

Penguins from the past



The east of New Zealand's South Island is one of the richest hunting grounds for fossil penguins in the world. Neville Peat reports on exciting research being carried out at Otago University.

Above: The proto-penguin of 55 to 62 million years ago based on a partial skeleton found near Waipara. This wing-propelled diver, unlike true penguins, had a long delicate bill and flexible elbows. In size it was somewhere between today's yellow-eyed and king penguins.

EWAN FORDYCE is used to stumbling upon old penguins. Last year the University of Otago palaeobiologist found a cluster of about 20 fossil bones at Kakanui, 15 kilometres south of Oamaru, close to the site of the world's very first fossil penguin discovery in the 1850s.

Fragmented ribs and limbs, the bones were lying in a limestone outcrop dated to the early Oligocene – about 34 million years ago.

It is likely that the fossil from the original 1850s discovery came from the same geological horizon. That bone – a fusion of ankle and metatarsal bones peculiar to penguins – was sent to Thomas Huxley in England for identification. The sensational thing about that bone was its size. The bird, described and named by Huxley, *Palaeudyptes antarcticus*, was thought to have stood at 1.45 metres.

From this and subsequent finds, the word has spread that ancient penguins were giants, capable of dwarfing the tallest existing penguin, the one-metre emperor. Estimates of height ranged to over two metres.

Dr Fordyce says, however, that many of the early penguins were of modest size, and he has the bones to prove it. One unnamed penguin from the late Oligocene (about 24 million years ago)

was no bigger than the little blue penguin of today. The smallest of the family, the little blue, averages a little over one kilogram and stands at about 0.3 metres.

But Fordyce has also found some large penguins, including one that was appreciably taller and heavier than the emperor. The bones came from a greensand deposit near the Waihao River in South Canterbury. This penguin lived about 28 million years ago.

Discovered in 1977 and still unnamed, it is remarkably complete. As no full fossil penguin skeletons have been found anywhere, the Waihao fossil is an exciting find. Since then a second well-preserved specimen, thought to be of the same

species, has been found at the same site.

The Waihao bird, measuring about 1.3 metres from tip to toe, was probably a fish-eater. This is indicated by its strikingly long and narrow bill. In contrast, many of today's penguins, the crested genus (*Eudyptes*) in particular, have bills of short stout design. Also their flippers are less flexible than those of the earliest penguins.

At least two other, somewhat smaller, species, represented by limb bones, have been found in deposits of similar age to the Waihao bird.

A graduate of Canterbury University, Ewan Fordyce has worked on fossils since the mid-1970s. His doctoral thesis examined pre-historic whales and dolphins. During an 18-month post-doctoral fellowship with the Smithsonian Institute in Washington DC, he extended his work in this field by comparing the fossils of North American and New Zealand cetaceans in relation to the formation of the southern oceans.

Now a senior lecturer with Otago University's Geology Department, he goes on field trips to the limestone and greensand areas of the Waitaki Valley and Canterbury whenever he can, with financial support for the field and technical work coming from the National Geographic Society in Washington, and the New Zealand Lotteries Commission.