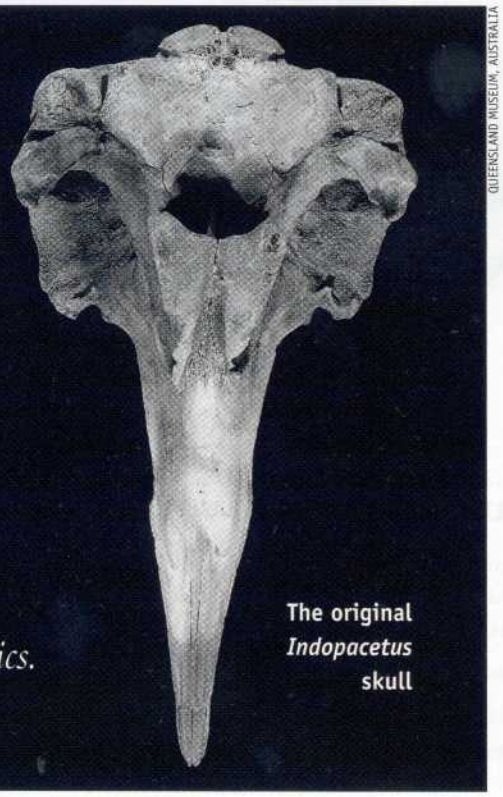
FINDINGS

Alive and Whale

A missing cetacean resurfaces in the Tropics.

By Robert L. Pitman



QUEENSLAND MUSEUM, AUSTRALIA

The original *Indopacetus* skull

It had to be out there somewhere. It wasn't just a set of car keys that had gone missing—somehow an entire species of whale had been lost for more than a century.

The story picks up in 1882 with a worn skull found on a beach in Queensland, Australia. The specimen ended up in the Queensland Museum, but it was not until 1926 that Heber Albert Longman, the museum's director, recognized it as a new species of beaked whale. From the family Ziphidae, these whales are so named because they have mouths like beaks, as dolphins do. But these would be large dolphins: members of some species range up to almost forty-two feet, although most individuals are only half that size. Longman named the new whale *Mesoplodon pacificus.* The genus name, derived from the Greek, means "armed with a middle tooth"; males of most species of *Mesoplodon* have a single large tooth that erupts from each side of the lower jawbone, halfway along its length. (Because heavy scarring is frequently found on adult males but never on females, scientists assume that males use these teeth as tusks to fight with other males for breeding privileges.) The name *pacificus* merely underscores the fact that the original specimen—the holotype—came from the Pacific coast of Australia.

For decades afterward, various authorities questioned the status of *M. pacificus* as a separate species, based as this was on a single specimen. Some suggested that the specimen could be a subspecies of True's beaked whale, *M. mirus* (a species with distinct populations in the North Atlantic and the southern oceans), or possibly a female southern bottlenose whale, *Hyperoodon planifrons.* It is a scientific truism that less data will always support more hypotheses.

Another seventy-three years elapsed before anyone found a second specimen. In 1955, another well-worn skull turned up, this time on the east coast of Africa, where Somalian fishermen found it on a beach. Although the find convinced even the skeptics that *M. pacificus* was indeed a different beast, it provided almost no new information about the animal. Beaked whales are probably the most poorly known group of large mammals alive today. They are shy and swim in deep waters, far offshore. If a vessel approaches within half a mile, they usually slip under the waves, diving for half an hour or more, and are typically never seen again. Even a researcher like me, who has spent his life counting and identifying whales and dolphins while traveling the oceans of the world, sees beaked whales only occasionally. I can rarely identify members of this family with certainty and can almost never photograph them. Several species of beaked whales have never been identified alive in the wild; practically everything known about most of them is based on stranded animals. And among these, *M. pacificus* was the rarest of the rare—just two skulls found on two beaches.

In 1968 Joseph C. Moore, then a curator at the Field Museum in Chicago, published a preliminary taxonomic review of the five living genera of beaked whales known at that time. He considered *M. pacificus* not only a valid species but one distinct enough from the other eleven species of *Mesoplodon* to deserve its own genus, for which he coined the name *Indopacetus,* to reflect the fact that the species was now known to occur in the Indian Ocean as well as in the Pacific. (I can only hope a different subspecies doesn't show up in the Atlantic—*Indopacetus pacificus atlanticus?*) However, many cetologists did not accept Moore's assessment, and several suggested that until more specimens became available, the

whale was probably best left in the genus *Mesoplodon*.

And so, nearly a hundred years had passed since the holotype specimen had been dragged off an Australian beach, and Longman's beaked whale, as it had become known, had revealed itself to science only twice, offering up just two damaged skulls. This left plenty of room for questions: Was the animal extinct or just exceedingly rare? How was it related to other whales? Where did it live, and what did it look like? Based on skull size, it was estimated to be about twenty-three feet long. For those seeking the whale, the ocean was an immense haystack, but this was still an awfully big needle.

At some point during a search for a whale, the story must shift offshore. In 1966, while conducting biological surveys at sea in the central Pacific for the Smithsonian Institution, Ken Balcomb, now at the Center for Whale Research on San Juan Island (off the north coast of Washington State), photographed a herd of twenty-five to thirty-five unidentified beaked whales near the equator. They were grayish brown in color, and some had a conspicuous tan forehead, known as a melon. Between the prominent melon and the beak was a crease, which placed the species within a distinct subset of beaked whales—the bottlenoses. The animals that Balcomb photographed were also larger than most species of beaked whales; researchers estimated them to be between twenty-three and thirty feet long. Exactly which species they were, however, was unknown. Balcomb had taken remarkably good photos, but the experts who examined them in order to identify the whales could only shrug their shoulders.

As the years went by, a handful of other sightings of bottlenose whales in the Tropics came trickling in, and scientists gradually accepted that they were probably southern bottlenose whales, a fairly common species but one normally found only in Antarctic waters. Was it odd that a species often seen in the company of icebergs was also to be found in the Tropics? Perhaps, but other whales, such as humpbacks and sperm whales, cover a similar range of latitudes and are equally at home with a backdrop of penguins or of palm trees. I myself had seen bottlenose whales in the Tropics at least ten times, and southern bottlenose whales in Antarctica dozens of times, and the two groups looked very similar to me. But they were always so far away, and fleeting glimpses were all they ever allowed, so I couldn't be sure if they actually were the same species.

Over the years, photographs of both the tropical and the Antarctic animals began to accumulate. One day five years ago, as I sat comparing some photos I had recently taken of southern bottlenose whales with some published photos of the tropical animals, I had one of those moments of stunned revelation that field researchers live for. The color patterns and body shapes had clear and consistent differences. The tropical animals had longer beaks and a different color patterning on the head; their calves had white rather than dark flanks. I realized that the bottlenose whale in the Tropics was not the southern bottlenose whale.

We compiled all that was known about Indopacetus, *which didn't take long. Descriptions of these whales are invariably terse.*

So what was it?

The twenty species of beaked whales known by 1997 were grouped into six genera. The photographed animals could belong to one of just a few species; the whales in the other groups were either too small or had the wrong color pattern, the wrong head shape, or the wrong dorsal fin. My colleagues and I made a quick review of our options and found only two possibilities: the tropical cetacean had to be either a new species or the enigmatic whale Longman had described seventy-five years earlier.

We compiled all that was known about *Indopacetus*, which didn't take long. Handbooks and field guides on whales and dolphins invariably offer only one terse paragraph about the genus. Not only does it always receive the shortest written account (pointing out its status as the least-known whale in the lot), but it is usually the only species not given a photo or illustration. Sometimes the text is accompanied by a dotted outline of a generic beaked whale (for the readers to color in if more information becomes available?) or an "artist's conception" of one (if you had only part of a bird skull in hand, would you draw a peacock or a pigeon?). All we knew for certain was that this was a fairly large beaked whale, that it was found in the tropical Indian and Pacific Oceans, and that it was probably a rare species. Not much to go on, but the information matched what we knew about our mystery whale, and when we wrote up our paper in 1999 describing the physical features, sighting locations, and other biological observations recorded during the preceding thirty years, we suggested that the whale might just be *Indopacetus pacificus*.

Given the rate at which information on the mysterious whale had accumulated during its first century of human recognition, my colleagues and I had no reason to expect that its identity would ever be resolved in our lifetimes. But it turned out that this species had waited in the wings long enough. Within six months of the publication of our paper, fisheries biologist Charles Anderson contacted me about a beaked whale stranded on a beach in the Maldives, in the northern Indian Ocean. It was an adult female with a near-term fetus; based on the descriptions in our paper, he was certain it was *Indopacetus*. At about the same time, Merel Dalebout, a

ROBERT L. PITMAN

Tropical bottlenose whales, seen alive in the Pacific—rather than on a museum shelf

doctoral candidate at the University of Auckland in New Zealand, had managed to extract and sequence some of the DNA from the *Indopacetus* holotype. She compared this genetic fingerprint with a tissue sample from the Maldivian whale and verified that the stranded animal was in fact *I. pacificus,* but the animal was too decomposed to compare with live animals we'd observed. Two months later, I received an e-mail from Graham Ross, of the Australian Biological Resources Study in Canberra, asking if I could identify the newborn whale in a photograph he'd attached. The animal clearly had the color pattern of the animals in our 1999 paper. I told him I was quite certain it belonged to the same species as the mystery whale we thought might be *I. pacificus.* Ross then told me that the newborn had been stranded on a beach in South Africa in 1976 and had originally been identified as a southern bottlenose, but that before he had contacted me, Dalebout had sequenced its DNA and determined that this whale, too, was *I. pacificus.* The link was forged—our tropical bottlenose whale was indeed Longman's long-lost whale!

For a hundred years, cetologists had nothing to work with but two skulls on the shelf. We now have specimen material from six individuals (including five skulls and one complete skeleton), records of more than two dozen sightings, numerous photographs of live animals in the field, recordings of their vocalizations, and (welcome to the twenty-first century) eight minutes of digital video footage. *Indopacetus* has suddenly become one of the better-known beaked whales, and future writers of cetacean field guides will have to christen another species as least known.

The search for the tropical bottlenose reinforced a scientific truism: less data will always support more hypotheses.

A curious thing is that *I. pacificus,* long before having been seen in the flesh either alive or dead, had acquired two common names. The first was Longman's beaked whale, a tribute to the describer; the second was Indopacific beaked whale, an alternative offered by those who oppose naming organisms after people (giving them a so-called patronymic). But this species may range beyond the Indian and Pacific Oceans, so in our paper we suggested "tropical bottlenose," which describes both the whale and its habitat.

In a world of declining biodiversity, we have discovered a missing whale still swimming in our oceans. *I. pacificus* may have been the largest animal left on the planet that had not been identified alive in the wild. But within a generation, we humans have almost certainly condemned one—and perhaps more—species of whales and dolphins to extinction, and things aren't necessarily improving. An increasing number of nations are once again beginning to view cetaceans as a cash crop—timber to be clear-cut. For those of us with a passion for mammals that swim in the sea, confirming *I. pacificus* as a living species helps offset these losses somewhat, even if it is a rare, elusive species that few will ever get to see.

Robert L. Pitman, a marine ecologist with the National Oceanic and Atmospheric Administration, says he "just may have the best job in the world."