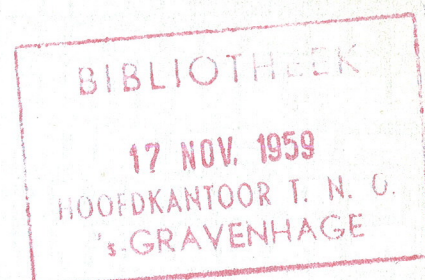


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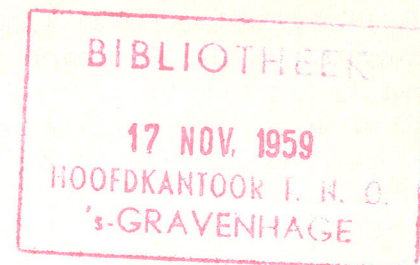


Ten Years of Whale Research

by

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**Chairman of the Board Whale Research Group T.N.O.
(Zoological Laboratory of the University
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Whaling is an old trade. It has its origins in the faraway dim past of the Stone Age (*Neolithicum*), when in Norway Porpoises and perhaps even the bigger Cetacea were hunted. It is certain that already in the 9th century the large whales were caught in Norway, in the 11th century the Basques started in the trade, and the 17th century is known for the great prosperity the whaling expeditions to Greenland brought to many West-European countries. In this century Japan too commenced to develop a whaling industry. The chase of the Sperm whale, with its romantic stories of Moby Dick and other awesome antagonists, took place mainly in the 18th and the beginning of the 19th century. The second half of that century is characterized by a relative rest for the whales. Only Norway and Japan, countries that depend on the sea for a great part of their protein and fat supply, from their coasts carried on the trade on a fairly large scale. This rest however did not last long, for the steamship and the whaling gun made it possible to chase also the swift Rorquals, and the explorations in the Antarctic drew the attention to the abundance of whales in these hitherto little frequented regions. Consequently the 20th century is in the first place the century of Antarctic whaling, carried on at first only by Norwegians but later on also by whaling companies from many other countries.

Even though in the years after the Second World War all expeditions together caught some 30,000 whales a year in the Antarctic, it is certain

that the whale population is not inexhaustible and that by international consultations it should be prevented that the goose that lays the golden eggs is killed. So, when in 1946 at the initiative of Vinke & Co. of Amsterdam, the Netherlands commenced whaling operations, the Netherlands Government joined the International Whaling Commission, a body that once a year meets in one of the 17 affiliated countries. The object of the Commission may best be described as «to save the whales without killing the industry». Generally, participation in the work of this Commission means participation in the biological research upon which the Commission's decisions should be ultimately based. Moreover an increase of our knowledge of the anatomy and functioning of whales may also directly serve the ends of the whaling industry — although whalers, particularly in the past, have been loath to recognize this. Professor Matthiessen in 1890 wrote for instance of Svend Foyn, the well-known inventor of the whaling gun and owner of a number of Norwegian land stations, «dass er die Naturforscher nicht leiden kann und nicht gerne Fremde auf seinen Stationen sieht». Fortunately even at that time the contrary opinion also had its supporters, for in the house of Captain Bull, at the Sørvær Station near Hammerfest Professor Matthiessen was made welcome and was given all assistance in his research on the eye of whales. Of course even now there still may be people who do not hold biologists in any higher esteem than did Svend Foyn, but on the

*) This article was written in 1957 at the 10th anniversary of the Netherlands Whale Research Group T.N.O.

whole the great importance of scientific research is recognized; in the Netherlands this has anyway been the case from the outset. On the first expedition of the «Willem Barendsz» in 1946—1947 two biologists were on board, Dr. W. Vervoort of Leyden and the author.

In the Netherlands the biology of whales was not an entirely new object of study. Although the famous Greenland whaling contributed practically nothing to our knowledge, yet in the 19th century some treaties on the biology of whales were published, and for our own times we may surely mention Dr. A. B. van Deinse, Dr. G. C. Junge and Prof. Dr. H. Boschma. The author of the present article in 1936 obtained the doctor's degree on a thesis on Cetacea. All this research however had a purely scientific character, and was not in the nature of the applied research that became of importance when the Netherlands joined in the whaling in-

dustry. It soon was evident that neither the Government nor the whaling company were suitable bodies for undertaking the further organization of research of an applied character. Fortunately the then-Chairman of T.N.O. Prof. Dr. H. R. Kruyt, immediately consented to establish a Group for Whale Research within the framework of this organization. The meeting on October 3, 1947, is set down as the day of founding.

From the outset it was a foregone conclusion that in the Board of the Research Group a close co-operation should be established between on the one hand the biological experts and on the other hand the representatives of the Direction of Fisheries and of the whaling company. Accordingly, from the outset these three groups have been represented on the Board. Till 1952 Prof. Dr. G. Krediet acted as Chairman; at present the Board consists of the undersigned as Chairman; Messrs. Dr. B. Havinga,

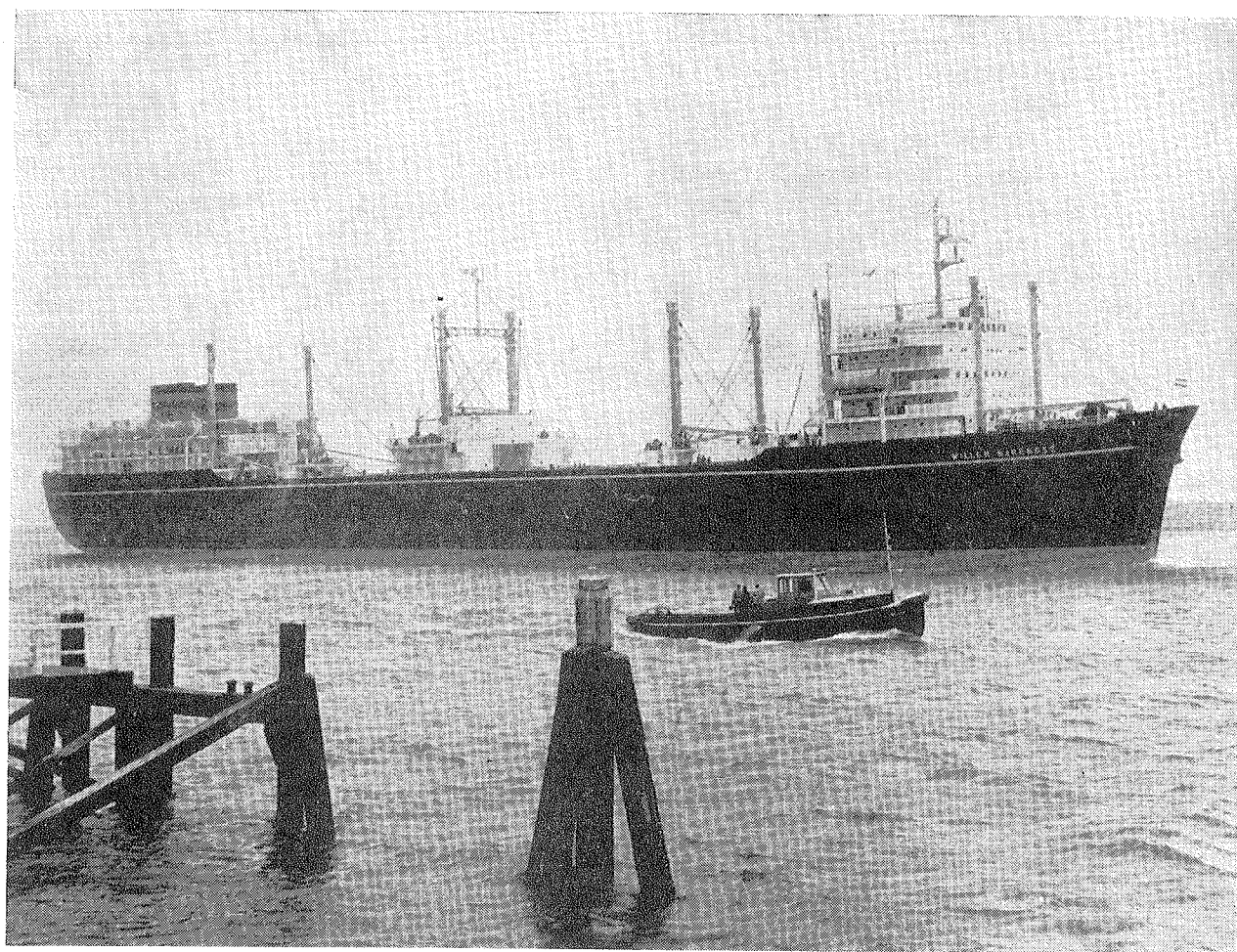


Fig. 1. Where the material for the Research Group is collected. The Netherlands factory ship «Willem Barendsz». Note the peculiar built up of the ship. The bridge and the appurtenant deckhouses are situated fore, amidships there are only a couple of small deckhouses with space in between for hauling the whale to a forward deck after the layer of blubber has been removed on the flensing plane (aft). Between the deckhouses aft the opening of the slipway for hauling dead whales on board may still be discerned.

Dr. P. Korringa and Dr. M. van Eekelen, biologists; Mr. H. S. Drost, Inspector of Fisheries in the 1st District; Ir. L. de Waal, Vice-President of the Netherlands whaling company, and Ir. J. W. J. Beek, Secretary General of T.N.O. Ir. G. J. Lienesch, Director of Fisheries, and Mr. E. Vinke, president of the whaling company, are always invited to take part in the discussions. The very close association of the Research Group and the industry finds its expression not only in the considerable financial contribution of the company to the budget of the Research Group, but moreover in the active partic-

Barendsz» for every expedition, but both Dr. E. J. Slijper and Jhr. E. W. van Lennep, the first directors, were on board for one season. Mr. van Utrecht got his practical experience in the Antarctic on board of the Norwegian whaler «Enern» on an expedition for marking whales and at the land station Husvik Harbour on South Georgia. Since then the supply of material has depended almost exclusively on the activities of the two Whaling Inspectors, officers of the Direction of Fisheries, who on board of the «Willem Barendsz» control the observance of the international rules. The present Inspector in Chief,

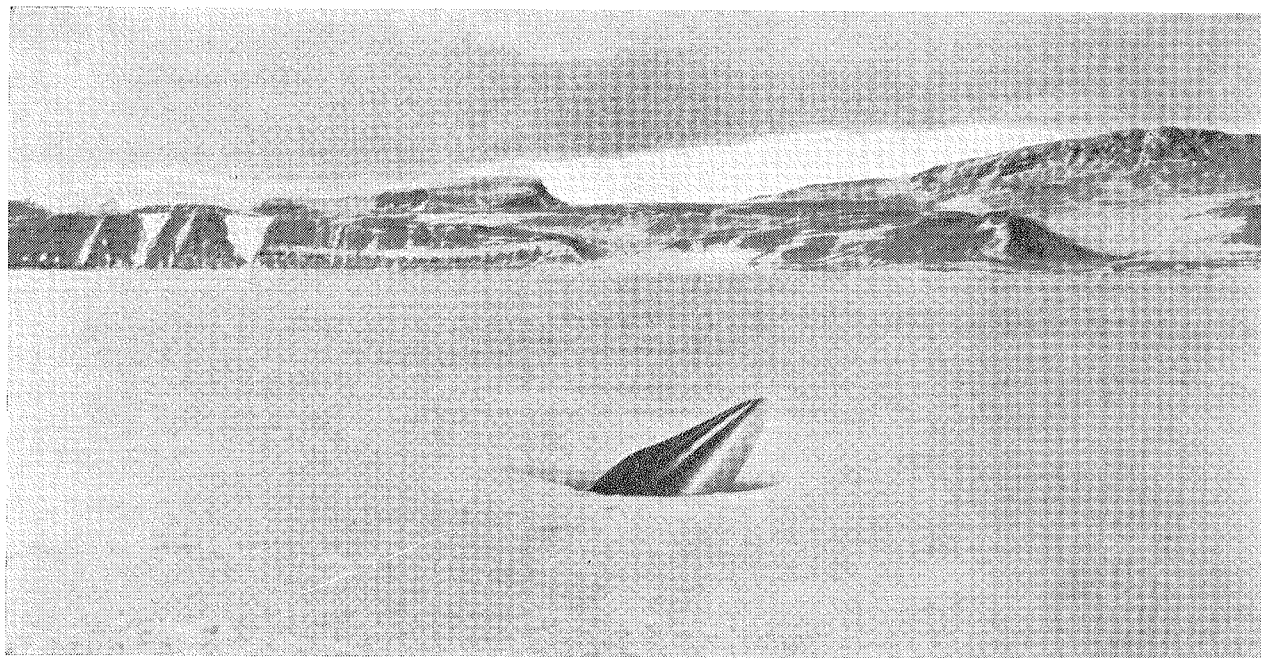


Fig. 2. In winter Minke whales often stay behind so long in the Crownprince Gustav Channel between James Ross Island and Graham Land, that the way to open sea is frozen and cut off. As the ice presses steadily onward they have difficulty in keeping open a few breathing holes, but generally these too at last freeze.

ipation of the representative of the company on the Board in the organization of the research. Ir. de Waal not only requested the Group to undertake certain research projects, but also put forward valuable suggestions and advice relative to their realization.

At first the work of the Research Group was slow to make any progress. After a most promising start successive changes in the direction (Dr. E. J. Slijper, Jhr. E. W. van Lennep, since 1952 W. L. van Utrecht), in the working accommodation, in the supply of material, for years slowed down the research. Only after the Group had found accommodation in the Zoological Laboratory of the University of Amsterdam (1952) matters improved considerably, also with regard to the supply of material. It is not feasible to station a biologist on the «Willem

Mr. W. H. E. van Dijk, has been most active in collecting material and data, the second Inspector, Mr. J. W. Kuyk, has also proved a valuable collaborator. The Captain of the «Willem Barendsz», Mr. J. Klijn, and several other members of the crew have always given the Inspectors every assistance in their work.

As in the Netherlands only one floating factory is in service, Netherlands whale research of necessity has to be modest in its scope and projects; it can not vie with the institutes of other countries, particularly not with those in Norway, England and Japan, that have a much more extensive staff and larger working accommodation at their disposal, and that publish in their own periodicals. The first task the Netherlands Research Group has set itself is to keep abreast of all developments of biological whale research. Consequently it has repeatedly been able

to give advice and information to the Netherlands Government and to the whaling company, and besides to co-operate in the training of the Whaling Inspectors. Moreover it is in a position to evaluate the results of the research of foreign institutes. Of course the best way to do this is by actively participating in the respective research projects.

The central problem of all conferences of the International Whaling Commission is the question how many baleen whales all 20 pelagic expeditions together may annually catch in the Antarctic waters without diminishing the population. It has been apparent for a long time that even the very detailed and scrupulously kept up to date International Whaling Statistics can but contribute very little to the solution of this problem, and that likewise the numerous biological researches devoted to this problem have not yet succeeded in pointing the way to a workable solution. For obtaining a satis-

factory insight in such a solution it will be necessary in the first place to dispose of a knowledge as exact as possible of the size of the population, of the death rate from natural causes and of the rate of reproduction. These last years the Research Group has been able to secure the co-operation of Dr. E. F. Drion (Department for Statistical Elaboration of Observations T.N.O.) for solving the statistical problems (population dynamics) that may arise in this connection.

The mathematician however can perform his work successfully only if the biologist has furnished him with sufficient reliable data. In order to determine the age at which the animals become sexually mature and the rate of reproduction after they have reached that age, it is necessary to make a thorough examination of the ovaria of the females. This is one of the problems on which the Research Group has been working from the outset. The death rate



Fig. 3. Whales are not Fishes but Mammals. They breathe through lungs and so have to surface regularly for breathing. That is the reason they can be caught. The nostril (blowhole) on the top of the head, is shown in this photograph of a Minke whale. The highly compressed breathing air expands in the free outside air and consequently cools so much that the water vapour condenses as a puff of vapour (blåst).

from natural causes among whales and other data that may be relevant for obtaining an insight in the state of the whale population may be deduced, under certain conditions, from the age distribution of the animals caught — but this means that the age of a great number of animals caught should be determined. For determining the age of whales as exactly as possible several methods have been worked out. One of them aims at computing the age from the periodically recurring configurations of tops in the longitudinal baleen-curve that represent a difference in thickness, comparable to year-rings. The present head of the Research Group has been working on this method for some years and, with the assistance of Miss C. N. Cock, he has developed an improved method for distinguishing these rings. Thanks to the good offices of the Whaling Inspectors the Research Group will be able within the next months to study another method of age determination, to wit by examination of the so-called ear-plugs. On these conically shaped objects consisting of a horny-like substance, that are found in the auditory meatus of whales, likewise a kind of year-

rings may be distinguished. Although for many years already scientists in other countries have likewise studied methods of age determination and have even endeavoured to establish correlations between the different methods, research on this subject as yet has not yielded fully satisfactory results, and this for the very simple reason that up till now not even one age determination could be verified against a whale of known age. The only way for learning to determine the exact age of whales is by marking a great number of animals when they are so young that, on the basis of their length, it is possible to determine their age with a margin of error of only a few months.

The Research Group has not restricted itself to the research projects described above. As a group of the T.N.O.-organization it has done research for the benefit of the Whaling Company on so-called «condensed whale solubles». Moreover it has worked on the thickness of the layer of blubber and on the mammary glands. Data concerning the thickness of the layer of blubber may furnish a kind of standard measure for judging the actual fatness of



Fig. 4. In Japan consumption of whale meat is widely advertised. This meat comes from the Antarctic as well as from the land stations. Whale steak is quite tasty and can hardly be distinguished from good beef steak. In Japan however it is sometimes eaten raw.

whales and so may bring to light possible defects in the method of processing. Research on the mammary glands is particularly important for the Inspection, as it is forbidden to shoot whales accompanied by a suckling calf and in practice an infringement of this rule can be ascertained only on board of the factory ship by examining whether the mammary glands are in lactation or not. For these

two researches a great many data should be available. In this respect however the Research Group has been very fortunate as far as during the last few years it has received considerable assistance from English, Norwegian and South-African colleagues. In other fields too the co-operation with colleagues from other countries is excellent, witness for instance the fact that the Research Group for

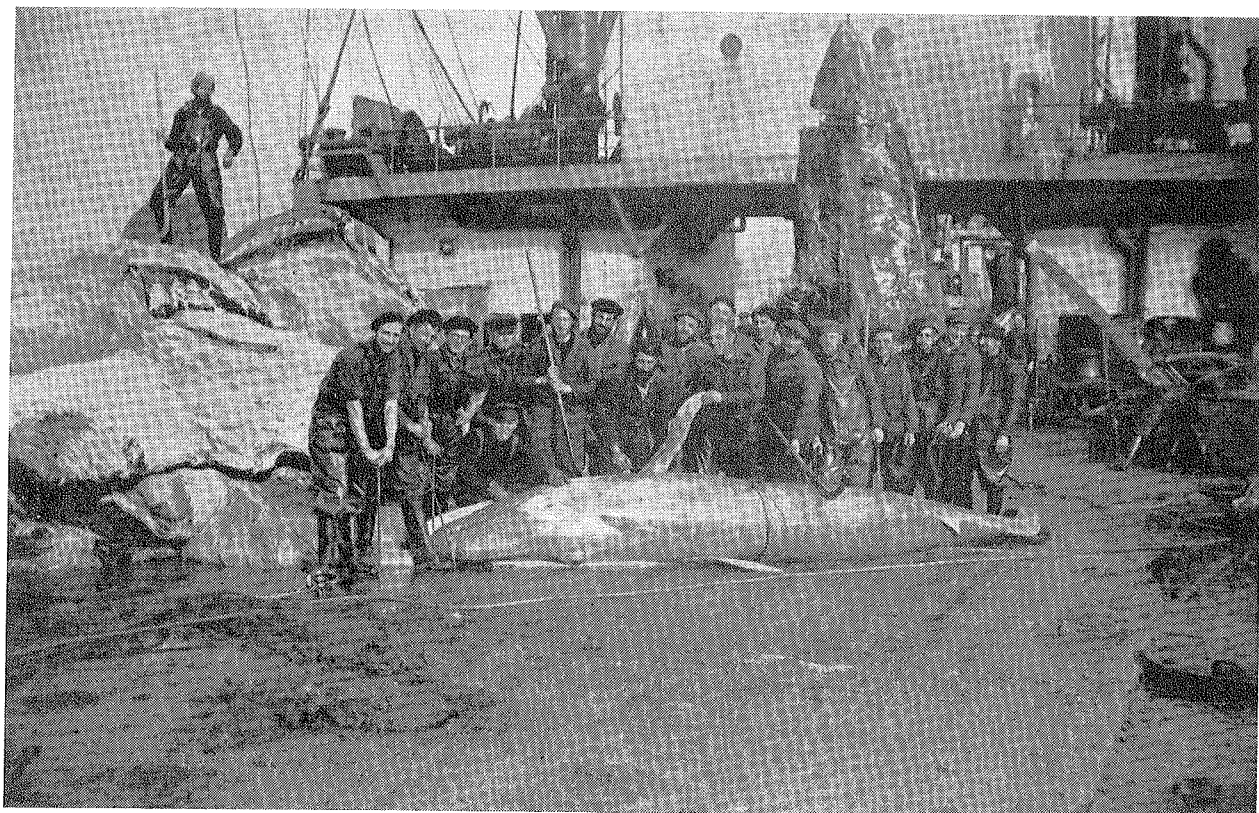


Fig. 5. A whale does not have tiny tots. In the 1947/1948 season this foetus of a Blue whale with a length of 570 cm. emerged on the deck of the «Willem Barendsz». Birth takes place in the warm waters when the calf is about 7 m. long. The length of the mother is about 25 m.

several of its publications has received hospitality in the Norsk Hvalfangst-Tidende and the Hvalrâdets Skrifter.

These last years the Research Group has also been active in organizing the observation of whales by members of the crew of Netherlands ships. For this purpose a leaflet was published in 1954 and widely distributed on the ships of the Netherlands Royal Navy and of the Netherlands Merchant Fleet. Since then 4500 observation forms have already been received and the stream does not yet show any signs of drying up. The purpose of this research project is to obtain better insight into the distribution and the migration routes of whales, particularly in those regions where they stay during the winter season. Many other valuable observations —

such as speed of swimming, rhythm of diving and surfacing, or presence of calf — are often reported on the forms. Moreover Captain W. F. J. Mörzer Bruins collected many important data concerning a great number of observations of various species of Cetacea.

Finally it should be mentioned that of course the Research Group also receives much material and many data that are not of immediate interest to applied research although as a matter of fact one never can tell what practical results the study of such material may yield in future. The working of this material, that may be of great importance from the point of view of pure science, is almost exclusively entrusted to research workers — sometimes also to advanced students — that receive no

remuneration from the Research Group. In the course of years valuable data have been obtained in this way concerning scars in the skin of Cetacea, blood vessels, spleen, lungs, parturition, and concerning a number of pathological phenomena. In many cases use was also made of Porpoises and Dolphins stranded on the Netherlands coast or caught by fishermen.

May the above suffice to prove that, although applied whale research in the Netherlands is still in its teens, the Research Group between 1947 and 1957 has shown that it certainly can fulfil its task of serving the economic interests of our country. This appears not only from the contacts with the whaling company, but especially from the fact that

the policy of the Netherlands delegation to the conferences of the International Whaling Commission in an increasing degree is determined by reports concerning problems that have been drawn up by the Research Group; for the economic aspects of the whaling industry depend in a large measure on the decisions made at these conferences. Therefore the opinion that the Research Group between 1947 and 1957 has justified its existence seems to be well-founded. The T.N.O. Organization has no need to regret its decision to establish a Whale Research Group, and it may be assured that, as long as the Netherlands continue to take part in whaling, its exertions will have most useful effects.

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