

Earth Sciences

Concerning the historical holotype of the Cretaceous bivalve *Lahillia larseni*

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Abstract

The first fossil fauna to be described from the Antarctic was collected at Seymour Island in December 1892 by Captain Carl Anton Larsen and the crew of the Norwegian whaling ship *Jason*. Some specimens collected by Larsen's crew were acquired by Charles Donald, the surgeon with an 1892–1893 Scottish whaling expedition from Dundee that was also operating in the vicinity of Seymour Island. Donald returned the fossils to Scotland, and they were described in two papers published by The Royal Society of Edinburgh (1894 and 1899) as, *inter alia*, two new species of Palaeogene bivalves and one of Cretaceous to Palaeocene age. Sadly, the described Palaeogene specimens are now lost, but one Cretaceous/Palaeocene survivor, the holotype of *Lahillia larseni*, has been located in the palaeontology collection of the British Geological Survey with the reference number FOR 4053. On Seymour Island, *Lahillia larseni* is a common species in both Upper Cretaceous and Palaeocene strata and is of particular importance as its abundance seems to have been unaffected by the end-Cretaceous extinction.

Keywords: Antarctica; Carl Anton Larsen; Charles Donald; K–Pg boundary; Seymour Island

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Historical background

The first fossil fauna to be recovered from the Antarctic was collected at Seymour Island on 3 December 1892 by Captain Carl Anton Larsen and the crew of the Norwegian whaling ship *Jason*. Seymour Island (64° 17' S, 56° 45' W) lies within an archipelago at the north-east end of the Antarctic Peninsula, and the circumstances of Larsen's discovery have been reviewed by Zinsmeister (1988). It is remarkable that Larsen should have stumbled upon a richly fossiliferous site that is now considered of global importance for geology, spanning as it does the Cretaceous–Palaeogene (K–Pg) boundary.

Also in the area at the time of Larsen's landing were whaling/sealing ships from Dundee, Scotland, and two carried surgeon-naturalists: Charles Donald aboard *Active* and William Speirs Bruce aboard *Balaena*. The ships met, the crews fraternized and, according to Aagaard (1930, p. 84, as translated in Zinsmeister 1988, p. 4), both Donald and Bruce were able to trade tobacco for some of the fossils collected by members of Larsen's crew. However, their own accounts (Bruce & Donald 1893, 1896) make clear that only Donald acquired specimens, whereas Bruce was simply shown fossils by Larsen, which he recognized as Tertiary bivalves; Donald described them as 'mostly Jurassic forms'.

Once back in Scotland, Donald passed his fossil collection (approximately nine specimens) to Professor James Geikie at the University of Edinburgh, who in turn passed them to the

Geological Survey palaeontologists George Sharman and Edwin Newton. In their description of the fossils (Sharman & Newton 1894), they defined two new bivalve species (*Cucullaea donaldi* and *Cytherea antarctica*), tentatively identified a gastropod as *Natica* sp., noted the probable presence of two additional bivalve species and confirmed associated petrified wood as of coniferous type. A 'Lower Tertiary' (Palaeogene) age was assigned, now refined to Eocene (Zinsmeister 1984).

Subsequently, another fossil specimen from Larsen's 1892 collection reached Sharman and Newton via 'Dr Murray' - probably John Murray, the eminent Scottish-Canadian oceanographer who was based in Edinburgh at the time and who, after his involvement with the 1872–1876 *Challenger* expedition, was an influential advocate for Antarctic exploration (Murray 1894). We speculate that this specimen was provided by Larsen as a duplicate from his own collection to represent a species not previously described, but precisely how Murray became involved is unknown. Sharman & Newton (1899) defined this bivalve as another new species, *Cyprina larseni*, and presumed it to be of the same age as the 'Lower Tertiary' fossils described previously. It is now known, as *Lahillia larseni*, to range from the Upper Cretaceous to the Palaeocene (Zinsmeister & Macellari 1988).

Following publication, the described Seymour Island fossil collection (Larsen appears not to have arranged formal descriptions of his own specimens) drifted into obscurity. When he came to revise the Seymour Island Palaeogene fauna, Zinsmeister (1984) regarded the Sharman & Newton (1894) holotypes as lost and instead defined neotypes. We have searched unsuccessfully for Donald's fossils in British institutional and museum collections and must concur with Zinsmeister's conclusion. Larsen subsequently

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Figure 1. The holotype of *Lahillia larseni* (Sharman & Newton 1899; BGS specimen FOR 4053). British Geological Survey © UKRI 2025 (image P1074719). All rights reserved.

visited Seymour Island and the vicinity on at least two other occasions, and more fossils from his various expeditions are held by the Naturhistoriska Riksmuseet, Stockholm. One specimen from his original 1892 collection is held by the Fram Museum, Oslo.

Taxonomic review

The history of the Sharman & Newton (1899) holotype of *C. larseni* sp. nov. is more positive. Zinsmeister & Macellari 1988 (pp. 276–279) confirmed it as the holotype of the revised species *L. larseni* (Sharman & Newton 1899), although they gave an erroneous date of 1897 (the paper was not read at a Royal Society of Edinburgh meeting until 7 February 1898). They did not illustrate the holotype but instead figured a ‘hypotype’ and several other specimens, all of which are housed in the United States National Museum. The holotype was listed as held by the Institute of Geological Sciences (IGS), London, with the reference number IGS 4053. However, in 1984, IGS had been renamed the British Geological Survey (BGS) and relocated, together with its collections, to Keyworth, near Nottingham. Now within the BGS collection, the *L. larseni* holotype has the reference number FOR 4053 (Fig. 1). It is recorded as having been presented by ‘J. Murray’. The prefix FOR identifies a specimen in the BGS’s ‘foreign collection’.

As *L. larseni* is now regarded as of Upper Cretaceous to Palaeocene age, in contrast to the Eocene assemblage described in Sharman & Newton’s 1894 paper, the holotype was most probably collected at a different locality on Seymour Island. Details are uncertain, but a note added to the BGS register entry for FOR 4053 citing Zinsmeister (1988) suggests a locality ‘just S of Cross Valley’. Irrespective, *L. larseni* is a common species in both Upper Cretaceous and Palaeocene strata and is of particular importance as its abundance seems to have been unaffected by the

end-Cretaceous extinction. It is also a key taxon for elucidating the evolutionary history of the austral subfamily Lahilliinae, an early member of the globally important family Cardiidae (i.e. the cockles; ter Poorten 2024, p. 13). Hence, the holotype has palaeontological importance beyond its historical interest for Antarctic exploration.

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Competing interests. The authors declare none.

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