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by L. A. Popov

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State of Coastal Walrus Rookeries in the Laptev Sea.

By L.A. Popov

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From: "Okhrana prirody i ozeleneniye" /Protection of Nature
and Planting of Greenery" No.3, 1960/.

The walrus is one of the representatives of the order of pinnipeds whose population has been considerably reduced in all its areas of habitation because of intensive hunting. The decrease in the walrus population is mainly observed on the shores of Canada, Greenland, Spitsbergen and Alaska. However, walruses living in the waters of the Soviet Arctic have not evaded the same fate, particularly in the areas around Novaya Zemlya and Franz Josef Land, where, starting with the second half of the previous century, walrus hunting was carried out intensely, first by the Norwegian hunters, then also by our hunters. The catastrophic state of the walrus resources lead to a prohibition of its hunting from shipside in Canada, Norway and America. In our waters the walrus was preserved in somewhat larger numbers, particularly in the eastern areas

of the Arctic, however, even here one cannot consider the stocks of this animal to be satisfactory. Therefore, in 1956, the Council of Ministers of the RSFSR has taken the decision on conservation measures of animals in the Arctic, according to which state hunting of walruses in the waters of the Soviet Union was totally prohibited and the hunting of this animal was only permitted to the local native population and to the hydrogeographical expeditions of the Glavsevmorput (TR: Main Northern Sea Route Administration) on licences.

A rational utilization of the stocks of any species of game animal, which keeps the numbers of the population at a sufficiently high level, can only be carried out as a result of a detailed study of the distribution of animals, of their biology (population composition, reproduction rate etc.) and of establishment of at least an approximate census of the population. We have such a picture for the walrus in the Kara Sea owing to the works of K.K. Chapsky, and for the Pacific walrus owing to the studies of L.O. Belopolsky, P.G. Nikulin and S.Yu. Freyman, but we still know very little concerning the distribution, biology and stocks of the walrus in the Sea of Laptev. No shipside hunting was ever carried out in this sea and the walrus was hunted exclusively by the local population.

Published information on the distribution of the walrus in the Sea of Laptev is limited to the work of K.K. Chapsky (1940), who because of insufficient material, presents only a very general review and almost completely avoids the problems of the distribution of coastal rookeries of walruses and their numerical characteristics. It is true, however, that more detailed descriptions, but only of certain coastal

walrus rookeries (Preobrazheniye Island, M. Proⁿchishcheva Bay) are contained in the works of V.N. Koshkin (1940) and of L.N. Popov /p.96 (1939)*).

As the basis of the present article we have used data collected during the author's voyages on hunting vessels in the Sea of Laptev in the years 1953 and 1954. We have investigated the coastal walrus rookeries in the western and the south-western parts of the sea and, furthermore, aerial reconnaissance was carried out in the southern part of the sea. In addition to the factual data we also collected questionnaire information, particularly from the eastern part of the sea; this information we obtained from polar pilots, vessel crews and local workers.

In the present article an effort is made to present an idea of the present distribution of coastal walrus rookeries in the Sea of Laptev and their numbers, data on the basis of which some measures for the conservation of the animal's population and for the regulation of hunting may be developed.

The Western and South-Western Regions of the Sea of Laptev.

B. Vilkitsky Strait. Concerning the B. Vilkitsky Strait G.L. Rutilevsky (1939), who overwintered on the Chelyuskin Cape from 1932 to 1933, informs us that the walruses here are found individually, in twos and in threes and occur here during most of the year. A.N. Tyulin**); in 1933 to 1934 he also recorded the presence

*) In the published diary of N. Begichev (Transactions of the Polar committee of the USSR Academy of Sciences, No.11, 1932) we also find data on the coastal walrus rookeries on the Begichev island (Editor's remark).

***) I am quoting according to K.K. Chapsky.

of individual walruses in the winter and spring seasons of the year. According to oral information from a participant in the expedition on the laboratory-ship "Rusanov", N.N. Kondakov, zoologist and artist, a coastal rookery of walruses numbering about 30 individuals was found at the end of August, 1932, somewhat west of the Cape Chelyuskin. The rookery was mixed in respect to sex and age. Numerous questionnaires collected by us from crews of hydrographic vessels and icebreakers indicate very rare occurrences of individual walruses in the strait. We encountered a solitary walrus in the water in the eastern part of the strait on August 28th, 1953; in 1954, while passing through the strait on August 21 and 22, we saw no walruses, in spite of the fact that drift-ice was observed here. Both our own observations and the questionnaire and published data indicate that the walrus is rarely found in Vilkitsky Strait.

"Komsomolskaya Pravda" Islands. Referring to oral information by Sinelnikov, K.K. Chapsky (1940) records that in the area of the "Komsomolskaya Pravda" Islands a group of hunters observed walruses during the winter and spring season. During the summer period, the walruses were found in this area by Pronchishchev in 1736 and by Amundsen in 1919.

According to information given by E.I. Shereshevsky, during the entire period of his observations (from the fall of 1934 to the fall of 1935), on the islands and on the adjoining coast no coastal walrus rookeries were observed. The walruses occurred in the water and on ice near the islands, but only individually. According to the questionnaire data, near the islands during summer the crews of hydrographic vessels encountered only individual

animals, but found no coastal rookeries. We observed this area from August 30th to September 3rd, 1954, when the ice was absent in the area of the islands. Regardless of detailed search we observed no walruses either on the coast, or in the water. In July, 1955, ^{the} schooner "Mayna" searched the area of the Bolshoy and the Volodarsky Islands, but found no walruses anywhere, even though there was ice in the area of the islands. Apparently the presence of coastal walrus rookeries on the islands of "Komsomolskaya Pravda" must be considered doubtful, although the walrus occasionally is found on the drifting ice when it migrates southwards to the area of its permanent rookeries. /p.97

Faddey Islands (The Southern, the Eastern and the Northern). Nansen (1956) reported encounters with walruses in the area of the Faddey Islands in September of 1894. Amundsen (1936) also found many walruses in the water in this area on September 14th, 1919. But they do not mention the presence of coastal rookeries on these islands. Neither do we find any such information in the literature published in recent years. We have observed a coastal walrus rookery on the Faddy^e (Southern) Island on August 23, 1954, when the sea was completely free of ice. On a pebble spit at the southern end of the island there were approximately 30 to 40 animals. On August 27th, when the vessel approached the island for the second time, the rookery had increased to approximately 60 to 70 animals. On the Faddey Island (Eastern) a rookery was located on 23rd of August, on a pebble spit at the southeastern end of the island and here we counted about 60 animals. On August 28th, the rookery increased to 90-100 animals. Later, on both rookeries the walrus

numbers remained constant. The age and sex composition of the rookery was heterogeneous: here were found adult males and females, immature animals of various age, yearlings and pups born during the current year. To determine the numbers of each of these groups we carried out visual observations for four hours. It turned out that in the observed group we found 18 (45%) sexually mature walruses and 22 (55%) sexually immature ones of various age. Sample shootings of the mature individuals indicated 55% females and 45% males. Among the sexually immature animals we found three recently born pups, five yearlings and 14 older animals.

We also searched the Faddey Island (Northern), but there we found no coastal rookeries.

Andrey Island. We have no contemporary published data on the presence of coastal walrus rookeries on the Andrey Island, although this area is a site of the usual habitation of walruses. On September 10th, 1953, we observed here several walrus families swimming. On a sand spit of the island were dead bodies of four walruses, three polar bears were wandering about nearby. There had been a coastal rookery prior to our arrival, but the walruses were chased away by an unknown ship. The existence of a small rookery was also confirmed by the presence of fresh walrus tracks on the sand. Inspector of the "Sevryba" trust, Y.I. Minkin informs us that on August 24th, 1954, a coastal walrus rookery was observed on the Morzhovaya spit. The rookery contained approximately 50 animals of various sex and age. At the same time, in the area north of the Andrey Island ($76^{\circ} 26'$ and $113^{\circ} 03'$) in the water he observed schools of walruses with a total number of about 350 animals. Several groups of walruses were observed by the schooner "Tyulen" on August 27, near

the Krestovy Cape, but there was no coastal rookery here.

The area of Pyotr Islands (Northern and Southern). In this area, on September 14th, 1919, Amundsen (1936) reported the presence of walruses on ice.

We have observed coastal walrus rookery on Pyotr Island (Northern) on September 4th, 1951. It was located along a sandy spit on the northern end of the island, and occupying approximately 500 square metres. According to approximate counts we found here from 130 to 140 walruses. All 18 killed walruses turned out to be males. This phenomenon is explained by the fact that, prior to shooting, the rookery was chased into the water by a polar bear. The bear was hiding in a sand pit behind driftwood timber (80 to 90 metres to the rookery), he was observing the walruses and, apparently, intended to attack them. On seeing people, the bear began to run directly towards the rookery. Females with pups and immature animals, who were lying closest to the water, rushed in great confusion to the sea and did not appear later on the shore.

/p.98

Adult walruses had also left the rookery, but after the departure of the bear they soon returned to the shore and took up their old places. Not far away from the rookery remains of a walrus-pup were found torn apart by a bear.

At a sand spit on Pyotr Island (Southern) schools and families of walruses were observed, on September 5th, with a total number of about 100 to 120 animals. The walruses stayed in the water and did not go ashore, which was connected to the fact that there were three polar bears on the spit. Apparently the animals had been lying on the shore, but were chased away by the bears. It may be assumed that also on this island there are coastal walrus

rookeries, but the numbers of resting animals cannot be accurately determined, since it is possible that some of the animals ^{were} / out of view when we were carrying out our reconnaissance.

The Maria Pronchishcheva Gulf. L.N. Popov (1939), who overwintered in the Maria Pronchishcheva Gulf, gives his observations of walrus, which he carried out during the years 1933 to 1936. Noting the presence of a permanent rookery at the entry to the gulf (in 1933 more than 400 animals), the author indicates that the numbers of the walrus population arriving here decreases every year after the beginning of intensive hunting. We have visited the gulf twice: once in the second third of September, 1953, and once at the end of August, 1954. In both instances we were unable to get close enough to the spit, because of fog, but we heard noises emitted by walrus lying on the shore. According to information supplied by comrade Blashkevich, inspector of the fishery inspection service, at the beginning of September, 1954, a walrus rookery was observed on the spit numbering about 30 to 40 animals. At the same time, approximately two nautical miles to the gulf, there was ice upon which walrus were staying in numbers totalling 50 to 60 head. On August 22, 1955, the vessel "Mayna" (according to the captain's report) discovered a coastal walrus rookery on the northern spit in front of the entrance to the gulf. There were only ^a few animals, approximately 20 to 30 head. Apparently the rookery was just beginning to form. We do not have concrete data on the numerical composition of the rookery in the Maria Pronchishcheva Gulf, but according to questionnaire information it is hardly greater than the rookeries on the Pyotr and Preobrazheniye Islands.

The area of the Preobrazheniye Island. The coastal walrus rookery on the Preobrazheniye Island was described for the first time by V.N. Koshkin (1940). This author points out that the greatest number of walruses constituting the rookery did not exceed 1300 animals in 1934 to 1935. The walrus rookery is located on a pebble spit at the southern end of the island. At the end of August, 1953, we observed here about 100 to 120 walruses. According to information supplied by persons overwintering at the polar station on the island, during the latest 5-6 years (i.e. starting with 1947), here a rookery was formed every year, but the number of arriving animals seldom exceeded 100 to 150 head. Thus, the size of the rookery, as compared to the years 1934 and 1935, has decreased considerably.

On September 5th, 1954, we observed, in the area of the Preobrazheniye Island, ice packed to gradation 4. Around the island itself stable ice was formed, but the walruses preferred to stay on the drifting ice in individual families. In 1954, the ice left the rookeries much later, than in 1953. It stayed for a longer time in the southwestern part of the sea. In August, here and on the ice-floes, very few walruses were seen. A fishing-boat from the Khatanga fish factory encountered during the period from June 30th to August 28th, on ice and in water only 11 walruses (the area of the northern and northeastern part of the B. Begichev Island and in the strait between the B. Begichev Island and the Preobrazheniye Island, also to the north-east of this island). We approached the Preobrazheniye Island for the second time on September 9th, but again there was stable ice at the shore and no coastal rookery was observed. Apparently, the walruses got ashore considerably later, when the stable ice had disappeared.

The area of B. Begichev Island. A coastal walrus rookery on the B. Begichev Island was discovered for the first time in 1908 by the famous polar traveller and hunter N.A. Begichev. There were many walruses at the rookery, the animals were unafraid and permitted people to come right up to them. In 1934, V.I. Koshkin* reported the discovery, by hunters, of a coastal walrus rookery near the Medvezhy Cape on the same island (770 to 800 animals). From the material kindly given me by S.K. Klumov it appears that the Hero of the Soviet Union pilot M.T. Slepnev, on September 1934 observed coastal walrus rookeries on the southern coast of the island. The greatest rookery located opposite Nordvik Cape contained approximately 400 to 500 animals. The other five rookeries (100 to 200 animals each) were located to the east of the first one and were arranged along the shore close to each other. We studied the B. Begichev Island (northern part) on September 7th, 1953. No coastal walrus rookery was observed on this part of the island, but several walrus families were swimming in the water. However, when the island was visited by ^A fishing-boat of the Khatanga fish-factory (according to the captain's information) on the eastern side of the island a rookery was observed with approximately 40 walruses. In 1954, at the end of August and beginning of September the fishing-boat sailed around the island, but observed no walruses on the shore. Stable shore ice was here at that time. Apparently, just as on the Preobrazheniye Island, the stable

*) I am quoting according to K.K. Chapsky (1940).

ice inhibited the formation of a rookery and the walrus preferred to stay in the open sea or on drifting ice floes. Insofar as we were able to determine from questionnaire data, in certain years the rookery on the B. Begichev Island may be somewhat larger than recorded by the fishing-boat in 1953, but, evidently, the numbers only slightly exceed 200 to 300 animals.

We have no published data on the presence of coastal rookeries on the Malyy Begichev Island. Observing the island on September 9th, 1954, from airplane, we found no rookery either.

The Peschany Island. Neither the old nor the contemporary literature mentions or describes any walrus rookeries on the Peschany Island. Apparently the remoteness of this island from the continent contributed to the preservation of walrus numbers, while on islands located closer to the continent the walrus were subjected to more intensive hunting by local hunters. Walrus rookery on the Peschany Island was, apparently, discovered in the Post-Revolutionary period, when extensive operations were initiated for the development of the Northern Sea Route. The earlier numbers of walrus on this island are unknown. It is also possible that walrus from other rookeries located closer to the continent moved to this island, although no reliable data are available on this question.

On September 3rd, 1953, we observed on this island two rookeries of walrus. One of the rookeries was located south of the lighthouse along the edge of the sandy shore of a small lagoon. In addition to the walrus lying on the shore, a small number of them was observed in the water near the rookery.

The second rookery was located north of the lighthouse and occupied a narrow strip along the shore. In 1954 there was only one coastal rookery which was formed somewhat later than in 1953. At the end of August and in the beginning of September, coastal stable ice appeared near the island. The fishery-boat of the Khatanga fish factory approached the island in mid-August and on September 5th, but observed no walruses. Pilots on ice reconnaissance flew over the island on 6th and 7th of September, but neither did they see any walruses. On September 9th, while on a reconnaissance, we discovered the beginning of the formation of a rookery. There was no more stable coastal ice, and the walruses were observed in considerable numbers on the shore and in the water within the rookery area. Approach of walruses from the northeast, i.e. from the direction of the open sea, was also observed. On September 12th, having approached the island on a schooner, we observed walruses on the edge of a lagoon. The second rookery (north of the lighthouse), which we observed in 1953, was lacking this time. /p.100

Both the first, and the second rookery were mixed in age and sex composition: besides adult males and females, there were immature animals and pups born during the current year. A definite pattern was observed in the arrangement of the animals. Females with pups and yearlings were located closest to the water, then came the immature animals of any age and farthest away from the shore were the adult males. The walruses were lying densely together, they rarely went in the water, and were apparently tired from the distant migration from the north.

In 1955, the ice left the islands much earlier, nor was it observed in adjoining areas, and by August 23 the schooner "Mayna" recorded

here a considerable walrus rookery.

The walruses appear in the region of the island in the last 10-day period of August. Presence of drifting ice and of stable coastal ice delays the exit of walruses to the rookery. The earlier the ice disappears in the rookery area, the earlier the walruses emerge on the coast. The animals usually leave the island in the first ten days of October, a phenomenon connected with the formation of the coastal stable ice and with the appearance of drifting ice.

Southern sea coast. We have no information on walrus rookeries in the areas of the Nordvik Peninsula, Anabar Gulf, continental areas between the Anabar Gulf and the Olenek river, and to the east of the Olenek river. K.K. Chapsky (1940) refers to Otpushchennikov, who reported the presence of a coastal walrus rookery on the Cape Pax (area of the Nordvik Bay). Numerous observations, both by polar travellers and by local inhabitants, indicate encounters with rare individual walruses in this area in various seasons of the year. Aerial reconnaissance carried out by us on September 9th, 1954, showed there were no rookeries in the areas of Nordvik Peninsula, Anabar Bay, coastal area between the Anabar and the Olenek Bays (Cape Iygal, Cape Terpyay, Cape Tumus, Salkay Island) the estuary of the Olenek river and the Olenek channel, nameless islands in the western part of the delta of the Lena River, nameless sand spits (south of the Samolet Island), the Samolet Island, the Aerosyomka Island. On the basis of existing published material and from old and contemporary questionnaire data we may conclude that there are no coastal walrus rookeries in this area.

K. Chapsky (1940) writes on the coastal walrus rookeries in the central part of the delta of the Lena River, referring to the information supplied by Otpushchennikov and Shtertser. Thus, in 1934, walrus rookeries were observed on the Sagastyr Island and on adjoining small islands (Dunay, Matvey and others). K.K. Chapsky (1940) quotes A.A. Romanov, who in the same year observed walruses on the Erkogor Island. Belousov (1953) reported that in 1951, in the estuary of the Tumatskaya channel in the Lena River, in the area of the Kuba and Dunay Islands a considerable walrus rookery was observed. The author gives no information on the numbers of animals in the rookery. According to the data of the associates of the Yakutsk Branch of the All-Union Research Institute for Lake and River Fisheries (written information by A. Pnev) the coastal walrus rookery is located on a sand spit 7 kilometres from the Kuba Island. The length of the sand spit during the ebb time reaches 5 kilometres, during flood time, 3 kilometres; the width of the spit during the flood is from 150 to 200 metres, and during the ebb, one kilometre. The walruses usually arrange themselves in the northern and in the northeastern parts of the spit; they appear here in the first half of August and depart at the end of the last third of September and in the first half of October. The age and sex composition of the rookery was mixed. Local hunters claim that at the beginning the main bulk of the rookery consists of mature and immature females, the adult males arrive here somewhat later. Thus, in 1952, in the period ranging from August 21 to September 4, the rookery consisted mainly of females, but after September 10th, the males began to appear. In 1951, about 700 walruses were present at the rookery; in 1952 the maximum

accumulation of walrus reached 500 animals. However, flying on September 9th, 1954, over the area of the Kuba and Dunay Islands, we did not observe any rookeries. It is possible that at the moment of our overflight they were chased into ^{the} water by local hunters. Pilots of the ice reconnaissance serving this sector of the Sea of Laptev confirm the presence of coastal walrus rookeries in the area of the Kuba and Dunay Islands.

There are no actual data on the presence of coastal walrus rookeries in the southeastern area of the sea (from the Gulf of Buor-Khay to the Laptev Strait) in the possession of the author. No reference to published data is available either. Data of hydrographic expeditions and aerial ice reconnaissances indicate only encounters with individual walrus in the water or on ice; it may be assumed that coastal walrus rookeries are absent in this area.

Eastern part of the sea. We have information supplied by P.N. Otpushchennikov and P. Skvortsov* on the coastal rookeries of the walrus in this part of the sea. The former mentions walrus rookeries on the Kotelny Island, but gives no data on the numbers of the animals in the rookeries. The latter author records ^{the} presence of a coastal walrus rookery on the Belkovsky Island and indicates the numbers of lying animals as approximately 200 walrus. On this area we also have data received from the Yakutsk Branch of the All-Union Research Institute for Lake and River Fisheries, which were compiled on the basis of reports from expeditions, as well as information

*) I am quoting according to K.K. Chapsky.

from the Lyakhov Commercial Hunting Station and from questionnaire data of the employees at the northern fish-factories. These data permit us to answer approximately the question of the quantitative composition of the existing coastal rookeries.

In the archipelago of the New Siberian Islands, coastal walrus rookeries are known on the Kotelny and the Belkovsky Islands. According to the information supplied by the hunter A. Kuchiisty of the Lyakhovskaya Commercial-Hunting Station, who operated in these areas from 1952 to 1954, the rookery on the Kotelny Island is located on the Anisiy Cape. The maximum amount of animals lying here was determined to be from 220 to 250 head. The walrus arrive August 15th to 20th and stay on the shore for 30 to 40 days. The rookery is located on the spit of the cape, the width of which is approximately 500 metres and the length about 5 kilometres. The walruses arrive from the north, north-east and emerge on the eastern shore of the cape. The lowest number of walrus observed in these years was 40 to 60 animals.

On the Belkovsky Island ^{there} is a small rookery numbering a few tens of animals. It is located on a narrow pebbled shallows, the length of which is approximately one kilometre. In 1951, the walrus did not stay on the island.

According to information from local hunters and according to data of the ice reconnaissance service, the walrus rookeries are absent from the Bolshoy and Maly Lyakhovsky Islands, from the Bunge Land, from the Faddeyevsky, Stolbovoy, Semenovskiy Islands. It has not been established whether there is a coastal walrus rookery on the Novaya Sibir Island, and in particular on its southeastern coast.

CONCLUSION

We come to the conclusion, on the basis of the discussed material, that in the summer and fall period in the Sea of Laptev, permanent coastal walrus rookeries are formed in three main areas (see map).

1. In the west and south-west on the coastal area and the islands of the eastern shores of the Taymyr Peninsula (Faddey, and Pyotr Islands, Maria Pronchishcheva Bay, Preobrazheniye Island, B. Begichev Island and Peschany Island). Without fear of making a serious mistake we can say that in this area of the sea there accumulate up to 70-80% of all the walruses staying in this period of time on the coastal rookeries of the Sea of Laptev. /p.102

2. In the south (the central part of the delta in the Lena River) the areas of the Kuba and Dunay Islands ^{are} where several hundreds of walruses rook.

3. In the east is the archipelago of the New Siberian Islands (Kotelny, Belkovsky Islands), where the rookeries are few in number; on the Belkovsky Island accumulate only a few tens, and on the Kotelny Island the maximum accumulation observed is 200 to 250 animals.

In the areas of the Nordvik Peninsula, Anabar Gulf, Cape Iygay, Terpyay-Tumis, Salkay Island, estuary of Olenek River, Olenek channel, nameless islands in the western part of the Lena delta, nameless sand spits (south of the Samolet Island), Samolet Island and Aerosyemka Island, the coastal walrus rookeries are absent. Only individual encounters with walrus in the water and rarely on ice are recorded here.

No coastal rookeries were recorded in the areas of the Buor-Khay Gulf, Yansk Bay, Dm. Laptev Strait, Great and Small Iyakhov Islands, Bunge Land, Faddey, Stolbovoy, Semenov Islands. It is possible that coastal rookeries existed in these areas earlier, but have disappeared as a result of hunting. Unfortunately, there are no factual data available on this question.

The walruses arrive at their coastal rookeries every year and place themselves on definite sections. However, in some years the numbers of arriving animals are different; only intensive persecution or almost complete destruction of a population forces the walruses to leave "their" sections behind and shift to other locations. On rookeries located in the area of polar stations the walruses are disturbed both by men, and dogs, but nevertheless, the walruses arrive every year to their sections (Preobrazheniye Island, M. Pronchishcheva Bay). Such an attachment of the walruses to their rookery site is explained, apparently, by the presence of the food base, by the historically created migration routes of the walrus populations to one or another area, by the ecology of the animals and by other causes. As a rule, in the areas of rookeries studied by us was found a rich bottom fauna, the base of which consisted of molluscs and other invertebrates. Most

probably favourable conditions for the development of this fauna are created on grounds with grey silt mixed with sand^{and} pebbles. It has been established by observations that walrus usually feed at shallow depth and close to the shore. It was noted that the feeding walrus concentrated in definite spots, a fact evidently connected with a concentration of bottom organisms. Ordinarily this was observed in areas of small bays, lagoons, curved spits, i.e. in places protected from the winds. All the described rookeries in the Sea of Laptev are found on sand or sand-pebble spits on the islands and in sections of sea shore. The walrus prefer to lie in locations protected from the winds, but low shores of the islands, particularly of the sandy ones, give poor protection to the animals against the effect of the wind.

The time when the animals emerge on the coastal rookery depends on the ice situation in the particular sea area. In ice-abundant years, when the coastal ice and the drift ice remain longer near the shore, the emergence of walrus on the shore is delayed. The walrus prefer to lie on the ice and move ashore only when the ice disappears. If drifting ice is absent, but the stable ice remains at the shores, then the walrus prefer to stay in the water, and only when the coastal ice disappears do they emerge on the shore. Thus, in 1954, in the sea areas, where both the stable ice and the drifting ice were absent (Faddey, Pyotr and Andrey Islands), the walrus began to emerge on the rookeries starting with the second half of August. In the areas where the coastal stable ice and the drifting ice remained (Peschany, Preobrazheniye and B. Begichev Islands) the formation of the rookeries began only from the moment the ice disappeared, and the first groups of

walrus began to emerge on the rookeries only on 8th or 9th September (the Peschany Island). No rookeries were observed prior to the 11th of September on the Preobrazheniye and Begichev Islands. In 1953 and in 1955 the ice left the shores considerably earlier, and by the second half of August the rookeries began to be formed on these and other islands in the western part of the sea. Thus, the approach of the walrus to the rookeries is connected, if not completely, then partly with the liberation of the sea areas from the ice, and consequently the earlier the ice disappears, the earlier will the rookeries begin to form. In years of average ice the beginning of the rookery formation starts between the 15th and 20th August. The formation of the rookeries is completed by mid-September. The latest approach of walrus from the sea was observed in 1953 on September 3rd, ^{and} in 1954, on September 15th. The walrus remain in the rookeries for 1.5 to 2 months, and by the middle of October, when the first ice appears, they move onto it.

In the summer and fall period the walrus in the Sea of Laptev form coastal rookeries of mixed type. The rookeries consist of adult males and females, of immature individuals of various ages, yearlings and newly born pups. For the determination of the percentage ratios of various age-sex groups on the seal rookeries the method of analysis of shootings is generally used. This method, based on a study of a considerable number of animals, gives fairly accurate results, since during the hunting season animals of all age groups are killed.

The situation is different when one studies the age-sex composition in the walrus rookeries. Prior to the prohibition of walrus hunting, the hunters shot exclusively adult, large animals, which were basically males. It is

quite natural that an analysis of such shootings could not give any true ratio between various age and sex groups in the population. Therefore, ^{the} only /p.104 method remaining is that of direct observation. Such a method is only applicable in small rookeries, because in large accumulations of walrus, it is difficult to count the numbers in one or another group, owing to the very dense arrangement of animals in the rookery. As pointed out earlier, we were successful only once in observing, for a period of several hours, a small walrus herd when it remained in quiet state. The observations have shown that out of 40 counted walrus, mature males and females constituted 45%, and the immature ones of both sexes and all ages, 55%. In the mature group, according to the data of shooting, there were 55% males and 45% females. In the group of immature walrus we observed 14 animals of various ages, 5 yearlings and three newly born pups, i.e. of the total number of immature ones there were 63.6%, 22.7%, and 13.7% respectively. On the Faddey Island (Eastern) of the total number of animals (approximately 60 head), there were six, i.e. 10%, of those born in the current year. On other rookeries a small number of pups was likewise observed.

When summing up the observations on all the rookeries, we may say that the pups of the current year constitute hardly more than 15% of the total number of walrus in the population.

In the southern and in the eastern parts of the sea the rookeries are rare, and only an insignificant number of animals stays here. At the present time we are unable to give a more or less accurate determination of the numbers of the entire population of the walrus in the Sea of Laptev, but even the presently available information indicates an unhealthy state of the

stocks. Apparently, under effect of local hunting of walrus practised here since olden days, the total number of the population is slowly decreasing, on the coastal rookeries, a phenomenon clearly observed at individual rookeries where the walrus were hunted more intensely (rookeries on the Preobrazheniye Island, in the M. Pronchishcheva Bay and others).

As we know, the reproduction rate of walrus is very slow. A clear example of this are the results of our reconnaissance in the area of Novaya Zemlya, which we carried out in 1952. Shipside hunting of walrus in this area has not been carried out since 1934, and it seems that the almost twenty-year-long protection (if we do not consider the small amount of hunting carried out by the local population) would have contributed to a considerable increase in the number of animals, however, the very first survey of the coastal rookeries at the northeastern end of Novaya Zemlya, carried out in the years 1953 to 1955, demonstrated that this had not taken place.

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