IMAGINARY SEA MONSTERS AND REAL ENVIRONMENTAL THREATS: RECONSIDERING THE FAMOUS OSBORNE, 'MOHA-MOHA', VALHALLA, AND 'SOAY BEAST' SIGHTINGS OF UNIDENTIFIED MARINE OBJECTS

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Abstract

At one time, largely but not exclusively during the nineteenth century, retellings of encounters with sea monsters were a mainstay of dockside conversations among mariners, press reportage for an audience of fascinated landlubbers, and journal articles published by believing or sceptical natural scientists. Today, to the increasing frustration of cryptozoologists, mainstream biologists and environmental historians have convincingly argued that there is a long history of conflating or misidentifying known sea animals as purported sea monsters. The present paper provides, for the first time, a detailed, diachronic review of competing theories that have been posited to explain four particular encounters with sea monsters, which at the time of the sightings (1877, 1890, 1905, and 1959) had garnered worldwide attention and considerable fame. In so doing, insights are gleaned about the role played by sea monsters in the culture of late-Victorian natural science. Additionally, and most importantly, I offer my own parsimonious explanation that the observed 'sea monsters' may have been sea turtles entangled in pre-plastic fishing gear or maritime debris. Environmental history is therefore shown to be a valuable tool for looking backward in order to postulate the length of time that wildlife populations have been subjected to anthropogenic pressure. This is something of contemporary importance, given that scholars are currently involved in deliberations concerning the commencement date of the Anthropocene Era.

Keywords: cryptozoology, sea monsters, UMOs (unidentified marine objects), sea turtles (chelonians), entanglement, fishing gear and maritime debris, Victorian natural science

Introduction

In his environmental history of the fishing industry in the North Atlantic, Jeffrey Bolster comments that ‘no marine environmental historian worth his or her salt can afford to ignore ... nineteenth-century sea serpents’.¹ The reason for this assertion is that during that period many of the world’s leading natural scientists considered the study of sea monsters to be not only a legitimate but also a meritorious field of scholarship.² For example, Harvard professor Jacob Bigelow, in an 1820 article entitled ‘Documents and Remarks Concerning the Sea Serpent’ published in the *American Journal of Science and Arts*, considered the famous Gloucester, Massachusetts sightings of three years earlier to represent ‘the most interesting problem in the science of natural history’.³ Dozens of articles were published about sea monsters in the world’s leading journals, among them no less than the august pages of *Nature*. Today, biologists, through having much greater knowledge about marine biodiversity compared to their nineteenth-century predecessors, have been able to posit known animals for many of the earlier sightings of hitherto unidentified marine objects, or ‘UMOs’.⁴

Modern and historical literature examining the case for the existence of sea monsters is based on two approaches to scholarship. The first and most common is to produce a large compilation of the extant sightings from which to draw zoological and taxonomic, and sometimes ecological, inferences.⁵ The other approach is to zero in on a limited number—those that are either the most famous or deemed

1 W. Jeffrey Bolster, *The Mortal Sea: Fishing the Atlantic in the Age of Sail* (Cambridge, MA: Belknap Press of Harvard University Press, 2012), doi.org/10.4159/harvard.9780674067219.

2 C. M. Brown, ‘A Natural History of the Gloucester Sea Serpent: Knowledge, Power, and the Culture of Science in Antebellum America’, *American Quarterly* 42 (1990): 402–36, doi.org/10.2307/2712941; S. L. Lyons, *Species, Serpents, Spirits, and Skulls: Science at the Margins in the Victorian Age* (Albany, NY: SUNY Press, 2009); B. Regal, ‘Richard Owen and the Sea-serpent’, *Endeavour* 36, no. 2 (2012): 65–8, doi.org/10.1016/j.endeavour.2011.12.001; E. I. Burns, ‘Monster on the Margin: The Sea Serpent Phenomenon in New England, 1817–1849’ (PhD diss., University of Buffalo, 2014).

3 Wayne Soini, *Gloucester’s Sea Serpent* (Charleston, SC: History Press, 2010).

4 C. G. M. Paxton, E. Knatterud, and S. L. Hedley, ‘Cetaceans, Sex and Sea Serpents: An Analysis of the Egede Accounts of a “Most Dreadful Monster” Seen Off the Coast of Greenland in 1734’, *Archives of Natural History* 32 (2005): 1–9, doi.org/10.3366/anh.2005.32.1.1; Charles G. M. Paxton and R. Holland, ‘Was Steenstrup Right? A New Interpretation of the 16th Century Sea Monk of the Oresund’ *Steenstrupia* 29 (2005): 39–47; M. A. Woodley, D. Naish, and C. A. McCormick, ‘A Baby Sea-serpent No More: Reinterpreting Hagelund’s Juvenile “Cadborosaur” Report’, *Journal of Scientific Exploration* 25 (2011): 497–514; Gary J. Galbreath, ‘The 1848 “Enormous Serpent” of the Daedalus Identified’, *The Skeptical Inquirer* 39, no. 5 (2015): 42–6; R. L. France, ‘Reinterpreting Nineteenth-century Accounts of Whales Battling “Sea Serpents” as an Illation of Early Entanglement in Pre-plastic Fishing Gear or Maritime Debris’, *International Journal of Maritime History* 28 (2016): 686–714, doi.org/10.1177/0843871416667434.

5 Henry Lee, *Sea Monsters Unmasked* (London: W. Clowes, 1883), doi.org/10.5962/bhl.title.101985; A. C. Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise* (Leiden: E. J. Brill, 1892); Bernard Heuvelmans, *In the Wake of the Sea-Serpents* (New York: Hill and Wang, 1968); Loren Coleman and Patrick Huyghe, *The Field Guide to Lake Monsters, Sea Serpents, and Other Mystery Denizens of the Deep* (New York: Putnam, 2003).

to be the most reliable or perhaps illustrative—from the vast corpus of sightings.⁶ For example, in his book of 1930, the retired naval commander Rupert T. Gould⁷ devotes entire chapters to only seven specific case studies: those of the famous 1817 Gloucester and 1848 *Daedalus* sightings, both of which have been the subject of extensive subsequent discussion,⁸ as well as those of the likewise famous 1877 HMY *Osborne*, 1890 ‘Moha-moha’, and 1905 *Valhalla* sightings, in addition to two others of much less renown. These last three sightings of UMOs are therefore some of the most important ones in the entire canon of sea-serpentology. For example, in a review of the book *Abominable Science*, which is harshly critical of cryptozoology (defined below), Matt Bille states that the *Valhalla* encounter is one of only two (the other being the Gloucester sightings) that represent ‘the foundational episodes in any argument [that can be made] for the [existence of a] sea serpent’.⁹

The purpose of this paper is to present a detailed examination of Gould’s three well-documented sightings of UMOs, those from 1877, 1890 and 1905, which have not received modern historical attention from scholars, unlike the Gloucester and *Daedalus* encounters of 1817 and 1859 respectively. In addition, a more recent account, that of the ‘Soay beast’ from 1959, will also be examined, as it is the last sighting of a UMO that generated attention approaching that received by the previous examples. The case studies examined therefore span a period of eight decades and a geographic breadth from Scotland and Italy to Brazil and Australia. A diachronic review of competing theories posited to explain each UMO is presented. Not only does this provide an illuminating, occasionally unflattering, glimpse into the highly opinionated, proto- and pseudo-scientific realms of late Victorian/early Edwardian natural history and twentieth-century cryptozoology respectively, but it also sets the stage for advancing my alternative, parsimonious explanation for what was observed by the various eyewitnesses.

In this last regard, there is an important environmental reason to focus on these four famous sightings of putative sea monsters. And that reason is my contention that these particular accounts can be reinterpreted as providing evidence that sea turtles (marine chelonians) may have been susceptible to becoming entangled in fishing nets and maritime debris for periods far longer than what is commonly believed to have been the case. In consequence, this work serves as a counterpoint to the cryptozoological belief in the existence of sea monsters.

6 R. T. Gould, *The Case for the Sea-Serpent* (London: P. Allan, 1930); Michael A. Woodley, *In the Wake of Bernard Heuvelmans: An Introduction to the History and Future of Sea Serpent Classification* (Bideford, Devon: CFZ Press, 2008).

7 Gould, *The Case for the Sea-Serpent*.

8 Brown, ‘A Natural History of the Gloucester Sea Serpent’; J. P. O’Neill, *The Great New England Sea Serpent: An Account of Unknown Creatures Sighted by Many Respectable Persons Between 1638 and the Present Day* (Camden, ME: Down East Books, 1999); Soini, *Gloucester’s Sea Serpent*; Regal, ‘Richard Owen and the Sea-serpent’; Burns, ‘Monster on the Margin’; Galbreath, ‘The 1848 “Enormous Serpent” of the *Daedalus* Identified’.

9 mattbille.blogspot.ca; Daniel Loxton and Donald R. Prothero, *Abominable Science! Origins of the Yeti, Nessie, and Other Famous Cryptids* (New York: Columbia University Press, 2013).

Cryptozoology is a field of supposition that tries to appropriate the prestige and rigour of science but often (though not always) falls far short of it,¹⁰ and is therefore for the most part not regarded as a legitimate, modern scientific discipline, partially due to its conflation with paracryptozoology, the belief in paranormal reports of dragons, unicorns, merbeings and other fairytale creatures,¹¹ as well as its implicit failure to employ parsimonious explanations;¹² i.e., Occam's razor. In contemporary society, one significant role played by cryptozoology is the psychological one of providing a vehicle to channel guilt over environmental problems;¹³ i.e., today, sea monsters are very rare or absent compared to times past, ergo we humans are to blame for bringing about their demise. J. P. O'Neill, for example, concludes her compilation of more than 400 years of New England sea serpent sightings with a chapter in which she proposes that overfishing of herring and discharge of pollution have resulted in the extirpation of the sea serpents.¹⁴ Paul Harrison suggests the present rarity of sea monsters around the British Isles compared to times past is due to noise from motor boats, and Mark Greener considers the relative rarity of global sightings today compared to the nineteenth century might be due to food web disturbances resulting from depleted food sources, as well as noise pollution from diesel-powered ships.¹⁵ Michael Woodley relates decreases in sea monster sightings to declining cod stocks, and calls for conservation plans to protect the rare creatures in the face of future climate change.¹⁶ In contrast, my reinterpretation of these four particular sea monster accounts as being evidence for early entanglement of chelonians in anthropogenic material suggests that cryptozoologists err in their conceptions of the monstrous. As illustrated in the novel *Lake Monsters*, it is the real monstrous acts perpetrated by humans rather than those perpetrated by imaginary monsters that are what we should be most fearful about.¹⁷

10 Loxton and Prothero, *Abominable Science!*

11 Elsie Schembri, 'Cryptozoology as a Pseudoscience: Beasts in Transition', *Studies by Undergraduate Researchers at Guelph* 5 (2011): 5–10.

12 Nikitha Das, 'Occam's Razor and Cryptozoology' *The Scientia Review* (2009) Massachusetts Academy of Math and Science at WPI, www.scientiareview.org; Gregory Konar, 'Not Your Everyday Animals: Applying Occam's Razor to Cryptozoology' *The Scientia Review* (2009) Massachusetts Academy of Math and Science at WPI, www.scientiareview.org.

13 Peter Dendle, 'Cryptozoology in the Medieval and Modern Worlds', *Folklore* 117 (2006): 190–206, doi.org/10.1080/00155870600707888.

14 O'Neill, *The Great New England Sea Serpent*.

15 Paul Harrison, *Sea Serpents and Lake Monsters of the British Isles* (London: Robert Hale, 2001); Mark Greener, 'The Golden Age of Sea Serpents', *Fortean Times*, cryptozoo-oscity.blogspot.co.nz/2010/03/here-be-sea-serpents-and-big-cats.html.

16 Woodley, *In the Wake of Bernard Heuvelmans*.

17 Joseph A. Citro, *Lake Monsters: A Novel* (Hanover, NH: University Press of New England, 2001).

Accounts of putative sea monsters

The HMY *Osborne* encounter, Sicily, 1877

On 6 June 1877, when the royal yacht *Osborne* docked in Gibraltar, its captain, Commander Hugh Pearson, reported to the Admiralty that members of his crew had seen a sea monster four days previously off the northern coast of Sicily. Three other crew members filed brief descriptions of the incident, of which that of Lieutenant William Haynes was the ‘most detailed’:

On the evening of that day, the sea being perfectly smooth, my attention was first called by seeing a ridge of fins above the surface of the water, extending about thirty feet, and varying from five to six feet in height. On inspecting it by means of a telescope, at about one and a-half cables’ [300 metres] distance, I distinctly saw a head, two flappers, and about thirty feet of an animal’s shoulder. The head, as nearly as I could judge, was about six feet thick, the neck narrower, about four to five feet, the shoulder about fifteen feet across, and the flappers each about fifteen feet in length. The movements of the flappers were those of a turtle, and the animal resembled a huge seal, the resemblance being strongest about the back of the head. I could not see the length of the head, but from its crown or top to just below the shoulder (where it became immersed), I should reckon about fifty feet. The tail end I did not see, being under water, unless the ridge of fins to which my attention was first attracted, and which disappeared by the time I got a telescope, were really the continuation of the shoulder to the end of the object’s body.

The animal’s head was not always above the water, but was thrown upwards, remaining above for a few seconds at a time, and then disappearing. There was an entirely [*sic*] absence of ‘blowing’ or ‘spouting’. I herewith beg to enclose a sketch [Figure 1] showing the view of the ‘ridge of fins,’ and [Figure 2] of the animal in the act of propelling itself by its two fins.¹⁸

18 Heuvelmans, *In the Wake of the Sea-Serpents*.

Figure 1: Long row of serrated 'fins' of the 1877 Osborne sighting of an UMO.

Source: Upper panel from *Land and Water*, 1877; lower panel from Gibson, *Monsters of the Sea: Legendary and Authentic*, 1890. Author's private collection.

Figure 2: Three versions of the end-view of the Osborne UMO swimming away.

Source: Upper panel from *Land and Water*, 1877; middle panel from Gould, *The Case for the Sea-Serpent*, 1930; lower panel from Gibson, *Monsters of the Sea: Legendary and Authentic*, 1890. Author's private collection.

By mid-June the ship had returned to Portsmouth where the commander filed his own official report, a synopsis of which was published, to much public interest, in the 14 June issue of *The Times*:

At about five o'clock in the afternoon of [June] the 2nd, the sea being exceptionally calm, while the yacht was proceeding round the north coast of Sicily towards Cape Vito, the officer on watch observed a long ridge of fins, each about six feet long, moving slowly along ... The fins were progressing in an eastwardly direction, and as the vessel more nearly approached them, they were replaced by the foremost part of a gigantic sea-monster. Its skin was, so far as could be seen, altogether devoid of scales, appearing rather to resemble in sleekness that of a seal. The head was bullet-shaped, with an elongated termination, being somewhat similar in form to that of a seal ... Its features were only seen by one officer, who described them as like those of an alligator. The neck was comparatively narrow, but so much of the body as could be seen, developed in form like that of a gigantic turtle, and from each side extended two fins, about fifteen feet in length, by which the monster paddled itself along after the fashion of a turtle.¹⁹

Subsequent distillations were printed in other newspapers such as the weeklies *The Graphic* and the *Portsmouth Times and Naval Gazette*. On 30 June, Lieutenant Haynes sent to the latter paper this letter:

[The fins] were of irregular heights, and extending about 30 or 40 feet in line ... in a few seconds they disappeared giving place to the foremost part of the monster. By this time it had passed astern, swimming in the opposite direction to that we were steering, and as we were passing through the water at 10½ knots, I could only get a view of it, 'end on', which I have shown in the sketch ... Its head was occasionally thrown back out of the water, remaining there for a few seconds at a time. It was very broad across the back or shoulders, about 15 or 20 feet, and the flappers appeared to have a semi-revolving motion, which seemed to paddle the monster along ... From the top of the head to the part of the back where it became immersed, I should consider 50 feet, and that seemed about a third of the whole length. All this part was smooth, resembling a seal. I cannot account for the fins, unless they were on the back below, where it [was] immersed.²⁰

The 'Moha-moha' creature, Australia, 1890

In June 1890, while on a beach on Great Sandy Island, Queensland, a schoolteacher, Selina Lovell, accompanied by the lighthouse keeper and his two children and assistant, two other individuals, and an Aboriginal, 'Robert, the black boy', spotted a UMO. Reported immediately in the local press, it was not until 3 January 1891 that a letter was published in the well-known and internationally distributed magazine *Land and Water*:

19 Heuvelmans, *In the Wake of the Sea-Serpents*.

20 Heuvelmans, *In the Wake of the Sea-Serpents*.

We have had a visit from a monster turtle fish. I send a sketch of it [Figure 3]. It let me stand for half an hour within five feet of it. When tired of my looking at it, it put its large neck and head into the water and swept round seaward, raising its huge dome-shaped body about five feet out of water, and put its twelve feet of fish-like tail over the dry shore, elevating it at an angle. Then, giving its tail a half twist, it shot off like a flash of lightning, and I saw its tail in the air about a quarter of a mile off, where the steamers anchor.

It has either teeth or serrated jaw-bones. Native blacks call it Moha-moha, and they say they like to eat it, and that it has legs and fingers. I did not see its legs, as they were in the water. What I saw of it was 27 ft or 28 ft, but I think it must be 30 ft in all. Whilst its head was out of water it kept its mouth open, and, as I could not see any nostrils, I fancy it breathes through its mouth. The jaws are about 18 in in length; the head and neck greenish white, with large white spots on the neck, and a band of white round a very black eye and round upper and lower jaws.

The body was dome-shaped, about 8 ft across and 5 ft high, smooth, and slate-grey in colour. Tail about 12 ft, the fish part wedge-shaped, and fin of chocolate-brown. Then beautiful silver shading to white scales [the] size of [a] thumb nail.²¹

Figure 3: Miss Lovell's 1890 drawing of the 'Moha-moha' UMO.

Source: From William Saville-Kent, *The Great Barrier Reef of Australia: Its Products and Potentialities* (London: W. H. Allen, 1893). Author's private collection.

Subsequently, the assistant curator of the Natural History Museum in London, William Saville-Kent, asked for a more detailed description from Lovell so he could attempt a taxonomic designation of the creature for the book he was writing, *The Great Barrier Reef of Australia*, to which she responded:

I was (while walking on the Sandy Island beach) admiring the stillness of the sea, it being dead calm, when my eye caught sight of the head and neck of a creature I had never seen before.

I went to the edge of the water and saw a huge animal, lying at full length, which was not at all disturbed by my close proximity to it, enabling me to observe the glossy skin of the head and neck, smooth and shiny as satin. Its great mouth was wide open all the time it was out of the water.

21 Gould, *The Case for the Sea-Serpent*.

In about a quarter of an hour or so it put its head and neck slowly into the sea, closing its jaws as it did so. I then saw what a long neck it had, as it moved round in a half circle, and also perceived that the head and neck were moving under a carapace. When the head was pointing out to sea it rose up, putting a long fish-like tail out of the water over dry shore, parallel to myself, and not more than five feet from me, not touching the sand, but elevated. I could have stood under the 'flukes of its tail.'

The only part of the body that had marks like joints (like in size and shape to a common brick) was also on the dry shore, but *resting* on the sand; the great dome-shaped carapace, dull slate-grey, was standing quite five feet high, and so hid its long neck and head from my view, which before it rose I could see as a long shadow on the water. The carapace was smooth and without marks of any sort. The fish-like part of the tail was glossy and shiny as the head and neck, but of a beautiful silver-grey, shading to white, with either markings or large scales, not like those of a fish in position, as the fishes' [*sic*] scales lie horizontally, while the Moha's, if scales, lie perpendicularly, each the size of a man's thumbnail. It had a thick fleshy fin near the end, about three feet from the flukes, and, like them, chocolate-brown. The flukes were semi-transparent; I could see the sun shining through them, showing all the bones very forked. One of the girls asked me if a shark had bitten a piece out of its tail, and the other wanted to know if I thought it was an alligator! The fish-like part was quite twelve feet long.

All the time the animal was on shore it was perfectly motionless; at last it gave a curious half-twist to the fluke of its tail, the movement only just reaching beyond the fleshy fin, and, without disturbing the water in the slightest degree, vanished. I seemed only to have taken one breath when I saw its tail out of the water about the place where the steamer anchors, sending a quantity of fish into the air. I then saw it give a twist of its tail, and it disappeared altogether. The black boy saw it on shore the previous Monday, the 9th inst.

As I was so close to it for at least half an hour, I was able to study its shape and colouring. In moving about, head and tail were seen alternatively [*sic*] above water, but not even the shadow of its great body, and, from the length of that, a spectator could not guess that the head and tail belonged to the same creature, particularly as the colouring was so different. The parts I did not see were the legs. I stooped down and tried, but in vain, to see them, though the Moha was standing in only a foot of water, but the Black described them as being like an alligator.²²

22 Gould, *The Case for the Sea-Serpent*.

The Yacht *Valhalla* encounter, Brazil, 1905

While off the mouth of the Parahiba River in Brazil in 1905, two British naturalists spotted a UMO, described as follows by Edmund Meade-Waldo in the *Proceedings of the Zoological Society*:

I was on the poop of the *Valhalla* with Mr. Nicoll, when he drew my attention to an object in the sea about 100 yards from the yacht; he said: 'Is that the fin of a great fish?'

I looked and immediately saw a large fin or frill sticking out of the water, dark seaweed-brown in colour, somewhat crinkled at the edge. It was apparently about 6 feet in length and projected from 18 inches to 2 feet from the water.

I got my field-glasses on to it ... and almost as soon as I had them on the frill, a great head and neck rose out of the water in front of the frill; the neck did not touch the frill in the water, but came out of the water [in] *front* of it, at a distance of not less than 18 inches, probably more. The neck appeared about the thickness of a slight man's body, and from 7 to 8 feet was out of the water; head and neck were about the same thickness.

The head had a very turtle-like appearance, as had also the eye. I could see the line of the mouth, but we were sailing pretty fast, and quickly drew away from the object, which was going very slowly. It moved its head and neck from side to side in a peculiar manner: the colour of the head and neck was dark brown above, and whitish below ... Since I saw the creature I consider on reflection that it was probably considerably larger than it appeared at first.²³

Twenty-three years later, in a letter to Gould, Meade-Waldo offered some additional comments on the sighting:

It made a wave as it went along, and *under* water behind the neck I could see a good-sized body. As we drew ahead we could see it swing its neck from side to side and it lashed the sea into foam.

The eye and the edge of the neck had a turtle-like appearance to us both. We were so astonished at the time that we could neither of us speak!²⁴

23 Heuvelmans, *In the Wake of the Sea-Serpents*.

24 Heuvelmans, *In the Wake of the Sea-Serpents*.

Figure 4: M. Nicoll's drawing of the UMO seen in 1905 from the *Valhalla*.

Source: From the *Proceedings of the Zoological Society*, 1906. Author's private collection.

The other naturalist, Michael Nicoll, also contributed to the scientific journal article, including a hand-drawn sketch (Figure 4):

At first, all we could see was a dorsal fin about four feet long, sticking up about two feet from the water; this fin was of a brownish-black colour and much resembled a gigantic piece of seaweed. Below the water we could indistinctly see a very large brownish-black patch, but we could not make out the shape of the creature. Every now and then the fin entirely disappeared below the water.

Suddenly an eel-like neck about six feet long, and of the thickness of a man's thigh, having a head shaped like that of a turtle, appeared in front of the fin. This head and neck, which were of the same colour above as the fin, but of a silvery-white below, lashed up the water with a curious wriggling movement ...

This creature was an example, I consider, of what has been so often reported, for want of a better name, as the 'great sea-serpent.' I feel sure, however, that it was not a reptile that we saw, but a mammal. It is, of course, impossible to be certain of this, but the general appearance of the creature, especially the soft, almost rubber-like fin, gave one this impression.²⁵

25 Heuvelmans, *In the Wake of the Sea-Serpents*.

Figure 5: An artist's version of the *Valhalla* encounter. Note the elongated neck compared to the original drawing made by the eyewitness in Figure 4.

Source: From *The Illustrated London News*, 1906. Author's private collection.

Several weeks later, an artistic rendition of the UMO (Figure 5) was published to much popular attention in *The Illustrated London News*. And in a book that came out two years later about his maritime travels, Nicoll offered one further bit of information about what he referred to as 'this remarkable monster': the 'fin resembled that of no fish I had previously seen'.²⁶

Interestingly, 19 years later, a British traveller, C. H. Proddgers, wrote in his book *Adventures in Peru* that he too had observed the creature in the same location off Brazil at the same time in 1905. His account of the UMO, seen at half the distance of the *Valhalla* sighting, provides additional information: '[i]t had a head as big as a cow's head, and the body looked as large [and] round as a flour barrel. I saw only one coil of the latter, and that was a matter of eight to ten yards away from the head, and raised above the water a foot or so'.²⁷

²⁶ Heuvelmans, *In the Wake of the Sea-Serpents*.

²⁷ Heuvelmans, *In the Wake of the Sea-Serpents*.

The 'Soay beast', Scotland, 1959

Off the Scottish island of Soay, in 1959, Tex Geddes and 'James Gavin' were in a small boat fishing when they spotted a UMO that would receive considerable attention. Geddes's first recounting occurred in a regional newspaper:

I noticed a large black shape on the surface of the water ... probably two miles from where we were fishing. When the object appeared to be steaming towards us we both stood up for a better view.

We both stared in amazement ... for this beast ... was like some hellish monster of prehistoric times.

The head was definitely reptilian 2 ft. 6 ins high, with large protruding eyes. There were no visible nasal organs, but a large red gash of a mouth which seemed to cut the head in half and which appeared to have distinct lips. The creature's back which rose sharply to its highest point some three or four feet out of the water, fell away gradually towards the after end. I would say that we saw eight to ten feet of back on the waterline.

Petrified we stood and watched as it came closer and closer. It was soon up parallel with the dinghy at a distance of twenty yards. It seemed oblivious to our presence despite the fact that it was constantly turning its head from side to side, as if surveying all around it.

Viewed in profile the head appeared to be rather blunt and much darker than the rest of the body, which appeared to be scaly, and the top of its back was surmounted by an immense saw-toothed ridge, or, as Mr. Gavin put it, 'Its back is like the Cuillin [a mountain range on Skye].'

It seemed to breathe through its mouth which opened and shut with great regularity ... It was only when it was swimming away from us that we were able to see that the creature's body, although four or five feet broad on the waterline rose sharply to almost a knife-edge at the top of the back.²⁸

Geddes then goes on to state he is familiar with the local marine animals and that 'the creature which we saw that day is entirely new to my experience. I am convinced that it can be nothing other than some prehistoric monster's second cousin'. The article contained a sketch by an artist (Figure 6) about which Geddes 'said that although the body is a fair representation, the head should be more tortoise-like and he cannot be certain about the scales'.²⁹

28 Heuvelmans, *In the Wake of the Sea-Serpents*.

29 Heuvelmans, *In the Wake of the Sea-Serpents*.

Figure 6: An artist's rendering of the 1959 sighting of the Soay beast.

Source: From *The Illustrated London News*, 1960. Author's private collection.

In another testimonial, Geddes added that he could distinctly hear the UMO breathing, and noted that it moved slowly, that there was a gap of 'at least two feet of clear water behind the neck, less than a foot of which we could see', that the creature submerged quickly with no disturbance, and that 'during one of its dives we clearly saw a large darker piece sticking up well aft, whether this was some sort of fin, whether a flipper or a foot, your guess is as good as mine'. He continued:

as it drew near, he [Geddes] first though[t] that it was a tortoise or a turtle, but as it came abreast of the boat he changed his mind ... A head that had 'two huge round eyes like apples, and what Mr. Gavin described as the head of a tortoise magnified to the size of a donkey's ... He could see neither nostrils nor ears ... At its nearest point the creature was no more than fifteen or twenty yards from [the] boat.³⁰

30 Heuvelmans, *In the Wake of the Sea-Serpents*.

Figure 7: Sketches of the Soay beast from eyewitnesses T. Geddes (left) and J. Gavin (right).

Source: From *The Illustrated London News*, 1960. Author's private collection.

Gavin offered his own version of the encounter:

At the waterline the body was 6 to 8 ft. long. It was hump-shaped rising to a centrally-placed apex about two feet high [Figure 7]. The line of the back was formed by a series of triangular-shaped spines, the largest at the apex and reducing in size to the waterline. The spines appeared to be solid and immobile—they did not resemble fins. I only got a lateral view of the animal but my impression was that the cross section of the body was roughly angular in shape. Apart from the forward glide I saw no movement.

The neck appeared to be cylindrical and ... about 8 ins in diameter. It arose from the water about 12 ins forward of the body. I could not see where they were joined; about 15 to 18 ins of neck was visible. The head was rather like that of a tortoise with a snake-like flattened cranium running forward to a rounded face ... I saw one laterally placed eye, large and round like that of a cow. When the mouth was opened I got the impression of large blubbery lips and could see a number of tendril-like growths hanging from the palate. Head and neck rose to a height of about two feet. At intervals the head and neck went forward and submerged ... After about five minutes the beast submerged with a forward diving motion—I thought I saw something follow the body down.³¹

Interpretations

Likely candidate analysis for the monsters' bodies

To counter the confirmation bias frequently displayed in the past by cryptozoologists who promote their own particular pet theories without consideration of possible alternatives, contemporary zoologists have used a simple procedure to objectively screen potential candidates for UMOs. Charles Paxton et al. compared one behavioural and six morphological characteristics of the famous Egede UMO seen off the coast of Greenland in 1734 to those for six species of 'suspect' large cetaceans (whales).³² Paxton and Holland compared eight morphological and two distributional characteristics of the enigmatic 'sea monk' recorded from

31 Heuvelmans, *In the Wake of the Sea-Serpents*; Maurice Burton, 'The Soay Beast', *The Illustrated London News* (4 June 1960): 972–3.

32 Paxton et al., 'Cetaceans, Sex and Sea Serpents'.

Nordic waters in the sixteenth century to those for five species of pinnipeds (seals), three species of fishes and the giant squid.³³ And Woodley et al. compared 29 morphological characteristics for what some cryptozoologists believed to be a juvenile of a plesiosaur-like creature caught in 1968 in British Columbia to those for 14 candidate fishes.³⁴ Whereas the first two studies used a simple binary system of presence or absence of a trait, the last study added the 'occasional' category, along with a numerical summary of overall likelihood. This is the approach I applied to the eyewitness descriptions of the bodies of the four UMOs in question.

Table 1 compares the presence of nine morphological (considering the body but not the tail), one distributional and four behavioural characteristics for a composite UMO assembled from all four accounts documented herein with either the absence or the ubiquitous or occasional presence of those traits for one extinct and 12 existing candidates of marine animals that have been posited as explanations for many sea serpent sightings. My fusion of the four sightings into a composite UMO in no way implies that these, geographically distinct, animals were the same species of 'sea monster'. Instead, I use this approach as merely a convenient way in which to compare characteristics of the generic UMO with those for other animals at a high taxonomic level of distinction, such as, for example, seals, sharks, or sea turtles, each as an inclusive generic group composed of many different species. Each particular trait is itemised with respect to the four UMO sightings in the table, thereby showing how each sighting contributes to the overall assessment. Of the 14 traits, five were observed for all four UMOs, four were observed for a single UMO, and two were observed for either two or three of the UMOs. The generation of the particular traits used for comparisons follows the aforementioned studies in selecting a suite of physical, behavioural and biogeographical characteristics standard to zoological investigation, and which can be used for distinguishing amongst the various candidate groups.

As can be seen from the numerical tabulations in Table 1, marine chelonians are the most likely candidate animals to explain the bodies of the present UMOs. This agrees with the associations made by the eyewitnesses themselves in relation to the animals that they believed each observed UMO to have resembled: turtles (all four accounts) > alligators (for the *Osborne* and Moha-moha sightings) > seals (for the *Osborne* encounter) = plesiosaurs (for the Soay beast). In terms of the numerical tabulations, cryptozoologists, believing, despite all palaeontological evidence to the contrary, in the continued existence of ancient aquatic reptiles, will take heart that the second-most likely candidate group was plesiosaurs. This should not be surprising given that plesiosaurs have themselves been described as resembling 'a snake threaded through the body of a turtle'.³⁵

33 Paxton and Holland, 'Was Steenstrup Right?'

34 Woodley et al., 'A Baby Sea-serpent No More'.

35 William Conybeare, 'On the Discovery of an Almost Perfect Skeleton of Plesiosaurus', *Transactions of the Geological Society of London*, 2nd series (1824).

Table 1: Diagnostic features for the body of the composite UMO assembled from the four accounts of sea monsters (*Os* = *Osborne*, *Mm* = *Moha-moha*, *V* = *Valhalla* and *Sb* = *Soay beast*) and likely candidate analysis for 13 generic groups of potential animals to explain the sightings. P = presence (numerical score of '1') or A = absence (numerical score of '0') of trait in all species within each candidate group, whereas O = occasional presence (numerical score of '0.5') of trait.

Composite 'monster'	Turtles	Alligators/ Crocodiles	Lizards	Snakes	Plesiosaurs	Giant squids	Seals	Dolphins/ Porpoises	Otters	Sharks	Tuna	Oarfish	Eels
Distinct head (<i>Os</i> , <i>Mm</i> , <i>V</i> , <i>Sb</i>)	P	O	O	O	P	A	P	A	P	A	A	A	A
Large eyes (<i>Mm</i> , <i>V</i> , <i>Sb</i>)	O	O	O	O	O	P	O	A	A	A	A	A	A
Obvious neck (<i>Os</i> , <i>Mm</i> , <i>V</i> , <i>Sb</i>)	P	O	O	A	P	A	P	A	P	A	A	A	A
Lips (<i>Sb</i>)	O	A	O	O	A	A	O	A	A	A	A	A	A
Shoulders (<i>Os</i> , <i>Mm</i> , <i>Sb</i>)	P	A	O	A	P	A	O	A	A	A	A	A	A
Dome/shell body (<i>Os</i> , <i>Mm</i> , <i>V</i> , <i>Sb</i>)	P	A	A	A	P	A	A	A	A	A	A	A	A
Lateral fins/legs (<i>Os</i>)	P	P	P	A	P	A	P	P	P	P	P	A	A
Dorsal ridge/fins (<i>V</i> , <i>Sb</i>)	O	O	O	A	O	A	A	P	A	P	P	P	A
Smooth skin (<i>Os</i> , <i>Mm</i>)	O	A	O	P	O	P	P	P	P	P	P	P	P
Surface swimming (<i>Os</i> , <i>Mm</i> , <i>V</i> , <i>Sb</i>)	P	P	P	P	P	O	P	P	P	O	O	O	O
Padding propulsion (<i>Os</i>)	P	A	A	A	P	A	A	A	A	A	A	A	A
Air breathing (<i>Os</i> , <i>Mm</i> , <i>V</i> , <i>Sb</i>)	P	P	P	P	P	A	P	P	P	A	A	A	A
Emerges onto land (<i>Mm</i>)	P	P	P	P	A	A	P	A	P	A	A	A	A
Known from all regions of sightings	P	O	P	P	A	P	O	P	O	P	O	O	P
Total similar	12	6.5	8.5	6.5	9.5	3.5	9	6	7.5	4.5	4	3	2.5

Source: Compiled by author.

There is a long history of confounding or misidentifying sea turtles with sea monsters. Indeed, one of the earliest mentions of a sea monster in Western history concerns one of the six mythological labours of Theseus. Near Megara (halfway between Athens and Corinth), the notorious bandit Sciron would force captured travellers, once relieved of their purses, to wash his feet. Then, while the unfortunates were kneeling down, he would suddenly kick them off the cliff into the sea, whereupon they would be consumed by a monstrous sea turtle that resided there. In a bit of ‘just deserts’, Theseus does the same to the bandit. In a companion paper, after a review of the complete sea serpent literature, I found more than a dozen examples of UMOs that were likely either unrecognised large turtles, or had a body part specifically noted to resemble that of a chelonian.³⁶

But for the case of the four sea monster encounters under consideration here, what happens when one tries to reconcile the bizarre, Dr Moreau-esque incongruity of a body of an UMO that clearly resembles that of a turtle with the presence of a long tail known not to exist for any living or extinct species of chelonian? Therein lies the dilemma. The following two sections review first, how nineteenth-century natural historians and twentieth-century scientists and cryptozoologists have struggled with this quandary, and second, my own explanation for the mystery, rooted in modern understanding of marine pollution and conservation biology.

Competing (crypto)zoological hypotheses

The HMY *Osborne* encounter

Gould³⁷ gives considerable attention to the ‘good deal of critical examination’ generated by the *Osborne* encounter, including a body of opinions solicited by maritime and zoological experts published in *Land and Water*. One of those experts was Sir Richard Owen, the father of palaeontology, who had, 29 years earlier, published a tract dismissing the famous *Daedalus* sighting. While in 1848 he offered a valid criticism of that sea serpent encounter, here, in old age, he assumed the role of a cranky curmudgeon in his outpouring of insults about anyone—by which he means anyone who is not as qualified a naturalist as himself—who believes that they have observed a sea monster. In his opinion, the UMO was simply a cetacean. Gould takes great umbrage at Owen’s cantankerous and hypercritical comments, concluding that Owen’s “‘opinion” is a confession of failure—nominally, failure to form any opinion about the reported facts; actually, failure to explain them away’. Bernard Heuvelmans, the father of cryptozoology, is particularly upset by Owen’s

36 R. L. France, ‘Historicity of Sea Turtles Misidentified as Sea Monsters: A Case for the Early Entanglement of Marine Chelonians in Pre-plastic Fishing Nets and Maritime Debris’, *Coriolis: An Interdisciplinary Journal of Maritime Studies* (2017): in press.

37 Gould, *The Case for the Sea-Serpent*.

proper scientific insistence that '[i]f the observer has not the zoological knowledge, or the opportunity for exact inspection, requisite for determining the species from the phenomena, he should abstain from giving the object any special name'. He also scolds Gould, who 'would rather, it seems, call it "object", or even "thingmejig", than prejudice scientific research by using more appropriate terms like "sea monster" or "strange beast"'.³⁸ And therein lies the difference between the pseudoscience of cryptozoology and real science; hence my deliberate use of the purposely opened term 'UMO' (i.e. the equivalent of using 'UFO' rather than 'flying saucer').

In his commentary in *Land and Water*, the Inspector of Fisheries, Francis Buckland, agrees with Owen that 'there has never been a case of a sea-serpent which could not be explained by natural causes', and raises the possibility that what the *Osborne* witnesses saw were the dorsal fins of four basking sharks swimming in single file. To this, and Buckland's backup hypothesis that the creature may have been a school of swordfish, Gould correctly inquires about what happened to the large body of the creature in such explanations. Oudemans also correctly dismisses the first supposition based on the simple fact that basking sharks are restricted to Arctic waters and do not occur in the Mediterranean.³⁹

The naturalist Henry Lee, in his commentary in *Land and Water*—reiterated later in his 1883 book—also questions the previous hypotheses, before giving up and concluding that 'the combination of ... [the imagined ridge of dorsal fins] with long flippers, and the turtle-like mode of swimming [of the body], forms a zoological enigma which I am unable to solve'. He states his belief that the creature is a species of marine animal that is 'either totally unknown to science, or which has hitherto been believed to be extinct'. In like fashion, Abraham Bartlett, superintendent of the London Zoological Gardens, after ruling out the possibility that the observed creature could have been a whale, porpoises, sharks, or even a monster turtle—the last excluded due to the presence being noted of a long row of serrated fins—agrees that it was a specimen of an as yet unknown species.⁴⁰

Other suggestions, including one published in *Nature* in 1880, posit a giant oarfish or manatee. Oudemans (1892), however, will have none of this, demonstrating a prodigious degree of confirmation bias in his quest to force-fit all observations to support his pet theory that all sea serpents are long-necked, palaeo-seals. He undertakes an exercise in selective data screening, in one case discounting that the movements of the flippers were like those of a turtle, rather than being, as he believed, like those of a sea-lion, 'for a sea-turtle cannot possibly elevate its flappers so high above the surface of the water, while sea-lions are able to do so'. We now know this to be incorrect, from behavioural accounts and photographs of sea turtles

38 Heuvelmans, *In the Wake of the Sea-Serpents*.

39 Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise*.

40 Lee, *Sea Monsters Unmasked*.

engaging in just such behaviour. Remarkably, Oudemans even goes as far as to actually invent descriptions of traits he believed the witnesses saw but neglected to report. He also selectively accepts one description of a trait while dismissing the drawings as being inaccurate, then does just the reverse a few sentences later with respect to another trait. However, he is partially correct about one thing, as will be seen later, namely his ‘firm conviction that the ridge of fins has nothing at all to do with the animal’.⁴¹ But for Gould, this supposition is just one mystery too many:

This merely gives us two enigmas instead of one. The fins—seven or eight in a line, and standing six or seven feet out of the water—were, in themselves, as unusual a sight, and one as difficult to explain, as the creature with the huge seal-like head, slender neck, and giant flippers, which replaced them. One such sight was remarkable enough: that two should occur—in precisely the same spot—at an interval not exceeding a few seconds, and the two should yet be completely independent, defies belief. However convenient theorists may find the ‘ridge of fins,’ these cannot, I suggest, be dismissed in this airy fashion, for they formed an integral portion of the evidence—and, presumably, of the ‘sea-monster.’⁴²

Later in his text, Gould concludes that the *Osborne* sighting may have either been of a giant turtle or a prehistoric Ichthyosaurus, the latter as a way to explain the inconvenient truth about the long ‘ridge of fins’. Although the first is a reasonable conclusion, the latter transgresses into the woolly world of cryptozoology. Gould is right, however, in his curt dismissal of a statement by *The Times*’ reporter who was certain that the appearance of the monster was due to it being disturbed from its deep lair in the Mediterranean by the eruption of an underwater volcano near Tunis that had occurred just before the sighting. In Gould’s words, this is ‘sheer *post hoc*, [ergo] *propter hoc*’ (i.e. the logical fallacy of ‘after this, therefore because of this’).⁴³

In his 1890 survey of maritime monsters, John Gibson comments on the hybrid fusion of the *Osborne* UMO, sporting as it did the dorsal fins of a basking shark, the head of a seal and the flippers of a turtle. As to what the creature actually was, he too is at a loss: ‘[t]his conundrum of an animal has been fairly given up by naturalists as unexplainable by a reference to any known group of animals’.⁴⁴ However, 70 years later, Maurice Burton, through the use of a side-by-side engraving of the *Osborne* creature and photographs of various turtles—some of which have dorsal serrations, which if magnified in size do resemble the UMO—makes the case that the creature was most likely to have been a turtle.⁴⁵

41 Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise*.

42 Gould, *The Case for the Sea-Serpent*.

43 Gould, *The Case for the Sea-Serpent*.

44 John Gibson, *Monsters of the Sea: Legendary and Authentic* (London: T. Nelson, 1890).

45 Burton, ‘The Soay Beast’.

Heuvelmans (1968) is also puzzled by the fact that it is 'hard to reconcile the two drawings and apply them to the same animal'. He sides with the theory that the drawing of the serrated fins could show a school of sharks or dolphins, and suggests that the other end-view drawing indicates that the creature was fleeing, being pursued and attacked by the school such that 'it might try in its terror to rise above the waters and so beat its fins in the air'. His alternative hypothesis is that it was indeed a single animal and that the ridge of fins was not dorsally situated but located along the sides of the animal as characteristic of his imagined 'great sea-centipede' category of sea monsters. And although he is off into flights of cryptozoological fantasy here, he is correct in rejecting the idea that the *Osborne* UMO could have been some type of prehistoric beast, believing that such thinking merely reflects the faddism of the day. 'Science', he states, 'is as susceptible to fashion as hats, literature or dance-steps'.⁴⁶ More recently, the cryptozoologist Dale Drinnon (2010) suggests that the large size of the *Osborne* UMO may be the result of either several whales in a line, or a 'mistaken view of a humpback whale from the rear, and the row of fins either a school of sharks or else the whale's pod of comrades [sic] in "fin-up" position', or simply the wake of a single cetacean.⁴⁷

The 'Moha-moha' creature

The Moha-moha sighting occurred in 1890, too late to be included in Oudemans's seminal treatise. But that did not stop the world-wide flourish of speculation as to the nature of what certainly remains one of the strangest of all UMO sightings. This particular case is also of interest for the unseemly glimpse portrayed of male chauvinism and expert arrogance.

Following the first report in *Land and Water*, the editor, the naturalist Buckland, remarked that he believed the creature to be a particular type of turtle found in New Guinea, neglecting to account for the marked disparity between Lovell's 10 metre-long animal and the fact that the purported candidate turtle is never larger than one metre in size. Buckland does make the valid point that 'the length and shape of the tail, as described, are, however, impossible, as no turtles have caudal appendages corresponding to the description', before concluding in a condescending manner that 'the fair observer must have been mistaken on this very important point' (when Gould reprinted this comment, he took it upon himself to emphasise the word 'impossible' by placing it in italics). Lovell retorted that 'You speak of the impossible length of its tail. I beg to state that this is a most astonishing statement from people who have never seen this monster, half fish, half tortoise. The tail was over the dry shore for half an hour, so close to me, that five footsteps would have enabled me

⁴⁶ Heuvelmans, *In the Wake of the Sea-Serpents*.

⁴⁷ Dale Drinnon, 'Extractions from Heuvelmans, In the Wake of Sea-Serpents, "Mistaken Observations" Category', *Still on the Track: The Voice of the International Cryptozoological Community* forteanzoology.blogspot.ca/2010/dale-drinnon-extractions-from.html.

to put my hand upon it'. She continues, informing him that the translation of the local Aboriginal name for the creature was 'dangerous turtle'. Buckland, however, would not back down, replying in turn with condescension: '[w]ith no wish to cast any doubt on our fair correspondent's veracity and powers of observation, we must adhere to the editorial remarks made ... [earlier], and point out to her that from a scientific point of view, the existence of a fish, together with those of a tortoise, are absolutely impossible'. Again, he suggests another candidate turtle for the UMO, which Gould, writing four decades later, has no trouble in dismissing. Buckland then recommends that Lovell should obtain a copy of a book entitled *Mythical Monsters* in which she will find 'all sorts of supposed monsters figured, including the sea-serpent'.⁴⁸

The editor of *Land and Water* goes on to state that the only solution to the half-fish, half-tortoise creature was that 'the monster tortoise had clasped by its nether limbs, and has pressed against its abdomen some very large fish, the upper part of whose body was thus concealed, while the tail projected behind, and gave the tortoise the appearance of having a fish's tail'. Gould begins by offering the valid comment: '[w]hy the "tortoise" should clasp the (20-foot or so) fish, except to eat it; why the latter should endure this process with absolute calm for half an hour and then suddenly come to life; and why it should still remain so gripped by the "tortoise", when the latter was swimming, as to give the impression of a single creature, he does not attempt to explain', before concluding in a way to ensure his notoriety for evermore: '[b]ut he [Buckland] makes one sensible remark: "... We lay no stress on the evidence of the blacks, as all coloured races are greatly given to exaggeration and invention"'.⁴⁹

If Lovell thought she would be any better treated by the naturalist Saville-Kent, with whom she had corresponded, she was mistaken. He sarcastically suggests that she could become rich through marketing a new type of turtle soup, which he proposes to name *Chelosauria lovelli* after her.

Gould, without hesitation, places the Moha-moha, along with the *Osborne* incident and possibly the *Valhalla* encounter (see below), within his 'giant' or 'monster' turtle category. Heuvelmans, however, suggests that the Moha-moha might be a gigantic placoderm, a type of armoured fish surviving from the Devonian period, that was observed 'in the process of swallowing a huge conger [eel] tail first'. Next, he states that as bizarre as the anatomy of the UMO was, the most astonishing thing about the affair was what he considered to be the innocence and ineptitude of all the aforementioned commentators. Demonstrating an extremely unflattering side of his personality, Heuvelmans pillories Lovell. She is labelled an 'arrant' and 'bad' liar because he is of the opinion that her accounts are 'a tissue of

48 Gould, *The Case for the Sea-Serpent*.

49 Gould, *The Case for the Sea-Serpent*.

contradictions and absurdities. It is evidence not of zoological fact but of psychotic behaviour—a characteristic of mythomania'. This is based on his assertion that the Moha-moha was 'impossible in the absolute'. In particular, this concerns the observation that its scales were perpendicular to the axis of the body, something that simply cannot occur in any animal that has to bend. 'The whole thing smells far too fishy', Heuvelmans believes, because her 'various accounts are fogged with deliberate ambiguity and confusion, so that if her lies are doubted she can pretend she has been misunderstood'. He cannot resist the snide comment that 'One pities her poor pupils, for her own style is often so confused as to be incomprehensible'. And he ends with a nasty flourish, declaring that 'I find it hard to believe that Miss Lovell was not a dotty old maid who had picked up, but not digested, a smattering of palaeontology and Brahmin legend. Exit *Chelosauria lovelli*'.⁵⁰ It is no surprise that the Moha-moha does not merit a place in his 'Father-of-all-the-turtles' category.

The yacht *Valhalla* encounter

The 1905 *Valhalla* encounter was, according to Gould, the world's most famous sighting of a sea monster since the *Daedalus* case. Gould begins his chapter dedicated to the encounter by setting the stage as to why this particular sighting deserves full attention: '[i]t is safe to say that it is generally recognised, even by those who are profoundly sceptical of other sea-serpent stories, as a piece of evidence which cannot be disregarded—and yet which cannot be explained by supposing that any known creature was seen'.⁵¹ Heuvelmans recounts that the science writer for *The Illustrated London News* was also of this opinion, quoting him: '[s]eriously, we can no longer regard the "sea-serpent" as a myth. There can be no question but that the ocean harbours some secret which we have no yet penetrated'.⁵²

Gould reminds us that the vessel was upon a scientific cruise, and that the two witnesses were 'very competent', one being a naturalist and the other an entomologist, both fellows of the Zoological Society. He cites a 1926 book by Captain Alfred Carpenter and Sir David Wilson Barker (*Nature Notes for Ocean Voyagers*, 2nd ed.) in which they offer the following explanation: '[o]ne wonders whether this was possibly a sword-fish (which has a large square dorsal-fin) and whether the long neck was not the sword at the end of which was an impaled fish which was being macerated by violent wriggings in the water'. Gould abruptly concludes his chapter on this sighting with the following non-committal statement: 'I really do not feel equal to commenting on this theory'. Later, however, in his summing up, he proposes the existence of 'a gigantic turtle-like creature' (my italics), of which the Moha-moha was unequivocally one, and 'possibly the *Valhalla's* monster' was another.⁵³

50 Heuvelmans, *In the Wake of the Sea-Serpents*.

51 Gould, *The Case for the Sea-Serpent*.

52 Heuvelmans, *In the Wake of the Sea-Serpents*.

53 Gould, *The Case for the Sea-Serpent*.

Heuvelmans discounts the idea, raised by some, that the *Valhalla* UMO could be either a gigantic pipefish or knifefish, both of which have elongated, undulating dorsal fins. Trusting the accuracy of Nicoll's drawing (Figure 4), he notes that because the mouth does not extend beyond the eye, as it should in reptiles, it means that the UMO was either a hitherto unrecorded type of fish or—his pet theory—a palaeopinniped. Because of this, he does not include the sighting in his final 'Father-of-all-the-turtles' classification.⁵⁴ Coleman and Huyghe also do not mention the *Valhalla* sighting in their own classification category of the giant cryptid chelonian.⁵⁵ More recently, Bille considers that the UMO might have been a giant eel, before concluding that it will probably remain a 'great unknown of the sea'.⁵⁶

The 'Soay beast'

Few encounters with UMOs in the second half of the twentieth century generated as much attention as the 1959 sighting of the Soay beast. Commentary began almost immediately after the reporting of the encounter, with a pair of articles by the zoologist Burton. He first raised the possibility of the beast being 'an unusually large leathery turtle' before abandoning the idea in the face of the incongruity posed by the jagged dorsal crest and the presence of scales. Citing the *Osborne* case for support, Burton proceeds to hypothesise the existence of 'some large turtle-like animal so far unidentified' that is characterised by 'a line of serrations along the back'. Later, he proposes it might be 'an aberrant offshoot of some ancestral sea-turtle'. To Burton, the characteristic shape, fleshy lips, jagged dorsal crest, absence of teeth, and leathery skin are all chelonian traits.⁵⁷ Heuvelmans adds that the presence of the tendril-like growth reported to be hanging from the palate of the Soay beast is similar to filaments around the mouth of the matamata, a freshwater turtle from South America. Heuvelmans goes on to cite several examples of enormous marine turtles to add credence to the idea that the Soay beast was a 'Father-of-all-the-turtles'. Burton, however, floats the possibility that the beast may have been an Iguanid lizard, and writes: '[t]his tentative hypothesis may seem preposterous, even crazy. At least we can say that the Soay Beast does not conform in the slightest with the best authenticated records of the sea serpent, and to identify it with these ... is even more preposterous'.⁵⁸

54 Heuvelmans, *In the Wake of the Sea-Serpents*.

55 Coleman and Huyghe, *The Field Guide to Lake Monsters, Sea Serpents, and Other Mystery Denizens of the Deep*.

56 mattbille.blogspot.ca.

57 Burton, 'The Soay Beast'.

58 Maurice Burton, 'Was the Soay Beast a Tourist?', *The Illustrated London News* (14 October 1961): 632.

Figure 8: View of the back of a leatherback sea turtle (A) and of the serrated medial ridge shown in sideview (B).

Source: From William Borlase, *The Natural History of Cornwall* (Oxford: W. Jackson, 1758) (A) and *Cheshire Life* 12 (1948), no page (B). Author's private collection.

The Dutch zoologist Leo Brongersma, an expert on turtles, published a detailed scientific article in 1968 about the Soay beast. He is rightly critical of the artist's rendering of the beast (Figure 6), believing it to have been influenced by the over-dramatic version of the encounter by Geddes; i.e. 'like some hellish monster of prehistoric times'. Brongersma parses the eyewitnesses' descriptions carefully and reaches the conclusion that the observers must have been much nearer to the UMO than the distances stated. In consequence, he believes this would have affected their size estimates, and through this sleight-of-hand, he considers the recalculated size of the UMO to be consistent with the largest known leatherback turtles. He notes that the carapace of such turtles have seven longitudinal ridges or keels, of which three are often seen when the animal swims on the surface. Further, the medial ridge of leatherbacks does look serrated when viewed in profile (Figure 8), thus making them resemble the Soay beast, once one scales down what he believed to have been the greatly exaggerated dimensions of said creature. Other observed traits of the UMO

such as the gaping mouth, large blubbery lips and horny papillae on the palate are all found in leatherback turtles. Burton's observation that the UMO's neck is unlike that of a leatherback turtle is refuted by the citation of sources describing the swimming behaviour of such turtles with their heads 'well above water' such that 'the similarity with the behavior of the Soay beast is striking'. Brongersma is less convincing, however, in his attempts to explain away the eyewitness accounts of 'a large darker piece sticking up well aft', which 'follow[ed] the body down', in addition to the 'scaly [tail portion of the] body' as somehow being traits that are natural to leatherback turtles. Nevertheless, he concludes confidently that: '[t]here is nothing in the accounts that definitely prohibits identifying the Soay Beast with the Leathery Turtle. To the contrary, the description by the observers is what one may expect when two people try to describe a strange creature, which is of a kind unknown to them, and which turns up in [an] area where it occurs only occasionally.'⁵⁹ Loren Coleman and Patrick Huyghe seem to agree, having no difficulty in placing the Soay beast within their giant cryptid chelonian category.⁶⁰

Parsimonious explanation for the monsters' tails

The parsimonious explanation for the *Osborne* UMO is of a sea turtle entangled in fishing gear or maritime debris. With little difficulty, the hitherto incongruous and mysterious 10-metre ridge of fins of irregular height shown in Figure 1 can be likened to a dragged length of fishing net and floats just as convincingly as can the body of the creature to a chelonian (Table 1), based on the eyewitness accounts as well as Figure 2. The descriptions and drawing of the extended 'ridge of fins' lying upon the surface of the water matches closely eyewitness accounts of the famous Gloucester sea serpent,⁶¹ a UMO that was almost certainly an entangled animal.⁶² Due to their life cycle and swimming, feeding and migratory behaviour, sea turtles are particularly susceptible to entanglement. As such, it is possible to view many online photographs of chelonians entangled in fishing gear including floats (e.g. Appendix: online photograph 1). It is easy to surmise how net floats—such as those made of styrofoam (polystyrene plastic) shown in modern photographs or those composed of cork or glass used in nineteenth-century purse seines (Figure 9)—if pulled in line strung out behind the unfortunate animal, and viewed from a distance as was the case for the *Osborne* UMO, could lead to the supposition that an elongated sea monster was being seen.

59 L. D. Brongersma, 'The Soay Beast', *Beaufortia* 184 (1968): 33–46.

60 Coleman and Huyghe, *The Field Guide to Lake Monsters, Sea Serpents, and Other Mystery Denizens of the Deep*.

61 Soini, *Gloucester's Sea Serpent*.

62 Elizabeth Farma, 'Debunking a Great New England Sea Serpent', *Sea Monster Week*, 23 December 2015 www.tor.com/2012/08/16/France, 'Reinterpreting Nineteenth-century Accounts of Whales Battling "Sea Serpents"'.

THE MENHADEN FISHERY.

Steamer's crew surrounding menhaden with a purse-seine. (Sect. v, vol. i, pp. 337-339.)

From sketch by Capt. B. F. Conklin.

THE MENHADEN FISHERY.

Menhaden fishermen at work: pulling of the seine nearly completed. (Sect. v, vol. i, p. 339.)

Engraving by H. W. Elliot.

Figure 9: One of the many methods of nineteenth-century fishing: purse seining for menhaden. It is not difficult to imagine how a distant view of the floats of such nets that had become non-lethally entangled on a swimming sea turtle might be construed as being the tail of an enormous, undulating sea monster if it were dragged along, bobbing up and down, over the surface of the water.

Source: Brown Goode et al., *The Fisheries and Fishery Industries of the United States* (Washington DC: US Government Printing Office, 1884). Author's private collection.

With respect to the Moha-moha UMO, it goes without saying that Heuvelmans's denigration of Lovell was as cruel as it was unfair. From my perspective of building a case that these early sea monster sightings may have been entangled chelonians, the most illuminating part of Lovell's encounter, and the one that comes closest to what I believe to be the truth, is her statement that 'a spectator could not guess that the head and tail belonged to the same creature'.⁶³ That the front end of the UMO was a turtle is incontestable, as there are no other marine animals in Australia of like size and physical resemblance that emerge upon land for such extended periods. The 12-foot long 'glossy' and 'shiny' tail, covered with silver-grey 'scales', and terminating in a fleshy brownish and translucent fin, suggests to me a twisted length of fishing net and broken shards of glass-blown floats, possibly festooned with pieces of brown algae or seaweed matted together, thereby giving the overall impression of solidity. Lovell, despite her proximity to the UMO, can be forgiven for imagining such a structure to have been a tail. There exist online photographs of marine animals pulling lengths of entangled kelp or debris that do indeed resemble tails (e.g. Appendix: online photograph 2).

Of the four famous UMO sightings described herein, that of the *Valhalla* is the one that most tenuously can be identified as being a turtle. This is a consequence of the likening being based solely on the description of the head and not that of the rest of the body: i.e. if we discount the parallel sighting of Prodggers, who referred to the presence of a large, barrel-like body. Could the 'coil' observed by Prodggers be the same as the frilled, seaweed-like fin, unlike that of any fish, observed by the naturalists on the *Valhalla*? And is this an example of an animal dragging a small piece of canvas sail or some such material, as I suggest to have been the case for at least one sea serpent sighting of just such an entangled cetacean?⁶⁴ Again, there are many photographs online of marine animals, including chelonians (e.g. Appendix: online photographs 3 and 4) pulling all manner of large bric-a-brac behind them. The long neck of the *Valhalla* UMO (exaggerated in the artist's rendering, Figure 5, compared to the original eyewitness's sketch, Figure 4) seems very un-turtle like, as does its 'peculiar' or 'curious' side-to-side 'wriggling' or 'swinging' movement that was forceful enough to lash the water into foam. What if this was not actually the head of the UMO but rather an upright piece of debris entangled around a submerged animal, which was almost certainly the case for the hitherto mysterious spine-like 'tongue' or 'horns' observed by some witnesses for the Gloucester UMO?⁶⁵ A group of dead sea turtles in the Mediterranean was once found completely enveloped in a jumble of abandoned or 'ghost' net material that included an upright pole attached to a float (Appendix: online photograph 5). Such pole-floats were (Figure 10)⁶⁶ and still are commonly used by fishermen to mark the ends of their set gill nets. Could such a pole, around which

63 Gould, *The Case for the Sea-Serpent*.

64 France, 'Reinterpreting Nineteenth-century Accounts of Whales Battling "Sea Serpents"'.

65 France, 'Reinterpreting Nineteenth-century Accounts of Whales Battling "Sea Serpents"'.

66 George Brown Goode, *The Fisheries and Fishery Industries of the United States* (Washington, DC: G.P.O., 1884).

a cord of twisted hemp netting and perhaps kelp is wrapped, rocking side-to-side in the waves, be mistaken for the long neck of thigh-like thickness that was observed? If so, then the distinguishing feature hitherto noted for its resemblance to a turtle based solely upon what had been imagined to be the head, is moot, and whatever this particular entangled animal actually was, remains a mystery.

THE GILL-NET COD FISHERY.

Norwegian method of setting nets at different depths to ascertain the vertical position of the fish. (Sect. v, vol. 1, p. 225.)

1, Nets. 2, Foot-lines by which the nets are held to the bottom. 3, Stone moorings to the nets. 4, Buoy-line. 5, Buoy.

Drawing by Capt. J. W. Collins.

THE GILL-NET COD FISHERY.

Way in which cod gill-nets are set for underrunning in Ipswich Bay, Mass. (Sect. v, vol. 1, p. 232.)

1, End of the gang of nets. 2, Anchor line, also called the "underrunning line." 3, Anchor. 4, Buoy-line. 5, Buoy.

Drawing by Capt. J. W. Collins.

Figure 10: Upright poles affixed to floats used to mark the position of gill nets in the nineteenth century. Could, in pulling such a float that is entangled on an accidentally by-caught animal, the pole, possibly festooned with seaweed and waving back and forth in the water as it moves along, be mistaken for the neck of a sea monster?

Source: Brown Goode et al., *The Fisheries and Fishery Industries of the United States* (Washington DC: US Government Printing Office, 1884). Author's private collection.

Burton⁶⁷ draws parallels between the Soay beast and some earlier sightings of UMOs in Scottish waters. Heuvelmans, however, is not so sure, dismissing one such suggested parallel sighting as being ‘a typical “string-of-buoys” monster’, and thus not at all similar to the type of creature that he construes the Soay beast to have been. Unknowingly, however, by using that remarkably apt choice of words—‘typical “string-of-buoys” monster’—Heuvelmans exactly hits the mark regarding what I believe the UMO to have been. Despite Brongersma’s contention, it is impossible to reconcile the artist’s drawing showing a stegosaur-like sequence of dorsal plates—which Geddes stated was ‘a fair representation’ of the body, and which agrees with the descriptions of the ‘immense saw-toothed’ and ‘knife-edge’ ridge of solid ‘triangular-shaped spines’ that somewhat resembled scales and which were three to four feet above the surface—with the relatively miniscule dorsal ridge of any species of marine turtle. This is unless, of course, one accepts my present thesis that the UMO may have been a leatherback turtle observed in a state of entanglement in some form of maritime debris. Again, it is easy to find online images of unfortunate marine turtles whose bodies are completely enveloped in a tangled mess of anthropogenic material of all sorts of shapes and sizes that jut out from the dorsal surface of their shells. This is what I propose to have also occurred, and is a way to parsimoniously explain this particular historic encounter with a putative sea monster.

These four famous encounters are by no means the only evidence existing to suggest that chelonians entangled in fishing gear or maritime debris have been misidentified as sea monsters. A review of the complete literature⁶⁸ reveals there to be a dozen accounts of less well-known sightings in which the observed UMO, whose described features are either specifically mentioned or can be inferred to have resembled those of a sea turtle, seems to be pulling a train of entangled debris that is mistaken for a tail, such as for example, that shown in Figure 11.

67 Burton, ‘The Soay Beast’.

68 France, ‘Historicity of Sea Turtles Misidentified as Sea Monsters’.

Figure 11: A UMO described as a 'turtle-bodied snake' observed in 1925 in the South China Sea.

Note: The drawing and account of the strange composite creature suggests the possibility that it may have been an entangled chelonian.

Source: Drawing by B. Heuvelmans based on original by eyewitness A. Jordan. From Heuvelmans, *In the Wake of the Sea-Serpents*. Author's private collection.

Discussion

The role of imaginary sea monsters in the culture and maturation of late-Victorian natural science

The cultural lens through which sea monsters have been regarded in Western civilisation has altered through time: from being associated with deities or themselves deified in (pre-)Antiquity; to being agents of danger during the *Hic sunt dracones* ('here be dragons') period of Renaissance maritime exploration; to representing discovery and perceptual contagion in the early 1800s; to inspiring debates and feelings of discontinuity in the late 1800s; to facilitating delusion as a result of perceptual contagion in the mid-twentieth century; to finally fostering anti-establishment discord from the late 1900s to the present.

In an article in the cryptozoological magazine *Fortean Times*, Greener notes that ‘many of the most vivid and credible reports of “sea monsters” come from [the] 19th-century’, a time which he refers to, in the title, as being ‘The Golden Age of Sea Serpents’.⁶⁹ In point of fact, a careful compilation of sightings through time and from across the world’s oceans reveals a timeline that is more complex.⁷⁰ The incidence of sea monster sightings displays a marked cyclicity, with peaks at the end of the age of exploration in the seventeenth century; another between the 1810s and the 1840s as a result of, and in response to, the famous Gloucester sightings; a return to popularity in the decades around the end of the nineteenth century at which time natural history was all the rage; a rapid rise from the 1930s to the 1950s coincident with and following the Loch Ness phenomenon; and what seems to be the start of another increase from the 1990s to today, in ‘the truth is out there’ period of cryptozoology. Whereas the Soay beast sighting occurred in the shadow of the global frenzy cast by ‘Nessie’, the other three UMO sightings took place during the more sober Victorian and Edwardian period of serious natural history investigation.⁷¹

Excluding the supernatural, fearsome humanoid monsters in late-Georgian and Victorian fiction, such as Dr Frankenstein’s patchwork creature, the alter ego Mr Hyde and Dr Moreau’s hybrids, served to raise questions, in the face of Darwinian theory, about what it meant to be human, as well as to provide a warning about the dangers of unshackled science.⁷² From a zoological perspective, to be regarded as a monster derives from being either an atypically large size (e.g. Darwin uses the phrase ‘monstrous as a whale’ in his 1859 *On the Origin of Species*) or representing an unknown creature,⁷³ displaying teratological abnormalities, or unusual inter-species hybridisations.⁷⁴ The four UMO sightings covered herein exhibit all these traits. For the two Victorian-period sightings, the explanations put forward by naturalists ranged from believing the monsters were either misidentified known animals (Owen, Buckland, anonymous *Nature* contributor), mysterious creatures unknown to science (Lee, Bartlett), or a palaeo-relict that had escaped extinction (Oudemans).

69 Greener, ‘The Golden Age of Sea Serpents’.

70 R. L. France, ‘The Sea-Orm Ouroboros: The Roles of Exploration, Natural History, Perceptual Contagion, and Pseudoscience in Patterns of Temporal Cyclicity in Sightings of Imaginary Aquatic Monsters.’ Manuscript in preparation.

71 Lynn Barber, *The Heyday of Natural History, 1820–1870* (Garden City, NY: Doubleday, 1980); U. C. Knoepfelmacher and G. B. Tennyson, *Nature and the Victorian Imagination* (Berkeley, CA: University of California Press, 1977); Carl Berger, *Science, God, and Nature in Victorian Canada* (Toronto: University of Toronto Press, 1983), doi.org/10.3138/9781442656857.

72 Christina Schneider, ‘The Monstrosity in the English Gothic Novel’, *The Victorian* 3 (2015): 1–11.

73 Ronald Westrum, ‘A Note about Monsters’, *Journal of Popular Culture* 8 (1975): 862–70, doi.org/10.1111/j.0022-3840.1975.00862.x.

74 Deborah P. Dixon and Susan M. Ruddick, ‘Monsters, Monstrousness, and Monstrous Nature/s’, *Geoforum* (2013) 237–8.

The historian Sherrie Lyons thinks the moniker applied to the Victorian Age, the 'age of science', would be more appropriately the 'age of contradictions' or 'age of transitions' in consequence of the climate of uncertainty generated by the promulgation and widespread discussion of competing theories and beliefs.⁷⁵ The subject of sea monsters played an important role in Victorian discussions concerning issues of naturalness, novelty, deep time and professionalism.

There is a long history of human–animal hybrids contributing to the definition of what humans are and what their relation to the natural world is, in terms of either our uniqueness or our commonality with other animals.⁷⁶ The fascination with sea monsters as composite creatures was prevalent in Victorian times, most notably in the form of mermaids, which fuelled scientific discourse about Darwinian theory and the chain of evolutionary life; i.e. could these half human–half fish beings be sea-to-land missing links?⁷⁷ In this respect, descriptions of sea monsters pushed the boundaries of what was evolutionarily possible. The statement by pre-eminent naturalist Phillip Gosse in his immensely popular *The Romance of Natural History* (1861), that 'nature has an awkward way of mocking at our impossibilities', was certainly borne out in the form of the platypus and other Australian animals which were then becoming more widely known.⁷⁸ If such odd creatures existed, why not strange monsters from mythology? For some, such as the noted naturalist Charles Gould, Darwin's theory gave credibility to the possible existence of composite creatures such as griffins, satyrs, hippogriffs and mermaids.⁷⁹ And so why not then the *Osborne* or *Moha-moha* sea monsters, which were certainly no more bizarre-looking than the platypus?

To Victorians, sea monsters 'embodied alternative modes of understanding about the natural world'.⁸⁰ Because of this, by their very nature, or possibly better, their 'un-nature', sea monsters, especially those that so obviously seemed to be hybridisations of recognised animals, such as the four UMOs examined herein, challenged Linnaean classification. By destabilising taxonomic categories, sea monsters raised questions about the ability of experts and therefore scientific authority.⁸¹ Furthermore, ascribing Latinised names to conveniently classified animals forms the very foundation of natural science, and in terms of metaphysics, is a way of maintaining the perception of humankind's superiority (in the form of stewardship) over the rest of the natural world. To taxonomically name and

75 Lyons, *Species, Serpents, Spirits, and Skulls*.

76 D. Dinnerstein, *The Mermaid and the Minotaur: Sexual Arrangements and Human Malaise* (New York: Harper & Row, 1976); Harriet Ritvo, *Noble Cows and Hybrid Zebras: Essays on Animals and History* (Charlottesville, NC: University of Virginia Press, 2010).

77 H. Brink-Roby, 'Siren canora: The Mermaid and the Mythical in Late Nineteenth-century Science', *Archives of Natural History* 35 (2008): 1–14, doi.org/10.3366/E0260954108000041.

78 Harriet Ritvo, *The Platypus and the Mermaid, and Other Figments of the Classifying Imagination* (Cambridge, MA: Harvard University Press, 1998).

79 Charles Gould, *Mythical Monsters* (London: W. H. Allen, 1886).

80 Ritvo, *The Platypus and the Mermaid*.

81 Lyons, *Species, Serpents, Spirits, and Skulls*; Regal, 'Richard Owen and the Sea-Serpent'; Ritvo, *The Platypus and the Mermaid*.

classify an animal is to domesticate and in a sense own it. Therefore, if composite creatures such as sea monsters defy categorisation, then our place of wisdom at the apex of Creation must be re-examined, something that feeds into the unease raised by Darwin's revolutionary theory. In short, to Victorian naturalists and scientists, sea monsters always remained the most frustrating of fauna.

The discovery and recognition of the fossilised bones of ancient 'monsters' throughout the 1800s had a profound effect upon Victorian society. In regard to composite creatures, the noted palaeontologist William Conybeare described, as was mentioned earlier, the plesiosaur as resembling 'a snake threaded through the body of a turtle',⁸² something not dissimilar to descriptions and illustrations of the sea monsters examined herein, as well as other sightings of what I believe to have been entangled chelonians (Figure 11), or what one anonymous reviewer of the present article prosaically called 'turtle-trash cyborgs'. The discovery of fossil remains of hybrid monsters from the past, such as 'fish-lizards' (i.e. ichthyosaurs) and 'almost-lizards' (i.e. plesiosaurs), provided a scientific basis for mythological sea monsters as well as making plausible the possibility that they might have survived into the present.⁸³ The result was, according to Lyons, that such Victorian palaeontological discoveries gave a level of scientific legitimacy to sea monsters that had hitherto not existed; nor has it since.

Given that the seas were relatively unexplored, it was completely plausible to believe that strange and as yet unknown creatures, possibly living fossils, might inhabit its depths,⁸⁴ for did not the old adage state *In mare multa latent* ('in the ocean many things are hidden')? Sea monsters therefore became the subject of impassioned debate in late-Victorian times as high-profile naturalists attempted to understand what they were rather than dismiss them out of hand. This is reflected by the publication of 26 papers between 1877 and 1899,⁸⁵ 19 in *Nature*,⁸⁶ and a flurry of contemporaneous books.⁸⁷ In a chapter entitled 'Swimming at the Edges of Scientific Respectability', Lyons argues that the sea monster became the locus for several boundary disputes in the culture of Victorian science.⁸⁸ The existence or non-existence of sea monsters was used to promote alternative views of the Earth's history and thus the legitimacy of the fledgling sciences of geology and palaeontology. Also the fact that most sightings, such as those for three of the four cases investigated herein, were made by amateurs, provoked a big debate about the credibility and

82 Conybeare, 'On the Discovery of an Almost Perfect Skeleton of Plesiosaurus'.

83 Adrienne Mayor, *The First Fossil Hunters: Dinosaurs, Mammoths, and Myth in Greek and Roman Times* (Princeton, NJ: Princeton University Press, 2000); Lyons, *Species, Serpents, Spirits, and Skulls*.

84 Edward Newman, 'The Great Sea Serpent', *Westminster Review* 50 (1849): 491–515; Lyons, *Species, Serpents, Spirits, and Skulls*.

85 Lyons, *Species, Serpents, Spirits, and Skulls*.

86 Ronald Westrum, 'Knowledge about Sea-Serpents', in *On the Margins of Science: The Social Construction of Rejected Knowledge*, ed. Roy Wallis (Keele: University of Keele, 1979), doi.org/10.1111/j.1467-954x.1979.tb00066.x.

87 Lee, *Sea Monsters Unmasked*; Gibson, *Monsters of the Sea: Legendary and Authentic*; Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise*; Gould, *Mythical Monsters*.

88 Lyons, *Species, Serpents, Spirits, and Skulls*.

character of eyewitnesses and indeed the role played by professional scientists in their goal to become the voice of authority on all matters of natural history; in short, the definition of what counted as valid evidence. The anti-establishment opinion was to trust the reports of salty sea dogs seeing live animals over museum landlubbers studying dead fossils.⁸⁹ In contrast, Sir Richard Owen insisted that no number of eyewitness testimonies counted in the absence of physical evidence confirmed by a museum-based authority.⁹⁰ In other words, legalistic endorsement of eyewitness testimonies, which can be influenced by so many subjective factors,⁹¹ is no way to go about doing objective science. All the magistrates in the world were not as important as a single specimen, and the opinions of amateur natural historians, many of whom were aristocratic gentlemen, did not count in the eyes of those who were part of the maturing discipline of true science. We now recognise that what constitutes real science practised by today's professional zoologists and botanists and the like is very different from the roots of those disciplines in proto-scientific natural history, as conducted by amateurs in the Victorian age.⁹²

Concerning the *Osborne* encounter, Owen scribbled the following in the margins of his copy of letters sent to him directly by the ship's commander: 'the object or phenomena may have been unknown to the observers [but they] were not necessarily caused by a "monster"'.⁹³ And his marginalia on his copy of an 1877 newspaper article entitled 'The Sea-serpent Again', in which the anonymous author states that 'there is not the slightest doubt that there are monsters in the sea of various kinds yet unknown to man', simply asks 'what proof of their monstrosity?'⁹⁴ Not for nothing, then, did the Prince Regent, Albert, dub Owen the 'sea-serpent killer'. And so by the end of the nineteenth century, the relationship between science and sea monsters coalesced into one of opposition and hostility.⁹⁵ It would be many decades before amateurs regained the podium with the advent of cryptozoology, largely disseminated by the unrefereed internet and often undertaken through a desire to prove the experts wrong,⁹⁶ most of whom avoid sea-serpentology anyway due to its unsavoury contemporary reputation of being an embarrassing pseudoscience.⁹⁷

89 Newman, 'The Great Sea Serpent'.

90 Regal, 'Richard Owen and the Sea-Serpent'.

91 Bruce A. Champagne, 'A Preliminary Evaluation of a Study of the Morphology, Behavior, Autoecology, and Habitat of Large, Unidentified Marine Animals, Based on Recorded Field Observations', in *Dracontology* Special Number 1: *Being an Examination of Unknown Aquatic Animals*, ed. Craig Heinselman (Francestown, NH: The editor, 2001); C. G. M. Paxton, 'The Plural of "Anecdote" can be "Data": Statistical Analysis of Viewing Distances in Reports of Unidentified Large Marine Animals 1758–2000', *Journal of Zoology* 279 (2009): 381–7, doi.org/10.1111/j.1469-7998.2009.00630.x; Charles G. M. Paxton and Adrian J. Shine, 'Consistency in Eyewitness Reports of Aquatic "Monsters"', *Journal of Scientific Exploration* 30 (2016): 16–26.

92 Robert Peters, 'From Natural History to Ecology', *Perspectives in Biology and Medicine* 23 (1980): 191–203; David Clifford, Elisabeth Wadge, Alex Warwick, and Martin Willis, eds., *Repositioning Victorian Sciences: Shifting Centres in Nineteenth-Century Scientific Thinking* (London: Anthem, 2006).

93 Regal, 'Richard Owen and the Sea-Serpent'.

94 Regal, 'Richard Owen and the Sea-Serpent'.

95 S. H. Gage, 'Zoology as a Factor in Mental Culture', *Science* 4 (1896): 207–13, doi.org/10.1126/science.4.86.207; Regal, 'Richard Owen and the Sea-Serpent'.

96 Peter Dendle, 'Cryptozoology in the Medieval and Modern Worlds'.

97 Schembri, 'Cryptozoology as a Pseudoscience: Beasts in Transition'.

Conclusion

By the end of the Victorian period and the first decades of the twentieth century, sea monsters became largely relegated to the world of fiction. Jules Verne's 1870 novel *Twenty Thousand Leagues Under the Sea* is composed in the form of a ship's log pertaining to a search for a sea monster. In the end, the fearful monster turns out to be a technologically advanced submarine piloted by a 'nobody' who engages in misanthropic behaviour that might be considered to be somewhat monstrous, at least to well-mannered Victorian sensibilities. In this, the novel is prescient in highlighting the fear that Victorians had about the advent of modernity and the discontinuity with the world beforehand.⁹⁸

Today, one widely recognised 'monstrous act' of human modernity is the serious threat posed to the abundance and biodiversity of marine animals by entanglement in maritime debris and active or abandoned ('ghost') fishing gear. More than 200 species,⁹⁹ including six of the seven species of sea turtles,¹⁰⁰ are caught in such material. Due to their life cycle and their feeding, swimming and migratory behaviour, chelonians are particularly susceptible to becoming entangled.¹⁰¹ Indeed, the worldwide number of sea turtles expiring in this way is truly staggering.¹⁰² Significantly, entanglement is seen to be only a recent phenomenon corresponding to the advent and widespread use of plastic from the middle of the twentieth century.¹⁰³ The present reconsideration of sea monster sightings from historical documents is important in suggesting that entanglement of sea turtles may have a much longer environmental history than is commonly believed (see France¹⁰⁴ for a discussion about the longevity of natural fibre hemp used in earlier fishing gear and maritime equipment).

98 Lyons, *Species, Serpents, Spirits, and Skulls*.

99 D. W. Laist, 'Impacts of Marine Debris: Entanglement of Marine Life in Marine Debris Including a Comprehensive List of Species with Entanglement and Ingestion Records', in *Marine Debris: Sources, Impacts, and Solutions*, ed. J. M. Coe and D. B. Rogers (New York: Springer, 1997).

100 C. Wilcox, G. Heathcote, J. Goldberg, R. Gunn, D. Peel, and B. D. Hardesty, 'Understanding the Sources and Effects of Abandoned, Lost, and Discarded Fishing Gear on Marine Turtles in Northern Australia', *Conservation Biology* 29 (2014): 198–206, doi.org/10.1111/cobi.12355.

101 J. G. B. Derraik, 'The Pollution of the Marine Environment by Plastic Debris: A Review', *Marine Pollution Bulletin* 42 (2002): 842–52, doi.org/10.1016/S0025-326X(02)00220-5.

102 C. Wilcox, B. D. Hardesty, R. Sharples, D. A. Griffen, T. J. Lawson, and R. Gunn, 'Ghostnet Impacts on Globally Threatened Turtles, a Spatial Risk Analysis for Northern Australia', *Conservation Letters* 6 (2013): 247–54, doi.org/10.1111/conl.12001; L. Alessandro and S. Antonello, 'An Overview of Loggerhead Sea Turtle (*Caretta caretta*) Bycatch and Technical Mitigation Measures in the Mediterranean Sea', *Review of Fish Biology and Fisheries* 20 (2010): 141–61, doi.org/10.1007/s11160-009-9126-1.

103 National Oceanic and Atmospheric Administration Marine Debris Program, *Entanglement of Marine Species in Marine Debris with an Emphasis on Species in the United States* (Silver Spring, MD: NOAA Marine Debris Program, 2014); M. R. Gregory, 'Environmental Implications of Plastic Debris in Marine Settings—Entanglement, Ingestion, Smothering, Hangers-on, Hitch-hiking and Alien Invasions', *Philosophical Transactions of the Royal Society B* 364 (2009): 2013–25, doi.org/10.1098/rstb.2008.0265.

104 France, 'Reinterpreting Nineteenth-century Accounts of Whales Battling "Sea Serpents"'.

In this regard, the discipline of environmental history provides a way to backcast the temporal frame of reference from which to detect anthropogenic change. Environmental history employed in this role functions as a sort of metaphorical Claude glass, those small convex mirrors used by eighteenth- and nineteenth-century tourists and amateur painters interested in the picturesque. Held in the hand, the viewer would look backward on the reflected landscape, the glass serving to abstract, simplify and refocus the scenery for careful examination. In this same manner, environmental history looks backward, enabling an illation to be made about the length of time that populations of marine animals may have been subjected to the anthropogenic pressures of not just direct fishery exploitation,¹⁰⁵ but also of ancillary by-catch resulting from entanglement in that fishing gear.¹⁰⁶

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Appendix

Online photographs

1. Sea turtle pulling length of entangled kelp (www.grindtv.com/wildlife/heroic-deckhand-swims-to-the-rescue-of-endangered-leatherbackturtle/#skmdR7MLGHBV2DGm.p7; author P. Thomas, 12 April 2016).
2. Sea turtles entangled in marine debris which includes sheet-like material (www.hunterdouglasfabrics.com/sea-tex/#bionic).

¹⁰⁵ H. K. Lotze and B. Worm, 'Historical Baselines for Large Marine Animals', *Trends in Ecology and Evolution* 24 (2009): 254–62; H. K. Lotze et al., 'Depletion, Degradation, and Recovery Potential of Estuaries and Coastal Seas', *Science* 312 (2006): 1806–9, doi.org/10.1126/science.1128035.

¹⁰⁶ France, 'Historicity of Sea Turtles Misidentified as Sea Monsters'; Farma, 'Debunking a Great New England Sea Serpent'; France, 'Reinterpreting Nineteenth-century Accounts of Whales Battling "Sea Serpents"'.

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