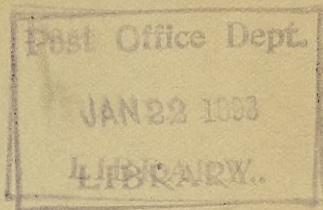


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REPORT

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ON



THE ROOKERIES OF THE COMMANDER ISLANDS,

SEASON OF 1897,

By LEONHARD STEJNEGER.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1897.

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INSPECTION OF THE COMMANDER ISLANDS FUR- SEAL ROOKERIES, 1897.

BY LEONHARD STEJNEGER.

ITINERARY.

Leaving Washington on June 5, I arrived in Tacoma, Wash., on June 12, when, on the following day, in company with Mr. Lucas, I proceeded in the steamship *City of Topeka* to Sitka, Alaska. Upon our arrival there, June 20, I at once embarked in the United States revenue-cutter *Grant*, Captain Munger, commanding. Departed from Sitka the following morning; arrived in Unalaska June 27. After coaling, the *Grant*, on the 30th, proceeded to the Commander Islands, landing me at Nikolski, Bering Island, on July 7. The British commissioner, Prof. D'Arcy Thompson, arriving on July 11, he, Mr. Barrett-Hamilton, and myself proceeded per dog sledges to the North Rookery, 12 miles distant, making an examination of the condition of this rookery. Professor Thompson then departed for Copper Island, while Mr. Barrett-Hamilton and I remained on Bering Island, deeming the closer inspection of the rookeries of the latter island, particularly the South Rookery, of higher importance.

Neither the administrator nor the assistant administrator having as yet arrived on the islands, it was considered best to await the arrival of the latter, Mr. N. S. Wachsmuth, in order to obtain the necessary permission for a protracted stay and a thorough examination of the south rookery. In the meantime, Mr. Barrett-Hamilton and I undertook another dog-sledge expedition to the north rookery on July 16, which was in every way satisfactory. Upon Mr. Wachsmuth's arrival we commenced to make the necessary preparations for the trip to the South Rookery; a boat and crew were obtained with some difficulty, tents rented, and camp equipage purchased, and on July 19, in the morning, we set out for the South Rookery. Although only 20 miles distant from Nikolski, it took five days to get there, on account of stress of weather. The nights we had to pass on the beaches, sleeping under the overturned boat. Wet and worn, we landed at the rookery on July 24, and went at once into camp. Until the 30th we studied this rookery every day very carefully at all the stages of the tide and in all kinds of weather, and a satisfactory count of the pups was made. On the latter date the Imperial Russian steamship *Yakut* arrived off the rookery, announcing the arrival in Nikolski of Mr. Grebuitski, the administrator, and offering to give us passage to the village, an offer we gladly accepted as our best chance of returning from the rookery.

Upon meeting Mr. Grebnitski, he expressed a desire to have me go to the North Rookery with him by boat, and as I was informed that Her Britannic Majesty's ship *Linnet*, which in the meantime had come to convey Mr. Barrett-Hamilton to Copper Island, had no accommodations, I decided to wait for the next Russian cruiser, and to accompany Mr. Grebnitski meanwhile to North Rookery. Press of other official business and unpropitious weather prevented the plan of visiting the North Rookery from being carried out, and on the 15th of August I consequently availed myself of the kind offer of the captain of the Imperial Russian cruiser *Koreets* to give me passage to Copper Island, where I was landed on the following day at Preobrazhenskoye village. It being deemed impracticable to land at the rookery village then on account of the surf, it mattered little that no boat could be obtained until the 19th, on which day I hired a boat and crew, arrived the day previous, and sailed to Glinka on the same day. The Glinka rookeries were examined during the following days, but the sealing season having been now closed, I could obtain no boat passage to Karabelni and was glad to be able to get away from Glinka to Preobrazhenskoye in a small boat on August 24. I was thus prevented from inspecting the Karabelni rookeries, a failure, however, of but little importance, on account of their comparative insignificance and the lateness of the season.

On August 31 the *Yakut* called at Preobrazhenskoye, and, the captain offering to convey me to Bering Island and from there to Petropaulski, I accepted gladly, that I might avail myself of the earliest opportunity of returning home, Mr. Barrett-Hamilton having already left the island on August 19. I arrived in Petropaulski on September 4, but found no vessel going to America or Japan until October 20. The Russian Seal Skin Company's steamer *Kotik*, Capt. C. E. Lindquist, in the meantime making a trip to the seal islands for the purpose of bringing back the skins, I proceeded in her, in order to inquire into the question of the mortality of the seal pups on North Rookery, Bering Island. I consequently left Petropaulski again on September 22 and arrived at the rookery in question the 27th. So unfavorable was the weather, that the *Kotik* had to return to Petropaulski, after nearly four weeks' absence, without having accomplished the taking off of the skins. It was my original intention to return in that vessel to Japan, but as she must make another attempt, which is more than likely to take at least two weeks more, I obtained passage in the Japanese steamer *Taiyu Maru* from Petropaulski to Hakodate, Japan, leaving the former port on October 20 and arriving at the latter October 25, whence I proceeded by railroad to Tokio and Yokohama. The first mail steamer brought me to San Francisco on November 27; on the 29th I conferred with Dr. Jordan, at Stanford University, and on December 5 I arrived in Washington, D. C.

ACKNOWLEDGMENTS.

I have to acknowledge with thanks the assistance and courtesies, both in transportation and otherwise, which I have received from the captains and officers of the United States revenue-cutter *Grant*, Capt. F. M. Munger, commanding, the Imperial Russian cruiser *Koreets*, Captain Serebrennikof, commanding, and the Imperial Russian transport *Yakut*, Capt. I. V. Sukhotin, commanding.

For important information and various assistance I am also under obligations to the administrator of the Commander Islands, Mr. N. A. Grebnitski, and to the assistant administrator, Mr. N. S. Wachsmuth.

To the Russian Seal Skin Company, the lessees of the Commander Islands, I am indebted for invaluable help and hospitality rendered by the general agent, Mr. Constantine M. Grunwaldt; the local agents on the islands, Mr. E. Kluge on Bering Island and Mr. A. Kantor on Copper Island, and last, but not least, to the captains of the company's vessels, Mr. C. E. Lindquist of the steamship *Kotik* and Mr. D. Grönberg of the barkentine *Bering*, as well as by Mr. P. H. Powers, the company's agent on board the steamship *Taiyu Maru*.

INTRODUCTORY REMARKS.

The inspection of the Commander Island rookeries during 1897 was beset by many difficulties and was at times not devoid of danger, chiefly on account of the lack of proper means of transportation. It is greatly to be regretted that no vessel could have been spared from the United States Revenue Service or Navy to stay about the islands during the sealing season. Much more work could then have been accomplished and much valuable time have been saved, which was now lost in waiting for the uncertain visits of the foreign men-of-war or the company's steamer. It must be remembered that the coasts of these islands have no harbors, that the weather is usually stormy and foggy, that the rookeries are situated 12 to 20 miles away from the villages, and that landing at these places is often impossible or dangerous for weeks at a time. Thus the steamer *Kotik* this year was forced to return to Petropaulski without having been able to land boats at the rookeries of Glinka and Karabelni on Copper Island, although she was more than three weeks about attempting the feat.

Coasting in small open boats along these stormy islands is neither pleasant nor without danger. It thus took us five days to make the distance of 20 miles from Nikolski to South Rookery, on Bering Island; five days of storm, heavy swell, rain, dangerous surf, and long, weary, wet nights on sandy or rocky beaches, with no other shelter than the overturned boat. Nor was the sail from Preobrazhenskoye to Glinka and back without its hardships. Then the long, dreary waiting for the ships, the arrival of which can not be known beforehand within weeks, with the necessity of being present and prepared to embark immediately. Under such circumstances work is difficult and at times impossible, and the trip, which in addition involves rough passages at sea for weeks and weeks in vessels not meant for passenger transportation, is anything but a pleasure excursion.

CONDITION OF THE COMMANDER ISLANDS SEA ROOKERIES DURING 1897.

BERING ISLAND.

North Rookery.—It will be remembered that in my official report for 1895, entitled *The Russian Fur-Seal Islands*,¹ I made it a point that while the Copper Island rookeries in 1895 showed tremendous falling off in the number of breeding females as compared with what I saw there in 1882-83 the North Rookery of Bering Island was much less affected, although of course a great diminution was quite perceptible even then. As an evidence I mentioned the general outline of the breeding mass of seals, and more especially a characteristic feature of the same, viz, a "band" of harems across the northern end of the "sands." This "band" was well shown both in photographs taken in 1885 and 1895.

¹ See U. S. Fish Commission Bulletin for 1896, Article I, pages 1 to 148.

In 1896 my visit to this rookery was so late that I had no opportunity to institute an intelligent comparison with the conditions of 1895, but during the present year (1897) my inspection was contemporaneous with that of 1895, at the height of the season, and consequently fully comparable.

As a result of this inspection I am able to demonstrate a very great decrease in the breeding females on North Rookery since 1895.

This rookery was visited by me twice during the height of the season of 1897; first on July 13, in company with Prof. D'Arcy Thompson and Mr. Barrett-Hamilton; the second time on July 16, in company with the latter gentleman.

On July 13, at our first visit, the weather was very warm, probably as much as $+64^{\circ}$ F., with bright sunshine, and at the time of our inspection it was very low water.

Quite a large number of females were in the water off the Reef Rookery, but even allowing liberally for these, it was at once evident that the number of females had greatly decreased since I inspected the rookery in 1895. The characteristic outline of the breeding mass had not only disappeared, there being hardly a trace of the "band," but there was a general thinness of the ranks, and the "massed" patches had shriveled up to an ominous degree. The best portion is still the western side of the "sands," but even here the decrease was noticeable, while to the north of this the density showed the greatest falling off. The "sands" were fringed all around, though on the east side there were now actual breaks in the continuity of the line. As already noted, a large number of females were in the water off the rookery, both on the western and eastern side of the reef. However, on July 15, 1895, the date when I photographed this rookery, the weather conditions were exactly similar, viz, a hot, sunshiny day, with hardly a breeze stirring, and the seals in the water were then equally numerous (see pl. 22, Russ. Fur-Seal Isls., and the note referring to the same in the list of illustrations, p. 138). The conditions are, therefore, absolutely comparable.

It was noted that the pups had already podded to some extent, but the season was equally far advanced on July 15, 1895.

Professor Thompson suggested that we make a rough estimate of the number of females actually on the ground (agreeing, as he did, with me that a regular count of this rookery is impracticable). We consequently counted independently a section at the eastern base of the "sands," and both found it to contain about 600 females and 10 bulls. Professor Thompson's estimate that the total occupied area of the rookery is fifteen times greater than that of the seals counted is possibly not very far from the truth, the result being about 9,000 to 10,000 females then on the rookery and about 150 bulls.

We could not get close enough to the seals to ascertain whether there was any great mortality among the new-born pups on the rookery ground proper. On the western edge of the Ladiginski Peninsula we counted about 15 dead pups, most of them with the hair already off. Mr. Barrett-Hamilton suggested that some of them might have died in yesterday's drive (the first drive during the season), but the hair on the best-preserved pup was already quite loose, and we all agreed that it had been dead for several days.

We next went to Kishotchnaya and found there a similar state of affairs. There was not a seal above the steep bevel of the beach; not one on the upper, flat, shingly portion which I have called the "parade." In 1895 the two lateral sections of this rookery extended a considerable distance backward, leaving the middle section bare to the bevel, but

all the harems situated there had now disappeared and the number of seals appeared nearly one-half less. In 1895 I had to keep well concealed behind the large stone so as not to disturb the nearest harems, which were scarcely 10 yards away. To-day Professor Thompson stood upright on the top of this rock without the seals on the beach even noticing his presence.

A cursory and rather superficial count of the females gave about 600 for the northern and 700 for the southern section. Allowing 900 for the middle section, the total was about 2,200 females, certainly a maximum estimate.

During our visit three days later, July 16, 1897, there was no change in the appearance of this part of the rookery (Kishotchnaya) except that there were but very few seals in the water, and a correspondingly large number on shore. On account of the unfavorable wind the guard whom the starshena sent with us would not allow us to go as far as we ourselves deemed safe and prudent. Mr. Barrett-Hamilton being very anxious to have a count of this rookery made as far as practicable, I agreed to undertake it jointly with him, though protesting that the conditions were such that not even an approximately accurate count could be made. I willingly admit, however, that on account of the great reduction in the number of the females since 1895, a count is somewhat more feasible now than then. For this count I can claim no more accuracy than for a well-considered estimate based upon my experience in actually counting and estimating the rookeries on the Pribilof Islands, and it is of no value except as a check upon such an estimate.

We divided the Kishotchnaya rookery into three sections according to whether the seals were lying outside the two rocky ledges or between them. We counted each division separately and compared the figures. For the first section (the southern), which could be observed best, our count agreed very closely (viz, 660 and 665), but for the two others Mr. Barrett-Hamilton's figures were considerably below mine (about 300); mine being the higher ones he accepted them. Following the various groups of female seals in the binocle, I could distinguish in the

	Seals.
South section (43 + 665)	708
Middle section	1, 034
North section	848

Total (Kishotchnaya) 2,590 female seals, or, in round numbers, 2,600 females. No allowance was made for seals which could not be seen. The number of these can only be guessed at, but including the very few seen in the water it is probably safe to say that there was altogether nearly 3,000 female seals on Kishotchnaya on July 16, 1897. This is also the figure I should have estimated offhand, and agrees pretty well with the estimate made July 13, viz, 2,200 and the large number seen in the water off the rookery. Eight hundred seals in the water occupy a large area, and this figure is probably over rather than under the actual number seen by us that day.

Three thousand then will about represent the maximum number of females present at any one time during the height of the season at Kishotchnaya, as the day was an ideal one for the seals to remain ashore. The weather was perfect, comfortably cool, cloudy, no rain, wind light southeast, half water, rising tide.

At the Reef we found on the 16th the same state of things as on Kishotchnaya, viz, a denser accumulation of the females on shore and none, to speak of, in the water: consequently the rookery looked fuller than it did three days previously at our first visit, and the gaps between

the patches appeared more or less closed up. The capacity of Reef rookery for this season (1897) was undoubtedly at its highest to-day, yet that characteristic "band" across the "sands" was not there, not even a trace, as the few individuals which we had noticed on the 13th had now left it. Nothing attests better the decrease of this rookery since I visited it in 1895.

Another point brought out by my inspection of the Bering Island rookeries in 1895 was the relative dearth of old bulls as compared with the condition on the Copper Island rookeries. The disproportion of the sexes was still evident on North Rookery in 1897, though much less marked than in 18'5, on account of the decrease of the females. It would be waste of time and paper to try to present figures to demonstrate it, as the counts that have been made are utterly worthless. There may have been 150 bulls on the Reef this year, or there may have been 200; there is no way of telling with certainty. The rookery had of necessity to be watched from such a distance that only a fraction of the bulls can be seen.

On Kishotchnaya the conditions are somewhat better, but the result of our count is not very satisfactory, as a recital of our experience on July 13 will show. The fact is, that the bulls are often so concealed while lying down among the females that it is impossible to see them, unless they are roused so as to stand up, and such a rousing can only be effected here in a few instances. A count of the bulls actually seen is therefore sure to be considerably under the true number. This was very forcibly shown during our inspection of Kishotchnaya on July 13. We had counted 7 bulls in the southern section, when Mr. Rogers, Professor Thompson's assistant, accidentally stampeded a portion of the females. At once 3 bulls, hitherto overlooked, got up in full view, and Rogers, to use Mr. Barrett-Hamilton's own words, "by stampeding them added 3 bulls to my list."

The general proposition, however, that there are still proportionally much fewer males on Bering Island than on Copper Island holds good (even after the killing of a number of them last year on the latter island) and is conceded by all.

Whether this comparative dearth of males on Bering Island is particularly injurious to the condition of the herd will find a negative answer in the South Rookery of Bering Island, as suggested by me on page 64 of my Russian Fur-Seal Islands.

South Rookery.—In view of the above suggestion I was ordered to pay special attention to the South Rookery during 1897.

There being no inhabitable house at this rookery, we were obliged to camp in the neighborhood, and from July 24 to 30 we (Mr. Barrett-Hamilton and myself) visited the rookery two or three times a day.

It will be remembered that this rookery is very small and situated under a steep bluff, which makes it possible to count the seals with some degree of accuracy. My visit in 1895 was too short to allow an actual count of the females, but I estimated their number at "about 600," while the maximum number of sikatchi, or bulls, was said by good authority to have been only 5 during that season. In my report upon that visit I urged the advisability of undertaking an exact count of the young ones the following year, in order to ascertain whether these few bulls had been sufficient for the impregnation of the whole number of females. I myself arrived too late in 1896 to be able to do it, and nobody else took up the suggestion. It was ascertained, however, that no more than 6 sikatchi had frequented the rookery that year.

In 1897 Mr. Barrett-Hamilton agreed to undertake the count in common with myself. At first we intended to drive the pups off in a body and count them in that way, but there were various objections to this plan; first, that the driving would materially interfere with the sealing at this rookery, the bachelors hauling up among the females and being culled from among these; second, that so many of the pups were in the water during the day (at low water) that it would be impossible to gather them all together on land, while in the evening when they all came ashore, water was high, thus preventing any driving at all. We relinquished this plan the more willingly as we found it quite feasible to make a fairly accurate count from the bluff overlooking the rookery.

Our general mode of procedure was first to define small separate groups of pups on shore and to count each one of these separately, then compare our figures, and, in case of disagreement, to count them over and over again until we arrived at nearly the same figures. We then counted those lying among the females nursing, those on separate rocks in the water, and those swimming. After a series of counts we found that only those made in the evening at high water when all the pups were ashore were of any value. An average of a selection of our best counts (7) gives 526 pups (minimum, 516; maximum, 533), which may be accepted as nearly exact.

Similar counts of the females were made regularly. As a matter of course, the figures for the various counts of the females vary very much more than those of the pups for two obvious reasons: First, because the actual number of females present on the rookery varies greatly from day to day, while that of the pups is constant, except for the gradual increase due to new births or slight decrease due to death; second, because there nearly always were a number of females swimming off the rookery, the number of which had to be more or less closely estimated. Nevertheless, the average of nine of our best counts may be taken as a fair daily average of the breeding females present at this rookery during our visit in 1897, this average being 449.

The experience of last year on the Pribilof Islands, where it was found that the number of pups on the rookeries was nearly twice as great as the number of females counted as present in the harems at the height of the season, had prepared us for the above results, viz, a greater number of pups than of cows counted. On the other hand, it would be very erroneous were we to take the above number of females and to that apply a correction derived from the census of St. Paul Island, in order to find out the number of pups which ought to have been on the South Rookery in 1897, for the reason that the above figure of 449 females also includes all the seals that were seen in the sea off the rookery in addition to those in the harems on shore. The average number of females on shore (nine counts) was about 236 (maximum 395, minimum 174).

Only 2 full-grown bulls attended to this rookery. A young bull, or polusikatch, was observed occasionally on the outskirts of the two harems; but his visits were not regular, and when there he was only attended by a couple of cows. The two bulls were also unevenly matched, for it was evident that the larger and apparently older bull had the greatest attraction in the eyes of the cows, as most of the 500 females belonged to his harem. I do not believe that more than a dozen cows were the legitimate property of the younger bull. One evening (July 28) he was quite alone, separated from the other harem, consisting of 174 females, by a pod of about 300 sleeping pups.

Astounding as it appears, there can be but little doubt that the single old bull had served the great majority of the 526 females on this rookery and, moreover, was in fit condition to keep the younger bull at a respectful distance as late in the season as July 30.

For 526 pups to have been born on this rookery in 1897 the 6 bulls which were there in 1896 must have been sufficient to impregnate probably at least 750 cows, as a number of the latter were undoubtedly killed during the pelagic sealing in the autumn of 1896 and spring of 1897, besides those perishing from other causes during the winter migration. This result sets definitely at rest any fears that may have been entertained respecting the sufficiency of the male element now doing duty on the North Rookery of Bering Island.

COPPER ISLAND.

Glinka Rookeries.—Owing to the lack of means of transportation, I was unable to reach the Glinka Rookeries until August 20. A detailed and conclusive comparison with the conditions of these rookeries in 1896 and 1895 is therefore out of the question. The beaches were now to a great extent occupied by the newly arrived yearlings and 2-year-old virgin cows; yet it was quite possible, in places at least, to judge of the extent of the harems during the earlier part of the season. From such observations as I was enabled to make, I have no hesitation in saying that the year 1897 shows some decrease of the seals observed by me in 1895, though not nearly as great as the falling off in the breeding areas on Bering Island North Rookery.

Under the circumstances, it would be useless to go into details, but I may say that the places where I noticed a diminution in the area occupied by the seals were at Zapadni, south end of rookery; at Palata, where I found that the seals had almost abandoned the brow of the clayey bank to the north of the gully and the elevated flat ground between the latter and that bank; also at Zapalata I noted conditions indicating a falling off both at the western end and at the middle portion of the eastern end; at the rookery of Urili Kamen the middle portion seems to have disappeared.

My observations relative to the falling off of the Palata breeding grounds are verified by a photograph by Mr. N. N. Lukin-Feodotitch, the Government overseer at Glinka, taken on July 28 (new style).

The overstocking of these rookeries with bulls and half bulls was startlingly evident, in spite of the lateness of the season. On all the abandoned breeding grounds there were groups of solitary bulls to be seen, while among the female seals, old and young, there was a large quantity of young bulls imitating the performance of the older sikatchi during the early part of the season. The killing of 172 superfluous bulls during 1896 does not seem to have had much effect; the number was too insignificant in proportion to those that were left, and during 1897 no bulls at all were killed off. This is greatly to be regretted, for while it is quite true that there is not the same chance of trampling to death of the newborn pups as in certain other rookeries, there are, nevertheless, a number of pups killed in this way, and the presence of this superfluity of males on the breeding ground is certainly not promoting the best interest of the rookeries.

MORTALITY OF PUPS.

Up to the end of our stay at South Rookery (July 30) no startling mortality was visible there. Early trampling to death was almost out

of the question, and if any newborn pups died in this or any other way, the bodies had been eaten or carried away by the blue foxes. During our stay we observed only three or four dead pups. Mr. Barrett-Hamilton on the last day secured three of these, but on account of our sudden departure no autopsy was made. This was hardly necessary, for the bodies were exceedingly emaciated and the rectum contained the tarry feces so characteristic of starvation. Besides these we noticed a few pups which appeared weak, as if starving.

At Glinka, on August 20. I saw a great number of decayed carcasses of young pups, probably a hundred or more, between Zapadni and Sabatcha Dira. These had apparently been dead a long time. There were no dead bodies of pups which had died within a few days, though I found a couple, of comparatively recent date, which from their extreme leanness appeared to have starved to death. A few, but only a few, of the pups which we saw on shore appeared weak and thin, and only one was in a so far advanced state of starvation as to make its death within a few days a matter of certainty.

Hoping to have a chance to investigate the question of the mortality of the pups on North Rookery, Bering Island, during the time while the steamer was taking on board the skins, I returned to the islands during the latter part of September.

On September 27 I went ashore at that rookery in the first boat and at once proceeded to the rookery ground in order to lose no time, as the vessel was only going to stay a few hours. There were only a few hundred female seals ashore, and as it was low water, these were chiefly located on the outer rocks and mostly on the eastern side of the reef. The weather was cloudy, with heavy squalls of a fresh southeaster, occasionally a light drizzling rain. Having received the oral permission of Mr. Grebnitski to go anywhere on the rookeries, I did not notify the kossak, who was at his house half a mile away.

I commenced to count the dead pups which I saw in the windrows around the "sands," starting from the southwestern end, distinguishing between those which had died within the last couple of weeks and those which were so utterly decayed as to indicate death at a very early period, probably shortly after birth. In the windrow around the "sands" I counted 429 comparatively fresh carcasses and 143 old ones; total, 572. The former were rather large black pups with a large proportion of gray ones, or gray in part. They showed every appearance of being starved to death. A few dying gray pups, lean and helplessly crawling about on their bellies, were seen, and only very few, scarcely more than half a dozen, perfectly fresh bodies. Two or three skeletons, perfectly fresh and pink, showed how the large gulls (*Larus glaucescens*) had disposed of some of the bodies, while the presence of a couple of blue foxes accounts for the others.

I have pointed out in my former reports that the foxes, so numerous on these islands, are accountable for the disappearance of a great number of dead pups from the beaches, and I may add here that our observations on the South Rookery make it appear probable that the number of the recently born dead pups eaten and carried away by the foxes is proportionately less than that of the starved pups, for several reasons: First, at the time of the births of the pups there is enough offal left on the killing grounds to make these more profitable to the foxes; second, the new-born dead pups are lying among the seals and it is as much as a fox's life is worth to venture in among the harems. We saw repeatedly how the cows resented the intrusion of the foxes and chased them off, and it was only by constant watching that the fox was

enabled to snatch a body away; and, thirdly, the young foxes were growing all the time, requiring more and more food, and finally themselves invading the rookeries where there would be no difficulty in securing the starved pups later in the season.

Having finished the count around the "sands," I proceeded to count the bodies on and around the rocks at the water's edge and the higher portions of the "sands," when I was stopped by a guard sent by the overseer, the kossak Selivanof, with an order for me to leave the rookery on the pretense that "the wind was bad." In spite of the absurdity of the excuse, as I was on the lee side of the few hundred seals on the beach, I obeyed at once, having as a matter of necessity no other course open to me. Selivanof was in the village, and by the time I could see him and remonstrate it would be too late to begin the count again, as the steamer could not wait for me. The skins being nearly all in, I returned, therefore, to the ship.

Though consequently exact figures can not be furnished, it is nevertheless certain that there has been in 1897 a considerable mortality among the pups on North Rookery, Bering Island, due to starvation.

Statistics relative to the fur-seal catch on the Commander Islands, summer, 1897.

BERING ISLAND DRIVES.

NORTH ROOKERY.

No. of drive.	Date (new style).	Locality.	Bachelors.	Cows.	Total.
	1897.				
1	July 12	Sivutchi Kamen.....	60		60
		Reef.....	186		186
2	July 27	Sivutchi Kamen.....	183		183
		Reef.....	775	4	779
3	July 28	Reef.....	189	2	191
4	Aug. 6	Reef.....	722	3	725
5	Aug. 12	Reef.....	920	1	921
		Kishotchnaya.....	216	2	218
6	Aug. 21	Reef.....	519		519
		Kishotchnaya.....	181		181
7	Aug. 26	Sivutchi Kamen.....	118		118
		Reef.....	352	1	353
8	Sept. 7	Sivutchi Kamen.....	a 96		96
		Reef.....	b 223	1	224
		Kishotchnaya.....	c 119		119
		Total.....			4,873

a Of these 10 were stagey.

b 23 stagey.

c 17 stagey.

SOUTH ROOKERY.

No. of drive.	Date (new style).	Bachelors.
	1897.	
1	July 14.....	14
2	July 20.....	32
3	August 1.....	23
4	August 9.....	30
5	August 24.....	26
6	August 28.....	16
7	September 7.....	5
	Two damaged skins.....	151
	Total.....	2
		153

Statistics relative to the fur-seal catch on the Commander Islands, summer, 1897.—Cont'd.

COPPER ISLAND DRIVE.

GLINKA.

No. of drive.	Date (new style).	Locality.	Over 20 pounds.	Under 7 pounds.	Full weight skins.	Total.
	1897.					
1	July 3	South end of island and other places		6	333	339
2	July 4	Sikatchinskaya		3	631	634
3	July 5	Babi Podiom		1	257	258
4	July 12	Urili Kamen, Pagani, Sabatchi Dira, Palata		212	1,071	1,283
5	July 18	Palata		3	63	66
6	July 25	Sabatchi Dira		22	a 544	366
7	July 27	Zapadni, Sabatchi Dira		19	a 554	573
8	July 28	Zapalata		8	449	557
9	July 30	Zapalata, Babi Podiom			321	321
10	Aug. 3	Zapadni, Urili		42	243	285
11	Aug. 9	Zapalata, Palata, Zapadni, Urili		13	208	221
12	Aug. 19	Palata		10	47	57
13	Aug. 20	Zapadni	1	6	64	71
14	Aug. 23	Babi Podiom		3	23	26
15	Aug. 26	Palata			19	19
		Total	1	348	4,627	4,976

a Including 1 cow.

KARABELNI.

No. of drive.	Date (new style).	Locality.	Under 7 pounds.	Full weight skins.	Total.
	1897.				
1	July 4	Stolp	4	260	284
2	July 6	do	5	122	127
3	July 13	do	14	285	299
4	July 20	do	1	112	113
5	July 26	do		58	58
6	Aug. 2	do	1	73	74
7	Aug. 4	do	2	73	a 76
8	Aug. 6	Bolshaya Bukhta		79	79
9	Aug. 10	Vodopad	12	187	199
10	Aug. 23	Stolp	1	19	20
		Total	40	1,288	1,329

a Including 1 cow.

SUMMARY OF COMMANDER ISLANDS AND ROBBEN ISLAND CATCH, SUMMER 1897.

Bering Island:			
	North Rookery	4,873	
	South Rookery	153	
	Total		5,026
Copper Island:			
	Glinka Rookeries	4,976	
	Karabelni	1,329	
	Caught in sea-otter nets	4	
	Total		6,309
	Commander Islands, total		11,335
	Robben Island		214
	Grand total		11,549

As might have been expected, the catch was considerably smaller than that of the corresponding season of 1896, the Bering Island rookeries and Karabelni showing a great falling off. The slight increase of the Glinka catch is caused by an unusual activity on the part of the Government agents in killing seals by means of boats at places on the shore where no killing was formerly thought possible. It is quite

characteristic that not a single seal was obtained at the old hauling ground at Pestshani, which formerly yielded the large majority of the skins. So desperate has the raking of these rookeries become, that during the present summer the bachelors were culled from among the breeding cows in some places, as on Bering Island. Conditions seem to have been similar at Karabelni, as the chief hauling ground, Vodopad, yielded only 199 skins.

It will be noted that if the killing had been stopped on August 1, the total for the Commander Islands would only have been 6,633 skins. Nothing could better illustrate the straits to which these rookeries have come.

IS A TEMPORARY STOPPAGE OF KILLING ON LAND ADVISABLE?

The propriety of prohibiting the killing of fur seals on land for a period of five years, as a means of building up the seal herd, has of late been discussed by the Russian authorities. The success in former years of such a cessation of killing on land, or "zapuska" as it is called, as well as its advantage in the management of the fox and sea-otter hunt, have undoubtedly influenced them; but they have plainly failed to see the difference between those old zapuskas, which protected the females as well as the males, and the zapuska of the present, the employment of which would only mean the protection of the males alone when on land. When at sea, they would be subjected to the same danger from the pelagic hunter as the females. It shows that they have utterly failed to grasp the two essential points of the seal question as it stands to-day, viz, that the decline of the seal herd is solely due to pelagic sealing, and that the increase and consequent rehabilitation of the herd depends solely upon the preservation of the female seals. If pelagic sealing be stopped, no zapuska is necessary, or, as I shall show, it will be directly hurtful. If pelagic sealing be continued, a zapuska will not only not protect the herd on shore, but it will directly result in increased catches for the pelagic sealers as long as the zapuska lasts, since they will have the additional males to prey upon which will have been spared on land.

Now, the future prosperity of the seal herd depends upon the number of females it contains; the number of bachelors is irrelevant in this connection. Suppose pelagic sealing be suppressed and a five years' zapuska instituted on the Commander Islands; what would result? At the end of the five years there would be exactly as many females as if no zapuska had been, not one more (possibly some less), because no female seals would have been killed even if the zapuska had not been kept. But there certainly would be a great many more killable seals at the beginning of the sixth year than during any one of the preceding years. A little reflection, however, will show that their total number must be less than the total sum of killed ones during these preceding years, inasmuch as the 2 to 4 years' old bachelors of these years would have escaped the killing and become sikatchi, that is, available rookery bulls, and consequently unfit for killing during the zapuska. And how would it look on the rookeries? Copper Island is already overstocked with bulls to such an extent that it would greatly benefit the herd to decimate them now; with a five years' zapuska the conditions would be infinitely worse. On Bering Island there is no overstocking of males now, but there is nothing to indicate that there are not enough bulls, and five years' prohibition would bring about the same deplorable condition as on Copper Island; in fact, the results

would be more disastrous, for the nature of the rookery beach on Bering Island is much less favorable to the pups in protecting them from being trampled to death.

To sum up, a zapuska as contemplated would result in (1) no addition of a single female to the herd; (2) loss in the total number of killables; (3) highly injurious overstocking of the rookeries with fighting males, and (4) a consequent heavy loss of young pups killed shortly after birth.

A zapuska without total stoppage of pelagic sealing would be even more senseless, as the females would continue to decrease at a much greater rate than the males, more females than males being killed at sea, and the resultant overstocking of the rookeries with bulls would be even more disproportionate and more disastrous.

That these considerations are not mere fanciful theories is plainly shown by our experience on the Pribilof Islands. As soon as the falling off in the catch of the bachelors called attention to the decrease of the seal herd a halt was called; the killing on land was reduced to a minimum. The temporary officials were then under the same erroneous impression as the Russian authorities now, viz, that the calamity consisted in the decrease of the bachelors, and they overlooked that it was the females, and they only, that needed being looked after. For several years only a fraction of the killable seals was allowed to be taken. What was the result? A single additional female on the rookeries? No; loss to the lessees and the Government of the bachelors spared; a corresponding gain to the pelagic sealers; a deplorable superabundance of bulls on the Pribilof rookeries, and numerous pups trampled to death soon after their birth. America has thus paid very dearly for her blunder. Are the Russians going to repeat it?

It is quite possible that they may quote the example of Robben Island. Thus, in 1891, only 450 skins were taken; then, in 1892, none; but in 1893, 1,500. Apart from the fact that raiding on land took place, I will only call attention to the fact that until within the last couple of years the killing on Robben Island was not so rigidly restricted to the males as is usual on the other rookeries.

Finally, it may be said against me that I have formerly favored a "total prohibition of killing on land one year."¹ It must be remembered that the recommendation in question was penned in 1895. At that time the number of males on Bering Island was more disproportionate than at present; consequently it seemed more desirable to increase the number of bulls. At that time we did not have the experience from the South Rookery, which shows that a much smaller number of males is sufficient than has hitherto been held possible.

I may add that the recommendation was made upon the supposition of a temporary suspension of pelagic sealing only, and that it was thought necessary to make some such concession to the pelagic sealer in order to obtain this suspension. Since 1895 we have learned a great deal, and progress is only possible if we recognize and renounce our past mistakes.

It can now be asserted with certainty that a zapuska of five years, or of one year, will retard the rehabilitation of the rookeries not only for so many years as the zapuska lasts, but until the blunder be corrected by a wholesale killing off of the superfluous bulls resulting at the end of the zapuska.

¹ Russian Fur-Seal Islands, p. 136.

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