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Research Project has proved a great success*

*After three years: 4500 reports with about
3500 observations*

By Prof. Dr. E. J. Slijper and W. L. van Utrecht

(Netherlands Whale Research Group T.N.O., Zoological Laboratory,
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(Reprint from the maritime monthly «De Blauwe
Wimpel» 13. p. 196, 1958.)

Ever since man has ventured upon the wide sea, the sailor has been familiar with the presence of whales and dolphins. Swimming and tumbling before the prow dolphins accompany the ship sometimes for days on and in order, as ancient belief will have it, to pilot the ship safely into port. In deeper water the sailor repeatedly encounters the big whales. At the most unexpected moments he sights the puff of vapour, the blâst, produced by these animals when they surface. For the sailor whales have become part of his work and of his life, and it may be supposed that the life and behaviour of these animals will interest him.

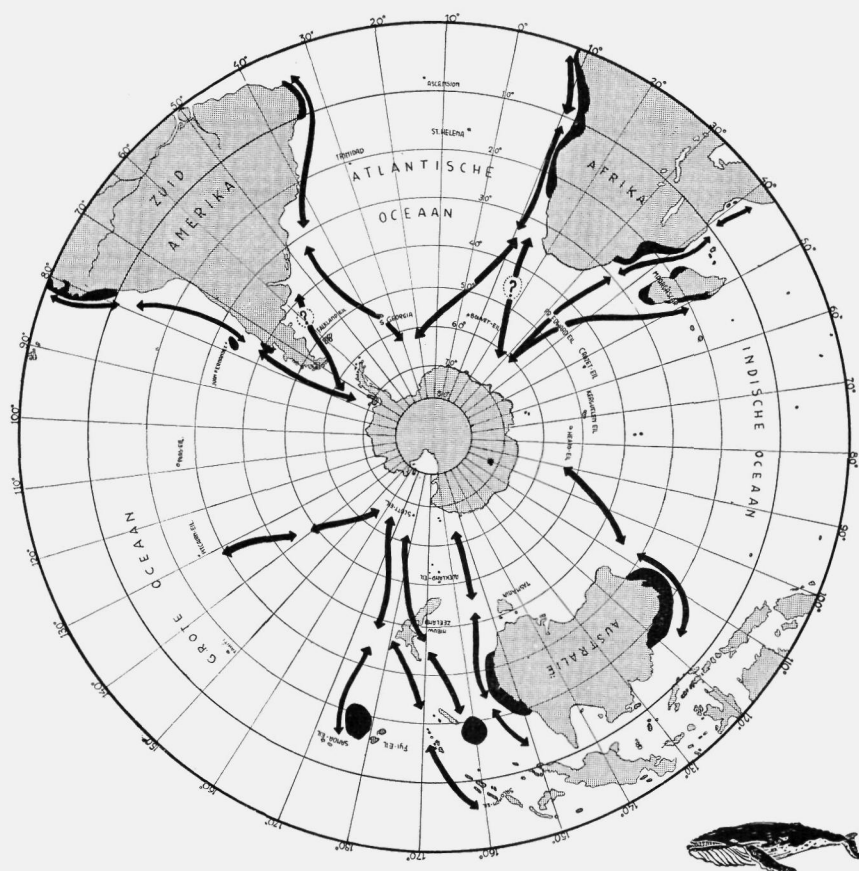
In 1951 English biologists tried to make use of this interest for the purposes of whale research. The most important whaling countries maintain biological institutes for the study of the biology of whales, since in this way greater insight may be obtained in the great problem that, every year, faces the International Whaling Commission, to wit: what measures should be taken in respect of whale catching in order to ensure that the whale population shall remain constant, so that following generations may continue to draw on this rich source of fats, meat and other valuable whale products.

One of the data the biologist should have at his disposal is a detailed knowledge of the distribution of whales and of their annual migration. It is known that most species in question stay in the

Arctic and Antarctic only during summer, when they are gathering food. During the winter months they live in the warm seas of the tropics and the subtropics (figures 1 and 2). They go there to mate and, in the next year, to calve, but they find practically no food in these waters. Only the Sperm whale and the Sei whale are more permanent residents of the warm waters.

Whales are caught all over the world, not only by factory ships in the cold waters of the Antarctic or the northern part of the Pacific Ocean, but also by a great number of land stations in the tropics and subtropics. Therefore it is of the utmost importance to know, for instance, the winter quarters of the animals that in a certain part of the Antarctic are hunted during summer. Are the animals left alone in these quarters because they stay clear of the coast or for other reasons, or are they, there too, pursued by the quick catchers?

In order to obtain knowledge concerning these matters it is necessary to dispose of a great number of observations, made during the course of a whole year — preferably even during the course of several years — , and moreover proceeding from all parts of the oceans. It is improbable that biologists could ever collect such extensive material, and therefore the Director of the English whale research, Dr. N. A. Mackintosh, had the idea to enlist the assistance of those, who by their continuous presence upon the

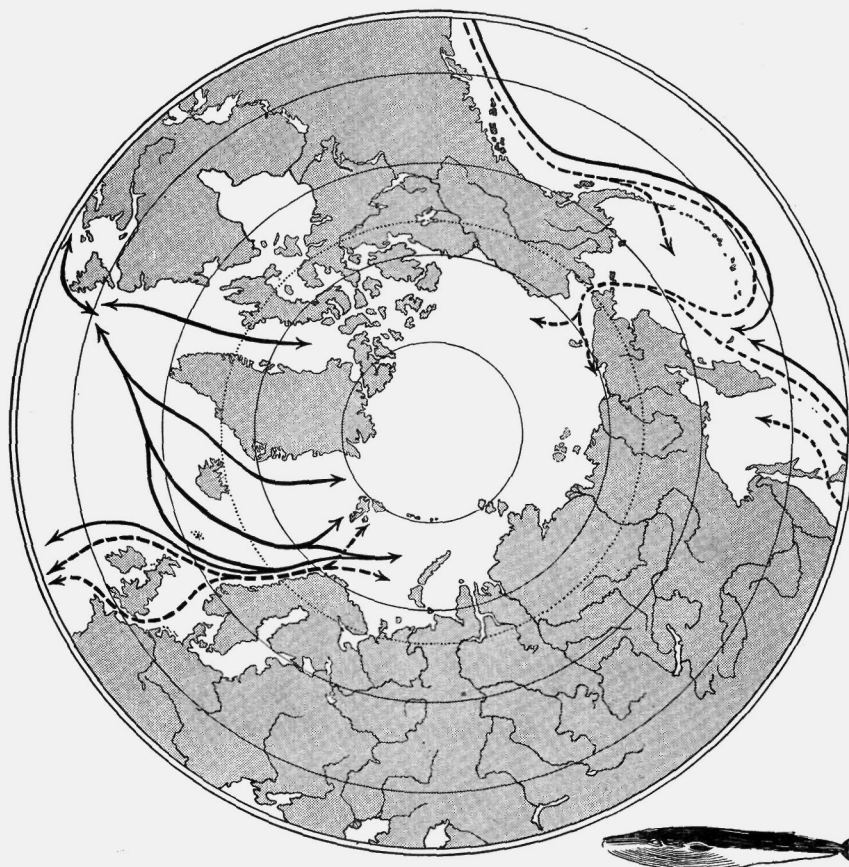


1. Map of the southern hemisphere showing the migration routes of the Humpback whale and the most important catching areas in the warm waters. According to data of the National Institute of Oceanography England, from Slijper, «Walvissen» (D.B. Centen Publishing Company, Amsterdam 1958).

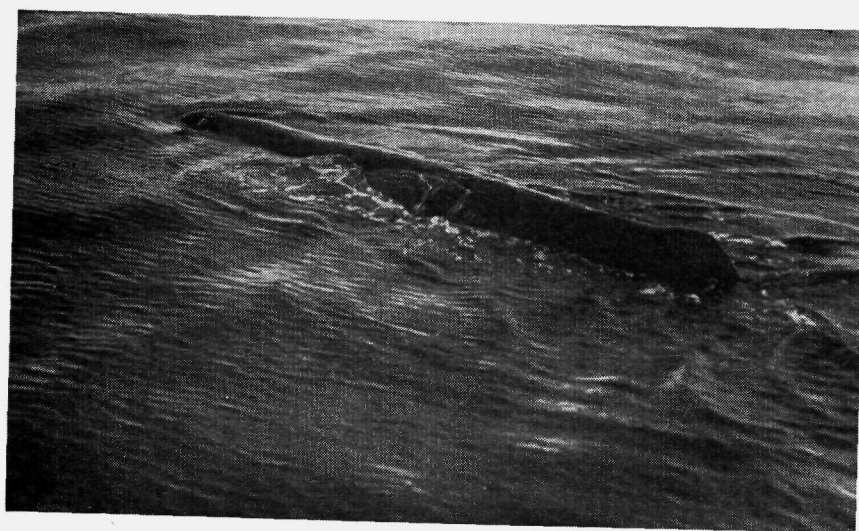
seas have the opportunity to collect the wanted data. Through the intermediary of the Meteorological Office he requested a great number of ships to look out for whales regularly and to send him their observations on forms issued for that purpose.

The Netherlands Whale Research Group T.N.O., the organization that in the Netherlands is charged with applied whale research, thought our country too might contribute to this research project. The Inspector of Fisheries in the 1st District, Mr. H. S. Drost, the Secretary of the Netherlands Shipowners Association, Rear Admiral E. A. Vreede, and the Chief of Staff of the Netherlands Navy kindly co-operated in the preparations, and so in the first days of April 1955 a leaflet could be sent to all ships that might be able to assist in carrying out the project. In this leaflet the purpose of the research was set out and instructions for making observations were given. Forms for the reporting of observations and of the route covered each day were joined to the leaflet (E. J. Slijper, Request to all Netherlands

sailors for assistance in observing whales. Netherlands Whale Research Group T.N.O., Amsterdam 1954). The Netherlands Royal Navy and all Netherlands shipping companies, without any exception, have co-operated in this research. The first form, the report of Captain H. Kroon, master of the «Mintaka N» (Van Nievelt Goudriaan & Co.), was received on May 10, 1955, and thereafter a continuous flow of forms kept coming in at the address of the Research Group. The greater part of the forms came from the head offices of the shipping companies in the Netherlands, but sometimes the envelopes bore strange stamps and had been postmarked at such far places as Sydney, Saida, Abidjan, Hong-kong or Mombasa. The weather ships of the Netherlands Aeronautical Service (particularly the «Cumulus») likewise sent in their data. But it is unfeasable to mention all shipping companies, all masters and other officers who have furthered the research project. There are hundreds of them. Without making invidious distinctions an exception may



2. Map of the northern hemisphere showing the migration routes of the Blue whale (unbroken lines) and of the Fin whale (broken lines) as far as these routes follow the coastline. At present practically nothing is known of a possible migration across the ocean. It is hoped that the research project described in the article will throw some light on this subject. From Slijper (1958).



3. Mr. R. Stephan (Government m.s. «Pool») made this splendid shot of a slowly surfacing Sperm whale off the coast of Netherlands New Guinea. The blowhole (left) and the dorsal hump (right) prove that the animal is a Sperm whale. From Slijper (1958).

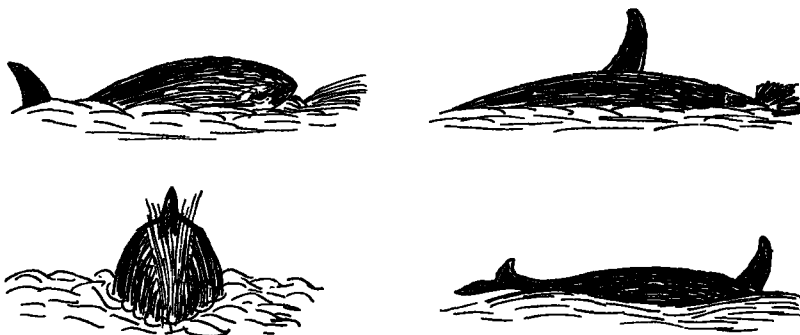
perhaps be made for the Shell Tankers, that often sent in reports from rarely navigated routes, as well as for the ships of Smit's Internationale Sleepdienst, where even during very difficult tows valuable observations were often made.

The general enthusiasm for observing whales is most clearly shown by the fact that on many occasions the route of a ship was temporarily

bellies turned to each other. This might indicate that these whales were mating; in view of the ship's position when the observation was made this is quite probable. «After 15 minutes the voyage had to be resumed» Captain Stiekel notes in his report, and to judge from the preceding vivid description he has regretted to do so. On October 1, 1955, 12 miles to the west of Fremantle, on another ship of



4. From the drawings of Mr. J. Stel (s.s. «Breda», K.N.S.M.) it is evident that on May 31 and July 1, 1955, he observed two Sperm whales off the coast of South-America. From Slijper (1958).



5. Sketches of an Orca, observed by 4th Mate L. G. Bosma («Alkaid», N.N.G.C.) on November 15, 1955, at 08° S — 33° W.



6. On August 5, 1956, 2nd Mate J. H. Logemann (s.s. «Gouwe», N.V. Houtvaart) at 25° N — 10° W observed a cetaceous animal he could not identify. A comparison of his sketches with fig. 7 immediately shows that he has seen a male Orca. The dorsal fin of the female is relatively lower.

changed for the better observation and identification of a whale sighted in the distance. Captain H. J. Stiekel stopped the engines of the «Merak N» (Van Nievelt Goudriaan & Co.) at 18° N — 20° W in order to observe a herd of Rorquals. They made a big noise, with their tails they beat up water columns to a height of 8 metres, and they even jumped perpendicularly out of the water with their

Van Nievelt Goudriaan & Co., the «Sirrah», a search light was rigged up when it grew dark at 9.00 p.m. for the better observation of two Humpback whales that over and over again dived under the ship. The long flippers and the tail fin were now and then clearly visible above the water.

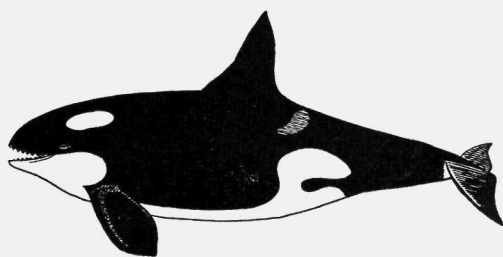
After a short time it was already clear that this enthusiasm, evidenced by a great number of

reports, would render the scheme a success. Now, after three years, we can safely state that the success is stupendous. In England 370 reports, containing 400 observations, were received in four years. After three years the Netherlands already dispose of 4500 reports, containing an estimated number of 3500 observations, this means that returns in the Netherlands have been ten times as high. The Research Group owes this extremely valuable material to the unflagging interest and devotion of all who participated in the observation scheme. No need to say that the Group is very grateful indeed!

But apart from feelings of gratitude, the Re-

up his function, but it will surely take a few years before the ultimate results of his work can be published.

First of all the available data must be checked. Most observers have tried to identify the species of the animal they saw with the aid of the leaflet, but this does not imply that identification was always possible or that all identifications are correct. Fortunately many observers have facilitated checking by noting some striking characteristics of the animal. From the outstanding description of 2nd Mate J. H. Logemann of the s.s. «Gouwe» (N. V. Houtvaart) it is safe to conclude that on August 14, 1956, at 5° N — 10° W he saw three Sperm whales swim-



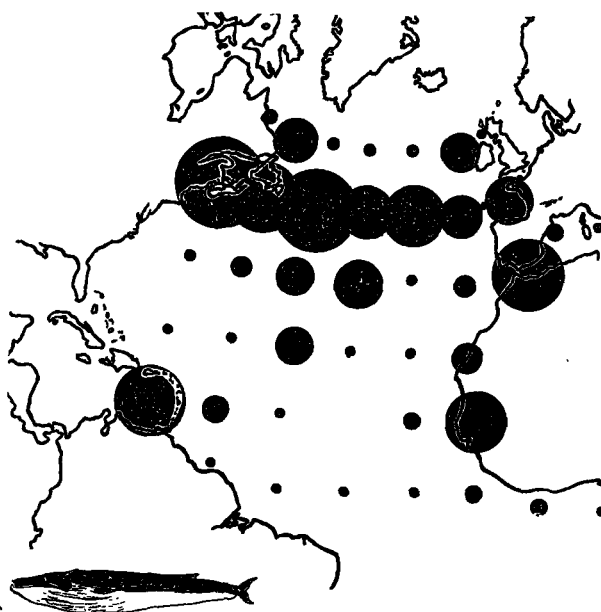
7. Male Orca. Compare the grey spot behind the dorsal fin with fig. 6. From Slijper (1958).

search Group also feels some pricks of a guilty conscience for not having informed its faithful assistants of the progress of the research. Of course, after taking such a lot of trouble, one likes to know what results have been obtained. That is quite understandable; but on the other hand one should keep in mind that, before further work could start, first a great number of data covering a period of three years had to be collected. That phase of the project however is now closed. We dispose of a wealth of data, and at present it is even advisable not to continue at least part of the observations until we know whether the available material suffices, or whether more data or perhaps other data are needed. This applies only to observations made along much navigated routes. If a ship should travel through less frequented areas every observation remains extremely valuable as does every observation, wherever made, concerning the vital functions and behaviour of the animals. These observations will always be very welcome.

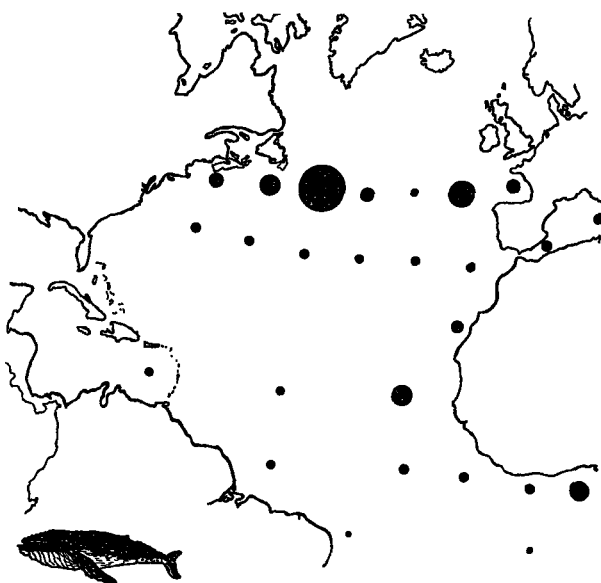
As set out above, the results of a project such as ours do not present themselves of their own accord. The Research Group has had to appoint an assistant specially for the working of the material. This appointment has been made possible by a subvention of the Organization Committee of Fisheries T.N.O. On March 1, 1958, Mr. C. Naaktgeboren took

ming alongside the ship. Likewise the photograph made by Mr. R. Stephan on board of the Government m.s. «Pool» (fig. 3) near Netherlands New Guinea is conclusive evidence that the animal observed was a Sperm whale, and so are the drawings of Mr. J. Stel (fig. 4). With the aid of the sketches sent in by 1st Mate M. J. P. Hahyary (m.s. «Rijniersz», K.P.M.) it was possible to identify an animal observed by him as a Humpback.

Sometimes it appears from the descriptions and the drawings that not a whale in the strict sense of the term was observed, but for instance a great Dolphin. «It is not possible to determine the species» 4th Mate L. G. Bosma of the «Alkaid» noted, when the leaflet did not offer him any guidance in identifying four animals with a length of 7 to 8 metres. His drawing (fig. 5) however unmistakably shows that they were Orcas, big predacious dolphins, that prey not only on fish, but also on porpoises, seals and penguins, and that even venture to attack big whales. The same conclusion may be drawn with even greater certainty from the description and drawings of 2nd Mate J. H. Logemann, because he even noted the light grey spot behind the dorsal fin, a distinctive characteristic of the male Orca (figures 6 and 7). From the reports sent in by Mr. H. A. de Boer, 1st Officer of the weather ship «Cumulus» it is clear that both on September



8. Distribution of the observations of 1717 Rorquals in the northern part of the Atlantic Ocean. The magnitude of the black dot is proportional to the number of animals observed in a square of 10 by 10 degrees in the period of May 1955 till December 1956. Provisional chart designed by W. L. van Utrecht and P. J. H. van Bree.



9. Distribution of the observations of 277 Humpback whales in the northern part of the Atlantic Ocean. See fig. 8.

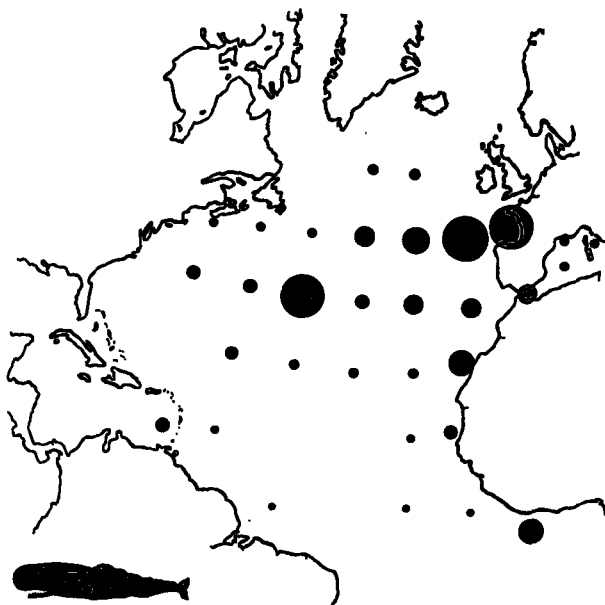
5 and on September 6, 1956, at 66° N — 02° E one to three Bottlenosed whales swam around the ship.

Sometimes however the description casts doubt upon the correctness of the identification. When at 32° N — 172° E four «Grey Whales» are reported, this might be correct in view of the locality where

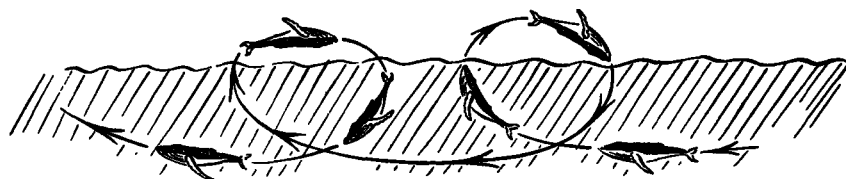
the observation was made, for the Grey whale occurs only in the northern part of the Pacific Ocean, although it should be borne in mind that up till now the Grey whale has practically been observed along the coast only when on migration. But the additional remark «big dorsal fin» does not at all

tally with the characteristics of this species, and so this observation will be set down as «Rorqual». For that matter, a great number of the animals observed will be set down under this heading. From the outset it was certain that the Blue whale, the Fin whale and the Sei whale can be distinguished from each other only by experts or under particularly favourable circumstances. Brown, who worked part

ber of observations will imply that few whales occur only in case the route on which the observation was made is as widely used as the other ones. This means that such maps give only a provisional and superficial impression of the distribution of the animals. It is necessary to introduce a certain well-defined standard for calculating the number of animals in a certain area, for instance the number



10. Distribution of the observations of 516 Sperm whales in the northern part of the Atlantic Ocean. See fig. 8.



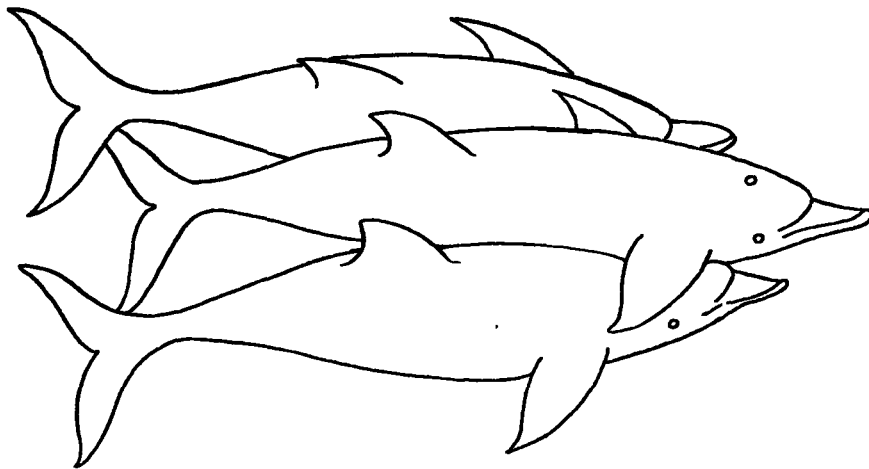
11. Somersaults of a Humpback whale observed by Messrs. Bannan and Hermans. From Slijper (1958).

of the English material, likewise divides the observations in Sperm whale, Humpback and Rorqual and a fourth group that can be set down only as «big whale» (S. G. Brown, *Whales Observed in the Indian Ocean. The Marine Observer* 27 p. 157, 1957). A similar division will be used in classifying the Netherlands material.

On maps of the North Atlantic Ocean Messrs. W. L. van Utrecht and P. J. H. van Bree marked the positions of the observations of 1717 Rorquals, 277 Humpbacks and 516 Sperm whales (figures 8, 9, 10). On these maps the much used navigation routes stand out clearly. Of course on much used routes many observations are made, a small num-

ber of animals observed per mile sailed — as Brown did — , or the number of animals observed per a certain number of hours sailed by daylight — as we shall try to do. This standard has moreover the advantage that it renders possible the introduction of a correction in respect of visibility.

But even so the provisional maps reproduced here warrant some conclusions. For instance, we may safely assume that along the big navigation route from Western Europe to the U.S.A. and Canada traffic is fairly constant. Now bearing this in mind it is remarkable that on the west side of the ocean a greater number of Rorquals has been observed than on the east side, and that particularly



12. Two Bottlenosed Dolphins keep a wounded comrade above the water. After Siebenaler and Caldwell from Slijper (1958).

near New Foundland a very great number of animals has been observed. But this was rather to be expected, for to the south-west of New Foundland is a zone where the cold water of the Labrador Stream and the warm water of the Gulf Stream meet, and it is wellknown that in such regions a rich fauna tends to develop, and that consequently in those regions whales find abundant food. The Humpbacks likewise appear to be most numerous near New Foundland, but the map does not show any similar phenomenon for the Sperm whales. Yet these animals too are attracted by such regions of abundance, as is proved a.o. by the fact that many Sperm whales occur in the Pacific Ocean off the Peruvian coast. The explanation may be that probably the greater part of the Sperm whales observed between 40° N and 50° N are males, for it is known that the great herds (harems) of females and calves ruled by one old male seldom venture outside the area between 40° N and 40° S. The males however that have not succeeded in gaining authority over a harem, during summer undertake long migration voyages to the North and to the South. And then it may be relevant that near the Azores great herds of Sperm whales have been observed. The warm waters of that region then constitute what may be called a reservoir, wherefrom *males* may set forth on their migrations. A similar reservoir of Sperm whales has not been observed in the western part of the Atlantic, and the maps indeed clearly indicate that neither the Gulf of Mexico nor the Caribbean Sea holds one, yet many observations of Rorquals have been made in those regions. This might explain why more Sperm whales have been seen in the eastern part than in the western part of the Atlantic Ocean.

The English research project too has shown that in the Caribbean Sea, and particularly near

the coast of Venezuela, Rorquals occur in great numbers. Of course the local population has known this for centuries, not for nothing a projecting rock of Margarita Island is called «Punta Ballena». First Mate G. J. Lange («Hestilia», K.N.S.M.) on September 1 and 13, 1955, obtained a good insight in the reason why these animals are so numerous in this region. On both days mentioned he observed 8 to 10 Rorquals in the Bay of Pampador (Margarita Island) and notes: «There were huge shoals of Sardines; it seems that these last years such shoals appear frequently near the coast of Venezuela.» More difficult to answer is the question where these animals come from. Do they belong to the northern or to the southern population? It seems more probable that they belong to the southern group, since animals from the North would have to break through the Gulf Stream, besides they find plenty of food near New Foundland. Further research concerning the time of the year when the animals are generally observed in the Caribbean will probably give a conclusive answer to this question. The same applies to the Rorquals observed off the West coast of Africa.

Concerning the Humpback whales the maps show that these animals, in contradistinction to the Rorquals and Sperm whales, have not or practically not been observed in mid-ocean. This was to be expected, for it is wellknown that on their migrations the Humpbacks prefer to follow the outline of the continents. That is the very reason why the tropic and subtropic land stations catch so many of these animals.

Apart from the thousands of observations granting further insight into the migration and distribution of whales, the assistance of the Netherlands mariners in this research project has moreover yielded a great number of data concerning the

biology of whales. Of course it was already well-known that some whales are playful animals and in play often jump high out of the water; but it must have been a grand sight for Mr. F. J. Engels (m.s. «Sibigo», K.P.M.) when on July 17, 1956, at 22° N — 151° E a herd of about 50 Humpback whales was encountered. «They swam mainly in pairs» the report states «and particularly the smaller animals repeatedly jumped clean out of the water.» One animal for twenty times in succession smacked the water surface with its tail while its body remained submerged. Pilot W. Bannan and 3rd Mate Th. J. Hermans made an elucidating drawing of the somersaults of a Humpback when the «Sibajak» (Kon. Rott. Lloyd) sailed along the coast of Australia on October 21, 1955, (fig. 11). Similar observations have been made by 1st Officer B. M. Maazen (s.s. «Duivendijk», Holl. Am. Lijn; on July 11, 1955, at 36° N — 122° W), 4th Mate H. W. V. van Eek («Tjisadane», K.J.C.P.L.; on June 8, 1955, at 24° S — 37° W) and Mr. M. A. Bakker (s.s. «Wester-toren», Ned. Tank & Paketv. Mij.; on May 23, 1955, Persian Gulf). Sperm whales jumping out of the water have been observed by Mr. W. Overmaas

(s.s. «Titus», K.N.S.M.) on May 7, 1955, between Ceuta and Tunis, and by 4th Mate J. G. Nagelkerke («Sirrah», Van Nievelt Goudriaan & Co.) on October 14, 1955, at 08° S — 121° E.

Of particular interest is the description of Mr. T. J. Terpstra (s.s. «Akkrumdijk», Holl. Am. Lijn) relating an encounter with 14 Sperm whales on August 10, 1955, in mid-ocean (35° N — 51° W). The animals swam in SSE direction at a distance of about 35 m. from the ship. One stayed behind playing with a log, again and again it dived under the log, and started afresh from the other side. It is an open question whether this behaviour may still be called «play». In the U.S.A. in some cases dolphins, particularly Bottlenosed Dolphins, have been observed to save a wounded animal of their own species from drowning by regularly pushing its head above the water surface (fig. 12). Likewise newborn calves, when they cannot get to the surface by their own efforts, may be helped in this way. It even seems probable that this particular pushing-upward-behaviour is stimulated by any object in the water that does not move (Readers wanting further information concerning the behaviour and other

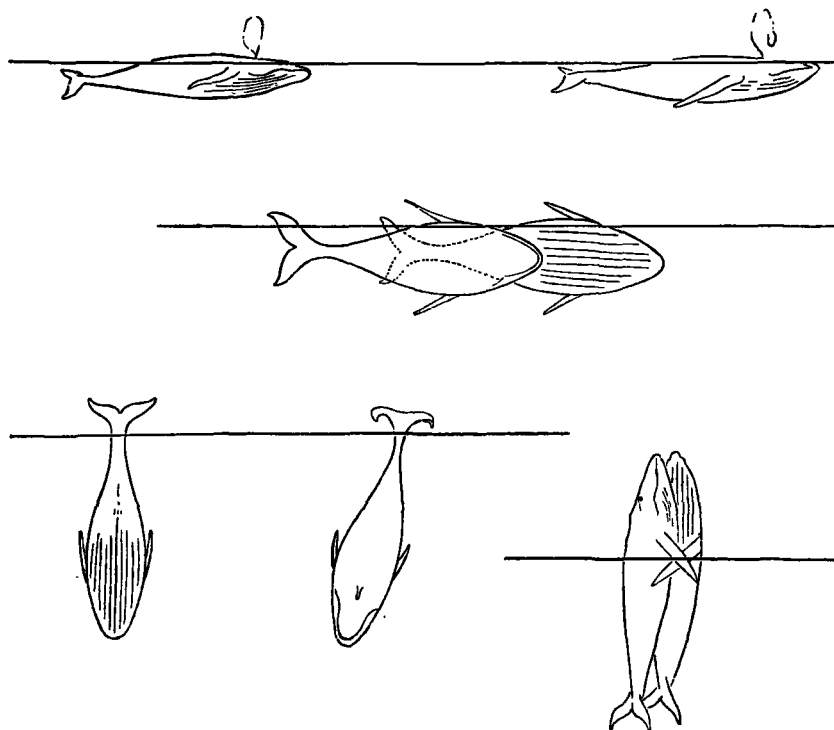


13. Four shots of the surfacing of a Minke whale, taken by Captain W. Peeters (m.s. «Cistula», Shell Tankers N.V.) in November 1957 before the port of Reunion. Note the blowhole, dorsal fin and the transverse tail fin, that are clearly visible in the photographs.

vital functions of whales may consult E. J. Slijper, Walvissen, D. B. Centen Publishing Company, Amsterdam 1958). The observations of Mr. Terpstra fully confirms this hypothesis. That Mr. Terpstra is also an enthusiastic angler is evident from the following sentence «When the position of the sun is favourable, the animal presents the same appearance as a pike standing in a polder-ditch.»

In contrast to these lively pictures of whales at

1956) have had similar adventures. Moreover, out of curiosity, Sperm whales may come so close to a ship that a collision is sometimes unavoidable. Second Mate S. van Weering (V.N.S.) reports that on August 24, 1955, at 01° N — 90° W two Sperm whales ventured so close to the s.s. «Muiderkerk», that one of them touched the ship on the port side and got a whack from the propeller, that caused it to revolve three times. Humpback whales too have been



14. Sketch drawings of the mating of Humpback whales. After Nishiwaki and Hayashi (1951) from Slijper (1958).

play, are the following observations of the animals in deep repose. Of many species it is known that they may sleep for hours on end floating on the surface, and that in their sleep they are easy to approach. Third Mate Jr. S. J. Gockinga (s.s. «Radjah», Mij. Nederland) on September 4, 1955, at 36° N — 01° E most clearly experienced this with regard to a Rorqual. Mr. G. Bloem reports that the «Prins Alexander» (Mij. Zeetransport N.V.) almost collided with a sleeping Sperm whale. And Captain A. P. Disselkoen of the N.V. Ver. Ned. Scheepv. Mij. actually did have such a collision, for on March 24, 1955, at about 55 miles West of Cape Gardafui the s.s. «Amerskerk» with a speed of 17 knots sailed headlong in a sleeping Sperm whale. The animal did not survive the shock, and the engines had to be stopped and turned backward in order to remove it from the prow. This collision is not a unique occurrence. The Russian whaler «Aleut» and the American passenger ship «Constitution» (Gulf of Genoa,

observed often to get quite close to ships, but nothing of the kind has been reported of Rorquals.

Data concerning the rhythm of the animals in surfacing, blowing and diving may contain valuable indications of their breathing under various circumstances. Naval Officer 3rd class F. A. J. de Boer, officer of the watch on board of H.M. «Piet Hein», on July 7, 1955, at the equator and 130° E during 38 minutes observed a leisurely swimming Sperm whale. Every two or three minutes the animal surfaced to breathe. The Sperm whale observed by the 2nd Mate of the «Beninkust» (V.N.S.) on September 5, 1956, at 07° N — 13° W on the contrary swam at high speed. As its oxygen reserve was exhausted in a shorter time, this animal produced a blast on the surface every minute. We may compare this to our own breathing, that too is accelerated when we speed up our pace.

The observation-reports contain many valuable descriptions of the manner in which whales surface

and blow. Undoubtedly Captain Peeters, master of the m.s. «Cistula» (Shell Tankers N.V.) furnished the most illuminating data. At about November 15, 1957, near Pointe des Galetes 50 miles off the coast, before the port of Reunion, a small whale swam around the ship at a distance of about 100 m. Thanks to his excellent photographic equipment and to a skill worthy of it, Captain Peeters succeeded in taking the beautiful series of photos on page 9 of the surfacing and the diving of the animal (fig. 13). «Its length was about 10 m.» he notes, and therefrom and from some characteristics clearly visible in the photographs it is possible to conclude that the animal was a Minke whale, a small relative of the big Rorquals, that occurs all over the world. For the big whalers it is too small fry, but it is caught in some places, particularly in Norway and Japan.

Of course every observation concerning the reproductive functions of the animal is of the greatest importance to whale research. This applies in the first place to mating, of which but very little is known. For more than a hundred years already whalers have told, that after a long introductory play, when the animals swim side by side or behind each other, they dive simultaneously and swim at each other at high speed. When they meet they shoot perpendicularly out of the water, their bellies turned to each other, and in that instant the mating proper takes place — the act itself taking as little time as in the case of cattle or deer. With a splash that can be heard at a great distance the animals fall back into the water. In 1951 two Japanese research workers had the opportunity to observe for three hours such mating behaviour in a couple of Humpback whales (fig. 14), and from their description it may be assumed that the behaviour observed by Captain J. Kerkhove and 2nd Mate H. Meyer («Muiderkerk», V.N.S.) at 27° S — 153° E in a couple of Humpbacks from a herd of 10 animals likewise was a mating. «Two animals repeatedly swam quite close together, later on they jumped more or less perpendicularly out of the water» they set down in their report. On September 25, 1955, similar behaviour was observed by Captain

P. G. van Altveer and Mr. G. A. Langeler in two unidentified whales at 18° S — 38° W. The description of Captain H. J. Stiekel, referred to hereinbefore, likewise indicates that he observed mating behaviour.

On May 25, 1956, at 09° N — 120° E 3rd Mate E. V. Jurg («Houtman», K.P.M.) noted that a Sperm whale he observed had a calf by its side, «swimming close to its mother». This confirms our surmises that in the northern Pacific the Sperm whale calves are born between May and August. Two observations of cows with calves, made by Messrs. L. C. L. Theunisse, A. G. Korteland and G. J. Alkema (s.s. «Esso», N.V. Petr. Ind. Mij.) on November 8 and 12, 1955, indicate that for calving the southern Humpbacks do not go only as far North as the Gulf of Aden, but even far into the Persian Gulf. When comparing these observations with the report of 1st Mate B. van Oss («Sirrah», Van Nievelt Goudriaan & Co.), who on October 24, 1955, encountered a herd of Humpbacks with their young off the South coast of Australia at 37° S — 125° E, we realize that the points of time at which different Humpback cows with their calves return to the South after their sejour in the warm waters may lie quite far apart. The Humpback with its calf observed by Captain H. J. Stiekel («Merak N», Van Nievelt Goudriaan & Co.) 10 miles NE of Fernando Naronha probably formed part of the southern population of the Atlantic Ocean. If this is the case, it proves that these animals from the South may likewise go far North in summer.

In the above notes we have but given some samples of the rich material of observations and descriptions that the Research Group has now at its disposal. May they give you a provisional impression of the importance of the material collected and may they be an incitement to continue making all kinds of observations on little navigated routes and making observations granting an insight into the biological functions of whales everywhere. The Research Group will always be glad to receive such observations, and hopes to be able in due time to inform you of the final conclusions of our research project.