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This collection of articles contains the materials from the Third All-Union Conference about Marine Mammals. Studied are the questions of the biology, morphology, hunting and processing technology of the economically valuable marine mammals - whales, seals, fur-seals and others.

The book is intended for the use of zoologists, students of the Faculties of Fisheries in the Technical Schools and "VUZ" - Higher Education Establishments and practical workers of the Fisheries.
Editorial staff:

Arsen'ev V.A., Zenkovich B.A., Chapskiy K.K.

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* Erignathus barbatus nauticus.

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UDK 599.51

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Whales, their hunting in the Arctic waters and the northern parts of the Pacific Ocean and the considerations about the conditions of their reserves. (Kity, ikh promysel v vodakh Antarktiki i severnoi chasti Tikhogo okeana i sobrazhenia o sostoianii zapasov). Z e n k o v i c h B.A. "Morskie mlekopitalushchie, 1969, Publisher "Nauka".

The contemporary whale-fishing industry uses nearly all of the convenient places of the World Ocean, but the most important fishing (with the expenditure of great effort and resources) is in two places : in the waters of the Antarctic and the northern part of the Pacific Ocean. In both regions there is a coastal and pelagic whale-fishing industry.

The herds of whales are significantly depleted here, for this reason there is complete prohibition of fishing of the Blue whales (Balaenoptera musculus L.) and the Humpbacked whales (Megaptera nodosa Bonn.), whose herds are in an especially poor shape. The population of the remaining whalebone whales and sei whales diminishes every year, on account of this it was proposed to put limits on the hunt of any kind of whales. These limits for the Antarctic are: finners - about 1800 head , sei whales - about 2000 head a season.

It is recommended to hunt cachalots in the cold zone of the Ocean only, which ensures the protection of the reproducing part of the herd, because only the large, superfluous to the herd, males go to the cold waters. Minimal size of the hunted cachalots should be 1250 cm.

It is necessary to organize a complex scientific expedition of many years duration for the study of whales in the cold and the warm zones of the World Ocean. This expedition should study also the other biological resources.

Fig. - 10

UDK 599.745.1

International Coordinated Research on Fur Seals.
(Mezhdunarodnye koordinirovannye issledovaniya po morskim kotikam).
A r s e n ' e v V.A. "Morskie mlekopitalushchie", 1969,
Publishing House "Nauka".

The work describes the organization of the International Commission on fur seals, it presents the

goals of the Convention ; and enumerates the questions which should be studied by all countries taking part in the Convention. It briefly gives the basic results of the coordinated studies which were carried out during the first six years of the Temporary Convention for the preservation of fur-seals in the northern part of the Pacific Ocean. Then it points out the recommendations which were made by the Commission for the preservation of the fur-seal herds and maintenance of a maximum level of harvest.

Tables - 7.

UDK 591.615

Questions about the protection and regulation of the marine mammals industry in the waters of the USSR (Voprosy okhrany i regulirovania promysla morskikh mlekopitaiushchikh v vodakh SSSR).

V a v i l o v Iu. A. "Morskije mlekopitaiushchie", 1969, Publishing House "Nauka".

For the purpose of a rational way of hunting marine mammals the USSR has established a number of regulations for this industry and the protection of the animals.

It is presently forbidden to hunt sea-otters anywhere. In order to further the increase of their herds this prohibition should stay. The question of acclimatization of the sea-otters in Murman is still premature. In the first place it is necessary to decide whether or not this reacclimatization is advisable. The measures for the protection of sea-otters have biological basis and further the growth of their numbers. In 1966 (besides general limits) we established an obligatory limit for the hunt of five-year old males. This kind of limitation should be continued in order to lower the numbers of the adult males.

For the rational utilization of "sivuch" - Eumetopias jubatus - it is necessary to regulate its hunt and decide the question of the realization of its production. There are no measures taken as yet for the regulations of hunt on the "akiba" - (Pusa hispida krascheninnikovi), "larga" (Phoca largha), "lakhtak" (Erignathus barbatus nauticus), "krylatka" (Histiophoca fasciata). There are no data on their numbers. Increase in the production from catches of the Far East seals is possible only through

the development of the "larga" industry, reserves of which are not sufficiently used. For the protection and the increase in population of walrus it is necessary to keep the limits of its hunt around 1100 head for the needs of the aboriginal population of Chukotka. White whale industry is developed insufficiently. There is no scientific research about the white whales. Grey whale hunt is permitted only to the aboriginal population for their needs.

The Ministry of Fisheries of the USSR established temporary rules for the use of the Baikal seals and the new rules are under study.

From April 1966 hunt for dolphin in the Black and the Azov Seas has been completely stopped. Bulgaria and Rumania also discontinued their hunt.

In spite of the great value of its fur, the Ladoga seal industry is not sufficiently developed. GosNIOR-Kh * should initiate research into it.

To better the organization of the marine mammals industry it is necessary to enlarge the scientific research about their biology and the improvement of the methods of their hunt.

UDK 599.(591.112)

About the blood supply of the valves of the heart in some marine mammals. (O krovosnabzhenii klapanov serdtsa u nekotorykh morskikh mlekopitaiushchikh). S o k o l o v V.V. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

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The examinations of 55 heart specimens from the adult individuals of 3 species (Caspian seal, common dolphin and bottlenosed whale) showed that there are bloodvessels in the atrioventricular valves, in the valves of aorta and the pulmonary trunk of the heart. Atrioventricular valves are supplied with blood significantly better than the aorta valves and the valves of the pulmonary trunk. On the whole, the valves of the dolphin's heart are vascularized better than those of seals.

* GosNIOR-Kh - State Institute for the Scientific Research of the River and Lake Fisheries. (Gosudarstvennyi nauchno-issledovatel'skii institut ozernogo i rechnogo rybnogo khoziaistva).

In the valves of the seal's heart and in those of dolphins is situated a rather dense network of bloodvessels; there are some relatively wide venous bloodvessels, which, apparently, serve as a well developed depot for the blood.

In dolphins the atrio-ventricular valves have arterio-venous anastomoses and a significant quantity of the bloodvessels were found in the region of the adjacent lateral edges of the crescent valves of the aorta and the pulmonary trunk.

In bottlenosed whales, which dive to the considerable depths, the vascularisation of the folds of the valves is more intensive.

Bibliography - 15 names, Fig. - 4.

UDK 599

The influence of "Tsunami" on the Urup's population of Sea-Otters. (Vliianie tsunami na urupskuiu populiatsiiu kalana).

V o r o n o v V.G. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

During the winter - spring period of 1964 there was a sudden disturbance in numbers and great loss to Urup's population of sea-otters, directly or indirectly influenced by "Tsunami". The animals were dull, wasted, did not react to the approach of people. In the daytime they rested in atypical for them coastal grounds, crowded into dense groups, using uncusomary

shelters, feeding close to the coast, getting their food in ways unusual for them. Excrements of the animals contained remains of foods usually not eaten by them (small mollusks Thais lima, sea roaches). On one quarter of the littoral were found about 150 dead animals, which had signs of a strong emaciation, rubbed sore paws and the tips of the noses; some were strongly infested with helminths. Factual data affirm the catastrophic disturbance of the coastal biocoenosis and the extermination of coastal fauna.

In addition to the destructive action of the "Tsunami", in the opinion of the author, they have some positive points, forcing the animals to the active migration.

Bibliography - 3 names, Tables - 1, Fig. - 2.

UDK 599.745 (591.473)

Characteristics of weight in the locomotion muscles of Pinnipeds.
(Vesovaia kharakteristika myshts organov dvizhenia lastonogikh).
S o k o l o v, A.S. "Morskie mlekopitaushchie", 1969,
Publishing House "Nauka".

Functional muscles of the same name in walrus, "sivutch" (Eumetopias jubatus), "lakhtak" (Erignathus barbatus nauticus), "larga" (Phoca largha), "krylatka" (Histiophoca fasciata) and "akiba" (Pusa hispida krascheninnikovi) differ significantly in their weight, which is taken as the index of their relative strength.

The highest relative weight of the musculature of the extremities is found in "sivutch", lesser in walrus, still lesser - true seals. Muscles of the front fins are heavier than those of the back ones: in "sivutch" 8-fold, in walrus - 4-fold and in true seals - 2-3 fold. The development of the muscles in fins is related to the character of swimming in the representatives of these three different families, and is reflected in the proportions of their bodies. The superficie of the front fins of "sivutch" is equal to the superficie of the crosscut of its body; of the walrus - half of it and in seals is equal from 26 to 35% of it. The body musculature of "sivutch" and walrus is 3 - 5 times weaker than that of seals, in whom it reaches the weight of the muscles of the extremities or even exceeds it. Back muscles are the strongest in "krylatka", the weakest - in "akiba".

In the front extremities of "sivutch" the largest muscles are those which move the fins during swimming, in true seals the most developed muscles are those which jointly with the body musculature move the body sideways and the back fins. In the back extremities of "sivuch" and walrus stronger muscles are in the coxal and the ankle articulations and in the true seals - muscles of the wrists and phalanges.

The difference in power of the musculature of the locomotive organs could be explained by the concrete conditions of life of each of the species.

Bibliography - 9 names, Tables - 9.

UDK 599.745.3

About the craniological characteristics of the bearded seal* from the Bering Sea. (K kranilogicheskoi kharakteristike lakhtaka Beringova moria). K o s y g i n G.M. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

After a brief survey of the literature on this question in the article gives data about the quantity of the materials collected and shows methods of its processing. Further on it gives a rather detailed description of the sizes of skulls of bearded seal from the Bering Sea, and also the sizes of the separate parts of the skull. At the same time it gives comparative data about the characteristics of craniums of the bearded seal from the Pacific and the Atlantic Oceans. As the result of the analysis of a large volume of materials, it is concluded that the descriptions of two subspecies of bearded seal are sound.

At the same time the author concludes that the morphological differences between the separate populations of bearded seal in the Far East are not present.

Bibliography - 18 names, Tables - 3, Fig. - 5.

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UDK 675.02(599.745.3)

Technological characteristics of the Greenland seals and the hooded seal and the improvement of the technology for the extraction of fats from the subcutaneous layer of blubber from these seals.

(Tekhnologicheskaya kharakteristika grenlandskogo tiulenia i khokhlacha i sovershenstvovanie tekhnologii vyrabotki zhira iz podkozhnogo sala etikh tiulenei). M o r s h t y n M.I. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The Greenland seal and hooded seal are characterized by their weight, thickness of the subcutaneous layer of blubber and the proportion in it of fat and water, which depends on their sex, age and the season of the catch. Given are some data about the indexes of fats extracted from the subcutaneous layer of the abovementioned seals: the value of iodine numbers, saponification number, content of non saponifiable substances, specific weight, coefficient of refraction, acidity numbers. It is shown that in fats of the subcutaneous tissues of seals there are small amounts of

* "lakhtak" - Erignathus barbatus nauticus.

non-saponifiable substances (0,3 - 0,7%) and the values of iodine numbers and the saponification numbers vary within significant limits even in fats extracted from the subcutaneous tissues of seals belonging to the same age group.

A formula is suggested for calculation of the viscosity of fats through the range of temperatures from 3° to 100°, which is very important for the calculation of sizes in piping and the fat processing machines.

A technological set-up is worked out for the extraction of fats from the subcutaneous blubber of seals, the basic operations of which are cutting up of the blubber and its centrifugation. The trials of this set-up in an experimental environment, which was installed in Laika fat factory of the Arkhangel'sk Fish Processing Plant, have shown that the amount of fats extracted from the white whale and the adult seal is about 97% of its content in the raw material (blubber). With the presently used methods (melting), it is possible to obtain only about 87%.

The advantages of this new method consist of a possibility for line production and continuity of the process, which ensures a significant increase in efficiency, mechanisation and the possibility of its automatization. A very important factor is the compactness of the installation, which with the same efficiency requires 4 times less space than a plant for rendering fats by melting, as it is done in the presently operating installations.

Bibliography - 10 names, Tables - 5.

UDK 599.745

Composition and placement of the females of fur seals on the harem grounds of the Tiuleny Island. (Sostav i razmeshchenie samok morskikh kotikov na garemnom lezhbishch' ostrova Tiulen'ego). B y c h k o v V.A. "Morskie mlekopitaiushchie", 1969, Publisher "Nauka".

In the article is described the composition of the herd and placement of the marked females of the fur-seal on the harem grounds. It is shown that on the Tiuleny Island a part of the females start reproducing from the age of three years, and in July the basic population consists of local animals of 4 years and over. The approximate ratio of intermixing of females of different origins on the harem grounds of Tiuleny Island is 96:2:2%.

Further it is noted that the females are relatively

little conservative about the choice of a place, as it was observed that some females moved from one part of the grounds to another.

On the basis of these data it is concluded that the fur-seal herd of Tiuleny Island reproduces mostly from the females of the local populations. For the conservation of normal reproduction it is recommended to protect the natural way of life of these animals on the harem grounds during the period of their reproduction.

Bibliography - 14 names, Tables - 4, Fig. - 6.

UDK 599.745.3 (551.46)

Relative index and possible factors in the mortality of the "krylatka" (Histriophora fasciata) from the Bering Sea. (Otnositel'nyi pokazatel' i vosmozhnye faktory smertnosti beringovomorskoi krylatki). S h u s t o v , A.P., 1969, "Morskie mlekopitaiushchie", Publishing House "Nauka".

The author points out that the material for the article came from the examination of 2670 seals. The work went on for 5 years. The relative index of natural mortality was calculated from the difference between the numbers of the neighbouring age groups present in the catches of subsequent years. It was noted that at the ages from 2 to 10 years the decrease is equal to 16.5% and from 10 to 20 years - 14.9%. In the article are enumerated possible causes of mortality of seals, to which are attributed deaths from enemies, from helminth infestations and from the unfavourable environment. It is assumed that because of a relatively high mortality (natural and through the industry), seals do not live up to the limit of their life span.

Bibliography - 14 names, Table - 1, Fig. - 2.

UDK 599.51.

Some data about the biology of the Grey Whale. (Nekotorye dannye po biologii serogo kita). Z i m u s h k o , V.V., "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The material was collected during the period of Summer - Fall 1965 and July - August 1966 on the collective farms of the Chukotka National District. Grey Whales from the California - Chukotka herd were studied.

Testes of 29 males were studied to determine their length at sexual maturity. It was noted that the weight of the testes starts increasing markedly when the length of the whale reaches 11 m. Histological analyses were also done. On the basis of size, weight and histological data, the author comes to the conclusion, that the Grey Whale males reach maturity when their length is about 11.5 m.

Among mature females of the Grey Whales were included those individuals which had an embryo in the uterus (or at least some traces of the corpus luteum on the ovaries). Inspection of the ovaries of 34 females showed that a marked increase in weight (and size) occurs when the length of females reaches 12 m. In the individuals in sizes from 12.1 to 12.5 m. on the ovaries were seen traces of 1 to 4 corpora lutea.

Proceeding from the available data, it is assumed that the females of the Grey Whale reach maturity when their body length reaches about 12 m. It is necessary to gather some additional materials for the purpose of a more complete characterization of these questions.

By analysing the composition in size of the number of caught whales and by comparing these data with the data found in the literature, it is considered that the condition of the herd is getting better and their numbers are on the increase.

Bibliography - 20 names, Tables - 2, Fig. - 2.

UDK 675.02 (599.745)

/334

Initial treatment and conservation of the fur-seal skins on the fishing ships and the coastal stations. (Pervichnaia obrabotka i konservirovanie mekhovykh shkur tyuleney na zveroboiynykh sudakh i beregovykh punktakh). I a k o v e n k o M. Ia. 1969, "Morskoe mleko i mlekopitaiushchie", Publishing House "Nauka".

The article is dedicated to the problems of the improvement of the technology for the initial treatment of seal-skins, which are a valuable raw product for the fur industry.

In a series of experiments tests were made on a method of defatting skins by washing them in water with the addition of the paste "Novost" at +40 C, but this method turned out to be of little use.

Therefore it was decided to create a special antioxidant which would protect the skins from the oxygenation of fats that had gotten on the fur side. Trials were made on the effects

freezing and subsequent defractation on the quality of skins.

On the fishing ships and the coastal stations were prepared 17 experimental lots, having more than 20 skins of the Greenland seals and hooded seals. These were treated by different methods of initial processing and preservation.

From the results of these experiments it was established that:

- 1) Defatting of the raw skins is more effective if they are rolled in drums filled with sawdust of pine or deciduous trees.
- 2) Treatment of skins from which the fat was scraped away with the antioxygenator "Pinol" and preservation of them by salting gave good results. This treatment is the most acceptable on fishing ships and coastal stations.

3) The combination of treatment of skins by rolling them in drums filled with sawdust and then with "Pinol" before salting them could only increase the effects of protection of their natural qualities for a longer period of time.

4) During the seal hunt, for the purpose of bettering quality of the raw material, attention should be paid to all the stages of primary treatment and preservation of the skins, which are a valuable raw product.

UDK 599.745

Questions about the protection and settlement of Sea-Otters on the Kuril Islands. (Voprosy okhrany i rasselenia kalanov na ostrovakh Kuril'skoi griady). N i k o l a e v, A.M. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

Contains a brief account from the literature about the sea-otter industry, about the attempts to regulate it in the recent past, gives estimates about the present population (3.5 - 4 thousand) and describes its distribution on the Kuril Islands. There is a relatively small part of the coast, on which there are no sea-otters. The author is against artificial acclimatization and re-acclimatization because he believes that sea-otters would settle naturally as their population increases. To speed up these processes, he recommends measures of protection directed towards the creation of more favorable conditions for increase of their herds.

Bibliography - 10 names.

UDK 599.745

Questions about the rational use of the herds of Kuril Sea-Otters. (Voprosy ratsional'nogo ispol'zovania pogolov'ia kurilskikh kalanov). N i k o l a e v, A.M. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

Noting some measures for limiting the industrial hunt of sea-otters but used at the end of XIX century, which did not give any real results because of poachers and high quotas allowed for hunting, the author develops the idea of the "stage" development of industrial hunting of the Kuril sea-otter population from the systematic collection of the skins of dead sea-otters to experimental killing, and from there to a rational industry. The method of selection recommended by Marakov for the Komandorskiye Islands was found unfit for the Kuril conditions.

For the collection of skins of dead sea-otters - it is recommended to set up inspection posts, make use of aviation and strengthen material stimulus. One of the important factors for the economical use of sea-otters is thought to be a yearly inventory of the livestock; and the best method of hunting is with nets.

Bibliography - 6 names.

UDK 599.745 (551.46)

Experiments in quantitative aero-visual survey of seals in the north-western part of the Bering Sea. (Opyt kolichestvennogo aerovizual'nogo ucheta tiulenei v severo-zapadnoi chasti Beringova moria). S h u s t o v, A.P. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The article points out the important role of aviation for scouting and inventory of seals, it gives detailed methods of conducting an aero-survey, types of airplanes, number of flights and the length of conducted flights. Information is given about the placement of seals depending on the type of ice and approximate numbers of the separate species of seals in the examined region. The author comes to the conclusion that the present decrease in numbers of "krylatka" (Histrio-phoca fasciata) (killed in hunt plus natural mortality), is higher than the increase by breeding, which leads to reduction in numbers of their population.

Bibliography - 10 names, Tables - 2.

UDK 599.745.3 (636.66; 551, 468.4)

Some indices about the condition of the herd of seals and about the seal industry in Baikal Lake. (O nekotorykh pokazateliakh sostoiania stada i promysle baikal'skoi nerpy). P a s t u k h o v, V.D. "Morskie mlekopitaiushchie", 1969, Publisher "Nauka".

This work gives a brief survey of the seal industry on Baikal Lake. The index of the condition of the herd is taken to be the number of animals taken by one hunter; decrease in these numbers means a decrease in the population of these animals. For the prevention of a further decrease in reserves it is recommended to change the character of this industry: It is recommended in the next decade to use exclusively the progeny after the period of shedding of hair, which yield a more valuable pelt. This system of conducting the exploitation of Baikal seals is the most rational and would lead to the increase in their reserves.

Bibliography - 10 names, Tables - 2, Fig. - 4.

/335

UDK 599.745.3 (551.468.4)

The beginning of sexual maturity in the female Baikal seal. p.335
(Nastuplenie polovoi zrelosti u samok baikal'skoi nerpy).

P a s t u k h o v, V.D. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

In the article are given results of the examination of the reproductive organs from 428 females of the different age - groups of Baikal seals. It is noted that all the year -old females should be considered as immature. At the age of 2 years some females ovulate but are not impregnated. Most of the 3 - 4 year olds ovulate and some of them are impregnated. Not less than 75% of the 4 years olds bear young for the first time, most of the 5 year olds give birth, in 6 year olds the number of births increase further and the females of 7 years and over all bear young. The conclusion is that from the age of 2 - 5 years (in different proportions), the females become potentially mature, from 3 to 6 years old - productively mature. The first progeny comes from females of 4- 7 years. It is noted that the females of Baikal Lake seals mature earlier than the females of seals from other, similar species.

Bibliography - 15 names, Tables - 2, Fig. - 4.

UDK 639.24

New data about the interior of Pinnipeds from the northern parts of the Pacific Ocean. (Novye dannye po inter'ernu lastonogikh severnoi chasti Tikhogo okeana). K o s y g i n G.M., S o k o l o v A.S., T i k h o m i r o v E.A., S h u s t o v A.P. "Morskije mlekopitaiushchie", 1969, Publishing House "Nauka".

For the clarification of peculiarities in changes of the internal organs with age, indexes were determined for the most important, in metabolic sense, parts of the body (without taking into account the abruptly changing amounts of subcutaneous fat or the skin with fat).

This work examines the character of changes with age in the weight of the skin and fat ("khorovina"), it compares the indexes of organs, calculated in proportion to the complete weight of the body and to the weight of the carcass; it shows the character of changes in the proportions of organs and parts of the body of pregnant and nonpregnant females, and also the peculiarities of the internal organs of the young of "lakhtak" (Erignathus barbatus nauticus) and "krylatka" (Histriophora fasciata), few days before their birth.

Using this new method of calculation of the indexes, it is possible to determine more certainly, that the relative size of the most important organs (heart, lungs, liver, diaphragm) changes corresponding to the character of life and activity of each group of the age groups, and in adult animals depends upon their sex and physiological condition.

Bibliography - 7 names, Tables - 3, Fig. - 4.

UDK 639.24

Distribution of large cetaceans in the tropical part of the Pacific Ocean. (Raspredelenie krupnykh kitoobraznykh v tropicheskoi chasti Tikhogo okeana). R o v n i n A.A., "Morskije mlekopitaiushchie", 1969, Publishing House "Nauka".

In 1964 TINRO* was studying whales from the tropical part of the Pacific Ocean. Distribution of whales in this part of the aquatory (after the available data) turned out to be irregular.

*TINRO - Tikhookeanskii nauchno-issledovatel'skii institut rybnogo khoziaistva i okeanografii (Vladivostok). (Scientific Research Institute of the Pacific Ocean Fisheries and Oceanography).

Cachalots were found mostly to the north-west of the Hawaiian Islands, not far from the coast of Mexico, to the west and south-west of the Galapagos Islands and also along the coasts of the South America. More often the groups of whales consisted of 3 - 15 animals. Isolated large aggregations (up to 400 whales) were seen.

Whalebone whales were seen at temperatures of 21°-30°C. They are relatively regularly distributed through the whole aquatory, keeping singly or in pods of 2 - 5 whales. Larger groups formed only in periods of migration. Mostly these whales were seen in the places where the cold waters from the depths come up to the surface, creating in these regions a clearly marked layer of a sharply different temperature ("thermocline") in the upper layers. Apparently such cooled waters are used by the cetaceans for better thermoregulation.

Bibliography - 18 names, Fig. - 3.

UDK 599.51 (211.2)

Whales and the plankton of the Antarctic. (Kity i plankton v Antarktike). Z e n k o v i c h B.A. "Morskoe mlekopitaishchie" 1969, Publishing House "Nauka".

An attempt was made to calculate the amount of plankton crustaceans eaten by whalebone whales in the waters of the Antarctic in the period, when the whale-fishing industry was initially organized. An estimate was made of the total number of whalebone whales caught in the period from 1904 - 1965, including Blue whales (Balaenoptera musculus), finners, Humpbacked whales (Megaptera nodosa Bonn.), and sei whales. This was the basis for calculation of the number of whales of each species which there probably were at the beginning of the period.

Visual observations showed that whales feed in cold waters not less than 4 times a day. The ration for each of the species was determined and on this basis a twenty-four hour ration for each whale. It is believed that the whales stay in the cool waters for 100 to 120 days. The amount of food for each of the species used during this period was calculated.

Nearly complete extermination of Blue and Humpbacked whales and a significant reduction in numbers of finners leads to the conclusion a large amount of plankton crustaceans is not being used as food.

UDK 599.745.3

/p.336

Zooplankton as an indicator of the gathering of the Whalebone whales. (Zooplankton kak indikator skoplenii usatykh kitov).
D o l z h e n k o v V.N. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

As a result of observations conducted in 1964 - 1965 and 1965 - 1966 from a scouting ship and also the examination of stomach contents of whales caught in the waters of Antarctic, it is noted that there is constant presence of aggregations of whales in fields of zooplankton. From the data of these observations it was clear that in the region of 30° - 34° South latitude and 90° - 98° East longitude in October - November, of 320 sei whales, 230 were seen in the zooplankton fields or in the immediate vicinity of them. Fewer sei whales were seen where the concentration of zooplankton was lower;

Towards the 60° - 65° South latitude (Antarctic divergence) are found the largest biomasses of seston - up to 530 mg/m^3 . At the same latitude the presence of whales with full stomachs was most frequently noted.

The whales fed most intensively in two regions: westwards from the 100° - 120° East longitude and eastwards from the 160° - 180° East longitude.

Bibliography - 7 names, Fig. - 4.

UDK 599.745.3

New materials about the characteristics of the island seal.
(Novye materialy po kharakteristike ostrovnogo tiulenya).
Belkin A.N., Kosygin G.M., Panin K.I. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

A catch of 75 seals from the islands and 56 "larga"

(*Phoca largha*) was taken and a comparative examination was made of them.

Craniological and other examinations were conducted following the accepted methods; the material was processed by the variation-statistical method.

The article gives a detailed description of the external appearance of the island seals, characteristics of the dimensions and weight of the body. It gives a thorough description of the structure of the skull as one of the basic indexes for systematic division. Further on, it gives data about the weight and

dimensions of some of the internal organs. In the work is given also some basic information about the biology of these seals: mating and whelping periods, hair shedding periods, characteristics of their living grounds, type of the coasts chosen by the seals for their coastal habitat, and information of the areas of distribution of seals. A part of the work is dedicated to the comparative analysis of the structure and basic biological moments of the island seals and typical Larcha from the point of view of their systematical independence. The authors come to the conclusion that the island seals are a genetically isolated, historically formed group of seals of the genus Phoca.

Bibliography - 31 names, Tables - 10, Fig. - 8.

UDK 599.51 (551.46)

About the distribution and migration of the Humpbacked Whales in the north-eastern part of the Pacific Ocean, Bering and Chukchi Seas. (O raspredelenii i migratsiakh gorbatykh kitov v severo-vostochnoi chasti Tikhogo okeana, Beringovom i Chukotskom moriakh). D o r o s h e n k o N.V. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The work is based on personal observations of the author during the hunting season of 1963 - 1965 and also on data from the different scouting ships.

Basing himself on the available materials, the author believes that the Humpbacked whales, which fatten up in the regions of the western part of the Gulf of Alaska, eastern Aleutian Islands and also in Bristol Bay, migrate at the end of the second decade of September and belong to the Asian herd. They come to the above-mentioned grounds along the Kuroshio current, turning further in the direction of the open sea along the Northern-Pacific current. Some of them come into the Bering and Chukchi Seas.

A part of ^{the} whales from the American herd is found in the Anadyr Bay and the Chukchi Sea, previously passing near the islands of Pribilof, Nunivak and others.

The mixing of the herds could happen only in the Spring because, in the Fall, whales belonging to the Asian herds leave the foraging fields one month earlier.

The highest concentrations of the Humpbacked whales in the period of foraging were observed in the region of the Fox Islands,

Shumagin, Kodiak Islands and in the north-western part of the Bristol Bay (situated in the regions of the cyclonic circulation).

Bibliography - 12 names.

UDK 599.745 (639.66; 551.468.4; 551.46)

About the regularization of the seal hunt in the regions of their low population in the White and Barents Seas. (Ob uporiadochenii dobychi tiulenei v raionakh ikh nizkoi chislennosti na Belom i Barentsevom moriakh). K a r p o v i c h V.V. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The article examines the seal hunt in the inner part of the Kandalakshskaya Guba, where these animals are few in numbers and are caught from time to time ^{to another by} amateurs. The Fishing Law allows hunting of bearded seal and ringed seal in the White and the Barents Seas to all citizens without exception (except killing in the water from May 15 to October 15 and all year round on the reservation territory). It is proposed to prohibit amateur hunting of seals (under cover of which poaching flourishes). For seal hunting it is recommended that a group of special and hunters be organized/more limited periods of hunt be established.

Bibliography - 1 name, Tables - 1, Fig. - 2.

UDK 599.745.3 (551.468.4)

Morpho-functional peculiarities of the Caspian Seals. (Morfo-funktional'nye osobennosti kaspiiskogo tiulenia). K o r z h u e v P.A. G l a z o v a T.N. "Morskie mlekopitaiushchie", 1969, Pub. "Nauka".

In the process of changing from the aquatic to the terrestrial way of life the skeletal and the muscular systems of the vertebrates underwent the most pronounced changes. The authors believe that these systems, which perform movement, are counteracting the gravitational forces. In the liquid medium these forces are weakened, which has put a peculiar stamp on the form and function of the aquatic organisms. For instance in the Caspian seals, because of this there is a relatively weak musculature (about 30% of the body weight), comparing to the terrestrial mammals (about 50% of the body weight) and skeleton, comprising about 5% of the body weight (3 - 4 times less, than in the terrestrial ^{and} mammals).

Bibliography - 9 names, Tables - 1.

UDK 639.24

/337

Materials about the anatomical structure and the innervation of the gullet and the larynx of cachalots. (Materialy po anatomicheskomu stroeniiu i innervatsii glotki i gortani kashalota). M a l y s h e v V.M. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

For the study of the anatomical and histological structure of the gullet and the larynx of the cachalot and their innervation material was taken from 11 animals (6 embryos and 5 adult cachalots). The examinations showed that the anatomical structure of the gullet of cachalots is characterized by a very powerful musculature, rich in tendinous strata. The musculature appears to consist of many complicated layers in which in some places are found separate, round in cross-section, thick muscular bundles, in their outer appearance resembling the comblike muscles of the heart.

The principal source of the cachalot's gullet innervation are the branches of the glossopharyngeal, vagus, accessory nerves, cranial vagosympathetic and stellar (caudal cervical) ganglions.

The anatomical peculiarities of the musculature of the larynx of cachalots include a sublingual - supralaryngeal muscle that is very strongly developed and thick. It starts on the stylo-hyoid. Ligamental endings of the right and the left muscles fuse into one thick cord, attached to the special eminence, situated in the middle of the length of the epiglottis on its anterior edge. The transversal arytenoid muscle, because of a sharply pronounced assymetry in the structure of the larynx and, specifically, because of the displacement of the arytenoid-supralaryngeal tube to the right, is situated at an angle.

Histological examinations of the mucous membranes of the gullet and the larynx showed a relatively weak concentration of the nerve elements.

Bibliography - 11 names, Fig. - 4.

UDK 599.51 (211.2)

Materials about the biology of Finners from the first and partly from the second sectors of the Antarctic. (Materialy po biologii finvalov I i chastichno II sektorov Antarktiki). I v a s h i n M.V. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The work was carried out after the materials collected by the Antarctic Whale-Fishing Fleet "Sovetskaya Rossiya".

In the eastern part of the Pacific Ocean sector in December

finners are found on the foraging grounds or in the vicinity of them. The whales most often caught were adult animals (mainly females). Numbers of the latter increased to $2/3$ in the first half of January, essentially on account of the arrival of the young immature individuals. At the end of January--beginning of February numbers of pregnant females among the mature part of the females increased and reached $2/3$.

An analysis of the ovaries showed that the whale fishery was principally getting those whales which had reached maturity a relatively short time ago or had just had time in their short life to give birth to 2 - 3 young. This apparently explains the small numbers of Finners which come to the foraging fields in the Bellingshausen Sea in the summertime.

In the region of the Folkland Islands in January - March there were constant sighting immature whales and young mature females, and frequent sightings of nursing females with their young.

Bibliography - 2 names, Tables - 2.

UDK 599.745

About the rate of reproduction of the northern Pacific Ocean seals.
(О темпе воспроизводства северотихоокеанских тюленей).
Тихомиров Е.А. "Морские млекопитающие", 1969,
Publishing House "Nauka".

The goal of the work is to summarize the data about the rate of reproduction of seals from the Far East - ringed seals from Okhotsk, "larga" (Phoca largha), striped seals, "lakhtak" (Erignathus barbatus nauticus), with the help of materials of the investigations carried out in Okhotsk and Bering Seas in 1959 - 1964. In the opinion of the author, the materials (samples) used for the calculation of the indexes of reproduction reflect the natural age/sex ratios existing in the populations. The index of the intensity of reproduction is calculated in percent of the basic reserves of the herd with the formula: $T=50 K/V$, where T is the intensity of reproduction (or the value in % presenting

the increase), V - the number of all females in the sample, and K - the number of females, actually taking part in reproduction.

The highest index of reproduction (26,3%) was found in the striped seals, in the second place was "larga" (25,1%).

In the third place ringed seals from Okhotsk (21,0%). It is emphasized, that the most reproductive are those seals which mature earlier.

Bibliography - 14 names, Fig. - 3.

UDK 599.50

About the mathematical modelling of the process of displacement of the herds of whales. (O matematicheskom modelirovanii protsessov peremeshcheniya skoplenii kitov). Prot sen ko A.A., Pok ro v s k i i B.I., "Morskie mlekopitaushchie", 1969, Publishing House "Nauka".

The article is dedicated to working out mathematical models characterizing the process of movement of whales, which permits organization of the whaling industry more effectively and economically. The solution of the problem of the optimum management of the dynamic systems describing the behavior of the herds of whales could greatly help the use of the apparatus of Markov's process. Obtained formulas of the transit probabilities allow variation in the management of the processes and proof of the hypotheses about the ~~fm~~ structure of management. Availability of formulas for transit probabilities gives a possibility for moving from the real biological information to the construction of the probable processes of the movement of the herds.

A study of the parameters of the process of movement of whale herds allows choice of effective criteria to prove the hypotheses and their biological essence.

Bibliography - 15 names, Fig. - 1.

UDK 599.745.3

/ p.338

Some peculiarities of the first period of life of the young of the hooded seal and the characteristics of their fur. (Nekotorye osobennosti nachal'nogo perioda zhizni detenyshei khokhlacha i kharakteristika ikh volosianogo pokrova). Be lo bo ro do v A.G., Po te lo v V.A., "Morskie mlekopitaushchie", 1969, Publishing House "Nauka".

The article gives more exact periods of birth of the bulk of the hooded seal population from Jan Mayen Island; there is a possibility of an earlier evaluation of the south-west region (compared with the north-eastern). On the ice first appear males, later they are joined by the females. The short period of lactation, in the majority of cases of 8 - 15 days duration,

is compensated by the high nutritive value of milk (containing in the mean 60% fat and 7,5% protein) and, apparently, its higher consumption. Together with the other morpho-physical peculiarities, this indicates a better adaptation of the hooded seal to the natural conditions. Characteristics of the fur of the young are described, which is of a high quality.

Bibliography - 14 names, Tables - 2.

UDK 599.745

Reference index about the characteristics of the inner organs of the Pacific Ocean Pinnipeds. (Spravochnye pokazateli po kharakteristike vnutrennikh organov tikhookeanskikh lastonogikh).

S o k o l o v A.S., K o s y g i n G.M., K u z i n A.E., P e r l o v A.S., T i k h o m i r o v E.A., S h u s t o v A.P. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

This gives the absolute weight of the parts of the body and the internal organs of several species of Pinnipeds: Sea-otters (Callorhinus ursinus), "Sivuch" (Eumetopias jubatus), walrus (Odobenus rosmarus divergens), "lakhtak" (Erignathus barbatus nauticus), "larga" (Phoca largha), "akiba" (Pusa hispida krasheninnikovi) and "krylatka" (Histiophoca fasciata) of different ages and sexes. The material, obtained from 230 individuals, could be used as initial comparative data in organometric examinations.

Bibliography - 2 names, Tables - 8.

UDK 599.745.3 (639.66)

Information about the hunt of northern Ringed Seals. (Svedeniia o promysle severnoi kol'chatoi nerpy). N a z a r e n k o Iu.I., "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The extremely unfavorable situation of statistics about the local hunting industry in the European North prompted the author, using different methods to obtain his information, to undertake an attempt to reconstruct, with the help of fragmentary and approximate data, the scale of the seal hunt over a number of years.

Bibliography - 10 names.

UDK 599.745

Some conclusions and perspectives in eco-morphological research of the Pacific Ocean Pinnipeds. (Nekotorye itogi i perspektivy ekolo-morfologicheskikh issledovaniy tikhookeanskikh lastonogikh).

S o k o l o v A.S. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

Data are given about the proportions of the internal organs, about the peculiarities in the structure of the lungs and trachea, the musculature of the organs of swimming, and also the basic indexes of blood of the four species of true seals: "lakhtak", "larga", "akiba" and "krylatka". Similar complex examinations allowed determination of the most essential peculiarities of the structure and the function of the most important systems of organs, depending on the conditions of habitat, character of swimming, depths and the duration of diving, which in many points is determined by the methods of obtaining food by each of the species.

When conducting functional-morphological studies use should be made of new methods of examination, based on the use of diverse contemporary devices (including the telemetrical systems) for objective evaluation of data on the ecology and physiology of Pinnipeds, which will materially widen the horizons of ecological morphology.

In this connection it is necessary to carry out a study of the species of importance in the commercial sense (for instance of the sea-otters and "sivuch"), their competition or indifference to one another, especially in the period of reproduction, which are still under discussion, and also "larga" and the island seals. The central nervous system and the sense organs of Pinnipeds should be studied for clarification of the methods of orientation of these animals in space during the search for food. It is necessary to carry out all the studies in natural conditions and in oceanariums.

Bibliography - 14, Fig. - 4.

UDK 599.745.3 (551.468.4; 551.46)

Distribution and migrations of bearded seal in the White, Barents and Kara seas. (Raspredelenie i migratsii morskikh zaitsev v Belom, Barentsevom i Karskom moriakh). P o t e l o v V.A. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

Based on his own visual observations, communications, of ships' captains members of different expeditions and local inhabitants, and also using the data from the literary sources, the author gives a survey of the seasonal distribution of bearded seal in the seas

* The latin names of all the species are given on the pp.25.

of the western sector of the Soviet Arctic. The largest numbers of these seals are seen in the funnel of the White Sea, along all the south-eastern border of the Barents Sea, along the west coast of Novaya Zemlya Islands up to Mys Zhe-lanya, between the Zemlya Frantsa Iosifa Islands in the Baydarat-skaya Guba, in the regions of Islands Belyy, Isker Minin and further to the north-east, nearly to Severnaya Zemlya. But this distribution is not completely stable. The author assumes the existence of seasonal migrations, directed in the spring-summer season from the south-eastern regions of the Barents Sea to the east and the north and in the autumn in the opposite direction.

Bibliography - 26 names, Fig. - 2.

UDK 599.745.3 (551.468.4)

About the periods of sexual maturing of the Caspian seal males. /p. 339
(O srokakh nastupleniya polovoi zrelosti u samtsov kaspiiskogo tiulenia). Timoshenko Iu.K. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

On the basis of comparison of the weight of testes and the age of 209 animals from which they were obtained, and partly on the amount of spermia taken from the appendages and which could be seen in the field of a microscope, the following propositions are made. Up to 5 years of age the testes grow very slowly. The first jump in weight occurs at the age of 6 years ($M=8,8$ g). In a few years a further sharp increase in weight is noted from one year to another ($M=16; 20,7; 33$ g), then the growth slows down. Parallel to the increase in weight of the gonads with age and a sharp increase during the period of the sexual maturing, some changes in weight are noted which are conditioned by the seasonal cycles of their functioning activity of which apparently slows down towards the end of March.

In contrast to previous notions, the males (after previous results of the examinations by the author) reach sexual maturity at the age of 6 - 8 years.

Bibliography - 6 names, Tables - 2, Fig. - 1.

UDK 599.745.3 (551.468.4)

Questions about the rational uses of the reserves of Caspian seals. (Voprosy ratsional'nogo ispol'zovania zapasov kaspiiskogo tiulenia). Timoshenko Iu.K. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

On the basis of a critical survey of the organisational and technical shortcomings, which characterize the Caspian seal-fishing industry in the recent and distant past, the author confirms a general reduction in the reserves of Caspian seals, especially a disproportionate lowering in numbers of the brood stock. He notes the failure to take into account the natural mortality (in the connection with a recently discovered rather prevalent diplococcal infection), and also insufficiency in the knowledge of the other aspects of the biology which the industry should be based, (in the first place age - sex composition of the seasonal concentrations of the livestock, exposition of the real proportions of barrenness). It is proposed to categorically prohibit fall hunting on the shallows, not to tolerate the total killing of the young (which happened in 1966). It is also necessary to step up the studies of the biological basis for the norms of killing of the young, the factors and numbers of natural mortality, and of the questions of reproduction.

Bibliography - 18 names, Tables - 3.

UDK 599.745.3 (551.468.4)

Numerical quantities and the industrial reserves of the Caspian seals. (Chislennost' i promyslovye zapasy kaspiiskogo tiulenya). B a d a m s h i n B.I. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The article is an attempt to take stock of the contemporary reserves of Caspian seals on the basis of the use of especially favorable industrial conditions of 1966, when nearly all the young of that year were killed (85000 head).

By extrapolating the composition of the herd on the fall feeding grounds for the age-sex structure and introducing some additional corrections, the author estimated the basic reserves as 520,000 head.

The following coefficients of the "natural decrease" are used: 5% in the first year of life, 2% during each of the next 6 years and 1% every year in the older age groups.

Bibliography - 10 names, Tables - 3, Fig. - 2.

UDK 599.51

Contemporary methods of determining the size of whale herds. (Sovremennyye metody opredeleniya velichiny stada kitov). Zasosov A.V. "Morskie mlekopitaiushchie", 1969, Publisher "Nauka".

For the evaluation of the strength of the herd of Antarctic Finners, the International Whale-Fishing Commission established a committee of scientists which used several methods for finding a solution to the given problem. The committee took into account the results of tagging, carried out an analysis of the composition of the herd by age, studied the relationship of changes in the numbers of animals killed to unit of effort, and also the character of replenishment of the herd. The results of the performed calculations attracted special attention of the Japanese scientists, who, having doubts about the reliability of the obtained results of calculations, set themselves a goal to get more precise estimates of the numbers of animals in herds, and also to work out their own suggestions about the necessary measures for regulation of the industry. In the computer technology laboratory of VNIRO*, during the study of the above-mentioned material, still another method of calculation of the reserves of finners was used.

The article contains an exposition of the results of all the above-mentioned calculations and the numbers of the highest possible quotas for the killing of finners.

Bibliography - 2 names, Tables - 2, Fig.- 3.

UDK 599.745

Mating and whelping periods of the Pacific walrus. (Sroki spari-
vania i shchenki tikhookeanskogo morzha). K r y l o v V.I.
"Morskoe mlekipitaishchie", Publishing House "Nauka".

The work describes the results of investigations carried out in the northern part of the Bering Sea in 1960 and 1962. During this period studies were made on 98 male and 63 female walrus. On the basis of examinations of the postpartum changes in the reproductive organs of females, it was determined that the majority of females whelp during the period from 1 to 20 May. Careful examinations of the ovaries and testes made it possible to conclude that the mating period runs parallel to the whelping period (from the beginning of April to the beginning of June). By comparison of the embryo sizes from the different subspecies of walrus, it was found that there is a difference in length of embryos.

* VNIRO - All-Union Institute of Scientific Research for the Sea-Fishing Industry and Oceanography (Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii).

examined during the same months. The author supposes that this is either determined by the different periods of mating or is a characteristic of the subspecies which is revealed as early as the embryonic stage.

Bibliography - 24 names, Tables - 4, Fig. - 3.

UDK 599.745.3

L p. 340

Industry and the condition of the reserves of the Greenland Seals in the region of Jan Mayen Island. (Promysel i sostoianie zapasov grenlandskogo tiulenia v raionakh ostrova Ian-Maiena). K h u z i n R.Sh. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

The author reproduces and analyses the Norwegian data about the dynamics of the Greenland seal-fishing industry in the region of Jan Mayen Island for a period of over one century, he takes into account changes which occurred during this time in the fishing fleet and characterizes the quantitative and the age-sex composition of catches by the fishing ships. In comparison with the 1870-1880 period, fishing diminished towards the first decade of the present century about 4 times, and then (after some increase following the First World War and the Second World war) went down for the second time to nearly the same level. In the postwar years the sizes of catches per each ship steadily decline. Biological data reveal strong rejuvenation of the herds, with the dominating position in the brood stock occupied by the younger females. The catastrophic situation in the Jan Mayen herd needs immediate and urgent measures for the protection and restoration of its reserves.

Bibliography - 5 names, Tables - 5, Fig. - 2.

UDK 599.745.3

Taxonomy of the seals genus Phoca sensu stricto in the light of modern craniological data. (Taksonomia tiulenei roda Phoca sensu stricto v svete sovremennykh kraniologicheskikh dannykh). C h a p s k i i K.K. "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

New craniological materials for the Pacific Ocean area of distribution permit revision of the composition of the seals genus Phoca (sensu stricto), which was confused by the abundance of synonyms and unsatisfactory diagnoses of species and subspecies. The author analysed over 40 craniological characteristics: $\frac{1}{4}$ of them proved to be useful for taxonomical differentiation.

As a result, the composite species Phoca vitulina broke down into two: It became possible to reconstruct the rank of species for the "pallasov larga" - Ph. largha; the recently described new species Ph. insularis Belkin on the basis of a number of craniological signs occupies a transitional position between the two foregoing species, but shows more signs of kinship with the Atlantic common seal, than with largha. Craniologically, this "islands" seal is, apparently, identical to the western Pacific Richards seal (Ph. vitulina richardi Gray).

Bibliography - 35 names, Tables - 2, Fig. - 3.

UDK 599.51 (211.2)

About the structure of the herds of sei whales (Balaenoptera Borealis L.) in sectors V and VI of the Antarctic. (O strukture stad seivalov (Balaenoptera Borealis L.) v V * VI sektorakh Antarktiki). Iukhov V.A. "Morskie mlekopitaiushchie", 1969, Publisher "Nauka".

The article presents results of observations of the structure of sei whale herds in the area of sectors V and VI of the Antarctic.

On the basis of the specifics of the sei whale herds (which forage in the higher latitudes) and possible consequences of hunting, the author comes to the conclusion that the structure and of the herds of sei whales is determined by their physiological condition and the ecological situation in the regions of hunting. On the foraging grounds the herds of sei whales form dense accumulations, a principal part of which is composed of females taking part in reproduction. In the regions more to the north are individuals whose physical condition does not allow them to go to the higher latitudes.

The hunting of the sei whales, foraging in sectors V and VI of the Antarctic must be conducted with due consideration for the peculiarities of herd structure.

Bibliography - 3 names.

UDK 639.24

Comparative analysis of the serum albumins of the cetaceans and some terrestrial mammals. (Sravnitel'nyi analiz syvorotochnik al'buminov kitoobraznykh i nekotorykh nazemnykh mlekopitaiushchikh). Borisov V.I., "Morskie mlekopitaiushchie", 1969, Publishing House "Nauka".

Albumins were obtained through the salting out of the whole globulin fraction with ammonium sulfate (after Silber and Abelev). In the work were used antisera obtained by the immunisation of rabbits with the sera of different species (cachalot, finner. Blue whale, "kosatka"*, steer, horse, dog). Immune sera were used in ring precipitation reactions and in analogous reactions in agar jelly. The precipitates in the latter were more often sketched.

These serological analysis showed that the albumins of a cachalot are closer to the albumins of "Kasatka"* in their antigen properties than to the albumins of the other examined animals, including the blue whalebone whale. Nevertheless the similarity between the albumins of a cachalot and a blue whale is relatively great. The albumins of the toothed and the whalebone whales show more closeness to the albumins of a steer than to the albumins of a dog or a horse.

Bibliography - 5 names, Tables - 1, Fig. -2.

UDK 639.24

/341

Comparative studies of the antigen properties of serum proteins of cetaceans and other animals. (Sravnitel'noe izuchenie antigennykh svoistv syvorotochnykh belkov kitoobraznykh i drugikh zhivotnykh). B o r i s o v V.I., "Morskije mlekopitaushchie", 1969, Publishing House "Nauka".

For the comparison of the sera antigens they used the method of double diffusion in agar jelly. Sera for the analyses were taken from a sterlet, a grass snake and 33 representatives from the other orders of mammals: insectivores (hedgehog), carnivores (dog, Arctic fox, brown and white bears, American mink, cat), pinnipeds (walrus, ringed seal, striped seal, hooded seal, cetaceans (cachalot, Blue whale, finner), even-toed (pig, steer, sheep) and the odd-toed (horse). Precipitating sera were obtained by different methodical modifications of the immunisation of rabbits.

Because of the complicated antigen composition of the sera it was not always possible to obtain a clear "antigen spectrum", nevertheless in the heterological reactions antisera against the

* "kosatka" - perhaps killer whale.

sera of cachalots showed more antigens in the sera of finners and the even-toeds. Antisera against the sera of whalebone whales bring on analogous reactions with the serum of a cachalot, and then the even-toed. Antiserum against the serum of the brown bear showed highest antigen spectrum in the sera of the carnivores and the pinnipeds.

In further experiments preference was given to reactions with depleted antisera.

A series of such experiments convincingly demonstrates the antigen similarity of the serum proteins of the toothed and whalebone whales, and also their closeness to the even-toed order.

Bibliography - 6 names, Tables - 4, Fig. - 1.

UDK 639.24

Serological analysis of the family interrelationship of cetaceans and some other mammals. (Serologicheskii analiz rodstvennykh vzaimootnoshenii kitoobraznykh i nekotorykh drugikh mlekopitalushchikh). B o r i s o v V.I. "Morskie mlekopitalushchie", 1969, Publishing House "Nauka".

After a short survey of the literature about the different hypotheses of the descent of whales, the author gives an account of the materials and methodology serological observations. blood sera in nearly all cases were ^{pre}conserved with the merthiolate, and were collected from 22 individuals belonging to 12 species of mammals from the orders of insectivores, carnivores, pinnipeds, cetaceans, even-toed and odd-toed animals nine antisera used for ring precipitation reactions were obtained by the methods of Boyden and Jemeroy, Kuo-Ching-Han, and Freund. Reactions were directed in the usual way. The highest titers in the reactions of the "anti-whale" sera were obtained with the sera of the whales; in second place in the degree of titres were reactions with sera of hoofed animals. Symptomatically a rather high (nearly on the level of the homologue) titre of the "antibear" serum in the reaction with the serum of a walrus. As a resumé, the following preliminary conclusions are given: toothed whales are related to the whalebone whales far more than to any other mammals, but of the latter the even-toed are closest to both groups of whales; pinnipeds are closest to the carnivores. The results of the serological

