

E. THE SEAL-LIFE ON THE PRIBYLOV ISLANDS.

8. THE HAIR-SEAL.

ENUMERATION OF THE VARIOUS SPECIES OF SEALS.—The history of the fur-seal, the one overshadowing and superlatively interesting subject of this discussion, I shall present in all its multitudinous details, even at the risk of being thought tedious. The aggregate of animal life shadowed every summer out upon the breeding grounds of the seal-islands is so vast, so anomalous, so interesting, and so valuable, that it deserves the fullest mention; and even when I shall have done, it will be but feebly expressed.

The seal-life on the Pribylov islands may be classified under the following heads, namely: (1) The fur-seal, *Callorhinus ursinus*, the "kautickie" of the Russians; (2) the sea-lion, *Eumetopias Stelleri*, the "seevitchie" of the Russians; (3) the hair-seal, *Phoca vitulina*, the "nearhpahsky" of the Russians; (4) the walrus, *Odobenus obesus*, the "morsjee" of the Russians.

THE HAIR-SEAL.—The above short schedule embraces the titles of all the pinnipeds found in, on, and around the island group. Of this list the hair-seal is the animal which has done so much to found that erroneous, popular, and scientific opinion as to what a fur-seal appears like. *Phoca vitulina* has, in this manner, given to the people of the world a false idea of its relatives. It is so commonly distributed all over the littoral salt waters of the earth, seen in the harbors of nearly every marine port, or basking along the loneliest and least inhabited of desolate coasts far to the north, that everybody has noticed it, if not in life, then in its stuffed skins at the museums, sometimes very grotesquely stuffed. This copy, set everywhere before the eye of the naturalist, has rendered it so difficult for him to correctly discriminate between the *Phocidae* and the *Otariidae*, that the synonymy of the *Pinnipedia* has been expanded until it is replete with meaningless description and surmise.

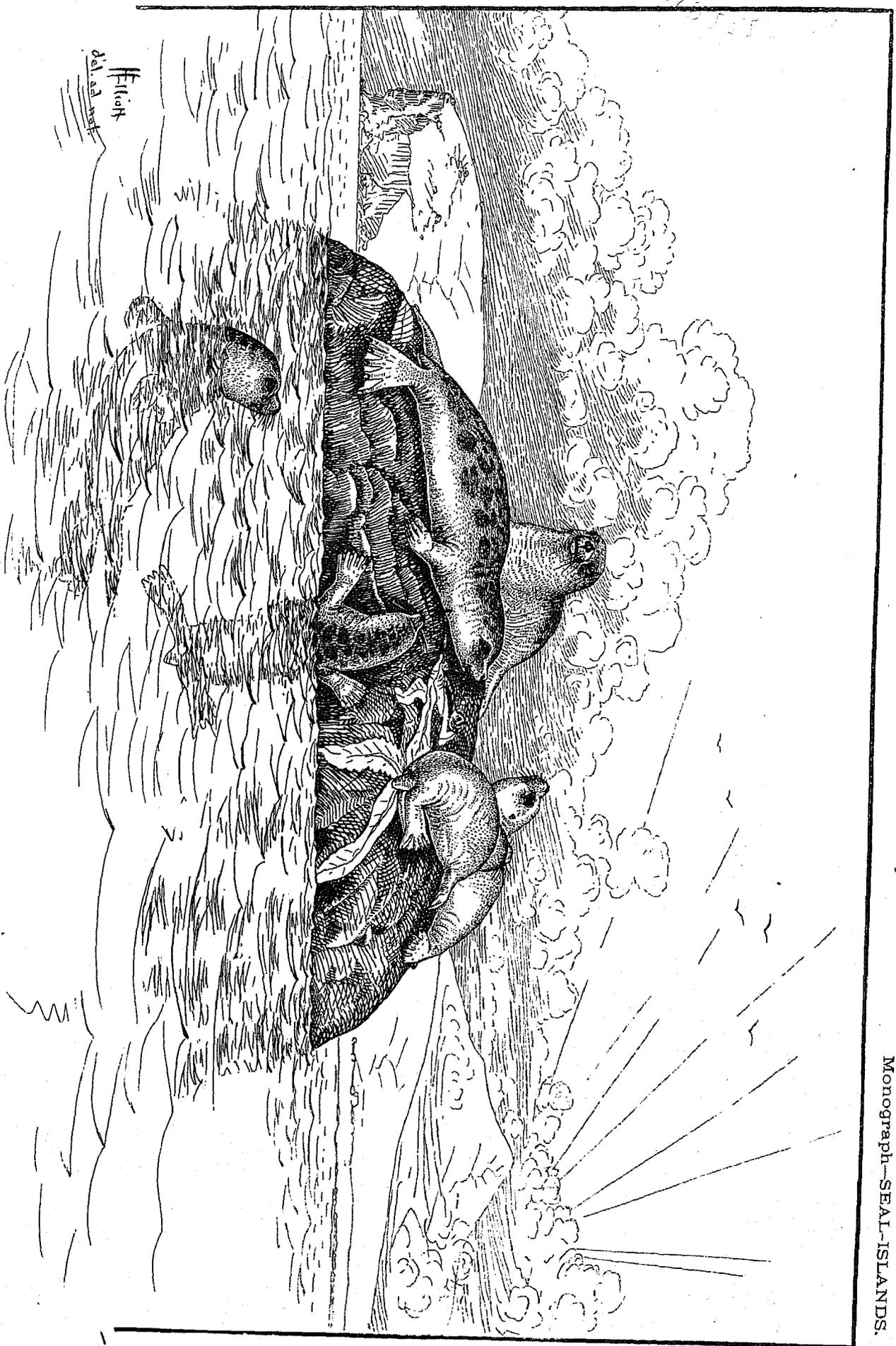
Although the hair-seal belongs to the great group of pinnipeds, yet it does not have even a generic affinity with those seals with which it has been so persistently grouped, namely, the fur-seal and the sea-lion. It no more resembles them, than does the raccoon the black or grizzly bear.

I shall not enter into a detailed description of this seal; it is wholly superfluous, for excellent, and, I believe, trustworthy accounts have been repeatedly published by writers* who have treated of the subject as it was spread before their eyes on the coasts of Labrador, Newfoundland, and Greenland; to say nothing of the researches and notes made by European scientists. It differs completely in shape and habit from its congeners on these islands. Here, where I have studied its biology, it seldom comes up from the water more than a few rods at the farthest; generally hauling and resting at the margin of the surf-wash. It takes up no position on land to hold and protect a family or harem, preferring the detached water-worn rocks, especially those on the lonely north shore of St. Paul, although I have seen it resting at "Gorbotch", near the sea-margin of the great seal-rookery of that name, on the Reef point of St. Paul; its cylindrical, supine, gray and white body marked in strong contrast with the erect, black and ocher-colored forms of the *Callorhinus*, which swarmed around about it. On such small spots of rock, wet and isolated from the mainland, and in secluded places on the north shore, the "Nearhpah" brings forth its young, a single pup, perfectly white, covered with long woolly hair, and weighing from 3 to 7 pounds. This pup grows rapidly, and after the lapse of four or five months it tips the scales at 50 pounds; by that time it has shed its infant coat and donned the adult soft steel-gray hair over the head, limbs, and abdomen, with the back most richly mottled and barred lengthwise, by dark brown and brown-black streaks and blotches, suffused at their edges into the light steel-gray ground of the body. When they appear in the spring following, this bright gray tone to their color has ripened into a dingy ocher, and the mottling spread well over the head and down on the upper side or back of the flippers, but fades out as it progresses. It has no appreciable fur or under-wool. There is no noteworthy difference as to color or size between the sexes. So far as I have observed, they are not polygamous. They are exceedingly timid and wary at all times, and in this manner and method they are diametrically opposed, not by shape alone, but by habit and disposition, to the fashion of the fur-seal in especial, and the sea-lion. Their skin is of little value, comparatively, but their chief merit, according to the natives, is the relative greater juiciness and sweetness of their flesh, over even the best steaks of sea-lion or fur-seal pup meat.

One common point of agreement among all authors was, by my observations of fact, so strikingly refuted, that I will here correct a prevalent error made by naturalists who, comparing the hair-seal with the fur-seal, state that in consequence of the peculiar structure of their limbs, their progression on land is "mainly accomplished by a wriggling, serpentine motion of the body, slightly assisted by the extremities". This is not so in any respect; for whenever I have purposely surprised these animals, a few rods from the beach-margin, they would awake and excitedly scramble, or rather spasmodically exert themselves, to reach the water instantly, by striking out quickly with both fore-feet simultaneously, lifting in this way alone, and dragging the whole body forward, without any "wriggling motion" whatever to their back or posterior parts, moving from six inches to a foot in advance every time their fore-feet were projected forward, and the body drawn along according to the violence of the effort and the character of the ground; the body of the seal then falls flat upon its stomach, and the fore-feet or flippers are

* A very complete résumé has been given by Allen, *Hist. North American Pinnipeds*, 1880.

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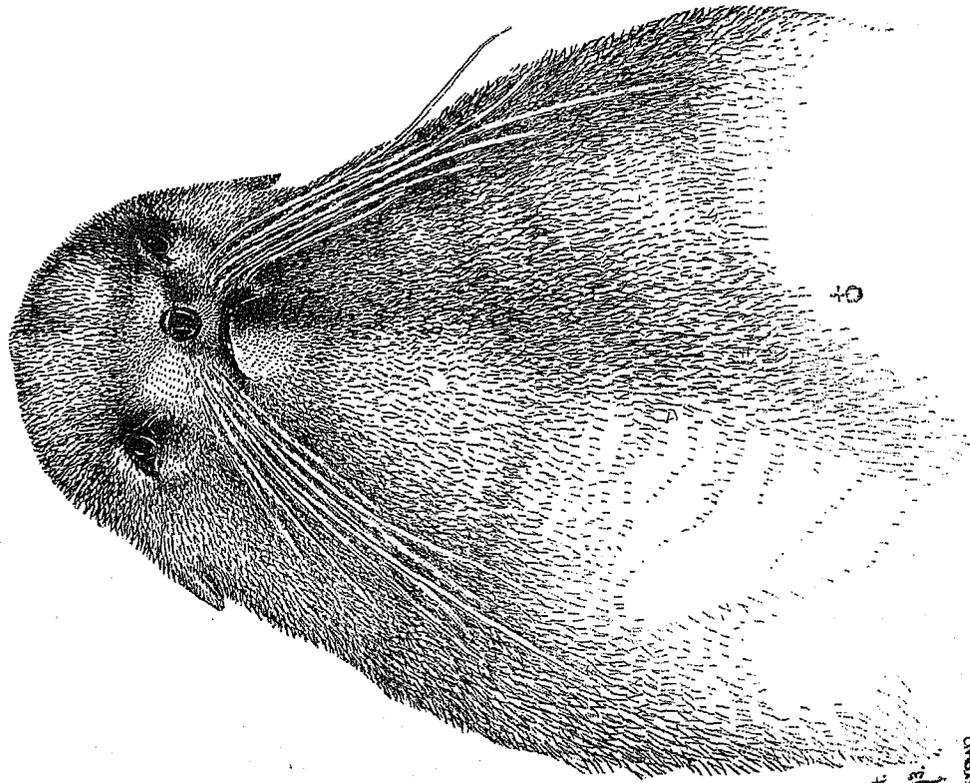
THE HAIR-SEAL.

(*Phoca vitulina*: male, female, and young.)

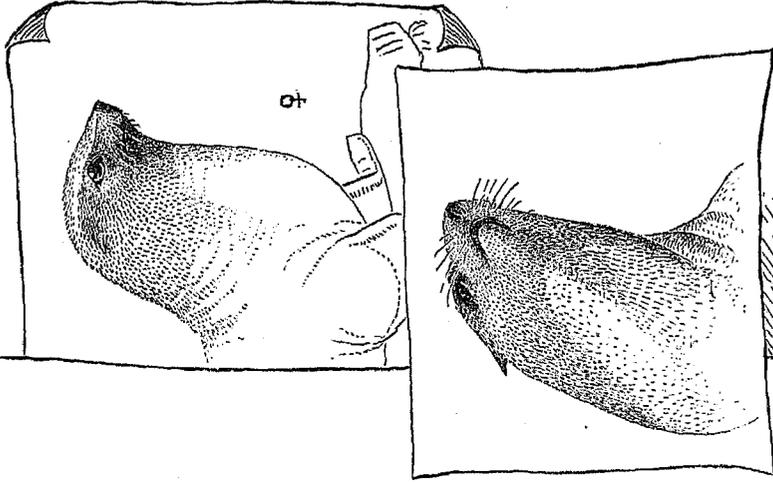
A life-study by the author: Zapadne, St. Paul Island, June 20, 1872.

Plate V.

Callorhinus, Rex.



W. H. Bennett
 del. et sculp.
 North Rockingham, N.S.W.
 Eribylo Group



THE COUNTENANCE OF THE FUR-SEAL.

Life-studies of Callorhinus by the author.

(Full face of old male; profile and under-view of female.)

free again for another similar motion. This action of *Phoca* is effected so continuously and so rapidly, that in attempting to head off a young "Nearhpah" from the water, at English bay, I was obliged to leave a brisk walk and take to a dog trot to do it. The hind-feet are not used when exerted in this rapid movement at all; they are dragged along in the wake of the body, perfectly limp and motionless. But they do use those posterior parts, however, when leisurely climbing up and over rocks undisturbed, or playing one with another; still it is always a weak, trembling terrestrial effort, and particularly impotent and clumsy. In their swift swimming the hind-feet of *Phocidæ* evidently do all the work; the reverse is the characteristic of the *Otaridæ*.

These remarks of mine, it should be borne in mind, apply directly to *Phoca vitulina*, and I presume indirectly with equal force to all the rest of its more important generic kindred, be they as large as *Phoca barbata* or less.

This hair-seal is found around these islands at all seasons of the year, but in very small numbers. I have never seen more than twenty-five or thirty at any one time, and I am told that its occidental distribution, although everywhere found, above and below, from the arctic to the tropics, and especially general over the North Pacific coast, nowhere exhibits any great number at any one place; but we know that it and its immediate kindred form a vast majority of the multitudinous seal-life peculiar to our North Atlantic shores, ice-floes, and contiguous waters. The scarcity of this species, and of all its generic allies, in the waters of the Pacific, is notable as compared with those of the circumpolar Atlantic, where these hair-seals are the seals of commerce, and are found in such immense numbers between Greenland and Labrador, and thence to the eastward at certain seasons* of every year, that employment is given to a fleet of about sixty sailing and steam vessels, which annually go forth† from St. John, Newfoundland, and elsewhere, fitted for seal-fishing, taking in all their voyages over 300,000 of these animals each season; the principal object of value, however, is the oil rendered from them, the skins having very small commercial importance.‡ Touching oil, etc., a business digest of this subject, as it refers to the seal-islands of Alaska, will be found in this memoir, in that portion descriptive of the methods employed by working the hauling-grounds of the "holluschickie".

9. LIFE-HISTORY OF THE FUR-SEAL.

DESCRIPTION OF AN ADULT MALE.—The fur-seal, *Callorhinus ursinus*, which repairs to these islands to breed and to shed its hair and fur, in numbers that seem almost fabulous, is the highest organized of all the *Pinnipedia*, and, indeed, for that matter, when land and water are weighed in the account together, there is no other animal known to man which can be truly, as it is, classed superior, from a purely physical point of view. Certainly there are few, if any, creatures in the animal kingdom that can be said to exhibit a higher order of instinct, approaching even our intelligence.

I wish to draw attention to a specimen of the finest of this race—a male in the flush and prime of his first maturity, six or seven years old, and full grown. When it comes up from the sea early in the spring, out to its station for the breeding season, we have an animal before us that will measure $6\frac{1}{2}$ to $7\frac{1}{2}$ feet in length from tip of nose to the end of its abbreviated, abortive tail. It will weigh at least 400 pounds, and I have seen older specimens much more corpulent, which, in my best judgment, could not be less than 600 pounds in weight. The head of this animal now before us, appears to be disproportionately small in comparison with the immensely thick neck and shoulders; but, as we come to examine it we will find it is mostly all occupied by the brain. The light frame-work of the skull supports an expressive pair of large bluish hazel eyes; alternately burning with revengeful, passionate light, then suddenly changing to the tones of tenderness and good nature. It has a muzzle and jaws of about the same size and form observed in any full-blooded Newfoundland dog, with this difference, that the lips are not flabby and overhanging; they are as firmly lined and pressed against one another as our own. The upper lips support a yellowish white and gray moustache, composed of long, stiff bristles, and when it is not torn out and broken off in combat, it sweeps down and over the shoulders as a luxuriant plume. Look at it as it comes leisurely swimming on toward the land; see how high above the water it carries its head, and how deliberately it surveys the beach, after having stepped upon it (for it may be truly said to step with its fore-flippers, as they regularly alternate when it moves up), carrying the head well above them, erect and graceful, at least three feet

* March and April.

† Sailing on the 10th of March, simultaneously: the Canadian law prohibits earlier work in this respect.

‡ An excellent, and, as far as I know, a correct description of this seal-fishery in the North Atlantic has been published by Michael Carroll, in his *Seal and Herring Fisheries of Newfoundland*. This gentleman writes in a manner indicative of much familiarity with the business, though it is to be regretted that his observations were not more systematized and concentrated. Mr. Carroll, when he published his work in 1873, had enjoyed a personal experience of over fifty years in the hair-seal hunting of the North Atlantic, and this report is, therefore, perhaps the best exposition of the habit and condition of those *Phocidæ* that is extant; at least I should judge so. Robert Brown, in 1868 (Proc. Zool. Society, London, pp. 413-418), gives a graphic sketch of the life of the Greenland hair-seal, while Ludwig Kumlein, in "Bulletin No. 15" of the United States National Museum, 1879, presents altogether the most interesting and valuable biology of the hair-seals in the waters of Cumberland sound that has as yet been printed. Allen, in his *History of the North American Pinnipeds*, 1880, has, with painstaking labor, carefully compiled the pertinent remarks of a whole army of lesser authorities upon the doing and well-being of the *Phocidæ*, and has arranged them in his memoir so that they appear to the best advantage. Carroll's report is exceedingly interesting, and could he be induced to rewrite his notes, systematising them, or permit some naturalist to do so who might draw out from him information on important points, now hidden, the result undoubtedly would accrue greatly to the benefit of all concerned, and cause him to reap a fitting recognition of his knowledge of the subject, which seems to be very full and exhaustive, as far as expressed by himself.

from the ground. The fore-feet, or flippers, are a pair of dark bluish-black hands, about 8 or 10 inches broad at their junction with the body, and the metacarpal joint, running out to an ovate point at their extremity, some 15 to 18 inches from this union; all the rest of the forearm, the ulna, radius, and humerus being concealed under the skin and thick blubber-folds of the main body and neck, hidden entirely at this season, when it is so fat. But six weeks to three months after this time of landing, when that superfluous fat and flesh has been consumed by self-absorption, those bones show plainly under the shrunken skin. On the upper side of these flippers the hair of the body straggles down finer and fainter as it comes below to a point close by, and slightly beyond that spot of junction where the phalanges and the metacarpal bones unite, similar to that point on our own hand where our knuckles are placed; and here the hair ends, leaving the rest of the skin to the end of the flipper bare and wrinkled in places at the margin of the inner side; showing, also, fine small pits, containing abortive nails, which are situated immediately over the union of the phalanges with their cartilaginous continuations to the end of the flipper.

On the under side of the flipper the skin is entirely bare, from its outer extremity up to the body connection; it is sensibly tougher and thicker than elsewhere on the body; it is deeply and regularly wrinkled with seams and furrows, which cross one another so as to leave a kind of sharp diamond-cut pattern. When they are placed by the animal upon the smoothest rocks, shining and slippery from algal growths and the sea-polish of restless waters, they seldom fail to adhere.

When we observe this seal moving out on the land, we notice that, though it handles its fore-feet in a most creditable manner, it brings up its rear in quite a different style; for, after every second step ahead with the anterior limbs, it will arch its spine, and in arching, it drags and lifts up, and together forward, the hind-feet, to a fit position under its body, giving it in this manner fresh leverage for another movement forward by the fore-feet, in which the spine is again straightened out, and then a fresh hitch is taken up on the posteriors once more, and so on as the seal progresses. This is the leisurely and natural movement on land, when not disturbed, the body all the time being carried clear of and never touching the ground. But if the creature is frightened, this method of progression is radically changed. It launches into a lope, and actually gallops so fast that the best powers of a man in running are taxed to head it off. Still, it must be remembered that it cannot run far before it sinks trembling, gasping, breathless, to the earth; thirty or forty yards of such speed marks the utmost limit of its endurance.

The radical difference in the form and action of the hind-feet cannot fail to strike the eye at once; they are one-seventh longer than the fore-hands, and very much lighter and more slender; they resemble, in broad terms, a pair of black kid gloves, flattened out and shriveled, as they lie in their box.

There is no suggestion of fingers on the fore-hands; but the hind-feet seem to be toes run into ribbons, for they literally flap about involuntarily from that point, where the cartilaginous processes unite with the phalangeal bones. The hind-feet are also merged in the body at their junction with it, like those anterior; nothing can be seen of the leg above the tarsal joint.

The shape of the hind-flipper is strikingly like that of a human foot, provided the latter were drawn out to a length of 20 or 22 inches, the instep flattened down, and the toes run out into thin, membraneous, oval-tipped points, only skin-thick, leaving three strong, cylindrical, grayish, horn-colored nails, half an inch long each, back six inches from these skinny toe-ends, without any sign of nails to mention on the outer big and little toes.

On the upper side of this hind-foot the body-hair comes down to that point where the metatarsus and phalangeal bones join and fade out. From this junction the phalanges, about six inches down to the nails above mentioned, are entirely bare, and stand ribbed up in bold relief on the membrane which unites them, as the web to a duck's foot; the nails just referred to mark the ends of the phalangeal bones, and their union in turn with the cartilaginous processes, which run rapidly tapering and flattening out to the ends of the thin toe-points. Now, as we are looking at this fur-seal's motion and progression, that which seems most odd, is the gingerly manner (if I may be allowed to use the expression) in which it carries these hind-flippers; they are held out at right angles from the body directly opposite the pelvis, the toe-ends or flaps slightly waving, curled, and drooping over, supported daintily, as it were, above the earth, the animal only suffering its weight behind to fall upon its heels, which are themselves opposed to each other, scarcely five inches apart.

We shall, as we see this seal again later in the season, have to notice a different mode of progression and bearing, both when it is lording over its harem, or when it grows shy and restless at the end of the breeding season, then faint, emaciated, and dejected; but we will now proceed to observe him in the order of his arrival and that of his family. His behavior during the long period of fasting and unceasing activity and vigilance, and other cares which devolve upon him as the most eminent of all polygamists in the brute world, I shall carefully relate; and to fully comprehend the method of this exceedingly interesting animal, it will be frequently necessary for the reader to refer to my sketch-maps of its breeding-grounds or rookeries, and the islands.

ARRIVAL AT THE SEAL-GROUNDS: COMING IN OF THE BULLS.—The adult males are the first examples of the *Callorhinus* to arrive in the spring on the seal-ground, which has been deserted by all of them since the close of the preceding year.

Between the 1st and 5th of May, usually, a few males will be found scattered over the rookeries, pretty close to the water. They are, at this time, quite shy and sensitive, seeming not yet satisfied with the land; and a great many

spend day after day idly swimming out among the breakers, a little distance from the shore, before they come to it, perhaps somewhat reluctant at first to enter upon the assiduous duties and the grave responsibilities before them in fighting for and maintaining their positions in the rookeries.

The first arrivals are not always the oldest bulls, but may be said to be the finest and most ambitious of their class. They are full grown and able to hold their places on the rookeries or the breeding-flats, which they immediately take up after coming ashore. Their method of landing is to come collectively to those breeding-grounds where they passed the prior season; but I am not able to say authoritatively, nor do I believe it, strongly as it has been urged by many careful men who were with me on the islands, that these animals come back to and take up the same position on their breeding-grounds that they individually occupied when there last year. From my knowledge of their action and habit, and from what I have learned of the natives, I should say that very few, if any, of them make such a selection and keep these places year after year. Even did the seal itself intend to come directly from the sea to that spot on the rookery which it left last summer, what could it do if it came to that rookery-margin a little late, and found that another "see-catch" had occupied its ground? The bull could do nothing. It would either have to die in its tracks, if it persisted in attaining this supposed objective point, or do what undoubtedly it does do—seek the next best locality which it can attain adjacent.

One old "see-catch" was pointed out to me at the "Gorbatch" section of the Reef rookery, as an animal that was long known to the natives as a regular visitor, close by or on the same rock, every season during the past three years. They called him "Old John", and they said they knew him because he had one of his posterior digits missing, bitten off, perhaps, in a combat. I saw him in 1872, and made careful drawings of him in order that I might recognize his individuality, should he appear again in the following year, and when that time rolled by I found him not; he failed to reappear, and the natives acquiesced in his absence. Of course it was impossible to say that he was dead, when there were 10,000 rousing, fighting bulls to the right, left, and below us, under our eyes, for we could not approach for inspection. Still, if these animals came each to a certain place in any general fashion, or as a rule, I think there would be no difficulty in recognizing the fact; the natives certainly would do so; as it is, they do not. I think it very likely, however, that the older bulls come back to the same common rookery-ground where they spent the previous season; but they are obliged to take up their position on it just as the circumstances attending their arrival will permit, such as finding other seals which have arrived before them, or of being whipped out by stronger rivals from their old stands.

It is entertaining to note, in this connection, that the Russians themselves, with the object of testing this mooted query, during the later years of their possession of the islands, drove up a number of young males from Lukannon, cut off their ears, and turned them out to sea again. The following season, when the drives came in from the "hauling-grounds" to the slaughtering-fields, quite a number of those cropped seals were in the drives, but instead of being found all at one place—the place from whence they were driven the year before—they were scattered examples of croppies from every point on the island. The same experiment was again made by our people in 1870 (the natives having told them of this prior undertaking), and they went also to Lukannon, drove up 100 young males, cut off their left ears, and set them free in turn. Of this number, during the summer of 1872, when I was there, the natives found in their driving of 75,000 seals from the different hauling-grounds of St. Paul up to the village killing-grounds, two on Novastoshnah rookery, 10 miles north of Lukannon, and two or three from English bay and Tolstoi rookeries, 6 miles west by water; one or two were taken on St. George island, 36 miles to the southeast, and not one from Lukannon was found among those that were driven from there; probably, had all the young males on the two islands this season been examined, the rest of the croppies that had returned from the perils of the deep, whence they sojourned during the winter, would have been distributed quite equally about the Pribylov hauling-grounds. Although the natives say that they think the cutting off of the animal's ear gives the water such access to its head as to cause its death, yet I noticed that those examples which we had recognized by this auricular mutilation, were normally fat and well developed. Their theory does not appeal to my belief, and it certainly requires confirmation.

These experiments would tend to prove very cogently and conclusively, that when the seals approach the islands in the spring, they have nothing in their minds but a general instinctive appreciation of the fitness of the land, as a whole; and no special fondness or determination to select any one particular spot, not even the place of their birth. A study of my map of the distribution of the seal-life on St. Paul, clearly indicates that the landing of the seals on the respective rookeries is influenced greatly by the direction of the wind at the time of their approach to the islands in the spring and early summer. The prevailing airs, blowing, as they do at that season, from the north and northwest, carry far out to sea the odor of the old rookery-flats, together with the fresh scent of the pioneer bulls which have located themselves on these breeding-grounds, three or four weeks in advance of their kind. The seals come up from the great North Pacific, and hence it will be seen that the rookeries of the south and southeastern shores of St. Paul island receive nearly all the seal-life, although there are miles of perfectly eligible ground at Nahsayvernia, or north shore. To settle this matter beyond all argument, however, I know is an exceedingly difficult task, for the identification of individuals, from one season to another, among the hundreds of thousands, and even millions, that come under the eye on one of these great rookeries, is well nigh impossible.

From the time of the first arrival in May up to the beginning of June, or as late as the middle of that month, if the weather be clear, is an interval in which everything seems quiet. Very few seals are added to the pioneers that have landed, as we have described. By the 1st of June, however, sometimes a little before, and never much later, the seal-weather—the foggy, humid, oozy damp of summer—sets in; and with it, as the gray banks roll up and shroud the islands, the bull-seals swarm from the depths by hundreds and thousands, and locate themselves in advantageous positions for the reception of the females, which are generally three weeks or a month later than this date in arrival.

PRE-EMPTION OF THE ROOKERIES: BATTLES OF THE SEALS.—The labor of locating and maintaining a position on the rookery is really a terribly serious business for these bulls which come in last; and it is so all the time to those males that occupy the water-line of the breeding-grounds. A constantly-sustained fight between the newcomers and the occupants goes on morning, noon, and night, without cessation, frequently resulting in death to one or even both of the combatants.

It appears, from my survey of these breeding-grounds, that a well-understood principle exists among the able-bodied bulls, to wit: that each one shall remain undisturbed on his ground, which is usually about six to eight feet square; provided that at the start, and from that time until the arrival of the females, he is strong enough to hold this ground against all comers; inasmuch as the crowding in of the fresh arrivals often causes the removal of those which, though equally able-bodied at first, have exhausted themselves by fighting earlier and constantly; they are finally driven by these fresher animals back farther and higher up on the rookery; and sometimes off altogether.

Many of those bulls exhibit wonderful strength and desperate courage. I marked one veteran at Gorbach, who was the first to take up his position early in May, and that position, as usual, directly at the water-line. This male seal had fought at least forty or fifty desperate battles, and fought off his assailants every time—perhaps nearly as many different seals which coveted his position—and when the fighting season was over (after the cows are mostly all hauled up), I saw him still there, covered with scars and frightfully gashed; raw, festering, and bloody, one eye gouged out, but lording it bravely over his harem of fifteen or twenty females, who were all huddled together on the same spot of his first location and around him.

This fighting between the old and adult males (for none others fight) is mostly, or rather entirely, done with the mouth. The opponents seize one another with their teeth, and, then clenching their jaws, nothing but the sheer strength of the one and the other tugging to escape can shake them loose, and that effort invariably leaves an ugly wound, the sharp canines tearing out deep gutters in the skin and furrows in the blubber, or shredding the flippers into ribbon-strips.

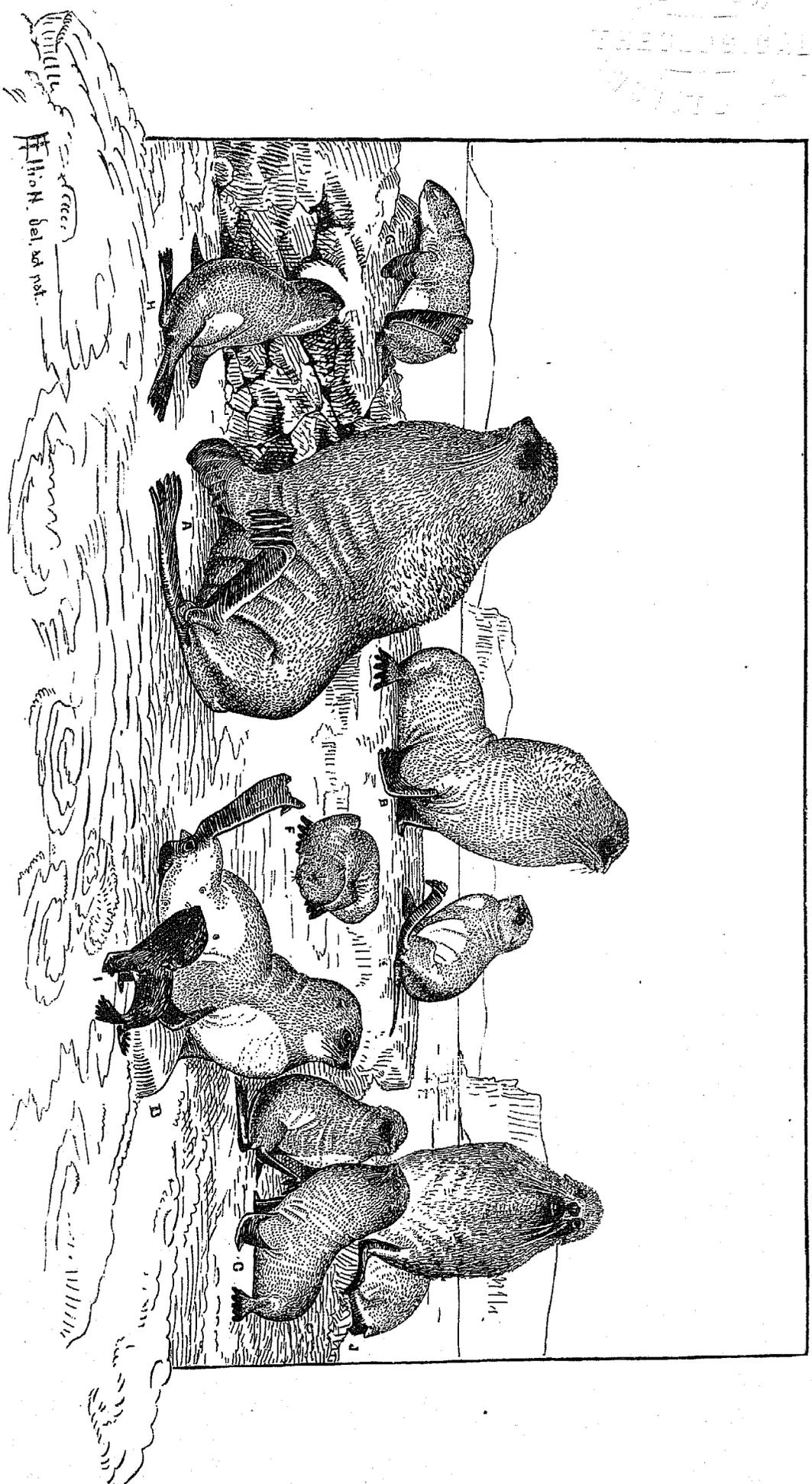
They usually approach each other with comically averted heads, just as though they were ashamed of the rumpus which they are determined to precipitate. When they get near enough to reach one another they enter upon the repetition of many feints or passes, before either one or the other takes the initiative by griping. The heads are darted out and back as quick as a flash; their hoarse roaring and shrill, piping whistle never ceases, while their fat bodies writhe and swell with exertion and rage; furious lights gleam in their eyes; their hair flies in the air, and their blood streams down; all combined, makes a picture so fierce and so strange that, from its unexpected position and its novelty, is perhaps one of the most extraordinary brutal contests man can witness.

In these battles of the seals, the parties are always distinct; the one is offensive, the other defensive. If the latter proves the weaker he withdraws from the position occupied, and is never followed by his conqueror, who complacently throws up one of his hind-flippers, fans himself, as it were, to cool his fevered wrath and blood from the heat of the conflict, sinks into comparative quiet, only uttering a peculiar chuckle of satisfaction or contempt, with a sharp eye open for the next covetous bull or "see-catch".*

ATTITUDES AND COLORATION OF THE FUR-SEALS.—The period occupied by the males in taking and holding their positions on the rookery, offers a very favorable opportunity to study them in the thousand and one different attitudes and postures assumed, between the two extremes of desperate conflict and deep sleep—sleep so profound that one can, if he keeps to the leeward, approach close enough, stepping softly, to pull the whiskers of any old male taking a nap on a clear place; but after the first touch to these moustaches, the trifier must jump with electrical celerity back, if he has any regard for the sharp teeth and tremendous shaking which will surely overtake him if he does not. The younger seals sleep far more soundly than the old ones, and it is a favorite pastime for the natives to surprise them in this manner—favorite, because it is attended with no personal risk; the little beasts, those amphibious sleepers, rise suddenly, and fairly shrink to the earth, spitting and coughing their terror and confusion.

The neck, chest, and shoulders of a fur-seal bull comprise more than two-thirds of his whole weight; and in this long, thick neck, and the powerful muscles of the fore-limbs and shoulders, is embodied the larger portion of his strength. When on land, with the fore-hands he does all climbing over the rocks and grassy hummocks back of the rookery, or shuffles his way over the smooth parades; the hind-feet being gathered up as useless trappings after every second step forward, which we have described at the outset of this chapter. These anterior flippers are

* "See-catch," native name for the bulls on the rookeries, especially those which are able to maintain their position.



THE FUR-SEAL.
(Callorhinus ursinus.)

A. Old "Seecatch," or male, 8 to 24 years.
 B. Young "Seecatch," 6 to 8 years.
 C. "Holluschickel," or young males, 2 years.

D. "Matrah," or cow nursing her "pup," I.
 E. Cow fanning herself.
 F. Cow sleeping.

G. Cow napping and fanning herself.
 H. Cow crooning to the male.
 I. Characteristic twisting of bodies of old males.

Life-studies by the author: Pribilof Islands. 1872-'75.

also the propelling power when in water, the exclusive machinery with which they drive their rapid passage; the hinder ones, floating behind like the steering sweep to a whale-boat, used evidently as rudders, or as the tail of a bird is, while its wings sustain and force its rapid flight.

The covering to the body is composed of two coats, one being a short, crisp, glistening over-hair; and the other a close, soft, elastic pelage, or fur, which gives the distinctive value to the pelt. I can call it readily to the mind of my readers, when I say to them that the down and feathers on the breast of a duck lay relatively as the fur and hair do upon the skin of the seal.

At this season of first "hauling up",* in the spring, the prevailing color of the bulls, after they dry off and have been exposed to the weather, is a dark, dull brown, with a sprinkling in it of lighter brown-black, and a number of hoary or grizzly gray coats peculiar to the very old males. On the shoulders of all of them, that is, the adults, the over-hair is either a gray or rufous ocher, or a very emphatic "pepper and salt"; this is called the "wig". The body-colors are most intense and pronounced upon the back of the head, neck, and spine, fading down on the flanks lighter, to much lighter ground on the abdomen; still never white or even a clean gray, so beautiful and peculiar to them when young, and to the females. The skin of the muzzle and flippers is a dark bluish-black, fading in the older examples to a reddish and purplish tint. The color of the ears and tail is similar to that of the body, perhaps a trifle lighter; the ears on a bull fur-seal are from one inch to an inch and a half in length; the pavilions or auricles are tightly rolled up on themselves, so that they are similar in shape to, and exactly the size of, the little finger on the human hand, cut off at the second phalangeal joint, a trifle more cone-shaped, however, as they are greater at the base than they are at the tip. They are haired and furred as the body is.

I think it probable that this animal has and does exert the power of compressing or dilating this scroll-like pavilion to its ear, just according as it dives deeper or rises in the water; and also, I am quite sure that the hair-seal has this control over the *meatus externus*, from what I have seen of it. I have not been able to verify it in either case by actual observation: yet such opportunity as I have had gives me undoubted proof of the fact, that the hearing of the fur-seal is wonderfully keen and surpassingly acute. If you make any noise, no matter how slight, the alarm will be given instantly by these insignificant-looking auditors, and the animal, awaking from profound sleep, assumes, with a single motion, an erect posture, gives a stare of stupid astonishment, at the same time breaking out into incessant, surly roaring, growling, and "spitting".

VOICE OF THE FUR-SEAL.—This spitting, as I call it, is by no means a fair or full expression of the most characteristic sound or action, so far as I have observed, peculiar to the fur-seals alone, the bulls in particular. It is the usual prelude to all their combats, and it is their signal of astonishment. It follows somewhat in this way: when the two disputants are nearly within reaching or striking distance, they make a number of feints or false passes, as fencing-masters do, at one another, with the mouth wide open, lifting the lips or snarling so as to exhibit the glistening teeth, and with each pass of the head and neck they expel the air so violently through the larynx, as to make a rapid *choo-choo-choo* sound, like steam-puffs as they escape from the smoke-stack of a locomotive when it starts a heavy train, especially while the driving-wheels slip on the rail.

All of the bulls have the power and frequent inclination to utter four distinct calls or notes. This is not the case with the sea-lion,† whose voice is confined to a single bass roar, or that of the walrus, which is limited to a dull grunt, or that of the hair-seal,‡ which is inaudible. This volubility of the fur-seal is decidedly characteristic and prominent; he utters a hoarse, resonant roar, loud and long; he gives vent to a low, entirely different, gurgling growl; he emits a chuckling, sibilant, piping whistle, of which it is impossible to convey an adequate idea, for it must be heard to be understood; and this spitting or *choo* sound just mentioned. The cows§ have but one note—a hollow, prolonged, bla-a-ting call, addressed only to their pups; on all other occasions they are usually silent. It is something strangely like the cry of a calf or an old sheep. They also make a spitting sound or snort when suddenly disturbed—a kind of a cough, as it were. The pups "blaak" also, with little or no variation, their sound being somewhat weaker and hoarser than their mother's, after birth; they, too, comically spit or cough when aroused suddenly from a nap or driven into a corner, opening their little mouths like young birds in a nest, when at bay, backed up in some crevice, or against some tussock.

Indeed, so similar is the sound, that I noticed that a number of sheep which the Alaska Commercial Company had brought up from San Francisco to St. George island, during the summer of 1873, were constantly attracted to the rookeries, and were running in among the "holluschickie"; so much so, that they neglected the good pasturage

* "Hauling up," a technical term, applied to the action of the seals when they land from the surf and haul up or drag themselves over the beach. It is expressive and appropriate, as are most of the sealing phrases.

† *Eumetopias Stelleri*.

‡ *Phoca vitulina*.

§ Without explanation, I may be considered as making use of paradoxical language by using these terms of description; for the inconsistency of talking of "pups", with "cows", and "bulls", and "rookeries", on the breeding-grounds of the same, cannot fail to be noticed; but this nomenclature has been given and used by the American and English whaling and sealing parties for many years, and the characteristic features of the seals themselves so suit the naming, that I have felt satisfied to retain the style throughout as rendering my description more intelligible, especially so to those who are engaged in the business, or may be hereafter. The Russians are more consistent, but not so "pat"; they call the bull "see-catch", a term implying strength, vigor, etc.; the cow, "matkai," or mother; the pups, "kotickie," or little seals; the non-breeding males under six and seven years, "holluschickie," or bachelors. The name applied collectively to the fur-seal by them is "morskie-kot," or sea-cat.

on the uplands beyond, and a small boy had to be regularly employed to herd them where they could feed to advantage. These transported *Oviæ*, though they could not possibly find anything in their eyes suggestive of companionship among the seals, had their ears so charmed by the sheep-like accents of the female pinnipeds, as to persuade them against their senses of vision and smell.

The sound which arises from these great breeding-grounds of the fur-seal, where thousands upon tens of thousands of angry, vigilant bulls are roaring, chuckling, and piping, and multitudes of seal-mothers are calling in hollow, blating tones to their young, that in turn respond incessantly, is simply defiance to verbal description. It is, at a slight distance, softened into a deep booming, as of a cataract; and I have heard it, with a light, fair wind to the leeward, as far as six miles out from land on the sea; and even in the thunder of the surf and the roar of heavy gales, it will rise up and over to your ear for quite a considerable distance away. It is the monitor which the sea-captains anxiously strain their ears for, when they run their dead reckoning up, and are laying to for the fog to rise, in order that they may get their bearings of the land; once heard, they hold on to the sound and feel their way in to anchor. The seal-roar at "Novastoshnah" during the summer of 1872, saved the life of the surgeon*, and six natives belonging to the island, who had pushed out on an egg-trip from Northeast point to Walrus island. I have sometimes thought, as I have listened through the night to this volume of extraordinary sound, which never ceases with the rising or the setting of the sun throughout the entire season of breeding, that it was fully equal to the churning boom of the waves of Niagara. Night and day, throughout the season, this din upon the rookeries is steady and constant.

EFFECTS OF HEAT ON THE SEALS.—The seals seem to suffer great inconvenience and positive misery from a comparatively low degree of heat. I have often been surprised to observe that, when the temperature was 46° and 48° Fahr. on land during the summer, they would show everywhere signs of distress, whenever they made any exertion in moving or fighting, evidenced by panting and the elevation of their hind-flippers, which they used incessantly as so many fans. With the thermometer again higher, as it is at rare intervals, standing at 55° and 60°, they then seem to suffer even when at rest; and at such times the eye is struck by the kaleidoscopic appearance of a rookery—in any of these rookeries where the seals are spread out in every imaginable position their lithesome bodies can assume, all industriously fan themselves; they use sometimes the fore-flippers as ventilators, as it were, by holding them aloft motionless, at the same time fanning briskly with the hinder ones, according as they sit or lie. This wavy motion of fanning or flapping gives a hazy indistinctness to the whole scene, which is difficult to express in language; but one of the most prominent characteristics of the fur-seal, and perhaps the most unique feature, is this very fanning manner in which they use their flippers, when seen on the breeding-grounds at this season. They also, when idle, as it were, off-shore at sea, lie on their sides in the water with only a partial exposure of the body, the head submerged, and then hoist up a fore- or hind-flipper clear out of the water, at the same time scratching themselves or enjoying a momentary nap; but in this position there is no fanning. I say "scratching", because the seal, in common with all animals, is preyed upon by vermin, and it has a peculiar species of louse, or parasitic tick, that belongs to it.

SLEEPING AFLOAT.—Speaking of the seal as it rests in the water, leads me to remark that they seem to sleep as sound and as comfortably, bedded on the waves or rolled by the swell, as they do on the land; they lie on their backs, fold the fore-flippers down across the chest, and turn the hind ones up and over, so that the tips rest on their necks and chins, thus exposing simply the nose and the heels of the hind-flippers above water, nothing else being seen. In this position, unless it is very rough, the seal sleeps as serenely as did the prototype of that memorable song, who was "rocked in the cradle of the deep".

FASTING OF THE SEALS AT THE ROOKERIES: INTESTINAL WORMS.—All the bulls, from the very first, that have been able to hold their positions, have not left them from the moment of their landing for a single instant, night or day; nor will they do so until the end of the rutting season, which subsides entirely between the 1st and 10th of August, beginning shortly after the coming of the cows in June. Of necessity, therefore, this causes them to fast, to abstain entirely from food of any kind, or water, for three months at least; and a few of them actually stay out four months, in total abstinence, before going back into the water for the first time after "hauling up" in May; they then return as so many bony shadows of what they were only a few months anteriorly; covered with wounds, abject and spiritless, they laboriously crawl back to the sea to renew a fresh lease of life.

Such physical endurance is remarkable enough alone; but it is simply wonderful, when we come to associate this fasting with the unceasing activity, restlessness, and duty devolved upon the bulls as the heads of large families. They do not stagnate like hibernating bears in caves; there is not one torpid breath drawn by them in the whole period of their fast; it is evidently sustained and accomplished by the self-absorption of their own fat, with which they are so liberally supplied when they first come out from the sea and take up their positions on the breeding-grounds; and which gradually disappears, until nothing but the staring hide, protruding tendons and bones mark the limit of their abstinence. There must be some remarkable provision made by nature for the

* Dr. Otto Cramer. The suddenness with which fog and wind shut down and sweep over the sea here, even when the day opens most auspiciously for a short boat-voyage, has so alarmed the natives in times past, that a visit is now never made by them from island to island, unless on one of the company's vessels. Several bidarrahs have never been heard from, which, in earlier times, attempted to sail, with picked crews of the natives, from one island to the other.

entire torpidity of the seals' stomachs and bowels, in consequence of their being empty and unsupplied during this long period, coupled with the intense activity and physical energy of the animals throughout that time, which, however, in spite of the violation of a supposed physiological law, does not seem to affect them, for they come back just as sleek, fat, and ambitious as ever, in the following season.

I have examined the stomachs of hundreds which were driven up and killed immediately after their arrival in the spring, near the village; I have the word of the natives here, who have seen hundreds of thousands of them opened during the slaughtering-seasons past, but in no single case has anything ever been found, other than the bile and ordinary secretions of healthy organs of this class, with the marked exception of finding in every one a snarl or cluster of worms,* from the size of a walnut to a bunch as large as a man's fist. Fasting apparently has no effect upon the worms, for on the rare occasion, and perhaps the last one that will ever occur, of killing three or four hundred old bulls late in the fall to supply the natives with canoe skins, I was present, and again examined their paunches, finding the same *ascaridae* within. They were lively in these empty stomachs, and their presence, I think, gives some reason for the habit which the old bulls have (the others do not) of swallowing small water-worn bowlders, the stones in some of the stomachs weighing half a pound apiece, in others much smaller. In one paunch I found over five pounds, in the aggregate, of large pebbles, which, in grinding against one another, I believe, must comfort the seal by aiding to destroy, in a great measure, those intestinal pests.

The sea-lion is also troubled in the same way by a similar species of worm, and I preserved the stomach of one of these animals in which there was more than ten pounds of stones, some of them alone very great in size. Of this latter animal, I suppose it could swallow bowlders that weigh two and three pounds each. I can ascribe no other cause for this habit among those animals than that given, as they are the highest type of the carnivora, eating fish as a regular means of subsistence, varying the monotony of this diet with occasional juicy fronds of sea-weed or kelp, and perhaps a crab or such once in a while, provided it is small and tender or soft-shelled. I know that the sailors say that the *Callorhinus* swallows these stones to "ballast" himself; in other words, to enable him to dive deeply and quickly; but I noticed that the females and the "holluschickie" dive quicker and swim better than the old fellows above specified, and they do so without any ballast. They also have less muscular power, only a tithe of that which the "see-catch" possesses. No, the ballast theory is not tenable. (See note, 39, J.)

ARRIVAL OF THE COW-SEALS AT THE ROOKERIES.—Between the 12th and 14th of June, the first of the cow-seals, as a rule, come up from the sea; then the long agony of the waiting bulls is over, and they signalize it by a period of universal, spasmodic, desperate fighting among themselves. Though they have quarreled all the time from the moment they first landed, and continue to do so until the end of the season, in August, yet that fighting which takes place at this date is the bloodiest and most vindictive known to the seal. I presume that the heaviest percentage of mutilation and death among the old males from these brawls, occur in this week of the earliest appearance of the females.

A strong contrast now between the males and females looms up, both in size and shape, which is heightened by the air of exceeding peace and dove-like amiability which the latter class exhibit, in contradistinction to the ferocity and saturnine behavior of the former.

DESCRIPTION OF THE COW-SEAL.—The cows are from 4 to 4½ feet in length from head to tail, and much more shapely in their proportions than the bulls; there is no wrapping around their necks and shoulders of unsightly masses of blubber; their lithe, elastic forms, from the first to the last of the season, are never altered; this they are, however, enabled to keep, because in the provision of seal-economy, they sustain no protracted fasting period; for, soon after the birth of their young they leave it on the ground and go to the sea for food, returning perhaps to-morrow, perhaps later, even not for several days in fact, to again suckle and nourish it; having in the mean time sped far off to distant fishing banks, and satiated a hunger which so active and highly organized an animal must experience, when deprived of sustenance for any length of time.

As the females come up wet and dripping from the water, they are at first a dull, dirty-gray color, dark on the back and upper parts, but in a few hours the transformation in their appearance made by drying is wonderful. You would hardly believe that they could be the same animals, for they now fairly glisten with a rich steel and maltese gray luster on the back of the head, the neck, and along down the spine, which blends into an almost snow-white over the chest and on the abdomen. But this beautiful coloring in turn is again altered by exposure to the same weather; for after a few days it will gradually change, so that by the lapse of two or three weeks it is a dull, rufous-ocher below, and a cinereous brown and gray mixed above. This color they retain throughout the breeding-season, up to the time of shedding their coat in August.

The head and eye of the female are exceedingly beautiful; the expression is really attractive, gentle, and intelligent; the large, lustrous, blue-black eyes are humid and soft with the tenderest expression, while the small, well-formed head is poised as gracefully on her neck as can be well imagined; she is the very picture of benignity and satisfaction, when she is perched up on some convenient rock, and has an opportunity to quietly fan herself, the eyes half-closed and the head thrown back on her gently-swelling shoulders.

The females land on these islands not from the slightest desire to see their uncouth lords and masters, but from

* *Nematoda*.

an accurate and instinctive appreciation of the time in which their period of gestation ends. They are in fact driven up to the rookeries by this cause alone; the young cannot be brought forth in the water, and in all cases marked by myself, the pups were born soon after landing, some in a few hours, but most usually a day or so elapses before delivery.

ORGANIZATION OF THE ROOKERIES.—They are noticed and received by the males on the water-line stations with attention; they are alternately coaxed and urged up on to the rocks, as far as these beach-masters can do so, by chuckling, whistling, and roaring, and then they are immediately under the most jealous supervision; but, owing to the covetous and ambitious nature of the bulls which occupy these stations to the rear of the water-line and way back, the little cows have a rough-and-tumble time of it when they begin to arrive in small numbers at first; for no sooner is the pretty animal fairly established on the station of male number one, who has welcomed her there, then he, perhaps, sees another one of her style in the water from whence she has come, and, in obedience to his polygamous feeling, devotes himself anew to coaxing the later arrival, by that same winning manner so successful in the first case; then when bull number two, just back, observes bull number one off guard, he reaches out with his long strong neck and picks up the unhappy but passive cow by the scruff of her's, just as a cat does a kitten, and deposits her upon his seraglio ground; then bulls number three and four, and so on, in the vicinity, seeing this high-handed operation, all assail one another, especially number two, and for a moment have a tremendous fight, perhaps lasting half a minute or so, and during this commotion the little cow is generally moved, or moves, farther back from the water, two or three stations more, where, when all gets quiet again, she usually remains in peace. Her last lord and master, not having the exposure to such diverting temptation as her first, gives her such care that she not only is unable to leave, did she wish, but no other bull can seize upon her. This is only a faint (and I fully appreciate it), wholly inadequate description of the hurly-burly and the method by which the rookeries are filled up, from first to last, when the females arrive. That is only one instance of the many trials and tribulations which both parties on the rookery subject themselves to, before the harems are filled.

Far back, fifteen or twenty "see-catchie" stations deep from the water-line, and sometimes more, but generally not over an average of ten or fifteen, the cows crowd in at the close of the season for arriving, which is by the 10th or 14th of July; then they are able to go about pretty much as they please, for the bulls have become so greatly enfeebled by this constant fasting, fighting, and excitement during the past two months, that they are quite content now even with only one or two partners, if they should have no more.

The cows seem to haul up in compact bodies from the water, filling in the whole ground to the rear of the rookeries, never scattering about over the surface of this area; they have mapped out from the first their chosen resting places, and they will not lie quietly in any position outside of the great mass of their kind. This is due to their intensely gregarious nature, and admirably adapted for their protection. And here I should call attention to the fact, that they select this rookery-ground with all the skill of civil engineers. It is preferred with special reference to the drainage, for it must lie so that the produce of the constantly dissolving fogs and rain-clouds shall not lie upon them, having a great aversion to, and a firm determination to rest nowhere on water-puddled ground. This is admirably exhibited, and will be understood by a study of my sketch-maps which follow, illustrative of these rookeries and the area and position of the seals upon them. Every one of those breeding-grounds slopes up gently from the sea, and on no one of them is there anything like a muddy flat.

I found it an exceedingly difficult matter to satisfy myself as to a fair general average number of cows to each bull on the rookery; but, after protracted study, I think it will be nearly correct when I assign to each male a general ratio of from fifteen to twenty females at the stations nearest the water; and for those back in order from that line to the rear, from five to twelve; but there are so many exceptional cases, so many instances where forty-five and fifty females are all under the charge of one male; and then, again, where there are two or three females only, that this question was and is not entirely satisfactory in its settlement to my mind.

Near Ketavie point, and just above it to the north, is an odd wash-out of the basalt by the surf, which has chiseled, as it were, from the foundation of the island, a lava table, with a single roadway or land passage to it. Upon the summit of this footstool I counted forty-five cows, all under the charge of one old veteran. He had them penned up on this table-rock by taking his stand at the gate, as it were, through which they passed up and passed down—a Turkish brute typified.

UNATTACHED MALES.—At the rear of all these rookeries there is invariably a large number of able-bodied males which have come late, but wait patiently, yet in vain, for families; most of them having had to fight as desperately for the privilege of being there as any of their more fortunately-located neighbors, who are nearer the water, and in succession from there to where they are themselves; but the cows do not like to be in any outside position. They cannot be coaxed out where they are not in close company with their female mates and masses. They lie most quietly and contentedly in the largest harems, and cover the surface of the ground so thickly that there is hardly moving or turning room until the females cease to come from the sea. The inaction on the part of the males in the rear during the breeding-season only serves to qualify them to move into the places which are necessarily vacated by those males that are, in the mean-time, obliged to leave from virile exhaustion, or incipient wounds. All the surplus able-bodied males, that have not been successful in effecting a landing on the rookeries,

cannot at any one time during the season be seen here on this rear line. Only a portion of their number are in sight; the others are either loafing at sea, adjacent, or are hauled out in morose squads between the rookeries on the beaches.

COURAGE OF THE FUR-SEALS.—The courage with which the fur-seal holds his position as the head and guardian of a family, is of the highest order. I have repeatedly tried to drive them from their harem posts, when they were fairly established on their stations, and have always failed, with few exceptions. I might use every stone at my command, making all the noise I could. Finally, to put their courage to the fullest test, I have walked up to within twenty feet of an old veteran, toward the extreme end of Tolstoi, who had only four cows in charge, and commenced with my double-barreled fowling-piece to pepper him all over with fine mustard-seed shot, being kind enough, in spite of my zeal, not to put out his eyes. His bearing, in spite of the noise, smell of powder, and painful irritation which the fine shot must have produced, did not change in the least from the usual attitude of determined, plucky defense, which nearly all of the bulls assumed when attacked with showers of stones and noise; he would dart out right and left with his long neck and catch the timid cows, that furtively attempted to run after each report of my gun, fling and drag them back to their places under his head; and then, stretching up to his full height look me directly and defiantly in the face, roaring and chuckling most vehemently. The cows, however, soon got away from him; they could not stand my racket in spite of their dread of him; but he still stood his ground, making little charges on me of ten or fifteen feet, in a succession of gallops or lunges, spitting furiously, and then comically retreating to the old position, with an indescribable leer and swagger, back of which he would not go, fully resolved to hold his own or die in the attempt.

This courage is all the more noteworthy from the fact that, in regard to man, it is invariably of a defensive character. The seal is always on the defensive; he never retreats, and he will not attack. If he makes you return when you attack him, he never follows you much farther than the boundary of his station, and then no aggravation will compel him to take the offensive, so far as I have been able to observe. I was very much impressed by this trait.

BEHAVIOR OF THE FEMALE SEALS ON THE ROOKERIES.—The cows, during the whole season, do great credit to their amiable expression, by their manner and behavior on the rookery; they never fight or quarrel one with another, and never or seldom utter a cry of pain or rage when they are roughly handled by the bulls, which frequently get a cow between them and actually tear the skin from her back with their teeth, cutting deep gashes in it as they snatch her from mouth to mouth. If sand does not get into these wounds it is surprising how rapidly they heal; and, from the fact that I never could see scars on them anywhere except the fresh ones of this year, they must heal effectually and exhibit no trace the next season.

The cows, like the bulls, vary much in weight, but the extraordinary disparity in the size of the sexes, adult, is exceedingly striking. Two females taken from the rookery nearest to St. Paul village, right under the bluffs, and almost beneath the eaves of the natives' houses, called "Nah Speel", after they had brought forth their young, were weighed by myself, and their respective returns on the scales were 56 and 100 pounds each; the former being about three or four years old, and the latter over six—perhaps ten; both were fat, or rather in good condition—as good as they ever are. Thus the female is just about one-sixth the size of the male.* Among the sea-lions the proportion is just one-half the bulk of the male,† while the hair-seals, as I have before stated, are not distinguishable in this respect, as far as I could observe, but my notice was limited to a few specimens only.

ATTITUDES OF FUR-SEALS ON LAND.—It is quite beyond my power, indeed entirely out of the question, to give a fair idea of the thousand and one positions in which the seals compose themselves and rest when on land. They may be said to assume every possible attitude which a flexible body can be put into, no matter how characteristic or seemingly forced or constrained. Their joints seem to be double-hinged; in fact, all ball and socket union of the bones. One favorite position, especially with the females, is to perch upon a point or edge-top of some rock, and throw their heads back upon their shoulders, with the nose held directly up and aloft; and then closing their eyes, to take short naps without changing their attitude, now and then softly lifting one or the other of their long, slender hind-flippers, which they slowly wave with that peculiar fanning motion to which I have alluded heretofore. Another attitude, and one of the most common, is to curl themselves up just as a dog does on a hearth-rug, bringing the tail and nose close together. They also stretch out, laying the head close to the body, and sleep an hour or two without rising, holding one of the hind-flippers up all the time, now and then gently moving it, the eyes being tightly closed.

I ought, perhaps, to define the anomalous tail of the fur-seal here. It is just about as important as the caudal appendage to a bear, even less significant; it is the very emphasis of abbreviation. In the old males it is positively only four or five inches in length, while among the females only two and a half to three inches, wholly inconspicuous, and not even recognized by the casual observer.

SLEEPING SEALS.—I come now to speak of another feature which interested me nearly, if not quite, as much as any other characteristic of this creature; and that is their fashion of slumber. The sleep of the fur-seal, seen on land, from the old male down to the youngest, is always accompanied by an involuntary, nervous, muscular twitching

* Adult male and female.

† Adult male and female; *Eumetopias Stelleri*.

and slight shifting of the flippers, together with ever and anon quivering and uneasy rollings of the body, accompanied by a quick folding anew of the fore-flippers; all of which may be signs, as it were, in fact, of their simply having nightmares, or of sporting, in a visionary way, far off in some dream-land sea; but perhaps very much as an old nurse said, in reference to the smiles on a sleeping child's face, they are disturbed by their intestinal parasites. I have studied hundreds of such, somnolent examples. Stealing softly up so closely that I could lay my hand upon them from the point where I was sitting, did I wish to, and watching the sleeping seals, I have always found their sleep to be of this nervous description. The respiration is short and rapid, but with no breathing (unless the ear is brought very close) or snoring sound; the quivering, heaving of the flanks only indicates the action of the lungs. I have frequently thought that I had succeeded in finding a snoring seal, especially among the pups; but a close examination always gave some abnormal reason for it; generally a slight distemper, never anything severer, however, than some trifle, by which the nostrils were stopped up to a greater or less degree.

The cows on the rookeries sleep a great deal, but the males have the veriest cat-naps that can be imagined. I never could time the slumber of any old male on the breeding-grounds, which lasted without interruption longer than five minutes, day or night; while away from these places, however, I have known them to lie sleeping in the manner I have described, broken by these fitful, nervous, dreamy starts, yet without opening the eyes, for an hour or so at a time.

With the exception of the pups, the fur-seal seems to have very little rest awake or sleeping; perpetual motion is well nigh incarnate with its being.

FUR-SEAL PUPS.—As I have said before, the females, soon after landing, are delivered of their young. Immediately after the birth of the pup (twins are rare, if ever) the little creature finds its voice, a weak, husky blaaf, and begins to paddle about with its eyes wide open from the start, in a confused sort of way for a few minutes, until the mother turns around to notice her offspring and give it attention, and still later to suckle it; and for this purpose she is supplied with four small, brown nipples, almost wholly concealed in the fur, and which are placed about eight inches apart, lengthwise with the body, on the abdomen, between the fore- and hind-flippers, with about four inches of space between them transversely. These nipples are seldom visible, and then faintly seen through the hair and fur. The milk is abundant, rich, and creamy. The pups nurse very heartily, almost gorging themselves, so much so that they often have to yield up the excess of what they have taken down, mewling and puking in the most orthodox manner.

The pup from birth, and for the next three months, is of a jet-black color, hair and flippers, save a tiny white patch just back of each forearm. It weighs first from three to four pounds, and is twelve to fourteen inches long. It does not seem to nurse more than once every two or three days, but in this I am very likely mistaken, for they may have received attention from the mother in the night, or other times in the day when I was unable to keep up my watch over the individuals which I had marked for this supervision.

The apathy with which the young are treated by the old on the breeding-grounds, especially by the mothers, was very strange to me, and I was considerably surprised at it. I have never seen a seal-mother caress or fondle her offspring; and should it stray to a short distance from the harem, I could step to and pick it up, and even kill it before the mother's eye, without causing her the slightest concern, as far as all outward signs and manifestation would indicate. The same indifference is also exhibited by the male to all that may take place of this character outside of the boundary of his seraglio; but the moment the pups are inside the limits of his harem-ground, he is a jealous and a fearless protector, vigilant and determined; but if the little animals are careless enough to pass beyond this boundary, then I can go up to them and carry them off before the eye of the old Turk without receiving from him the slightest attention in their behalf—a curious guardian, forsooth!

It is surprising to me how few of these young pups get crushed to death while the ponderous males are floundering over them, engaged in fighting and quarreling among themselves. I have seen two bulls dash at each other with all the energy of furious rage, meeting right in the midst of a small "pod" of forty or fifty pups, tramp over them with all their crushing weight, and bowling them out right and left in every direction by the impetus of their movements, without injuring a single one, as far as I could see. Still, when we come to consider the fact that, despite the great weight of the old males, their broad, flat flippers and yielding bodies may press down heavily on these little fellows without actually breaking bones or mashing them out of shape, it seems questionable whether more than one per cent. of all the pups born each season on these great rookeries of the Pribylov islands are destroyed in this manner on the breeding-grounds.*

The vitality of the fur-seal is simply astonishing. His physical organization passes beyond the fabled nine lives of the cat. As a slight illustration of its tenure of life, I will mention the fact, that one morning the chief came to me with a pup in his arms, which had just been born, and was still womb-moist, saying that the mother had been killed at Tolstoi by accident, and he supposed that I would like to have a "choochil".† I took it up

* The only damage which these little fellows have up here, is being caught by an October gale down at the surf-margin, when they have not fairly learned to swim; large numbers have been destroyed by sudden "nips" of this character.

† Specimen to stuff.

into my laboratory, and finding that it could walk about and make a great noise, I attempted to feed it, with the idea of having a comfortable subject to my pencil, for life-study, of the young in the varied attitudes of sleep and motion. It refused everything that I could summon to its attention as food; and, alternately sleeping and walking, in its clumsy fashion, about the floor, it actually lived nine days—spending the half of every day in floundering over the floor, accompanying all movement with a persistent, hoarse, blaating cry—and I do not believe it ever had a single drop of its mother's milk.

In the pup, the head is the only disproportionate feature at birth, when it is compared with the adult form; the neck being also relatively shorter and thicker. The eye is large, round and full, but almost a "navy blue" at times, it soon changes into the blue-black of adolescence.

The females appear to go to and come from the water to feed and bathe, quite frequently, after bearing their young, and the immediate subsequent coitus with the male; and usually return to the spot or its immediate neighborhood, where they leave their pups, crying out for them, and recognizing the individual replies, though ten thousand around, all together, should blaate at once. They quickly single out their own and nurse them. It would certainly be a very unfortunate matter if the mothers could not identify their young by sound, since their pups get together like a great swarm of bees, and spread out upon the ground in what the sealers call "pods", or clustered groups, while they are young and not very large; but from the middle or end of September, until they leave the islands for the dangers of the great Pacific, in the winter, along by the first of November, they gather in this manner, sleeping and frolicking by tens of thousands, bunched together at various places all over the islands contiguous to the breeding-grounds, and right on them. A mother comes up from the sea, whither she has been to wash, and perhaps to feed, for the last day or two, feeling her way along to about where she thinks her pup should be—at least where she left it last—but perhaps she misses it, and finds instead a swarm of pups in which it has been incorporated, owing to its great fondness for society. The mother, without first entering into the crowd of thousands, calls out just as a sheep does for a lamb; and, out of all the din she—if not at first, at the end of a few trials—recognizes the voice of her offspring, and then advances, striking out right and left, toward the position from which it replies. But if the pup happens at this time to be asleep, it gives, of course, no response, even though it were close by; in the event of this silence the cow, after calling for a time without being answered, curls herself up and takes a nap, or lazily basks, to be usually more successful, or wholly so, when she calls again.

The pups themselves do not know their own mothers—a fact which I ascertained by careful observation—but they are so constituted that they incessantly cry out at short intervals during the whole time they are awake, and in this way the mother can pick out from the monotonous blaating of thousands of pups, her own, and she will not permit any other to suckle it; but the "kotickie" themselves attempt to nose around every seal-mother that comes in contact with them. (See note, 39, L.)

DISORGANIZATION OF THE ROOKERIES.—Between the end of July and the 5th or 8th of August of every year, the rookeries are completely changed in appearance; the systematic and regular disposition of the families or harems over the whole extent of breeding-ground has disappeared; all that clock-work order which has heretofore existed seems to be broken up. The breeding-season over, those bulls which have held their positions since the first of May leave, most of them thin in flesh and weak, and of their number a very large proportion do not come out again on land during the season; but such as are seen at the end of October and November, are in good flesh. They have a new coat of rich, dark, grey-brown hair and fur, with gray or grayish ocher "wigs" of longer hair over the shoulders, forming a fresh, strong contrast to the dull, rusty, brown and umber dress in which they appeared to us during the summer, and which they had begun to shed about the first of August, in common with the females and the "holluschickie". After these males leave, at the close of their season's work and of the rutting for the year, those of them that happen to return to the land in any event do not come back until the end of September, and do not haul upon the rookery-grounds again. As a rule they prefer to herd together, like the younger males, upon the sand-beaches and rocky points close to the water.

The cows and pups, together with those bulls which we have noticed in waiting in the rear of the rookeries, and which have been in retirement throughout the whole of the breeding-season, now take possession, in a very disorderly manner, of the rookeries. There come, also, a large number of young, three, four, and five-year old males, which have been prevented by the menacing threats of the older, stronger bulls, from landing among the females during the rutting-season.

Before the middle of August three-fourths, at least, of the cows at this date are off in the water, only coming ashore at irregular intervals to nurse and look after their pups a short time. They presented to my eye, from the summits of the bluffs round about, a picture more suggestive than anything I have ever seen presented by animal life, of entire comfort and enjoyment. Here, just out and beyond the breaking of the rollers, they idly lie on the rocks or sand-beaches, ever and anon turning over and over, scratching their backs and sides with their fore- and hind-flippers. The seals on the breeding-ground appear to get very lousy. (See note, 39, K.)

MANGY COWS AND PUPS.—The frequent winds and showers drive and spatter sand into their fur and eyes, often making the latter quite sore. This occurs when they are obliged to leave the rocky rookeries and follow their pups out over the sand-ridges and flats, to which they always have a natural aversion. On the hauling-grounds

they pack the soil under foot so hard and tightly in many places, that it holds water in the surface depressions, just like so many rock-basins. Out of and into these puddles the pups and the females flounder and patter incessantly, until evaporation slowly abates the nuisance. This is for the time only, inasmuch as the next day, perhaps, brings more rain, and the dirty pools are replenished.

The pups sometimes get so thoroughly plastered in these muddy, slimy puddles, that the hair falls off in patches, giving them, at first sight, the appearance of being troubled with scrofula or some other plague: from my investigations, directed to this point, I became satisfied that they were not permanently injured, though evidently very much annoyed. With reference to this suggestion as to sickness or distemper among the seals, I gave the subject direct and continued attention, and in no one of the rookeries could I discover a single seal, no matter how old or young, which appeared to be suffering in the least from any physical disorder, other than that which they themselves had inflicted, one upon the other, by fighting. The third season, passing directly under my observation, failed to reward my search with any manifestation of disease among the seals which congregate in such mighty numbers on the rookeries of St. Paul and St. George. The remarkable freedom from all such complaints enjoyed by these animals is noteworthy, and the most trenchant and penetrating cross-questioning of the natives, also, failed to give me any history or evidence of an epidemic in the past.

HOSPITALS.—The observer will, however, notice every summer, gathered in melancholy squads of a dozen to one hundred or so, scattered along the coast where the healthy seals never go, those sick and disabled bulls which have, in the earlier part of the season, been either internally injured or dreadfully scarred by the teeth of their opponents in fighting. Sand is blown by the winds into the fresh wounds and causes an inflammation and a sloughing, which very often finishes the life of the victim. The sailors term these invalid gatherings "hospitals", a phrase which, like most of their homely expressions, is quite appropriate.

YOUNG SEALS LEARNING TO SWIM.—Early in August, usually by the 8th or 10th, I noticed one of the remarkable movements of the season. I refer to the pup's first essay in swimming. Is it not odd—paradoxical—that the young seal, from the moment of his birth until he is a month or six weeks old, is utterly unable to swim? If he is seized by the nape of the neck and pitched out a rod into the water from shore, his bullet-like head will drop instantly below the surface, and his attenuated posterior extremities flap impotently on it; suffocation is the question of only a few minutes, the stupid little creature not knowing how to raise his immersed head and gain the air again. After they have attained the age I indicate, their instinct drives them down to the margin of the surf, where the alternate ebbing and flowing of its wash covers and uncovers the rocky or sandy beaches. They first smell and then touch the moist pools, and flounder in the upper wash of the surf, which leaves them as suddenly high and dry as it immersed them at first. After this beginning they make slow and clumsy progress in learning the knack of swimming. For a week or two, when overhead in depth, they continue to flounder about in the most awkward manner, thrashing the water as little dogs do, with their fore-feet, making no attempt whatever to use the hinder ones. Look at that pup now, launched out for the first time beyond his depth; see how he struggles—his mouth wide open, and his eyes fairly popping. He turns instantly to the beach, ere he has fairly struck out from the point whence he launched in, and, as the receding swell which at first carried him off his feet and out, now returning, leaves him high and dry, for a few minutes he seems so weary that he weakly crawls up, out beyond its swift returning wash, and coils himself up immediately to take a recuperative nap. He sleeps a few minutes, perhaps half an hour, then awakes as bright as a dollar, apparently rested, and at his swimming lesson he goes again. By repeated and persistent attempts, the young seal gradually becomes familiar with the water and acquainted with his own power over that element, which is to be his real home and his whole support. Once boldly swimming, the pup fairly revels in his new happiness. He and his brethren have now begun to haul and swarm along the whole length of St. Paul coast, from Northeast point down and around to Zapadnie, lining the alternating sand-beaches and rocky shingle with their plump, black forms. How they do delight in it! They play with a zest, and chatter like our own children in the kindergartens—swimming in endless evolutions, twisting, turning, or diving—and when exhausted, drawing their plump, round bodies up again on the beach. Shaking themselves dry as young dogs would do, they now either go to sleep on the spot, or have a lazy terrestrial frolic among themselves.

How an erroneous impression ever got into the mind of any man in this matter of the pup's learning to swim, I confess that I am wholly unable to imagine. I have not seen any "driving" of the young pups into the water by the old ones, in order to teach them this process, as certain authors have positively affirmed.* There is not the slightest supervision by the old mother or father of the pup, from the first moment of his birth, in this respect, until he leaves for the North Pacific, full-fledged with amphibious power. At the close of the breeding season, every year, the pups are restlessly and constantly shifting back and forth over the rookery ground of their birth, in large squads, sometimes numbering thousands upon thousands. In the course of this change of position they all sooner or later come in contact with the sea; they then blunder into the water for the first time, in a most awkward, ungainly manner, and get out as quick as they can; but so far from showing any fear or dislike of this, their most natural element, as soon as they rest from their exertion they are immediately ready for a new trial, and keep at it, provided the sea is not too stormy or rough. During all this period of self-tuition they seem thoroughly to enjoy the exercise, in spite of their repeated and inevitable discomfitures at the beginning.

* Allen. *History of North American Pinnipeds*, p. 387.

PODDING OF THE PUPS.—The “podding” of these young pups in the rear of the great rookeries of St. Paul, is one of the most striking and interesting phases of this remarkable exhibition of highly-organized life. When they first bunch together they are all black, for they have not begun to shed the natal coat: they shine with an unctuous, greasy reflection, and grouped in small armies or great regiments on the sand-dune tracts at Northeast point, they present a most extraordinary and fascinating sight. Although the appearance of the “holluschickie” at English bay fairly overwhelms the observer with the impression of its countless multitudes, yet I am free to declare, that at no one point in this evolution of the seal-life, during the reproductive season, have I been so deeply stricken by the sense of overwhelming enumeration, as I have when, standing on the summit of Cross hill, I looked down to the southward and westward over a reach of six miles of alternate grass and sand-dune stretches, mirrored upon which were hundreds of thousands of these little black pups, spread in sleep and sport within this restricted field of vision. They appeared as countless as the grains of the sand upon which they rested.

SECOND CHANGE OF COAT.—By the 15th of September, all the pups born during the year have become familiar with the water; they have all learned to swim, and are now nearly all down by the water's edge, skirting in large masses the rocks and beaches previously this year unoccupied by seals of any class. Now they are about five or six times their original weight, or, in other words, they are 30 to 40 pounds avoirdupois, as plump and fat as butterballs, and they begin to take on their second coat, shedding their black pup-hair completely. This second coat does not vary in color, at this age, between the sexes. They effect this transformation in dress very slowly, and cannot, as a rule, be said to have ceased their molting until the middle or 20th of October.

This second coat, or sea-going jacket, of the pup, is a uniform, dense, light-gray over-hair, with an under-fur which is slightly grayish in some, but is, in most cases, a soft, light-brown hue. The over-hair is fine, close, and elastic, from two-thirds of an inch to an inch in length, while the fur is not quite half an inch long. Thus the coarser hair shingles over and conceals the soft under-wool completely, giving the color by which, after the second year, the sex of the animal is recognized. The pronounced difference between the sexes is not effected, however, by color alone until the third year of the animal. This over-hair of the young pup's new jacket on the back, neck, and head, is a dark chinchilla-gray, blending into a stone-white, just tinged with a grayish tint on the abdomen and chest. The upper lip, upon which the whiskers or moustaches take root, is covered with hair of a lighter gray than that of the body. This moustache consists of fifteen or twenty longer or shorter bristles, from half an inch to three inches in length, some brownish, horn-colored, and others whitish-gray and translucent, on each side and back and below the nostrils, leaving the muzzle quite prominent and hairless. The nasal openings and their surroundings are, as I have before said when speaking of this feature, similar to those of a dog.

EYES OF THE PUP-SEALS.—The most attractive feature about the fur-seal pup, and that which holds this place as it grows on and older, is the eye. This organ is exceedingly clear, dark, and liquid, with which, for beauty and amiability, together with real intelligence of expression, those of no other animal that I have ever seen, or have ever read of, can be compared; indeed, there are few eyes in the orbits of men and women which suggest more pleasantly the ancient thought of their being “windows to the soul”. The lids to the eye are fringed with long, perfect lashes, and the slightest irritation in the way of dust or sand, or other foreign substances, seems to cause them exquisite annoyance, accompanied by immoderate weeping. This involuntary tearfulness so moved Steller that he ascribed it to the processes of the seal's mind, and declared that the seal-mothers actually shed tears.

RANGE OF VISION.—I do not think that their range of vision on land, or out of the water, is very great. I have frequently experimented with adult fur-seals, by allowing them to catch sight of my person, so as to distinguish it as of foreign character, three and four hundred paces off, taking the precaution of standing to the leeward of them when the wind was blowing strong, and then walking unconcernedly up to them. I have invariably noticed, that they would allow me to approach quite close before recognizing my strangeness; this occurring to them, they at once made a lively noise, a medley of coughing, spitting, snorting, and baaing, and plunged in spasmodic lopes and shambled to get away from my immediate neighborhood; as to the pups, they all stupidly stare at the form of a human being until it is fairly on them, when they also repeat in miniature these vocal gymnastics and physical efforts of the older ones, to retreat or withdraw a few rods, sometimes only a few feet, from the spot upon which you have cornered them, after which they instantly resume their previous occupation of either sleeping or playing, as though nothing had happened. (See note, 39, M.)

POWER OF SCENT: ODOR OF THE SEALS.—The greatest activity displayed by any one of the five senses of the seal, is evidenced in its power of scent. This faculty is all that can be desired in the line of alertness. I never failed to awaken an adult seal from the soundest sleep, when from a half to a quarter of a mile distant, no matter how softly I proceeded, if I got to the windward, though they sometimes took alarm when I was a mile off.

They leave evidences of their being on these great reproductive fields, chiefly at the rookeries, in the hundreds of dead carcasses which mark the last of those animals that have been rendered infirm, sick, or were killed by fighting among themselves in the early part of the season, or of those which have crawled far away from the scene of battle to die from death-wounds received in the bitter struggle for a harem. On the rookeries, wherever these lifeless bodies rest, the living, old and young, clamber and patter backward and forward over and on the putrid remains, and by this constant stirring up of decayed matter, give rise to an exceedingly disagreeable and far-

reaching "funk". This has been, by all writers who have dwelt on the subject, referred to as the smell which these animals emit for another reason—erroneously called the "rutting odor". If these creatures have any odor peculiar to them when in this condition, I will frankly confess that I am unable to distinguish it from the fumes which are constantly being stirred up and rising out of those decaying carcasses of the older seals, as well as from the bodies of the few pups which have been killed accidentally by the heavy bulls fighting over them, charging back and forth against one another, so much of the time.

They have, however, a very characteristic and peculiar smell, when they are driven and get heated; their breath exhalations possess a disagreeable, faint, sickly odor, and when I have walked within its influence at the rear of a seal-drive, I could almost fancy, as it entered my nostrils, that I stood beneath an aillanthus tree in bloom; but this odor can by no means be confounded with what is universally ascribed to another cause. It is also noteworthy, that if your finger is touched ever so lightly to a little fur-seal blubber, it will smell very much like that which I have appreciated and described as peculiar to their breath, which arises from them when they are driven, only it is a little stronger. Both the young and old fur-seals have this same breath-taint at all seasons of the year.

REVIEW OF STATEMENTS CONCERNING LIFE IN THE ROOKERIES.—To recapitulate and sum up the system and regular method of life and reproduction on these rookeries of St. Paul and St. George, as the seals seem to have arranged it, I shall say that—

First. The earliest bulls land in a negligent, indolent way, at the opening of the season, soon after the rocks at the water's edge are free from ice, frozen snow, etc. This is, as a rule, about the 1st to the 5th of every May. They land from the beginning to the end of the season in perfect confidence and without fear; they are very fat, and will weigh at an average 500 pounds each; some stay at the water's edge, some go to the tier back of them again, and so on until the whole rookery is mapped out by them, weeks in advance of the arrival of the first female.

Second. That by the 10th or 12th of June, all the male stations on the rookeries have been mapped out and fought for, and held in waiting by the "see-catchie". These males are, as a rule, bulls rarely ever under six years of age; most of them are over that age, being sometimes three, and occasionally doubtless four, times as old.

Third. That the cows make their first appearance, as a class, on or after the 12th or 15th of June, in very small numbers; but rapidly after the 23d and 25th of this month, every year, they begin to flock up in such numbers as to fill the harems very perceptibly; and by the 8th or 10th of July, they have all come, as a rule—a few stragglers excepted. The average weight of the females now will not be much more than 80 to 90 pounds each.

Fourth. That the breeding-season is at its height from the 10th to the 15th of July every year, and that it subsides entirely at the end of this month and early in August: also, that its method and system are confined entirely to the land, never effected in the sea.

Fifth. That the females bear their first young when they are three years old, and that the period of gestation is nearly twelve months, lacking a few days only of that lapse of time.

Sixth. That the females bear a single pup each, and that this is born soon after landing; no exception to this rule has ever been witnessed or recorded.

Seventh. That the "see-catchie" which have held the harems from the beginning to the end of the season, leave for the water in a desultory and straggling manner at its close, greatly emaciated, and do not return, if they do at all, until six or seven weeks have elapsed, when the regular systematic distribution of the families over the rookeries is at an end for this season. A general medley of young males now are free, which come out of the water, and wander over all these rookeries, together with many old males, which have not been on seraglio duty, and great numbers of the females. An immense majority over all others present are pups, since only about 25 per cent. of the mother-seals are out of the water now at any one time.

Eighth. That the rookeries lose their compactness and definite boundaries of true breeding-limit and expansion by the 25th to the 28th of July every year; then, after this date, the pups begin to haul back, and to the right and left, in small squads at first, but as the season goes on, by the 18th of August, they depart without reference to their mothers; and when thus scattered, the males, females, and young swarm over more than three and four times the area occupied by them when breeding and born on the rookeries. The system of family arrangement and uniform compactness of the breeding classes breaks up at this date.

Ninth. That by the 8th or 10th of August the pups born nearest the water first begin to learn to swim; and that by the 15th or 20th of September they are all familiar, more or less, with the exercise.

Tenth. That by the middle of September the rookeries are entirely broken up; confused, straggling bands of females are seen among bachelors, pups, and small squads of old males, crossing and recrossing the ground in an aimless, listless manner. The season now is over.

Eleventh. That many of the seals do not leave these grounds of St. Paul and St. George before the end of December, and some remain even as late as the 12th of January; but that by the end of October and the beginning of November every year, all the fur-seals of mature age—five and six years, and upward—have left the islands. The younger males go with the others: many of the pups still range about the islands, but are not hauled to any great extent on the beaches or the flats. They seem to prefer the rocky shore-margin, and to lie as high up as they can get on such bluff rookeries as Tolstoi and the Reef. By the end of this month, November, they are, as a rule, all gone.

Such is the sum and the substance of my observations which relate to the breeding-grounds alone on St. Paul and St. George. It is the result of summering and wintering on them, and these definite statements I make with that confidence which one always feels, when he speaks of that which has entered into his mind by repeated observation, and has been firmly grounded by careful deductions therefrom.

10. THE "HOLLUSCHICKIE" OR "BACHELOR" SEALS—A DESCRIPTION.

THE HAULING-GROUNDS AND THEIR OCCUPANTS.—I now call the attention of the reader to another very remarkable feature in the economy of the seal-life on these islands. The great herds of "holluschickie",* numbering from one-third to one-half, perhaps, of the whole aggregate of near 5,000,000 seals known to the Pribylov group, are never allowed by the "see-catchie", under the pain of frightful mutilation or death, to put their flippers on or near the rookeries.

By reference to my map, it will be observed that I have located a large extent of ground—markedly so on St. Paul—as that occupied by the seals' "hauling-grounds"; this area, in fact, represents those portions of the island upon which the "holluschickie" roam in their heavy squadrons, wearing off and polishing the surface of the soil, stripping every foot, which is indicated on the chart as such, of its vegetation and mosses, leaving the margin as sharply defined on the bluffy uplands and sandy flats as it is on the map itself.

The reason that so much more land is covered by the "holluschickie" than by the breeding-seals—ten times as much at least—is due to the fact, that though not as numerous, perhaps, as the breeding-seals, they are tied down to nothing, so to speak—are wholly irresponsible, and roam hither and thither as caprice and the weather may dictate. Thus they wear off and rub down a much larger area than the rookery-seals occupy; wandering aimlessly, and going back, in some instances, notably at English bay, from one-half to a whole mile inland, not traveling in desultory files along winding, straggling paths, but sweeping in solid platoons, they obliterate every spear of grass and rub down nearly every hummock in their way.

DEFINITION OF "HOLLUSCHICKIE".—All the male seals, from six years of age, are compelled to herd apart by themselves and away from the breeding-grounds, in many cases far away; the large hauling-grounds at Southwest point being about two miles from the nearest rookery. This class of seals is termed "holluschickie" or the "bachelor" seals by the people, a most fitting and expressive appellation.

The seals of this great subdivision are those with which the natives on the Pribylov group are the most familiar: naturally and especially so, since they are the only ones, with the exception of a few thousand pups, and occasionally an old bull or two, taken late in the fall for food and skins, which are driven up to the killing-grounds at the village for slaughter. The reasons for this exclusive attention to the "bachelors" are most cogent, and will be given hereafter when the "business" is discussed.

LOCATING THE HAULING-GROUNDS: PATHS THROUGH THE ROOKERIES.—Since the "holluschickie" are not permitted by their own kind to land on the rookeries and stop there, they have the choice of two methods of locating, one of which allows them to rest in the rear of the rookeries, and the other on the free beaches. The most notable illustration of the former can be witnessed on Reef point, where a pathway is left for their ingress and egress through a rookery—a path left by common consent, as it were, between the harems. On these trails of passage they come and go in steady files all day and all night during the season, unmolested by the jealous bulls which guard the seraglios on either side as they travel; all peace and comfort to the young seal if he minds his business and keeps straight on up or down, without stopping to nose about right or left; all woe and desolation to him, however, if he does not, for in that event he will be literally torn in bloody griping, from limb to limb, by the vigilant old "see-catchie".

Since the two and three-year old "holluschickie" come up in small squads with the first bulls in the spring, or a few days later, such common highways as those between the rookery-ground and the sea are traveled over before the arrival of the cows, and get well defined. A passage for the "bachelors", which I took much pleasure in observing day after day at Polavina, another at Tolstoi, and two on the Reef, in 1872, were entirely closed up by the "see-catchie" and obliterated, when I again searched for them in 1874. Similar passages existed, however, on several of the large rookeries of St. Paul; one of those at Tolstoi exhibits this feature very finely, for here the hauling-ground extends around from English bay, and lies up back of the Tolstoi rookery, over a flat and rolling summit, from 100 to 120 feet above the sea-level. The young males and yearlings of both sexes come through and between the harems, at the height of the breeding-season, on two of these narrow pathways, and before reaching the ground above, are obliged to climb up an almost abrupt bluff, which they do by following and struggling in the water-runs and washes that are worn into its face. As this is a large hauling-ground, on which, every favorable day during the season, fifteen or twenty thousand commonly rest, the sight of skillful seal-climbing can be witnessed here at any time during that period; and the sight of such climbing as this of Tolstoi is exceedingly novel and interesting. Why, verily, they ascend over and upon places where an ordinary man might, at first sight, with great positiveness say that it was utterly impossible for him to climb.

* The Russian term "holluschickie" or "bachelors" is very appropriate, and is usually employed.

HAULING-GROUNDS ON THE BEACHES.—The other method of coming ashore, however, is the one most followed and favored. In this case they avoid the rookeries altogether, and repair to the unoccupied beaches between them, and then extend themselves out all the way back from the sea, as far from the water, in some cases, as a quarter and even half of a mile. I stood on the Tolstoi sand-dunes one afternoon, toward the middle of July, and had under my eyes, in a straightforward sweep from my feet to Zapadne, a million and a half of seals spread out on those hauling-grounds. Of these, I estimated that fully one-half, at that time, were pups, yearlings, and "holluschickie". The rookeries across the bay, though plainly in sight, were so crowded, that they looked exactly as I have seen surfaces appear upon which bees had swarmed in obedience to that din and racket made by the watchful apiarian, when he desires to hive the restless honey-makers.

The great majority of yearlings and "holluschickie" are annually hauled out and packed thickly over the sand-beach and upland hauling-grounds, which lay between the rookeries on St. Paul island. At St. George there is nothing of this extensive display to be seen, for here is only a tithe of the seal-life occupying St. Paul, and no opportunity whatever is afforded for an amphibious parade.

GENTLENESS OF THE SEALS.—Descend with me from this sand-dune elevation of Tolstoi, and walk into that drove of "holluschickie" below us; we can do it; you do not notice much confusion or dismay as we go in among them; they simply open out before us and close in behind our tracks, stirring, crowding to the right and left as we go, twelve or twenty feet away from us on each side. Look at this small flock of yearlings, some one, others two, and even three years old, which are coughing and spitting around us now, staring up at our faces in amazement as we walk ahead; they struggle a few rods out of our reach, and then come together again behind us, showing no further sign of notice of ourselves. You could not walk into a drove of hogs, at Chicago, without exciting as much confusion and arousing an infinitely more disagreeable tumult; and as for sheep on the plains, they would stampede far quicker. Wild animals indeed! You can now readily understand how easy it is for two or three men, early in the morning, to come where we are, turn aside from this vast herd in front of and around us two or three thousand of the best examples, and drive them back, up, and over to the village. That is the way they get the seals; there is not any "hunting" or "chasing" or "capturing" of fur-seals on these islands.

"HOLLUSCHICKIE" DO NOT FAST.—While the young male seals undoubtedly have the power of going for lengthy intervals without food, they, like the female seals on the breeding-grounds, certainly do not maintain any long fasting periods on land; their coming and going from the shore is frequent and irregular, largely influenced by the exact condition of the weather from day to day; for instance, three or four thick, foggy days seem to call them out from the water by hundreds of thousands upon the different hauling-grounds (which the reader observes recorded on my map). In some cases, I have seen them lie there so close together that scarcely a foot of ground, over whole acres, is bare enough to be seen; then a clear and warmer day follows, and this seal-covered ground, before so thickly packed with animal life, will soon be almost deserted: comparatively so at least, to be filled up immediately as before, when favorable weather shall again recur. They must frequently eat when here, because the first yearlings and "holluschickie" that appear in the spring are no fatter, sleeker, or livelier than they are at the close of the season; in other words, their condition, physically, seems to be the same from the beginning to the end of their appearance here during the summer and fall. It is quite different, however, with the "see-catch"; we know how and where it spends two to three months, because we find it on the grounds at all times, day or night, during that period.

SPORTS AND PASTIMES OF THE YOUNG "BACHELORS."—A small flock of the young seals, one to three years old, generally, will often stray from these hauling-ground margins, up and beyond, over the fresh mosses and grasses, and there sport and play one with another, just as little puppy-dogs do; and when weary of this gamboling a general disposition to sleep is suddenly manifested, and they stretch themselves out and curl up in all the positions and all the postures that their flexible spines and ball-and-socket joints will permit. They seem to revel in the unwonted vegetation, and to be delighted with their own efforts in rolling down and crushing the tall stalks of the grasses and umbelliferous plants; one will lie upon its back, hold up its hind-flippers, and lazily wave them about, while it scratches, or rather rubs, its ribs with the fore-hands alternately, the eyes being tightly closed during the whole performance; the sensation is evidently so luxurious that it does not wish to have any side-issue draw off its blissful self-attention. Another, curled up like a cat on a rug, draws its breath, as indicated by the heaving of its flanks, quickly but regularly, as though in heavy sleep; another will lie flat upon its stomach, its hind-flippers covered and concealed, while it tightly folds its fore-feet back against its sides, just as a fish carries its pectoral fins—and so on to no end of variety, according to the ground and the fancy of the animals.

These "bachelor" seals are, I am sure, without exception, the most restless animals in the whole brute creation, which can boast of a high organization. They frolic and lope about over the grounds for hours, without a moment's cessation, and their sleep, after this, is exceedingly short, and it is ever accompanied with nervous twitchings and uneasy muscular movements; they seem to be fairly brimful and overrunning with spontaneity—to be surcharged with fervid, electric life.

Another marked feature which I have observed among the multitudes of "holluschickie", which have come under my personal observation and auditory, and one very characteristic of this class, is, that nothing like ill-humor

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Monograph—SEAL-ISLANDS.

Plate VII.



Cone Hill.

Upper Zapadnie.

S. W. Point.

Zapadnie.

NATIVES SELECTING A DRIVE.

View over hauling-grounds of "holluschrickie" at English Bay, looking west from Tolstoi Sand-dunes.

H. Licht
Oct. 24. 1911.

appears in all of their playing together; they never growl or bite, or show even the slightest angry feeling, but are invariably as happy, one with another, as can be imagined. This is a very singular trait; they lose it, however, with astonishing rapidity, when their ambition and strength develops and carries them, in due course of time, to the rookery. (See note, 39, N.)

The pups and yearlings have an especial fondness for sporting on the rocks which are just at the water's level and awash, so as to be covered and uncovered as the surf rolls in. On the bare summit of these wave-worn spots, they will struggle and clamber in groups of a dozen or two at a time throughout the whole day, in endeavoring to push off that one of their number which has just been fortunate enough to secure a landing; the successor has, however, but a brief moment of exultation in victory, for the next roller that comes booming in, together with the pressure by its friends, turns the table, and the game is repeated, with another seal on top. Sometimes, as well as I could see, the same squad of "holluschickie" played for a whole day and night, without a moment's cessation, around such a rock as this, off "Nah Speel" rookery; but in this observation I may be mistaken, because the seals cannot be told apart.

SEALS AMONG THE BREAKERS.—The graceful unconcern with which the fur-seal sports safely in, among, and under booming breakers, during the prevalence of the numerous heavy gales at the islands, has afforded me many consecutive hours of spell-bound attention to them, absorbed in watching their adroit evolutions within the foaming surf, that seemingly, every moment, would, in its fierce convulsions, dash these hardy swimmers, stunned and lifeless, against the iron-bound foundations of the shore, which alone checked the furious rush of the waves. Not at all. Through the wildest and most ungovernable mood of the roaring tempest and storm-tossed waters attending its transit, I never failed, on creeping out, and peering over the bluffs, in such weather, to see squads of these perfect watermen—the most expert of all amphibians—gamboling in the seething, creamy wake of mighty rollers, which constantly broke in thunder tones over their alert, dodging heads. The swift succeeding seas seemed, every instant, to poise the seals at the very verge of death. Yet the *Callorhinus*, exulting in his skill and strength, bade defiance to their wrath, and continued his diversions.

SWIMMING FEATS OF THE "BACHELORS".—The "holluschickie" are the champion swimmers of all the seal-tribe; at least, when in the water around the islands, they do nearly every fancy tumble and turn that can be executed. The grave old males and their matronly companions seldom indulge in any extravagant display, as do these youngsters, jumping out of the water like so many dolphins, describing beautiful elliptic curves sheer above its surface, rising three and even four feet from the sea, with the back slightly arched, the fore-flippers folded tightly against the sides, and the hinder ones extended and pressed together straight out behind, plunging in head first, to reappear in the same manner, after an interval of a few seconds of submarine swimming, like the flight of a bird, on their course. Sea-lions and hair-seals never jump in this manner. (See note, 39, O.)

All classes will invariably make these dolphin-jumps, when they are surprised or are driven into the water, curiously turning their heads while sailing in the air, between the "rises" and "plumps", to take a look at the cause of their disturbance. They all swim rapidly, with the exception of the pups, and may be said to dart under the water with the velocity of a bird on the wing; as they swim they are invariably submerged, running along horizontally about two or three feet below the surface, guiding their course with the hind-flippers as by an oar, and propelling themselves solely by the fore-feet, rising to breathe at intervals which are either very frequent or else so wide apart that it is impossible to see the speeding animal when he rises a second time.

How long they can remain under water without taking a fresh breath, is a problem which I had not the heart to solve, by instituting a series of experiments at the island; but I am inclined to think that, if the truth were known in regard to their ability of going without rising to breathe, it would be considered astounding. On this point, however, I have no data worth discussing, but will say that, in all their swimming which I have had a chance to study, as they passed under the water, mirrored to my eyes from the bluff above by the whitish-colored rocks below the rookery waters at Great Eastern rookery, I have not been able to satisfy myself how they used their long, flexible hind-feet, other than as steering media. If these posterior members have any perceptible motion, it is so rapid that my eye is not quick enough to catch it; but the fore-flippers, however, can be most distinctly seen, as they work in feathering forward and sweeping flatly back, opposed to the water, with great rapidity and energy. They are evidently the sole propulsive power of the fur-seal in the water, as they are its main fulcrum and lever combined, for progression on land. I regret that the shy nature of the hair-seal never allowed me to study its swimming motions, but it seems to be a general point of agreement among authorities on the *Phocidæ*, that all motion in water by them arises from that power which they exert and apply with the hind-feet. So far as my observations on the hair-seal go, I am inclined to agree with this opinion.

All their movements in water, whether they are traveling to some objective point or are in sport, are quick and joyous; and nothing is more suggestive of intense satisfaction and pure physical comfort, than is that spectacle which we can see every August, a short distance out at sea from any rookery where thousands of old males and females are idly rolling over in the billows side by side, rubbing and scratching with their fore- and hind-flippers, which are here and there stuck up out of the water by their owners, like the lateen-sails of the Mediterranean feluccas, or, when the hind-flippers are presented, like a "cat-o'-nine tails". They sleep in the water a great deal, too, more than is generally supposed, showing that they do not come on land to rest—very clearly not.

CLASSING THE "HOLLUSCHICKIE" BY AGE.—When the "holluschickie" are up on land they can be readily separated into their several classes as to age, by the color of their coats and size, when noted, namely, the yearlings, the two, three, four, and five years old males. When the yearlings, or the first class, haul out, they are dressed just as they were after they shed their pup-coats and took on the second covering, during the previous year in September and October; and now, as they come out in the spring and summer, one year old, the males and females cannot be distinguished apart, either by color or size, shape or action; the yearlings of both sexes have the same steel-gray backs and white stomachs, and are alike in behavior and weight.

Next year these yearling females, which are now trooping out with the youthful males on the hauling-grounds, will repair to the rookeries, while their male companions will be obliged to come again to this same spot.

SHEDDING THE HAIR: STAGEY SEALS.—About the 15th and 20th of every August, they have become perceptibly "stagey", or, in other words, their hair is well under way in shedding. All classes, with the exception of the pups, go through this process at this time every year. The process requires about six weeks between the first dropping or falling out of the old over-hair, and its full substitution by the new. This takes place, as a rule, between August 1 and September 28.

The fur is shed, but it is so shed that the ability of the seal to take to the water and stay there, and not be physically chilled or disturbed during the process of molting, is never impaired. The whole surface of these extensive breeding-grounds, traversed over by us after the seals had gone, was literally matted with the shed hair and fur. This under-fur or pelage is, however, so fine and delicate, and so much concealed and shaded by the coarser over-hair, that a careless eye or a superficial observer might be pardoned in failing to notice the fact of its dropping and renewal.

The yearling cows retain the colors of the old coat in the new, when they shed it for the first time, and from that time on, year after year, as they live and grow old. The young three-year-olds and the older cows look exactly alike, as far as color goes, when they haul up at first and dry out on the rookeries, every June and July.

The yearling males, however, make a radical change when they shed for the first time, for they come out from their "staginess" in a nearly uniform dark gray, and gray and black mixed, and lighter, with dark ocher to whitish on the upper and under parts, respectively. This coat, next year, when they appear as two-year-olds, shedding for the three-year-old coat, is a very much darker gray, and so on to the third, fourth, and fifth season; then after this, with age, they begin to grow more gray and brown, with rufous-ocher and whitish-tipped over-hair on the shoulders. Some of the very old bulls change in their declining years to a uniform shade all over of dull-grayish ocher. The full glory and beauty of the seal's moustache is denied to him until he has attained his seventh or eighth year.

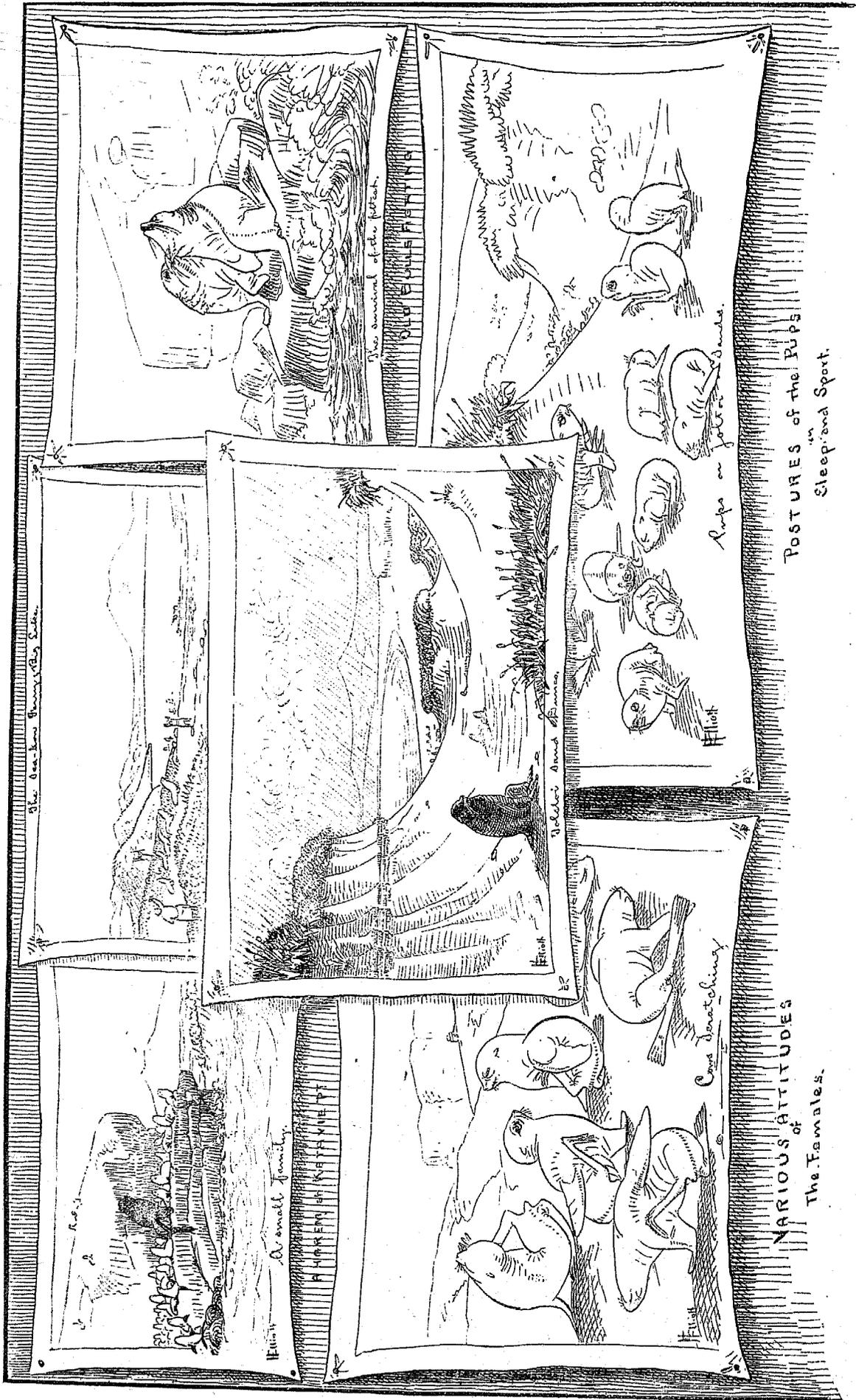
COMPARATIVE SIZE OF FEMALES AND MALES.—The female does not get her full growth and weight until the end of her fourth year, so far as I have observed, but she does most of her growing longitudinally in the first two; after she has passed her fourth and fifth years, she weighs from 30 to 50 pounds more than she did in the days of her youthful maternity.

The male does not get his full growth and weight until the close of his seventh year, but realizes most of it, osteologically speaking, by the end of the fifth; and from this it may be perhaps truly inferred, that the male seals live to an average age of eighteen or twenty years, if undisturbed in a normal condition, and that the females attain ten or twelve seasons under the same favorable circumstances. Their respective weights, when fully mature and fat in the spring, will, in regard to the male, strike an average of from four to five hundred pounds, while the females will show a mean of from 70 to 80 pounds.

I did not permit myself to fall into error in estimating this matter of weight, because I early found that the apparent huge bulk of a sea-lion bull or fur-seal male, when placed upon the scales, shrank far below my notions: I took a great deal of pains, on several occasions, during the killing-season, to have a platform scale carted out into the field, and as the seals were knocked down, and before they were bled, I had them carefully weighed, constructing the following table from my observations:

TABLE SHOWING THE WEIGHT, SIZE, AND GROWTH OF THE FUR-SEAL (*CALLORHINUS URSINUS*), FROM THE PUP TO THE ADULT, MALE AND FEMALE.

Age.	Length.	Girth.	Gross weight of body.	Weight of skin.	Remarks.
	<i>Inches.</i>	<i>Inches.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
One week.....	12 to 14	10 to 10½	6 to 7½	1½	A male and female, being the only ones of the class handled, June 20, 1873.
Six months.....	24	25	39	3	A mean of ten examples, males and females, alike in size, November 28, 1872.
One year.....	33	25	39	4½	A mean of six examples, males and females, alike in size, July 14, 1873.
Two years.....	45	30	58	5½	A mean of thirty examples, all males, July 24, 1873.
Three years.....	52	36	87	7	A mean of thirty-two examples, all males, July 24, 1873.
Four years.....	58	42	135	12	A mean of ten examples, all males, July 24, 1873.
Five years.....	65	52	200	16	A mean of five examples, all males, July 24, 1873.
Six years.....	72	64	280	25	A mean of three examples, all males, July 24, 1873.
Eight to twenty years.....	75 to 80	70 to 75	400 to 500	45 to 50	An estimate only, calculating on their weight when fat, and early in the season.



SUNDRY SEAL-SKETCHES FROM THE AUTHOR'S PORTFOLIO.

St. Paul Island, June and July, 1872.

WEIGHT OF FEMALE SEALS.—The adult females will correspond with the three years old males in the above table, the younger cows weighing frequently only 75 pounds, and many of the older ones going as high as 120, but an average of 80 to 85 pounds is the rule. Those specimens of the females which I weighed were examples taken by me for transmission to the Smithsonian Institution, otherwise I should not have been permitted to make this record of their weight, inasmuch as weighing them means to kill them; and the law and the habit, or rather the prejudice of the entire community up there, is unanimously in opposition to any such proceeding, for they never touch females here, and never set their foot on or near the breeding-grounds on such an errand. It will be noticed, also, that I have no statement of the weights of these exceedingly fat and heavy males which first appear on the breeding-grounds in the spring; those which I have referred to, in the table above given, were very much heavier at the time of their first appearance in May and June, than at the moment when they were in my hands, in July; but the cows, and the other classes, do not sustain protracted fasting, and therefore their weights may be considered substantially the same throughout the year.

CHANGE IN WEIGHT.—Thus, from the fact that all the young seals and females do not change much in weight from the time of their first coming out in the spring, till that of their leaving in the fall and early winter, I feel safe in saying that they feed at irregular but not long intervals, during the time that they are here under our observation, since they are constantly changing from land to water and from water to land, day in and day out. I do not think that the young males fast longer than a week or ten days at a time, as a rule.

DISPERSAL OF THE "HOLLUSCHICKIE".—By the end of October and the 10th of November, the great mass of the "holluschickie", the trooping myriads of English bay, Southwest point, Reef parade, Lukannon sands, the tablelands of Polavina, and the mighty hosts of Novastoshnah, at St. Paul, together with the quota of St. George, had taken their departure from its shores, and had gone out to sea, spreading with the receding schools of fish that were now returning to the deep waters of the North Pacific, where, in that vast expanse, over which rolls an unbroken billow, 5,000 miles from Japan to Oregon, they spend the winter and the early spring, until they reappear and break up, with their exuberant life, the dreary winter-isolation of the land which gave them birth.

TASTE OF THE SEALS IN THE MATTER OF WEATHER.—A few stragglers remain, however, as late as the snow and ice will permit them to, in and after December; they are all down by the water's edge then, and haul up entirely on the rocky beaches, deserting the sand altogether; but the first snow that falls makes them very uneasy, and I have seen a large hauling-ground so disturbed by a rainy day and night, that its hundreds of thousands of occupants fairly deserted it. The fur-seal cannot bear, and will not endure, the spattering of sand into its eyes, which always accompanies the driving of a rain-storm; they take to the water, to reappear when the nuisance shall be abated.

The weather in which the fur-seal delights is cool, moist, foggy, and thick enough to keep the sun always obscured, so as to cast no shadows. Such weather, which is the normal weather of St. Paul and St. George, continued for a few weeks in June and July, brings up from the sea millions of fur-seals. But, as I have before said, a little sunshine, which raises the temperature as high as 50° to 55° Fahr., will send them back from the hauling-grounds almost as quickly as they came. Fortunately, these warm, sunny days on the Pribylov islands are so rare that the seals certainly can have no ground of complaint, even if we may presume they have any at all. Some curious facts in regard to their selection of certain localities on these islands, and their abandonment of others, I will discuss in a succeeding chapter, descriptive of the rookeries; this chapter is illustrated by topographical surveys made by myself.

ALBINOS.—I looked everywhere and constantly, when treading my way over acres of ground which were fairly covered with seal-pups, and older ones, for specimens that presented some abnormality, that is, monstrosities, albinos, etc., such as I have seen in our great herds of stock; but I was, with one or two exceptions, unable to note anything of the kind. I have never seen any malformations or "monsters" among the pups and other classes of the fur-seals, nor have the natives recorded anything of the kind, so far as I could ascertain from them. I saw only three albino pups among the multitudes on St. Paul, and none on St. George. They did not differ, in any respect, from the normal pups in size and shape. Their hair, for the first coat, was a dull ocher all over; the fur whitish, changing to a rich brown, the normal hue; the flippers and muzzle were a pinkish flesh-tone in color, and the iris of the eye sky-blue. When they shed the following year, they are said to have a dirty, yellowish-white color, which makes them exceedingly conspicuous when mixed in among a vast majority of black pups, gray yearlings, and "holluschickie" of their kind. (See note, 39, O.)

WHERE DO THE SEALS DIE?—It is perfectly evident that a large percentage of this immense number of seals must die every year from natural limitation of life. They do not die on these islands; that much I am certain of. Not one dying a natural death could I find or hear of on the grounds; they evidently lose their lives at sea, preferring to sink with the *rigor mortis* into the cold, blue depths of the great Pacific, or beneath the green waves of Bering sea, rather than to encumber and disfigure their summer haunts on the Pribylov islands.

11. DESCRIPTION OF THE FUR-SEAL ROOKERIES OF ST. PAUL AND ST. GEORGE.

DEARTH OF INFORMATION CONCERNING THE FACTS ABOUT THE ROOKERIES.—Before I can intelligently and clearly present an accurate estimate of the aggregate number of fur-seals which appear upon those great breeding-grounds of the Pribylov group every season, I must take up, in regular sequence, my surveys of these remarkable rookeries which I have illustrated in this memoir by the accompanying sketch-maps, showing topographically the superficial area and distribution assumed by the seal-life at each locality.

It will be observed, that the sum total on St. Paul island preponderates, and completely overshadows that which is represented at St. George. Before passing to the detailed discussion of each rookery, it is well to call attention to a few salient features in regard to the present appearance of the seals on these breeding-grounds, which latter are of their own selection. Touching the location of the fur-seals to-day, as I have recorded and surveyed it, compared with their distribution in early times, I am sorry to say that there is not a single line on a chart, or a word printed in a book, or a note made in manuscript, which refers to this all-important subject, prior to my own work, which I present herewith for the first time to the public. The absence of definite information in regard to what I conceive to be of vital interest and importance to the whole business, astonished me; I could not at first believe it; and, for the last four or five years, I have been searching among the archives of the old Russian company, as I searched diligently when up there, and elsewhere in the territory of Alaska, for some evidence in contradiction of this statement which I have just made. I wanted to find—I hoped to discover—some old record, some clue, by which I could measure with authority and entire satisfaction to my own mind, the relative volume of seal-life in the past, as compared with that which I record in the present, but was disappointed.

I am unable, throughout the whole of the following discussion, to cite a single reliable statement which can give any idea as to the condition and numbers of the fur-seal on these islands, when they were discovered in 1786-'87, or during the whole time of their occupation since, up to the date of my arrival. I mark this so conspicuously, for it is certainly a very strange oversight, a kind of neglect, which, in my opinion, has been, to say the least, inexcusable.

RUSSIAN RECORDS.—In attempting to form an approximate conception of what the seals were or might have been in those early days, as they spread themselves over the hauling- and breeding-grounds of these remarkable islands, I have been thrown entirely upon the vague statements given to me by the natives and one or two of the first American pioneers in Alaska. The only Russian record which touches ever so lightly upon the subject* contains the remarkable statement, which is, in the light of my surveys, simply ridiculous now, that is, that the number of fur-seals on St. George during the first years of Russian occupation, was nearly as great as that on St. Paul. The most superficial examination of the geological character portrayed on the accompanying maps of these two islands, will satisfy any unprejudiced mind as to the total error of such a statement. Why, a mere tithe only of the multitudes which repair to St. Paul, in perfect comfort, over the sixteen to twenty miles of splendid landing-ground found thereon, could visit St. George, when all of the coast-line fit for their reception at this island, is a scant two and a half miles; but for that matter there was, at the time of my arrival and in the beginning of my investigation, a score of equally wild and incredible legends afloat in regard to the rookeries on St. Paul and St. George. Finding, therefore, that the whole work must be undertaken *de novo*, I set about it without further delay.

IMMENSE MORTALITY OF THE SEALS IN 1836.—Prior to the year 1835, no native on the islands seemed to have any direct knowledge or was acquainted with a legendary tradition even, in relation to the seals, concerning their area and distribution on the land here; but they all chimed in after that date with great unanimity, saying that the winter preceding this season (1835-'36) was one of frightful severity; that many of their ancestors who had lived on these islands in large barraboras just back of the Black bluffs, near the present village, and at Polavina, then perished miserably.

They say that the cold continued far into the summer; that immense masses of clearer and stronger ice-floes than had ever been known to the waters about the islands, or were ever seen since, were brought down and

* Veniaminov: *Zapieskie ob Oonalashkenskaho Otdayla*, 2 vols., St. Petersburg, 1842. This work of Bishop Innocent Veniaminov is the only one which the Russians can lay claim to as exhibiting anything like a history of western Alaska, or of giving a sketch of its inhabitants and resources, that has the least merit of truth, or the faintest stamp of reliability. Without it we should be simply in the dark as to much of what the Russians were about during the whole period of their occupation and possession of that country. He served, chiefly as a priest and missionary, for 25 years, from 1814 to 1839, at Oonalashka, having the seal-islands in his parish, and was made bishop of all Alaska. He was soon after recalled to Russia, where he has since become the primate of the national church, ranking second to no man in the empire, save the czar; he is advanced in years, being now more than 90 years of age. He must have been a man of fine personal appearance, judging from the following description of him, noted by Sir George Simpson, who met him at Sitka, in 1842, just as he was about to embark for Russia: "His appearance, to which I have already alluded, impresses a stranger with something of awe, while in further intercourse, the gentleness which characterizes his every word and deed, insensibly molds reverence into love; and, at the same time, his talents and attainments are such as to be worthy of his exalted station. With all this, the bishop is sufficiently a man of the world to disdain anything like cant. His conversation, on the contrary, teems with amusement and instruction, and his company is much prized by all who have the honor of his acquaintance." Such is the portrait drawn of him by a governor of the Hudson's Bay Company. [Veniaminov died since the above note was written, at Moscow, April 22, 1879.—H. W. E.]

shoved high up on to all the rookery-margins, forming an icy wall completely around the island, looming up 20 to 30 feet above the surf; they further state that this wall did not melt or in any way disappear until the middle or end of August, 1836.

They affirm that for this reason the fur-seals, when they attempted to land, according to their habit and their necessity, during June and July, were unable to do so in any considerable numbers. The females were compelled to bring forth their young in the water and at the wet, storm-beaten surf-margins, which caused multitudes of the mothers and all of the young to perish. In short, the result was a virtual annihilation of the breeding-seals. Hence, at the following season, only a spectral, a shadowy imitation of past times could be observed upon the seal-grounds of St. Paul and St. George.

On the Lagoon rookery, now opposite the village of St. Paul, there were then only two males, with a number of cows. At Nah Speel, close by and right under the village, there were then only some 2,000; this the natives know because they counted them. On Zapadnie there were about 1,000 cows, bulls, and pups; at Southwest point there were none. Two small rookeries were then on the north shore of St. Paul, near a place called "Maroonitch"; and there were seven small rookeries running round Northeast point, but on all of these there were only 1,500 males, females, and young; and this number includes the "holluschickie", which, in those days, lay in among the breeding-seals, there being so few old males that they were gladly permitted to do so. On Polovina there were then about 500 cows, bulls, pups, and "holluschickie"; on Lukannon and Keetavie about 300; but on Keetavie there were only ten bulls and so few young males lying in altogether, that these old natives, as they told me, took no note of them on the rookeries just cited. On the Reef, in Gorbotch, were about 1,000 only; in this number last mentioned some 800 "holluschickie" may be included, which lay in with the breeding-seals. There were only twenty old bulls on Gorbotch, and about ten old males on the Reef. The village was placed on its present site ten years prior to this period of 1835-'36.

Such, briefly and succinctly, is the sum and the substance of all information which I could gather prior to 1835-'36; and while I do not entirely credit these statements, yet the earnest, straightforward agreement of the natives has impressed me so that I narrate it here. It certainly seems as though this enumeration of the old Aleuts was painfully short.

Then, again, with regard to the probable truth of the foregoing statement of the natives, perhaps I should call attention to the fact that the entire sum of seal-life in 1836, as given by them, is just 4,100, of all classes, distributed as I have indicated above. Now, on turning to Bishop Veniaminov, by whom was published the only statement of any kind in regard to the killing on these islands from 1817 to 1837, the year when he finished his work,* I find that he makes a record of slaughter of seals in the year 1836, of 4,052, which were killed and taken for their skins; but if the natives' statements are right, then only 50 seals were left on the island for 1837, in which year, however, 4,220 were again killed, according to the bishop's table, according to which there was also a steady increase in the size of this return from that date along up to 1850, when the Russians governed their catch by the market alone, always having more seals than they knew what to do with.

Again, in this connection, the natives say that until 1847, the practice on these islands was to kill indiscriminately both females and males for skins; but after this year, 1847, the strict respect now paid to the breeding-seals, and exemption of all females, was enforced for the first time, and has continued up to date.

Thus it will be seen that there is, frankly stated, nothing to guide to a fair or even an approximate estimate as to the numbers of the fur-seals on these two islands, prior to my labor.

MANNER OF COMPUTING THE NUMBER OF SEALS.—After a careful study of the subject, during three entire consecutive seasons, and a confirmatory review of it in 1876, I feel confident that the following figures and surveys will, upon their own face, speak authoritatively as to their truthful character.

At the close of my investigation, during the first season of my labor on the ground, in 1872, the fact became evident that the breeding-seals obeyed implicitly an imperative and instinctive natural law of distribution; a law recognized by each and every seal upon the rookeries, prompted by a fine consciousness of necessity to its own well-being. The breeding-grounds occupied by them were, therefore, invariably covered by the seals in exact ratio, greater or less, as the area upon which they rested was larger or smaller. They always covered the ground evenly, never crowding in at one place here, to scatter out there. The seals lie just as thickly together, where the rookery is boundless in its eligible area to their rear and unoccupied by them, as they do in the little strips which are abruptly cut off and narrowed by rocky walls behind. For instance, on a rod of ground, under the face of bluffs which hemmed it in to the land from the sea, there are just as many seals, no more and no less, as will be found on any other rod of rookery-ground throughout the whole list, great and small; always exactly so many seals, under any and all circumstances, to a given area of breeding-ground. There are just as many cows, bulls, and pups on a square rod at Nah Speel, near the village, where, in 1874, all told, there were only seven or eight thousand, as there are on any square rod at Northeast point, where a million of them congregate.

This fact being determined, it is evident that, just in proportion as the breeding-grounds of the fur-seal on these islands expand or contract in area from their present dimensions, the seals will increase or diminish in number.

* Zapieskie ob Oenalashkenskaho Otdaya, St. Petersburg, 1842.

The discovery, at the close of the season of 1872, of this law of distribution, gave me at once the clue I was searching for, in order to take steps by which I could arrive at a sound conclusion as to the entire number of seals herding on the island.

I noticed, and time has confirmed my observation, that the period for taking these boundaries of the rookeries, so as to show this exact margin of expansion at the week of its greatest volume, or when they are as full as they are to be for the season, is between the 10th and 20th of July every year; not a day earlier, and not many days later. After the 20th of July the regular system of compact, even organization breaks up. The seals then scatter out in pods or clusters, the pups leading the way, straying far back—the same number instantly covering twice and thrice as much ground as they did the day or week before, when they lay in solid masses and were marshaled on the rookery-ground proper.

There is no more difficulty in surveying these seal-margins during this week or ten days in July, than there is in drawing sights along and around the curbs of a stone-fence surrounding a field. The breeding-seals remain perfectly quiet under your eyes all over the rookery, and almost within your touch, everywhere on the outside of their territory that you may stand or walk. The margins of massed life, as I have indicated on the topographical surveys of these breeding-grounds of St. Paul and St. George, are as clean cut and as well defined against the soil and vegetation, as is the shading on my maps. There is not the least difficulty in making the surveys, and in making them correctly.

Now, with a knowledge of the superficial area of these breeding-grounds, the way is clearly open to a very interesting calculation as to the number of fur-seals upon them. I am well aware of the fact, when I enter upon this discussion, that I cannot claim perfect accuracy, but, as shadowing my plan of thought and method of computation, I propose to present every step in the processes which have guided me to the result.

ROOKERY-SPACE OCCUPIED BY SINGLE SEALS.—When the adult males and females, fifteen or twenty of the latter to every one of the former, have arrived upon the rookery, I think an area a little less than two square feet for each female may be considered as the superficial space required by each animal with regard to its size and in obedience to its habits; and this limit may safely be said to be over the mark. Now, every female, or cow, on this two square feet space, doubles herself by bringing forth her young; and in a few days or a week, perhaps, after its birth, the cow takes to the water to wash and feed, and is not back on this allotted space one-fourth of the time again during the season. In this way, is it not clear that the females almost double their number on the rookery-grounds, without causing the expansion of the same beyond the limits that would be actually required, did they not bear any young at all? For every 100,000 breeding-seals, there will be found more than 85,000 females, and less than 15,000 males; and in a few weeks after the landing of these females, they will show for themselves; that is, for this 100,000, fully 180,000 males, females, and young instead, on the same area of ground occupied previously to the birth of the pups.

It must be borne in mind, that perhaps 10 or 12 per cent. of the entire number of females were yearlings last season, and come up on to these breeding-grounds as virgins for the first time during this season—as two-year old cows; they of course bear no young.

The males being treble and quadruple the physical bulk of the females, require about four feet square for their use of this same rookery-ground, but as they are less than one-fifteenth the number of the females, much less, in fact, they therefore occupy only one-eighth of the space over the breeding-ground, where we have located the supposed 100,000; this surplus area of the males is also more than balanced and equalized by the 15,000 or 20,000 virgin females which come on to this rookery for the first time to meet the males. They come, rest a few days or a week, and retire, leaving no young to show their presence on the ground.

Taking all these points into consideration, and they are features of fact, I quite safely calculate upon an average of two square feet to every animal, big and little, on the breeding-grounds, as the initial point upon which to base an intelligent computation of the entire number of seals before us. Without following this system of enumeration, a person may look over these swarming myriads between Southwest point and Novastoshnah, guessing vaguely and wildly, at any figure from one million up to ten or twelve millions, as has been done repeatedly. How few people know what a million really is; it is very easy to talk of a million, but it is a tedious task to count it off, and makes one's statements as to "millions" decidedly more conservative after the labor has been accomplished.

REVIEW OF THE ROOKERIES OF ST. PAUL.—Before summing up the grand total, I shall now, in sequence, review each one of the several rookeries of St. Paul, taking them in their order as they occur, going north from the Reef point. The accompanying maps show the exact area occupied by the breeding-seals and their young in the season of 1874, which is the date of my latest field-work on the Pribylov islands.

THE REEF ROOKERY.—By reference first to the general map, it will be observed that this large breeding-ground, on that grotesquely-shaped neck which ends in the Reef point, is directly contiguous to the village—indeed, it may be fairly said to be right under the lee of the houses on the hill. It is one of the most striking of all the rookeries, owing probably to the fact that on every side it is sharply and clearly exposed to the vision, as the circuit is made in boats. A reach of very beautiful drifting sand, a quarter of a mile from the village hill to the Reef bluffs, separates the breeding-grounds proper from the habitations of the people. These Zoltoi sands are, however,

a famous rendezvous for the "holluschickie", and from them, during the season, the natives make regular drives, having only to step out from their houses in the morning and walk but a few rods to find their fur-bearing quarry.

Passing over the sands on our way down to the point, we quickly come to a basaltic ridge or back-bone, over which the sand has been rifted by the winds, and which supports a rank and luxuriant growth of the *Elymus* and other grasses, with beautiful flowers. A few hundred feet farther along our course brings us in full view, as we look to the south, of one of the most entrancing spectacles which seals afford to man. We look down upon and along a grand promenade-ground, which slopes gently to the eastward, and trends southward down to the water from the abrupt walls bordering on the sea on the west, over a parade-plateau as smooth as the floor of a ball-room, 2,000 feet in length, from 500 to 1,000 feet in width, over which multitudes of "holluschickie" are filing in long strings, or deploying in vast platoons, hundreds abreast, in an unceasing march and countermarch; the breath which rises into the cold air from a hundred thousand hot throats hangs like clouds of white steam in the gray fog itself; indeed, it may be said to be a seal-fog peculiar to the spot, while the din, the roar arising over all, defies our description.

We notice to our right and to our left, the immense solid masses of the breeding-seals at Gorbotch, and those stretching and trending around nearly a mile from our feet, far around to the Reef point below and opposite the parade-ground, with here and there a neutral passage left open for the "holluschickie" to go down and come up from the waves.

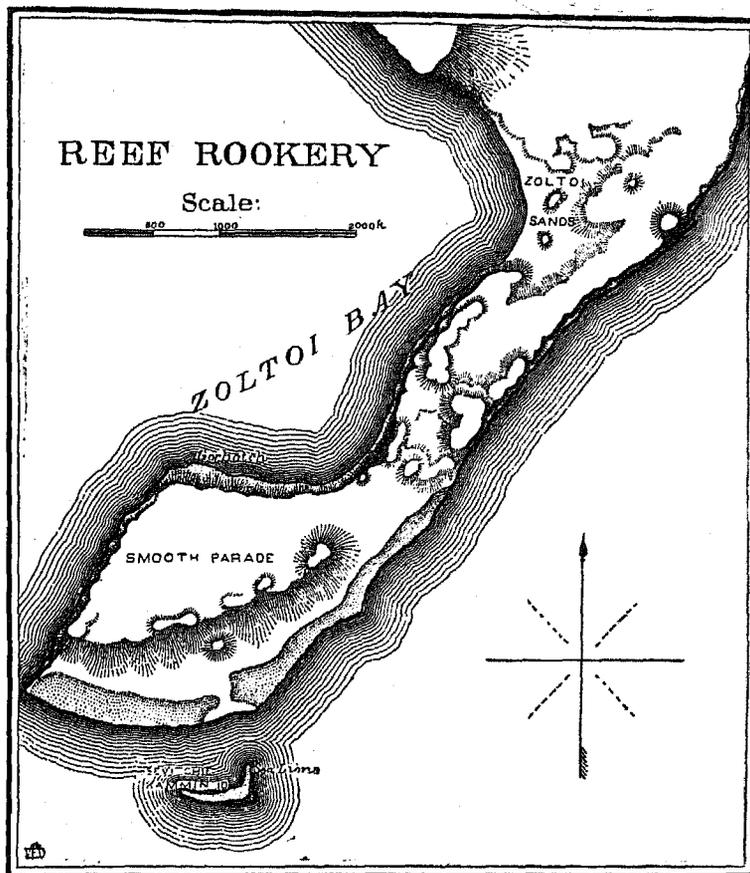
The adaptation of this ground of the Reef rookery to the requirements of the seal is perfect. It so lies that it falls gently from its high Zoltoi bay-margin on the west to the sea on the east; and upon its broad expanse not a solitary puddle of mud-spotting is to be seen, though everything is reeking with moisture, and the fog even dissolves into rain as we view the scene. Every trace of vegetation upon this parade has been obliterated; a few tufts of grass, capping the summits of those rocky hillocks, indicated on the eastern and middle slope, are the only signs of botanical life which the seals have suffered to remain.

A small rock, "Seevitchie Kammin," five or six hundred feet right to the southward and out at sea, is also covered with the black and yellow forms of fur-seals and sea-lions. It is environed by shoal-reefs, rough, and kelp-grown, which navigators prudently avoid.

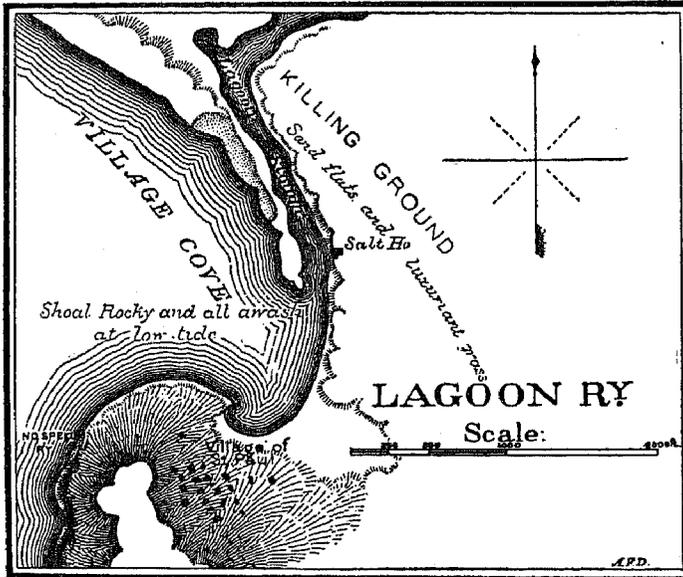
This rookery of the Reef proper has 4,016 feet of sea-margin, with an average depth of 150 feet, making ground for 301,000 breeding-seals and their young. Gorbotch rookery has 3,660 feet of sea-margin, with an average depth of 100 feet, making ground for 183,000 breeding-seals and their young; an aggregate for this great Reef rookery of 484,000 breeding-seals and their young. Heavy as this enumeration is, yet the aggregate only makes the Reef rookery third in importance, compared with the others which we are yet to describe.

LAGOON ROOKERY.—We now pass from the Reef up to the village, where one naturally would not expect to find breeding-seals within less than a pistol-shot from the natives' houses; but it is a fact, nevertheless, for on looking at the sketch map of the Lagoon rookery herewith presented, it will be noticed that I have located a little gathering of breeding-seals right under the village hill to the westward of that place called "Nah Speel". This is in itself an insignificant rookery and never has been a large one, though it is one of the oldest on the island. It is only interesting, however, superficially so, on account of its position, and the fact that through every day of the season half the population of the entire village go and come to the summit of the bluff, which overhangs it, where they peer down for hours at a time upon the methods and evolutions of the "kautickie" below, the seals themselves looking up with intelligent appreciation of the fact that, though they are in the hands of man, yet he is wise enough not to disturb them there as they rest.

If at Nah Speel, or that point rounding into the village cove, there were any suitable ground for a rookery to grow upon or spread over, the seals would doubtless have been there long ago. There are, however, no such natural advantages offered them; what there is they have availed themselves of.



Looking from the village across the cove and down upon the Lagoon, still another strange contradiction appears—at least it seems a natural contradiction to one's usual ideas. Here we see the Lagoon rookery, a



reach of ground upon which some twenty-five or thirty thousand breeding-seals come out regularly every year during the appointed time, and go through their whole elaborate system of reproduction, without showing the slightest concern for or attention to the scene directly east of them and across that shallow slough not forty feet in width. There are the great slaughtering fields of St. Paul island; there are the sand-flats where every seal has been slaughtered for years upon years back, for its skin; and even as we take this note, forty men are standing there knocking down a drove of two or three thousand "holluschickie" for the day's work, and as they labor, the whacking of their clubs and the sound of their voices must be as plain to those breeding-seals, which are not one hundred feet from them, as it is to us, a quarter of a mile distant! In addition to this enumeration of disturbances, well calculated to amaze, and dismay, and drive off every seal within its influence, are the decaying bodies of the last year's catch—75,000 or 85,000 unburied carcasses—that are sloughing away

into the sand, which two or three seasons from now, nature will, in its infinite charity, cover with the greenest of all green grasses. The whitened bones and grinning skulls of over 3,000,000 seals have bleached out on that slaughtering-spot, and are buried below its surface now.

Directly under the north face of the Village Hill, where it falls to the narrow flat between its feet and the Cove, the natives have sunk a well. It was excavated in 1857, they say, and subsequently deepened to its present condition, in 1868. It is twelve feet deep, and the diggers said that they found bones of the sea-lion and fur-seal thickly distributed every foot down, from top to bottom; how much lower these osteological remains of pre-historic pinnipeds can be found, no one knows as yet; the water here, on that account, has never been fit to drink, or even to cook with; but being soft, was and is used by the natives for washing clothes, etc. Most likely, it records the spot where the Russians, during the heydays of their early occupation, drove the unhappy visitors of Nah Speel to slaughter. There is no Golgotha known to man elsewhere in the world as extensive as this one of St. Paul.

Yet, the natives say that this Lagoon rookery is a new feature in the distribution of the seals; that when the people first came there and located a part of the present village, in 1824 up to 1847, there never had been a breeding-seal on that Lagoon rookery of to-day; so they have hauled up here from a small beginning, not very long ago, until they have attained their present numerical expansion, in spite of all these exhibitions of butchery of their kind, executed right under their eyes, and in full knowledge of their nostrils, while the groans and low moanings of their stricken species stretched out beneath the clubs of the sealers, must have been far plainer in their ears than they are in our own.

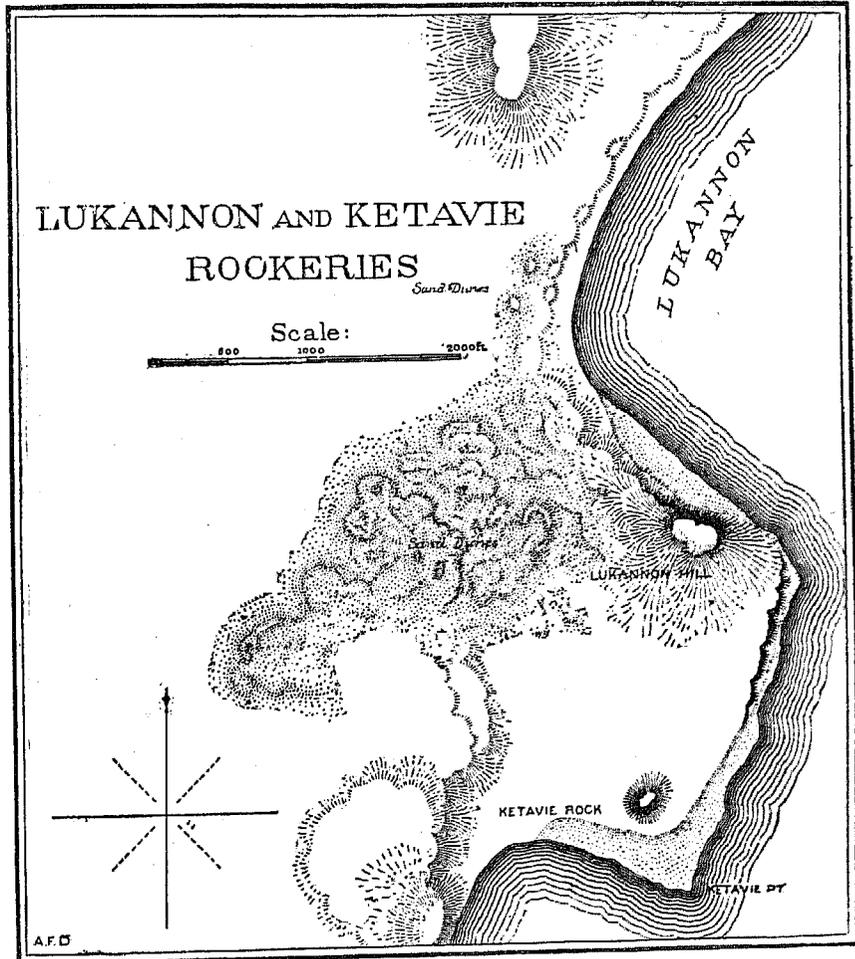
Still they come—they multiply, and they increase—knowing so well that they belong to a class which intelligent men never did molest; to-day at least they must know it, or they would not submit to these manifestations which we have just cited, so close to their knowledge.

The Lagoon rookery, however, never can be a large one on account of the very nature of the ground selected by the seals; for it is a bar simply pushed up above the surf-wash of bowlders, water-worn and rounded, which has almost inclosed and cut out the Lagoon from its parent sea. In my opinion, the time is not far distant when that estuary will be another inland lake of St. Paul, walled out from salt water and freshened by rain and melting snow, as are the other pools, lakes, and lakelets on the island.

LUKANNON AND KEETAVIE ROOKERIES.—The next rookeries in order can be found at Lukannon and Keetavie. Here is a joint blending of two large breeding-grounds, their continuity broken by a short reach of sea-wall right under and at the eastern foot of Lukannon hill. The appearance of these rookeries is like all the others, peculiar to themselves. There is a rounded, swelling hill, at the foot of Lukannon bay, which rises perhaps 160 or 170 feet from the sea, abruptly at the point, but swelling out, gently up from the sand-dunes in Lukannon bay, to its summit at the northwest and south. The great rookery rests upon the northern slope. Here is a beautiful adaptation of the finest drainage, with a profusion of those rocky nodules scattered everywhere over it, upon which the females so delight in resting.

Standing on the bald summit of Lukannon hill, we turn to the south, and look over Keetavie point, where another large aggregate of breeding-seals rests under our eye. The hill falls away into a series of faintly terraced

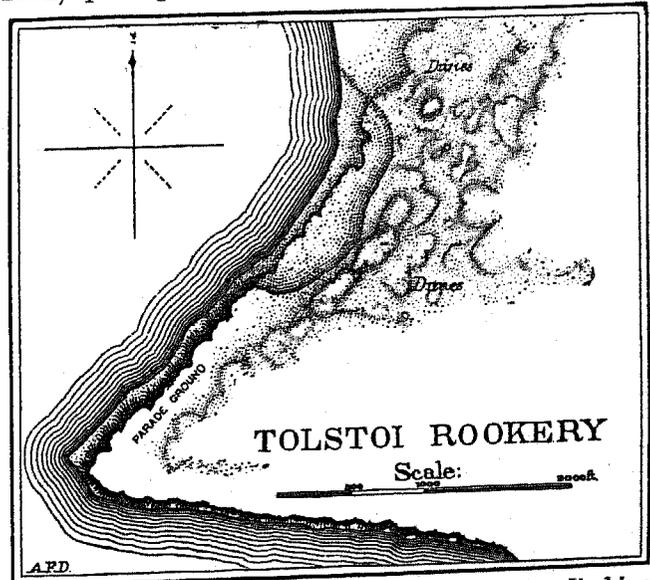
tables, which drop down to a flat that again abruptly descends to the sea at Keetavie point. Between us and the Keetavie rookery is the parade-ground of Lukannon, a sight almost as grand as is that on the Reef which we have feebly attempted to portray. The sand-dunes to the west and to the north are covered with the most luxuriant grass, abruptly emarginated by the sharp abrasion of the hauling-seals: this is shown very clearly on the general map. Keetavie point is a solid basaltic shelf. Lukannon hill, the summit of it, is composed of volcanic tufa and cement, with irregular cubes and fragments of pure basalt scattered all over its flipper-worn slopes. Lukannon proper has 2,270 feet of sea-margin, with an average depth of 150 feet, making ground for 170,000 breeding-seals and their young. Keetavie rookery has 2,200 feet of sea-margin, with an average depth of 150 feet, making ground for 165,000 breeding-seals and their young, a whole aggregate of 335,000 breeding-seals and their young. This is the point, down along the flat shoals of Lukannon bay, where the sand-dunes are most characteristic, as they rise in their wind-whirled forms just above the surf-wash. This also is where the natives come from the village during the early mornings of the season, for driving, to get any number of "holluschickie".



It is a beautiful sight, glancing from the summit of this great rookery-hill, up to the north over that low reach of the coast to Tonkie Mees, where the waves seem to roll in with crests that rise in unbroken ridges for a mile in length each, ere they break so grandly and uniformly on the beach. In these rollers the "holluschickie" are playing like sea-birds, seeming to sport the most joyously at the very moment when the heavy billow breaks and falls upon them.

TOLSTOI ROOKERY.—Directly to the west from Lukannon, up along and around the head of the Lagoon, is the seal-path road over which the natives bring the "holluschickie" from Tolstoi. We follow this and take up our position on several lofty grass-grown dunes, close to and overlooking another rookery of great size; this is Tolstoi.

We have here the greatest hill-slope of breeding-seals, on either island, peculiarly massed on the abruptly sloping flanks of Tolstoi ridge, as it falls to the sands of English bay, and ends suddenly in the precipitous termination of its own name, Tolstoi point. Here the seals are in some places crowded up to the enormous depth of 500 measured feet, from the sea-margin of the rookery to its outer boundary and limitation; and, when viewed as I viewed it in July, taking the angles and lines shown on the accompanying sketch-map, I considered it, with the bluffs terminating it at the south, and its bold sweep, which ends on the sands of English bay, to be the most picturesque, though it is not the most impressive, rookery on the island—especially when that parade-ground, lying just back and over the point and upon its table-rock surface, is reached by the climbing seals.



and upon its table-rock surface, is reached by the climbing seals.

If the observer will glance at the map, he will see that the parade-ground in question lies directly over and about 150 feet above, the breeding-seals immediately under it. The sand-dune tracts which border the great body of the rookery seem to check the "holluschickie" from hauling to the rear, for sand drifts here, in a locality so high and exposed to the full force of the wind, with more rapidity and consequently more disagreeable energy to the seals than anywhere else on the island.

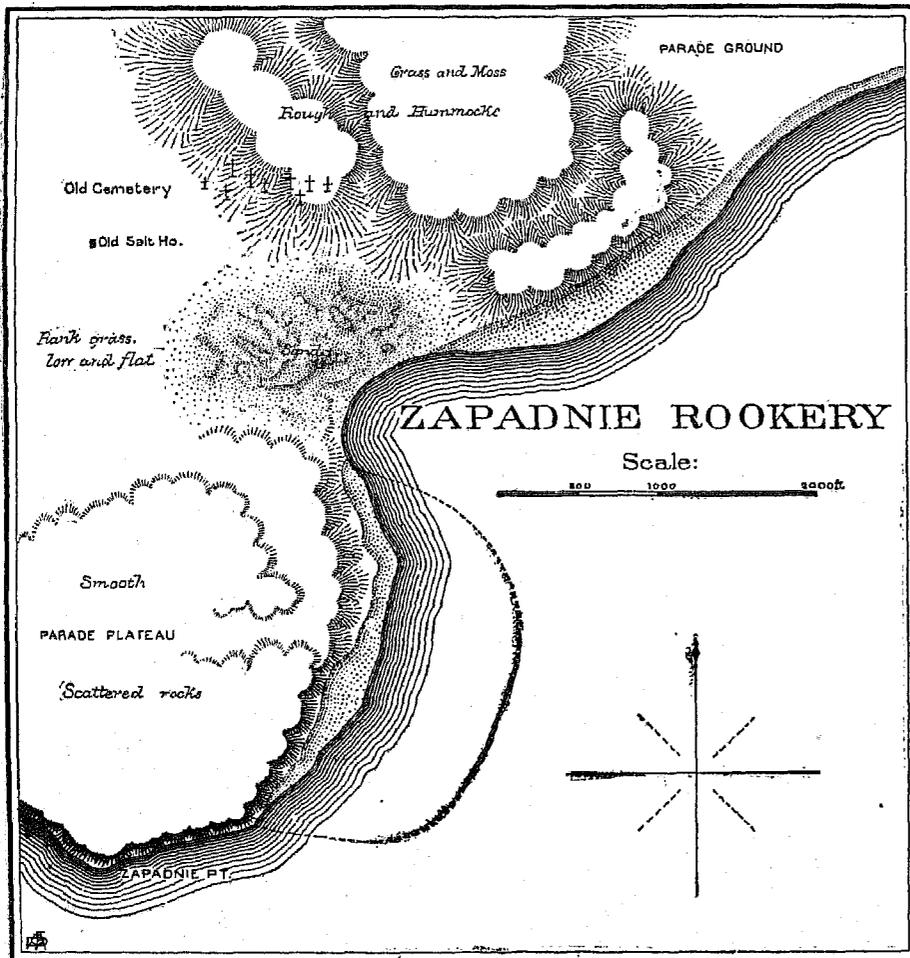
A comical feature of this rookery is the appearance of the foxes in the chinks under the parade-ground and interstices of the cliffs; their melancholy barking and short yelps of astonishment, as we walk about, contrast quite sensibly with the utter indifference of the seals to our presence.

From Tolstoi at this point, sweeping around three miles to Zapadnie, is the broad sand-reach of English bay, upon which and back over its gently rising flats are the great hauling-grounds of the "holluschickie", which I have indicated on the general map, and to which I made reference in a previous section of this chapter. Looking at the myriads of "bachelor-seals" spread out in their restless hundreds and hundreds of thousands upon this ground, one feels the utter impotency of verbal description, and reluctantly shuts his note- and sketch-books to gaze upon it with renewed fascination and perfect helplessness.

Tolstoi rookery has attained, I think, its utmost limit of expansion. The seals have already pushed themselves as far out upon the sand at the north as they can or are willing to go, while the abrupt cliffs, hanging over more than one-half of the sea-margin, shut out all access to the rear for the breeding-seals. The natives said that this rookery had increased very much during the last four or five years prior to the date of my making the accompanying survey. If it continues to increase, the fact can be instantly noted, by checking off the ground and comparing it with the sketch-map herewith presented. Tolstoi rookery has 3,000 feet of sea-margin, with an average depth of 150 feet, making ground for 225,000 breeding-seals and their young.

ZAPADNIE ROOKERY.—From Tolstoi, before going north, we turn our attention directly to Zapadnie on the west, a little over two miles as the crow flies, across English bay, which lies between them. Here again we find another

magnificent rookery, with features peculiar to itself, consisting of great wings separating, one from the other, by a short stretch of five or six hundred feet of the shunned sand-reach which makes a landing and a beach just between them. The northern Zapadnie lies mostly on the gently sloping, but exceedingly rocky, flats of a rough volcanic ridge which drops there to the sea; it, too, has an approximation to the Tolstoi depth, but not to such a solid extent; it is the one rookery which I have reason to believe has sensibly increased since my first survey in 1872. It has overflowed from the boundary which I laid down at that time, and has filled up for nearly half a mile, a long ribbon-like strip of breeding-ground to the northeast from the hill-slope, ending at a point where a few detached rocks jut out, and the sand takes exclusive possession of the rest of the coast. These rocks aforesaid are called by the natives "Nearhpahskie kammin", because it is a favorite resort for the hair-seals. Although this extension of a very decided margin of breeding-ground, over half a mile in length, between 1872 and 1876, does not, in the aggregate,



point to a very large increased number, still it is a gratifying evidence that the rookeries, instead of tending to diminish in the slightest, are more than holding their own.

Zapadnie, in itself, is something like the Reef plateau on its eastern face, for it slopes up gradually and gently to the parade-plateau on top—a parade-ground not so smooth, however, being very rough and rocky, but which the

seals enjoy. Just around the point, a low reach of rocky bar and beach connects it with the ridge-walls of South-west point: a very small breeding-rookery, so small that it is not worthy of a survey, is located here; I think, probably, on account of the nature of the ground, that it will never hold its own, and is more than likely abandoned by this time.

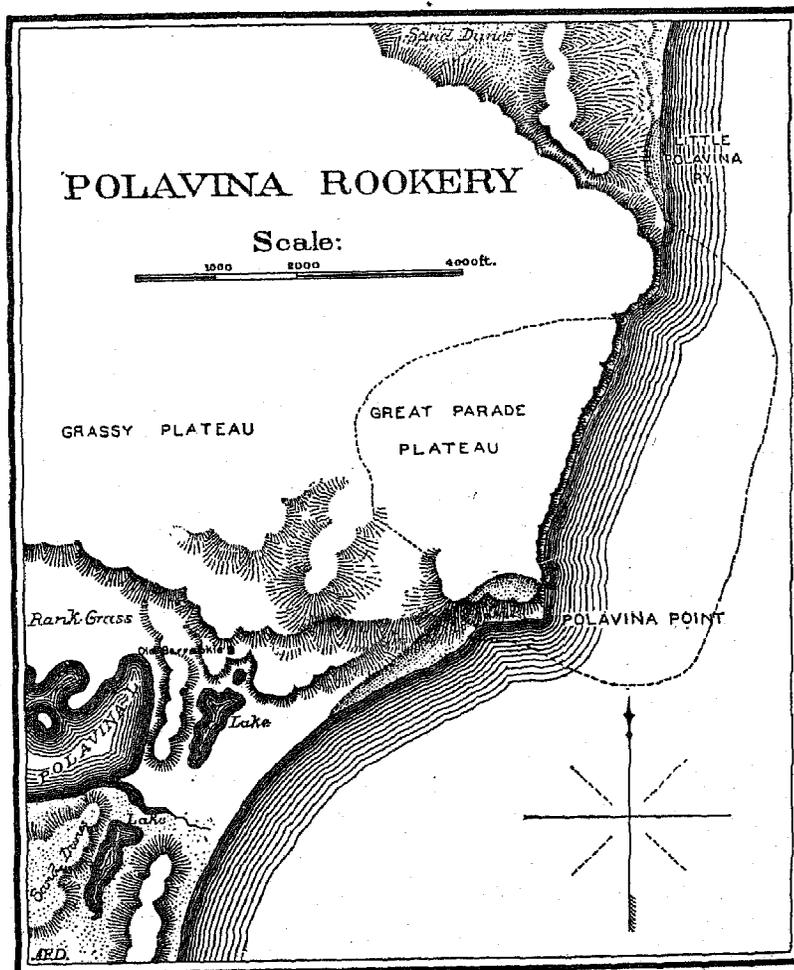
One of the prehistoric villages, the village of Pribylov's time, was established here between the point and the cemetery ridge, on which the northern wing of Zapadnie rests. The old burying-ground, with its characteristic Russian crosses and faded pictures of the saints, is plainly marked on the ridge. It was at this little bight of sandy landing that Pribylov's men first came ashore and took possession of the island, while others in the same season proceeded to Northeast point and to the north shore, to establish settlements of their own order. When the indiscriminate sealing of 1868 was in progress, one of the parties lived here, and a salt-house which was then erected by them still stands; it is in a very fair state of preservation, although it has never been since occupied, except by the natives who come over here from the village in the summer to pick the berries of the *Empetrum* and *Rubus*, which abound in the greatest profusion around the rough and rocky flats that environ the little adjacent lake. The young people of St. Paul are very fond of this berry-festival, so-called among themselves, and they stay here every August, camping out, a week or ten days at a time, before returning to their homes in the village.

Zapadnie rookery has, the two wings included, 5,880 feet of sea-margin, with an average depth of 150 feet, making ground for 441,000 breeding-seals and their young, being the second rookery on the island as to size and importance.

The "holluschickie" that sport here on the parade-plateau, and indeed over all of the western extent of the English bay hauling-grounds, have never been visited by the natives for the purpose of selecting killing drives since 1872, inasmuch as more seals than were wanted have always been procured from Zoltoi, Lukannon, and Lower Tolstoi points, which are all very close to the village. I have been told, since making this survey, that during the past year the breeding-seals of Zapadnie have overflowed, so as to occupy all of the sand-strip which is vacant between them on the accompanying map.

POLAVINA ROOKERY.—Half-way between the village and Northeast point lies Polavina, another one of the seven large breeding-grounds on this island. The conspicuous cone-shaped head of Polavina Sopka rises clearly cut and smooth from the plateau at its base, which falls two miles to the eastward and southeastward, sharp off into the sea, presenting a bluff margin over a mile in length, at the base of which the sea thunders incessantly. It exhibits a very beautiful geological section of the simple structure of St. Paul. The ringing, iron-like basaltic foundations of the island are here setting boldly up from the sea to a height of 40 or 50 feet—black and purplish-red, polished like ebony by the friction of the surf, and worn by its agency into grotesque arches, tiny caverns, and deep fissures. Surmounting this lava-bed is a cap of ferruginous cement and tufa from three to ten feet in thickness, making a reddish floor, upon which the seals patter in their restless, never-ceasing, evolutions, sleeping or waking, on the land. It is as great a single parade-plateau of polished cement as that of the Reef, but we are unable from any point of observation to appreciate it, inasmuch as we cannot stand high enough to overlook it, unless we ascend Polavina Sopka, and then the distances, with the perspective fore-shortening, destroy the effect.

The rookery itself occupies only a small portion of the seal-visited area at this spot. It is placed at the southern termination, and gentle sloping of the long reach of bluff wall, which is the only cliff between Lukannon and Novastoshnah. It presents itself to the eye, however, in a very peculiar manner, and with great scenic effect, when the observer views it from the extreme point of its mural elevation; viewed from thence, nearly a mile to the northeast, it rises as a front of bicolored lava-wall, high above the sea that is breaking at its



base, and is covered with the infinite detail of massed seals in reproduction: at first sight, one wonders how they got there. No passages whatever can be seen, down or up. A further survey, however, discloses the common occurrence of rain-water runs between surf-beaten crevices, which make many stairways for the adhesive feet of *Callorhinus* amply safe and comfortable.

For the reason cited in a similar example at Zapadnie, no "holluschickie" have been driven from this point since 1872, though it is one of the easiest worked. It was in the Russian times a pet sealing-ground with them. The remains of the old village have nearly all been buried in the sand near the lake, and there is really no mark of its early habitation, unless it be the singular effect of a human grave-yard being dug out and despoiled by the attrition of seal bodies and flippers. The old cemetery just above and to the right of the barrabkie, near the little lake, was originally established, so the natives told me, far away from the hauling of the "holluschickie"; it was, when I saw it in 1876, in a melancholy state of ruin—a thousand young seals at least moved off from its surface as I came up, and they had actually trampled out many sandy graves, rolling the bones and skulls of Aleutian ancestry in every direction. Beyond this old barrabkie, which the present natives established as a house of refuge during the winter when they were trapping foxes, looking to the west over the lake, is a large expanse of low, flat swale and tundra, which is terminated by the rocky ridge of Kaminista; every foot of it has been placed there subsequent to the original elevation of the island by the action of the sea, beyond all question. It is covered with a thick growth of the rankest sphagnum, which quakes and trembles like a bog under one's feet, but over which the most beautiful mosses ever and anon crop out, including the characteristic floral display before referred to in speaking of the island; most of the way from the village up to Northeast point, as will be seen by a cursory glance at the map, with the exception of this bluff of Polavina and the terraced table setting back from its face to Polavina Sopka, the whole island is slightly elevated above the level of the sea, and its coast-line is lying just above and beyond the reach of the surf, where great ledges of sand have been piled up by the wind, capped with sheafs and tufts of rank-growing *Elymus*.

There is a small rookery, which I call "Little Polavina", indicated here, which does not promise much for the future; the sand cuts it off on the north, and sand has blown around so at its rear, as to make all other ground not now occupied by the breeding-seals there quite ineligible. Polavina rookery has 4,000 feet of sea-margin, including Little Polavina, with 150 feet of average depth, making ground for 300,000 breeding-seals and their young.

NORTHEAST POINT OR NOVASTOSHNAH ROOKERY.—Though this is the last of the St. Paul rookeries which I notice, yet it is so much greater than any other one on the island, or two others for that matter, that it forms the central feature of St. Paul, and in truth presents a most astonishing and extraordinary sight. It was a view of such multitudes of amphibians, when I first stood upon the summit of Hutchinson hill, and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me courage to maintain the truth in regard to the subject.

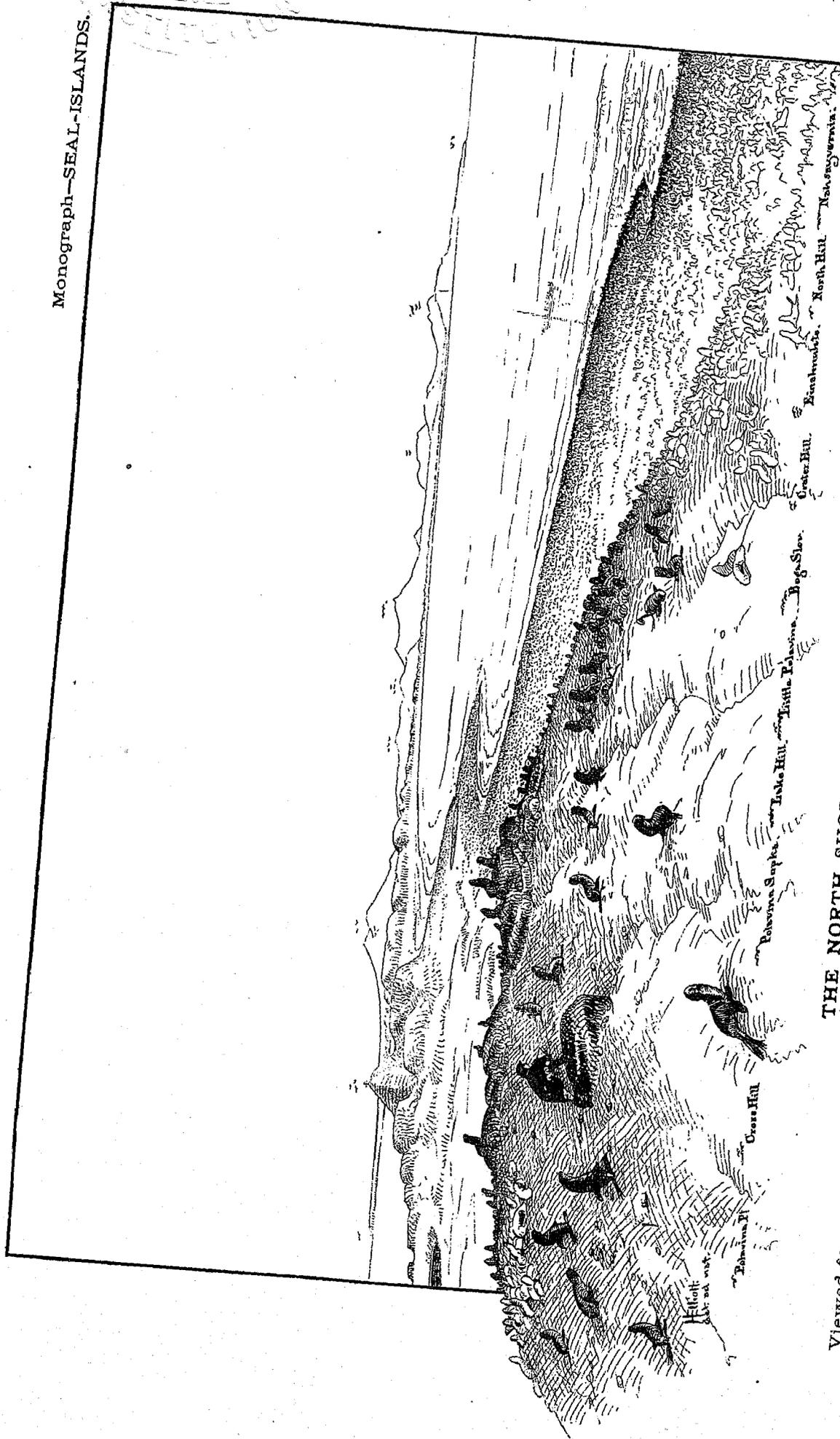
The result of my first survey here presented such a startling array of superficial area massed over by the breeding-seals, that I was fairly disconcerted at the magnitude of the result. It troubled me so when my initial plottings were made, and I had worked them out so as to place them tangibly before me, that I laid the whole preliminary survey aside, and seizing upon the next favorable day went over the entire field again. The two plats then, laid side by side, substantially agreed, and I now present the great rookery to the public. It is in itself, as the others are, endowed with its own particular physiognomy, having an extensive sweep, everywhere surrounded by the sea, except at that intersection of the narrow neck of sand which joins it to the main island. Hutchinson hill is the foundation of the point—a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner, which is so rough, and yet polished so highly by the countless pattering flippers of its visitors, as to leave it entirely bare and bald of every spear of grass or trace of cryptogamic life. The hill is about 120 feet high; it has a rounded summit flecked entirely over by the "holluschickie", while the great belt of breeding-rookery sweeps high up on its flanks, and around right and left, for nearly three and a half miles unbroken—an amazing sight in its aggregate, and infinite in its detail.

The picturesque feature, also, of the rookery here, is the appearance of the tawny, yellowish bodies of several thousand sea-lions, which lay in and among the fur-seals at the several points designated on the sketch-map, though never far from the water. Sea-Lion neck, a little tongue of low basaltic jutting, is the principal corner where the natives take these animals from when they capture them in the fall for their hides and sinews.*

Cross, or St. John's, hill, which rises near the lake, to a height of 60 or 70 feet, and is quite a land-mark itself, is a perfect cone of sand entirely covered with a luxuriant growth of *Elymus*; it is growing constantly higher by the fresh deposit brought by wind, and its retention by the annually rising grasses.

At this point, it will be noticed, there is a salt-house, and here is the killing-ground for Northeast point, where nineteen or twenty thousand "holluschickie" are disposed of for their skins every season; their carcasses being spread out on the sand-dunes between the foot of Cross hill and Webster's house; a squad of sealers live there during the

*The sea-lions breed on no one of the other rookeries at this island, the insignificant number that I noticed on Seevitchie Kamnis excepted. At Southwest point, however, I found a small sea-lion rookery, but there are no breeding fur-seals there. A handful of *Emetopias* used to breed on Otter island, but do not now, since it has been necessary to station government agents there, for the apprehension of fur-seal pirates, during the sealing season.



THE NORTH SHORE OF ST. PAUL ISLAND.

Viewed from the summit of Hutchinson's Hill, looking W. S. W. over a portion of the Great Novastoshnah Rookery.

three or four weeks that they are engaged in the work. The "holluschickie" are driven from the large hauling-grounds on the sand-flats immediately adjacent to the killing-grounds, being obtained without the slightest difficulty.

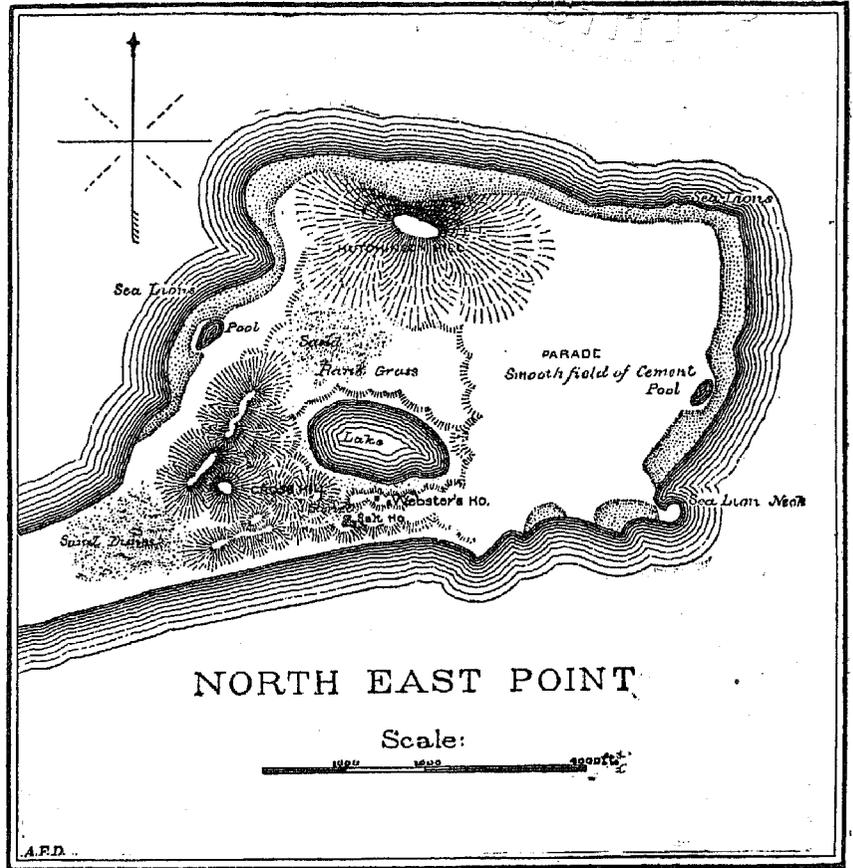
Here also was the site of a village, once the largest one on this island ere its transfer to the sole control and charge of the old Russian-American Company, ten years after its discovery in 1787. The ancient cemetery and the turf lines of the decayed barraboras are still plainly visible.

The company's steamer runs up here, watching her opportunity, and drops her anchor, as indicated on the general chart, right south of the salt-house, in about four fathoms of water; and the skins are invariably hustled aboard, no time being lost, because it is an exceedingly uncertain place to safely load the vessel.

There is no impression in my mind really more vivid, than is the one which was planted there during the afternoon of that July day, when I first made my survey of this ground; indeed, whenever I pause to think of the subject, the great rookery of Novastoshnah rises promptly to my view, and I am fairly rendered voiceless as I try to speak in definition of the spectacle. In the first place, this slope from Sea Lion neck to the summit of Hutchinson's hill

is a long mile, smooth and gradual from the sea to the hill-top; the parade ground lying between is also nearly three-quarters of a mile in width, sheer and unbroken. Now, upon that area before my eyes, this day and date of which I have spoken, were the forms of not less than three-fourths of a million seals—pause a moment—think of the number—three-fourths of a million seals moving in one solid mass from sleep to frolicsome gambols, backward, forward, over, around, changing and interchanging their heavy squadrons, until the whole mind is so confused and charmed by the vastness of mighty hosts that it refuses to analyze any further. Then, too, I remember that the day was one of exceeding beauty for that region; it was a swift alternation over head of those characteristic rain fogs, between the succession of which the sun breaks out with transcendent brilliancy through the misty halos about it; this parade-field reflected the light like a mirror, and the seals, when they broke apart here and there for a moment, just enough to show its surface, seemed as though they walked upon the water. What a scene to put upon canvas—that amphibian host involved in those alternate rainbow lights and blue-gray shadows of the fog!

RECAPITULATION OF THE ESTIMATES OF NUMBER OF SEALS.—Below is a recapitulation of these figures made from my surveys of the area and position of the breeding-grounds of St. Paul island, between the 10th and 18th of July, 1872, confirmed and revised to that date in 1874. It is the first survey ever made on the island of its rookeries:

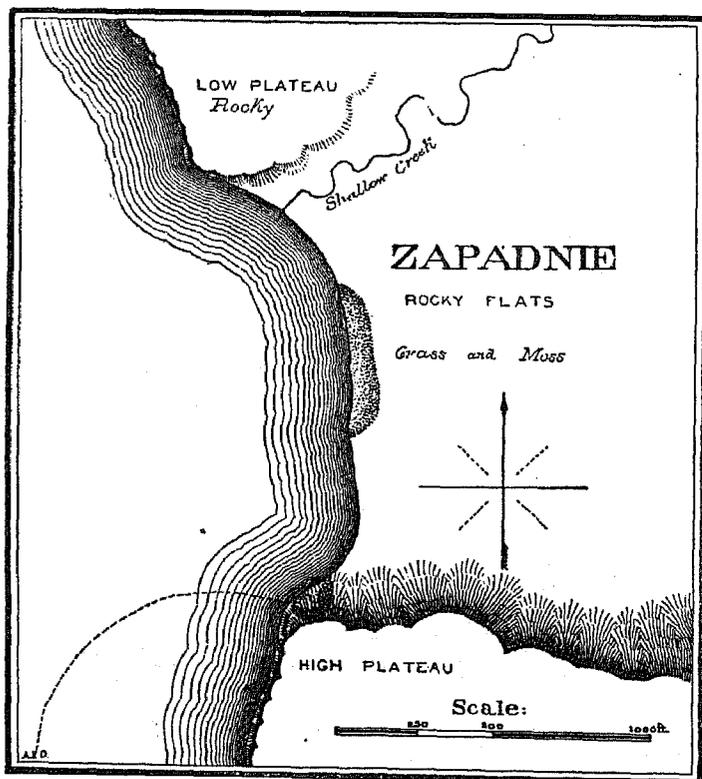


Breeding-grounds of the fur-seal, on St. Paul island.	Number of seals, male, female, and young.
"Reef rookery" has 4,016 feet of sea-margin, with 150 feet of average depth, making ground for.....	301,000
"Gorboteh rookery" has 3,660 feet of sea-margin, with 100 feet of average depth, making ground for.....	183,000
"Lagoon rookery" has 750 feet of sea-margin, with 100 feet of average depth, making ground for.....	37,000
"Nah Speel rookery" has 400 feet of sea-margin, with 40 feet of average depth, making ground for.....	8,000
"Lukannon rookery" has 2,270 feet of sea-margin, with 150 feet of average depth, making ground for.....	170,000
"Keetavio rookery" has 2,200 feet of sea-margin, with 150 feet of average depth, making ground for.....	165,000
"Tolstoi rookery" has 3,000 feet of sea margin, with 150 feet of average depth, making ground for.....	225,000
"Zapadnie rookery" has 5,880 feet of sea-margin, with 150 feet of average depth, making ground for.....	441,000
"Polavina rookery" has 4,000 feet of sea-margin, with 150 feet of average depth, making ground for.....	300,000
"Novastoshnah, or Northeast point" has 15,840 feet of sea-margin, with 150 feet of average depth, making ground for....	1,200,000
A grand total of breeding-seals and young for St. Paul island in 1874 of.....	3,030,000

ST. GEORGE.—St. George is now in order, and this island has only a trifling contribution for the grand total of the seal-life; but small as it is, it is of much value and interest. Certainly Pribylov, not knowing of the existence of St. Paul, was as well satisfied as if he had possessed the boundless universe, when he first found it. As in the case of St. Paul island, I have been unable to learn much here in regard to the early status of the rookeries, none of the natives having any real information. The drift of their sentiment goes to show that there never was a great assemblage of fur-seals on St. George; in fact, never as many as there are to-day, insignificant as the exhibit is, compared with that of St. Paul. They say that, at first, the sea-lions owned this island, and that the Russians, becoming cognizant of the fact, made a regular business of driving off the "seevitchie", in order that the fur-seals might be encouraged to land. Touching this statement, with my experience on St. Paul, where there is no conflict at all between the fifteen or twenty thousand sea-lions which breed around on the outer edge of the seal-rookeries there, and at Southwest point, I cannot agree to the St. George legend. I am inclined to believe, however, indeed it is more than probable, that there were a great many more sea-lions on and about St. George before it was occupied by men—a hundred-fold greater, perhaps, than now; because, a sea-lion is an exceedingly timid, cowardly creature when it is in the proximity of man, and will always desert any resting place where it is constantly brought into contact with him.*

The scantiness of the St. George rookeries, is due to the configuration of the island itself.† There are five separate, well-defined rookeries on St. George, as follows:—

ZAPADNIE ROOKERY.—Directly across the island, from its north shore to Zapadnie bay, a little over three miles from the village, is a point where the southern bluff-walls of the island turn north, and drop quickly down from their lofty elevation in a succession of heavy terraces, to an expanse of rocky flat, bordered by a sea sand-beach; just between the sand-beach, however, and these terraces, is a stretch of about 2,000 feet of low, rocky shingle, which borders the flat country back of it, and upon which the surf breaks free and boldly. Midway between the two points is the rookery; and a small detachment of it rests on the direct sloping of the bluff itself, to the southward; while in and around the rookery, falling back to some distance, the "hol-luschickie" are found.



A great many confusing statements have been made to me about this rookery—more than in regard to any other on the islands. It has been said, with much positiveness, that, in the times of the Russian rule, this was an immense rookery for St. George; or, in other words, it covered the entire ground between that low plateau to the north and the high plateau to the south, as indicated on the map; and it is also cited in proof of this that the main village of the island, for many years, thirty or forty, was placed on or near the limited drifting sand-dune tracts just above the plateau, to the westward. Be the case as it may, it is certain that for a great, great many years back, no such rookery has

ever existed here. When seals have rested on a chosen piece of ground to breed, they wear off the sharp edges of fractured basaltic bowlders, and polish the breccia and cement between them so thoroughly and so finely that years and years of chiseling by frost, and covering by lichens, and creeping of mosses, will be required to efface that record. Hence I was able, acting on the suggestion of the natives at St. Paul, to trace out those deserted fur-seal rookeries

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* This statement of the natives has a strong circumstantial backing by the published account of Choris, a French gentleman of leisure, and amateur naturalist and artist, who landed at St. George in 1820 (July); he passed several days off and on the land; he wrote at short length in regard to the sea-lion, saying "that the shores were covered with innumerable troops of sea-lions. The odor which arose from them was insupportable. These animals were all the time rutting", etc., yet nowhere does he speak in the chapter, or elsewhere in his volume, of the fur-seal on St. George, but incidentally remarks that over on St. Paul it is the chief animal and most abundant.—*Voyage Pittoresque au tour du Monde, Iles Aléoutiennes*, pp. 12, 13, pl. xiv. 1822.

† Although this writing of Choris in regard to the subject is brief, superficial, and indefinite, yet I value the record he made, because it is *prima facie* evidence, to my mind, that had the fur-seal been nearly as numerous on St. George then as it was on St. Paul, he would have spoken of the fact surely, inasmuch as he was searching for just such items with which to illuminate his projected book of travels. The old Russian record as to the relative number of fur-seals on the two islands of St. George and St. Paul is clearly as palpably erroneous for 1820, as I found it to be in 1872, 1873. No intelligent steps toward ascertaining that ratio were ever taken until I made my survey.

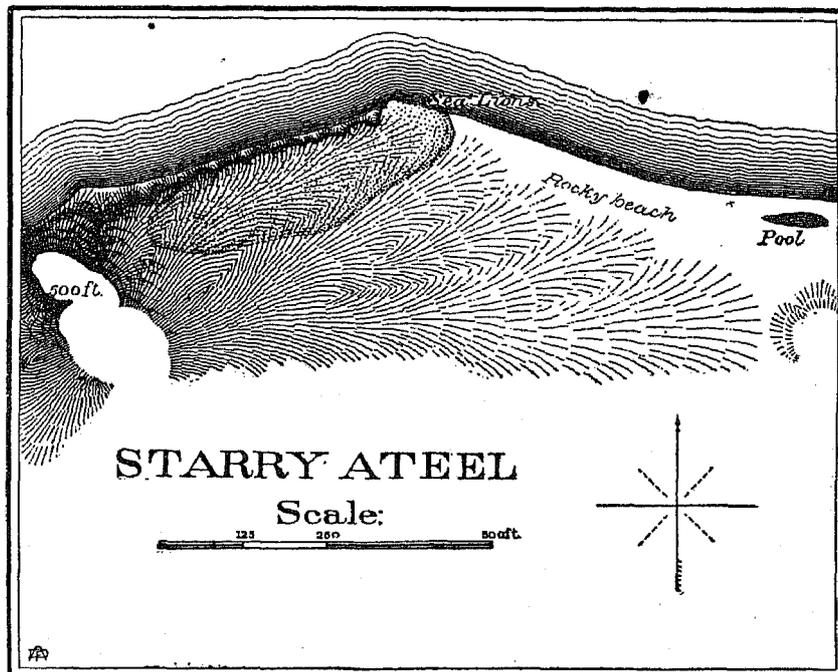
on the shores of that island. At Maroonitch, which had, according to their account, been abandoned for over sixty years by the seals, still, at their prompting, when I searched the shore, I found the old boundaries tolerably well defined; I could find nothing like them at Zapadnie.

Zapadnie rookery in July, 1873, had 600 feet of sea-margin, with 60 feet of average depth; making ground for 18,000 breeding-seals and their young. In 1874, I resurveyed the field and it seemed very clear to me that there had been a slight increase, perhaps to the number of 5,000, according to the expansion of the superficial area over that of 1873.

From Zapadnie we pass to the north shore, where all the other rookeries are located, with the village at a central point between them on the immediate border of the sea. And, in connection with this point, it is interesting to record the fact that every year, until recently, it has been the regular habit of the natives to drive the "holluschickie" over the two and a half or three miles of rough basaltic uplands which separate the hauling-ground of Zapadnie from the village; driving them to the killing-grounds there, in order to save the delay and trouble generally experienced in loading these skins in the open bay. The prevailing westerly and northwesterly winds during July and August, make it, for weeks at a time, a marine impossibility to effect a landing at Zapadnie, suitable for the safe transit of cargo to the steamer.

This three miles of the roughest of all rough walks that can be imagined, is made by the fur-seals in about seven or eight hours, when driven by the Aleuts; and, the weather is cool and foggy. I have known one treasury agent, who, after making the trip from the village to Zapadnie, seated himself down in the barrabkie there, and declared that no money would induce him to walk back the same way that same day—so severe is the exercise to one not accustomed to it; but it exhibits the power of land-locomotion possessed by the "holluschickie".*

STARRY ATEEL †.—This rookery is the next in order, and it is the most remarkable one on St. George, lying as it does in a bold sweep from the sea, up a steeply inclined slope to a point where the bluffs bordering it seaward are over 400 feet high; the seals being just as closely crowded at the summit of this lofty breeding plat as they are at the water's edge; the whole oblong oval on the side hill, as designated by the accompanying survey, is covered by their thickly clustered forms. It is a strange sight also, to sail under these bluffs with the boat, in fair weather, for a landing; and, as you walk the beach, over which the cliff wall frowns a sheer 500 feet, there, directly over your head the craning necks and twisting forms of the restless seals, ever and anon, as you glance upward, appear as if ready to launch out and fall below, so closely and boldly do they press the very edge of the precipice. ‡ There is a low, rocky beach to the



* The peculiarly rough character to this trail is given by the large, loose, sharp-edged basaltic boulders, which are strewn thickly over all those lower plateau that bridge the island between the high bluffs at Starry Ateel and the slopes of Ahluckeyak hill. The summits of the two broader, higher plateaus, east and west respectively, are comparatively smooth and easy to travel over; and so is the sea-level flat at Zapadnie itself. On the map of St. George, a number of very small ponds will be noticed; they are the fresh-water reservoirs of the island. The two largest of these are near the summit of this rough divide; the seal-trail from Zapadnie to the village runs just west of them, and comes out on the north shore, a little to the eastward of the hauling-grounds of Starry Ateel, where it forks and unites with that path. The direct line between the village and Zapadnie, though nearly a mile shorter on the chart, is equal to 5 miles more of distance by reason of its superlative rocky inequalities.

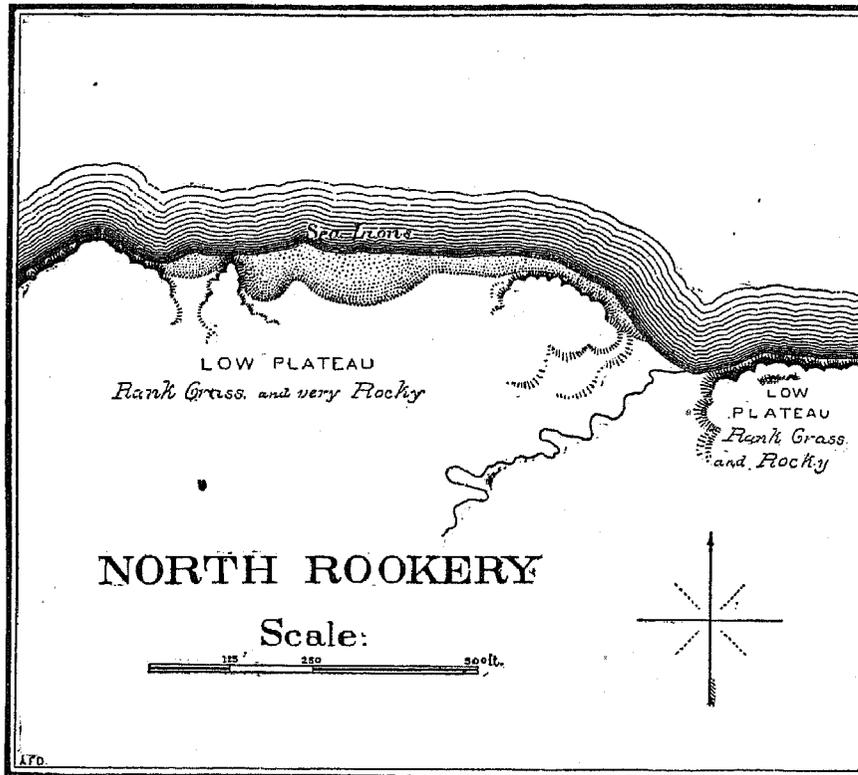
† "Starry Ateel" or "Old Settlement"; a few hundred yards to the eastward of the rookery, is the earthen ruins of one of the pioneer settlements in Pribylov's time, and which, the natives say, marks the first spot selected by the Russians for their village after the discovery of St. George, in 1786.

‡ I have been repeatedly astonished at the amazing power possessed by the fur-seal, of resistance to shocks which would certainly kill any other animal. To explain clearly, the reader will observe, by reference to the maps, that there are a great many cliffy places between the rookeries on the shore-lines of the islands. Some of these cliffs are more than 100 feet in abrupt elevation above the surf and rocks awash below. Frequently "holluschickie", in ones, or twos, or threes will stray far away back from the great masses of their kind, and fall asleep in the thick grass and herbage which covers these mural reaches. Sometimes they will lie down and rest very close to the edge, and then as you come tramping along you discover and startle them and yourself alike. They, blinded by their first transports of alarm, leap promptly over the brink, snorting, coughing, and spitting as they go. Curiously peering after them and looking down upon the rocks, 50 to 100 feet below, instead of seeing their stunned and motionless bodies, you will invariably catch sight of them rapidly scrambling into the water; and, when in it, swimming off like arrows from the bow. Three "holluschickie" were thus

eastward of this rookery, over which the "holluschickie" haul in proportionate numbers, and from which the natives make their drives, coming from the village for this purpose, and directing the seals back, in their tracks.* Starry Ateel has 500 feet of sea and cliff margin,

with 125 feet of average depth, making ground for 30,420 breeding-seals and their young.

NORTH ROOKERY.—Next in order, and half a mile to the eastward, is this breeding-ground, which sweeps for 2,750 feet along and around the sea-front of a gently sloping plateau;† being in full sight of and close to the village. It has a superficial area occupied by 77,000 breeding-seals and their young. From this rookery to the village, a distance of less than a quarter of a mile, the "holluschickie" are driven which are killed for their skins, on the common track or seal-worn trail, that, not only the "bachelors" but ourselves travel over *en route* to and from Starry Ateel and Zapadnie; it is a broad, hard-packed erosion through the sphagnum, and across the rocky plateaux—in fact a regular seal-road, which has been used by the drivers and victims during the last eighty or ninety years. The fashion on St. George, in this matter of driving seals, is quite different from that



on St. Paul. To get their maximum quota of 25,000 annually, it is necessary for the natives to visit every morning the hauling-grounds of each one of these four rookeries on the north shore, and bring what they may find back with them for the day.

inadvertently surprised by me on the edge of the west face to Otter island. They plunged over from an elevation, there, not less than 200 feet in sheer elevation, and I distinctly saw them fall in scrambling, whirling evolutions, down, thumping upon the rocky shingle beneath, from which they bounded, as they struck, like so many rubber balls. Two of them never moved after the rebound ceased, but the third one reached the water and swam away like a bird on the wing.

While they seem to escape without bodily injury incident to such hard falls as ensue from dropping 50 or 60 feet upon pebbly beaches and rough bowlders below, and even greater elevations, yet I am inclined to think that some internal injuries are necessarily sustained in most every case, which soon develop and cause death; the excitement and the vitality of the seal, at the moment of the terrific shock, is able to sustain and conceal the real injury for the time being.

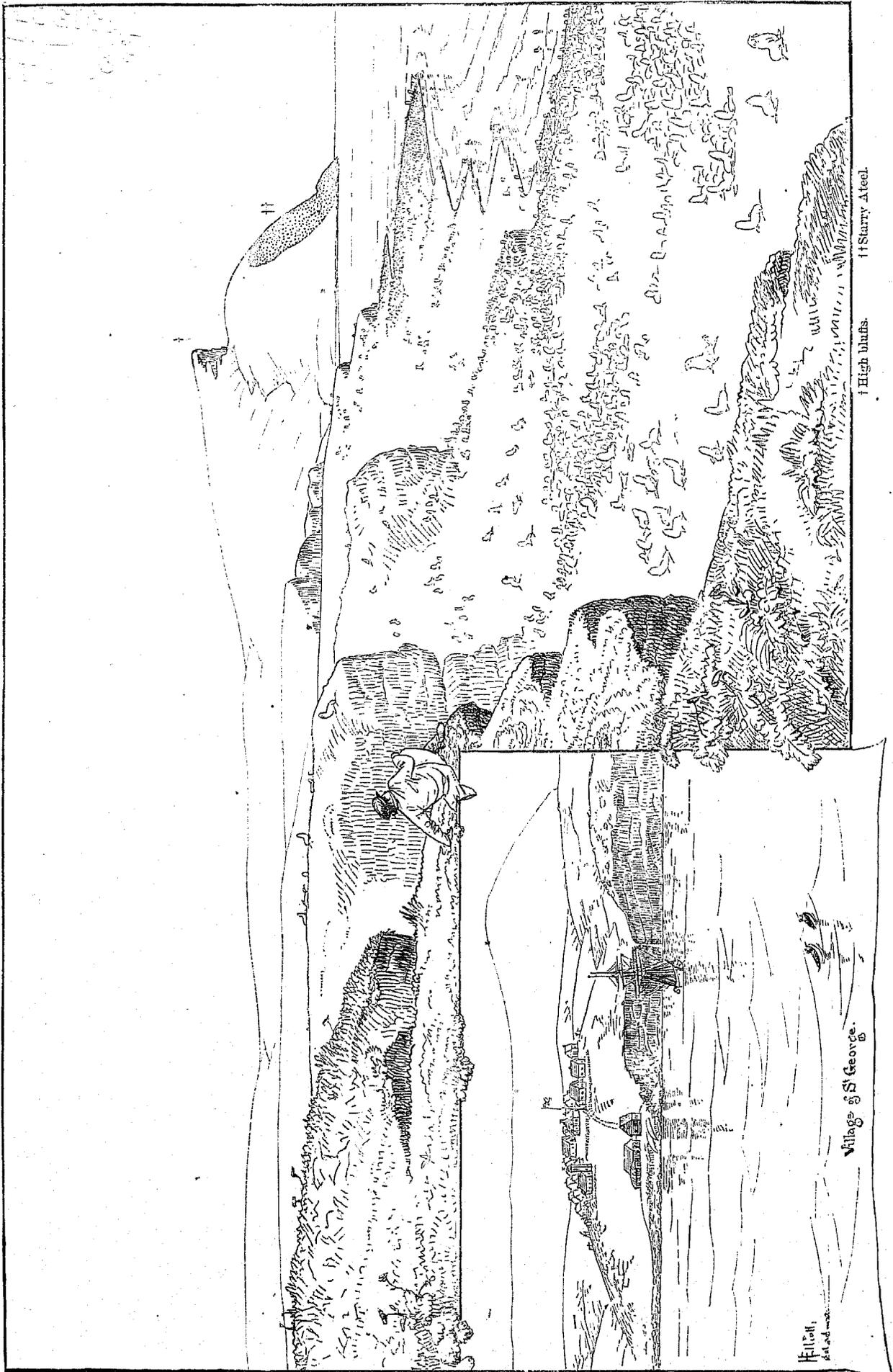
*Driving the "holluschickie" on St. George, owing to the relative scantiness of hauling area for those animals there, and consequent small numbers found upon these grounds at any one time, is a very arduous series of daily exercises on the part of the natives who attend to it. Glancing at the map, the marked considerable distance, over an exceedingly rough road, will be noticed between Zapadnie and the village; yet, in 1872, eleven different drives across the island, of 400 to 500 seals each, were made in the short four weeks of that season.

The following table shows plainly the striking inferiority of the seal-life, as to aggregate number, on this island, compared with that of St. Paul:

Rookeries of St. George.	Number of drives made in 1872.	Number of seals driven.
"Zapadnie" (between June 14 and July 28)	11	5,194
"Starry Ateel" (between June 6 and July 29)	14	5,274
"North Rookery" (between June 1 and July 27)	16	4,818
"Little Eastern"		
"Great Eastern" (between June 5 and July 28)	16	9,714

The same activity in "sweeping" the hauling-grounds of St. Paul would bring in ten times as many seals, and the labor be vastly less; the driving at St. Paul is generally done with an eye to securing each day of the season only as many as can be well killed and skinned on that day, according as it be warmish or cooler.

†I should say "a gently sloping and alternating bluff plateau"; 2,000 feet are directly under the abrupt faces of low cliffs, while the other 750 feet slope down gradually to the water's edge; these narrow cliff belts of breeding fur-seals might be properly styled "rookery ribbons".



H. Holt,
1884.

Village of St. George.

† High bluffs.

†† Starry Ateel.

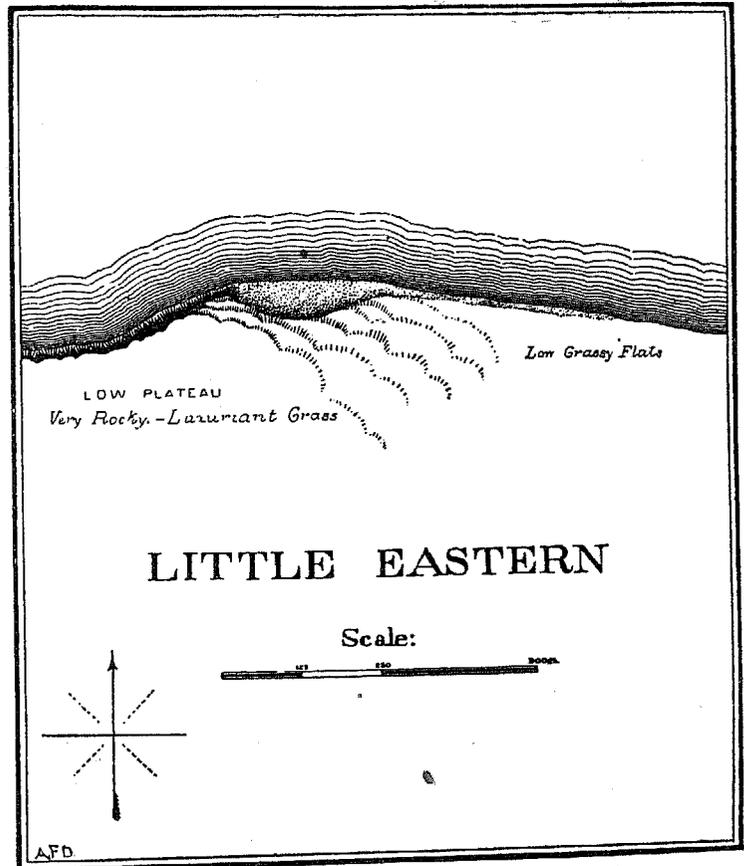
VIEW OF THE NORTH ROOKERY, LOOKING WEST TO STARRY ATEEL.

St. George Island, Pribilof Group.

LITTLE EASTERN ROOKERY.*—From the village to the eastward, about half a mile again, is a little eastern rookery, which lies on a low, bluff slope, and is not a piece of ground admitting of much more expansion. It has superficial area for the reception of nearly 13,000 breeding-seals and their young.

THE GREAT EASTERN.—This is the last rookery that we find on St. George. It is an imitation, in miniature, of Tolstoi on St. Paul, with the exception of there being no parade-ground in the rear, of any character whatever. It is from the summit of the cliffs, overlooking the narrow ribbon of breeding-seals right under them, that I have been able to study the movements of the fur-seal in the water to my heart's content; for out, and under the water, the rocks, to a considerable distance, are covered with a whitish algoid growth, that renders the dark bodies of the swimming seals and sea-lions as conspicuous as is the image thrown by a magic lantern of a silhouette on a screen prepared for its reception.† The low rocky flats around the pool to the westward and northwest of the rookery seem to be filled up with a muddy alluvial wash that the seals do not favor; hence nothing but "holluschickie" range round about them.

RECAPITULATION.—In recapitulation, therefore, the breeding-grounds on St. George island, according to the surveys which I made between the 12th and 15th of July, 1873, gave the following figures. They are also, as in the case of St. Paul, the first surveys ever made here:



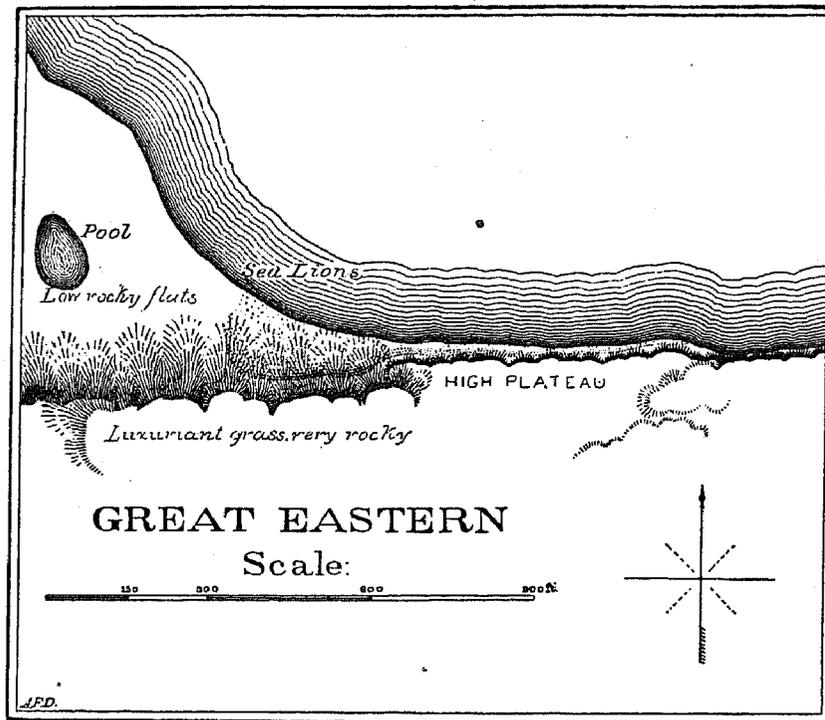
Name of breeding-grounds, July 12-15, 1873.	Seals: ♂ ♀ ⊙.
"Zapadnie rookery" has 600 feet of sea-margin, with 60 feet of average depth, making ground for	18,000
"Starry Ateel" rookery has 500 feet of sea-margin, with 125 feet of average depth, making ground for.....	30,420
"North rookery" has 750 feet of sea-margin, with 150 feet of average depth, and 2,000 feet of sea-margin, with 25 feet of average depth; making ground in all for.....	77,000
"Little Eastern" rookery has 750 feet of sea-margin, with 40 feet of average depth, making ground for.....	13,000
"Great Eastern" rookery has 900 feet of sea-margin, with 60 feet of average depth, making ground for.....	25,000
A grand total of the seal-life for St. George island, breeding-seals and young, of.....	163,420
Grand total for St. Paul island, brought forward, breeding-seals and young, of.....	3,030,000
Grand sum total for the Pribylov islands (season of 1873), breeding-seals and young.....	3,193,420

The figures above thus show a grand total of 3,193,420 breeding-seals and their young. This enormous aggregate is entirely exclusive of the great numbers of the non-breeding seals, that, as we have pointed out, are never permitted to come up on those grounds which have been surveyed and epitomized by the table just exhibited. That class of seals, the "holluschickie", in general terms, all males, and those to which the killing is confined, come up on the land and sea-beaches between the rookeries, in immense straggling droves, going to and from the sea at

* The site of this breeding-ground and that of the marine slope of the killing-grounds to the east of the village, on this island, is where sea-lions held exclusive possession prior to their driving off by the Russians—so the natives affirm—the only place on St. George now where the *Eumetopias* breeds, is that one indicated on the general chart, between Garden cove and Tolstoi Mees.

† The algoid vegetation of the marine shores of these islands is one that adds a peculiar charm and beauty to their treeless, sunless coasts. Every kelp bed that floats raft-like in Bering sea, or is anchored to its rocky reefs, is fairly alive with minute sea-shrimps, tiny crabs, and little shells which cling to its masses of interwoven fronds or dart in ceaseless motion through, yet within its interstices. It is my firm belief that no better base of operations can be found for studying marine invertebrata than is the post of St. Paul or St. George; the pelagic and the littoral forms are simply abundant beyond all estimation within bounds of reason. The phosphorescence of the waters of Bering sea surpasses, in continued strength of brilliant illumination, anything that I have seen in southern and equatorial oceans. The crests of the long unbroken line of breakers on Lukannon beach looked to me, one night in August, like an instantaneous flashing of lightning,

irregular intervals, from the beginning to the closing of the entire season. The method of the "holluschickie" on these hauling-grounds is not systematic—it is not distinct, like the manner and law prescribed and obeyed by the breeding-seals, which fill up those rookery-grounds to the certain points as surveyed, and keep these points intact for a week or ten days, at a time, during the height of every season in July and August; but, to the contrary, upon the hauling-grounds to-day, an immense drove of 100,000 will be seen before you at English bay, sweeping hither and surging thither over the polished surface which they have worn with their restless flippers, tracing and retracing their tireless marches; consequently the amount of ground occupied by the "holluschickie" is vastly in excess of what they would require did they conform to the same law of distribution observed by the breeding-seals; and this ground is therefore wholly untenable for any such definite basis and satisfactory conclusion as is that which I have surveyed on the rookeries. Hence, in giving an estimate of the aggregate number of "holluschickie" or non-breeding seals, on the Pribylov islands, embracing as it does all the males under six and seven years of age and



all the yearling females, it must, necessarily, be a simple opinion of mine founded upon nothing better than my individual judgment. This is my conclusion:

The non-breeding seals seem nearly equal in number to that of the adult breeding-seals; but without putting them down at a figure quite so high, I may safely say that the sum total of 1,500,000, in round numbers, is a fair enumeration, and quite within bounds of fact. This makes the grand sum total, of the fur-seal life on the Pribylov islands, over 4,700,000.

THE INCREASE OR DIMINUTION OF THE SEAL-LIFE, PAST, PRESENT, AND PROSPECTIVE.—One stereotyped question has been addressed to me universally by my friends since my return, first in 1873, from the seal-islands. The query is: "At the present rate of killing the seals, it will not be long ere they are exterminated; how much longer will they last?" My answer is now as it was then, "Provided matters are conducted on the seal-islands in the future as they are to-day, 100,000 male seals under the age of five years and over one, may be safely taken every year from the Pribylov islands, without the slightest injury to the regular birth-rates, or natural increase thereon; provided, also, that the fur-seals are not visited by any plague, or pests, or any abnormal cause for their destruction, which might be beyond the control of men; and to which, like any other great body of animal life, they must ever be subjected to the danger of."*

LOSS OF LIFE SUSTAINED BY THE YOUNG SEALS.—From my calculations, given above, it will be seen that 1,000,000 pups, or young seals, in round numbers, are born upon these islands of the Pribylov group every year; of this million, one-half are males. These 500,000 young males, before they leave the islands for sea, during October and November, and when they are between five and six months old, fat and hardy, have suffered but a trifling loss in numbers, say one per cent., while on and about the islands of their birth, surrounding which, and upon which, they have no enemies whatever to speak of; but, after they get well down to the Pacific, spread out over an immense area of watery highways in quest of piscatorial food, they form the most helpless of their kind to resist

between Tolsti Mees and Lukannon head, as the billows successively rolled in, and broke; the seals swimming under the water, here on St. George and beneath the Black Bluffs, streaked their rapid course like comets in the sky; and every time their dark heads popped above the surface of the sea, they were marked by a blaze of scintillant light.

*The thought of what a deadly epidemic would effect among these vast congregations of *Pinnepedia* was one that was constant in my mind when on the ground and among them. I have found in the *British Annals* (Fleming's), on page 17, an extract from the notes of Dr. Trail: "In 1833 I inquired for my old acquaintances, the seals of the Hole of Papa Westray, and was informed that about four years before they had totally deserted the island, and had only within the last few months begun to reappear. * * * About fifty years ago multitudes of their carcasses were cast ashore in every bay in the north of Scotland, Orkney, and Shetland, and numbers were found at sea in a sickly state." This note of Trail is the only record which I can find of a fatal epidemic among the seals; it is not reasonable to suppose that the Pribylov rookeries have never suffered from distempers in the past, or are not to, in the future, simply because no occasion seems to have arisen during the comparatively brief period of their human domination.

or elude the murderous teeth and carnivorous attacks of basking sharks* and killer-whales†. By these agencies, during their absence from the islands until their reappearance in the following year, and in July, they are so perceptibly diminished in number that I do not think, fairly considered, more than one-half of the legion which left the ground of their birth, last October, came up the next July to these favorite landing-places; that is, only 250,000 of them return out of the 500,000 born last year. The same statement, in every respect, applies to the going and the coming of the 500,000 female pups, which are identical in size, shape, and behavior.

As yearlings, however, these 250,000 survivors, of last year's birth, have become strong, lithe, and active swimmers; and, when they again leave the hauling-grounds as before, in the fall, they are fully as able as are the older class to take care of themselves; and when they reappear next year, at least 225,000 of them safely return in the second season after birth; from this on I believe that they live out their natural lives of fifteen to twenty years each; the death-rate now caused by the visitation of marine enemies affecting them, in the aggregate, but slightly. And again, the same will hold good touching the females, the average natural life of which, however, I take to be only nine or ten years each.

Out of these 225,000 young males, we are required to save only one-fifteenth of their number to pass over to the breeding-grounds, and meet there the 225,000 young females; in other words, the polygamous habit of this animal is such that, by its own volition, I do not think that more than one male annually out of fifteen born is needed on the breeding-grounds in the future; but in my calculations, to be within the margin and to make sure that I save two-year-old males enough every season, I will more than double this proportion, and set aside every fifth one of the young males in question; that will leave 180,000 seals, in good condition, that can be safely killed every year, without the slightest injury to the perpetuation of the stock itself forever in all its original integrity.†

In the above showing I have put the very extreme estimate upon the loss sustained at sea by the pup-seals too large, I am morally certain; but, in attempting to draw this line safely, I wish to place the matter in the very worst light in which it can be put, and to give the seals the full benefit of every doubt. Surely I have clearly presented the case, and certainly no one will question the premises after they have studied the habit and disposition of the rookeries; hence, it is a positive and tenable statement, that no danger of the slightest appreciable degree of injury to the interests of the government on the seal-islands of Alaska, exists as long as the present law protecting it, and the management executing it, continues.

COURSE PURSUED BY THE SEALS AFTER LEAVING THE ISLANDS.—These fur-seals of the Pribylov group, after leaving the islands in the autumn and early winter, do not visit land again until the time of their return in the following spring and early summer, to these same rookery- and hauling-grounds, unless they touch, as they are navigating their lengthened journey back, at the Russian Copper, and Bering islands, 700 miles to the westward of the Pribylov group. They leave the islands by independent squads, each one looking out for itself; apparently all turn by common consent to the south, disappearing toward the horizon, and are soon lost in the vast expanse below, where they spread themselves over the entire North Pacific as far south as the 48th and even the 47th parallels of north latitude. Over the immense area between Japan and Oregon, doubtless, many extensive submarine fishing-shoals and banks are known to them; at least, it is definitely understood that Bering sea does.

* *Somniosus microcephalus*. Some of these sharks are of very large size, and when caught by the Indians of the northwest coast, basking or asleep on the surface of the sea, they will, if transfixed by the native's harpoons, take a whole fleet of canoes in tow and run swiftly with them several hours before exhaustion enables the savages to finally dispatch them. A Hudson Bay trader, William Manson (at Ft. Alexander, in 1865), told me that his father had killed one in the smooth waters of Millbank sound, which measured 24 feet in length, and its liver alone yielded 36 gallons of oil. The *Somniosus* lays motionless for long intervals in calm waters of the North Pacific, just under and at the surface, with its dorsal fin clearly exposed above; what havoc such a carnivorous fish would be likely to effect in a "pod" of young fur-seals, can be better imagined than described.

† *Orca gladiator*. While revolving this particular line of inquiry in my mind when, on the ground and among the seals, I involuntarily looked constantly for some sign of disturbance in the sea which would indicate the presence of an enemy; and, save seeing a few examples of the *Orca*, I never detected anything; if the killer-whale was common here, it would be patent to the most casual eye, because it is the habit of this ferocious cetacean to swim so closely at the surface as to show its peculiar sharp, dorsal fin high above the water; possibly a very superficial observer could and would confound the long, trenchant fluke of the *Orca* with the stubby node upon the spine of the humpback whale, which that animal exhibits only when it is about to dive. Humpbacks feed around the islands, but not commonly—they are the exception; they do not, however, molest the seals in any manner whatever; and little squads of these pinnipeds seem to delight themselves by swimming in endless circles around and under the huge bodies of those whales, frequently leaping out and entirely over the cetacean's back, as witnessed on one occasion by myself and the crew of the "Reliance", off the coast of Kadiak, June, 1874.

‡ When regarding the subject in 1872-73, of how many surplus young males could be wisely taken from the Pribylov stock, I satisfied myself that more than 100,000 could be drawn upon annually for their skins, and hence was impressed with the idea that the business might be safely developed to a greater maximum; since then, however, I have been giving attention to the other side of the question, which involves the market for the skins and the practical working of any sliding scale of increased killing, such as I then recommended. A careful review of the whole matter modifies my original idea and causes me to think that, all things considered, it is better to "let well enough alone". Although it would be a most interesting commercial experiment to develop the yield of the Pribylov islands to their full capacity, yet, in view of the anomalous and curious features of the case, it is wiser to be satisfied with the assured guarantee of perpetuation in all original integrity, which the experience of the last ten years gives us on the present basis of 100,000, than to risk it by possibly doubling the revenue therefrom. Therefore, I am not now in favor of my earlier proposition of gradually increasing the killing, until the maximum number of surplus "hollaschickie" should be ascertained.

not contain them long when they depart from the breeding-rookeries and the hauling-grounds therein. While it is carried in mind that they sleep and rest in the water with soundness and with the greatest comfort on its surface, and that even when around the land, during the summer, they frequently put off from the beaches to take a bath and a quiet snooze just beyond the surf, we can readily agree that it is no inconvenience whatever, when the reproductive functions have been discharged, and their coats renewed, for them to stay the balance of the time in their most congenial element—the briny deep.

NATURAL ENEMIES OF THE FUR-SEALS.—That these animals are preyed upon extensively by killer-whales (*Orca gladiator*), in especial, and by sharks, and probably other submarine foes now unknown, is at once evident; for, were they not held in check by some such cause, they would, as they exist to-day on St. Paul, quickly multiply, by arithmetical progression, to so great an extent that the island, nay, Bering sea itself, could not contain them. The present annual killing of 100,000 out of a yearly total of over a million males does not, in an appreciable degree, diminish the seal-life, or interfere in the slightest with its regular, sure perpetuation on the breeding-grounds every year. We may, therefore, properly look upon this aggregate of four and five millions of fur-seals, as we see them every season on these Pribylov islands, as the maximum limit of increase assigned to them by natural law. The great equilibrium, which nature holds in life upon this earth, must be sustained at St. Paul as well as elsewhere.

FOOD CONSUMED BY THE FUR-SEALS.—Think of the enormous food-consumption of these rookeries and hauling-grounds; what an immense quantity of finny prey must pass down their voracious throats as every year rolls by. A creature so full of life, strung with nerves, muscles like bands of steel, cannot live on air, or absorb it from the sea. Their food is fish, to the practical exclusion of all other diet. I have never seen them touch, or disturb with the intention of touching it, one solitary example in the flocks of water-fowl which rest upon the surface of the water all about the islands. I was especially careful in noting this, because it seemed to me that the canine armature of their mouths must suggest flesh for food at times as well as fish; but fish we know they eat. Whole windrows of the heads of cod and wolf fishes,* bitten off by these animals at the nape, were washed up on the south shore of St. George during a gale in the summer of 1873; this pelagic decapitation evidently marked the progress and the appetite of a band of fur-seals to the windward of the island, as they passed into and through a stray school of these fishes.

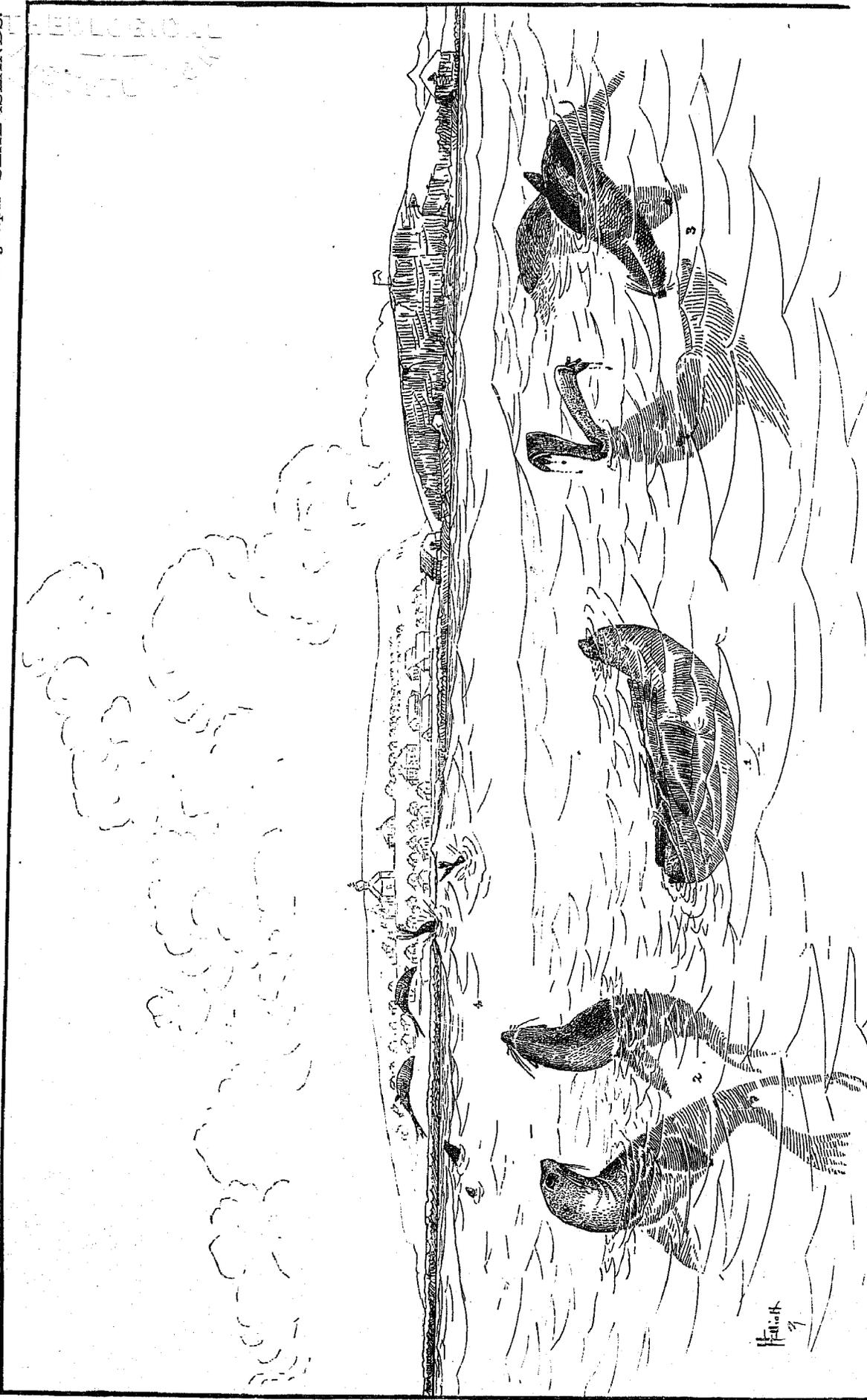
How many pounds per diem is required by an adult seal, and taken by it when feeding, is not certain in my mind. Judging from the appetite, however, of kindred animals, such as sea-lions fed in confinement at Woodward's gardens, San Francisco, I can safely say that forty pounds for a full-grown fur-seal is a fair allowance, with at least ten or twelve pounds per diem to every adult female, and not much less, if any, to the rapidly growing pups and young "holluschickie". Therefore, this great body of four and five millions of hearty, active animals which we know on the seal-islands, must consume an enormous amount of such food every year. They cannot average less than ten pounds of fish each per diem, which gives the consumption, as exhibited by their appetite, of over six million tons of fish every year. What wonder, then, that nature should do something to hold these active fishermen in check.†

* *Anarrhichas* sp.

† I feel confident that I have placed this average of fish eaten per diem by each seal at a starvation allowance, or, in other words, it is a certain minimum of the whole consumption. If the seals can get double the quantity which I credit them with above, startling as it seems, still I firmly believe that they eat it every year. An adequate realization by ichthyologists and fishermen as to what havoc the fur-seal hosts are annually making among the cod, herring, and salmon of the northwest coast and Alaska, would disconcert and astonish them. Happily for the peace of political economists who may turn their attention to the settlement and growth of the Pacific coast of America, it bids fair to never be known with anything like precision. The fishing of man, both aboriginal and civilized, in the past, present, and prospective, has never been, is not, nor will it be, more than a drop in the bucket contrasted with the piscatorial labors of these ichthyophagi in those waters adjacent to their birth. What catholic knowledge of fish and fishing banks any one of those old "seecatchie" must possess, which we observe hauled out on the Pribylov rookeries each summer. It has, undoubtedly, during the eighteen or twenty years of its life, explored every fish eddy, bank, or shoal throughout the whole of that vast immensity of the North Pacific and Bering sea. It has had more piscine sport in a single twelve month than Izaak Walton had in his whole life.

An old sea-captain, Dampier, cruising around the world just about 200 years ago, wrote diligently thereof (or, rather, one Funnel is said to have written for him), and wrote well. He had frequent reference to meeting hair-seals and sea-lions, fur-seals, etc., and fell into repeating this maxim, evidently of his own making: "For wherever there be plenty of fysh, there be seals." I am sure that, unless a vast abundance of good fishing-ground was near by, no such congregation of seal-life as is that under discussion on the seal-islands, could exist. The whole eastern half of Bering sea, in its entirety, is a single fish-spawning bank, nowhere deeper than 50 to 75 fathoms, averaging, perhaps, 40; also, there are great reaches of fishing-shoals up and down the northwest coast, from and above the straits of Fuca, bordering the entire southern, or Pacific, coast of the Aleutian islands. The aggregate of cod, herring, and salmon which the seals find upon these vast ichthyological areas of reproduction, must be simply enormous, and fully equal to the most extravagant demand of the voracious appetites of *Callorhini*.

When, however, the fish retire from spawning here, there, and everywhere over these shallows of Alaska and the northwest coast, along by the end of September to 1st of November, every year, I believe that the young fur-seal, in following them into the depths of the great Pacific, must have a really arduous struggle for existence—unless it knows of fishing banks unknown to us. The yearlings, however, and all above that age, are endowed with sufficient muscular energy to dive rapidly in deep soundings, and to fish with undoubted success. The pup, however, when it goes to sea, five or six months old, is not lithe and sinewy like the yearling; it is podgy and fat, a comparative clumsy swimmer, and does not develop, I believe, into a good fisherman until it has become pretty well starved after leaving the Pribylovs.



PELAGIC ATTITUDES OF THE FUR-SEAL.

1. Position when sleeping. 2. Position in rising to breathe, survey, etc. 3. Positions in scratching, etc. 4. "Dolphin jumps."

The village of St. Paul in the distance, and the Black Bluffs to the right on the middle ground.

PELAGIC RANGE OF FUR-SEALS FOR FOOD.—During the winter solstice—between the lapse of the autumnal, and the verging of the vernal equinoxes—in order to get this enormous food supply, the fur-seals are necessarily obliged to disperse over a very large area of fishing ground, ranging throughout the North Pacific, 5,000 miles across between Japan and the straits of Fuca. In feeding, they are brought to the southward all this time; and, as they go, they come more and more in contact with those natural enemies peculiar to the sea of these southern latitudes, which are almost strangers and are really unknown to the waters of Bering sea; for I did not observe, with the exception of ten or twelve perhaps, certainly no more, killer-whales,* a single marine disturbance, or molestation, during the three seasons which I passed upon the islands, that could be regarded in the slightest degree inimical to the peace and life of the *Pinnipedia*; and thus, from my observation, I am led to believe that it is not until they descend well to the south of the Aleutian islands, and in the North Pacific, that they meet with sharks to any extent, and are diminished by the butchery of killer-whales.†

The young fur-seals going out to sea for the first time, and following in the wake of their elders, are the clumsy members of the family. When they go to sleep on the surface of the water, they rest much sounder than the others; and their alert and wary nature, which is handsomely developed ere they are two seasons old, is in its infancy. Hence, I believe that vast numbers of them are easily captured by marine foes, as they are stupidly sleeping, or awkwardly fishing.

BEHAVIOR OF FUR-SEALS IN THE WATERS AROUND THE ISLANDS.—In this connection I wish to record an impression very strongly made upon my mind, in regard to their diverse behavior when out at sea, away from the islands, and when congregated thereon. As I have plainly exhibited in the foregoing chapter, they are practically without fear of man when he visits them on the land of their birth and recreation; but the same seal that noticed you with quiet indifference at St. Paul, in June and July, and the rest of the season while he was there, or gambled around your boat when you rowed from the ship to shore, as a dog will play about your horses when you drive from the gate to the house, that same seal, when you meet him in one of the passes of the Aleutian chain, 100 or 200 miles away from here, as the case may be, or to the southward of that archipelago, is the shiest and wariest creature your ingenuity can define. Happy are you in getting but a single glimpse of him, first; you will never see him after, until he hauls out, and winks and blinks across Lukannon sands.‡

But the companionship and the exceeding number of the seals, when assembled together annually, makes them bold; largely due, perhaps, to their fine instinctive understanding, dating, probably, back many years, seeming to know that man, after all, is not wantonly destroying them; and what he takes, he only takes from the ravenous maw of the killer-whale or the saw-tipped teeth of the Japan shark. As they sleep in the water, off the straits of Fuca, and the northwest coast as far as Dixon's sound, the Indians, belonging to that region, surprise them with spears and rifle, capturing quite a number every year, chiefly pups and yearlings.

I must not be understood as saying that fish alone constitute the diet of the Pribylov pinnipeds; I know that they feed, to a limited extent, upon crustaceans and upon the squid (*Loligo*), also, eating tender algoid sprouts; I believe that the pup-seals live for the first five or six months at sea largely, if not wholly, upon crustaceans and squids; they are not agile enough, in my opinion, to fish successfully in any great degree, when they first depart from the rookeries.

* But I did observe a very striking exhibition, however, of this character one afternoon while looking over Lukannon bay. I saw a "killer" chasing the alert "holluschickie" out beyond the breakers, when suddenly, in an instant, the cruel cetacean was turned toward the beach in hot pursuit, and in less time than this is read the ugly brute was high and dry upon the sands. The natives were called, and a great feast was in prospect when I left the carcass.

But this was the only instance of the orca in pursuit of seals that came directly under my observation; hence, though it does undoubtedly capture a few here every year, yet it is an insignificant cause of destruction, on account of its rarity.

† In the stomach of one of these animals, year before last, 14 small harp-seals were found.—*Michael Carroll's Report of Seal and Herring Fisheries of Newfoundland.*

‡ When fur-seals were noticed, by myself, far away from these islands, at sea, I observed that then they were as shy and as wary as the most timorous animal which, in dreading man's proximity, could be—sinking instantly on apprehending the approach or presence of the ship, seldom to reappear to my gaze. But, when gathered in such immense numbers at the Pribylov islands, they are suddenly metamorphosed into creatures wholly indifferent to my person. It must cause a very curious sentiment in the mind of him who comes for the first time, during the summer season, to the island of St. Paul; where, when the landing boat or lighter carries him ashore from the vessel, the whole short marine journey is enlivened by the gambols and aquatic evolutions of fur-seal convoys to the "bidarral," which sport joyously and fearlessly round and round his craft, as she is rowed lustily ahead by the natives; the fur-seals, then, of all classes, "holluschickie" principally, pop their dark heads up out of the sea, rising neck and shoulders erect above the surface, to peer and ogle at him and at his boat, diving quickly to reappear just ahead or right behind, hardly beyond striking distance from the oars; these gymnastics of *Callorhinus* are not wholly performed thus in silence, for it usually snorts and chuckles with hearty reiteration.

The sea-lions up here also manifest much the same marine interest, and gives the voyager an exhibition quite similar to the one which I have just spoken of, when a small boat is rowed in the neighborhood of its shore rookery; it is not, however, so bold, confident, and social as the fur-seal under the circumstances, and utters only a short, stifled growl of surprise, perhaps; its mobility, however, of vocalization is sadly deficient when compared with the scope and compass of its valuable relative's polyglottis.

The hair-seals (*Phoca vitulina*) around these islands never approached our boats in this manner, and I seldom caught more than a furtive glimpse of their short, bull-dog heads when traversing the coast by water.

The walrus (*Rosmarus obesus*) also, like *Phoca vitulina*, gave undoubted evidence of sore alarm over the presence of my boat and crew anywhere near its proximity in similar situations, only showing itself once or twice, perhaps, at a safe distance by elevating nothing but the extreme tip of its muzzle and its bleared, popping eyes above the water; it uttered no sound except a dull, muffled grunt, or else a choking, gurgling bellow.

ENCYSTED BULLETS, ARROWS, ETC., IN FUR-SEALS.—On the killing-grounds at St. George, in June, 1873, the natives would frequently call my attention to seals that they were skinning, in the hides of which buckshot were embedded and encysted just under the skin, in the blubber. From one animal I picked out fifteen shot, and the holes which they must have made in the skin were so entirely healed over as not to leave the faintest trace of a scar. These buckshot were undoubtedly received from the natives of the northwest coast, anywhere between the straits of Fuca and the Aleutian islands. The number taken by these hunters on the high seas is, however, inconsiderable; the annual average, perhaps, of 5,000 skins is a fair figure—some seasons more, some seasons less. The natives also have found on the killing-grounds, in the manner just indicated, specimens of the implements employed by the Aleuts to the southward, such as tips of birds' spears and bone lances, comfortably encysted in the blubber under the skin; but only very small fragments are found, because I believe any larger pieces would create suppuration and slough out of the wounds.*

INCREASE OF THE SEAL-LIFE.—I am free to say that it is not within the power of human management to promote this end to the slightest appreciable degree over its present extent and condition as it stands in the state of nature, heretofore described. It cannot fail to be evident, from my detailed narration of the habits and life of the fur-seal on these islands during so large a part of every year, that could man have the same supervision and control over this animal during the whole season which he has at his command while they visit the land, he might cause them to multiply and increase, as he would so many cattle, to an indefinite number—only limited by time and the means of feeding them. But the case in question, unfortunately, is one where the fur-seal is taken, by demands for food, at least six months out of every year, far beyond the reach or even cognizance of any man, where it is all this time exposed to many known powerful and destructive natural enemies, and probably many others, equally so, unknown, which prey upon it, and, in accordance with that well-recognized law of nature, keeps this seal-life at a certain number—at a figure which has been reached, for ages past, and will continue to be in the future, as far as they now are—their present maximum limit of increase, namely, between four and five million seals, in round numbers. This law holds good everywhere throughout the animal kingdom, regulating and preserving the equilibrium of life in the state of nature; did it not hold good, these seal-islands and all Bering sea would have been literally covered, and have swarmed like the *Medusæ* of the waters, long before the Russians discovered them. But, according to the silent testimony of the rookeries, which have been abandoned by the seals, and the noisy, emphatic assurance of those now occupied, there were no more seals when first seen here by human eyes in 1786 and 1787, than there are now in 1881, as far as all evidence goes.

* Touching this matter of the approximate numbers of fur-seals which are annually slain in the open sea, straits, and estuaries of Bering and the North Pacific oceans, I have, necessarily, no definite data upon which to base a calculation; but such as I have, points to the capture every year of 1,000 to 1,400 young fur-seals in the waters of Oomnak pass, and as many in the straits adjoining Borka village, by the resident Aleuts; these are the only two points throughout the entire Aleutian chain and the peninsula where any *Callorhinus* is taken by the natives, except an odd example now and then elsewhere. On the northwest coast, between San Francisco and Prince William sound, the fur-seal is only apprehended, to any extent, at two points, viz, off the straits of Fuca, ten to twenty miles at sea, sweeping over a series of large fishing shoals which are located there, and in that reach of water between Queen Charlotte island and the mouth of Dixon sound. Several small schooners, with native crews, and the Indians, themselves, in their own canoes, cruise for them here during May and June of each year. How many they secure every season is merely a matter of estimation, and therefore not a subject of definite announcement. In my judgment, after carefully investigating the question at Victoria and Port Townsend in 1874, I believe, as an average, that these pelagic fur-sealers do not, altogether, secure 5,000 animals annually.

Those seals killed by the Aleuts of Makushin and Borka settlements, above referred to, are all pups, and are used at home—home exported for trade.

The last record which I can find of fur-seals being taken on land other than that of the Pribylov group of the American side, is the following brief table of Techmainov, who, in 1863, published (in 2 volumes) a long recapitulation of the Russian-American Company's labors in Alaska as illustrated by a voluminous series of personal letters by the several agents of that company. Techmainov says that these fur-seals were taken on the Farralones, which are small islets just abreast of the entrance to the Golden Gate, California.

Taken on the Farralones, California coast.....	1824.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Fur-seals.....	1,050	455	200	210	287	205	118	54

This period of 1824–1834 was the one passed by the Russians in their occupation of Ross or Bodega, California, where a colony was engaged in raising cereals and beef, for the stations in Alaska. I am inclined to think, however, that very likely many of the specimens of *Callorhinus* counted in this table were shot or speared, as they now are, out at sea off the straits of Fuca. The number is insignificant, but the pelts were not very valuable in those days, and probably very slight exertions were made to get them; or, otherwise, 3,000 or 5,000 annually could have been secured at sea then, as they are to-day, by our people and the Indians of Cape Flattery.

The record, however, of killing fur-seals on the Farralones, between 1806 and 1837, by the Russians, who were established then at Bodega, California, is an honest one. I do not find any mention made of the fact that they bred there, and I am inclined to think they did not. I believe that when small squads of *Callorhinus ursinus* hauled out on the Californian islets, they did so lured by the large numbers of breeding *Zalophus*, and the *Eumetopias* which repaired there then, as they do now, for that purpose. Had the sea-lions not been there, in the manner aforesaid, the presence of fur-seals on North American land, elsewhere than on that of the Pribylov group, would not have been thus determined and established.

Again, in this connection, and corroborative, is the fact that in 1878 a few hundred fur-seals were taken by sea-lion hunters among the *Zalophus* at Santa Barbara and Guadalupe islands, southern Californian coast. I am assured of this fact by the evidence of the gentleman who himself purchased the skins from the lucky hunters. None had ever been seen there before, by our people, and none have been taken since. The Russian archives give no testimony on this score.



FUR-SEALS SPORTING AROUND THE BAIDAR.

Natives of St. Paul lightering off the bundled seal-skins to the ship from the Village Cove.

View looking east over Zoltoi Bay on to "Gorbatch" of the Great Reef Rookery.

SITES OF ABANDONED ROOKERIES.—With reference to the amount of ground covered by the seals, when first discovered by the Russians, I have examined every foot of the shore line of both islands where the bones, and polished rocks, etc., might be lying on any deserted areas. Since then, after carefully surveying the new ground now occupied by the seals, and comparing this area with that which they have deserted, I feel justified in stating that for the last twelve or fifteen years, at least, the fur-seals on these islands have not diminished, nor have they increased as a body to any noteworthy degree; and throughout this time the breeding-grounds have not been disturbed except at that brief but tumultuous interregnum during 1868; and they have been living since in a perfectly quiet and natural condition.

CAN THE NUMBER BE INCREASED?—What can be done to promote their increase? We cannot cause a greater number of females to be born every year than are born now; we do not touch or disturb these females as they grow up and live; and we never will, if the law and present management is continued. We save double—we save more than enough males to serve; nothing more can be done by human agency; it is beyond our power to protect them from their deadly marine enemies as they wander into the boundless ocean searching for food.

In view, therefore, of all these facts, I have no hesitation in saying, quite confidently, that under the present rules and regulations governing the sealing interests on these islands, the increase or diminution of the seal-life thereon will amount to nothing in the future; that the seals will exist, as they do exist, in all time to come at about the same number and condition recorded in this monograph. To test this theory of mine, I here, in the record of my surveys of the rookeries, have put stakes down which will answer, upon those breeding-grounds, as a correct guide as to their present, as well as to their future, condition, from year to year.

SURVEYING THE CONDITION OF THE ROOKERIES.—During the first week of inspection of some of those earliest arrivals, the "seecatchie", which I have described, will frequently take to the water when approached; but these runaways quickly return. By the end of May, however, the same seals will hardly move to the right or left when you attempt to pass through them. Then, two weeks before the females begin to come in, and quickly after their arrival, the organization of the fur-seal rookery is rendered entirely indifferent to man's presence on visits of quiet inspection, or to anything else, save their own kind, and so continues during the rest of the season.

INDIFFERENCE OF FUR-SEALS TO CARRION SMELLS, BLOOD, ETC.—I have called attention to the singular fact, that the breeding-seals upon the rookeries and hauling-grounds are not affected by the smell of blood or carrion arising from the killing-fields, or the stench of blubber fires which burn in the native villages. This trait is conclusively illustrated by the attitude of those two rookeries near the village of St. Paul; for the breeding-ground on this spit, at the head of the lagoon, is not more than forty yards from the great killing-grounds to the eastward; being separated from those spots of slaughter, and the seventy or eighty thousand rotting carcasses thereon, by a slough not more than ten yards wide. These seals can smell the blood and carcasses, upon this field, from the time they land in the spring until they leave in the autumn; while the general southerly winds waft to them the odor and sounds of the village of St. Paul, not over 200 rods south of them, and above them, in plain sight. All this has no effect upon the seals—they know that they are not disturbed—and the rookery, the natives declare, has been slightly but steadily increasing. Therefore, with regard to surveying and taking those boundaries assumed by the breeding-seals every year, at that point of high tide, and greatest expansion, which they assume between the 8th and 15th of July, it is an entirely practicable and simple task. You can go everywhere on the skirts of the rookeries almost within reaching distance, and they will greet you with quiet, inoffensive notice, and permit close, unbroken observation, when it is subdued and undemonstrative, paying very little attention to your approach.

YEARLY CHANGES IN THE ROOKERIES.—I believe the agents of the government there, are going to notice, every year, little changes here and there in the area and distribution of the rookeries; for instance, one of these breeding-grounds will not be quite as large this year as it was last, while another one, opposite, will be found somewhat larger and expanded over the record which it made last season. In 1874, it was my pleasure and my profit to re-traverse all these rookeries of St. George and St. Paul, with my field notes of 1872 in my hand, making careful comparisons of their relative size as recorded then, and now. To show this peculiarity of enlarging a little here, and diminishing a little there, so characteristic of the breeding-grounds, I reproduce the following memoranda of 1874:

NORTHEAST POINT, July 18, 1874.

CONTRAST ON ST. PAUL BETWEEN 1872 AND 1874.—Quite a strip of ground near Webster's house has been deserted this season; but a small expansion is observed on Hutchinson's hill. The rest of the ground is as mapped in 1872, with no noteworthy increase in any direction. The condition of the animals and their young, excellent; small irregularities in the massing of the families, due to the heavy rain this morning; sea-lions about the same; none, however, on the west shore of the point.

The aggregate of life on this great rookery is, therefore, about the same as in 1872; the "holluschickie", or killable seals, hauling as well and as numerous as before. The proportions of the different ages among them of two, three, and four-year-olds, pretty well represented.

POLAVINA, July 18, 1874.

Stands as it did in 1872; breeding- and hauling-grounds in excellent condition; the latter, on Polavina, are changing from the uplands down upon Polavina sand beach, trending for three miles toward northeast point. The numbers of the "holluschickie" on this ground of Polavina, where they have not been disturbed for some five years, to mention, in the way of taking, do not seem to be any greater than they are on the hauling-grounds adjacent to Northeast point and the village, from which they are driven almost every day.

during this season of killing. I notice also this remarkable characteristic of the "holluschickie"; no matter how cleanly the natives may drive the seals off of a given piece of hauling-ground this morning, if the weather is favorable, to-morrow will see it covered again just as thickly; and, thus they drive in this manner from Zoltoi sands almost every day during the killing-season, generally finding on the succeeding morning more, or as many, seals as they drove off the previous dawn. This seems to indicate that the "holluschickie" recognize no particular point as favored over another at the island when they land, which is evidently in obedience to a general desire of coming ashore at such a suitable place as promises no crowding and no fighting.

Not materially changed in any respect from its condition at this time in 1872.

LUKANNON AND KETAVIE, July 19, 1874.

Just the same. Condition excellent.

GORBOTCH, July 19, 1874.

A slight contraction on the south sea-margin of this ground; compensated for by fresh expansion under the bluffs on the northwest side; not noteworthy in either instance. Condition excellent.

REBEF, July 19, 1874.

A diminution of one-half at least. Very few here this year. It is no place for a rookery; not a pistol-shot from the natives' houses, and all the natives' children fooling over the bluffs.

NAH SPIEL, July 20, 1874.

No noteworthy change; if any, a trifling increase. Condition good. Animals clean and lively.

LAGOON, July 20, 1874.

No perceptible change in this rookery from its good shape of 1872. The condition excellent.

TOLSTOI, July 21, 1874.

A remarkable extension or increase I note here, of 2,000 feet of shore line, with an average depth of 50 feet of breeding-ground, which has been built on to Upper Zapadnie, stretching out toward Tolstoi; the upper rookery proper has not altered its bearings or proportions; the sand beach belt between it and Lower Zapadnie is not occupied by breeding-seals; and a fair track for the "holluschickie", 500 feet wide, left clear, over which they have traveled quite extensively this season, some 20,000 to 25,000 of them, at least, lying out around the old salt-house to-day. Lower Zapadnie has lost in a noteworthy degree about an average of 20 feet of its general depth, which, however, is more than compensated for by the swarming on the upper rookery. A small beginning had been made for a rookery on the shore just southwest from Zapadnie lake, in 1872, but this year it has been substantially abandoned.

ZAPADNIE, July 22, 1874.

CONTRAST ON ST. GEORGE BETWEEN 1873 AND 1874.—An epitomé of my notes for St. George, gives, as to this season of 1874, the following data for comparison with that of 1873:

This rookery shows a slight increase upon the figures of last year, about 5,000. Fine condition.

ZAPADNIE, July 8, 1874.

No noteworthy change from last year.

STARRY ATHEL, July 6, 1874.

No essential change from last year. Condition very good.

NORTH ROOKERY, July 6, 1874.

A slight diminution of some 2,000 or so. Condition excellent.

LITTLE EASTERN, July 6, 1874.

A small increase over last year of about 3,000, only trifling, however; the aggregate seal-life here similar to that of last season, with the certainty of at least a small increase. The unusually early season, this year, brought the rookery "seeatchie" on the ground very much in advance of the general time; they landed as early as the 10th of April, while the arrival of the cows was as late as usual, corresponding to my observations during the past seasons.

EASTERN ROOKERY, July 7, 1874.

The general condition of the animals of all classes on St. George is most excellent—they are sleek, fat, and free from any disease.

In this way it is plain that, practically, the exact condition of these animals can be noted every season; and, should a diminution be observed, due to any cause, known or unknown, the killing can be promptly regulated, or stopped, to any required quota.

Ten years have passed, with the end of last season, in which nearly 100,000 young males have been annually taken on St. Paul and St. George; 75,000 from the former, and 25,000 from the latter, as a rule; and we now have the experience with which to enlighten our understanding, and to make our statement correct. That affirmation is, that if the effect of annually killing 100,000 young male seals is either to increase or to diminish the seal-life on the Pribylov islands, it cannot be noticed; it has not to a certainty wrought injury, and it has not promoted an increase. I advanced this hypothesis in 1873; and I now find it completely verified and confirmed by the united, intelligent testimony of those who have followed on the ground in my footsteps.

PECUNIARY VALUE OF THE SEAL-LIFE ON THE PRIBYLOV ISLANDS.—The theoretical value of these interests of the government on the Pribylov islands, represented by 2,500,000 to 3,000,000 fur-seals, male and female, in good condition, is not less than \$10,000,000 or \$12,000,000; taking, however, the females out of the question, and from this calculation, and looking at the "holluschickie" alone, as they really represent the only killable seals, then the commercial value of the same would be expressed by the sum of \$1,800,000 to \$2,000,000; this is a permanent principal invested here, which now nets the public treasury more than 15 per cent. annually; a very handsome rate of interest, surely.

STRANGE IGNORANCE OF THEIR VALUE IN 1867.—Considering that this return is the only one made to the government by Alaska, since its transfer, and that it was never taken into account, at first, by the most ardent

advocates of the purchase of Russian-America, it is in itself highly creditable and interesting; to Senator Sumner the friends of the acquisition of this territory in 1867, delegated the task of making the principal argument in its favor. Everything that was written in strange tongues was carefully translated for the choice bits of mention which could be found of Alaska's value. Hence his speech* on the subject possesses this interest: it is the embodiment of everything that could be scraped together, having the faintest shadow of authenticity, by all of the eager friends of the purchase, which gave the least idea of any valuable natural resources in Alaska; therefore, when, in summing all this up, he makes no reference whatever to the seal-islands, or the fur-seal itself, the extraordinary ignorance at home and abroad relative to the Pribylov islands can be well appreciated.

THOUGHTS UPON THE POSSIBLE MOVEMENTS OF THE FUR-SEALS IN THE FUTURE.—As these animals live and breed upon the Pribylov islands, the foregoing studies of their habit declare certain natural conditions of landing-ground and climate to be necessary for their existence and perpetuation. From my surveys made upon the islands to the north, St. Matthew and St. Lawrence, together with the scientific and corroborating testimony of those who have visited all of the mainland coast of Alaska, and the islands contiguous, including the peninsula and the great Aleutian archipelago, I have no hesitation in stating that the fur-seal cannot breed, or rest for that matter, on any other land than that now resorted to, which lies within our boundary lines; the natural obstacles are insuperable. Therefore, so far as our possessions extend, we have, in the Pribylov group, the only eligible land to which the fur-seal can repair for breeding; and on which, at St. Paul island alone, there is still room enough of unoccupied rookery-ground for the accommodation of twice as many seals as we find there to-day. But we must not forget a very important prospect; for, we know that to the westward, only 700 miles, and within the jurisdiction of Russia, are two other seal-islands—one very large, on which the fur-seal regularly breeds also; and though from the meager testimony in my possession, compared with St. Paul, the fur-seal life upon them is small, still, if that land within the pale of the czar's dominion be as suitable for the reception of the rookeries as is that of St. Paul, then what guarantee have we that the seal-life on Copper and Bering islands, at some future time, may not be greatly augmented by a corresponding diminution of our own, with no other than natural causes operating? Certainly, if the ground on either Bering or Copper island, in the Commander group, is as well suited for the wants of the breeding fur-seal as is that exhibited by the Pribylov islands, then I say confidently that we may at any time note a diminution here and find a corresponding augmentation there; for I have clearly shown, in my chapter on the habits of these animals, that they are not so particularly attached to the respective places of their birth, but that they rather land with an instinctive appreciation of the fitness of that ground as a whole.

NEED OF MORE DEFINITE KNOWLEDGE CONCERNING THE RUSSIAN SEAL-ISLANDS.—If we, however, possess all the best suited ground, then we can count upon retaining the seal-life as we now have it, by a vast majority, and, in no other way; for it is not unlikely that some season may occur when an immense number of the fur-seals, which have lived during the last four or five years on the Pribylov islands, should be deflected from their usual feeding-range at sea by the shifting of schools of fish, and other abnormal causes, which would bring them around quite close to the Asiatic seal-grounds, in the spring; and the scent from those rookeries would act as a powerful stimulant and attraction for them to land there, where the conditions for their breeding may be just as favorable as they desired. Such being the case, this diminution, therefore, which we would notice on the Pribylov group, might be the great increase observed at the Commander islands, and not due to any mismanagement on the part of the men in charge of these interests. Thus, it appears to me necessary that definite knowledge concerning the Commander islands and the Kuriles should be gathered.

If we find, however, that the character of this Russian seal land is restricted to narrow beach-margins, under bluffs, as at St. George, then we shall know that a great body of seals will never attempt to land there when they could not do so without suffering, and in violation of their laws, during the breeding-season. Therefore, with this correct understanding to start on, we can then feel alarmed with good reason, should we ever observe any diminution, to a noteworthy degree, on our seal-islands of Bering sea.

POSSIBLE DEFLECTION OF SEALS IN FEEDING.—I do not call attention to this subject with the slightest idea in my mind, as I write, of any such contingency arising, even for an indefinite time to come; but still I am sensible of the fact that it is possible for it to occur any season. But the seals undoubtedly feed on their pelagic fields in systematic routine of travel, from the time they leave the Pribylov islands until that of their return; therefore, in all probability, unless the fish upon which they are nourished suddenly become scarce in our waters and soundings, the seals will not change their base, as matters now progress; but it is possible for the finny shoals and schools to be so deflected from their migration to and from their spawning-beds, as to carry this seal-life with it, as I have hinted above. Thus it cannot be superfluous to call up this question, so that it shall be prominent in discussion, and suggestion for future thought.

NEED OF CAREFUL YEARLY EXAMINATION.—In the meantime the movements of the seals upon the great breeding-rookeries of St. Paul and those of St. George should be faithfully noted and recorded every year; and as time goes on this record will place the topic of their increase or diminution beyond all theory or cavil.

* Speech on cession of Russian-America, U. S. Senate, 1867; "Summary," p. 48.

12. MANNER OF TAKING THE SEALS.

EXHIBIT OF ALL SKINS SHIPPED FROM THE PRIBYLOV ISLANDS.—As an exhibit of the entire number of fur-seal skins taken for taxes and sale from the Pribylov islands, between 1797 and 1880, inclusive, I present the following table, which, although it may vary from the true aggregate, during the long period of nearly one hundred years covered by it, I am nevertheless satisfied it is the best evidence of the kind which can be obtained. Prior to the year 1868 it will be noticed that I have given only a series of estimates for the period antedating that year, as far back as 1862. The reason for this is that I can find nowhere, in writing, an authenticated record of the catch. It was the policy of the old Russian company invariably to take more skins, every year, from these islands down to Sitka than they could profitably dispose of annually in the markets of the world; a large surplus being yearly left over, which were suffered to decay or be destroyed by moths, and subsequently thrown into the sea. I can only judge, therefore, of what they took in that period, from what I know they had on hand in their salt-house at St. George and St. Paul during 1867, which was 40,000 to 48,000 skins; and this the natives told me was a larger average than they had taken for a great many years prior to that date. Hence, I have proportioned it back to the last record, which I find in Techmainov, whose figures, embraced in the three periods, from 1796 to 1861, have been given as copied by him from the authentic archives of the old Russian company; he is careful to say, in this connection, that the exhibit does not show all skins that were taken from the seal-islands, but only those which the Russians took for sale from Sitka.

And, again, other Russian authors, rather than this historian of the Russian American Company, have said that immense numbers of fur-seal skins—hundreds of thousands—were frequently accumulated in the warehouses at Sitka only to decay and be destroyed. Their aggregate cannot be estimated within any bound of accuracy, and it is not in the sum total of the following table. What we have taken on the island, since 1868, is presented below, almost correct. In the appendix, where I give a short digest of Professor Nordenskiöld's visit to Bering island, will be found another table showing the number of skins taken from those Russian Commander islands. In the following table, relative to the Pribylov group, it will be noticed that there is a gap of ten years, between 1786, the date of their discovery, and 1805, the time of the earliest Russian record. How many were taken then, there is not the faintest evidence in black and white; but we do know that from the time of the discovery of the Pribylov islands up to 1799, the taking of fur-seals on both of these islands progressed without count or lists, and without any responsible head or director; because there were then, upon those islands, seven or eight different companies, represented by as many agents or leaders, and all of them vied one with the other in taking as many fur-seals as they could:*

Fur-seal skins taken from the Pribylov islands for shipment and sale.

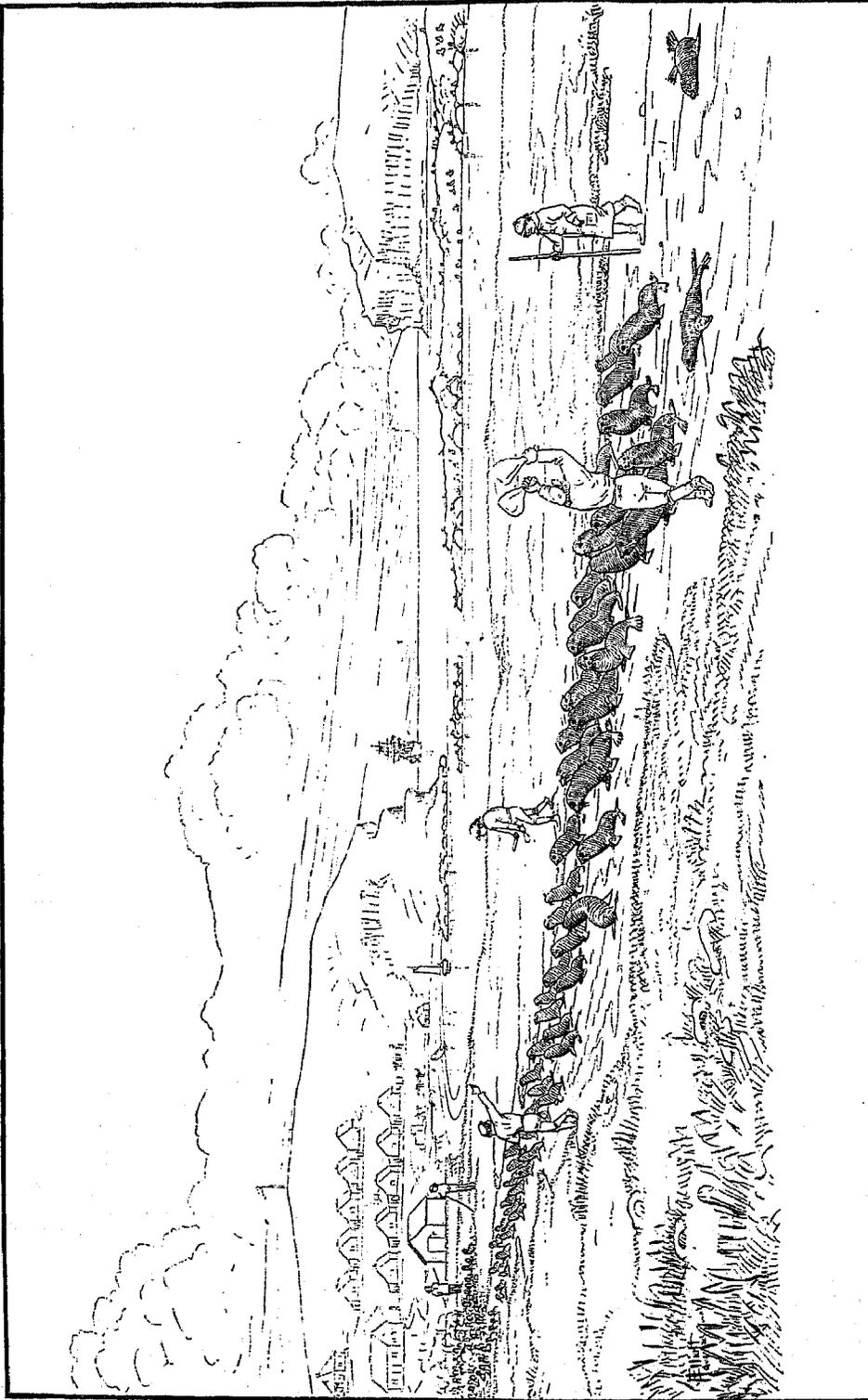
Period.	Number of skins.	Period.	Number of skins.	Period.	Number of skins.	Period.	Number of skins.
* 1797-1821 (24 years).....	1, 232, 374	1864	126, 000	1870.....	9, 965	1876.....	99, 000
* 1821-1842 (21 years).....	458, 502	1865.....	140, 000	1871.....	93, 000	1877.....	83, 500
* 1842-1861 (19 years).....	372, 000	1866.....	142, 000	1872.....	99, 000	1878.....	95, 000
1862.....	120, 000	1867.....	148, 000	1873.....	99, 630	1879.....	99, 968
1863.....	125, 000	1868.....	242, 000	1874.....	99, 820	1880.....	99, 950
		1869.....	87, 000	1875.....	99, 500	Total, 1797 to 1880 ..	3, 561, 051

*Including about 5,000 annually from the Commander islands.

THE MANNER IN WHICH THE SEALS ARE TAKEN.—By reference to the habit of the fur-seal, which I have discussed at length, it is now plain and beyond doubt, that two-thirds of all the males which are born, and they are equal in numbers to the females born, are never permitted by the remaining third, strongest by natural selection, to land upon the same breeding-ground with the females, which always herd thereupon *en masse*. Hence, this great band of "bachelor" seals, or "holluschickie", so fitly termed, when it visits the island is obliged to live apart entirely—sometimes, and some places, miles away from the rookeries; and, in this admirably perfect method of nature are those seals which can be properly killed without injury to the rookeries, selected and held aside by their own volition, so that the natives can visit and take them without disturbing, in the least degree, the entire quiet of the breeding-grounds, where the stock is perpetuated.

The manner in which the natives capture and drive the "holluschickie" up from the hauling-grounds to the slaughter-fields near the two villages of St. Paul and St. George, and elsewhere on the islands, cannot be improved

*The attempt, on my part, to get an authentic list of the numbers of fur-seals slain upon the Pribylov islands, prior to 1868, has simply been, to my mind, a partial failure. My investigation and search for such record, has satisfied me that it does not exist; memoranda of shipments only, each season, were made by the agents of the Russian company when the vessels took those skins from the seal-islands to Sitka; and of these skins again, count was only made of such as were exported to China or Russia, no mention being made anywhere of the number which was consumed in Alaska by the company's large force of attachés, or else destroyed at New Archangel. This method of accounting for the yield from the Pribylovs from 1806 or 1817 up to 1867, naturally confuses a correct determination as to the sum total—renders it, perhaps, very inaccurate. This explanation is, at least, due to the reader.



NATIVES DRIVING THE "HOLLUSCHICKIE."

The drove passing over the lagoon flats to the killing-grounds, under the village hill, St. Paul Island.

Looking S. S. W. over the village cove and Lagoon Breeding Rookery, July 14, 1872.

upon. It is in this way: at the beginning of every sealing-season, that is, during May and June, large bodies of the young "bachelor" seals do not haul up on land very far from the water—a few rods at the most—and, when these first arrivals are sought after, the natives, in capturing them, are obliged to approach slyly and run quickly between the dozing seals and the surf, before they can take alarm and bolt into the sea; in this manner a dozen Aleuts, running down the sand beach of English bay, in the early morning of some June day, will turn back from the water thousands of seals, just as the mold-board of a plow lays over and back a furrow of earth. When the sleeping seals are first startled, they arise, and, seeing men between them and the water, immediately turn, lope, and scramble rapidly back up and over the land; the natives then leisurely walk on the flanks and in the rear of the drove thus secured, directing and driving it over to the killing-grounds, close by the village.*

PROGRESSION OF A SEAL-DRIVE.—A drove of seals on hard or firm grassy ground, in cool and moist weather, may be driven with safety at the rate of half a mile an hour; they can be urged along, with the expenditure of a great many lives, however, at the speed of a mile or a mile and a quarter per hour; but this is seldom done. An old bull seal, fat and unwieldy, cannot travel with the younger ones, though it can lope or gallop as it starts across the ground as fast as an ordinary man can run, over 100 yards; but then it fails utterly, falls to the earth supine, entirely exhausted, hot, and gasping for breath.

The "holluschickie" are urged along over the path leading to the killing-grounds with very little trouble, and require only three or four men to guide and secure as many thousand at a time. They are permitted frequently to halt and cool off, as heating them injures their fur. These seal-halts on the road always impressed me with a species of sentimentalism and regard for the creatures themselves. The men dropping back for a few moments, the awkward shambling and scuffing of the march at once ceases, and the seals stop in their tracks to fan themselves with their hind-flippers, while their heaving flanks give rise to subdued panting sounds. As soon as they apparently cease to gasp for want of breath, and are cooled off comparatively, the natives step up once more, clatter a few bones with a shout along the line, and the seal-shamble begins again—their march to death and the markets of the world is taken up anew.

DOCILITY OF FUR-SEALS WHEN DRIVEN.—I was also impressed by the singular docility and amiability of these animals when driven along the road; they never show fight any more than a flock of sheep would do; if, however, a few old seals get mixed in, they usually get so weary that they prefer to come to a stand-still and fight rather than move; otherwise no sign whatever of resistance is made by the drove from the moment it is intercepted, and turned up from the hauling-grounds, to the time of its destruction at the hands of the sealing-gang.

This disposition of the old seals to fight rather than endure the panting torture of travel, is of great advantage to all parties concerned; for they are worthless commercially, and the natives are only too glad to let them drop behind, where they remain unmolested, eventually returning to the sea. The fur on them is of little or no value; their under wool being very much shorter, coarser, and more scant than in the younger; especially so on the posterior parts along the median line of the back.

CHANGE IN PELAGE.—This change for the worse or deterioration of the pelage of the fur-seal takes place, as a rule, in the fifth year of their age; it is thickest and finest in texture during the third and fourth year of life; hence, in driving the seals on St. Paul and St. George up from the hauling-grounds the natives make, as far as practicable, a selection from males of that age.

* The task of getting up early in the morning, and going out to the several hauling-grounds, closely adjacent, is really all there is of the labor involved in securing the number of seals required for the day's work on the killing-grounds. The two, three, or four natives upon whom, in rotation, this duty is devolved by the order of their chief, rise at first glimpse of dawn, between 1 and 2 o'clock, and hasten over to Lukannon, Tolstoi, or Zoltoi, as the case may be, "walk out" their "holluschickie", and have them duly on the slaughtering-field before 6 or 7 o'clock, as a rule, in the morning. In favorable weather the "drive" from Tolstoi consumes two and a half to three hours' time; from Lukannon, about two hours, and is often done in an hour and a half; while Zoltoi is so near by that the time is merely nominal.

I heard a great deal of talk among the white residents of St. Paul, when I first landed and the sealing-season opened, about the necessity of "resting" the hauling-grounds; in other words, they said that if the seals were driven in repeated daily rotation from any one of the hauling-grounds, that this would so disturb these animals as to prevent their coming to any extent again thereon, during the rest of the season. This theory seemed rational enough to me at the beginning of my investigations, and I was not disposed to question its accuracy; but, subsequent observation directed to this point particularly, satisfied me, and the sealers themselves with whom I was associated, that the driving of the seals had no effect whatever upon the hauling which took place soon or immediately after the field, for the hour, had been swept clean of seals by the drivers. If the weather was favorable for landing, *i. e.*, cool, moist, and foggy, the fresh hauling of the "holluschickie" would cover the bare grounds again in a very short space of time—sometimes in a few hours after the driving of every seal from Zoltoi sands over to the killing-fields adjacent, those dunes and the beach in question would be swarming anew with fresh arrivals. If, however, the weather is abnormally warm and sunny, during its prevalence, even if for several consecutive days, no seals to speak of will haul out on the emptied space; indeed, if these "holluschickie" had not been taken away by man from Zoltoi or any other hauling-ground on the islands when "tayopli" weather prevailed, most of those seals would have vacated their terrestrial loafing places for the cooler embraces of the sea.

The importance of clearly understanding this fact as to the readiness of the "holluschickie" to haul promptly out on steadily "swept" ground, provided the weather is inviting, is very great; because, when not understood, it was deemed necessary, even as late as the season of 1872, to "rest" the hauling-grounds near the village (from which all the driving has been made since), and make trips to far away Polavina and distant Zapadnié—an unnecessary expenditure of human time, and a causeless infliction of physical misery upon phocine backs and flippers.

It is quite impossible, however, to get them all of one age without an extraordinary amount of stir and bustle, which the Aleuts do not like to precipitate; hence the drive will be found to consist usually of a bare majority of three and four-year-olds, the rest being two-year-olds principally, and a very few, at wide intervals, five-year-olds, the yearlings seldom ever getting mixed up.

METHOD OF LAND TRAVEL.—As the drove progresses along the path to the slaughtering grounds, the seals all move in about the same way; they go ahead with a kind of walking step and a sliding, shambling gallop. The progression of the whole caravan is a succession of starts, spasmodic and irregular, made every few minutes, the seals pausing to catch their breath, and make, as it were, a plaintive survey and mute protest. Every now and then a seal will get weak in the lumbar region, then drag its posteriors along for a short distance, finally drop breathless and exhausted, quivering and panting, not to revive for hours—days, perhaps—and often never. During the driest driving-days, or those days when the temperature does not combine with wet fog to keep the path moist and cool, quite a large number of the weakest animals in the drove will be thus laid out and left on the track. If one of these prostrate seals is not too much heated at the time, the native driver usually taps the beast over the head and removes its skin.*

PROSTRATION OF FUR-SEALS BY HEAT.—This prostration from exertion will always happen, no matter how carefully they are driven; and in the longer drives, such as two and a half, and five miles from Zapadnie on the west, or Polavina on the north, to the village at St. Paul, as much as three or four per cent. of the whole drive will be thus dropped on the road; hence I feel satisfied, from my observation and close attention to this feature, that a considerable number of those that are thus rejected from the drove, and are able to rally and return to the water, die subsequently from internal injuries sustained on the trip, superinduced by this over-exertion. I, therefore, think it highly improper and impolitic to extend drives of the "holluschickie" over any distance on St. Paul island exceeding a mile, or a mile and a half; it is better for all parties concerned, and the business too, that salt-houses be erected, and killing-grounds established contiguous and to all of the great hauling-grounds, two miles distant from the village on St. Paul island, should the business ever be developed above the present limit; or should the exigencies of the future require a quota from all these places, in order to make up the 100,000 which may be lawfully taken.

ABUNDANT SUPPLY OF "HOLLUSCHICKIE."—As matters are to-day, 100,000 seals alone on St. Paul can be taken and skinned in less than forty working days, within a radius of one mile and a half from the village, and from the salt-house at Northeast point; hence the driving, with the exception of two experimental droves which I witnessed in 1872, has never been made from longer distances than Tolstoi to the eastward, Lukannon to the northward, and Zoltoi to the southward of the killing-grounds at St. Paul village. Should, however, an abnormal season recur, in which the larger proportion of days during the right period for taking the skins be warmish and dry, it might be necessary, in order to get even 75,000 seals within the twenty-eight or thirty days of their prime condition, for drives to be made from the other great hauling-grounds to the westward and northward, which are now, and have been for the last ten years, entirely unnoticed by the sealers.

KILLING THE SEALS.—The seals, when finally driven up on those flats between the east landing and the village, and almost under the windows of the dwellings, are herded there until cool and rested. The drives are usually made very early in the morning, at the first breaking of day, which is half-past one to two o'clock of June and July in these latitudes. They arrive, and cool off on the slaughtering-grounds, so that by six or seven o'clock, after breakfast, the able-bodied male population turn out from the village and go down to engage in the work of slaughter. The men are dressed in their ordinary working-garb of thick flannel shirts, stout cassimere or canvas pants, over which the "tarbossa" boots are drawn; if it rains they wear their "kamlaikas", made of the intestines and throats of the sea-lion and fur-seal. Thus dressed, they are each armed with a club, a stout oaken or hickory bludgeon, which have been made particularly for the purpose at New London, Connecticut, and imported here for this especial service. These sealing clubs are about five or six feet in length, three inches in diameter at their heads, and the thickness of a man's forearm where they are grasped by the hands. Each native also has his stabbing-knife, his skinning-knife, and his whetstone; these are laid upon the grass convenient, when the work of braining or knocking the seals down is in progress. This is all the apparatus which they have for killing and skinning.

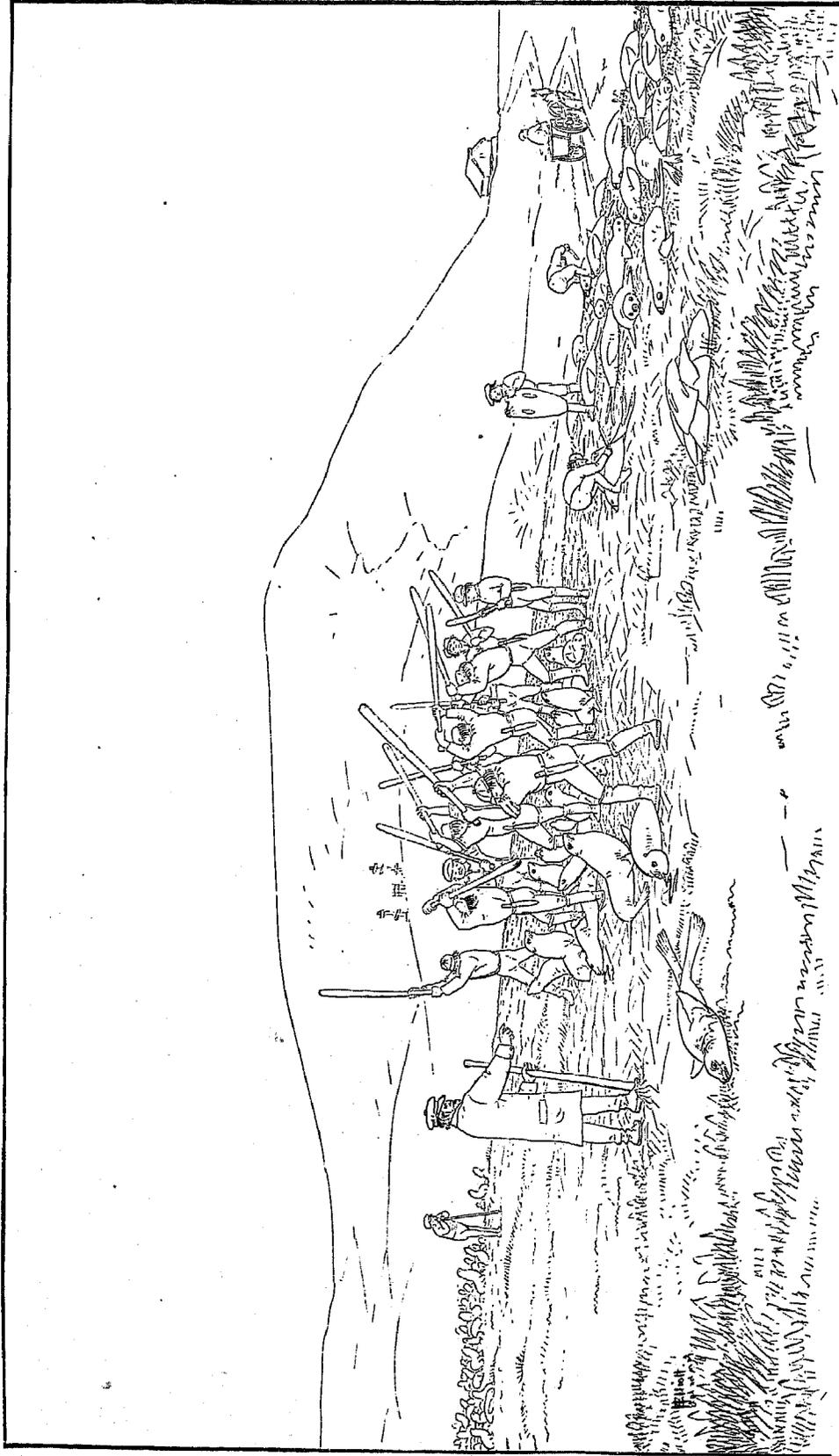
THE KILLING GANG AT WORK.—When the men gather for work they are under the control of their chosen foremen or chiefs; usually on St. Paul, divided into two working parties at the village, and a sub-party at Northeast point, where another salt-house and slaughtering-field is established. At the signal of the chief the work of the day begins by the men stepping into the drove, corraled on the flats; and, driving out from it 100 or

* The fur-seal, like all of the pinnipeds, has no sweat-glands; hence, when it is heated, it cools off by the same process of panting which is so characteristic of the dog, accompanied by the fanning that I have hitherto fully described; the heavy breathing and low grunting of a tired drove of seals, on a warmer day than usual, can be heard several hundred yards away. It is surprising how quickly the hair and fur will come out of the skin of a blood-heated seal—literally rubs bodily off at a touch of the finger. A fine specimen of a three-year-old "holluschak" fell in its tracks at the head of the lagoon while being driven to the village killing-grounds. I asked that it be skinned with special reference to mounting; accordingly a native was sent for, who was on the spot, knife in hand, within less than 30 minutes from the moment that this seal fell in the road; yet, soon after he had got fairly to work, patches of the fur and hair came off here and there wherever he chanced to clutch the skin.

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Plate XIV.

Monograph—SEAL-ISLANDS.



THE KILLING-GANG AT WORK.

Method of slaughtering Fur-seals on the grounds, near the village, St. Paul Island.

The drove in waiting.

Sealers knocking down a "pod."

Natives skinning.

150 seals at a time, make what they call a "pod", which they surround in a circle, huddling the seals one on another as they narrow it down, until they are directly within reach and under their clubs. Then the chief, after he has cast his experienced eye over the struggling, writhing "kautickie" in the center, passes the word that such and such a seal is bitten, that such and such a seal is too young, that such and such a seal is too old; the attention of his men being called to these points, he gives the word "strike", and instantly the heavy clubs come down all around, and every one that is eligible is stretched out stunned and motionless, in less time, really, than I take to tell it. Those seals spared by order of the chief, now struggle from under and over the bodies of their insensible companions and pass, hustled off by the natives, back to the sea.*

METHOD OF ALEUTS IN SKINNING FUR-SEALS.—The clubs are dropped, the men seize the prostrate seals by the hind-flippers, and drag them out, so they are spread on the ground without touching each other; then every sealer takes his knife and drives it into the heart at a point between the fore-flippers of each stunned form; the blood gushes forth, and the quivering of the animal presently ceases. A single stroke of a heavy oak bludgeon, well and fairly delivered, will crush in at once the slight, thin bones of a fur-seal's skull, and lay the creature out almost lifeless. These blows are, however, usually repeated two or three times with each animal, but they are very quickly done. The bleeding, which is immediately effected, is so speedily undertaken in order that the strange reaction, which the sealers call "heating", shall be delayed for half an hour or so, or until the seals can all be drawn out, and laid in some disposition for skinning.

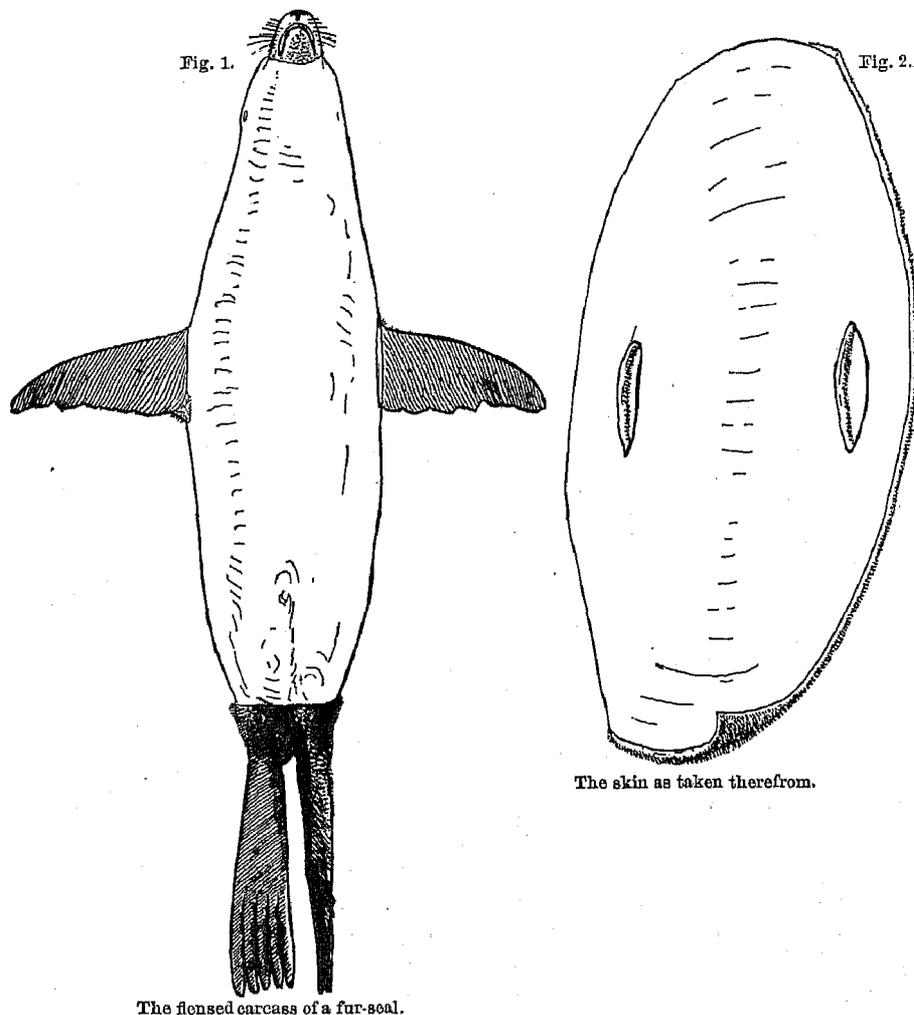
I have noticed that within less than thirty minutes from the time a perfectly sound seal was knocked down, it had so "heated", owing to the day being warmer and drier than usual, that, when touching it with my foot, great patches of hair and fur scaled off. This is a rather exceptionally rapid metamorphosis—it will, however, take place in every instance, within an hour, or an hour and a half

on these warm days, after the first blow is struck, and the seal is quiet in death; hence no time is lost by the prudent chief in directing the removal of the skins as rapidly as the seals are knocked down and dragged out. If it is a cool day, after bleeding the first "pod" which has been prostrated in the manner described, and after carefully drawing the slain from the heap in which they have fallen, so that the bodies will spread over the ground just free from touching one another, they turn to and strike down another "pod"; and so on, until a whole thousand or two are laid out, or the drove, as corraled, is finished. The day, however, must be raw and cold for this wholesale method. Then, after killing, they turn to work, and skin; but, if it is a warm day, every pod is skinned as soon as it is knocked down.

The labor of skinning is exceedingly severe; and is trying even to an expert, demanding long practice ere the muscles of the back and thighs are so developed as to permit a man to bend down to, and finish well, a fair day's

*The aim and force with which the native directs his blow, determines the death of the seal; if struck direct and violently, a single stroke is enough; the seals' heads are stricken so hard sometimes that those crystalline lenses to their eyes fly out from the orbital sockets like hail-stones, or little pebbles, and frequently struck me sharply in the face, or elsewhere, while I stood near by watching the killing-gang at work.

A singular lurid green light suddenly suffuses the eye of the fur-seal at intervals when it is very much excited, as the "podding" for the clubbers is in progress; and, at the moment when last raising its head it sees the uplifted bludgeons on every hand above, fear seems then for the first time to possess it and to instantly gild its eye in this strange manner. When the seal is brained in this state of optical coloration, I have noticed that the opalescent tinting remained well defined for many hours or a whole day after death; these remarkable flashes are very characteristic to the eyes of the old males during their hurly-burly on the rookeries, but never appear in the younger classes unless as just described, as far as I could observe.



The flensed carcass of a fur-seal.

The skin as taken therefrom.

work. The knives used by the natives for skinning are ordinary kitchen or case-handle butcher-knives. They are sharpened to cutting edges as keen as razors; but, something about the skins of the seal, perhaps fine comminuted sand along the abdomen, so dulls these knives, as the natives work, that they are constantly obliged to whet them.

The body of the seal, preparatory to skinning, is rolled over and balanced squarely on its back; then the native makes a single swift cut through the skin down along the neck, chest, and belly, from the lower jaw to the root of the tail, using, for this purpose, his long stabbing knife.* The fore- and hind-flippers are then successively lifted, as the man straddles the seal and stoops down to his work over it, and a sweeping circular incision is made through the skin on them just at the point where the body-fur ends; then, seizing a flap of the hide on either one side or the other of the abdomen, the man proceeds with his smaller, shorter butcher-knife, rapidly to cut the skin, clean and free from the body and blubber, which he rolls over and out from the hide by hauling up on it as he advances with his work, standing all this time stooped over the carcass so that his hands are but slightly above it, or the ground. This operation of skinning a fair-sized "holluschak" takes the best men only one minute and a half; but the average time made by the gang on the ground is about four minutes to the seal. Nothing is left of the skin upon the carcass, save a small patch of each upper lip on which the coarse mustache grows, the skin on the tip of the lower jaw, the insignificant tail,† together with the bare hide of the flippers.

BLUBBER OF FUR-SEAL: UNPLEASANT ODOR.—On the removal of the skin from the body of the fur-seal, the entire surface of the carcass is covered with a more or less dense layer, or envelope, of a soft, oily, fat blubber, which in turn completely conceals the muscles or flesh of the trunk and neck; this fatty substance, which we now see, resembles that met with in the seals generally everywhere, only possessing that strange peculiarity not shared by any other of its kind, of being positively overbearing and offensive in odor to the unaccustomed human nostril. The rotting, sloughing carcasses around about did not, when stirred up, affect me more unpleasantly than did this strong, sickening smell of the fur-seal blubber. It has a character and appearance intermediate between those belonging to the adipose tissue found on the bodies of cetacea and some carnivora.

This continuous envelope, of blubber, to the bodies of the "holluschickie" is thickest in deposit at those points upon the breast between the fore-flippers, reaching entirely around and over the shoulders, where it is from one inch to a little over in depth. Upon the outer side of the chest it is not half an inch in thickness, frequently not more than a quarter; and it thins out considerably as it reaches the median line of the back. The neck and head are clad by an unbroken continuation of the same material, which varies from one-half to one-quarter of an inch in depth. Toward the middle line of the abdominal region there is a layer of relative greater thickness. This is coextensive with the sterno pectoral mass; but it does not begin to retain its volume as it extends backward, where this fatty investment of the carcass upon the loins, buttocks, and hinder limbs fades out finer than on the pectoro-abdominal parts, and assumes a thickening corresponding to the depth on the cervical and dorsal regions. As it

*When turning the stunned and senseless carcasses, the only physical danger of which the sealers run the slightest risk, during the whole circuit of their work, occurs thus: at this moment the prone and quivering body of the "holluschak" is not wholly inert, perhaps, though it is nine times out of ten; and, as the native takes hold of a fore-flipper to jerk the carcass over on to its back, the half-brained seal rouses, snaps suddenly and viciously, often biting the hands or legs of the unwary skimmers, who then come leisurely and unconcernedly up into the surgeon's office at the village, for bandages, etc.; a few men are bitten every day or two during the season on the islands, in this manner, but I have never learned of any serious result following any case.

The sealers, as might be expected, become exceedingly expert in keeping their knives sharp, putting edges on them as keen as razors, and in an instant detect any dullness, by passing the balls of their thumbs over the suspected edges to the blades.

The white sealers of the Antarctic always used the orthodox butchers' "steel" in sharpening their knives, but these natives never have; and, probably never will abandon those little whet-stones above referred to.

During the Russian management, and throughout the strife in killing by our own people in 1868, a very large number of the skins were cut through, here and there, by the slipping of the natives' knives, when they were taking them from the carcasses, and "flensing" them from the superabundance, in spots, of blubber. These knife-cuts through the skin, no matter how slight, give great annoyance to the dresser; hence they are always marked down in price. The prompt scrutiny of each skin on the islands, by the agent of the Alaska Commercial company, who rejects every one of them thus injured, has caused the natives to exercise greater care, and the number now so damaged, every season, is absolutely trifling.

Another source of small loss is due to a habit which the "holluschickie" have of occasionally biting one another when they are being urged along in the drives, and thus crowded once in a while one upon the other; usually these examples of "zoobäden" are detected by the natives prior to the "knocking down", and spared; yet those which have been nipped on the chest or abdomen cannot be thus noticed; and, until the skin is lifted, the damage is not apprehended.

† This tail of the fur-seal is just a suggestion of the article, and that is all. Unlike the abbreviated caudal extremities of the bear or the rabbit, it does not seem to be under the slightest control of its owner—at least I never could see it move to any appreciable degree, when the seal is in action on land. Certainly there is no service required of it, but it does appear to me rather singular that none of the changeful moods of *Callorhinus* are capable of giving rise to even a tremor in its short stump of a tail. It is never raised or depressed, and, in fact, amounts to a mere excrescence, which many casual observers would not notice. The shrinking, twitching movements of the seal's skin, here and there at irregular intervals, are especially noticed when that animal is asleep, so that even when awake I believe that the dermatological motion is an involuntary one. The tail of the sea-lion is equally inconsequential; that of the walrus, even more so, while *Phoca vitulina* has one a trifle longer, relatively, and much stouter—fleshier than that of the fur-seal.

I found that the natives here were pronounced evolutionists, as are all the many Indian tribes with which I have been thrown in contact during my travels from Mexico to the head of the Stickeen river. They declare that their remote ancestry undoubtedly were fur-seals; indeed, there is a better showing for the brain cases of the fur-seal over that of the monkey's skull as to weight with reference to physical bulk; while their tails are as short or even shorter than most of the anthropoid apes.

descends on the limbs this blubber thins out very perceptibly; and, when reaching the flippers it almost entirely disappears, giving way to a glistening aureolar tissue, while the flipper skin finally descends in turn to adhere closely and firmly to the tendinous ligamentary structures beneath, which constitute the tips of the *Pinnipedia*.

The flesh and the muscles are not lined between, or within, by fat of any kind. This blubber envelope contains it all with one exception—that which is found in the folds of the small intestine and about the kidneys, where there is an abundant secretion of a harder, whiter, though still offensive, fat.

FLESH OF FUR-SEAL AS AN ARTICLE OF DIET.—It is quite natural for our people, when they first eat a meal on the Pribylov islands, to ask questions in regard to what seal meat looks and tastes like; some of the white residents will answer, saying that they are very fond of it, cooked so and so; others will reply that in no shape or manner can they stomach the dish. The inquirers must needs try the effect on their own palates. I frankly confess that I had a slight prejudice against seal meat at first, having preconceived ideas that it would be fishy in flavor, but I soon satisfied myself to the contrary, and found that the flesh of young seals, not over three years old, was full as appetizing and toothsome as most of the beef, mutton, and pork, I was accustomed to at home; the following precautions must be rigidly observed, however, by the cook who prepares fur-seal steaks and sausage balls for our delectation and subsistence—he will fail, if he does not:

1st. The meat must be perfectly cleaned of every vestige of blubber or fat, no matter how slight.

2d. Cut the flesh, then, into very thin steaks or slices, and soak them from six to twelve hours in salt and water (a tablespoon of fine salt to a quart of fresh water); this whitens the meat, and removes the residuum of dark venous blood that will otherwise give a slightly disagreeable taste, hardly definable, though existing.

3d. Fry these steaks, or stew them *a la mode*, with a few thin slices of sweet “breakfast” bacon, seasoning with pepper and salt; a rich brown gravy follows the cooking of the meat; serve hot, and it is, strictly judged, a very excellent meal for the daintiest feeder—and I hereby recommend it confidently as a safe venture for any newcomer to make.

MEAT OF THE SEA-LION.—The flesh of young sea-lions is still better than that of the fur-seal, while the natives say that the meat of the hair-seal (*Phoca vitulina*) is superior to both, being more juicy; fur-seal meat is exceedingly dry, hence the necessity of putting bacon into the frying-pan or stew-pot with it; sea-lion flesh is an improvement in this respect, and also that its fat, strange to say, is wholly clear, white, and inodorous, while the blubber of the “holluschickie” is sickening to the smell, and will, nine times out of ten, cause any civilized stomach to throw it up as quickly as it was swallowed. The natives, however, eat a great deal of it simply because they are too lazy to clean their fur-seal cuts, and not because they really relish it.

In this connection it may be well to add, that the liver of both *Callorhinus* and *Eumetopias* is sweet and wholesome; or, in other words, it is as good as liver usually is in Fulton market; the tongues are small, white, and fat; they are regularly cut out to some extent, and salted in ordinary water-buckets for exportation to curious friends; they have but slight claim to gastronomic favor. The natives are, however, very partial to the liver; but, though they like the tongues, yet they are too lazy to prepare them. A few of them, in obedience to pressing and prayerful appeals from relatives at Oonalashka, do exert themselves enough every season to undergo the extra labor of putting up a few barrels of fresh salted seal meat, which, being carried down to Illoolook by the company's vessels, affords a delightful variation to the steady and monotonous codfish diet of the Aleutian islanders.

OTHER AUTHORITIES ON HAIR-SEAL MEAT.—An old writer, in describing men and things in the western islands of Scotland (Martin, 1716), does not give the same evidence of appreciation. He says that the Scotch there “salt the seals with the ashes of burnt sea-ware [algoid melanospermæ], and say they are good food. The vulgar eat them commonly in the spring time, with a long pointed stick instead of a fork, to prevent the strong smell which their hands otherwise would have for several hours afterward. The flesh and broth of fresh young seals is, by experience, known to be pectoral. The meat is astringent, and used as an effectual remedy against diarrhea and dysentery. The liver of a seal being dried and pulverized, and afterward a little of it drank with milk, *aquavita*, or red wine, is also good against fluxes”.

Again, “the seal, though esteemed only fit for the vulgar, is also eaten by persons of distinction, though under a different name, to wit, ham”; also, a pleasant smile involuntarily arises to the face of the naturalist, when he learns from the same old writer that “the popish vulgar of the islands to the southward from this [island] eat these seals in Lent instead of fish”. Martin refers to *Phoca fetida*, I think.

NATIVES' USE OF FUR-SEAL FLESH MEDICINALLY.—I could not learn from the natives on the Pribylov islands that they held any notions of medicinal virtue whatever in regard to the flesh of the fur-seal or other pinnipeds indigenous. They do make certain special uses of the liver, gall, testes, etc., but the exact application I could not satisfactorily determine. They considered the establishment of our surgeon and pharmacy as a direct vote of censure upon their therapeutics, and were too willing to forget what they knew whenever I asked leading questions on the subject.

FIRST ESTABLISHMENT OF A PHARMACY: NATIVES THEIR OWN SURGEONS.—The natives, prior to the transfer of the territory, as well as the agents and employes of the old Russian company, were compelled to do their own doctoring and surgery as best they knew how, and with the scanty supply of natural and artificial resource at their command. They may be, therefore, truly described as having been helpless in the presence of serious physical ailment.

When our government took possession of Alaska, they brought with them, however, the first physicians and supplies that had ever had lodgment on the Pribylov islands, and when these officers took their departure with the troops, their services and stores were naturally suggested as desirable of continuance. Accordingly, the Alaska Commercial Company, when it took the business control of the islands, 1870-71, promptly established a doctor and a pharmacy on each island, and latterly a small hospital has been erected and sustained by it at St. Paul. These physicians are agents of the company, under salary, and are directed to give their time and attention to all illness on either island, free of charge; also, dispensing needful medicines, etc., gratis. Dr. Otto Cramer, a native of Berlin, was the surgeon on St. Paul during my sojourn there, and I recall his sad death at sea in 1875 with unfeigned regret, for he was a singularly well-read gentleman and an accomplished physician, musician, and scholar in his mind. He was a victim to acute melancholia; some heavy shadow was hanging from his early life over him which none of us cared to lift.

STOLID BEHAVIOR OF NATIVES WHEN INJURED.—Dr. Cramer often said, speaking of the peculiarities of the natives when sick at St. Paul, that they never notified him of their illness until the diseases had usually got so firm hold of the patients as to baffle all medical relief. He complained that they would let the old shamanistic doctress of the village charm, drug, and weary the sick until death seemed imminent, and then stolidly send for him. "Ochta, mein Gott! too late, too late, such people!" he would usually conclude his account of this case or that, as it might be.

NATIVE METHODS OF COOKING.—The native cooking is now all done in their houses, on small cast-iron stoves of American pattern and make. In olden times the unavoidable use of fur-seal blubber in culinary operations caused the erection, outside of most "barrabaras", of a small sod-walled and low dirt-roofed kitchen, in which the strong-smelling blubber-fires were kindled. Indifferent as the native became to smells and smoke in the filthy life of early days upon these islands, yet the acrid, stifling, asthmatic effect of the blubber clouds never failed to punish him whenever he attempted to make use of such a fire in his living-room. Most of these "cookhnets", or "povarniks", were in full blast when I first landed at St. Paul, and coming frequently into range of their smoky effluvium, I was infinitely annoyed; now, however, the complete substitution of new frame-houses for the "barrabkies" has, I believe, caused a perfect abatement of the nuisance.

The people of the seal-islands indulge in very liberal quantities of boiled seal meat and tea; these staples, together with hard bread or soda crackers, form the routine of their bill of fare, as far as cooking goes, varied at wide intervals by boiled halibut, stewed or roasted birds, and the queerly-scrambled eggs of the same. The more ancient these oölogical viands, the better for Aleutian gusto. Some of the women, however, have learned to bake bread and biscuits, but this consumes too much of the scant fuel at their disposal to be a popular or general practice among them. They sit at tables in their houses now, on benches, and eat from plates with knives and forks, instead of squatting around an iron pot on the "barrabkie" floor to dip in *sans ceremonie* with spoons, ladles, and grimy fingers as in "ye olden tyme". They have, however, one sad failing developed by this march to a higher civilization, and that is the determination of the Aleutian dish-washer to use cold water on her greasy plates.

GREAT SIZE OF THE FUR-SEAL'S HEART: ITS EXPANDED LUNGS.—In opening many hundreds of these freshly-killed seals, after skinning, while searching in vain for supposed food-contents of their stomachs, I was impressed by the exceeding size of the heart, and the perfect organization of the lungs; while the volume of blood in proportion to the size and weight is, I am sure, greater in the fur-seal than in any other animal. The enormous lungs, and the veins laid bare, showed their beautiful adaptation to frequent aquatic submergence, by their great capacity toward the root of the heart, and by the enormous cava or hepatic reservoir. The widened aortic arch and the diminution of the abdominal aorta modify the blood-current, of which the vast muscular apparatus of the forequarters and the large brain must receive the major share of supply as it comes from the enlarged heart.*

13. MANNER OF CARING FOR AND SHIPPING THE FUR-SEAL SKINS.

CURING THE RAW SKINS.—The skins are taken from the field to the salt-house, where they are laid out, after being again carefully examined, one upon another, "hair to fat", like so many sheets of paper, with salt profusely spread upon the fleshy sides as they are piled up in the "kenches", or bins.† The salt-house is a large barn-like frame structure, so built as to afford one-third of its width in the center, from end to end, clear and open as a passageway; while on each side are rows of stanchions, with sliding planks, which are taken down and put up in the form of deep bins, or boxes—"kenches," the sealers call them. As the pile of skins is laid at the bottom of an empty "kench", and salt thrown in on the outer edges, these planks are also put in place, so that the salt may be kept intact until the bin is filled as high up as a man can toss the skins. After lying two or three weeks in this style

* I had prepared many notes upon the muscular anatomy of the fur-seal and the sea-lion; but I find that it has been anticipated so well by what Dr. Murie published in the transactions of the Zoölogical Society of London, 1869-72, as to render their reproduction here quite superfluous. These observations of Dr. Murie constitute one of the most valuable contributions to the knowledge of the anatomy of this animal that has ever been made. He carefully dissected a young male sea-lion after its death, which had been brought to the Zoölogical Society's gardens from the Falkland islands.

† The practice of curing in early times was quite different from this rapid and effective process of salting. The skins were then all air-dried; pegged out, when "green", upon the ground, or else stretched upon a wooden trellis or frame, which stood like a rude fence



KENCHING FUR-SEAL SKINS.

Interior of the Salt-house at the village, St. Paul Island. Natives planting the pelts in the curing bins or "kenches," salting, assorting, etc.

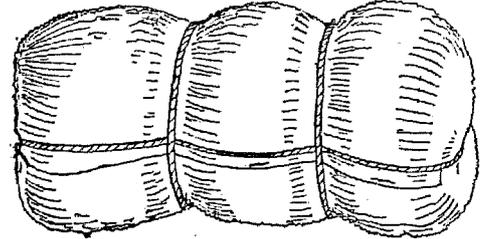
they become "pickled", and they are suited then at any time to be taken up and rolled into bundles, of two skins to the package, with the hairy side out, tightly corded, ready for shipment from the islands.

AVERAGE WEIGHT OF RAW SKINS.—The average weight of a two-year-old skin is $5\frac{1}{2}$ pounds; of a three-year-old skin, 7 pounds; and, of a four-year-old skin, 12 pounds; so that as the major portion of the catch is two or three year-olds, these bundles of two skins each have an average weight of from 12 to 15 pounds. In this shape they go into the hold of the company's steamer at St. Paul,* and are counted out from it in San Francisco. Then they are either at once shipped to London by the Isthmus of Panama in the same shape, only packed up in large hogsheads of from 20 to 40 bundles to the package, or expressed by railroad, via New York, to the same destination.

PACKING SKINS FOR SHIPMENT.—The work of bundling the skins is not usually commenced by the natives until the close of the last week's sealing; or, in other words, those skins which they first took, three weeks ago, are now so pickled by the salt in which they have been lying ever since, as to render them eligible for this operation and immediate shipment. The moisture of the air dissolves and destroys a very large quantity of the saline preservative which the company brings up annually in the form of rock-salt, principally obtained at Carmen island, Lower California.

LAW PROTECTING THE SEALS.—The Alaska Commercial Company, by the provisions of law under which they enjoy their franchise, are permitted to take 100,000 male seals annually, and no more, from the Pribylov islands. This they do in June and July of every year. After that season, the skins rapidly grow worthless, as the animals enter into shedding, and, if taken, would not pay for transportation and the tax. These natives are paid 40 cents a skin for the labor, and they keep a close account of the progress of the work every day; they do so, as it is all done by them, and they know within 50 skins, one way or the other, when the whole number have been secured each season. This is the only occupation of the 398 people here, and they naturally look well after it. The interest and close attention paid by these natives, on both islands, to the "holluschickie" and this business, was both gratifying and instructive to me during my residence there.

ERRONEOUS POPULAR IDEAS.—The common or popular notion in regard to seal-skins is, that they are worn by those animals just as they appear when offered for sale; that the fur-seal swims about, exposing the same soft



A bundle of two skins.

adjacent to the killing-grounds; it was the accumulation of such air-dried skins from the Pribylov islands, at Sitka, which rotted so in 1803, that "750,000 of them were cut up, or thrown out into the sea", completely destroyed. Had they been treated as they now are, such a calamity and hideous waste could not have occurred.

The method of air-drying which the old settlers employed, is well portrayed by the practice of the natives now, who treat a few hundred sea-lion skins to the process every fall; preparing them thus for shipment to Oonalashka, where they are used by brother Aleuts in covering their bidarkies or kyacks.

The natives, in speaking to me of this matter, said that whenever the weather was rough and the wind blowing hard, these air-dried seal-skins, as they were tossed from the bidarra to the ship's deck, numbers of them would frequently turn in the wind and fly clean over the vessel into the water beyond, where they were lost.

Under the old order of affairs, prior to the present management, the skins were packed up and carried on the backs of the boys and girls, women and old men, to the salt-houses, or drying-frames. When I first arrived, season of 1872, a slight variation was made in this respect, by breaking a small Siberian bull into harness and hitching it to a cart, in which the pelts were hauled. Before the cart was adjusted, however, and the "buik" taught to pull, it was led out to the killing-grounds, by a ring in its nose, and literally covered with the green seal-hides, which were thus packed to the konches. The natives were delighted with even this partial assistance; but now they have no further concern about it at all, for several mules and carts render prompt and ample service. They were introduced here, first, in 1874. The Russian-American Company and also the Alaska Commercial Company have brought up three or four horses to St. Paul, but they have been unfortunate in losing them all soon after landing, the voyage and the climate combined being inimical to equine health; but the mules of the present order of affairs have been successful in their transportation to and residence on the Pribylov islands. One, the first of these horses just referred to, perhaps did not have a fair chance for its life. It was saddled one morning, and several camp-kettles, coffee-pots, etc., slung on the crupper for the use of the Russian agent, who was going up to Northeast point for a week or ten days' visit. He got into the saddle, and while *en route*, near Polavina, a kettle or pot broke loose behind, the alarmed horse kicked its rider promptly off, and disappeared on a full run, in the fog, going toward the bogs of Kamminista, where its lifeless and fox-gnawed body was found several days afterward.

* The shallow depths of Bering sea give rise to a very bad surf, and though none of the natives can swim, as far as I could learn, yet they are quite creditable surfmen, and work the heavy "baidar" in and out from the landing adroitly and circumspectly. They put a sentinel upon the bluffs over Nah Speel, and go and come between the rollers as he signals. They are not graceful oarsmen under any circumstances, but can pull heartily and coolly together when in a pinch. The apparent ease and unconcern with which they handled their bidarra here in the "baroon" during the fall of 1869, so emboldened three or four sailors of the United States Revenue Marine cutter "Lincoln" that they lost their lives in that surf through sheer carelessness. The "gig" in which they were coming ashore "broached to" in the breakers just outside of the cove, and their lifeless forms were soon after thrown up by the merciless waves on the Lagoon rookery. Three graves of these men are plainly marked on the slope of the Black Bluffs.

There is a false air of listlessness and gentleness about an open sea, or roadstead roller, that is very apt to deceive even watermen of good understanding. The crushing, overwhelming power with which an ordinary breaker will hurl a large ship's boat on rocks awash, must be personally experienced ere it is half appreciated.

The bundled skins are carried from the salt-houses to the baidar, when the order for shipment is given, and pitched into that lighter one by one, to be rapidly stowed; 700 to 1,200 bundles make the average single load; then, when alongside the steamer, they are again tossed up, and on her deck, from whence they are stowed in the hold.

coat with which our ladies of fashion so delight to cover their tender forms during inclement winter. This is a very great mistake; few skins are less attractive than is the seal-skin when it is taken from the creature. The fur is not visible; it is concealed entirely by a coat of stiff overhair, dull, gray-brown, and grizzled. It takes three of them to make a lady's sacque and boa; and in order that the reason for their costliness may be apparent, I take great pleasure in submitting a description of the tedious and skillful labor necessary to their dressing ere they are fit for sale, which will be found in the appendix.

SKETCH OF THE RUSSIO-CHINA TRADE IN FUR-SEAL PELTRIES.—During the whole of the extended period, from 1799 to 1867, inclusive, the Russians shipped and sold nearly all of the fur-seal skins that were taken from the Pribylov islands, in that great international mart of Kiachta, on the Chinese frontier. Since the Americans have taken control, the sales have all been practically made in London. The Alaska Commercial Company sells every one of its skins from the Pribylov and Commander groups there, in the same ware-room where the Hudson Bay Company, when it had a thrifty existence and was a power, used to auction its furs annually. As millions of the air-dried pelts taken from the seal-islands of Alaska have been bartered in the China-Russian station, a brief description of Kiachta may be interesting.

Prior to 1722, the Russians enjoyed a treaty with China which sanctioned the individual traveling of Muscovitic traders direct from the frontier to Peking; after a period of three and thirty years, the Russians were abruptly and entirely deprived of those coveted commercial privileges. After all intercourse between the two countries had ceased for five years, the Russians obtained a new treaty in 1728, by which, in order to prevent future misunderstandings, the international trade, as far at least as private individuals were concerned, should be conducted on the boundary line, exactly upon the same spot where this new treaty was negotiated. Here Kiachta was built, though she still had a rival in Peking; for, by the provisions of the new treaty, government trading caravans were allowed to penetrate to the capital of the Chinese empire. But, in 1762, Catharine the Second relinquished this imperial monopoly, and that action at once rendered this little town the grand and sole emporium of commerce between Russia and China.

DESCRIPTION OF KIACHTA.—Kiachta, then, as now, stands on a rivulet of the same name, which, rising in Siberia and crossing the frontier line, washes the foundations of Maimatschin, a China town only a few miles away. Taken by itself, it is beset on all sides by rugged mountains; and the streamlet which forms a bond of union between these large empires of Asia is so tiny that, even by the aid of damming, it often fails to afford an adequate supply of water to the four or five thousand dwellers on its banks. These two small settlements, Kiachta and Maimatschin, are situated as nearly as possible on the fiftieth parallel of latitude, being about 1,000 miles from Peking and 4,000 from Moscow. Though the Chinese route is much the shortest on the map, it is practically as hard a journey; for at a distance of about a week's march from Peking, the Chinese have a forty days' tramp, and upward, over a dismal desert of table-land. It is parched with heat during one-half of the year, and covered with snow during the other. The Russians, however, whether they come from the west with manufactured goods, or from the north and east with furs, enjoy the advantages of a peopled country and of navigable waters nearly all the way to Irkutsk, and when they have met at this, the common center of all the lines of communication, they may, and often do, prosecute the rest of their journey to the very neighborhood of Kiachta by crossing lake Baikal and ascending its principal tributary, the Selenga river.

CHARACTER OF THE TRADE.—The Russian traders bring chiefly furs, woollens, cottons, and linens, while the Chinese bring teas principally, also silks, and sugar-candy; thus the seal-skins of Alaska were wont to go first from the seal-islands to Sitka; there they were assorted and put up into square bales, about 3 feet by 2, pressing the bundles in an old-fashioned hand-lever press, and cording them while under this pressure; then envelopes of green walrus hide were sewed over them, and the packages, duly numbered, went to the Okotsk by ship, then to Kiachta by pack-horses, where the buyers of Peking finally inspected and purchased them, giving in exchange the celebrated black teas of Maimatschin, the finest brands in all Mongolia, and produced only in the north of China, and which can be more cheaply transported from thence to Siberia than to Canton.

CHINESE DISPOSITION OF FUR-SEAL PELTRIES.—The Chinese buyers sent their Pribylov peltries down to their home-markets on camels, and in carts drawn by oxen, to Kalgan, where the seal-skins were again sold to other dealers, who carried them to the ultimate retail trade.

VOLUME OF KIACHTA TRADE IN 1837.—What the fur-trade of Kiachta to-day is, even though the rare skin of *Callorhinus* is seldom seen, I can find no data; but in 1837 the native land furs were represented by a value of 7,406,188 roubles, and the peltries from Russian America, including the fur-seals, sea-otter, and all the Alaskan land catch, was 1,600,000 roubles. How many fur-seals were sold in this aggregate, I cannot ascertain, but the scanty yield during the two and three years preceding would not warrant any considerable showing.

CHINESE TRADERS.—The Chinese at Kiachta were at first much more shrewd in their bargains than were their Russian neighbors; but the Slavonic instincts did not need much brushing up ere they were fully equal to all emergencies; the methods of the Chinese in selecting seal-skins were elaborate and lengthy—each pelt was handled and measured, then a little metal tag attached on which the result was recorded. I find a great deal of confusion in the data at my command as to what the average price was in this market, because the Russians took

all ages, and at all stages of the season, from June to December; consequently, the number of really prime skins was small compared with the whole aggregate sold; the best pelts brought from "10 to 15 roubles"—\$8 to \$12.50; the average sales were made, however, as low as from \$4 to \$5 per skin. Techmainov gives the most information touching the value of Russian American furs in those times, that I can find; but, in regard to specific figures for the fur-seal quotations, he is only vague and general, the reason doubtless being that the whole volume of trade at Kiachta was and is exclusively one of barter, without the intervention of coin on either side.

SEASON OF KIACHTA COMMERCE.—The business life of Kiachta is never fully aroused until winter has well set in, continuing until spring. There is no written regulation to this effect, but it has the force of law through habit. In disposing of their commodities, the Chinese have considerable local advantage, because their teas never remain a single season unsold at Maimatschin, while the Russian goods, partly through a diminution of the demand, and partly through the artifices of the Celestials, are often so depreciated in value as to have to wait two and three years for a market.

DEMAND OF CHINESE FOR FURS.—The Chinese have from time immemorial been solicitous purchasers of furs. The northern provinces of their dominions are not only subjected to an extremely rigorous winter climate, but are those where the most wealthy reside, because the best teas of the Celestial Empire grow there; hence the desire for fur robes and garments as measures of comfort during cold weather is universal among the inhabitants; they constitute an important part of the wardrobe of every important Chinaman throughout all "Kathay". A Russian authority, Paul von Krusenstern, says: "With the least change of air the Chinese immediately alter their dress; and even at Canton, which is within the confines of the tropics, they wear furs in the winter."

FIRST TRAFFIC IN FURS BETWEEN AMERICA AND CHINA.—It is a curious fact, that until Captain John Gore anchored, December 18, 1779, near Canton with the ships of Cook's last voyage, from Kamtchatka and the northward, the furs which these English seamen then offered to the Chinese for sale were the first peltries ever brought into their markets by sea. The Chinese had hitherto gained everything of this character from without their precincts, by overland trade with Siberian merchants, or from the Burmese frontier via Bhamo.

When Captain Gore, the surviving senior officer of Cook's last voyage, 1776-'80, returned to England, he found that war was existing with the United States, France, and Spain; the British government determined to withhold from the world all information of the voyage; hence it was not until the winter of 1784-'85 that it was published. The statements contained in this work respecting the great abundance of animals yielding fine furs on the northwest coast, and the successful pecuniary bartering of the ships at Canton, stirred up a great many active men who fitted out vessels for the traffic. The first individual trader from the south on the northwest coast, was John Hanna, an Englishman, who sailed from Canton, May, 1785, and filled his little schooner with sea-otter skins at Nootka; then Portlock and Dixon, and Meares, in 1786; Gray and Kendrick, the first Americans, in 1787, head a long list of traders who came successively after them. In no record whatever of this pelagic fur-trade can I find any mention made of the skin of the fur-seal, nor the slightest hint whatever until the period of the Fraser river gold excitement, in 1862, when the first quotation of a fur-seal skin is made, taken at sea off the straits of Fuca.

WHAT THE RUSSIANS KNEW OF THE BUSINESS.—Perhaps the best, and an entirely correct, epitomé of what the Russians at headquarters of the company in Sitka really knew, biographically and commercially, of the fur-seal, is embodied in the following words of Governor Simpson, of the Hudson Bay Company, who, in 1841-'42, was the guest of Governor Etholine. He had supreme control of Alaskan life and trade then, and gave to his English official peer, doubtless, all the knowledge which he possessed:

Some twenty or thirty years ago there was a most wasteful destruction of the seal, when young and old, male and female, were indiscriminately knocked on the head. This imprudence, as any one might have expected, proved detrimental in two ways. The race was almost extirpated; and the market was glutted to such a degree, at the rate for some time of two hundred thousand skins a year, that the prices did not even pay the expenses of carriage. The Russians, however, have now adopted nearly the same plan which the Hudson Bay Company pursues, in recruiting any of its exhausted districts, killing only a limited number of such males as have attained their full growth, a plan peculiarly applicable to the fur-seal, inasmuch as its habits render the system of husbanding the stock as easy and certain as that of destroying it.

In the month of May, with something like the regularity of an almanac, the fur-seals make their appearance at the island of St. Paul, one of the Aleutian group. Each old male brings a herd of females under his protection, varying in number according to his size and strength. The weaker brethren are obliged to content themselves with half a dozen wives, while some of the sturdier and fiercer fellows preside over harems that are two hundred strong. From the date of their arrival in May to that of their departure in October, the whole of them are principally ashore on the beach. The females go down to the sea once or twice a day, while the male, morning, noon, and night, watches his charge with the utmost jealousy, postponing even the pleasures of eating and drinking and sleeping to the duty of keeping his favorites together. If any young gallant ventures by stealth among any senior chief's bevy of beauties, he generally atones for his imprudence with his life, being torn to pieces by the old fellow, and such of the fair ones as may have given the intruder any encouragement are pretty sure to catch it in the shape of some secondary punishment. The ladies are in the straw about a fortnight after they arrive at St. Paul; about two or three weeks afterward they lay the single foundation, being all that is necessary, of next season's proceeding, and the remainder of their sojourn they devote exclusively to the rearing of their young. At last the whole band departs, no one knows whither. The mode of capture is this: at the proper time the whole are driven, like a flock of sheep, to the establishment, which is a mile distant from the sea, and there the males of four years, with the exception of the few that are left to keep up the breed, are separated from the rest and killed. In the days of promiscuous massacre such of the mothers as had lost their pups would ever and anon return to the establishment, absolutely harrowing up the sympathies of the wives and the daughters of the hunters, accustomed as they were to such scenes, with their doleful lamentations.

The fur-seal attains the age of fifteen or twenty years, but not more. The females do not bring forth young till they are five years old. The hunters have frequently marked their ears each season, and many of the animals have been notched in this way ten times, but very few of them oftener.

Under the present system, the fur-seals are increasing rapidly in number. Previously to its introduction, the animal hunts had dwindled down to three and four thousand. They have now gradually got up to thrice that amount, and they are likely soon to equal the full demand, not exceeding thirty thousand skins, of the Russian government.*

It is valuable, as showing that, as long ago as 1841-'42, under Russian management, more than 30,000 skins per annum would be a loss, and not profitable to take from the seal-islands. Also, that, though the tardy recognition of the fact that females should not be slaughtered was made on the Pribylov islands shortly prior to 1841-'42, yet suitable regulations had not yet been made for the management of the business, inasmuch as *all* classes, "as a whole," were driven to the killing-grounds. This harassed and disturbed the females quite as badly as if killed outright. In 1845 the present order of implicit non-trespass upon the breeding-rookeries was first established, and I am sorry that I cannot find the name of the intelligent Russian who promulgated it, so that it might be known and respected, as it so well deserves.

NO FUR-SEALS KNOWN TO EARLY TRADE.—The homely, yet explicit, letters of William Beresford should be noticed, for he sailed from London in 1797-'98, as a trader with Portlock and Dixon, and he gives, perhaps, the only straightforward synopsis of the fur-trade of the northwest coast as it was then. He reviews the subject as it presents itself to him from Cook's inlet to Cape Mendocino, in the series of field-notes which are printed and form the body and soul of *Dixon's Voyage*.

Nowhere does the author mention the fur-seal in this narrative, covering as it does two years' cruising between Kadiak and Cape Flattery. He evidently had not even heard of it, though at the time the Russians were working the Pribylov islands barbarously, taking hundreds of thousands of skins.

When I first went to the northwest coast, May, 1865, I learned from the venerable Doctor Tolmie, a recently retired chief factor of the Vancouver (Hudson Bay Company's) district, a great deal of the fur-bearing animals of that country, as known to the celebrated company which he had represented. I find no mention in my memoranda made at the time, that he indicated the skin of the fur-seal as one of the long list of items of trade; and while I was in that country between the Stikeen mouth and Puget sound, 1865-'67, inclusive, I never heard a single word of the fur-seal, and I, myself, then never recognized its name. I do not think, therefore, it worth while to discuss the idle rumors, now prevalent to some extent, as to the "fact" that the fur-seal is breeding in some lonely nook here and there along the coast. The Indians would have known it full well a hundred years ago, and such anxious seekers after choice peltries as William Beresford and the Hudson Bay Company, would have profited accordingly.

PELAGIC FUR-SEALING A RECENT ENTERPRISE.—Fur-seals then, as now, were annually seen in all probability by the natives of the coast at sea, between Prince of Wales island and the Columbia river; but, either they were not deemed worthy of the labor in capture, or else the superior value of the sea-otter chase drew every attention of the pelagic hunters, just as it does to-day. At least I feel warranted in this conclusion, by the full and explicit details which Alexander Mackenzie gives of the furs that he saw in the natives' possession when he came overland from Montreal to the Pacific ocean in 1793. He describes the sea-otter almost exclusively. He speaks, however, of the natives having seal's flesh for sale; that it was eaten raw, "cut into chunks." Most likely this seal-meat of Mackenzie's notice was that of *Phoca vitulina*, which animal I have seen myself, nearly 100 miles up the Fraser river from the coast. However, it may have been that of the fur-seal, for he was among those savages who inhabited the islands and coast of Queen Charlotte sound, where these animals are to-day often seen sleeping or sporting in the broad reach of that open roadstead.

14. ECONOMIC VALUE OF THE SKINS, OIL, AND FLESH OF THE FUR-SEAL.

REASON WHY FUR-SEAL SKINS ARE ALL SOLD IN LONDON.—On account of the fact that the labor in this country, especially skilled labor, commands so much more per diem in the return of wages than it does in London or Belgium, it is not practicable for the Alaska Commercial Company, or any other company here, to attempt to dress and put upon the market the catch of Bering sea, which is in fact the entire catch of the whole world. Our people understand the theory of dressing these skins perfectly; but they cannot compete with the cheaper labor of the Old World. Therefore, nine-tenths nearly of the fur-seal skins taken every year are annually purchased and dressed in London, and from thence distributed all over the civilized world where furs are worn and prized.

CAUSE OF VARYING PRICES OF DRESSED SEAL-SKINS.—The great variations of the value of seal-skin sacques, ranging from \$75 up to \$350, and even \$500, is not often due to the variance in the quality of the fur originally; but it is due to the quality of the work whereby the fur was treated and prepared for wear. For instance, the cheap sacques are so defectively dyed that a little moisture causes them to soil the collars and cuffs of their owners, and a little exposure causes them speedily to fade and look ragged. A properly dyed skin, one that has been conscientiously and laboriously finished, for it is a labor requiring great patience and great skill, will not rub off or

*An Overland Journey Round the World, 1841-1842, Sir George Simpson, Governor-in-Chief Hudson Bay Company's territories; Philadelphia, 1847, pp. 130-131.

"crock" the whitest linen when moistened; and it will wear the weather, as I have myself seen it on the form of a sea-captain's wife, for six and seven successive seasons, without showing the least bit of dimness or raggedness. I speak of dyeing alone; I might say the earlier steps of unhairing in which the over-hair is deftly combed out and off from the skin, heated to such a point that the roots of the fur are not loosened, while those to the coarser hirsute growth are. If this is not done with perfect uniformity, the fur will never lay smooth, no matter how skillfully dyed; it will always have a rumpled, ruffled look. Therefore, the hastily-dyed sacques are cheap; and are enhanced in order of value just as the labor of dyeing is expended upon them.

GRADATION OF THE FUR OF *CALLORHINUS URSINUS*.—The gradation of the fur of *Callorhinus* may, perhaps, be best presented in the following manner:

- 1 YEAR OLD ♂: WELL GROWN: at July 1 of every season:
FUR fully developed as to uniform length and thickness and evenness of distribution; it is lighter in color, and softer in texture than hereafter, during the life of the animal; average weight of skin as removed by the sealers from the carcass, 4½ pounds.
- 2 YEAR OLD ♂: WELL GROWN: at June 1 of every season:
FUR fully developed as to even length and thickness and uniformity of distribution; it has now attained the darker buff and fawn color, sometimes almost brown, which it retains throughout the rest of the life of the animal; it is slightly and perceptibly firmer and stiffer than it was last year, not being at all "fluffy" as in the yearling dress now; average weight of skin, as taken from the body, 5½ pounds.
- 3 YEAR OLD ♂: WELL GROWN: at June 1 of every season:
FUR fully developed, as to even length, but a shade longer over the shoulders, where the incipient "wig" is forming; otherwise perfectly uniform in thickness and even distribution; this is the very best grade of pelt which the seal affords during its life; average weight of skin, as taken from the body, 7 pounds.
- 4 YEAR OLD ♂: WELL GROWN: at June 1 of every season:
FUR fully developed as to even length, except a decided advance in length and perceptible stiffness over the shoulders, in the "wig"; otherwise perfectly uniform in thickness and even distribution; this grade is almost as safe to take, and as good as is the three-year-old; average weight of skin, as removed, 12 pounds.
- 5 YEAR OLD ♂: WELL GROWN: at May to June 1 of every season:
FUR fully developed, but much longer and decidedly coarser in the "wig" region; otherwise, uniform in thickness and distribution; the coarseness of the fur over the shoulders and disproportionate length thereon destroys that uniformity necessary for rating A 1 in the market; in fact it does not pay to take this skin; average weight, 16 pounds.
- 6 YEAR OLD ♂: WELL GROWN: from May to June 1 of every season:
FUR fully developed, still longer and stiffer in the "wig" region, with a slightly thinner distribution over the post-dorsal region, and shorter; this skin is never taken—it is profitless; average weight, 25 pounds.
- 7 YEAR OLD AND UPWARD ♂: from May to June 1 of every season:
FUR fully developed, but very unevenly distributed, being relatively scant and short over the posterior dorsal region, while it is twice as long and very coarse in the covering to the shoulders especially and the neck and chest. Skins are valueless to the fur trade; weights, 45 to 60 pounds.

The analysis, as above, is a brief epitomé of the entire subject; only, it should be added that the female skins are as finely furred as are the best grades of the males; and also, that age does not cause the quality of their pelage to deteriorate, which it does to so marked an extent in the males. But, taking them into consideration is entirely out of the question, and ought to be so forever.

The foetal coat of the pup is composed of coarse black hair alone, the underwool not at all developed, when this is shed and the new coat put on in September and October, it is furred and haired as a yearling, which I diagnose above; this pelage has, however, no commercial value.

All the skins taken by the company for the last eight years have been prime skins, in the fair sense of the term; but, all the seal-skin sacques made therefrom have not been of the first quality, by any means.

In order that the rules and regulations and the law governing and protecting the interests of the government on these islands may be fully understood, I embody them in the appendix.

OIL OF THE FUR-SEAL.—I have spoken of the blubber, and as I mentioned it, doubtless the thought will occur, what becomes of the oil contained therein; is it all allowed to waste? A most natural query, and one that I made instantly after my first arrival on the islands. I remember seeing 40 or 50 hogsheads and tierces headed up and standing near the foot of the village hill, in which were many thousands of gallons of fur-seal oil. I asked the agent of the company when he was going to ship it; he shrugged his shoulders and said: "As soon as it will pay."

I made, during the season, careful notes as to the amount of oil represented by the blubber exposed on the 100,000 young male seal carcasses, and I found that the two and three year old "holluschickie" bodies as left by the skinner would not clean up on an average more than a half a gallon of oil; while the four-year-old males would make nearly a gallon. It should be remembered that quite a large portion of the seal's fat is taken off with the skin, as its presence thereon is necessary to that proper amalgamation and preservation by the salt when it is applied to its fresh surface in the "kenches"; hence the amount of oil represented by these carcasses every year is not much over 60,000 gallons.

CONDITION OF THE FUR-SEAL OIL MARKET.—When among the seal-oil dealers in New York city, during the month of May, in 1876, I took these notes with me and investigated the standing and the demand for fur-seal oil in their market and the markets of the world; and the statements of these oil experts and dealers were all in accord as to the striking inferiority of fur-seal oil, compared with the hair-seal and sea-elephant oil, which they dealt in largely. The inferiority of the fur-seal oil is due primarily to the offensive odor of the blubber, which

I have spoken of heretofore. This singularly disagreeable smell does not exist in the blubber of the hair-seal (*Phocida*), the sea-elephant or sea-lion, and it makes the process of refining very difficult. They said it was almost impossible to properly deodorize it and leave the slightest margin of profit for the manufacturer and the dealer. It was gummy and far darker in color than any other seal-oil, hence it possessed little or no commercial value. Then, again, when the subject of taking oil from the seal-islands of Alaska is considered, the following obstacles, in addition to the first great objection just cited, arise at once to financial success: the time, trouble, and danger in loading a vessel with oil at the islands where, on account of the absence of a harbor and the frequent succession of violent gales, a ship is compelled to anchor from a mile and a half to three miles from the coast, on which the surf is always breaking. The cost, again, of casks and cooperage will amount to 10 cents per gallon; the cost of the natives' work in securing and bringing the blubber to the try-works, 10 cents per gallon; the cost of refining it, 10 cents; and the cost of transportation of a cargo of, say, 60,000 gallons will amount to nearly 20 cents per gallon; thus making a gallon of fur-seal oil aggregate in cost to the taker 50 cents, which entails upon him nothing but pecuniary loss when the cargo goes upon the market, and where it is worth only from 40 to 50 cents retail, with a dull sale at that.*

FRAGILE CHARACTER OF FUR-SEAL BONES.—I looked at the fur-seal bones, and at first sight it seemed as though a bone-factory might be established there; but a little examination of the singularly light and porous osseous structure of the *Callorhinus* quickly stifled that enterprise. The skull and larger bones of the skeleton are more like pasteboard than the bone which is so common to our minds. When dried out, the entire skeleton of a three-year-old male will not weigh seven pounds; indeed, I am inclined to think it would be much less than that if thoroughly kiln-dried, as after the fashion of the bone-mills. Therefore, although 100,000 of these skeletons bleach out and are trodden down annually, upon the Pribylov islands, yet they have not the standing for any commercial value whatsoever, considering their distance and difficulty of access from those impoverished fields where they might serve our farmers as fertilizing elements.†

DECAY OF SEAL CARCASSES.—Another singular and striking characteristic of the island of St. Paul, is the fact that this immense slaughtering-field, upon which 75,000 to 90,000 fresh carcasses lie every season, sloughing away into the sand beneath, does not cause any sickness among the people who live right over them, so to speak. The cool, raw temperature, and strong winds, peculiar to the place, seem to prevent any unhealthy effect from the fermentation of decay. The *Elymus* and other grasses once more take heart and grow with magical vigor over the unsightly spot, to which the sealing-gang again return, repeating their bateau, which we have marked before, upon this place, three years ago. In that way this strip of ground, seen on my map between the village, the east landing, and the lagoon, contains the bones and the oil-drippings and other fragments thereof, of more than 3,000,000 seals slain since 1786 thereon, while the slaughter-fields at Novastoshnah record the end of a million more.

I remember well the unmitigated sensations of disgust that possessed me when I first landed, April 28, 1872, on the Pribylov islands, and passed up from the beach, at Lukannon, to the village, over the killing-grounds; though there was a heavy coat of snow on the fields, yet each and every one of 75,000 decaying carcasses was there, and bare, having burned, as it were, their way out to the open air, polluting the same to a sad degree. I was laughed at by the residents who noticed my facial contortions, and assured that this state of smell was nothing to what I should soon experience when the frost and snow had fairly melted. They were correct; the odor along by the end of May was terrific punishment to my olfactories, and continued so for several weeks until my sense of smell became blunted

* In 1873, not having had any experience and not even knowing the views of the oil dealers themselves, I left the seal-islands believing that if the special tax which was then laid upon each gallon of oil as it might be rendered was removed, that it would pay the manufacturer, and in this way employ the natives, many days of the year otherwise idle, profitably. The company assured me that as far as its conduct in the matter was concerned, it would be perfectly willing to employ the natives in rendering fur-seal oil, and give them all the profit, not desiring itself to coin a single penny out of the whole transaction; possibly this could be done if the special tax of 55 cents per gallon was stricken off. The matter was then urged upon the Treasury Department, by myself, in October, 1873, and the tax was repealed by the department soon after. But it seems that I was entirely mistaken as to the quality and value of the oil itself. I made, to satisfy myself, a very careful investigation of the subject in 1876, going personally to the leading dealers in whale and seal oil of New York city, and they were unanimous in their opposition to handling fur-seal oil, some of them saying that they would not touch it at any price. I felt considerably chagrined, because had I known as much in 1873, I would have saved myself then, and my friends subsequently, a good deal of unnecessary trouble and profitless action.

† The bones of *Callorhinus*, though apparently strong, are surprisingly light and porous; indeed, they resemble those of *Aves* more than those commonly credited to mammalia; the osseous structure, however, of *Phoca vitulina*, the hair-seal which I examined there, side by side with that of the fur-seal, was very much more solid and weighed, bone for bone of equal age, just about one-third more, the skull especially; also the shoulder-blades and the pelvic series. If the bones of the animals were not divested of their cartilaginous continuations and connections, then the aggregate weight of the fur-seal is equal to its hairy-skinned relative; the entire skeleton of a three-year-old ♂ *Callorhinus*, completely divested by sea-fleas (*Amphipoda*) of all flesh and fat, but with every ligamentary union and articulation perfect (the cartilaginous tee-ends all present), was just 8 pounds, and I have reason to believe that when it became air-dried and bleached it did not weigh more than 4 or 5. The bones of the older seals are relatively very much heavier, but only relatively; the frailness and fragility is constant through life, though the skulls of the old males do thicken up on their crests and about the rami of their jaws very perceptibly.

Sea-lion bones are, however, normally strong and heavy; the bone of the fur-seal is evidently stout enough, but it is singularly light, while the walrus, that dull, sluggish brute, has a massive osteological frame. I made these relative examinations more especially to ascertain something which might pass for a correct estimate of what the bony waste on the killing-grounds of the Pribylov island amounted to annually, with a view of its possible utilization. The spongy bones of the whole 100,000 annually laid out would not render according to my best judgment, 50 tons of dry bone-meal—an insignificant result and unworthy of further notice on these islands.

and callous to this stench by long familiarity. Like the other old residents I then became quite unconscious of the prevalence of this rich "funk", and ceased to notice it.

Those who land here, as I did, for the first time, nervously and invariably declare that such an atmosphere must breed a plague or a fever of some kind in the village, and hardly credit the assurance of those who have resided in it for the whole period of their lives, that such a thing was never known to St. Paul, and that the island is remarkably healthy. It is entirely true, however, and, after a few weeks' contact, or a couple of months' experience, at the longest, the most sensitive nose becomes used to that aroma, wafted as it is hourly, day in and out, from decaying seal-flesh, viscera, and blubber; and, also, it ceases to be an object of attention. The cool, sunless climate during the warmer months has undoubtedly much to do with checking too rapid decomposition, and consequent trouble therefrom, which would otherwise arise from the killing-grounds.

The freshly-skinned carcasses of this season do not seem to rot substantially until the following year; then they rapidly slough away into the sand upon which they rest; the envelope of blubber left upon each body seems to act as an air-tight receiver, holding most of the putrid gases that evolved from the decaying viscera until their volatile tension causes it to give way; fortunately the line of least resistance to that merciful retort is usually right where it is adjacent to the soil, so both putrescent fluids and much of the stench within is deodorized and absorbed before it can contaminate the atmosphere to any great extent. The truth of my observation will be promptly verified, if the skeptic chooses to tear open any one of the thousands of gas-distended carcasses in the fall, that were skinned in the killing-season; if he does so, he will be smitten by the worst smell that human sense can measure; and should he chance to be accompanied by a native, that callous individual, even, will pinch his grimy nose and exclaim, it is a "keeshla pahknoot"!

At the close of the third season after the skinning of the seal's body, it will have so rotted and sloughed down, as to be marked only by the bones and a few of the tendinous ligaments; in other words, it requires from thirty to thirty-six months' time for a seal carcass to rot entirely away, so nothing but whitened bones remain above ground. The natives govern their driving of the seals and laying out of the fresh bodies according to this fact; for they can, and do, spread this year a whole season's killing out over the same spot of the field previously covered with such fresh carcasses three summer's ago; by alternating with the seasons thus, the natives are enabled to annually slaughter all of the "holluschickie" on a relatively small area, close by the salt-houses, and the village, as I have indicated on the map of St. Paul.

DESCRIPTION OF KILLING-GROUND OF ST. PAUL.—The killing-ground of St. Paul is a bottomless sand flat, only a few feet above high water, and which unites the village hill and the reef with the island itself; it is not a stone's throw from the heart of the settlement—in fact, it is right in town—not even suburban.

DESCRIPTION OF THE KILLING-GROUND AT ST. GEORGE.—On St. George the "holluschickie" are regularly driven to that northeast slope of the village hill which drops down gently to the sea, where they are slaughtered, close by and under the houses, as at St. Paul; those droves which are brought in from the North Rookery to the west, and also Starry Ateel, are frequently driven right through the village itself. This slaughtering field of St. George is hard tufa and rocky, but it slopes down to the ocean rapidly enough to drain itself well; hence the constant rain and humid fogs of summer carry off that which would soon clog and deprive the natives from using the ground year after year in rotation, as they do. Several seasons have occurred, however, when this natural cleansing of the ground above-mentioned has not been as thorough as must be to be used again immediately; then the seals were skinned back of the village hill, and in the ravine to the west on the same slope from the summit.

This village site of St. George to-day, and the killing-grounds adjoining, used to be, during early Russian occupation, in Pribylov's time, a large sea-lion rookery, the finest one known to either island, St. Paul or St. George. Natives are living there who told me that their fathers had been employed in shooting and driving these sea-lions so as to deliberately break up the breeding-ground, and thus rid the island of what they considered a superabundant supply of the *Eumetopias*, and thereby to aid and encourage the fresh and increased accession of fur-seals from the vast majority peculiar to St. Paul, which could not take place while the sea-lions held the land.*

*The St. Paul village site is located wholly on the northern slope of the village hill, where it drops from its greatest elevation, at the flagstaff, of 125 feet gently down to the sandy killing-flats below and between it and the main body of the island. The houses are all placed facing the north, at regular intervals along the terraced streets, which run S. E. and N. W. There are 74 or 80 native houses, 10 large and smaller buildings of the company, the treasury agent's residence; the church, the cemetery crosses, and the school building are all standing here in coats of pure white paint. The survey of the town site, when rebuilt, was made by Mr. H. W. McIntyre, of the Alaska Commercial Company, who, himself, planned and devised the entire reconstruction. No offal or decaying refuse of any kind is allowed to stand around the dwellings or lie in the streets. It required much determined effort on the part of the whites to effect this sanitary reform, but now most of the natives take equal pride in keeping their surroundings clean and unpolluted.

The site of the St. George settlement is more exposed and bleak than is the one we have just referred to on St. Paul. It is planted directly on the rounded summit of one of the first low hills that rise from the sea on the north shore; indeed, it is the only hill that does slope directly and gently to the salt water on the island. Here are 24 to 30 native cottages, laid with their doors facing the opposite sides of a short street between, running also east and west, as at St. Paul. There, however, each house looks down upon the rear of its neighbor, in front and below. Here the houses face each other, on the top of the hill. The treasury agent's quarters, the company's six or seven buildings, the school-house, and the church are all neatly painted, and this settlement, from its prominent position, shows from the sea to a much better advantage than does the larger one of St. Paul. The same municipal sanitary regulations are enforced here. Those who may visit the St. George and St. Paul of to-day will find the streets dry and hard as floors. They have been covered with a thick layer of volcanic cinders on both islands.