

tivistic electrons in the magnetosphere, much like a radio pulsar. How relativistic nonthermal electrons are accelerated by a process making thermal X-rays remains unexplained. Still, the X-ray spectral signatures suggest that neutron stars are the sources of  $\gamma$ -ray bursts, and the results of Murakami *et al.* show that a vanguard of apparently thermal X-rays, which is clearly connected to the main portion of the burst,

## ZOOLOGY

## A whale of a new species

Katherine Ralls and Robert L. Brownell, Jr

ALTHOUGH four new species of whale have been identified since 1937, the absence of new ones for the past 28 years might be taken to mean that they had finally all been discovered. Not so — a new species of beaked whale, *Mesoplodon peruvianus*, is described by J. C. Reyes and colleagues in the latest issue of *Marine Mammal Science*<sup>1</sup>.

The beaked whales, family Ziphiidae, comprise almost 30 per cent of the toothed whales but are poorly known. In contrast, the great baleen whales are well described, in part because they were commercially hunted, and no new species have been discovered since 1878, when the last of the ten now recognized, Bryde's whale, was named<sup>2</sup>. Six of the seven beaked whales described in this century are in the genus *Mesoplodon* (see table), and most of what little is known about the genus, and the family as a whole, has been gleaned from carcasses washed ashore. One species (*M. pacificus*) is still known only from its bones and the

must be accommodated by a  $\gamma$ -ray burst model. Whether these objects are more closely related to radio pulsars or accreting neutron stars, or whether they turn out to be extragalactic flashers of a different order, has yet to be answered. □

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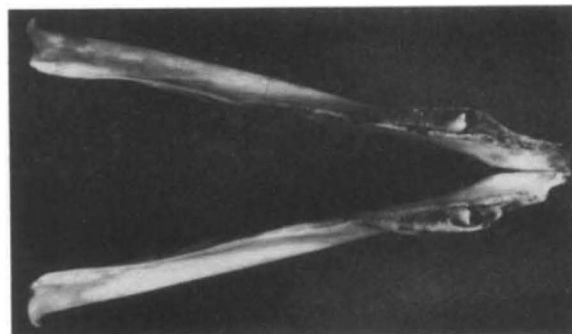
appearance of the whole animal remains a matter of conjecture.

Members of four of the five beaked whale genera have reduced numbers of teeth. The name *Mesoplodon* (loosely interpreted as "armed with a tooth in the middle of the jaw") refers to the two remaining functional teeth of adult males, which are on the lower jaw and are one of their most striking features. The bizarre teeth of the male strap-toothed whale (*M. layardii*) even grow up and over the upper jaw, sometimes actually touching and thus preventing their owner from opening his mouth more than about five cm (ref. 3). The amount of the tooth exposed in the living animal varies from species to species: in some nearly all the tooth is exposed, whereas in others most of it is covered by gum tissue and only the tip protrudes. Females also have the same two teeth in the lower jaw, but they are not functional as they rarely emerge from the gums. The meagre data available imply that these animals prey predominantly on squid and fish found at moderate to considerable depths<sup>3</sup>, a soft diet that can be captured and consumed without the aid of teeth.

In *Mesoplodon*, linear scars up to about 2 m in length are often found on adult males, and are usually assumed to be the result of intraspecific combat. These scars often occur as pairs of parallel lines, implying that they were formed by the two teeth of a rival male<sup>3,4</sup>; males apparently keep the mouth closed while wounding other males. Members of the genus tend to occur as antitropical pairs of closely related species, a species of each pair occurring in the temperate waters of each of the two hemispheres, although one (*M. densirostris*) is found in tropical waters world-wide and two others (*M. ginkgodens* and *M. pacificus*) are confined to the warm waters of the Pacific and Indian Oceans.

The latest example of *Mesoplodon* was described from ten specimens collected from the central and southern Peruvian coast. Six,

and perhaps seven, of them were captured incidentally in drift gill-nets set for sharks, and three were washed ashore. Some new specimens from the Mexican coast may also belong to this species and its latitudinal range may extend beyond the places where both the known and the suspected specimens were collected. The teeth of the adult males are relatively small compared to those of its congeners. The long axis of each tooth is almost perpendicular to the long axis of the mandible (see figure), a feature which distinguishes this species from all others in the genus. *Mesoplodon peruvianus* is the smallest known member of the genus, and, indeed, of all the beaked whales, both in terms of total length at birth (159 cm) and the maximum known total adult body length of 372 cm. (The smallest previously known species of *Mesoplodon* is *M. hectori*, for which the smallest calf measured 190 cm in length and the maximum known adult total length is 443 cm.)



Dorsal view of the lower jaw of the holotype of *Mesoplodon peruvianus*<sup>1</sup>. That only two teeth remain functional is characteristic of males of the genus; that their long axis is almost perpendicular to the jaw is characteristic of the species. Length of the jaw is about 53 cm.

There have been several sightings of a distinctive but unidentifiable species of beaked whale in the eastern tropical Pacific, meaning that there still may be at least one more undescribed species of *Mesoplodon*<sup>5</sup>. Given that Earth's dwindling large-mammal fauna is comparatively well catalogued, *Mesoplodon* is likely to remain the least known genus of large mammal — as Minasian and colleagues have pointed out in *The World's Whales*<sup>6</sup>, "The mysteries these strange whales present will not be easily solved by the handful of specimens chance provides in one lifetime". □

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Species of cetacean described since 1900 (refs 1,2)\*

Andrews' beaked whale, <i>Mesoplodon bowdonini</i> Andrews, 1908
Spectacled porpoise, <i>Australophocaena dioptrica</i> (Lahille, 1912)
True's beaked whale, <i>M. mirus</i> True, 1913
Baiji (Chinese river dolphin), <i>Lipotes vexillifer</i> Miller, 1918
Longman's beaked whale, <i>M. pacificus</i> Longman, 1926
Tasman beaked whale, <i>Tasmacetus shepherdi</i> Oliver, 1937
Fraser's dolphin, <i>Lagenodelphis hosei</i> Fraser, 1956
Vaquita (Gulf of California harbour porpoise), <i>Phocoena sinus</i> Norris and McFarland, 1958
Ginkgo-toothed beaked whale, <i>M. ginkgodens</i> Nishiwaki and Kamiya, 1958
Hubbs' beaked whale, <i>M. carlhubbsi</i> Moore, 1963
<i>M. peruvianus</i> <sup>1</sup> , Reyes <i>et al.</i> , 1991

\*All 11 species are toothed whales, seven are beaked whales (family Ziphiidae), and six of these seven are in the genus *Mesoplodon*. The genus *Tasmacetus* also belongs to the beaked whales.

<sup>1</sup>As Reyes *et al.* provide no common name for the newly described species, we propose the name pygmy beaked whale.

1. Reyes, J. C., Mead, J. G. & Van Waerebeek, K. V. *Marine Mammal Sci.* **7**, 1 (1991).
2. Honacki, J. H. *et al.* *Mammal Species of the World — A Taxonomic and Geographic Reference* (Allen Press, Lawrence, Kansas, 1982).
3. Mead, J. G. *Handbook of Marine Mammals* Vol. 4, 349 (Academic, New York, 1989).
4. Heyning, J. E. *Canad. J. Zool.* **62**, 1645 (1984).
5. Pitman, R. L. *et al.* *Marine Mammal Sci.* **3**, 345 (1987).
6. Minasian, S. M. *et al.* *The World's Whales* (Smithsonian Books, Washington, DC, 1984).