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Cases of scoliosis in which no gross morphologic deformities or primary neuromuscular or connective tissue disorders can be identified are termed idiopathic. Females are affected seven times more frequently than males, and one of the most common idiopathic patterns is a right thoracic curve from T4, 5 or 6 to T11, 12 or L1 (Keim, 1978, op. cit.) such as seen in the present case. Studies on idiopathic infantile scoliosis have demonstrated it to be highly familial, with its prevalence increasing with increased maternal age (DeGeorge, 1967, J. Med. Genet. 4: 251–257). At least two researchers have postulated the condition to be inherited, possibly by a sex-linked dominant mode with variable expressivity and incomplete penetrance (Wynne-Davies, 1968, J. Bone Jt. Surg. 50-B: 24–30; Cowell, 1972, Clin. Orthop. 86: 121–131).

The cause of the scoliosis in the sea otter of this report can only be speculative. While no gross vertebral, spinal or rib anomalies were noted, the absence of the animal's head precluded identification of any skull, palate or brain deformities which, if present, might have suggested a congenital or neurologic etiology. Although histopathology failed to reveal any structural abnormalities in nerves, muscle or connective tissue, primary disease in one or more of these areas cannot be ruled out. Unfortunately circumstances prevented histochemistry, muscle enzyme analysis, electromyography and cerebrospinal fluid analysis, tests which might have provided clues to the origin of the scoliosis.

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Spondylitis Deformans in a Bryde's Whale (*Balaenoptera edeni* Anderson) Stranded on the Southern Coast of Queensland

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The pathological vertebral condition known as spondylitis deformans in cetaceans has been discussed by a number of authors (Slijper, 1936, *In* Capita Zoologica, Martinus Nijhoff, The Hague, The Netherlands, 590 pp.; van Bree and Duguy, 1970, Der Zoologische Garten 39: 11–15). Slijper (1936, op. cit.) listed its occurrence in 39 cetaceans, one of which was a Bryde's whale. This paper reports a further example of spondylitis deformans, associated with spinal canal stenosis, in that species.

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On 30 October 1982 a Bryde's whale stranded and died on a sand-bank near the southern end of Stewart Island (25°38′S, 152°57′E) in the Great Sandy Strait. It measured 14.35 m in length, but its sex was not determined. The carcass, when affected by autolysis, drifted for some days before washing ashore on the western side of Fraser Island, approximately 5 km from the stranding site. The skeleton was collected by a team from the Queensland Museum on 15 February 1983 and was subsequently registered (QM JM 4386).

The spinal column between lumbar

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FIGURE 1. Photograph (right lateral view) of the ankylosed and hyperostotic L7–11 vertebrae of a Bryde's whale. L7 is to the right of the photograph.

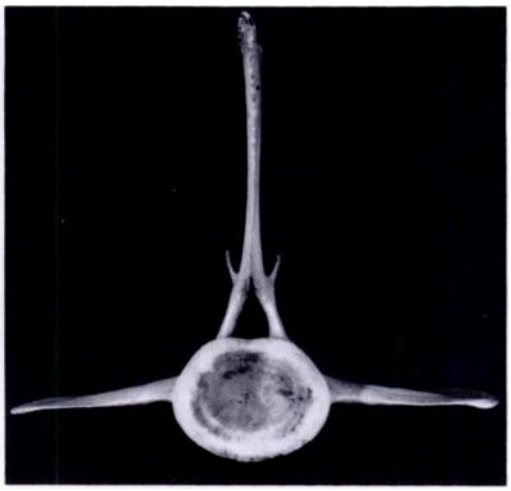


FIGURE 3. Photograph (caudo-cephalic view) of the L6 vertebra of a Bryde's whale, which is normal in appearance. Concentric hyperostosis extended forward from the body of L7 to surround the L6–7 disc space but was not attached to the corresponding aspect of L6.

vertebrae 7–12 and caudal vertebrae 2–3 showed extensive ankylosis and hyperostosis with maximal involvement at L7–11 (Fig. 1). The transition in the pathological process between L7 and the more cephalad lumbar vertebrae was abrupt whereas the severity of the process diminished progressively in a caudal direction. When the L7–9 region was viewed from the dorsal aspect bilateral "foramina" were noted (Fig. 2). These were continuous with grooves on the hyperostotic ventral aspects of the vertebrae and were considered to have contained arteries which became encased by progressive paravertebral hyperostosis. The spinal canal in the same

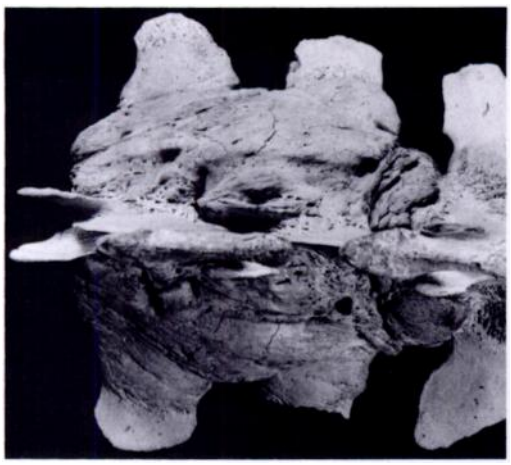


FIGURE 2. Photograph (dorso-ventral view) of the L7–9 vertebrae demonstrating arterial "foramina" at the L7 and 8 levels of a Bryde's whale. The left transverse process of L8 was damaged during transport.

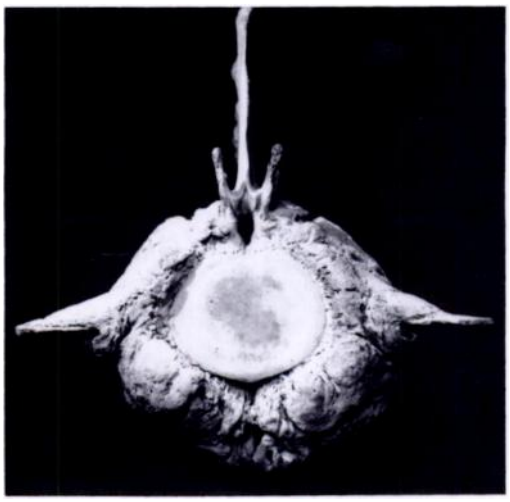


FIGURE 4. Photograph (cephalo-caudal view) of the L7 vertebra demonstrating the extent of the concentric hyperostosis and the narrowing of the spinal canal in a Bryde's whale.

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region was markedly stenosed and this was demonstrated by comparative *en face* projections of L7 and L6, its normal cephalad neighbor (Figs. 3, 4). The interpedicular diameters of the spinal canal at L7 and L6 were 3.1 and 7.2 cm respectively.

The ear plugs of the whale were not recovered but the recorded length (14.35 m) indicated that it was mature. The maximum lengths of male and female Bryde's whales are reported to be 14.3 and 14.6 m respectively (Watson, 1981, Sea Guide to Whales of the World, Hutchinson, London, Great Britain, 302 pp.), although the maximum lengths of male and female Bryde's whales captured at the Great Barrier Island whaling station in New Zealand between 1956 and 1961 were 14.6 and 14.9 m respectively (Gaskin, 1968, Fish. Res. Bull. 1: 1–89).

Spondylitis deformans is known to occur in terrestrial mammals as well as in cetaceans and has been reported also in reptilian and sirenian fossils (Slijper, 1936, op. cit.). In man the condition, diagnosable radiologically and sometimes termed Forestier's disease, may be asymptomatic (Paul and Juhl, 1965, The Essentials of Roentgen Interpretation, Harper & Row, New York, USA, 902 pp.). However, if spinal canal stenosis develops severe neurological disability may result. There is agreement that the condition in all affected animals is associated with the aging process and is probably related to the mechanics of repetitive ligamentous traction (Lagier, 1977, Scand. J. Rheumatol. 6: 245–249). The powerful tail muscles of cetaceans are attached to the lumbo-caudal region of the vertebral column, the involved region in the present case. In the previously reported series of 39 cetaceans affected by spondylitis deformans only one exhibited disease confined to the relatively immobile cervical and upper thoracic portion of the vertebral column (Slijper, 1936, op. cit.). Despite the severity of spinal ankylosis in the present case and other reported cases, the significance of the condition in relation to isolated cetacean stranding is uncertain. If spinal canal stenosis were to have resulted in paresis of the tail muscles then it may have contributed to this whale's debilitation. However, there is no means of testing that supposition and it may be preferable, in the present state of knowledge, to regard spondylitis deformans as merely a manifestation of aging.

The staff of the Queensland Museum have been most helpful. Dr. A. Bartholomai, the Director of the Museum, kindly permitted publication of the paper. Mr. B. Cowell prepared the photographs and Mr. S. Van Dyck organized the collection and preparation of the specimen. Dr. P. B. Best of Cape Town encouraged preparation of the paper. Mr. M. Cox initially identified and measured the whale.

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