Pribiloff seals extends as far south as the latitude of southern California, the return course following the coast. The Com­mander seals reach the latitude of southern Japan and return on their course. The fur-seals find their food, chiefly squid, Alaska pollack, and especially a small smelt-like fish *(Thero- brοmus callorhinι),* in deep water, and their feeding-grounds in Bering Sea and on the migrations lie mainly along the 100- fathom curve.

The Commander Islands were discovered by Vitus Bering in 1 741, and our first knowledge of the northern fur-seal herds comes from the notes of Georg Wilhelm Steller, a German naturalist accompanying Bering’s expedition. The Pribiloff Islands were discovered in 1786 and transferred with the territory of Alaska to the United States in 1867. Up to 1867 the catch taken by the Russian Company holding the Alaska monopoly was about 75,000 yearly. Between 1868 and 1897 the reported catch of seals from the Pribiloff herd on land was 2,440,213, and 651,282 were reported as taken by pelagic sealing; but the latter is certainly greatly under the truth. From 1867 to 1902 the fur-seal catch was worth, it has been estimated, about $35,000,000. From 1870 to 1890 the United States government leased the islands to the Alaska Commercial Company, and in 1890 the monopoly passed to the North American Commercial Company; this lease expired on the 1st of May 1910, and was not to be renewed. The catch was limited to 60,000 in 1890 and 1891; 7500 in 1892 and 1893; 20,000 in 1894; 15,000 in 1895, 20,000 in 1897; 30,000 in 1896, 1898-1903; and 15,000 in 1904, 1905 and 1906. The total number of skins shipped by the lessees from 1870 to 1906 was 2,135,248. From 1868 to 1906 the receipts from royalties on skins was $9,311,054·77, and the expenses of the United States were $1,353,015·53 (including $349,464·88 for agents, $254,051·49 for supplies to natives, $483,842·65 for Bering Sea awards and commission, and $41,000·31 for investigation of the fur-seal fisheries in 1898-1899); besides this, from 1890 to 1895 the government expended $1,410,722 for the policing of Bering Sea and the prevention of illegal pelagic hunting.

The Russians worked out the principle, based on the polygamous habit of the animals, of affording absolute protection to the breeding female herd, and confining the killing to the superfluous males. The young males, or bachelors, “ haul out ” to rest and sleep on beaches adjacent to, but distinct from, the breeding-grounds. Here they are surrounded at night by the sealing gangs, rounded up in droves of from 1000 to 3000, and driven inland to the killing-grounds. The large droves are broken up into successive “ pods, or groups, of from 20 to 50, of which the “ killable" seals (animals of three years of age or approximating to such in size) are knocked down with clubs, those too large or too small being allowed to escape. The skins are removed, salted in kenches and, when cured, are exported. The two important processes in dressing the skins are the removal of the long hairs which grow out through the short thick fur, and the dyeing

of the fur itself black.

The decline in the fur-seal herds of Bering Sea is due to the growth of a rival sealing industry—the hunting of the animals at sea with spear or shot-gun, known as pelagic sealing.@@1 Stragglers from the migrating herd had from the earliest times been taken by the Indians of Cape Flattery and Vancouver island, going out from the shore in their canoes, but the number so captured was small. In 1879, however, sailing vessels began to be used to carry the hunters and their canoes out to the main body of the herd, and to enable them to follow its movements. The industry developed rapidly, by 1892 employing a fleet of 122 sailing vessels, each with from five to twenty hunting crews. The catch at sea grew to a maximum in 1894 of 140,000 skins. The operations of the fleet gradually extended to cover the entire migration route of the herd, and in 1883 the sealers entered its summer feeding-grounds in Bering Sea. Pelagic hunting, necessarily indiscriminate, affected most seriously the herd of breed­ing females. Investigations carried on in Bering Sea in 1895 and 1896 show that from 62 to 84% of the pelagic catch were of this class, the death of the female involving the death of her unborn offspring, as well as that of the unweaned young. From 1870 to 1902 the “ pelagic" catch has been estimated (Jordan) as 1,000,000, nearly half the corresponding total for the land-catch.

The abuse of pelagic sealing naturally created much indignation

in America. Under sanction of a claim made by Russia in 1821 to exclusive jurisdiction in Bering Sea (a claim decided by the Paris Tribunal of 1893 to be untenable), the United States in 1886 seized sealing vessels operating in that sea—among them Canadian vessels. This brought on a diplomatic discussion with the British government, which culminated in 1892 in a treaty by which it was agreed to submit to arbitration the claims of the United States to jurisdiction in Bering Sea in the interests of her fur-seal herd when beyond the ordinary territorial limits. The Tribunal of Arbitration met in Paris in 1893 (see Bering Sea Arbitration). Its decision was adverse to the contentions of the United States, and equally adverse to the life of the fur-seal herds. As agreed upon in such event, the tribunal formu­lated a set of rules for the regulation of pelagic sealing, with a view to the protection of the seals. These regulations provided fora close season in May, June and July, and a protected zone of 60 m. radius about the breeding islands. The regulations failed of their object, because the breeding females do not feed within the protected area, but far outside, and are therefore taken without restriction on the feeding-grounds in August and September, their young being left to starve.

In 1896 it was agreed between the United States and Great Britain that a new investigation of the facts of seal life should be made. At the close of this inquiry in 1897 the two Commissions met in Washington as a Joint Conference of Fur Seal Experts, and after a discussion of the results of their labours, a substantial agreement was reached on all essential facts. On the basis of this agreement the fur-seal question passed into the hands of a Joint High Commission, representing Great Britain, the United States and Canada, called at Quebec in September 1898 to consider a number of questions at issue between the United States and Canada. There the matter rested. Meanwhile the herds continued to decline, and the pelagic catch itself fell rapidly with the depleted herds.

The following is a summary of the fur skins from various sources over the period 1743 to 1897:—'

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| --- | --- |
| From all sources prior to 1868 . | . 3,197,154 |
| Land sealing, 1868-1897, Pribiloff herd | . 2,440,213 |
| ,, „ Commander herd . | 942,736 |
| Pelagic sealing, 1868-1897, Pribiloff herd | 651,282 |
| „ „ Commander herd | 312,247 |
| Lobos Island skins | 316,746 |
| Cape Horn skins | 122,390 |
| Grand Total | . 7,982,768 |

For a full account of the fur-seals and the fur-seal industries, reference should be made to the reports of D’Arcy W. Thompson, Commissioner for Great Britain, and his associates, for 1896 and 1897 *(Parliamentary Papers,* “ United States,” No. 3 [1897], and No. **I** [1898]), and especially to the final report of David S. Jordan, Commissioner for the United States, and his associates, for the same years (Treasury Department Document No. 2017, *Fur Seals and Fur Seal Islands of North Pacific Ocean,* 4 vols. and atlas, Wash- ington, 1898). Other papers of importance are: H. W. Elliott’s “ Monograph of the Seal Islands of Alaska,” Bull. 147, *U.S.* *Fish Commission* (1882), and the report of C. H. Merriam and T. C. Mendenhall, the American Commissioners for 1891, *Proc. Paris Arbitration,* ii. 311-396.

SEALING WAX. In medieval times, when the principal use of sealing wax was for attaching the impression of seals to official documents, the composition used consisted of a mixture of Venice turpentine, beeswax and colouring matter, usually vermilion. The preparation now employed contains no wax. Fine red stationery sealing wax is composed of about seven parts by weight of shellac, four of Venice turpentine, and three to four of vermilion. The resins are melted together in an earthenware pot over a moderate fire, and the colouring matter is added slowly with careful stirring. The mass when taken from the fire is poured into oiled tin moulds the form of the sticks required, and when hard the sticks are polished by passing them rapidly over a charcoal fire, or through a spirit flame, which melts the superficial film. For the brightest qualities of sealing wax bleached lac is employed, and a proportion of perfuming matter—storax or balsam of Peru—is added. In the commoner qualities considerable admixtures of chalk, carbonate of magnesia, baryta white or other earthy matters are employed, and for the various colours appropriate mineral pigments. In inferior waxes ordinary resin takes the place of lac, and the dragon gum of Australia (from *Xanthorrhoea hastilis)* and other resins are similarly substituted. Such waxes, used for bottling, parcelling and other coarser applications, run thin when heated, and are comparatively brittle, whereas fine wax should soften slowly and is tenacious and adhesive.

@@@l A temporary cause for the shrinkage of the herd was the ravages of the *Uncinaria,* a worm which attacked the infant seals; in 1906 it seemed no longer to be present.