BODYPLAN OF A MALE SPERM WHALE *(PHYSETER MACROCEPHALUS)* STRANDED NEAR BRESKENS, NETHERLANDS

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Introduction

On January 3, 1970, a male sperm whale with a length of 16.65 m was stranded on the Spijkerplaat off Breskens in the mouth of the Westerschelde, Netherlands (HUSSON and VAN BREE, 1972). The Rijksmuseum van Natuurlijke Historie, Leiden, purchased the animal from the fisherman, who found the dying animal, and towed the dead animal to a beach at the foot of the seadyke near Breskens.
The director of the Museum, Prof. Brongersma, phoned the second author and arrangements were made to preserve the skeleton after taking measurements and photographs. On January 5 a crew was on the spot and under the direction of Prof. Brongersma measurements and photographs were taken and the cutting-in initiated. Under adverse weather conditions tissue material, the skeleton, fluke and flippers were eventually preserved. The three extremities were measured in detail in the museum by the second author by the same method as used for measuring a dolphin (PURVES, DUDOK VAN HEEL and JONK, 1975).

Discussion

The measurements of the animal are shown inTable I. From these the bodyplan was drawn, aided by a large number of photographs of the actual animal. Slides, which the second author took at the whaling station at Steinsham, Norway, and on board the catching boats of this station, offered additional information. Besides, the first author could benefit from his studies of the dolphin bodyplan, which he prepared for reproduction in print (PURVES c.s., 1975).
CLARKE and PALIZA (1972) measured a large number of sperm whales, which were caught in the Southeast Pacific. For comparison their data, as far as relevant, have been included in Table I. This Table shows that the average length of male sperm whales when reaching physical maturity is 16.30 m. Furthermore the same authors conclude that so far there are no significant differences between animals in the southern hemisphere (Durban, Antarctic) and the Azores and the Bonin Islands. The Breskens sperm whale is only slightly larger than Clarke's and Paliza's average male animal at physical maturity and the proportional measurements are very close to those of the Breskens animal.
In the bodyplan the fluke has been drawn as being symmetrical. The second author has seen beautiful symmetrical flukes in sperm whales of 17 - 17.5 m long, but also malformed flukes like the one of the Breskens animal (Fig. 4). The same can be noticed in dolphins and none of them seem to be the worst for it. The malformation in the fluke of the Breskens animal was not caused by the stranding as the edges were still covered by skin.
Most people remember a sperm whale as a plump and heavy animal, in particular because of its square head as seen from the side. The bodyplan, however, shows the head - with the beautiful recess for the lower jaw and the fine keel leading towards it- in harmony with a fine streamlined slender body. As a whole, the body shape has a cylindrical front, a centre of buoyancy forward of half the total length and a fine streamlined afterbody, giving an optimal flow of water to the well shaped tail, to create a maximum propulsive effort. Is it coincidence that we also find these three main particulars in modern ship design of very large tankers?

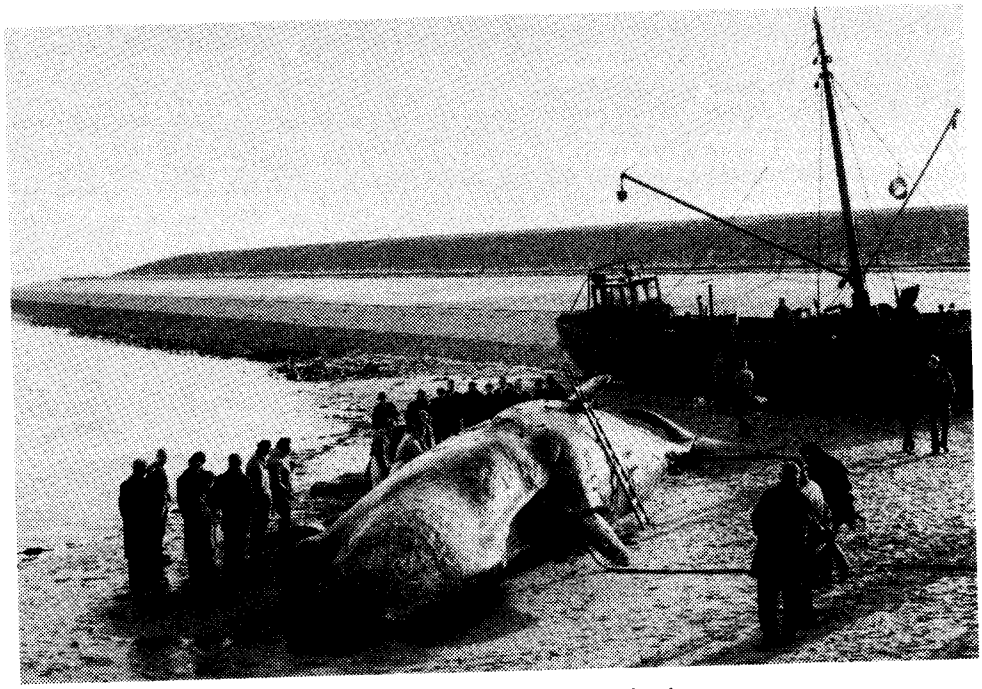

Fig. 1. Male sperm whale beached near Breskens, Netherlands.

Fig. 2. A sperm whale is slender. Knowing the total length, photographs like this were extremely useful to obtain additional precise measurements.

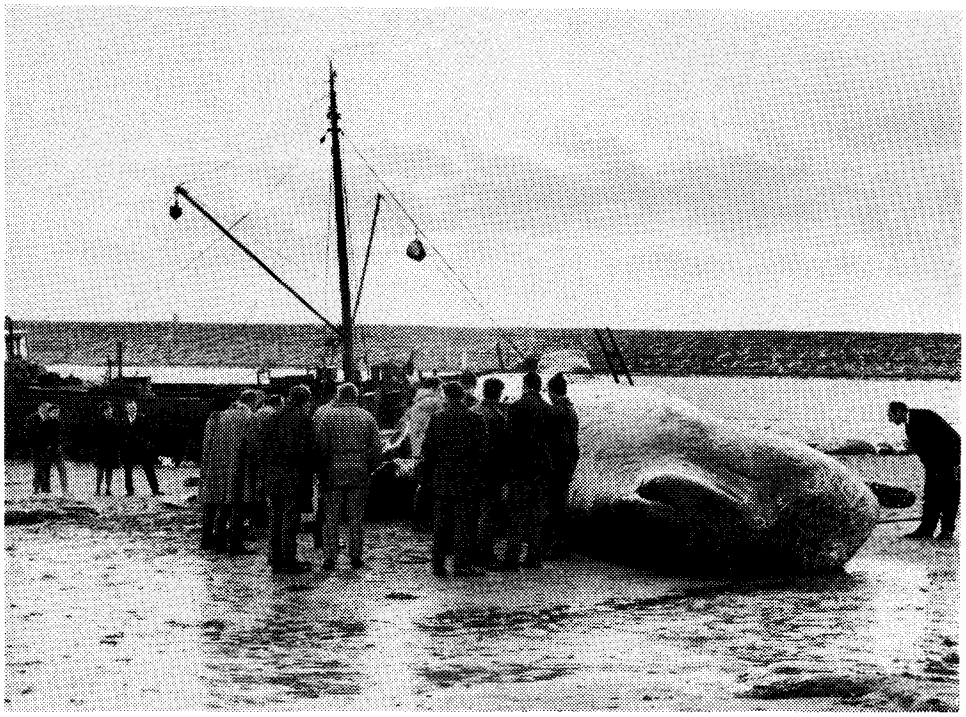

Fig. 3. The blow hole.

Summary

The bodyplan, measurements, proportions and photographs of a male sperm whale of 16.65 m long, which stranded alive on a sandbank in the mouth of the Westerschelde, Netherlands, on January 3, 1970, are reproduced. The measurements compare very closely to those of the "average" animal when reaching physical maturity, as derived from measuring a large group of animals taken in the Southeast Pacific.

Acknowledgement

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Fig. 4. The fluke.

References

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PURVES, P.E., W.H. DUDOK VAN HEEL and A. JONK, 1975. Locomotion in dolphins. I: Hydrodynamic experiments on a model of the bottlenosed dolphin, *Tursiops truncatus* (Mont.). Aquatic Mammals 3 (1): 5-31.

N.B. Reproductions of the original large scale drawings of the bodyplan of the sperm whale and the dolphin (PURVES c.s., 1975) are available from the managing editor at costprice.

Table I.

Sperm whale, measurements in cm.
A: Breskens animal. B: Average male at physical maturity; after CLARKE and PALIZA, 1972.

	A	B
Total length	1665	1630
Projection of snout beyond tip of lower jaw	116	114
Tip of snout to centre of blowhole	68	74
Tip of snout to angle of gape	414	412
Tip of snout to centre of eye	470	476
Tip of snout to tip of flipper	740	738
Height of head at position of eye	306	261
Notch of flukes to posterior emargination of dorsal fin	530	526
Notch of flukes to centre of anus	480	455
Notch of flukes to umbilicus	733	739
Axilla to tip of flipper	110	93
Greatest width of flipper	75	75
Width of flukes at insertion	140	128
Span of flukes, tip to tip	390	405
Vertical height of dorsal fin	38	35
Length of base of dorsal fin	130	140
Length of blowhole	60	
Length of anus	43	
Length of basis of the penis	ca. 40	
Length of penis	ca. 150	
Length of umbilicus	ca. 30	
Length of eye slit	18	

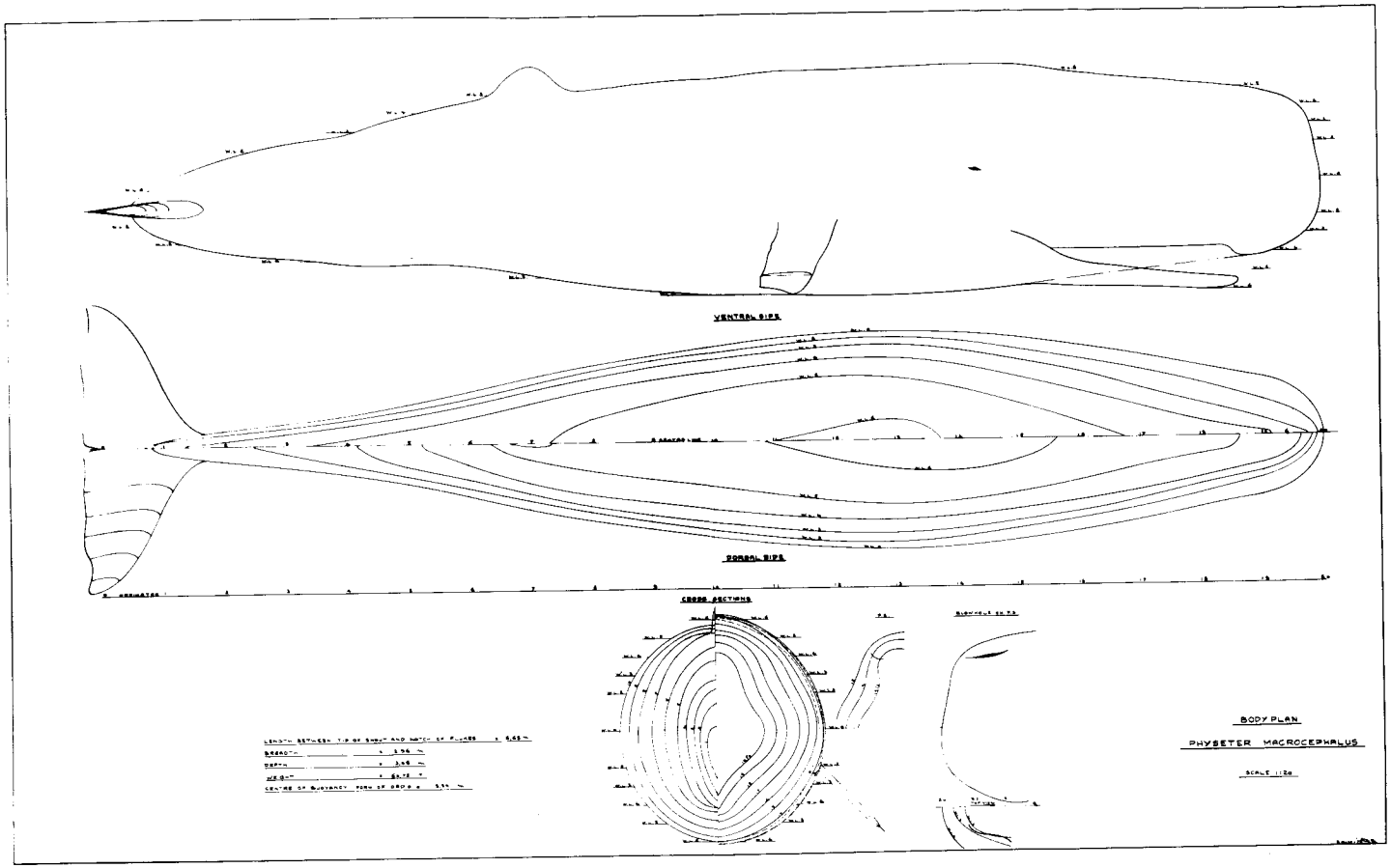

Fig. 5 Bodyplan of a male spermwhale.