Graham of Sierra Leone...); this was on exhibition some years ago and a considerable amount was collected to view for a hospital benefit'.

The Horniman merman (Wellcome number A17758) was also purchased at a Stevens' auction, on 2nd September 1919. The specimen was one of a number of lots titled 'A Collection of Native Weapons, Carvings, etc', with the sub-heading 'The Property of an Officer. Without Reserve'. Lot 391 read 'Japan – Mermaid, papier-mache body, 20 inches by 9 inches'. A pencil addition noted the object had been purchased for 60 shillings. Unfortunately no name was given for the Officer, halting further research into the provenance of the specimen. The discovery of the origins of the Horniman mermaid did however overlap with a piece of research carried out on another mermaid purchased by Wellcome and now on permanent loan to the Science Museum. Again, cross-referencing the accession number through the Wellcome Archives and Stevens' auction catalogues, its purchase was traced to auctions of 'native curios' on the 27th and 28th January 1931, where it was listed as Lot 83: 'Japanese mermaid, 2 babies ditto and a fine specimen beaver, mounted on a wood stand' (purchased for £2 10 shillings)'.

Why did Henry Wellcome acquire at least three mermaids? [2] His primary interest lay in the history of medicine, as evidenced by his Historical Medical Museum, opened in 1913. In 1928 Wellcome described to the Royal Commission on National Museums and Galleries how he wished to create a 'Museum of Man', ranging across time and global in conception, which his Historical Medical Museum would form just a part. In his words the museum would 'connect the links in the chain of human experience which stretch back from the present time into the prehistoric period of the early ages'. [3] This vision makes clear why one of the main collecting focuses for Wellcome was ethnographic material, which comprised more than half of his collection (Arnold & Olsen 2003) and it may help to explain why he acquired mermaids. Also, Wellcome's interests in mythology and folklore should be considered: he did choose the unicorn, with its cure-all horn, as the symbol for his pharmaceutical business.

Mermaids in context



Figure 1: one of the earliest depictions of the specimen that was to become the Feejee Mermaid, an example of the 'Scream' type Japanese mermaids or *ningyo* (?Eades c.1822) © The British Library Board (PT 2937).

Mythological water spirits have been depicted by numerous cultures over millennia, making it unsurprising that interpretations of convergent depictions tend to be influenced by the culture of the observer rather than the culture of the creator. Yet particular depictions may hold specific meanings or relate to particular narratives. Japanese mermaids depicted in the late 18th and early 19th Century typically stand on the curve of their tail, their hands in a pose reminiscent of 'The Scream' by Munch. The Feejee Mermaid conformed to this type (figure 1). Surviving examples of the type are represented in the British Museum and National Museum of Ethnology, Leiden where the Jan Cock Blomhoff specimen is held – one of the few surviving museum mermaid specimens mentioned in a contemporary account (see Overmeer Fisscher 1833). These types of mermaid or *ningyo* are also still to be found in Buddhist and Shinto shrines in Japan. Some are reputed to be of great antiquity and have moral stories related to their acquisition – a tradition not restricted to *ningyo*, as other supernatural creatures (*yōkai*) such as the popular *kappa* (Foster 1998) are also represented. Depictions of such *yōkai* were popularised in late 18th Century Japan by the artistic works of Japanese folklore scholar Toriyama Sekien (1712-1788). At the time, Japan was closed to foreigners as a result of the *sakoku* or 'locked country' policy of the Tokugawa administration, with only the Chinese and Dutch acknowledged as trading partners. So it was almost certainly at a popular *misemono* carnival on the Dutch trading island of Dejima in the bay of Nagasaki that *ningyo* were first brought to the attention of Europeans. In the 1820s von Siebold made reference to the story of a fisherman claiming to have caught a

mermaid which, with its dying breath, predicted a time of great prosperity, but also a fatal epidemic that could be averted by owning a likeness of the mermaid (Busk 1841). With this encouragement, examples of manufactured *ningyo* began to appear alongside a variety of attractions and goods at *misemono* carnivals of the late 18th and early 19th Century (Markus 1985) and it might be expected that they would conform to narrow set of depictions since they were meant to be in the likeness of the original. It is worth noting that this story of prophylaxis provides a possible justification for inclusion of the mermaid figures in Wellcome's collections relating to medicine, as does the Japanese folk story of *Yao Bikuni*, in which a young girl becomes immortal by unwittingly eating the flesh of a mermaid.

Somewhat different to the 'Scream' type is the 'crawling type' that is commonly seen in collections, and of which the Horniman and Science Museum mermaids are good examples. These specimens are supported on their arms with their tail lacking a strong curve. They have deeply sculpted details of ribs and vertebrae (often continuing far up the back of the head), the eyes are circular indentations marking where glass eyes have fallen out (examples with the eyes in situ are rare, but can be seen in the collection of artist James Ensor) and some of these specimens have wispy white 'hair' on the head, beard area and perhaps on the shoulders and arms. This type is first described in detail by Buckland in 1858 (Buckland 1860) and further discussed by him in relation to their contemporary Japanese production in 1866 (Buckland 1868). These dates are significant, since they come after the 1854 Convention of Kanagawa and 1854 Anglo-Japanese Friendship Treaty, which enabled wider trade with Japan. They also fall into the range of dates that the Feegee Mermaid was being exhibited in America and England. Since other museums were acquiring mermaids to compete with Barnum (Cook 2001) it seems plausible that the 'crawling type' may have been primarily produced for the museum market. Alternatively, specimens in private Japanese hands may have been sold by their owners as the socio-political climate leading to the Meiji upheaval eroded many of the traditions of Edo period Japan (Groemer 1999).

Japanese Monkey-fish

'Is the merman real?' and 'what is the merman made from?' are two of the most frequently asked questions of the Horniman Collections Conservation and Care department. It was in an effort to answer these questions that Paolo Viscardi, a natural history curator with experience of identifying animals from teeth and bones, became involved with the 'Japanese Monkey-fish', as the merman is described in the Horniman's accession register. The specimen is part of the natural history collections, perhaps in wry acknowledgement of its status as an unusual 'species', but more likely because it was considered to be a taxidermy creation, better off stored with other taxidermy.

Initial inspection revealed that the interpretation of the merman as a taxidermy monkey attached to a fish was incorrect. The specimen lacks the distinctive set of four incisors in top and bottom jaws found in simians, instead the jaws contain several rows of teeth (figure 2b) and appear to be from a type of wrasse.[4] Close examination of the torso of the specimen under a microscope revealed a matrix containing fibres, consistent with papier-mâché. The only part of the specimen to match expectations was the tail – which is most likely from a species of carp, based on the structure of the scales (figure 2c). It was hoped that species level identification of the fish would confirm the region of the world in which the specimen was made. Unfortunately, despite the best efforts of the laboratory of Professor Markus Pfenninger (Goethe-Universität, Frankfurt), DNA retrieved from samples taken from the teeth and tail were too degraded to yield useful information - a common problem when

testing DNA of older museum specimens. Without the independent information provided by species data, the provenance of the specimen could only be determined on the basis of the archival information and data associated with similarly constructed examples.

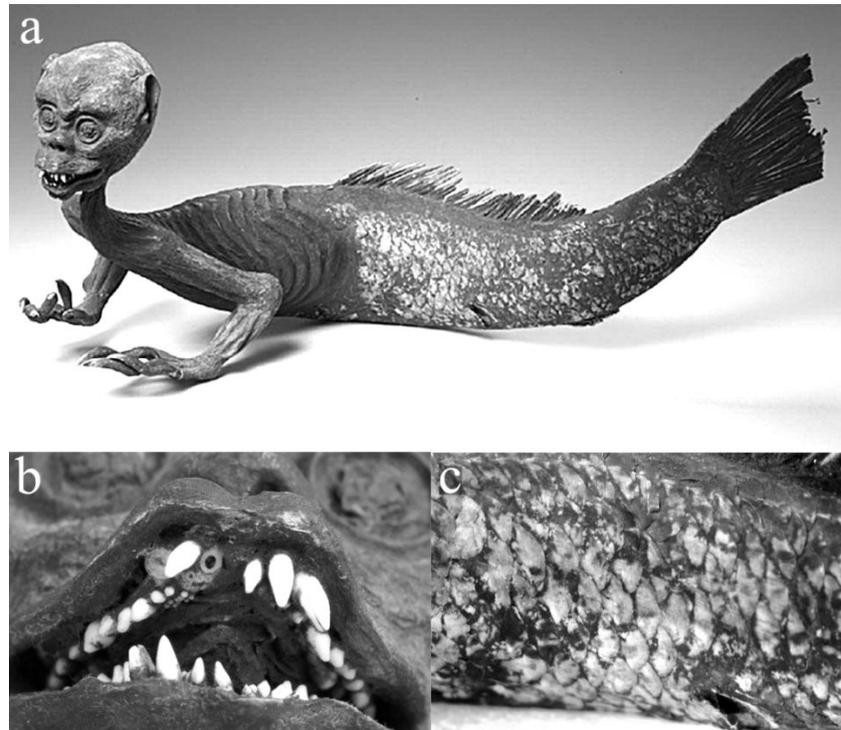


Figure 2: Horniman Museum 'Japanese Monkey-fish' NH.82.5.223

The construction of the specimen was researched in greater detail through X-radiography (conducted on site using a mobile X-ray service) and Computed Tomography (CT) scans that were kindly conducted free of charge at the Saad Centre for Radiography, City University London. Interpretation of the scans was carried out in collaboration with Dr James Moffatt of St. George's, University of London.

CT analysis

CT technology is usually employed in medical imaging and utilises serial X-ray sections of the body in a single plane, which can then be manipulated by digital means to provide reconstructed sections in other planes. Individual volumetric pixels (voxels) indicate the density of materials being scanned at that point and are represented in greyscale, with the densest materials – such as metal – appearing white. Software can manipulate CT data, segmenting elements by their density and generating reconstructions of three-dimensional volumes. Using these techniques it is possible to separate dense bone from other tissues and reconstruct isolated skeletal elements in 3D which can be rotated and examined in detail. In our analysis we used the software Mimics [5] to perform these tasks, allowing us to obtain a deeper insight into the construction of the Horniman merman.

Because many elements of the specimen have similar or overlapping densities, it was not possible to automatically segment the CT data into component parts, as would be possible with flesh and bone. Fortunately, interpretation of the CT data was greatly assisted by reference to X-rays. It was clear from the X-rays that elements of metal (wire and a nail), wood (the internal structure of the body, shoulders and tail), cord (the inner part of the head), a homogenous material that may be clay and less dense layers that appear to be

cloth, were used in the construction of the merman (figure 3a,b). The X-ray images were used to help identify and delineate individual layers in three dimensions. For example, the density of the outer papier-mâché layer is very similar to that of the clay layer, although the materials are clearly separate and differ in homogeneity (figure 3c-g). By looking through sections of the CT data where these layers interface, it was possible to determine how to separate them manually.

Once other densities had been segmented from the data, a three dimensional volume of the clay and papier-mâché layers was prepared and the outer layer was 'digitally dissected' (by rotating the three dimensional image on the screen and labelling regions for deletion) leaving only the inner clay. This technique was used to fully separate each layer of material in the specimen. The result was a digital model of the merman in which each element of construction could be visualised in isolation, or together with other materials (figure 3h-k). Although this analysis revealed few novel gross structural findings that were not apparent from the X-ray images, it provided a unique insight into the likely method of construction, as each layer could be added in sequence. Additionally, slight differences in the densities of small pieces allowed for the closer inspection of how individual parts were held together with pegs and suchlike.

Construction

The construction of the Merman appears to have begun with two sections of wood nailed perpendicularly to form a torso and shoulders. A notch cut vertically into the front of the torso accommodates the neck piece, the coarser grain of which suggests the use of a different kind of wood. Two pegs, possibly bamboo, inserted through the arms of the torso notch hold the neck in place. A horizontal groove cut into the rear section of the torso provides a bed for the wire spine, which runs in a single curving piece to the tail. Metal objects (such as metal dental fillings) create a flare in CT images, producing artefacts (figure 3d,g) which require manual removal. Without the X-ray images, the single nail securing the shoulder crosspiece may have been disregarded as an aberration of the scanning process, as it appears on only two or three sections of the data. The groove in the torso accommodating the wire is wider than the wire itself and there is a small piece of wood of similar grain density to the neck adhered over the groove. A layer of cloth (possibly fixed with glue) is wrapped around the rearmost part of the wooden torso form and is subsequently more thickly wound around the wire up to the tail piece. An arrow-shaped piece of wood was attached at the tail end of the wire (figure 3d,h,i), presumably to prevent the wire piercing the fish skin and to provide a form for the end of the tail. The thickness and grain of the wood of the torso and tail pieces were similar, suggesting that they had the same source. Over the top of the cloth a layer of homogenous material that we interpret to be clay was smoothly applied. A hole in the top of the neck provided an attachment point for a length of cord, which was wound around to bulk up the head, inadvertently producing a brain-like structure on X-ray and CT images (figure 3b,e). The upper arms, one formed from a piece of wood, the other possibly from rolled paper, were probably added at this point. The inner structure of the forearms and hands were provided by bent wire. Final construction involved additional layers of cloth to fill the space between the body form and the skin of the fish.

The tail seems likely to have been made from the body of a carp with the head removed at the gill slits and the body cut along the belly allowing removal of the internal organs and muscle. The inside of the skin was likely washed and treated with a preservative (possibly

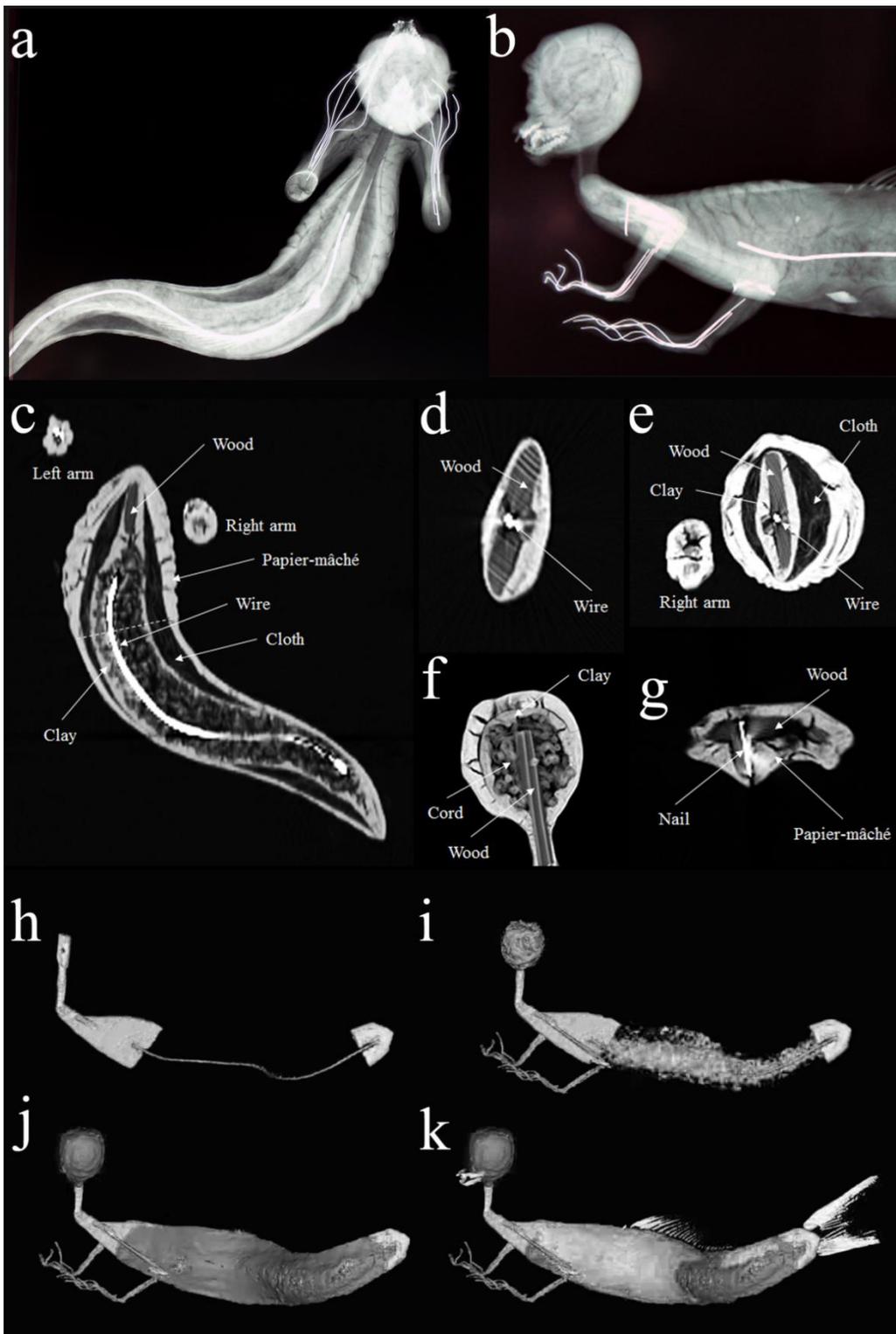


Figure 3: Example CT and X-ray images of the Horniman merman: a&b) dorsal and lateral X-rays; c) longitudinal section illustrating the different layers, materials used and the limited variation in densities. Dashed line demarcates fish section from the artificial front portion; d) illustrates fine wood grain of the tail-piece and effects of flare from the dense wire; e) cross-section of the head and neck. Coarser grain of the wood in the neck indicates a different wood to other parts of the specimen. The outer part of the head is papier-mâché; f) cross section through the torso, showing the wire spine, wooden body form covered in clay, cloth and the papier-mâché outer layer; g) detail of the shoulder crosspiece, showing a nail holding sections of wood together. The nail generates significant flare artefacts; h-k) stages in the construction reproduced using rendered CT data.

salt) before being stretched over the prepared form, with cloth added as padding, since the clay layer does not closely correspond to the skin in several places.

The cloth layer continues up the torso to provide bulk to match the dimensions of the tail. The outer papier-mâché layer was applied over this, with wrasse jaws embedded to make the mouth and the rest of the head and torso carefully sculpted to create features and the impression of bones and sinews. The junction between the torso and tail and the seam along the underside of the tail were coated with a tinted resin or gum to disguise the joins.

Buxton mermaid

The Buxton mermaid was chosen as the subject of a research and conservation project undertaken by Anita Hollinshead at the University of Lincoln between autumn 2010 and spring 2012. The mermaid had been on display since 1988 as part of a discreet 'Cabinet of Curiosities' exhibition, but the information about the specimen was minimal, which the project sought to address in order to inform its future care and interpretation.

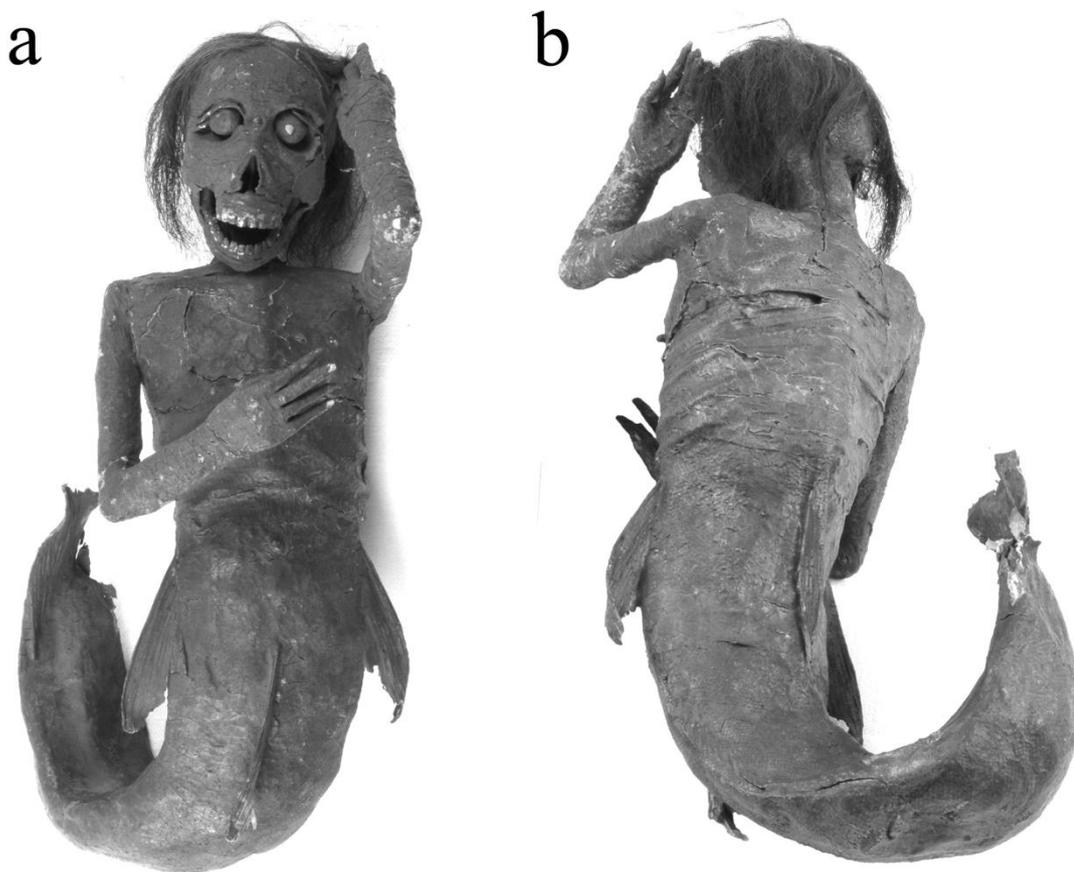


Figure 4: Front, side and back view of the Buxton Mermaid in December 2011 before conservation treatment (Reproduced with permission of David Padley, University of Lincoln)

Anita serendipitously contacted the Horniman Museum while the research into their merman was underway and visited to see the results of their analyses (as reported above). The research on the Horniman specimen was largely complete at this point and the Object in Focus loans project was being planned, with the merman selected for a series of six loans. It was agreed to end the tour with a reunion between the merman and the mermaid at Buxton Museum in March 2012. To inform the necessary conservation of the mermaid, information was required about the construction and composition.

The Buxton mermaid stands in an upright position, balanced on the curve of the tail with the right arm folded across the chest and the left arm raised so that the hand is behind the head. From the position of the hands it seems possible that they were originally holding a comb and a mirror. The dimensions of the specimen are 38cm x 18cm x 12.5cm and on external examination it appeared to have been made from a combination of taxidermy (including a real fish tail), papier-mâché and real hair. The mermaid has modelled details such as ribs, finger nails, nipples and a belly button. It also has eye sockets, eyes, a nasal septum, teeth and a tongue. A lot of work and imagination has gone into creating an object that might appear to be an anatomically accurate mummified mermaid.

Unfortunately the years had not been kind to the specimen. The surface of the mermaid was very dirty and dusty, with the front much dirtier than the back (figure 4); possibly at some point the specimen was displayed against a wall in a room with an open fire, so smoke and soot could have migrated into the surface coating, causing discolouration. The surface coating was also very dry and fragile with small flakes very loosely attached to the substrate and large flakes coming away with edges that were in danger of breaking. The hair came out with the lightest touch. The teeth were discoloured and stained, and a large flake of pigment was missing from the left eye. The fins on the tail were dry, fragile, broken and bent out of shape in places. A piece of the end of the tail was missing and there was a hole in the fish skin below the tail fin. However, apart from the damage to the tail, the mermaid appeared to be quite structurally sound.

Conservation

The conservation of the Buxton mermaid was undertaken at the University of Lincoln. Forensic Photographer David Padley took a comprehensive set of images of the mermaid which captured much more detail than the naked eye. Forensic Anthropologist Gillian Fowler confirmed that there was no human skeletal material included. Mike Shaw, a student exploring fish DNA, took samples from the tail for analysis, but the DNA had degraded beyond the point at which it could be analysed – as with the Horniman samples discussed previously. Dr Nicola Crewe examined hair samples using a scanning electron microscope and a transmitted light microscope, concluding that the hair was almost certainly human and from a single donor; it was light to medium brown; in very good condition and had not been subjected to dyes or chemical treatments; and that it was coated with a sticky debris composed of dirt, dust and the surface coating of the specimen.

The mermaid was X-rayed using a Faxitron 43804N cabinet on a phosphor plate (Agfa CR MD4 OT) and subjected to 20 kilovolts for two minutes. [6] The resulting high-quality images demonstrated very clearly the construction of the mermaid. The front-on X-ray (figure 5a) revealed that the torso of the mermaid was created using an armature of wood and wire with a stuffing of fibrous material. The shoulders and spine are built from wood held together with hand-made nails [7] and the ribs are created from what is likely to be hand drawn/extruded wire. The grain of the wood is visible and is also seen along the left arm, which may mean that the fingers are carved wood. The fingernails are a denser material and may be slithers of bone, or possibly mother-of-pearl. The teeth are of a different density to other materials in the head and are interpreted as carved bone. There is no other bone present in the head, despite the appearance of a structural 'skull'. It is not clear from figure 5a how this skull was made, although figure 5b shows wood grain in the side view of the skull. This is not visible in the first X-ray because it is in a plane parallel to the grain. The head is attached to the shoulders by wire and a wooden 'neck' that starts at the shoulders

and goes up inside the skull. A lot of effort went into creating the head - the skull has a cavity at the back where the wood has been hollowed out, creating a bowl-like structure.

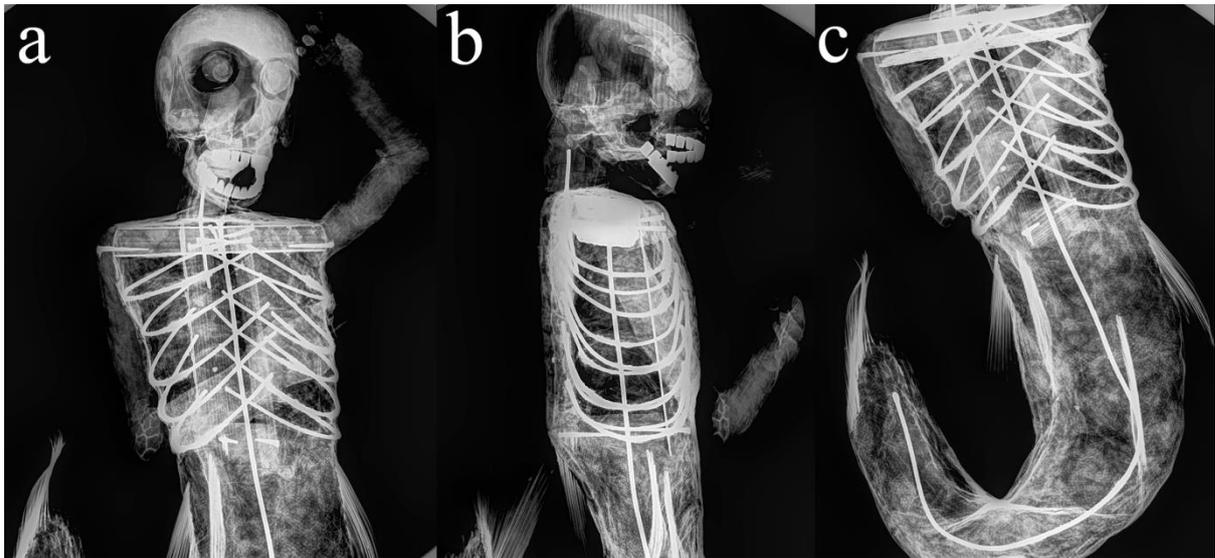


Figure 5: a) X-ray from the front of the Mermaid; b) X-ray side view from left to right; c) X-ray of the tail from front to back (Reproduced with permission of Jo Wright, University of Lincoln)

The nose is a separate slither of wood with a distinct septum. The eyes are made of an unknown material that has a higher density than wood. The torso appears to have been modelled on a human chest with wooden shoulders and a wooden spine. The wire ribs are attached to this spine and overlap at the front. Figure 5c shows the single wire running from the shoulders to the tip of the tail creating a curved shape. It appears that all four fins at the top of the tail were reattached after the tail was stuffed, since no fish have four fins in this arrangement. The tail fin is original. The fish skin was stuffed with what appears to be textile or paper, visible through the end of the tail and on the X-ray. The fish skin was cut and folded into shape at the top of where the tail curves.

The surface of the torso was examined closely with fibre optic cold lights, hand lens and microscope, which revealed a layer of material with a caramel-like appearance. There was an air bubble in this material which, through the microscope, revealed that the armature had been wrapped in a loosely woven white fabric (linen, silk or cotton) creating the appearance of fish skin. A fragment of the coating tested positive for the presence of protein using the Biuret test, indicating that it was some form of animal-derived glue. This precluded the use of water-based cleaning methods as they would dissolve the coating. The mermaid was lightly cleaned using a smoke sponge after the method proved safe and effective when used on a small test area. Soft brushes and a vacuum (on a very low setting) were used to clean around the eye sockets. A fine paint brush was used to try to lightly remove dirt from the hair, but this caused hairs to become detached and the process was stopped immediately and a loose silk net 'bonnet' was made to protect the hair from any further damage during cleaning.

The surface of the Mermaid was extremely fragile, so once cleaned it required consolidation. The approach adopted was to apply a consolidant under the surface of the small loose flakes with a fine paint brush. Other larger flakes of the surface had come away from the substrate, making their edges vulnerable to snapping off, so a decision was made to fill behind these flakes with a Japanese tissue pulp to provide support and stabilisation.

Before attempting this technique, tests were undertaken by replicating the surface coating of the mermaid by partially gluing samples of parchment onto a wooden substrate with wood glue so that there were gaps at the edges. These recreated the gaps around the edges of the large flakes of surface coating that had become detached from the substrate on the specimen. The test gaps were filled with 2 different paper pastes; the first made from Japanese tissue pulped in a solution of Evacon R (15% in distilled water) and the other made from Carboxymethyl Cellulose (20% in distilled water). The Carboxymethyl Cellulose did not adhere effectively to the substrate or parchment, the Evacon R was effective but set too hard in the first test, so was used at 10% instead.

To consolidate the flaking surface on the arms, hands, face, shoulders and some parts of the torso, a 10% solution of Klucel G (hydroxypropyl cellulose) in distilled water was applied on the tip of a fine paintbrush so that it was drawn under loose surface flakes. Klucel G was selected after discussions with Kim Sloan, Curator of the Enlightenment Gallery at the British Museum, where Japanese tissue and Klucel G was used to repair an 18th Century Japanese merman in 2002. This technique worked well on the Buxton mermaid and the surface was much more stable afterwards. The larger flakes on the surface of the mermaid were stabilised with the Japanese tissue and Evacon R pulp tinted with acrylic pigment so that it blended into the colour of the original substrate.

The misshapen fins were rehydrated using a Preservation Pencil, set to 55°C, which passed a stream of water vapour through a nozzle into the fins. The rehydrated fins were gently bent back into shape and clamped between pieces of acid free board until dry. Very fine Japanese tissue and Klucel G (10% in water) were used to back up and support the damaged areas of the rehydrated fins and to repair the damage at the end of the tail. Japanese tissue paper used to repair the fins and tail was also colour matched with acrylic pigments. Finally, the specimen was frozen to eliminate any insect pests. On the 19th March 2012 the mermaid was returned to Buxton Museum & Art Gallery to be exhibited alongside the Horniman merman for two months.

Conclusion

Imaging technology has contributed significantly to the understanding of the construction of mermaid figures, contradicting historical interpretations. Interdisciplinary collaboration has played a key role in understanding the outputs of the imaging and providing the information needed to formulate a working hypothesis for exploring the history of mermaid figures as ethnographic objects. It is hoped that further work to test hypotheses to allow them to be treated as artefacts with a cultural significance, rather than merely being considered hoaxes intended to deceive unwary Europeans.

Where the Buxton mermaid fits into this working hypothesis is as yet uncertain. The specimen may have been produced somewhere other than Japan, possibly in Sierra Leone since that is where the last known owner, Mr Graham, was based. Indeed, the Buxton mermaid may possibly be a representation of Mami Wata, which would better fit the comb and mirror pose (Drewal 1988). The similarities of the specimen to the 'Scream' type of *ningyo* (in particular the strongly curved tail) may possibly have been inspired by *ningyo* displayed in Africa *en route* to Europe. Accounts show that such displays occurred in Cape Town (Anon. 1822). Alternatively it may be that Japanese specimens found their way to the Dutch Gold Coast on Dutch ships up until 1872 and were subsequently acquired by Mr Graham who is known to have collected ticks in the Gold Coast area in 1908 (Nuttall 1926). It is interesting to note that Mr Graham had at least one other mermaid that was posed in a

similar manner and it may be possible that he constructed them himself as an exercise in anatomy.

A considerable body of historical information has been collected about these and other mermaid specimens during the course of this research, which there is insufficient space to explore in more detail here. However, plans are underway for a comprehensive exhibition on mermaids from UK collections, so more opportunities to share the findings of our research will present themselves. If you are interested in contributing or finding out more please contact the lead author.

Acknowledgements

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Notes

[1] Where possible the accession numbers were passed on to institutions with transferred material.

[2] Not including the unaccounted-for pair of mer-babies.

[3] *Guide to the Wellcome Historical Medical Museum, 54a., Wigmore Street, London, W.* Wellcome Historical Medical Museum: London. 1926. Quote from pages 6-7.

[4] Pers. comm. Oliver Crimmen, Natural History Museum, 2012.

[5] <http://biomedical.materialise.com/mimics>

[6] Exposure time determined by tests conducted by Jo Wright using a taxidermy squirrel.

[7] Identified as hand-made on the basis of the shape of the nail head.

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