ZOOLOGICA

SCIENTIFIC CONTRIBUTIONS OF THE NEW YORK ZOOLOGICAL SOCIETY

VOLUME I, NUMBER 8.

SCIENTIFIC RESULTS OF THE EXPEDITION TO THE GULF OF CALIFORNIA, IN CHARGE OF C. H. TOWNSEND, BY THE U. S. FISHERIES STEAMSHIP "ALBATROSS" IN 1911, COMMANDER G. H. BURRAGE, U. S. N., COMMANDING.

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II

THE NORTHERN ELEPHANT SEAL

Macrorhinus angustirostris, Gill

BY

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Director of the New York Aquarium.

PUBLISHED BY THE SOCIETY
THE ZOOLOGICAL PARK, NEW YORK

APRIL 15, 1912.

FIG. 52. VIEW OF NORTH END OF ELEPHANT SEAL ROOKERY, GUADALUPE ISLAND.
Males, females, two-year-olds and yearlings. The males with heads erected are in fighting attitude, with proboscis retracted and mouth wide open. U. S. S. *Albatross* in distance.

THE NORTHERN ELEPHANT SEAL.

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Illustrated with Photographs by the Writer.

The elephant seal is the largest of all seals and owes its name to its great size and to the remarkable trunk or snout developed in the adult male.

The northern elephant seal has long been on the verge of extinction and is now found only on Guadalupe, an uninhabited island lying in the Pacific Ocean 140 miles off the northern part of the peninsula of Lower California.

It formerly had a range extending from Cape San Lazaro near Magdalena Bay on the Peninsula, northward to Point Reyes near San Francisco, California, a distance of nearly a thousand miles, and has never been definitely recorded from any other region of the North Pacific Ocean. It was abundant at several points along the coast and especially so on all of the islands off the west coast of Lower California.*

Being valuable for its oil it was killed in large numbers by vessels primarily engaged in the pursuit of the gray whale which was also abundant in the same region. There is a record showing that the elephant seal was being killed for commercial purposes at Santa Barbara Island, California, as late as 1852. During the late fifties, apparently, its numbers in Lower California became reduced to mere scattered groups.

Captain C. M. Scammon, who has long been the principal authority on the northern elephant seal, writing in 1869,‡ reported that it was then "nearly if not quite extinct." Since the publication in 1874 of his work on the Marine Mammals of the

*The habitat of the southern elephant seal originally extended throughout the Antarctic islands, including Kerguelen, Heards, St. Paul, Tristan-da-Cunha, Falklands, Tierra del Fuego, South Georgia, South Shetlands, Juan Fernandez and islands south of New Zealand. It has disappeared from some of these places and is now found chiefly at Kerguelen Island.

‡Proceedings Academy Natural Sciences, Philadelphia, April, 1869, pp. 61-63.

Northwestern Coast, there has been little information available respecting the species.

In 1884 and again in 1892, I obtained information from seal hunters in California that 419 elephant seals had been taken by them at various times from 1880 to 1884 at San Cristobal Bay and Guadalupe Island, Lower California. According to my informants, some of whom had long engaged in sealing in a desultory way, the elephant seal became scarce about 1865, and only a few stragglers had been found until the discovery of a small herd at San Cristobal Bay in 1880. This bay occupies a midway position on the Peninsula and is uninhabited, there being no fresh water along the coast within fifty miles. As the beaches are narrow, elephant seals found lodgment chiefly in the dry gullies opening into them.

I visited this locality in October and December, 1884, in the schooner *Laura* of San Francisco in search of specimens of the elephant seal for the United States National Museum* The beach frequented by the seals was kept under observation from October 20 until December 31, but we obtained only sixteen animals, the skins and skeletons of which were secured for the National Museum. I visited a number of other localities on the same voyage, but the species was not observed elsewhere, although we searched both the coast and the islands as far south as Magdalena Bay. We examined the shores of Guadalupe Island in October, but on account of unfavorable weather, overlooked the locality at present occupied by the elephant seal on the northwest side of the island. It may have existed there at that time.

In 1892, I again visited Guadalupe Island in the schooner *Santa Barbara,* under the auspices of the Department of State, with a view to identifying the species of fur seal known to exist there, the information being desired for the use of the Fur Seal Arbitration then convened at Paris.† Although the entire coast line of the island was carefully examined during our search for the fur seal, we found no trace of the elephant seal until we

*An Account of Recent Captures of the California Sea Elephant and Statistics Relating to the Present Abundance of the Species. By Charles H. Townsend. Proc. U. S. National Museum, 1885, pp. 90-93.

†Notes on the Fur Seals of Guadalupe, The Galapagos and Lobos Islands. By Charles H. Townsend, Report on Fur Seal Investigations 1896-97, part III, pp. 265-69, Treas. Dept., Doc. No. 2717, Div. Special Agents.

reached the so-called Elephant Beach under the cliffs on the northwest side. According to Captain Hunt of the schooner *Santa Barbara,* eighty elephant seals were found on this beach in 1883. Here we found eight elephant seals, seven of which were killed, but the weather conditions becoming suddenly unfavorable and the landing dangerous, we were compelled to abandon four of these. At that time, May 23, the larger animals were shedding their hair.

The fur seal obtained at this island proved to be a new species of the Antarctic genus and was described as *Arctocephalus townsendi* by Merriam.

Captain J. R. Mullett of Monterey, California, is said to have obtained a few specimens of the elephant seal in 1904, presumably at Guadalupe. In 1907 Mr. Charles Harris visited Guadalupe Island in the interest of the Hon. Walter Rothschild, remaining from June 2 to 13. He found about forty elephant seals and obtained fourteen specimens, four of which were lost in the surf.*

For many years no reports have been received from San Cristobal Bay and other points in Lower California formerly inhabited by the elephant seal, and there has been no further account of the small herd found at Guadalupe Island in 1907. As Lower California is sometimes visited by parties in small vessels in search of sea-lions which are killed for their hides and oil, naturalists had little hope of its continued existence, and the recent discovery of a herd of considerable size was a matter of surprise and great zoological interest.

Rediscovery in 1911.

During the winter of 1911 while in charge of the deep sea investigations of the United States Steamship *Albatross* in the Lower California region, I called at Guadalupe Island and was fortunate enough to secure the specimens, photographs and data upon which the present paper is based.

We reached Guadalupe on March second, and immediately landed the members of the scientific staff on the east side for a day's collecting and proceeded at once with the ship to the north-

**Mirounga angustirostris* (Gill), by the Hon. Walter Rothschild, Ph. D., Novitates Zoologicae, vol. XV, 1908, p. 393. Mr. Harris also published an account of this trip to Guadalupe Island in the Pacific Monthly for April, 1909, entitled A Cruise After Sea Elephants.

west side in the hope of finding a few survivors of the elephant seal.* After a forenoon's search we located a herd of about 125 of these animals on Elephant Beach. I killed one large male and one large female which we skinned and took to the ship. Returning with larger boats and some nets, six yearlings were captured alive and sent on board. While the *Albatross* went to the east side to pick up the scientific staff, I devoted the afternoon to making observations and taking photographs, the ship not returning until nightfall. There is deep water all about the Island, but after much cautious sounding Commander Burrage found an anchorage in fifteen fathoms of water about a mile off shore. The following day being too stormy to make landings, the time was spent in the preparation of our specimens. On the morning of the fourth we succeeded after some difficulty in effecting a landing when I killed two more of the large males the skinning and skeletonizing of which occupied us for several hours.†

The sea becoming rough, we were compelled to leave the beach in the afternoon and the embarking of our heavy specimens was both difficult and dangerous.

Elephant Beach is located under high and impassable cliffs and is flanked by cliffs which extend into the sea, making the top of the island altogether inaccessible from this point. Its northern end is well marked by heavy rock slides. The beach is accessible from the sea only, and is usually further protected by a heavy surf. It is not more than three or four hundred yards in length by thirty in width, the greater part of it is sandy, the inner margin being lined with talus from the cliffs.

The seals had little fear of man, and the few animals which left the beach would probably not have done so had they not been disturbed by sailors walking among them. While the large specimens were being skinned and skeletonized, some of the animals slept undisturbed within thirty feet of where the men were working. I succeeded in obtaining about fifty good photographs showing the general character of the rookery and the attitudes of the animals. The herd consisted chiefly of large males and im-

*Members of scientific staff: Dr. J. N. Rose, Dr. Paul Bartsch, U. S. National Museum. W. L. Schmitt, L. M. Tongue, U. S. Bureau of Fisheries. Preparators: H. E. Anthony, J. C. Bell, American Museum of Natural History.

†These skins are now being mounted and will constitute an important group in the American Museum of Natural History.

mature animals of various sizes. There were probably not more than fifteen adult females present and only six of these were accompanied by newly born young. The indications were, therefore, that the breeding season was just commencing and that other adult females might arrive later. We did not observe any male with more than one female, and the family groups were distributed all along the rookery.

Size.

The three males which we killed were the largest in sight and were found to average just sixteen feet in length, with an average girth of eleven feet. The largest specimen of the northern elephant seal recorded as actually measured was "twenty-two feet long from tip to tip and yielded 210 gallons of oil."* The adult female we killed was nearly eleven feet long. Some of the females with young pups appeared to be slightly longer, but we did not attempt to measure them. There were numerous immature males about the size of the adult female and many animals of intermediate sizes between these and the newly born pups. Animals of the yearling size were distinctly more numerous than those of any other size. The newly born pups were quite distinguishable in color from the yearlings, being dusky black. They were about a week old. The color of the adults is yellowish

*Scammon. Overland Monthly, February, 1870. In this article the writer refers to individuals that attained "the enormous dimensions of twelve feet in circumference and more than twenty-four feet in length. Lydekker, in discussing the Antarctic species says, "Probably twenty-five feet would not be an undue estimate for the length of an adult male, and it is far from improbable that close upon thirty feet may have been reached in some cases." Morrell says, "I have seen the male (Antarctic) sea elephant more than twenty-five feet in length, and measuring sixteen feet around the body."

The elephant seal is much larger than the walrus, which does not exceed thirteen feet in length or fourteen feet in girth.

Captain B. D. Cleveland of New Bedford, Massachusetts, who has during the past dozen years made several voyages to Kerguelen Island after elephant seals, says in a recent article in Hampton's Magazine that the largest males measure sixteen feet in length, thirteen feet in girth and may yield as much as 245 gallons of oil. He found the blubber to be seven inches thick on the fattest animals at the commencement of the season, six or eight weeks later it was not more than two inches thick, the seals having fasted in the meantime. Captain Cleveland says he secured from 2,600 to 3,000 barrels of oil on a voyage, that the animals are killed by shooting and that the skin has no commercial value. Sealing begins in November and ends in May before the harbor freezes over. With a crew of thirty-five men, 120 elephant seals were killed and stripped in one day. The oil is worth from forty-seven to fifty cents a gallon.

brown, the younger animals being grayish brown. The largest male elephant seal obtained by Harris in 1907 was sixteen feet, eight inches in length and had a girth of eleven feet, eight inches. The proboscis was eighteen inches long, measured from its tip to the eye. The largest female obtained was eleven feet, five inches long, with a girth of six feet, five inches.

The skin of the adult male is exceedingly heavy, being nearly an inch thick about the fore part of the neck. Our knives dulled so rapidly in skinning that it was found necessary to have a grindstone sent ashore and keep two men busy at the task of sharpening. The carcasses were so heavy that it required all the strength of half a dozen men to turn them over with the aid of a rope and hand-holes cut in the skins. We found the blubber to be about four inches thick in some places.

Behavior of Males.

Unless actually teased by members of our party, the old animals did not attempt to leave the beach, and many of them did not raise their heads from the sand until closely approached, although wide awake. When driven from a comfortable resting-place they would soon settle down, and after throwing sand on their backs with the front flippers become quiet again. Both young and old have the habit of covering themselves with sand when settling down to rest. The females, although but little molested, appeared to be even more passive than the males.

Some of the large males after being driven into the sea, soon returned. While in the water they remained near the surf, disregarding the boats which passed near them, the head being usually held well above water with the proboscis partially retracted. When making a landing the large male does so very slowly with frequent pauses, from time to time raising and spreading the hind flippers to get the benefit of each low wave that helps him through the shallows. When finally clear of the water and dependent upon his own efforts in getting his ponderous bulk to a dry place well up the sloping beach, progress becomes very slow, but the elephant seal is able to crawl long distances. While at San Cristobal Bay in 1884, the sealers showed me places three or four hundred yards up the ravines where they had formerly killed them.

Most of the attitudes here described are well shown in the accompanying photographs, but it must be confessed that we could not have secured all of our pictures without getting the animals thoroughly aroused. In some cases I focused my camera on the head of an elephant seal at a distance of eight or ten feet and then had a sailor kick the animal violently in the ribs, one of them became thoroughly angered only after a sailor had jumped upon his back. When moving of its own accord the elephant seal arches the body in a way suggestive of the motion of the inch-worm, drawing the hind quarters well forward with the belly lifted from the ground, and then shifting the forequarters with the front flippers braced outward.

Fighting.

The large males that accompanied the nursing females were frequently engaged in fights with unattached males. There had evidently been considerable fighting as their necks were more or less raw and in some cases had festering sores. In comparison with them the necks of the younger males were smooth and without tooth-marks. In fighting, the large males crawl slowly and laboriously within striking distance, and then rearing on the front flippers and drawing the heavy pendant proboscis into wrinkled folds well up on top of the snout, strike at each other's necks with their large canines. The fighting was accompanied with more or less noise and snorting, but we heard none of the extremely loud bellowing described by writers as characteristic of the Antarctic species of elephant seal.

The skin of the under surface of the neck and fore part of the breast is greatly thickened, it is practically hairless and years of fighting has given it an exceedingly rough and calloused surface. This *shield,* as it may be called, is the part of the animal most exposed to attack when fighting, it extends from the throat just below the base of the jaws, down to the level of the flippers and rather more than half way back on each side of the neck and breast. Although ugly wounds are inflicted by the large canines, the heavy skin in no case seemed to be broken through. While the animal takes good care of its head and proboscis, the calloused breast shield is freely exposed to the enemy.

The fighting is not of the desperate sort indulged in by the fur seal, and the contestants soon separate; there seems to be no actual seizing and holding of the skin and after each sharp blow the head is quickly withdrawn and held aloft. When the head of the male is elevated, the skin at the top of the neck and shoulders is thrown into a series of eight or ten heavy folds which extend downward and forward. These folds do not show when the animal is at rest with the head stretched forward on the sand. The fore flippers are large and thick and have heavy claws, the posterior three claws being well separated.

Proboscis.

The proboscis is broad and fleshy to the tip where the nostrils are placed, the nasal openings being wide apart and directed somewhat downward and outward. The length of the proboscis forward from the canines is about equal to the distance between the canine and eye. It is exceedingly thick and heavy and its width is about equal to the space between the eyes. In one of our specimens, not the largest, it was about nine inches long, but the proboscis of the dead animal can be stretched out somewhat longer.* When the animal is crawling the proboscis is relaxed and pendant; when sleeping, it rests upon the sand in a shapeless mass. When persistently annoyed the old male slowly raises his head, and retracting the proboscis opens the mouth very wide. He does not bellow loudly but there is much blowing out of the breath through the nostrils with a gurgling sound, the whole proboscis vibrating heavily with the effort.

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*Cleveland says of the southern species that it has "a trunk fifteen inches long;" meaning doubtless its full length back to a point opposite the angle of the mouth.

In our largest skull—twenty-three and three-quarter inches long—the distance between the canines and the orbit is nine and one-half inches. In the dried and still unmounted skins of our three males, the distance between the tip of the proboscis and the eye averaged twenty-three inches, but the skins may have been somewhat stretched. In the largest of these skins the distance from the first row of whiskers to the tip of the snout, is fourteen inches. In the largest male obtained by Harris, the distance from tip of proboscis to eye was eighteen inches, making the length of the proboscis forward from the canines about nine inches. Scammon (Proc. Acad. Nat. Sci., Phila., 1869, pp. 61-63) says, "the proboscis of the northern species in a large male extends from opposite the angle of the mouth forward about fifteen inches." The United States National Museum has a skull obtained at San Cristobal Bay in 1884 by C. H. Townsend which is twenty-four inches in extreme length.

Sometimes when the head is turned up, the proboscis relaxes until it hangs into the open mouth. The animal may continue to turn its head over backwards until the half-relaxed proboscis actually overhangs to the rear. We did not at any time see the trunk thrown into a rounded or tubular form. In fighting it is closely retracted and the seal is apparently successful in keeping it out of harm's way, as many of the animals with badly damaged necks, had trunks showing no injury whatever.

When the proboscis is fully retracted it exhibits three bulging transverse folds on top separated by deep grooves. The upper groove remains distinguishable when the proboscis is relaxed, while above it the upper fold remains as a fleshy hump. We did not observe any actual inflation of the trunk, which, as examined during the skinning operations, is fibrous and fleshy throughout. There was no special expansion of the nasal passages observable, and while the photographs appear to indicate an inflation, such is not the case; the heavy folds of the retracted proboscis must be produced by purely muscular action. It cannot be capable of inflation in the sense that the trunk of the male hooded-seal (*Cystophora*) is inflated. The massing of the heavy fleshy appendage into compact folds on top of the head, is really the opposite of inflation. There is little indication of the proboscis in the half-grown male; it probably does not develop until sexual maturity is reached. Under excitement both female and young extend the nose into a sharply pointed tip.

A careful examination of all available published photographs of the Antarctic species has failed to show in any case, a proboscis as long as those shown in our photographs of the northern species.

Food.

I have not found anything in the stomach of the elephant seal that would serve to indicate the nature of its food; in fact we never found anything but a handful of sand. Our captive elephant seals refused to eat fresh fish during the two days voyage to San Diego and took no food for more than a week after their journey overland. In the New York Aquarium they have subsisted entirely on fresh fish cut into moderate sized pieces, but

greatly preferred it alive. Live crabs and bits of seaweed placed in their pool always remained untouched.

They doubtless feed on live squid like the fur seal, but refused the dead squid we took pains to procure for them. Peron found cuttlefish beaks and *Fucus* in the Antarctic elephant seal's stomach. Lambert says, "their food is chiefly kelp, but I have found squid in their stomach." Harris found "tiny sardines not more than two inches long" in the stomachs of some of the elephant seals taken at Guadalupe Island; such fishes being abundant at the mouths of the sea caves near by. Cleveland describes the food of the southern species as consisting of "cuttlefish and mollusks."

The heavy claws of the fore flippers may be useful to the animal in procuring mollusks from sandy bottom.

Young.

The yearling elephant seal is somewhat heavier and longer than the nursing pup, but is proportionately more slim, brownish gray in color and has longer whiskers. The nursing pup is *black* and its length is about four feet. It is so remarkably fat as to be practically unable to move, while the yearling is quite active. None of the six yearlings brought to the New York Aquarium exceeded five feet in length. Their weights varied from 167 pounds to 301 pounds, males being heavier than females.

The nursing female was usually accompanied by a yearling, as well as a young pup. Doubtless the presence of the yearling with the adult female accounts for the conflicting statements of sealers about the breeding season. Judging from the conditions that we observed at Guadalupe Island, the breeding season begins just before the first of March. The period of gestation must be nearly twelve months,* as the females with black pups about a week old, were already mating. I am convinced that the young animals I described in 1884 as pups were really yearlings. I never saw the *black* pup until 1911, and there are none in museums, at least in America.

*Twelve months is known to be the period of gestation in the fur seal. Captain Cleveland makes the statement that the female of the southern elephant seal "gives birth to young twice a year," but his observations on this point have been misinterpreted. He says mating begins in November, which is the beginning of summer; a second mating would mean a breeding season at the beginning of winter, which is incredible.

It is to be regretted that we did not bring back the skin of a nursing pup and the whole head and proboscis of a large male for anatomical study. In our desire to treat this unique herd with due consideration, we have relinquished, temporarily at least, the opportunity to thoroughly investigate the character of the proboscis. With the exception of the large female, the specimens procured were such as could be taken with the least possible injury to the herd as a whole. Some of the yearlings taken alive, I regret to state, have already become available for anatomical purposes.

The yearling frequently emits a sound not unlike the scream of the peacock. On first landing we were unable to account for these singular noises and ascribed them to sea-gulls, but soon discovered their true source. This call or scream is most frequently heard when the yearling is disturbed or trampled on by larger animals.

The taking of the live yearlings was a simple matter. Some heavy pieces of netting were thrown over the animals into which they were tightly rolled, so that the sailors could handle them without fear of being bitten or of their climbing out of the boats. On board ship they were for a time given the freedom of the decks, but later were kept in a pen. They showed no inclination to bite either while on the ship or when they were received at the New York Aquarium.

The photographs of the young animals taken at the Aquarium show some attitudes which were not observed on the beach at Guadalupe Island. Assuming that they were yearlings when captured at Guadalupe, they are now (February, 1912) twenty-three months old. While the animal is plump and rounded when at rest on the floor of the empty seal pool, it may look quite slim when stretching up its head to the hand of a visitor. The neck becomes remarkably drawn out, and it may reach upward until the tips of the flippers are lifted from the flooring.

Another attitude which the young animal takes at times, shows it balanced upon the stomach with the forequarters elevated until the tips of the front flippers are clear of the floor, the head turned far backward and almost touching the hind flippers which are lifted nearly as high as the head. It can also turn the head backward until the nose touches the floor. We did not succeed in getting photographs of these two attitudes.

Although handled but little, they are very amiable, only opening the mouth when approached too closely by the photographer. In swimming about the pool the fore flippers are seldom used. The animals often go to sleep under water, stretched out on the floor of the pool. The eyes of the elephant seal are remarkably large and lustrous. They are suggestive of the eyes of nocturnal animals, and it may be that the species is more active by night than by day.

Distribution Since 1880.

The number of elephant seals known to have been killed or captured in Lower California from 1880 to 1911 is shown in the following record:

1880	San Cristobal Bay, Schooner San Diego	30
1882	San Cristobal Bay, Schooner San Mateo	46
1883	San Cristobal Bay, Schooner ———	110
1883	Guadalupe Island, Schooner ———, Wentworth, Master	80
1884	San Cristobal Bay, Sloop Liberty, Morrison, Master	93
1884	San Cristobal Bay, Schooner San Diego	40
1884	San Cristobal Bay, Schooner Laura, Morrison, Master (C. H. Townsend in charge)	16
1884	Guadalupe Island, Schooner San Diego	4
1892	Guadalupe Island, Schooner Santa Barbara, Hunt, Master (C. H. Townsend in charge)	7
1904	Guadalupe Island, Schooner ———, Mullett, Master	4
1907	Guadalupe Island, Schooner Freia (C. M. Harris in charge)	14
1911	Guadalupe Island, U. S. S. Albatross, G. H. Burrage, U. S. N. Comdg. (C. H. Townsend in charge)	10
	Total	454

The above record is probably far from complete, as only 600 animals (including those now at Guadalupe Island) accounted for in forty or fifty years would be but slow increase for animals of the seal tribe. It is interesting to note that the record of killings as far as we have it, is limited to two localities, and one of these, San Cristobal, has yielded nothing since 1884.

Continued Existence.

The northern elephant seal has persisted as a race under the most adverse conditions. Its pursuit for oil as carried on prior to 1860 or possibly 1865, having nearly exterminated it, there

followed a period of comparative immunity during which its numbers slowly increased. Again subjected to persistent slaughter from 1880 to 1884, it disappeared for a time and was not seen until rediscovered at Guadalupe Island in 1892. Since then thirty-five elephant seals have been killed at Guadalupe for museum purposes. Had that island been visited by seal oil hunters, the elephant seal would probably not be in existence to-day.

Present Number.

When the *Albatross* left Guadalupe on March 4, 1911, there were not less than 125 elephant seals on the rookery. The breeding season having just commenced and the number of adult females present being considerably less than the number of adult males, and less than half the number of yearlings, there is reason to believe that the adult female portion of the herd would be better represented before the end of the month. The present size of the herd may therefore be estimated at 150 animals of all classes.

Eleven days later when the *Albatross* reached San Cristobal Bay on the Peninsula, I examined the site of the old rookery at that locality without finding any indication of its being occupied. We found no signs of elephant seals at either San Benita or Cedros Islands where the ship called on the voyage southward. I examined the shores of San Benita very thoroughly. Both of these islands were formerly breeding resorts of the species.

Distinctness of the Northern Species.

The specific distinctness of the northern elephant seal is well shown in the accompanying photographs of skulls of *M. angustirostris* and *M. leoninus* in the American Museum of Natural History. The skulls are those of adult males and both exceed twenty-two inches in extreme length, *angustirostris* being longer, while *leoninus* has the greater zygomatic width.

In the northern species the zygomatic arch is heavier throughout than in the southern species. In the former the jugal at its narrowest point has nearly twice the height of that of the latter, while its extreme length is considerably less. Its

upper posterior branch is higher and the inferior branch shorter than in the southern species. Its union with both maxillary and squamosal is decidedly less oblique and its upper portion is more strongly curved inward.

The frontal portion of the skull is much higher and narrower than in *M. leoninus*. The lower jaw is higher and its angle greater. Other aspects of the skulls show strongly marked differences, which appear also in the four other skulls examined.

Protection.

The northern elephant seal as we have seen, now breeds only on Guadalupe Island. Its numbers are slowly increasing and it is to be hoped that it will not be molested by seal oil hunters. The principal source of danger to this herd lies in the fact that its existence is now known in California where small-scale hunting enterprises to Lower California are sometimes organized.

The island is not inhabited and the Mexican government has not heretofore been interested in the protection of its animal life. It lies 140 miles off shore in latitude 29° 10′ N., and longitude 118° 18′ W., is twenty-one miles long and has an elevation near its northern end of 4,523 feet.

A plan was presented by the writer to the Secretary of Commerce and Labor, whereby the Guadalupe herd might be protected through United States customs houses on the Pacific coast by the refusal of clearance or entry to vessels dealing in seal products from Mexican waters. We also urged that the matter of protection of the elephant seals be brought to the attention of the proper authorities in Mexico with a view to securing concerted action. We are now informed that the Secretary of State has received information that the Mexican authorities have taken steps to prevent the killing of these seals, and the Secretary of the Treasury has been requested to assist in the work of protection through the administration of the customs.

New Information.

The observations made in 1911 on the elephant seal, together with the specimens and photographs which were secured, appear

to yield information on some features of its natural history which have hitherto been obscure. The following points may be noted:

The northern species is unquestionably distinct.

It now breeds only at Guadalupe Island and there are probably about 150 of the animals in existence.

The trunk of the adult male eighteen feet long, has a length of nine or ten inches forward from the canine teeth.

The trunk is not capable of inflation, but is retracted into heavy folds on top of the head by muscular action.

The breeding season begins a few days before March first and the period of gestation is twelve months.

The color of the young at birth is black.

The yearling emits a call or scream unlike the voice of any other seal.

The food preferred by the yearling and two-year-old in captivity is fish.

The yearling and two-year-old frequently lift the head and the hind flippers above the back until they nearly meet.

NOTE.—I have recently found in Blackwood's Magazine for December, 1818, some interesting information about the elephant seal of Tristan-da-Cunha Island, which lies in mid Atlantic in the latitude of the Cape of Good Hope. The article contains a letter written at Tristan-da-Cunha in 1811 by J. Lambert, from which I quote the following: "Sea-elephants . . . are plenty and they pup yearly, coming up in the months of August and September for that purpose. About a month or five weeks they take the male and then go off to feed, and in six weeks come up and remain a month of two to shed their old coat and get a new one, and from that time are for the most part lying in the sun asleep.

"The males, however, stay off longer, as they of course require a longer period to feed. Their food is chiefly kelp, but I have found squid in their stomach. . . . This last season I think 1,000 pups were brought forth on this island, and as many more on the other two, and I suppose when I passed near those islands they must have been almost innumerable, seeing some parties or other have been oiling here ever since and so many yet remain. If they are not disturbed for two or three years, the increase must be great and profitable, especially if their skins are attended to and salted.

"We have killed about eighty since we landed, and suppose we shall kill about two a week through the year. We have made about 1,000 gallons of oil. . . . The elephant in general makes about a barrel of oil, though some of the males will produce 100 gallons; of course there would be as many skins as barrels of oil, besides, at least, 1,000 pup skins, which are very fine and pretty, and would no doubt average a dollar each."

The Challenger Expedition did not find the elephant seal at Tristan-da-Cunha in 1873, the last having been seen, according to Moseley, "two years before."

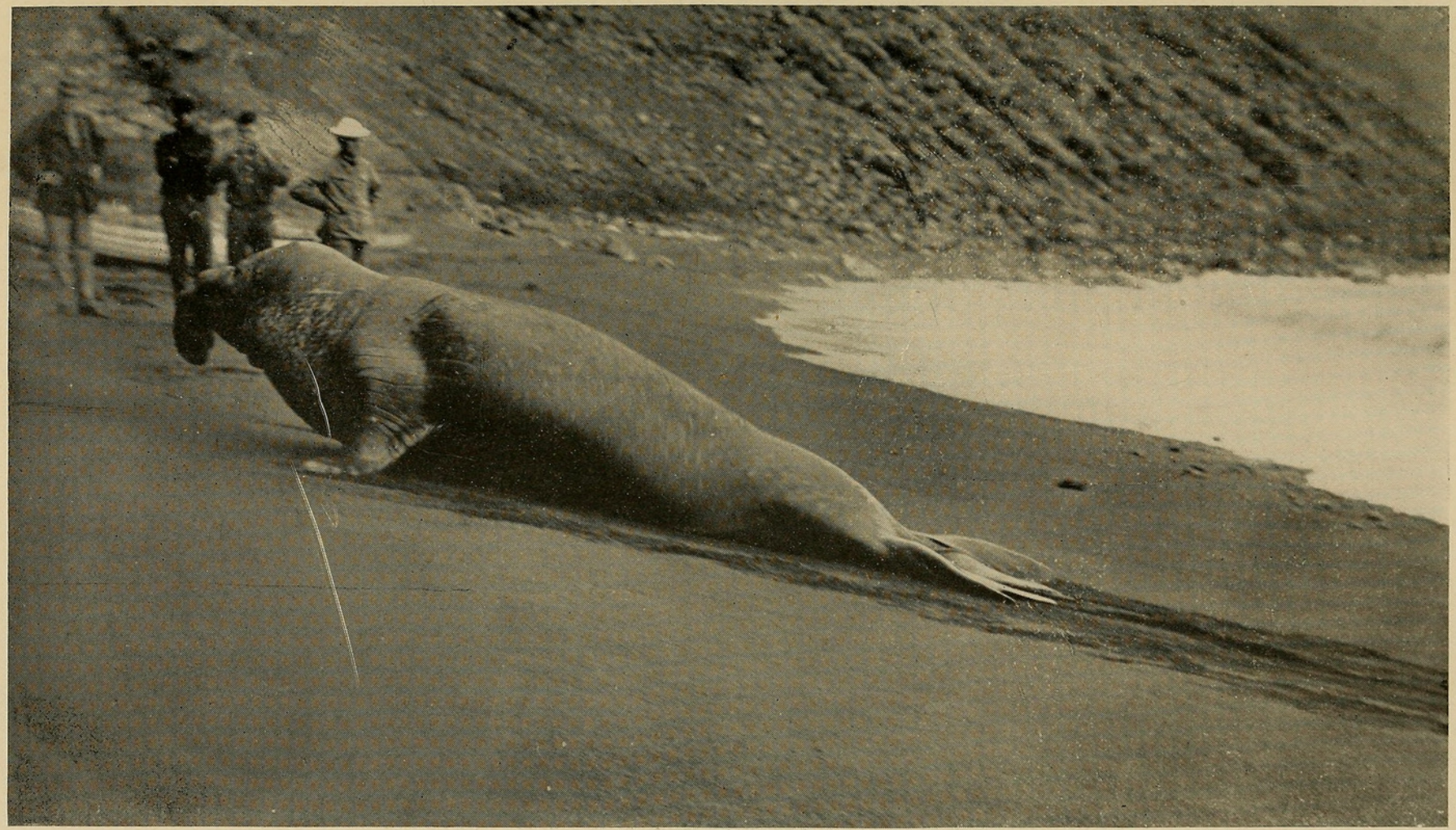

FIG. 53. MALE ELEPHANT SEAL SIXTEEN FEET LONG.

Crawling attitude with proboscis relaxed and almost dragging on the sand. The hind flippers are usually trailed in progression on land.

FIG. 54. ADULT MALE ELEPHANT SEAL THROWING SAND ON HIS BACK.
The head is turned backward until the proboscis overhangs to the rear.

FIG. 55. MALE ELEPHANT SEAL THROWING SAND ON ITS BACK WITH FORE FLIPPERS. PROBOSCIS PARTLY RELAXED.

FIG. 56. MALE ELEPHANT SEALS APPROACHING TO FIGHT.
When within striking distance, both rear high on fore flippers, retract proboscis and open mouth very wide.

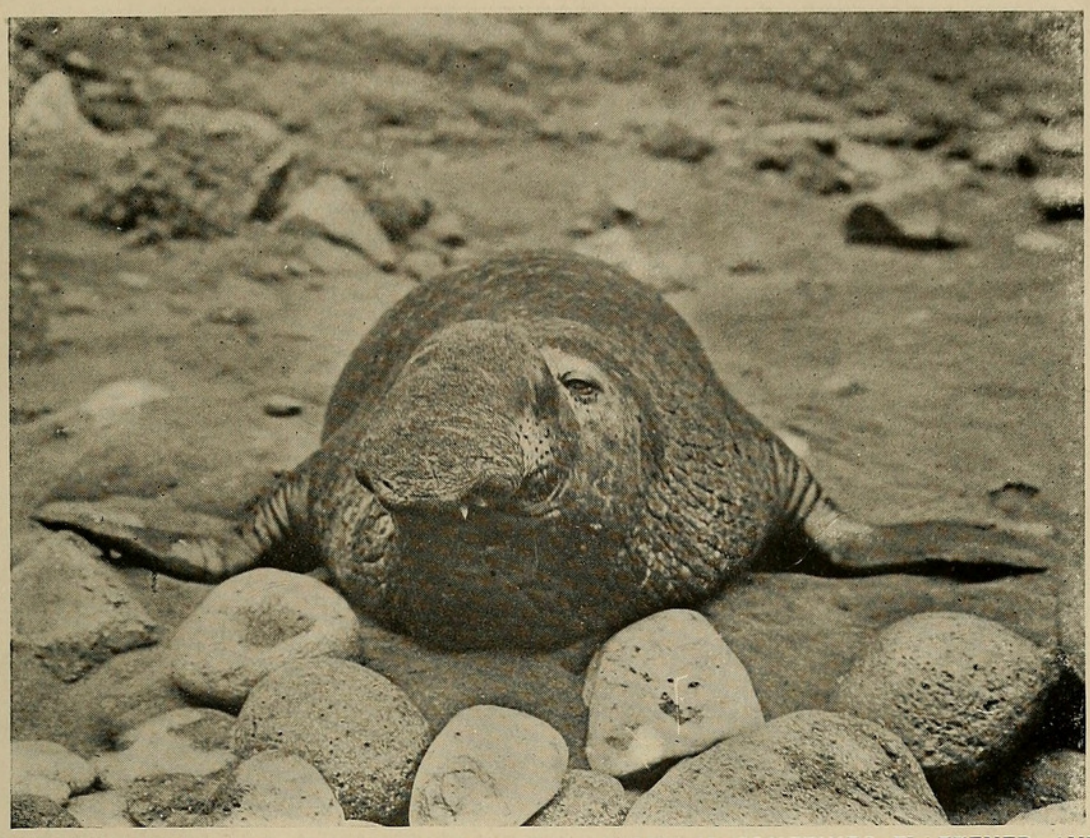

FIG. 57. ADULT MALE ELEPHANT SEAL. THE SNOUT IS SOMETIMES FLATTENED AND APPEARS VERY BROAD.

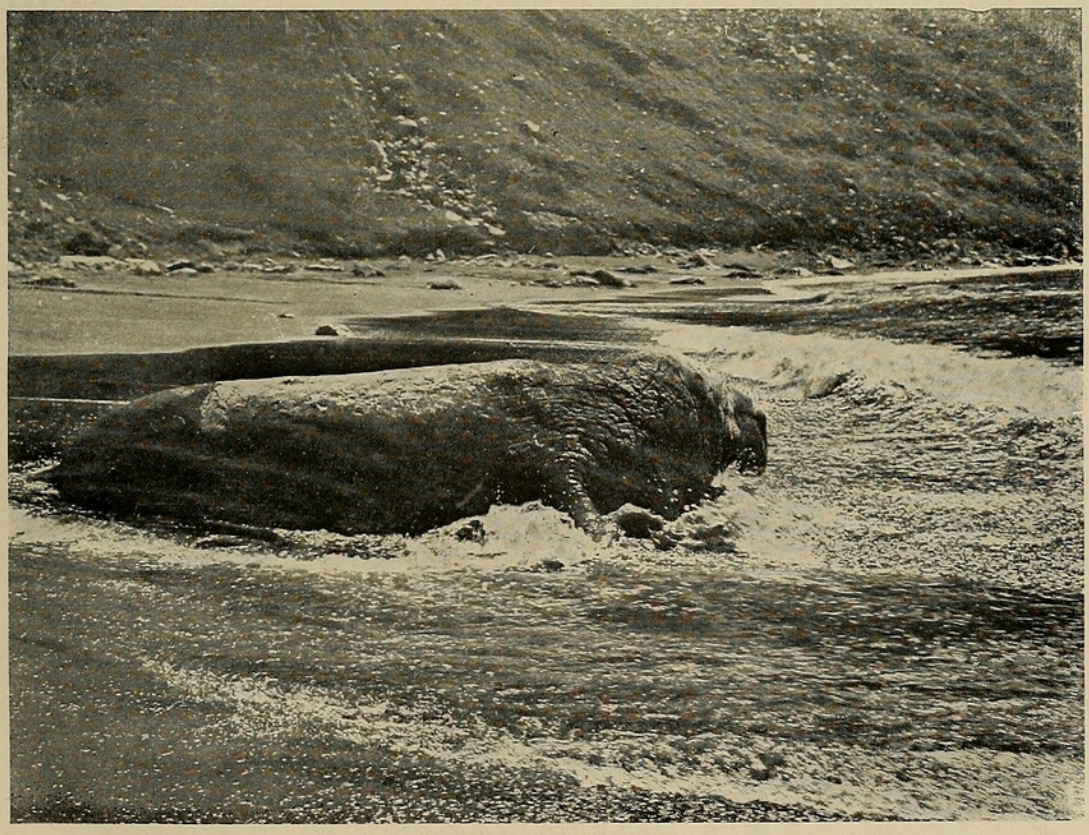

FIG. 58. ADULT MALE ELEPHANT SEAL CRAWLING INTO THE SURF.

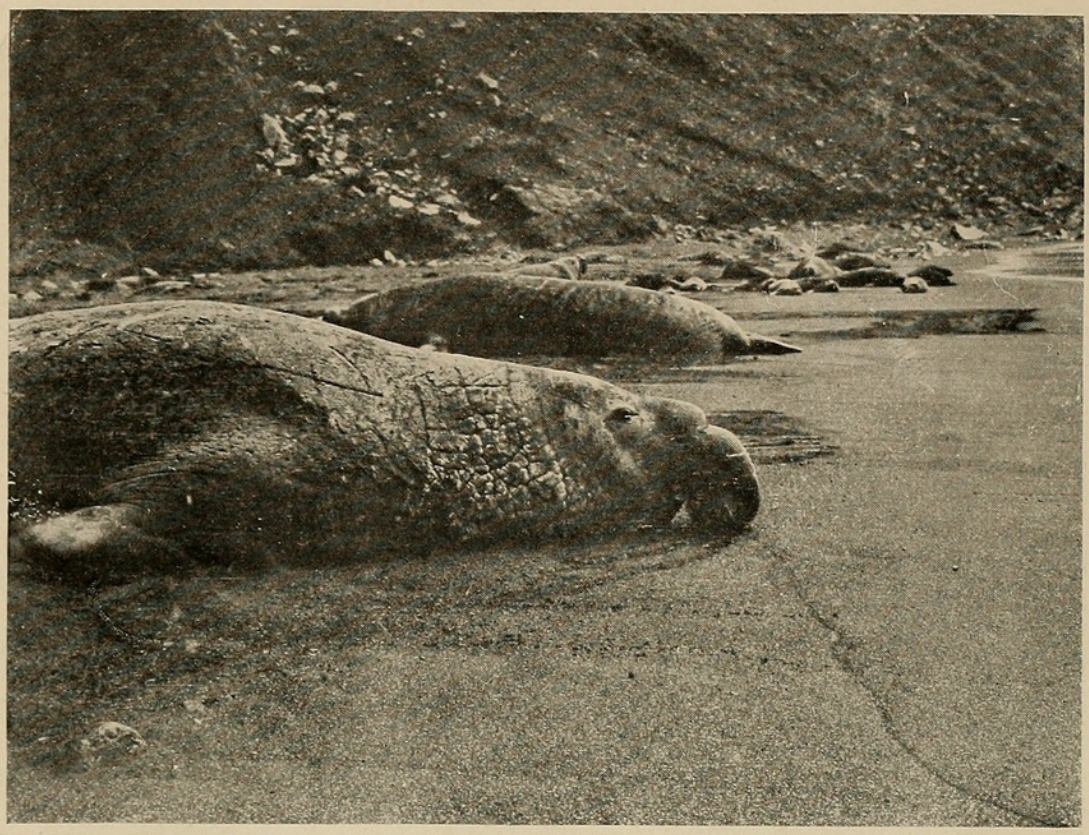

FIG. 59. ADULT MALE ELEPHANT SEAL SLEEPING—BODY AND SNOUT RELAXED, TIP OF SNOUT TURNED UNDER.

FIG. 60. ADULT MALE ELEPHANT SEAL.

The proboscis is drawn into heavy folds on the forehead, the back of the neck deeply wrinkled. The calloused shield of the neck and chest extends about half way round the neck. The fore flippers are powerful and easily raise the fore quarters from the ground.

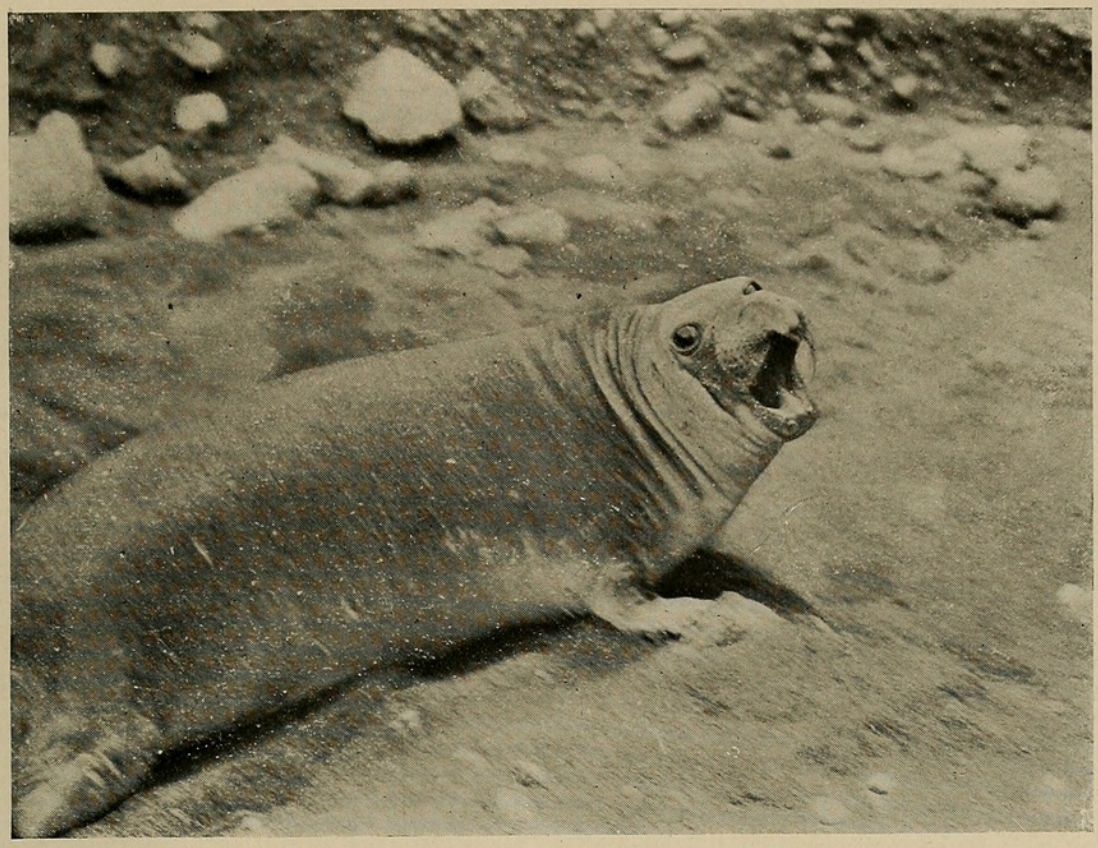

FIG. 61. ADULT FEMALE ELEPHANT SEAL. UNDER EXCITEMENT THE NOSE IS PROJECTED INTO A POINTED TIP.

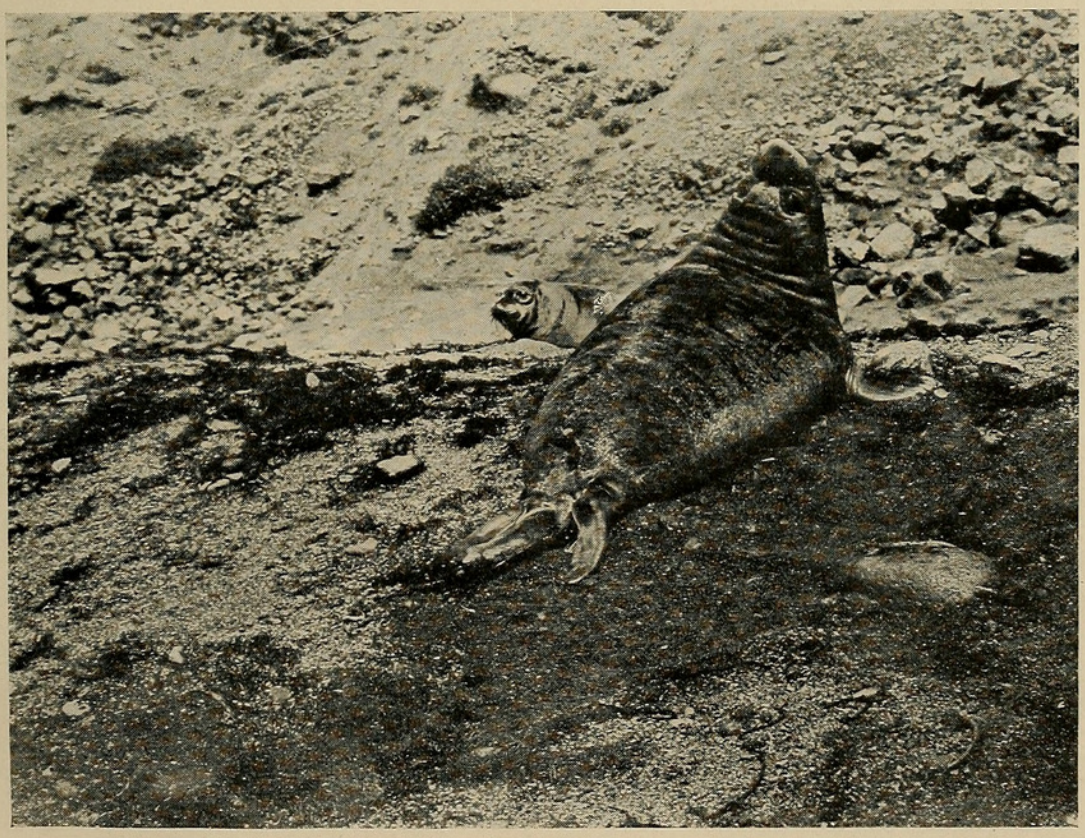

FIG. 62. VIEW OF BLACK PUP, SHOWING ITS EXCESSIVE FATNESS.

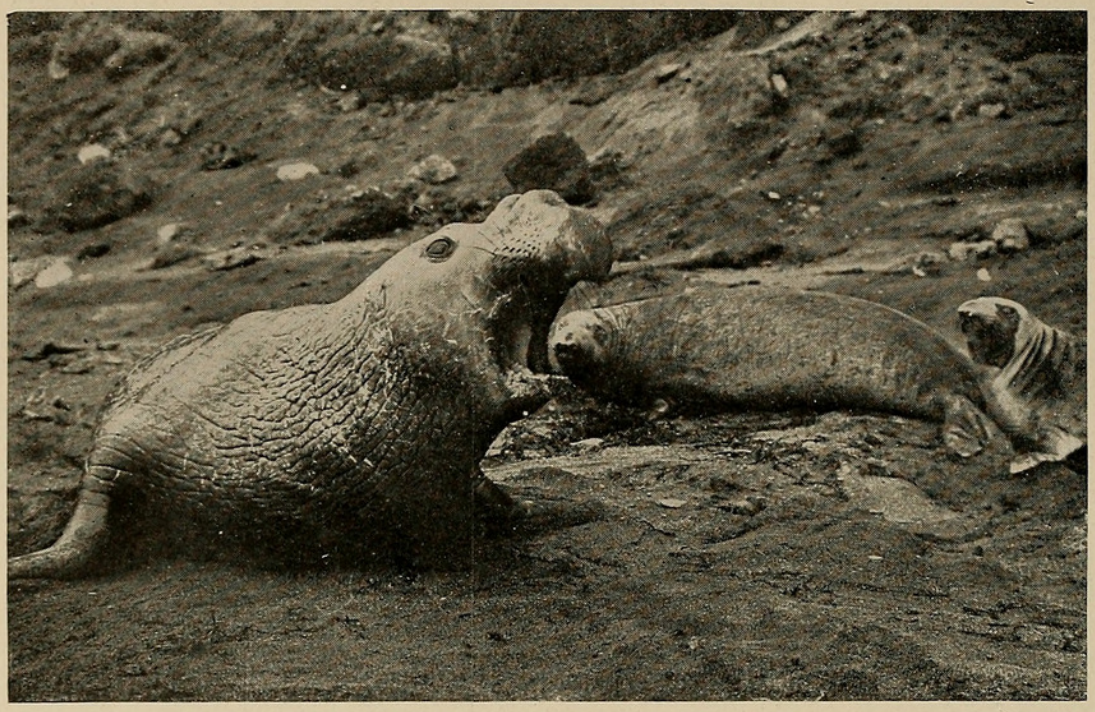

FIG. 63. ADULT MALE, ADULT FEMALE AND YEARLING.

The male is thoroughly aroused and in threatening attitude. The whiskers are erected and the mouth opened wide. The large canines are concealed by the pendant tip of the proboscis.

FIG. 64. ELEPHANT SEALS, ADULT MALES, FEMALE, BLACK PUP AND YEARLING.

Male at left with proboscis relaxed and its tip spread.

FIG. 65. ADULT MALE ELEPHANT SEAL WITH PROBOSCIS PARTLY RELAXED.
The eye is large and lustrous.

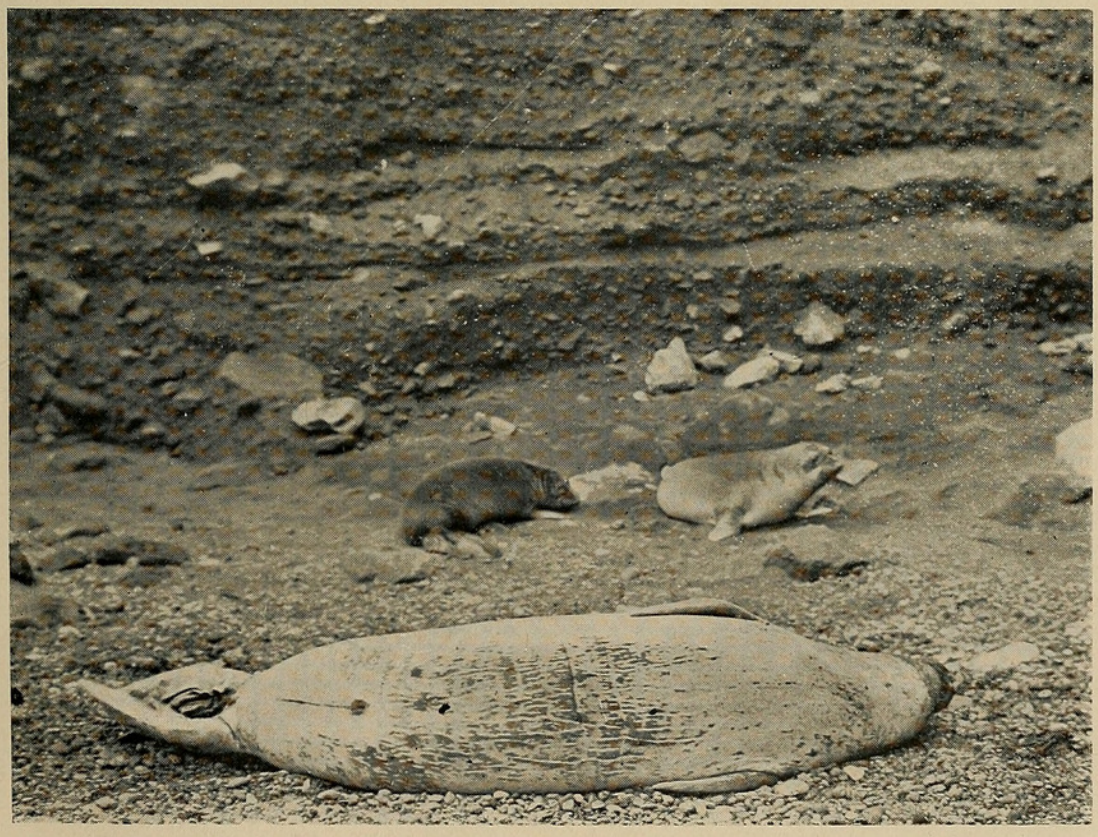

FIG. 66. SLEEPING IMMATURE MALE, YEARLING AND BLACK PUP.

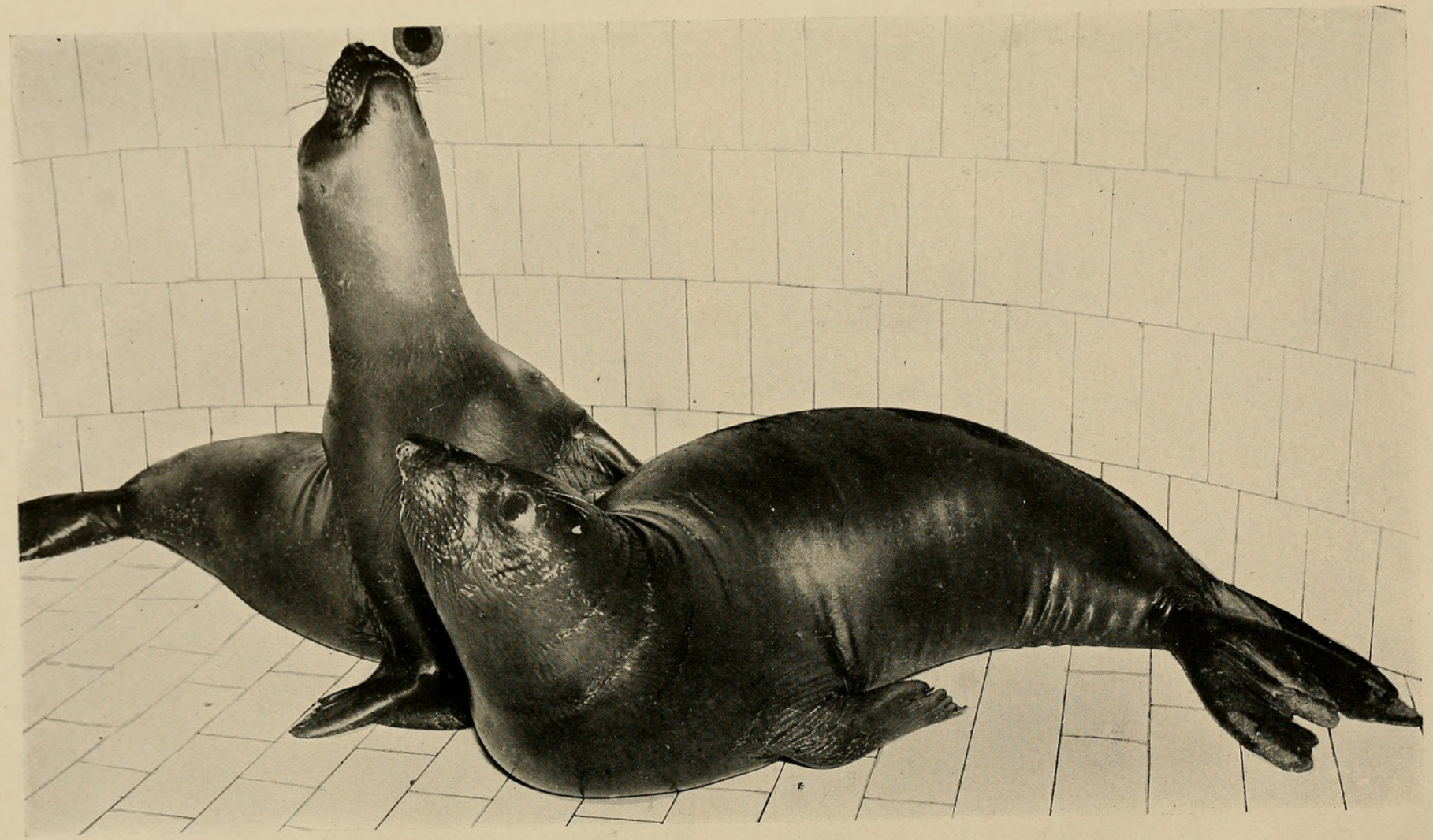

FIG. 67. ELEPHANT SEALS NEARLY TWO YEARS OLD IN NEW YORK AQUARIUM.

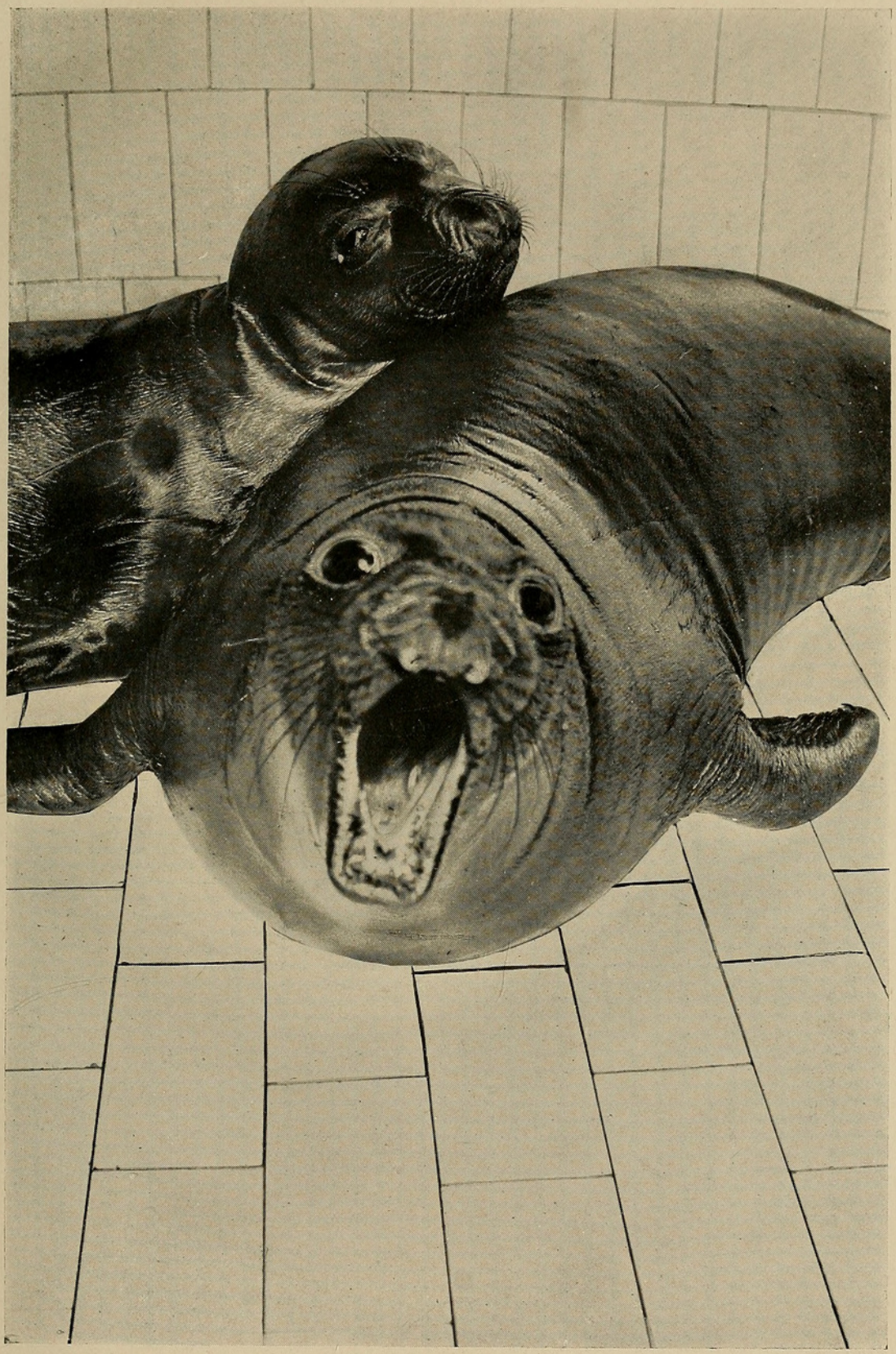

FIG. 68. ELEPHANT SEALS NEARLY TWO YEARS OLD IN NEW YORK AQUARIUM.
No other species of seal opens the mouth so wide when in threatening attitude.

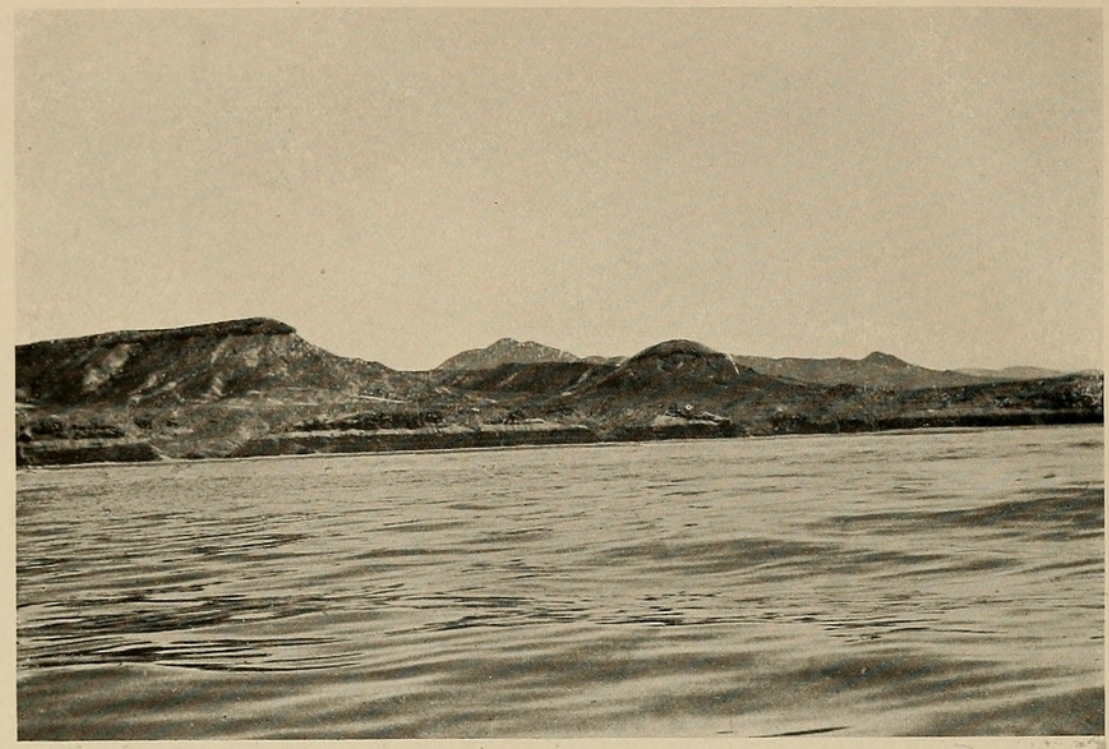

FIG. 69. A PORTION OF THE COAST AT SAN CRISTOBAL BAY, LOWER CALIFORNIA, FREQUENTED BY ELEPHANT SEALS AS LATE AS 1884.

The animals generally occupied the mouths of the gullies, the beaches under the bluffs being narrow. The coast of this part of the Peninsula is totally lacking in fresh water for a distance of over 100 miles, and has always been uninhabited.

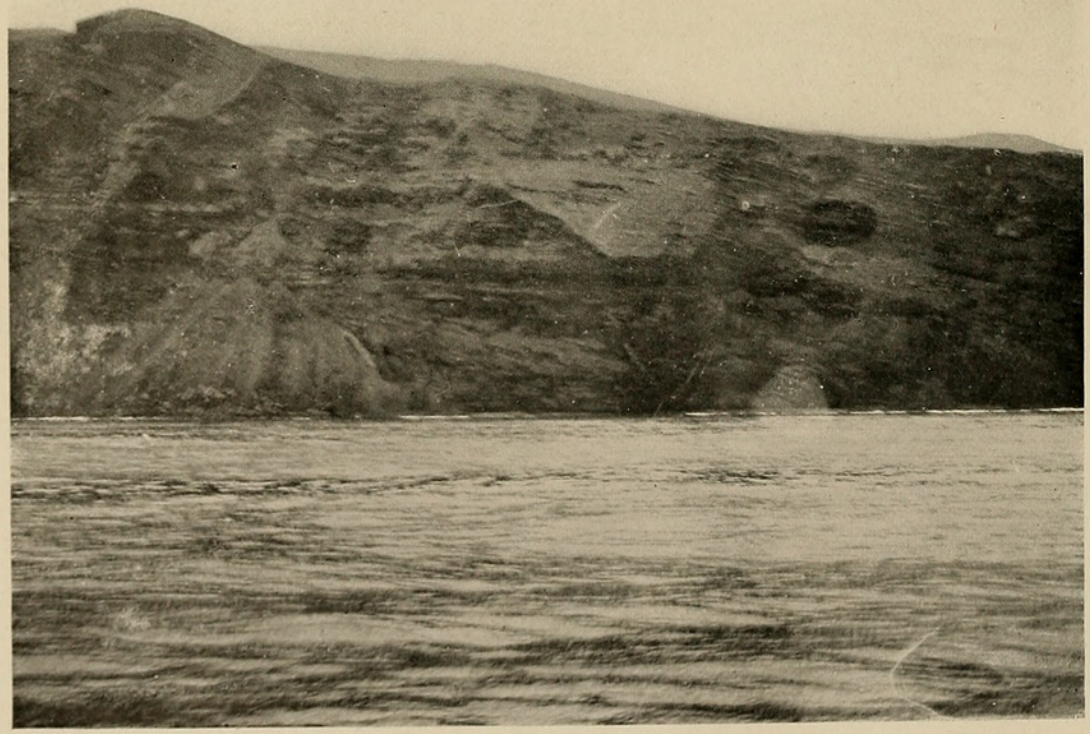

FIG. 70. NORTHWEST SIDE OF GUADALUPE ISLAND, AT DISTANCE OF ONE MILE.

Small beach occupied by elephant seals is in center of picture, near large rock slide.

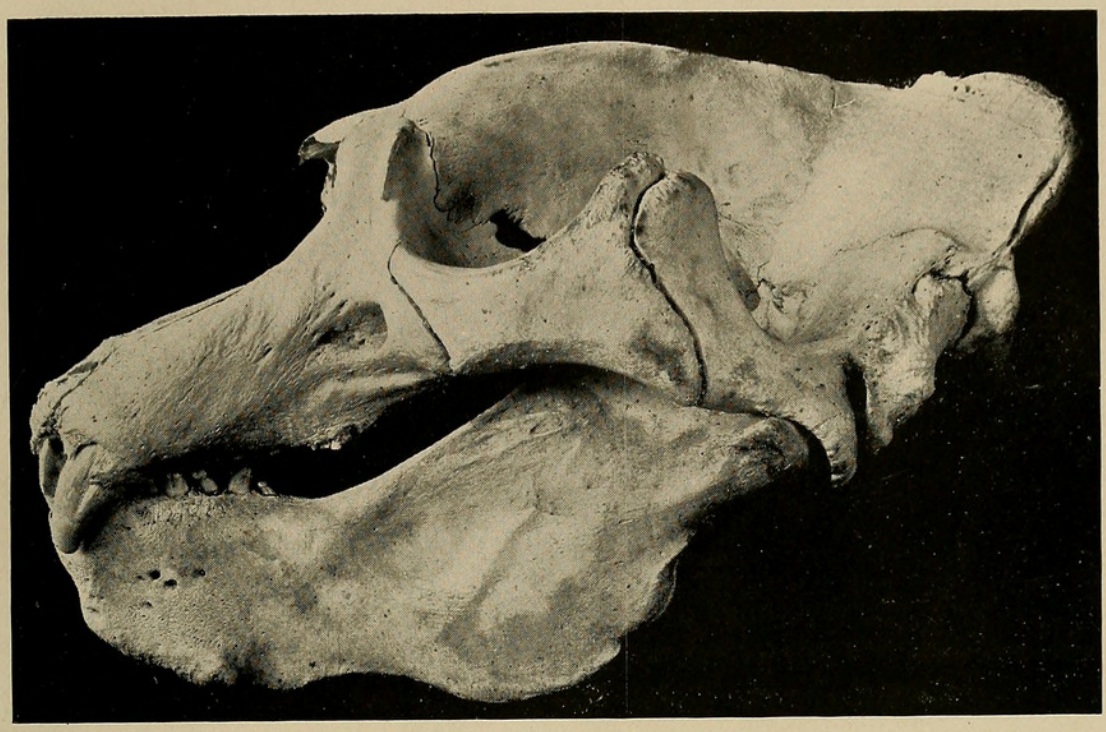

FIG. 71. SKULL OF ADULT MALE *MACRORHINUS ANGUSTIROSTRIS*, FROM GUADALUPE ISLAND, LOWER CALIFORNIA.

Extreme length 23⅝ inches, extreme zygomatic width 13⅞ inches.

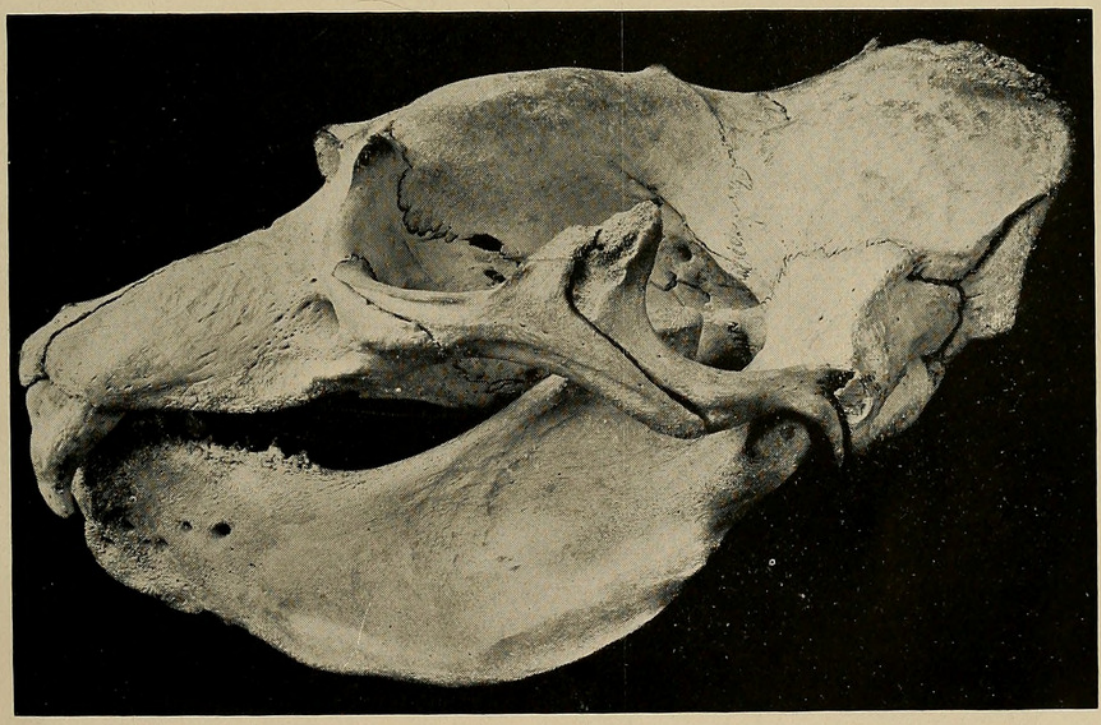

FIG. 72. SKULL OF ADULT MALE *MACRORHINUS LEONINUS*, KERGUELEN ISLAND, ANTARCTIC.

Extreme length 22¼ inches, extreme zygomatic width 14½ inches.