

**ON A LUXATION OF THE SKULL-ATLAS JOINT AND
CONSECUTIVE ANKYLOSIS IN A GREY SEAL,
HALICHOERUS GRYPUS (FABRICIUS, 1791), WITH NOTES
ON OTHER GREY SEALS FROM THE NETHERLANDS**

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With two plates

On January 3, 1969, about 1 km south of Zandvoort, Netherlands, a very young female Grey Seal was found on the beach. The animal was exhausted and in a bad condition and could therefore be caught. It was taken to the Amsterdam Zoo where, in spite of good care, it died on February 17 of the same year. While living in the Zoo it was noted that the seal from time to time had convulsions, that it was partially lame, and that its head was positioned in a rather unusual manner. After its death, the Grey Seal was brought to the Zoological Museum of the Amsterdam University for dissection.

During the dissection and more clearly afterwards when the whole skeleton was cleaned, a luxation of the skull-atlas joint and a consecutive ankylosis was observed (see plate 2). Although it cannot be proved, we have the impression, in view of the state of development of the ankylosis, that the luxation dated from the time of birth or shortly afterwards. No wonder that the seal was partly paralysed and that it had convulsions.

If it is accepted that this young seal has had the luxation from the time of its birth, it must have travelled a distance of over 500 km in spite of its condition, before it was found on the beach near Zandvoort. This is assuming that the Grey Seal came from the Farne Islands near the England-Scotland border (see further on in this article). If the mean date of birth in the Farne Islands colony of *Halichoerus grypus* is about the 2nd of November and the moulting and lactation period lasts about 21 days, then the young animal had a little less than 6 weeks to move from the Farne Islands to the Netherlands' coast. A remarkable performance in view of its condition!

Until the second World War, Grey Seals were unknown from coastal waters and beaches of the Netherlands and the species was hardly mentioned in faunistic publications. Only once, between 1915 and 1918, a specimen was

observed by the late Dr. K. Kuiper (formerly director of the Rotterdam Zoo). After the war, in 1955, a fullgrown Grey Seal was seen in the neighbourhood of the Isle of Texel by Mr. G. J. de Haan of the Texel Natural History Museum (Kristensen, 1957). From that year on, Grey Seals were observed in increasing numbers on the Dutch beaches, alive or dead. On January 9, 1958, a young *Halichoerus grypus*, marked on November 24, 1957 at the Farne Islands, was found on the north coast. Other marked animals were recovered in later years and it turned out they all came from the Farne Islands (see Hickling, 1962).

As a complete survey of the records of Grey Seals in the Netherlands will be published shortly by Dr. J. L. van Haaften, it is superfluous to mention here the localities and numbers of specimens that were seen or caught. It may be worth-while to mention that several of these seals entered rivers and were caught or seen far away from the sea in fresh water (e.g. ZMA 5845, which was caught at Capelle-aan-de-IJssel, north-east of Rotterdam; see pl. 1).

That we (again) have Grey Seals in the Netherlands, Germany, Belgium and France we owe to the Grey Seals Protection Act passed in Great Britain in 1932. As a result of this protective measure the number of *Halichoerus grypus* has considerably increased and the animals thus could enlarge their distribution area. However, it is tragic that the beneficial influence of the act, for Grey Seals living in the North Sea, is partly neutralized at the present time by over-fishing and pollution of their habitat.

Through Mr. G. J. de Haan of the Texel Museum, who devotes a large part of his time to saving young seals, the Amsterdam Zoological Museum received, directly and indirectly, a number of dead Grey Seals. The museum furthermore obtained some specimens found drowned in nets and in fishing-traps. The material now present consists of:

- ZMA 668. Old collection — without any data (probably a female).
- ZMA 2744. Male specimen found drowned in nets at 55°N, 3°30'E on 9.ii.1960. Total length, 225 cm; weight, 210 kg.
- ZMA 4013. Male found on beach near Bergen-aan-Zee in the course of January, 1961. Died in Amsterdam Zoo on 24.ii.1961. Total length, 89.6 cm.
- ZMA 5845. Male specimen, caught on 10.viii.1963 near Capelle-aan-de-IJssel; died in Amsterdam Zoo on 2.ix.1963. Total length, 118.0 cm. See plate 1.
- ZMA 5851. Female specimen. From the North Sea; died in Amsterdam Zoo on 30.xii.1931.
- ZMA 6049. Male specimen found on 28.xii.1962 on beach near Den Helder (marked with number A 086 at the Isle of Staple, Farne Islands on 27.xi.1962; age then about 18 days); died at Natural History Museum, Texel on 20.x.1963. Total length, 131.0 cm.
- ZMA 10.905. Male specimen found on S.W. beach of Texel, during period 27-31.xii.1966. Total length, 95.0 cm; weight, 15.8 kg.

- ZMA 10.906. Male specimen found on S.W. beach of Texel, during period 27-31.xii.1966. Total length, 75.0 cm; weight, 10.5 kg.
- ZMA 11.655. Male specimen, received by the Amsterdam Zoo on 17.xi.1967 from Natural History Museum, Texel, where it lived in captivity for several years. Died in Amsterdam Zoo (nasal passages blocked by *Halarachne halichoeri* Allman, 1844, identified by Dr. G. L. van Eyndhoven) on 23.xi.1968. Total length, 222 cm.
- ZMA 11.826. Female specimen. Found on beach near Zandvoort on 3.i.1969. Died in Amsterdam Zoo on 17.ii.1969. Total length, 87.2 cm, weight, 16.9 kg. See plate 2.
- ZMA 14.293. Male specimen found drowned in a fish-trap near inner side of the dike closing the former Zuiderzee (Kornwerderzand) on 28.iii.1971. Total length, 132.5 cm; weight, 45.5 kg.
- ZMA 14.514. Male specimen. Born in 1966 on the Farne Islands; died in Natural History Museum, Texel, on 3.viii.1971. Total length, 190 cm; weight, 110 kg.
- ZMA 14.538. Male specimen found drowned in nets at 54°30'N, 00°30'W on 24-25.viii.1971. Total length, 214 cm; weight, 209 kg. Nota bene: this animal had clearly visible auricles, 16 mm long.

The left lower canine was extracted from every skull and the tooth halved longitudinally, polished, etched and stained in the way described by Stirling (1969). The growth laminae (year rings) were then counted under a binocular microscope. The results are represented in table 1, together with some other data pertaining to the animals. It must be noted that even in very young Grey Seals found dead in the early months of the year, the teeth showed a winter lamina which must have been formed soon after birth, probably during the period of weaning. Although the specimens ZMA 5845 and ZMA 14.293 were probably less than a year old, their teeth showed the beginning of a second winter lamina, although both had died at the end of summer. It may be that this phenomenon was related to the unnatural conditions (e.g. fresh water), in which the animals lived. That Grey Seal ZMA 6049 showed the beginning of a winter lamina is more understandable, as this specimen died on the 20th of October.

Several authors (e.g. Scheffer, 1950; Mohr, 1966) have shown that a relation exists between the age of male seals and the development of their baculum (weight and length). In Grey Seals this relation has been demonstrated very clearly by Hewer (1964). He found that the os penis index (weight in grams divided by the length in centimetres) attains a value of approximately 1.0 when sexual maturity is attained (at six years of age) and that a value of approximately 2.4 is reached at the age of ten years. The os penis index in ZMA 2744 is 2.12 (9-10 years), in ZMA 11.655 it is 1.33 (7-8 years), in ZMA 14.514 it is 0.76 (5-6 years) and in ZMA 14.538 it is 1.74 (8-9 years) (see table); all values are in accordance with the findings of Hewer (1964).

TABLE I

Data concerning the remains of Grey Seals present in the collection of the Zoological Museum, Amsterdam. Cbl means condylobasal length; for other particulars, see text.

Collection number	Cbl in mm	L. baculum in mm	W. baculum in g	Tooth age in years
ZMA 668 (? cf. ♀)	242.5	—	—	15-17
ZMA 2744 (♂)	288.5	181.5	38.5	9-10
ZMA 4013 (♀)	166.0	—	—	0-1
ZMA 5845 (♂)	189.0	56.5	0.78	1-2
ZMA 5851 (♀)	165.5	—	—	0-1
ZMA 6049 (♂)	210.9	62.0	0.85	1-2
ZMA 10.905 (♂)	180.0	45.0	0.42	0-1
ZMA 10.906 (♂)	164.6	?	?	0-1
ZMA 11.655 (♂)	281.0	167.1	22.28	7-8
ZMA 11.826 (♀)	169.0	—	—	0-1
ZMA 14.514 (♂)	265.0	142.0	10.87	5-6
ZMA 14.293 (♂)	201.7	57.5	0.66	1-2
ZMA 14.538 (♂)	283.0	175.0	30.45	8-9

In comparison with *Phoca vitulina*, the Common or Harbour Seal, *Halichoerus grypus* is considered a rare species with a discontinuous distribution on both sides of the North Atlantic. In the very detailed and interesting study by Davies (1957) theories were evolved to explain this discontinuity in distribution. However, I believe that the apparent rarity of the Grey Seal and its present distribution are related to human influences during the last 3000 years. This opinion is based on the following arguments.

Remains of Grey Seals are often found in refuse heaps of prehistoric settlements of Western and North-Western Europe (for a detailed survey, see Clark, 1946). This is in contrast with remains of *Phoca vitulina*, which are excavated only rarely. Parts of skulls and other bones of Grey Seal were found in prehistoric and early historic sites, also in the Netherlands, e.g. at Marssum (Van Giffen, 1913), Vlaardingen (Van Bree, 1961), Vogelenzang (Clason, 1967), Voorschoten and Leidschendam (Groenman-Van Waateringe et al., 1968).

Grey Seal pups are born with long, creamy-white fur (lanugo) which is shed after 3 to 4 weeks. During the lactation period and before their moult they normally remain high up on the beach or rocky underground where they are born, during which period the cows regularly crawl up to feed the pups. As a consequence of this behaviour, pups and lactating females of this species are very easy to kill, and will have been so for people of primitive societies without fire-arms. With the augmentation of human populations, Grey Seals breeding at easily accessible localities would have been killed

first and only those colonies which were found on inaccessible places (rocky islands, deep coves, etc.) would be spared (i.e. the pre-war situation). It even seems possible that the timing of the present reproduction period during winter is the result of human predation pressure.

We have seen that as a result of the aforementioned 1932 British Grey Seals Protection Act, *Halichoerus grypus* is now found regularly in coastal waters and on beaches of Germany, the Netherlands, Belgium and France (Lucas, 1960; Van Bree & Chanudet, 1965). In France young animals have been observed up to the French-Spanish border and according to Roux (1957) it is probable that a small breeding colony settled at île d'Ouessant. It could only be a matter of time and of absolute protection before other breeding colonies may be found on the continent besides Norway and the coasts of the Baltic, where they already exist. According to unchecked statements Grey Seals have already been born on a high sand-bank near the German Atlantic coast. New colonies would be possible, provided they were not disturbed by visiting tourists or by too much sea transport or flying in the immediate neighbourhood.

In consideration of the above-mentioned arguments I believe that the Grey Seal originally was a very common animal (more common than the Common Seal) occurring along the whole west coast of Europe from Portugal (south of which was found *Monachus monachus*) to the north of Norway (where could be found *Cystophora cristata*, *Phoca groenlandica*, *Erignathus barbatus* and even *Odobenus rosmarus*). According to Saemundsson (1939) Grey Seals live in coastal waters of Iceland, but from his statement "this big seal is a pretty valuable creature and much coveted by the farmers, . . ." it becomes clear that without human interference the Icelandic population would have been much larger than it is now. Accepting that the original population was much larger I would not be surprised that even in early historic times Grey Seals migrated to and from the American continent by way of South Greenland during summer, and that a migration occurred between Iceland and Western Europe, so that no discontinuous distribution existed at that time.

At the end of these notes, I want to express my sincere thanks to the managements of the Amsterdam Zoo, the State Institute of Fishery Research (R.I.V.O.-IJmuiden) and to Messrs G. J. de Haan, W. L. van Utrecht, E. J. Schenkkan, P. E. Purves and R. W. M. van Soest, for their co-operation in obtaining dead Grey Seals and for their help in this study.

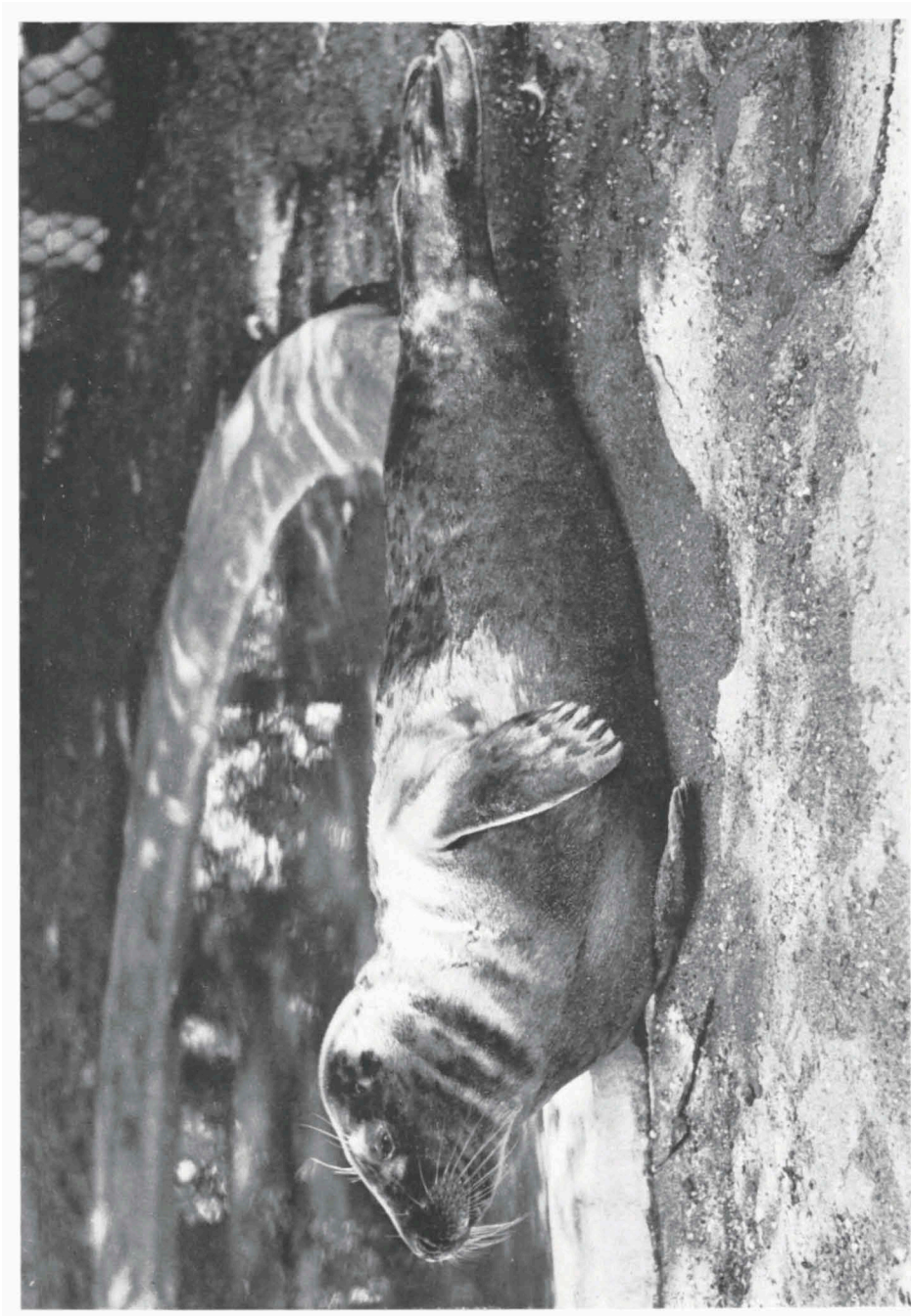
SUMMARY

The author reports on the remains of some Grey Seals from the Netherlands' coast. Special attention is paid to a young specimen with a luxation of the skull-atlas joint,

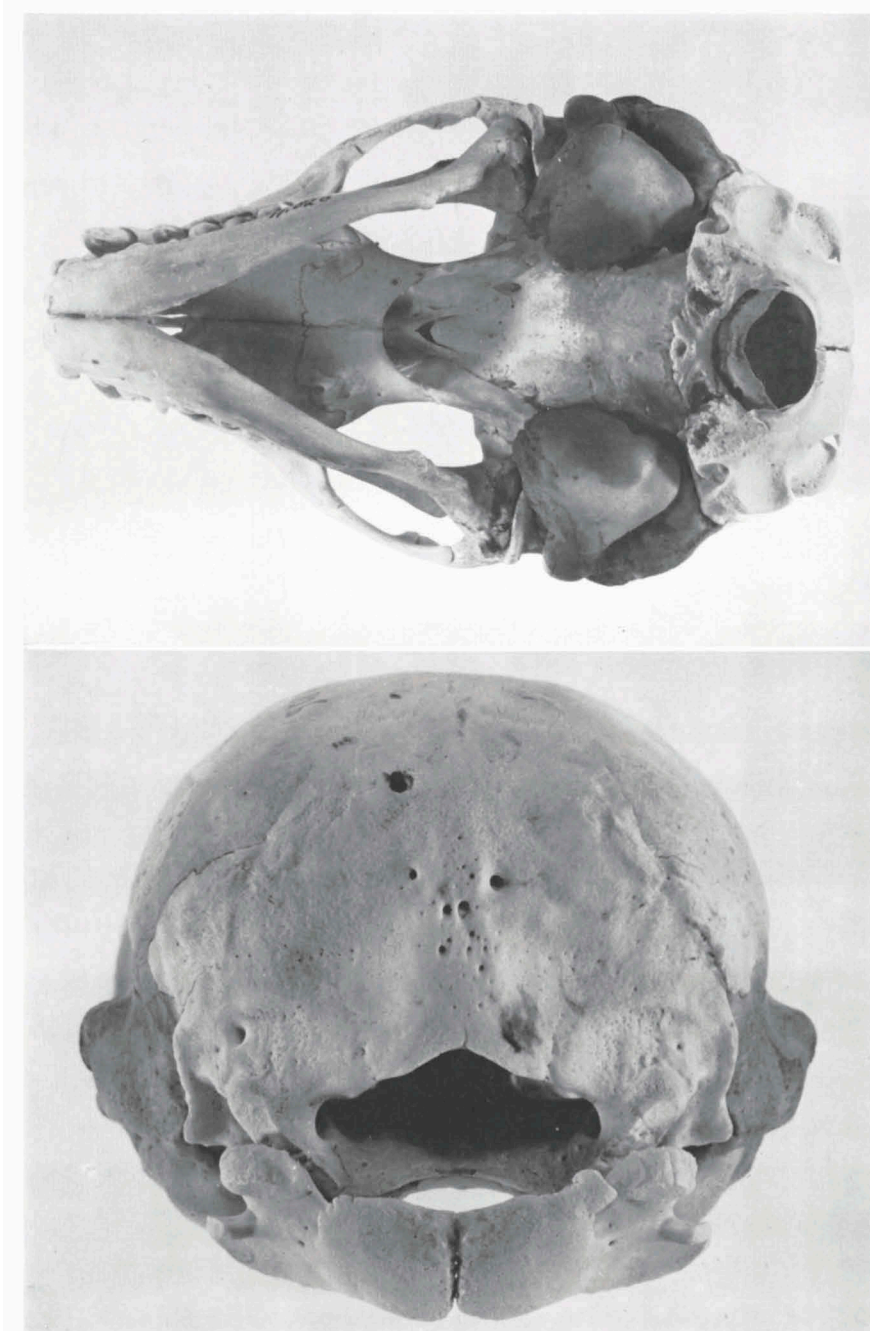
which most probably migrated in that condition from the Farne Islands to the continental coast. According to the author, *Halichoerus grypus* was originally a very common animal and the species originally had a wider distribution than at present.

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Young male Grey Seal caught on August 10, 1963, near Capelle-aan-de-IJssel, Netherlands. Photograph taken in the Amsterdam Zoo.



Upper fig. Underside of the skull of a young female Grey Seal (ZMA 11.826) with a luxation of the skull-atlas joint and consecutive ankylosis.
Lower fig. Caudal view of the skull of a specimen of *Halichoerus grypus* (ZMA 11.826) with ankylosed atlas.