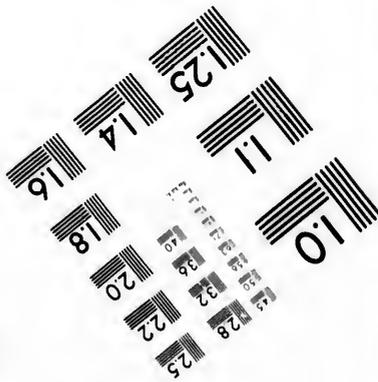
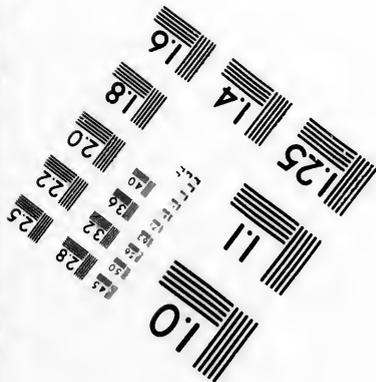
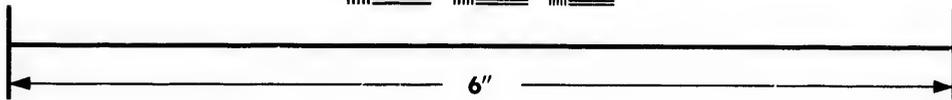
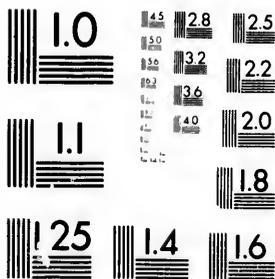


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

15
16
18
20
22
25
28
32
36
40
45
1.8

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

© 1981

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>									

The copy filmed here has been reproduced thanks to the generosity of:

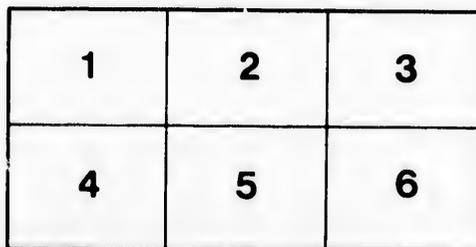
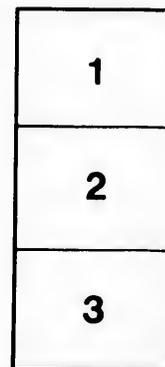
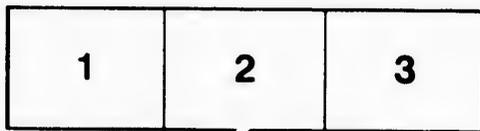
Library Division
Provincial Archives of British Columbia

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Library Division
Provincial Archives of British Columbia

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

Wlp
972.2
1144

PHILOSOPHICAL SOCIETY OF WASHINGTON

BULLETIN VOL. XIII, pp. 123-162

ALASKA AS IT WAS AND IS
1865-1895

BY



WILLIAM HEALEY DALL

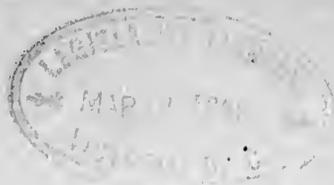
ANNUAL PRESIDENTIAL ADDRESS DELIVERED BEFORE THE PHILOSOPHICAL
SOCIETY OF WASHINGTON, DECEMBER 6, 1895

WASHINGTON
PUBLISHED BY THE SOCIETY
DECEMBER, 1895

6.4.36.

5

Usp
972.2
D144



ALASKA AS IT WAS AND IS:
1865-1895.

BY

WILLIAM HEALEY DALL.

[The annual presidential address, delivered before the Philosophical Society of Washington, December 6, 1895.]

In 1864 the apparent hopelessness of the attempts to establish a workable transatlantic telegraph cable led those interested in telegraphic communication with Europe to consider other means of attaining that end. It was thought that a short cable across Bering strait might be made to work, and no doubt was entertained of the possibility of maintaining the enormously extended land lines which should connect the ends of this cable with the systems already in operation in Europe and the United States. A company was formed for this purpose, and an expedition to undertake the explorations necessary to determine the route was organized. The coöperation of the Russian and American governments was secured and the necessary funds subscribed. Searching for properly qualified explorers, the promoters of the enterprise consulted the Smithsonian Institution and were brought into communication with Robert Kennicott, of Chicago, a young and enthusiastic naturalist, who had already made some remarkable journeys in the Hudson Bay territories in the interest of science. His explorations had taken him to the most remote of the Hudson Bay posts—Fort Yukon, on the river of the same name—regardless of every kind of hardship, privation, and isolation. His ardor was so contagious that before returning to civilization he had communicated it to almost every one o.

18—Bull. Phil. Soc., Wash., Vol. 13.

(123)

1301

Pacific N. W. History Dept.
PROVINCIAL LIBRARY
VICTORIA, B. C.

the hard-headed fur traders in that remote and inhospitable region, and for years afterward bird skins, eggs, ethnological specimens, and collections in every branch of natural history poured from the frozen north into the Smithsonian Museum by hundreds and thousands.

When Kennicott, after traveling for months on snowshoes, sledges, or bateaux, stood at last on the steep bluff at Fort Yukon, he saw the yellow flood of the great river surging by the most remote outpost of civilization and disappearing to the westward in a vast and unknown region. An uninhabited gap of hundreds of miles lay between him and the nearest known native settlement to the west. Far in the north the midnight sun lighted up the snowy peaks of the Romanzoff mountains, whose further slope it was believed gave on the Polar sea. No one knew where the Yukon met the ocean. On most maps of that day a large river called the Coivile, found by Simpson on the Arctic coast as he journeyed toward Point Barrow, was indicated as the outlet of the Yukon watershed. South of the Romanzoff mountains for an unknown distance vast tundras, scantily wooded with larch and spruce, the breeding grounds of multitudes of water fowl, intersected by many streams, but level as a prairie, extended to the west.

The native population of this region, as far as known, had always been scanty, and an epidemic of scarlet fever, introduced some years before through contact with other tribes trading to the coast, had swept them absolutely out of existence. Not an individual was left, and the nomadic natives who reached Fort Yukon from the east and southeast hesitated to approach the hunting grounds, where the mysterious pestilence might linger still.

Obliged to terminate his explorations here, Kennicott returned, after months of weary travel, to the United States, but cherished the hope of some day penetrating the *terra incognita* on whose borders he had been obliged to pause and turn away. The dream of his life was thereafter the exploration of Russian America, the discovery of its fauna,

and the determination of its relations to the fauna of Siberia and Japan. The group of young zoölogists which gathered about him at the Chicago Academy of Sciences, an institution of which Kennicott was practically the creator, was frequently roused to enthusiasm by impromptu lectures on the problems to be solved, the specimens to be collected, and the adventures to be anticipated in that virgin territory.

The need of the telegraph company for one familiar with life and conditions in the north brought him the long sought opportunity, and he undertook to lead the exploration, provided he was permitted to utilize it for science to the fullest extent commensurate with the attainment of the objects of the expedition. He stipulated that he should be permitted to select a party of six persons who should be qualified to make scientific observations and collections in the intervals of other work, but who should hold themselves ready to do any work required by the promoters of the enterprise, even to digging post-holes for the line if called upon.

His terms were accepted, and the scientific corps of the expedition organized and started for San Francisco. Here two of the members were detailed to join the party engaged in exploring the route through British Columbia; the others, of whom the speaker was one, accompanied Kennicott to the north.

In July, 1865, the expedition entered the bay of Sitka and our acquaintance with Russian America began.

Sitka was then a stockaded town of about 2000 inhabitants, with a village of more than 1500 Indians outside the walls. The settlement contained a Greek church, a Lutheran chapel, shipyards, warehouses, barracks, a club-house for the officers, a sawmill, a foundry where brass, copper, and iron castings of moderate size were made, beside numerous dwellings. All the buildings were log structures, their outer walls washed with yellow ochre, the roofs chiefly of metal painted red. High above the rest, on an elevated rock, rose a large building, in which the governor of the Russian colonies had his residence. This, known to visitors

as the "castle," was built of squared logs, with two stories and a cupola and was defended by a battery. The warm colors of the buildings, above which rose the pale green spire and bulbous domes of the Greek church, seen against steep, snow-tipped mountains densely clothed with sombre forests of spruce, produced a picturesque effect unique among American settlements.

Outside the walls, along the beach, was a long row of large Indian houses, low and wide, without windows, built of immense planks painfully hewn out of single logs with stone adzes, whose marks could still be distinctly seen. They were entered by small, low doors, rounded above, so that he who came in must bend to an attitude ill suited to defense. The front of each house was painted with totemic emblems in red ochre. Their dimensions were sometimes as much as 40 by 60 feet, and the area within formed one large room, with the rafters visible overhead, the middle portion floored only with bare earth, on which the fire was built, the smoke escaping through a large square hole in the roof. On either side were raised platforms with small partitioned retreats like state-rooms, each sheltering a single family. As many as one hundred people sometimes dwelt in one of these houses. The only ornaments were totemic carvings, generally against the wall opposite the entrance; overhead hung nets, lines, and other personal property drying in the smoke along with strips of meat or fish and fir branches covered with the spawn of herring.

On the bank, which rose behind the houses, densely covered with herbage of a vivid green, were seen curious box-like tombs, often painted in gay colors or ornamented with totemic carvings or wooden effigies. These tombs sheltered the ashes of their cremated dead. On the beach in front of the houses lay numerous canoes whose graceful shape and admirable workmanship extorted praises from the earliest as well as the later explorers of the coast. When not in use these were always sheltered from the sun by branches of spruce and hemlock or tarpaulins of refuse skins. Among

the canoes innumerable wolfish dogs snarled, fought, or played the scavenger.

The natives still retained to some extent their original style of dress, modified now and then by a Russian kerchief or a woolen shirt. As a rule, they were barefooted, stolid, sturdy, uncompromising savages, who looked upon the white man with a defiance but slightly tempered by fear and a desire to trade. The mission church of that day was built into the stockade, with doors entering it both from the Indian and the Russian town. When services were held the outer door was opened, the town door closed and stoutly barred. Once these fierce clausmen had endeavored to rush into and take the settlement when the door leading inward had been left unfastened. From the time when the first white men to touch these shores, Chirikoff's boat's crew in 1741, were without provocation massacred, these natives had not failed to maintain their reputation for courage, greed, treachery, and intelligence.

These conditions outside the settlement necessitated a military discipline within it. Sentries regularly paced the walks by day and night, the sullen Indians were systematically watched, and the little batteries kept in readiness for use.

The needs of the business of the company, made Sitka a lively manufacturing town, in spite of the multitudinous Russian holidays. Society there was like a bit of old Russia, with the manners, vices, and sturdy qualities of sailor, peasant, and courtier fully exemplified within its narrow limits. A fishery at Deep lake, a few miles away, furnished fresh salmon in abundance, which was freely distributed to all comers twice or thrice a week during the season. The company furnished each employé with certain stated rations of flour, sugar, tea, etc., at fixed prices; the harbor, within a few yards of the stockade, contained abundance of seafish, and the Indians' price for a deer, skinned and dressed, was a silver dollar or a glass of vodka. The primeval forest came close to the town; the demand for firewood and timber had made little impression upon it. White settlements in the

Alexander archipelago were confined to a few small fortified trading posts. Fort Wrangell and Fort Tongass alone could be regarded as approximately permanent. The parties sent out to trade or hunt worked from a temporary camp or an armed vessel as a base, and, owing to the ill-feeling which existed between the natives and Russians, smuggling and illicit trading were rife. Missionary effort did not exist outside of Sitka, and even there amounted to little more than the bribery of some greedy savage to perform for a consideration some rites which he did not understand.

The law of Russia which prevented a permanent severance of a subject from his native soil (except for crime) operated to encourage temporary unions of the company's servants with native women. Marriages were not allowed between full-blooded Russians and natives, as at the expiration of his term of service the Russian must return to his own parish in Russia, and the native could not be carried away from the place of her nativity. After the transfer of Alaska to the United States many of these Russians elected to remain in the country and were married to the mothers of their children; but at the time of our first visit the most surprising social fact to us was the perfect equality which appeared to subsist between these irregular partners and the married women who had come from Russia. So far as we could perceive, both classes behaved with equal propriety and were treated with equal respect by the community, and the only restriction which the authorities insisted upon was that no Russian should take to himself a partner who had not been duly baptized. The issue of these unions, being of Alaskan birth, were free to marry in the country, and with their descendants constituted the class to which the Russians gave the name of "Creoles." Some of them rose to eminence in the service, and one at least became governor of the colonies.

At the time of our visit the business of the colony was exclusively the development of the fur trade. Agriculture was confined to a trifling amount of gardening very imperfectly performed. The fisheries were utilized only to supply food

for the people in the company's employ, or to insure subsistence for the natives whose time was devoted to hunting the sea otter or preparing skins for the authorities. The fur trade of southeastern Alaska was not very productive. The natives were disposed to trade with the Hudson Bay Company or illicit traders rather than with the Russians, partly because they obtained better prices for their skins and partly because the Russians refused to trade intoxicating liquors, while the outsiders were not troubled with any scruples in such matters. The furs were divided by the Russians into two classes—the precious furs, such as the fox, sea otter, and sable, which were strictly reserved for the company, a certain proportion being imperial perquisites of the Russian court, and the cheaper sorts, which might be used by the company's employés for winter clothing, and were sold at a fixed price to them for this purpose. This included the muskrat, mink, Parry's marmot or ivrashka, the fur seal, and some others. Dry skins of the fur seal were sold at the company's warehouse for 12½ cents apiece, the modern plucking and dyeing of the fur, invented by an American, Raymond, of Albany, not having reached a perfection sufficient to attract the fashionable world.

The European trading goods and supplies were mainly brought by ship from Hamburg, the same vessel taking the annual load of skins to China, where an exchange was made for tea and silk, which were carried back to Europe. Flour was imported latterly from California and some goods were brought from Aian and other ports on the Okhotsk sea in the early days of the business, but in 1865 this trade had come to a standstill or nearly so. In mineral resources almost nothing was done; a little coal was taken out at Cook's inlet for local uses, and the exportation of ice from Kadiak to California was carried on under a lease by an American company. The presence of gold, iron, and graphite was known to the authorities, but prospecting was not encouraged, as it was supposed the development of mineral resources might react unfavorably on the fur trade.

The first codfisherman visited the Shumagin islands in 1865. The whale fishery was wholly in the hands of Americans and other foreigners, uncontrolled by the Russians, and the timber was used only for local purposes.

The main business of the company was done at its continental trading posts in the northern part of the territory and in the Aleutian chain; its authority in the territory was as absolute as the presence of the uncivilized tribes would admit. Under the guns of the trading posts the company was master; out of their range every man was a law unto himself.

After transacting its business at Sitka the expedition touched at the island of Unga to examine a coal mine, at Unalashka, the Pribiloff islands, and at Saint Michael's, Norton sound, where Kennicott and the explorers for the Yukon were landed. The speaker was put in charge of the scientific work of the expedition and remained with the fleet, visiting Bering strait, where landing places for the cable were searched for; and Petropavlovsk, the capital of Kamchatka, where the Siberian parties were provided for; and then the vessels returned to San Francisco.

The following year, on returning to Saint Michael's, we were met by the news of Kennicott's death from heart disease, brought on by over-exertion and anxiety. The Yukon exploration was still incomplete, though information received made it certain that the Kwikhpak of the Russians and the Yukon and Pelly of the English were one and the same river. It remained to emphasize this information by a continuous exploration which should cover the unmapped portion of this mighty stream. The scientific work in zoölogy projected by Kennicott had been left by his premature death unrealized. The speaker determined to carry out these plans and was authorized to remain in the country for that purpose.

As soon as sufficient snow had fallen to render sledging practicable a portage from Norton sound to the Yukon river was traversed, a small boat transported on a sledge for use

during the following summer, and the Yukon ascended on the ice to the trading post at Nulato, a distance of some three hundred miles. Here the party of five wintered and in March divided into two parts—one, under Frank Ketchum, taking sledges with the intention of traversing the unknown region on the ice and after reaching Fort Yukon to ascend further in canoes; the other to await the break-up of the ice in May and follow in the skin canoe, so as to rescue the first party should they have failed to carry out their plans. Both projects were successfully carried out and the two parties reunited at Fort Yukon on the 29th of June, 1867. They returned by the whole length of the river and reached Saint Michael's on the 25th of July. Here astonishing news awaited us: The Atlantic cable was a triumphant success, the United States were in negotiation for the purchase of Russian America, our costly enterprise was abandoned, and all hands were to take ship for California.

The collections and observations had been but half completed. The natural history of the Upper Yukon and the borders of Norton sound had been pretty well examined, but the vast delta of the Yukon, with its wonderful fauna of fishes and water birds, its almost unknown native tribes and geographic features, remained practically untouched. I immediately determined to remain and devote the following year to the unfinished work. An arrangement with the Russians was made and this plan carried out. In the autumn of 1868 I left Norton sound for California on a trading vessel and returned to civilization.

At the time our explorations of the Yukon began this immense region was occupied by two or three thousand Indians, many of whom had never seen a white man. The Russian establishments on the Yukon were only three in number, hundreds of miles apart, and chiefly manned by Creole servants of the company, not over a dozen at each post. An inefficient priest, with a few alleged converts, conducted as a mission of the Greek church the only religious establishment in the whole Yukon valley. The industries of

the region comprised trapping, hunting, and fishing; the first for revenue, the others for subsistence. The means of navigation were birch-bark canoes and small skin-boats. Once a year the clumsy barkass of the Russians, loaded with tea, flour, and trading goods, was laboriously forced upstream to the Nulato post, returning with a load of furs. The tribes of Eskimo extraction occupied the lower river banks from the sea to the Shageluk slough, above which they were replaced by Indians of the Tinneh stock. These were to be found in scattered villages at various points on the river or its tributaries, where the abundance of fish offered means of subsistence. The extreme limit of population was to be found at the junction with the Yukon of the large river Tananá, where the island of Nūklūkayét was recognized as neutral ground, where delegations from all the tribes met in the spring for their annual market of furs. Here our party had the interesting experience of meeting the delegation of Tananá Indians in full native costume of pointed shirts and trousers of dressed deerskin adorned with black and white beads, the nasal septum pierced to carry an ornament of dentalium shell, their long hair formed into a bundle of locks, stiff with tallow, wound with beads, dusted with powdered hematite and the chopped down of swans. The ranks of frail birch canoes were accurately aligned, and their paddles rose and fell with military precision. When they rounded the point of the island and approached the beach, where stood the first white men they had ever seen, they were met by a complimentary salvo from the guns of the Indians already on shore, and responded by wild yells and graceful waving of their paddles.

The waters of the Tananá had never known an explorer and its geography was wholly unknown. Never again will it be possible for an ethnologist to see upon the Yukon such a body of absolutely primitive Indians untarnished by the least breath of civilization.

Above Nuklukayét the Yukon enters a cañon, known as the Lower Ramparts, above which the depopulated area already

alluded to extends to the site of Fort Yukon, near the British boundary on the Arctic circle.

The noble stream I have described extends, including windings, about 1,600 miles from Fort Yukon to the sea. The valley is sometimes wide and low, sometimes narrow and contracted by low, wooded mountains. Everywhere until the delta is approached the banks are wooded. There are many tributaries, none of which were then explored, and on either side of the main artery the land stretched unexplored for hundreds of miles. Not another person speaking any European tongue except the Russian was resident in all this territory during the second year of my sojourn. Outside of the three trading posts, not a native had ever bought a pound of flour or an ounce of tea. The use of woolen clothing had hardly begun, and soap was a rare and costly luxury. I made the first candles ever molded on the Yukon, and but for the lack of hardwood ashes to furnish alkali would have tried my hand at soap. People lived on game and fish. The caribou was plentiful in the absence of rifles; the moose was not yet exterminated; the warm days of spring brought incalculable multitudes of ducks and geese, to say nothing of other water fowl; the Arctic rabbit and the ptarmigan were a constant resource, and the rivers and lakes in many places teemed with fish. Clothing was made of deer-skin and sewed with sinew; the ornaments were fringes from the gray wolf or wolverine. Undergarments were occasionally made of cotton bought from the traders, but more usually from the skins of fawns. At one village during the season for taking them I saw 4300 fawn skins hanging up to dry. Such reckless destruction has since borne its natural fruit. It was only at certain localities even then that deer were plentiful. The main staple of subsistence was fish. During the summer the river was studded with traps for salmon; in winter the traps were set in the ice, and under favorable conditions furnished a steady supply of white-fish, burbot, pike, grayling, and the great red sucker. The salmon were cleaned, split into three parts connected at the tail,

and dried in the open air by millions; they furnished food for man and dog, and when well cured were not unpalatable. Vegetable food was almost unknown, except in the form of berries. The green flower stalks of *Rumex* and *Archangelica* were occasionally eaten, and the dwellers by the sea sometimes gathered dulse, but for practical purposes the diet was meat and fish.

It was known that gold existed in the sands of the river, but the inexperienced fur traders looked for it in the bars of the main river and not in the side cañons of small streams, where it has since been found in such abundance. The real riches of the Yukon valley then lay in its furs. In a garret at Fort Yukon the post trader showed me with pardonable pride 300 silver fox skins of the first quality. Beautiful in themselves and for what they represented—gold, praises, and promotion in the service—one might almost forget that some of the company's servants at this post had not tasted bread or butter, sugar or tea for seven long years.

The region of the delta was and is still remarkable as being the breeding place of myriads of water fowl, some of which are peculiar to the Alaskan region. Nearly one hundred species gather there, and one of them comes all the way from north Australia, by the coasts of China and Japan, to lay its eggs and rear its young in the Yukon delta. It is also remarkable for the abundance of the great king salmon, sometimes reaching a weight of 130 pounds, a fish less plentiful further up and which does not ascend to the headwaters of the river.

All this immense territory has since been penetrated by traders and prospectors. Stern-wheel steamers have defied the current, and ply regularly on the river during the season of open water. Mission schools are numerous and reindeer scarce. The fur trade wanes, while many thousands of dollars in gold dust have been laboriously extracted from the gravels. The natives buy tea and flour and dress in woolen clothing. With the miners whisky has reached the wilderness, and the sound of the American language is

heard in the land. Tame reindeer have been imported from Siberia with a view to their domestication by the Eskimo of the Arctic coast, who are on the verge of starvation at frequent intervals, owing to the destruction of their food supply by the whalers and walrus-hunters and the introduction of Winchester rifles for killing the wild deer. With the alternative of starvation as a stimulus, the chances of success ought to be good.

In carrying out the plans which Kennicott had meditated, but which death had stayed, I had succeeded in gathering rather abundant material for my friends, the ornithologists, botanists, ethnologists, and so on, but to do it I had to put aside the work in the department in which I personally was most interested. The shores of Norton sound and the tundra of the Yukon valley offered little in the way of mollusks or other invertebrates. The desire to extend our knowledge of the geographical distribution of the sea fauna led me to propose a further exploration of the coasts of the territory, especially of the Aleutian chain, under the auspices of the United States Coast Survey. A geographical reconnaissance was undertaken and carried on during five years, investigating magnetism and hydrology, making charts, tidal observations, meteorological and hypsometric notes. In all this I was ably seconded by my companions, Mark W. Harrington and Marcus Baker, who need no introduction to this audience. At the same time and without interfering with the regular work the dredge was kept constantly busy, and on my return from field-work the material for the studies I had so long looked forward to was actually gathered.

The region which includes the Aleutian chain and other islands west of Kadiak presents a striking contrast to the densely wooded mountains and shining glaciers of the Sitkan region to the east and the rolling tundra cut by myriad rivers in the north. Approached by sea, the Aleutian islands seem gloomy and inhospitable. Omnipresent fog wreaths hang about steep cliffs of dark volcanic rock. An angry

surf vibrates to and fro amid outstanding pinnacles, where innumerable sea birds wheel and cry. The angular hills and long slopes of talus are not softened by any arborescent veil. The infrequent villages nestle behind sheltering bluffs, and are rarely visible from without the harbors. In winter all the heights are wrapped in snow, and storms of terrific violence drive commerce from the sea about them.

Once pass within the harbors during summer and the repellent features of the landscape seem to vanish. The mountain sides are clothed with soft yet vivid green and brilliant with many flowers. The perfume of the spring blossoms is often heavy on the air. The lowlands are shoulder high with herbage, and the total absence of trees gives to the landscape an individuality all its own. No more fascinating prospect do I know than a view of the harbor of Unalashka from a hilltop on a sunny day, with the curiously irregular, verdant islands set in a sea of celestial blue, the shorelines marked by creamy surf, the ravines by brooks and waterfalls, the occasional depressions by small lakes shining in the sun.

The sea abounds with fish; the offshore rocks are the resort of sea-lions and formerly of sea-otters; the streams afford the trout-fisher abundant sport, and about their mouths the red salmon leap and play. In October the hillsides offer store of berries, and in all this land there is not a poisonous reptile or dangerous wild animal of any sort.

The inhabitants of these islands are an interesting and peculiar race. Their characteristics have been well described by Veniaminoff, who knew and loved them. By the testimony of their language, physique, and culture they are shown to be a branch of the Eskimo stock, driven from the continent, as the shell-heaps reveal, at a very ancient date and isolated since from contact with any other native race, specialized and developed by their peculiar environment to a remarkable degree. Conquered by the Russian hunters of the eighteenth century, practically enslaved for a century, their ancient religion frankly abandoned for the rites of the

Greek church, an apathetic reticence replaced the rollicking good nature characteristic of the Eskimo people. In 1865 they were supported by the company; the men shipped off in hunting parties in search of the sea-otter were separated from their families sometimes for many months and rewarded according to their success; but, while the company provided food for all who needed it, the time of the Aleut was not his own. I have already mentioned that the fur-seal at that time had very little commercial value. The fishery on the Pribiloff islands was conducted by Aleuts under supervision, and the skins were mostly shipped to China or Europe. It has been noted as surprising that the value of the fur-seal fishery is so little referred to in the arguments urging the acquisition of the territory in 1867. This was not an oversight; the seal fisheries at that time were not especially lucrative, and the millions which the industry has since produced could not have been predicted in 1867.

At the time of my first visit and until very recently the sole productive industry of the Aleut people consisted in the sea-otter hunting and the fur-seal fishery. Much of their subsistence was and is obtained from the natural products of the region—fish, wild fowl, and the flesh of marine mammals. The custom of preparing clothing from the skins of birds and animals has long been abandoned. The Aleut and his family now dress in clothing of wool or cotton, burn kerosene in an American lamp, and cook their food on an iron stove. The barabora or native hut, built of sod and stones, has been generally replaced by a frame cottage, and the means for supplying these artificial wants has been obtained from the income derived from the seal and sea-otter. Now that these animals are approaching extinction, at least from a commercial standpoint, the question of how to provide even the modest income needed for these people is a serious one. While it is not yet settled that the half-starved Eskimo of the northern coast will adopt the new mode of life necessitated by the care and maintenance of large herds of tame reindeer, and the success of that experiment is still

questionable, there is no doubt in my mind that the introduction of the deer into the Aleutian chain is not only perfectly practicable, but that it offers the only solution of the problem of providing for the Aleuts which seems to possess the elements necessary for success. There are no predacious animals to molest the deer, like the wolves of the mainland; there is an abundant supply of forage, and the climate and conditions are those that the animal is known to thrive in. A herd introduced a few years ago into Bering island, on the Russian coast, and simply let alone and protected from dogs, has increased very much in number and will soon afford skins and tallow for export. There is no obvious reason why on most of the Aleutian islands equally good results should not be obtained. Some few deer were introduced upon the island of Amaknak, in the bay of Unalashka, a few years since, but they were the property of whites, not natives, were not protected from the numerous dogs of an adjacent settlement, and have not thriven.

When the time comes, and it seems not far away, when the natives realize that they must depend on the deer to replace the vanishing fur animals as a source of income, and when they can acquire property in deer, I believe the result will be all that could be wished.

In closing this summary of early conditions in the Territory and of the events which enabled them to be observed, it may not be out of place to summarize also the results of the scientific work of those years. Of course, only the more important points can be alluded to. As the Western Union Telegraph Expedition ended by a withdrawal from the country, and was the occasion of a large expenditure of money with no return to its promoters, no general report was ever officially prepared, and the work of the scientific corps was made known piecemeal in various technical journals. The published results were associated in the minds of students with the individual authors rather than with the expedition as a whole. The subsequent work under the auspices of the Coast Survey, which in fact grew out of the

work done or attempted in the earlier exploration, has been, so far as it was geographical, regarded very naturally as incidental to the usual work of that bureau, and so far as it has been of other sorts has not been connected in the public mind with any organization in particular. The fact that the Revenue Marine, the Army and Navy, the Signal Service, and several unofficial organizations or individuals have carried out praiseworthy explorations with most excellent results has led to the further obscuration of the earlier work as a connected whole. I believe no one of those engaged in it has yet attempted to enumerate the results, either general or scientific, directly or indirectly consequent upon the expedition. The present summary may therefore serve a useful purpose.

The most important result which indirectly came about from the explorations by our parties was the acquisition of Alaska by the United States. While the transfer might have been proposed and the question discussed if there never had been any Telegraph expedition, yet I believe, in view of the opposition which existed in Congress and the cheap ridicule of part of the daily press, that if it had not been for the interest excited by the expedition and the information which its members were able to furnish to the friends of the purchase the proposition would have failed to win approval.

But, leaving such questions apart and considering merely the scientific results, the expedition made weighty additions to geographical knowledge. To it we owe the first mapping of the Yukon from actual exploration, adding to the list of American rivers one of the largest known. Old maps of North America made the Rocky mountains extend in nearly a straight line northward to the Polar sea. Our explorations showed that the mountains curved to the westward, leaving a gap to the northward through which the Canadian fauna reached to the shores of the Pacific and Bering sea. The general faunal distribution of life at this end of the continent in its broader sense was settled then and there. A general knowledge of the country, till then practically un-

known except to a few fur traders, was obtained and made public. To the Coast Survey work of 1871-74 we owe some forty charts, a large proportion of which are of harbors or passages never previously surveyed. In preparing a Coast Pilot of southeastern Alaska, while that part of it useful to navigators was in the nature of things rapidly superseded, yet the work, being conscientious and thorough in the matter of names, practically settled the geographic nomenclature of that region for all time. The myth of a branch of the Kuro Siwo or Japanese warm current running north through Bering sea and strait and producing open water in the Polar sea still lingers in some dark corners of geographic literature; but our researches, covering actual observation, the whole literature, and scores of old manuscript logbooks, conclusively show that there is no such current as that referred to, and that the currents which do exist have no connection whatever with the Japanese stream. Meteorological observations were kept up in all those years, and afterward a complete synopsis of all the recorded meteorological data for that region was prepared and issued by the Coast Survey with abundant illustrations. One of the results of the magnetic observations made by our party, in the endeavor to correct the discrepancies between the variation of the compass needle as shown on the charts of Bering sea and strait and those observed by present navigators, was the discovery that the needle had reached its easternmost elongation and had for some time been receding in the amount of its variation. In gathering confirmatory data during 1874 and 1880 more than forty stations in all parts of the territory were occupied. As in the case of the meteorology, the literature and all practicable sources were ransacked for magnetic records,* and these, with our own observations, were utilized in the excellent discussions of Alaskan magnetism by Dr. C. A. Schott.

In geology we were tutored before sailing in 1865 by Professor Agassiz and carried with us a written schedule of ob-

*This work was almost entirely done by Mr. Marcus Baker.

servations to be made on the glaciers. Our explorations showed that north of the Alaskan mountains, as in some parts of Siberia, there are no glaciers, and there has been no glaciation in the ordinary sense, but that in its stead we have the singular phenomenon of the Ground-ice formation, a state of affairs in which ice plays the part of a more or less regularly interstratified rock, above which are the clays containing remains of the mammoth and other animals, showing that they became extinct not because of the refrigeration of the region, but coincidentally with the coming of a warmer climate.

In anthropology, in addition to large collections obtained from the living tribes, vocabularies, etc., the names and boundaries of all the tribes were obtained for the first time, the Eskimo were shown to exist on the Asiatic coast as immigrants driven by war from America, and a very ancient confusion of these people with the Asiatic Chukchi was definitely cleared up. The data obtained in regard to the various branches of the Eskimo stock brought welcome confirmation to the theory of Rink on the origin of this people—a theory which would probably have been by this time more widely known if it had been more sensational and less scientific.

The patient examination of many village sites, shell-heaps, and middens throughout the Aleutian chain resulted in the discovery that the successive strata, judged by the implements found in them, showed a gradual progress in culture from that of the lowest, a crude Eskimo type, to that of the uppermost stratum, which contained the evidences of Aleut culture of the type immediately before their subjugation by the Russians. This was, I believe, at that time the first instance in which the paleontologic method, if I may call it so, had been applied to the study of American shell-heaps.

In biology, the first object of the work planned by Kennicott had been the determination of what constituted the fauna and flora, and from that knowledge the determination of the relations between the Asiatic and American assemblies. This was accomplished in essentials, though it need

not be said that the details will still supply an opportunity for study for many a year to come. The enumeration of the greater part of the population of mammals, birds, and fishes has been accomplished and the plants have been fairly well collected, so that we know that the fauna and flora, deduction being made of circumboreal species, is essentially American and not tinged to any marked extent with Asiatic ingredients. Among the lower animals the brachiopods, hydroid zoöphytes and corallines; part of the sponges; the limpets, chitons, and nudibranchs among the mollusks; have been monographically studied. The crustacea, insects, and a large part of the mollusks yet remain to be worked up in a similar manner.

To close the record of achievement, I may mention the bibliography of Alaskan literature prepared by Mr. Baker and myself, which, up to May, 1879, when it went to press, comprised 3,832 titles in eleven languages. Since it was published by the Coast Survey nearly as many more have been accumulated, and the list probably will continue to increase from year to year.

Since my field-work closed, in 1880, Alaskans have not been idle. The prospector has invaded the recesses of the land, and surveys, explorations, and mountaineering have been almost constantly carried on. The tourist has discovered the country and written books which, although they have the resemblance of one pea to another, have nevertheless carried tidings of Alaska to most corners of the Union. Alaska in one sense is no longer unknown, and she is even beginning to be somewhat understood and appreciated. The missionary has been up and down in the land, and has done much good in many ways, not without occasional mistakes.

It was, therefore, with curiosity as well as interest that I returned to the territory last May, after an absence of fifteen years. In looking back on the summer's experiences, a comparison between the Alaska of 1865 and that of 1895 naturally suggests itself. I was rash enough twenty-five years ago to indulge in prophecy as to the future of the territory.

I did not count on the inertia of Congress or the stupidity of officials, as I might now. Nevertheless progress has been made, and a summary of present conditions, perhaps even a peep into the future, is not inappropriate at this time.

Since 1865 the fur-seal fishery has risen, produced its millions, and declined to a point where its close in a commercial sense may almost be predicted. The first fisherman sought the cod in that year, and a modest fleet has kept the business going ever since, with more or less fluctuation in the catch. The salmon canner was then unknown, but has since invaded nearly every important fishing site. The placer miner has developed and exhausted the gold of the Stikine region, and pushed on to the headwaters of the Yukon and its affluents. The clink of the drill and the monotonous beat of the stamp-mill are familiar sounds on the quartz ledges, which in 1865 lay peacefully under their blankets of moss. The whaling fleet has laid its bones on the sandy bars of the Arctic coast, while the innovating steam whaler has pushed its way past Point Barrow into the very fastness of the ice at Herschel island, to find, in its turn, its occupation gradually passing away. The imperial sea-otter is on the way to becoming a memory, and the Aleuts, his persecutors, are not unlikely to follow him.

As regards the inhabitants of the territory, a complete change is conspicuous. Some thousands of white fishermen, hunters, miners, and prospectors are now scattered along the coast and rivers, on the whole a hard-working, orderly set, with here and there a rascally whisky smuggler or a stranded gentleman. Apart from a few mining camps, the parasites who live by the vices of others are few. A country where he who would live must work is not attractive to them. Cut off from direct contact with the rest of the United States, Alaska is really a colony and not a frontier territory in the sense usually understood. As such, its needs should have been the subject of study and appropriate legislation, the neglect of which by Congress so far is bitterly and justly resented by the entire population. Into political matters I

shall not enter, but must observe that among the numerous ill-paid officials few are well prepared to handle all the difficult questions presented in such a community, and the executive, such as it is, is without the legal authority or the proper facilities for governing or even visiting the greater part of the region it is supposed to control. The state of the law is uncertain, the seat of authority obscure, divided illegitimately between naval officers, the revenue-cutter service, and a powerless governor, who, whatever his wishes and intentions, is not permitted by the law to control anything. If it were not for the orderly character and good sense of the white population, the territory might easily become a pandemonium. This condition of things is disgraceful, and reform is urgently needed.

The change in the native population of southeastern Alaska is very marked. In a general way a similar change has taken place all over the territory. The primitive condition of the natives has almost wholly disappeared. The turf-covered hut has given way to frame shanties; log houses are rarely built; the native dress has disappeared, replaced by cheap ready-made clothing; native manufactures, utensils, weapons, curios, all are gone, or made only in coarse facsimile for sale to tourists; the native buys flour and tea, cooks his salmon in a frying-pan, and catches his cod or halibut with a Birmingham hook and a Gloucester line. In the whole of southern Alaska, thanks to the schools, the children and many young people speak fairly good English. If the present influences continue, another generation will see the use of English universal and the native languages chiefly obsolete. The day of the ethnological collector is past. Southeastern Alaska is swept clean of relics; hardly a shaman's grave remains inviolate.

In other parts of the territory the same is more or less true. The native population is focusing about the commercial centers. The people gather where work and trade afford opportunities, and I have seen more than one pretentious church standing empty among the abandoned houses of a

formerly prosperous village. There is some admixture of blood in marriages between the often attractive "Creole" women and the incoming settlers. These marriages are often very fruitful, but the pure-blooded natives seem to be diminishing. The Aleuts, whose census is accurately made annually by the Greek church, are distinctly losing ground, and will doubtless pass away in a few generations. The same is probably true of the Tlinkit people. As we approach the Arctic region, changes of all sorts are less marked and civilization has had less effect. Here the subsistence of the natives presents serious and increasing difficulties. Their natural food supply has been practically destroyed by the whites and by repeating firearms, of which the natives have many. The whales are almost extinct, and the whaling fleet itself is nearly so. The walrus preceded the whale, and the hair seal has never been sufficiently abundant in this region for a sole resource. The chief salmon streams are or soon will be monopolized by the whites near the sea, and the natives of the upper Yukon will go hungry. The present law allows unrestricted fishing to the natives and a close time of one day a week for the whites. The latter hire the natives to fish during the prohibited day, and so the salmon have no close time. Where a salmon stream is monopolized by one firm, they do not usually cut their own throats by taking all the salmon, but where there are several competing firms there is little respite for the fish.

The cod fishery was for some years carried on by two competing firms, who have now composed their differences. They had salting stations on shore, and bought fish at so much a thousand from fishermen, who used small sailing vessels or dories and fished near shore. Now it is found cheaper and, for other reasons, preferable to return to the older system of fishing in the open sea from a sea-going vessel, as on the banks at the east. The preparation of the Alaska fish has often been hasty, careless, and inferior to that done in the east; so Alaska codfish, originally of equal

quality, are less esteemed commercially than the eastern cod. For some reason I do not understand the Pacific ocean at best offers but a small market for fish under present conditions, and so I look to see the codfishing industry develop slowly and perhaps be the last as it is, in my opinion, the most substantial and important of the resources of the territory. At present the salmon are commercially more important, but unless more effectively supervised and regulated they will meet with the same fate as the fisheries of California and the Columbia river. There should be a resident inspector at every important fishery, and as the business is carried on for at most two or three months in the year, a vigilant inspection by a cutter or fisheries vessel told off for this especial work would counteract any tendency to bribe the resident inspector. I have seen 3,500,000 pounds of canned salmon taken in one season from one small stream, representing at least 5,000,000 pounds of eatable fish, and it seems that an annual supply of the best fish food like that is worth preserving; but if the work is to be put into the hands of the lowest class of political appointees instead of intelligent experts, making the offices will not save the fish.

In the matter of furs we may regard the fur-seal fishery as doomed. It is probable that few of the pelagic sealers will pay expenses after this season, and two or three years are likely to see the end of the business. It is costing us much more than the catch is worth now, and the most sensible way of ending the matter is generally felt to be the destruction at one fell swoop of all the seals remaining on the islands and the abandonment of the business.

The continental furs, owing to competition between traders, are now selling for nearly their full market value, and little profit can be expected from them. They are also growing more and more scarce, as the high prices stimulate trapping. The natural and satisfactory offset to this would be the establishment of preserves, such as the "fox farms," of which mention has been frequently made in the daily press. Many of

*Do not in the
manager policy*

these have been started, and the multitudinous islands offer opportunities for many more; but the business is hazardous, since there is no protection against poachers, and a very ill-judged attempt has been made by the Treasury, I am informed, to impose, in addition to the annual sum for which the island is leased, a "tax" of \$5 on each fox killed over twenty from each "farm." It is doubtful if the Treasury is entitled to tax anybody without the explicit authority of Congress, and a tax of 50 per cent. on the gross value of the product not only is oppressive and exorbitant, but will put a stop to a business which should be encouraged.

The timber of Alaska, though by no means insignificant, is not likely to be much sought for, except for local purposes, for many years. I may point out, however, that there are millions of acres here densely covered with the spruce best suited for wood pulp, and plenty of water power for pulp-mills, so that this resource is not without a future.

A forthcoming report of the United States Geological Survey will treat of the existing and prospective mining industries.

To sum up, it may be said that the whaling and sealing industries of Alaska are practically exhausted, the fur trade is in its decadence, the salmon canning in the full tide of prosperity, but conducted in a wasteful and destructive manner which cannot long be continued with impunity. The cod and herring fisheries are imperfectly developed, but have a substantial future with proper treatment. Mineral resources and timber have hardly been touched. No business-like experiment with sheep or cattle on the islands has been tried by competent hands, while the introduction of reindeer, though promising well, is still in the experimental stage. Socially, the territory is in a transition state, the industries of the unexploited wilderness are passing away, while the time of steady, business-like development of the more latent resources has not yet arrived. The magnificent scenery, glaciers, and volcanoes make it certain that Alaska will in the future be to the rest of the United States what Nor-

way is to western Europe—the goal of tourists, hunters, and fishermen. Agriculture will be restricted to gardening and the culture of quick-growing and hardy vegetables for local use. The prosecution of most Alaskan industries being in untrained hands, failures and disappointment will no doubt be frequent, but when the pressure of population enforces more sensible methods the territory will support in reasonable comfort a fair number of hardy and industrious inhabitants.

List of Scientific Publications based on the work of the Scientific Corps of the Western Union Telegraph Expedition to Alaska (1865-'68), and on the United States Coast Survey explorations (1871-'80), under the direction of W. H. Dall, in the same region.

The following list is intended to comprise the titles, in brief, of the more important publications which have arisen directly from the work of the Scientific Corps of the Western Union Telegraph Expedition, and of the supplemental explorations by parties under my direction, in connection with the work of the United States Coast and Geodetic Survey, in the endeavor to complete the interrupted plans of the earlier expedition. For a more complete Alaskan bibliography, to 1879, reference may be had to the publication on that topic hereunder cited. The present list is brought to date, but publications relating only to Siberia are not included; it does comprise, in addition to articles printed by members of the expedition, others by specialists in various departments based on collections brought back for study. Considerations of space forbid an attempt to make this list complete, but, such as it is, it is hoped that it may give a better idea of the additions to knowledge which resulted from the labors of Kennicott and his associates and serve to illustrate a not uninteresting chapter in the exploration of Northwest America. It should, however, be clearly understood that a considerable amount of exploration, growing out of subsequent events not

connected with the Telegraph expedition, has produced a respectable body of literature which finds no place in the present list as above limited.

The members of the Scientific corps in 1865 were Robert Kennicott, H. M. Bannister, F. Bischoff, W. H. Dall, H. W. Elliott, Charles Pease, and J. T. Rothrock. In the scientific work done under the auspices of the Coast Survey (1871-'85) I was joined by Mark W. Harrington and Marcus Baker, of the Survey, and in 1880 by T. H. Bean, of the United States National Museum.

Publications by Bush, Dall, Elliott, Kennan, and others on material not connected with the explorations previously enumerated or relating wholly to Siberia are not included in the list.

GEOGRAPHY AND EXPLORATION.

(See also under Meteorology and Geology.)

- Baker (Marcus). Boundary line between Alaska and Siberia.
Bull. Phil. Soc. of Wash., iv, pp. 123-133, 1881, with maps.
- Dall (William Healey). Report on the operations of the Scientific Corps of the Western Union Telegraph Expedition during the season of 1865.
Proc. Chicago Academy of Sciences, i, pp. 31, 32. 1866.
- Explorations in Russian America.
American Journal of Science, xlv, pp. 96-99. Jan., 1868.
- Exploration of the interior of Russian America.
Mining and Scientific Press, San Francisco, Oct. 3 and 10, 1868.
- Remarks on Alaska.
Proc. Cal. Acad. Sci., iv, pp. 30-37, 268, 293, 294. 1868.
- Die telegraphen expedition auf dem Jukon in Alaska.
Petermann's Geogr. Mittheil., xv, pp. 361-365, with map.
Oct., 1869.
- Alaska and its resources.
Lee & Shepard, Boston, 8°, xii, 628 pp., 15 pl., 1 map. 1870.
- Survey of Alaska.
House Reps. Exec. Doc. No. 255, 41st Congr., 2d sess., 8°, Washington, Gov't Printing Office, May 11, 1870.

- Dall (William Healey). On exploration in Russian America.
Proc. Am. Acad. Arts and Sci., viii, pp. 297, 298. 1870.
- Die aufnahme der Aleuten und die untersuchung der Behring See.
In Hydrogr. Mitth. Berlin, 1873, pp. 316, 317. Dec., 1873.
- Forschungen in den Aleutischen Inseln, 1873.
Petermann's Mitth., xx, pp. 151, 152. March, 1874.
- Explorations in the Aleutian islands and their vicinity.
Journ. Am. Geogr. Soc., v, pp. 243-245. 1874.
- Harbors of Alaska and the tides and currents in their vicinity.
U. S. Coast Survey report for 1872, App. 10, pp. 177-212. 1875.
- Arbeiten der Küstenaufnahme von Alaska in jahre 1874.
Petermann's Mitth., xxi, pp. 155, 156. May, 1875.
- Report of explorations on the coast of Alaska.
U. S. Coast Survey report for 1873, App. 11, pp. 111-122. 1875.
- Report on Mount St. Elias, with map and view.
In same for 1875, App. 10, pp. 157-188; extras, Nov., 1875.
- Scientific results of the exploration of Alaska by the parties under the charge of W. H. Dall, during the years 1865-1874.
Washington, W. H. Dall, 1876-1880, 8°, pp. 1-276, with 36 plates.
[A uniformly paged reprint of papers by Dall and others on various topics. The papers will be referred to separately here.]
- Neuere Forschungen auf den Aleuten.
Deutsche Geogr. Blatt., Bremen, ii, pp. 38-43 and 84-101, with map, Jan. to April, 1878.
- Alaska forschungen im Sommer 1880.
Petermann's Geogr. Mitth. 1881. pp. 46, 47. Feb., 1881.
- U. S. Coast Survey operations in the vicinity of Bering strait.
Proc. Royal Geogr. Soc., London, Jan., 1881, pp. 47-49.
- Pacific Coast Pilot. Coast and islands of Alaska. Dixon entrance to Yakutat bay with the Inland passage. Washington, U. S. Coast Survey, 1883.
Royal 8°, pp. x, 333, 16 maps and 13 plates.
The appendices include:
List of charts useful for navigation in the region.
Isogonic chart of Alaska and adjacent region.

List of astronomical positions and magnetic declinations.
 Table of distances. Table of routes.
 Note on pronunciation of native and Russian names.
 Meteorological tables. Index to the work.
 Indices to geographical authorities used in compiling the work and *not indexed in the original*, comprising Beechey, Billings, Cook and King, Dixon, Langsdorff, La Perouse, Lisianski, Lütke, Meares, Portlock, Vancouver, and the voyage of the *Sutil and Mexicana* (Alcala Galiano).

Dall (William Healey). Alaska.

American Cyclopaedia, New York, Appleton, 1883, with map.

— On the position of Mt. St. Elias and the Schwatka expedition to Alaska.

Proc. Royal Geogr. Soc., x, No. 7, pp. 444, 445. July, 1887.

— Alaska revisited. I-VI.

The Nation, New York, 1895, vol. 61, No. 1566, pp. 6, 7, July 4; No. 1567, p. 24, July 11; No. 1572, p. 113, Aug. 15; No. 1573, pp. 131, 132, Aug. 22; No. 1576, p. 183, Sept. 12; No. 1578, p. 220, Sept. 26. Also in the New York Evening Post of July 4, 11, Aug. 19, 22, and Sept. 21, 28, 1895.

Rothrock (Joseph Trimble). Northwestern North America; its resources and inhabitants.

Journ. Am. Geogr. Soc., iv, pp. 393-415. New York, 1874.

Whymper (Frederick). A journey from Norton sound, Bering sea, to Fort Youkon.

Journ. Roy. Geogr. Soc., London, xxxviii, pp. 219-237. 1868.

METEOROLOGY AND HYDROLOGY.

Bannister (Henry Martyn). Meteorological correspondence.

Smithsonian Report for 1866, pp. 411, 412. 1867.

Dall (W. H.) Coast Pilot of Alaska. Appendix I, Meteorology and Bibliography.

376 pp., 13 pl., 28 maps, 4°, U. S. Coast Survey, 1879.

— Ueber das Klima von Alaska.

Zeitschr. der Oesterreichischen Ges. für Meteorologie, xvii, pp. 443, 444. Nov., 1882. 8°.

— Hydrologie des Bering-Meeress und der benachbarten gewässer.

Petermann's Mitth., pp. 361-380, with map and sections, and pp. 443-448. Oct. to Nov., 1881.

Dall (W. H.) The currents and temperatures of Bering sea and the adjacent waters.

U. S. Coast Survey Report for 1880, App. No. 16, separately printed, 4°, pp. 46, maps and section. March, 1882.

MAGNETISM.

Schott (Charles A.) U. S. Coast and Geodetic Survey. Methods and results. Terrestrial magnetism. Collection of results for declination, dip, and intensity (etc.).

U. S. Coast Survey Report for 1881, App. No. 9 (separately issued), 67 pp., 4°, 1882; cf. pp. 5-7, 37-39.

— On the secular variation of the magnetic declination in the United States (etc.).

In the same. Report for 1882, Appendices 12, 13, pp. 211-328; also separately; cf. pp. 243, 246-249, 285, and isogonic chart of Alaska.

— The magnetic observations made on Bering's first voyage (etc.).

U. S. Coast and Geodetic Survey Bull. No. 20, vol. i, pp. 211-214. 1891.

HISTORY, BIBLIOGRAPHY, AND ECONOMICS.

Dall (W. H.) Robert Kennicott.

Trans. Chicago Acad. Sci., i, part 2, pp. 133-226, with portrait. 1869.

A biographical sketch prepared by a committee of the Academy appointed at the meeting of Nov. 13, 1866. Dall's contribution occupies pp. 216-224.

— Is Alaska a paying investment?

Harper's Monthly Magazine, xlv, Jan., 1872, pp. 252-257.

— Abstract of the population of the native tribes of Alaska.

U. S. Comm'r Indian Affairs, Rep. for 1874, pp. 198-201. 1875.

— Documents relating to the Alaskan boundary question.

Senate Ex. Doc. No. 146, 50th Congr., 2d sess. Washington, Govt. Printing Office, 1889, 8°, pp. 1-40, charts 10-17.

— A critical review of Bering's first expedition, 1725-1730, together with a translation of his original report upon it, with a map.

Nat. Geogr. Mag., ii, No. 2, June, 1890, pp. 1-57.

— Geographical explorations. Early expeditions to the region of Bering sea and strait. From the reports and journals of Vitus

Ivanovich Bering, translated by William Healey Dall. Washington, Government Printing Office, 1891.

U. S. Coast Survey, Report for 1890, Appendix 19, pp. 759-774, 4°, with two maps. March, 1891.

This paper, separately printed as above with title page and cover, appears in the annual volume with the following heading:

“Notes on an original manuscript chart of Bering's expedition of 1725-1730, and on an original manuscript chart of his second expedition, together with a summary of a journal of the first expedition kept by Peter Chaplin and now first rendered into English from Bergh's Russian version.”

Dall (W. H.) and Baker (Marcus). Partial list of charts, maps, and publications relating to Alaska and the adjacent region.

U. S. Coast and Geodetic Survey, Pacific Coast Pilot, Alaska, second series, Appendix 1, pp. 163-375, 4°, Washington, 1879; also separately.

GEOLOGY AND PALEONTOLOGY.

(See also Botany.)

Dall (W. H.) Observations on the geology of Alaska.

U. S. Coast Survey, Coast Pilot of Alaska, part 1, pp. 193-202. 1869.

— Notes on Alaska and the vicinity of Bering strait.

Am. Journ. Science, third series, xxi, pp. 104-111, with maps. Feb., 1881.

— Note on Alaska Tertiary deposits.

Am. Journ. Science, third series, xxiv, pp. 67, 68, July, 1882.

— Glaciation in Alaska.

Proc. Phil. Soc. of Washington, 1883, vol. vi, pp. 33-36.

— A new volcanic island in Alaska.

Science, iii, No. 51, Jan. 25, 1884, pp. 89-93.

— Further notes on Bogosloff island.

Science, v, No. 101, Jan. 9, 1885, pp. 32, 33.

— Bulletin of the U. S. Geological Survey, No. 84. Correlation Papers. Neocene, by William Healey Dall and Gilbert Dennison Harris; Washington, Government Printing Office, 1892, 8°, 349 pp., with many illustrations and 3 maps.

Geology of Alaska, pp. 232-268, with map.

White (Charles A.) On a small collection of Mesozoic fossils obtained in Alaska by Mr. W. H. Dall (etc.).

U. S. Geol. Survey, Bulletin No. 4, Washington, the Survey, 1884, pp. 10-15, pl. vi.

FAUNAL DISTRIBUTION.

Dall (W. H.) On the trend of the Rocky Mountain range north of latitude 60°, and its influence on faunal distribution.

Proc. Am. Assoc. Adv. Sci., xviii, p. 247. Aug., 1869.

— On the marine faunal regions of the North Pacific (etc.).

Proc. Acad. Nat. Sci., Phila., 1876, pp. 205-208; Sci. Results, pp. 1-4. Dec., 1876.

— Faunal regions. Distribution of plants and animals. Charts xxvii and xxviii.

In Coast Pilot of Alaska, App. I, Meteorology. Washington, U. S. Coast Survey, 1879.

ANTHROPOLOGY.

Dall (W. H.) On the distribution of the native tribes of Alaska.

Proc. Am. Assoc. Adv. Sci., 18th (Salem) meeting, 1869, xviii, pp. 263-273, 1870. Synopsis in Am. Nat. Oct., 1869.

— On prehistoric remains in the Aleutian islands.

Proc. Cal. Acad. Sci., iv, pp. 283-287. Nov., 1872.

— On further examinations of the Amaknak cave.

Proc. Cal. Acad. Sci., v, pp. 196-200. 1873.

— Notes on some Aleut mummies.

Proc. Cal. Acad. Sci., v, pp. 399, 400. Oct., 1874.

— Alaskan mummies.

Am. Naturalist, ix, pp. 433-440. Aug., 1875.

— Tribes of the extreme Northwest.

Art. I. On the distribution and nomenclature of the native tribes of Alaska and the adjacent territory, with a map, pp. 7-40.

Art. II. On succession in the shell heaps of the Aleutian islands, pp. 41-91.

Art. III. Remarks on the origin of the Innuvit, pp. 93-106.

Terms of relationship used by the Innuvit, pp. 117-119.

Table showing relationship of tribes of Puget sound, etc., p. 241.

In Contr. to Am. Ethnology, i, 4°, Washington, Gov't Printing Office, July, 1877; extras, May, 1877.

- Dall (W. H.) Social life among our aborigines.
Am. Naturalist, xii, pp. 1-10. Jan., 1878.
- On the remains of later prehistoric man obtained from caves in the Catharina archipelago, Alaska Territory (etc.).
Smithsonian Contr. to Knowledge, 318, 4°, pp. 40, 10 pl. 1878.
- The Chukches and their neighbors in the northeastern extremity of Siberia.
Proc. Roy. Geogr. Soc., London, Sept., 1881, pp. 568-570.
- On the so-called Chukchi and Nanollo people of Eastern Siberia.
Am. Naturalist, xv, 857-868. Nov., 1881.
- On masks, labrets, and certain aboriginal customs, with an enquiry into the bearing of their geographical distribution.
U. S. Bureau of Ethn., Annual Rep. for 1882, Washington, 1884, 8°, pp. 67-200, pl. v-xxix; also separately.
- The native tribes of Alaska: An address before the Section of Anthropology of the American Association for the Advancement of Science, at Ann Arbor, August, 1885, by William H. Dall, vice-president.
Proc. A. A. A. S., xxxiv, 1885, pp. (1-19) 363-379.
- Otis (George A.) List of the specimens of the anatomical section of the U. S. Army Medical Museum.
Washington, Army Med. Museum, 1880, 8°, pp. viii, 194; cf. pp. 35-39, 54-56, 166, 167, for description and measurements of crania.
- Wyman (Jeffries). Observations on crania.
Proc. Boston Soc. Nat. Hist., xi, pp. 440-462, 1868, 8°, cuts; also separately.

ZOOLOGY.

Mammals.

- Bannister (Henry Martyn). The Esquimaux dog.
Am. Naturalist, iii, No. 10, Dec., 1869, pp. 522-530.
- Coues (Elliott) On the Muridæ.
 Philadelphia, Collins, 1874 [N. W. Boundary Survey], 8°, pp. 28. Based partly on Alaskan material.
- Dall (W. H.) List of the mammalia of Alaska.
Alaska and its Resources, pp. 576-578. 1870.

- Dall (W. H.) Catalogue of the Cetacea of the north Pacific ocean, with osteological notes, etc.
 In Seaman's Marine Mammalia of the Northwest Coast of North America, 4^o, San Francisco, 1874; Appendix, pp. 278-307. Separately printed, 1873.
- Truc (Frederick W.) On the skeleton of Phoca (Histriophoca) fasciata, Zimmerman.
 Proc. U. S. Nat. Mus., vi, 1883, pp. 417-426, pl. xi-xiv. 1884.
- On a new species of porpoise, Phocæna Dalli, from Alaska.
 The same, viii, 1885, pp. 95-98, pl. ii-v.

Birds.

- Baird (Spencer F.) On additions to the bird fauna of North America made by the Scientific Corps of the Russo-American Telegraph Expedition.
 Trans. Chicago Acad. Sci., i, pp. 311-325, pl. 27-34. 1869.
- Bean (Tarleton H.) Our unique spoon-billed sandpiper.
 Forest and Stream, xvi, No. 12, p. 225. April 21, 1881.
- Notes on birds collected during the summer of 1880 in Alaska.
 Proc. U. S. Nat. Mus., 1882, pp. 144-173. 1882.
- Cabanis (J.) Ueber *Pyrrhula cassini* und *P. cineracea* aus Siberien.
 Jour. für Ornith., 1871, p. 218; 1872, pp. 315, 316; 1873, pp. 314, 315.
- Dall (W. H.) and Bannister (H. M.) List of the birds of Alaska, with biographical notes.
 Trans. Chicago Acad. Sci., i, pp. 267-310, pl. xxvii-xxxiv. 1869.
- Dall (W. H.) Birds of Alaska.
 Alaska and its resources, pp. 586-586. 1870.
- Notes on the avifauna of the Aleutian islands from Unalashka eastward.
 Proc. Cal. Acad. Sci., v, pp. 25-35. Feb., 1873.
- Notes on the avifauna of the Aleutian islands, especially those west of Unalashka.
 Proc. Cal. Acad. Sci., v, pp. 270-281. March, 1874.
- Newton (Alfred.) Notes on the birds of the Yukon region.
 The Ibis, 2d series, vi, p. 521. 1870.
- Tristram (H. B.) Notes on some passerine birds, chiefly palearctic.
 The Ibis, 3d series, i, No. 2, pp. 231-234. 1871.

Fish and Fisheries.

- Bean (Tarleton H.) Description of a new fish from Alaska (etc.).
Proc. U. S. Nat. Mus., ii, pp. 212-218. 1879.
- Descriptions of some new genera and species of Alaskan fishes.
The same, pp. 353-359. 1880.
- Descriptions of new fishes from Alaska and Siberia.
The same, iv, pp. 144-159. 1881.
- A preliminary catalogue of the fishes of Alaskan and adjacent waters.
The same, v, pp. 239-272. 1881.
- Description of a new species of *Alepidosaurus* from Alaska.
The same, vi, pp. 661-663. 1883.
- A partial bibliography of the fishes of the Pacific coast of the United States and of Alaska (etc.).
The same, iv, pp. 312-317. 1882.
- List of fishes known to occur in the Arctic ocean north of Bering strait.
Report on the cruise of the *Corwin*. Washington, Government Printing Office, 1883, pp. 118-120, 4°.
- The fishery resources and fishing grounds of Alaska.
Fishing industries of the U. S., i, sect. 3, pp. 81-113. 1887.
- The codfishery of Alaska.
Fishing industries of the U. S., i, sect. 5, p. 198. 1887.
- The Burbot, *Lota maculosa*.
Fishing industries of the U. S., i, sect. 7. 1887.
- Dall (W. H.) The food-fishes of Alaska.
U. S. Com'r Agriculture, Report for 1870, pp. 375-392. 1871.
- Milner (James W.) Notes on the grayling of North America (etc.).
U. S. Com'r Fisheries, Report for 1872-'73, pp. 729-742. 1874.

Mollusca and Brachiopoda.

- Bergh (Rudolph). On the nudibranchiate gastropod mollusca of the north Pacific ocean, with special reference to those of Alaska.
Part I.
Proc. Acad. Nat. Sci., Phila., for 1879, pp. 71-132, l. pi-viii.
May, 1879.
- Part II.
In the same, pp. 40-127, pl. i-viii. 1880.
- The two papers above cited appear in *Sci. Res. Expl. of Alaska*, pp. 127-276, pl. i-xvi.

- Dall (W. H.) Materials for a monograph of the family Lepetidae.
Am. Journ. Conch., v, pp. 140-150. 1869.
- On the Limpets, with special reference to the species of the west coast of America and to a more natural classification of the group.
In same, vi, pp. 228-282, pl. xiv-xvii. April, 1871.
- Diagnoses of sixty new forms of mollusks from the west coast of America and the North Pacific ocean.
In same, vii, pp. 93-160, pl. xiii-xvi. Oct., 1871.
- Preliminary descriptions of new species of mollusks from the northwest coast of America.
Proc. Cal. Acad. Sci., iv, pp. 270, 271. Oct., 1872.
- Preliminary descriptions of new species of mollusks from the northwest coast of America.
In same, iv, pp. 302, 303. Dec., 1872.
- Descriptions of new species of mollusca from the coast of Alaska, with notes on some rare forms.
In same, v, pp. 57-62. April, 1873.
- Catalogue of shells from Bering strait (etc.).
In same, v, pp. 246-253. 1874.
- Preliminary descriptions of new species of mollusks from the northwest coast of America.
In same, p. 6; extras, March 19, 1877.
- Aleutian cephalopods.
Am. Nat., vii, No. 8, Aug., 1873, pp. 484, 485.
- Report on the brachiopoda of Alaska (etc.).
Proc. Acad. Nat. Sci., Phila. 1877, pp. 155-173; Sci. Results, art. iii, pp. 45-62. July, 1877.
- Descriptions of new forms of mollusks from Alaska (etc.).
Proc. U. S. Nat. Mus., 1878, pp. 1-3. Feb., 1878.
- Report on the Limpets and Chitons of the Alaskan and Arctic regions.
Proc. U. S. Nat. Mus., 1879, pp. 281-344, pl. i-v. 1879. Sci. Results Expl. Alaska, pp. 63-126, pl. i-v.
- Report on the mollusca of the Commander islands, Bering sea, collected by Leonard Stejneger in 1882 and 1883.
Proc. U. S. Nat. Mus., 1884, pp. 340-349, pl. ii. 1884.

- Dall (W. H.) New or specially interesting shells of the Point Barrow expedition.
Proc. U. S. Nat. Mus. 1884, pp. 523-526, pl. ii. 1884.
- Report on Bering island mollusca.
Proc. U. S. Nat. Mus. 1886, pp. 209-219. 1886.
- Supplementary notes on some species of mollusks of the Bering sea and vicinity.
Proc. U. S. Nat. Mus. 1886, pp. 297-309, pl. iii, iv. Oct., 1886.
- Report on the mollusks.
In Report of the International Polar Expedition to Point Barrow, Washington, Gov't, 1885, 4°, pp. 177-184, with plate.
- On the genus *Corolla* (Dall).
The Nautilus, iii, No. 3, July, 1889, pp. 30, 31.
- Notes on some recent brachiopods.
Proc. Acad. Nat. Sci., Phila. for 1891, pp. 172-175, pl. iv.
- On some new or interesting west American shells (etc.).
Proc. U. S. Nat. Mus., xiv, pp. 173-191. 1891. See also the same, xvii, pp. 706-733, pl. xxv-xxxii. 1895.
- Lea (Isaac). Description of five new species of Unionidae (etc.).
Proc. Acad. Nat. Sci., Phila., xix, p. 81. 1867.

Crustacea.

- Benedict (James E.) Preliminary descriptions of thirty-seven new species of hermit crabs of the genus *Eupagurus*.
Proc. U. S. Nat. Mus., xv, pp. 1-26, 1892.
- Corystoid crabs of the genera *Telmessus* and *Erimacrus*.
Proc. U. S. Nat. Mus., xv, pp. 223-230, pl. xxv-xxvii. 1892.
- Descriptions of new genera and species of crabs of the family Lithodidae, etc.
Proc. U. S. Nat. Mus., xvii, pp. 479-488. 1894.
- Dall (W. H.) Descriptions of three new species of crustacea, parasitic on the cetacea of the northwest coast of America.
Proc. Cal. Acad. Sci., iv, pp. 281-283. Nov., 1872.
- On the parasites of the cetaceans of the northwest coast of America, with descriptions of new forms.
In same, iv, pp. 299-301. Dec., 1872.
- On new parasitic crustacea from the northwest coast of America.
In same, v, pp. 254, 255. March, 1874.

Lütken (Christian Frederick). Tillæg til Bidrag til kundskab om Arterne af Slægten *Cyamus* Latreille (etc.).

Vid. Selsk. Skr. 6 Række, iv, pp. 317-322 and pl., also separately.

Rathbun (Mary J.) Catalogue of the crabs of the family *Maiidae* (etc.).

Proc. U. S. Nat. Mus., xvi, pp. 63-103, pl. iii-viii. 1893.

— Descriptions of new genera and species of crabs from the west coast of North America.

Proc. U. S. Nat. Mus., xvi, pp. 223-260. 1893.

— Notes on the crabs of the family *Inachidae* (etc.).

Proc. U. S. Nat. Mus., xvii, pp. 43-75. 1894.

Insects.

Hagen (Herman). List of neuroptera of Alaska.

Alaska and its Resources, pp. 588, 589. 1870.

Packard (Alpheus S., Jr.) List of nocturnal lepidoptera of Alaska.

Alaska and its Resources, p. 587. 1870.

— List of hymenoptera of Alaska.

The same, pp. 587, 588. 1870.

— Notice of hymenoptera and nocturnal lepidoptera collected in Alaska by W. H. Dall, director of the Scientific Corps of the Western Union Telegraph Expedition, with a list of neuroptera by P. R. Uhler and Dr. H. Hagen.

Trans. Chicago Acad. Sci., vol. ii, pp. — —, with a plate. Chicago, 1870.

This report was printed, but nearly all the copies were destroyed in the great fire at Chicago, and it cannot be considered as effectively published.

Seudder (Samuel Hubbard). List of diurnal lepidoptera of Alaska.

Alaska and its Resources, pp. 588, 589. 1870.

— Report on a collection of diurnal lepidoptera made in Alaska by the Scientific Corps of the Russo-American Telegraph Expedition under the direction of Lieut. W. H. Dall.

Proc. Boston Soc. Nat. Hist., v, pp. 404-408. 1869. Also in Entomological Notes, ii, pp. 42-46. 1869.

Calentecates.

Clark, (Samuel Fessenden). Report on the hydroids collected on the coast of Alaska by W. H. Dall, U. S. Coast Survey, and party.

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 209-238, p. vii-xvi. 1877. Sci. Results Expl. Alaska, pp. 5-34, pl. i-x.

- Dall (W. H.) On some hydrocorallineæ from Alaska (etc.).
Proc. Biol. Soc. of Wash., ii, pp. 111-115. April, 1884.

Porifera.

- Lambe (Lawrence M.) Sponges from the western coast of North America.
Trans. Roy. Soc. Canada, 1894, sec. iv, pp. 113-138, pl. ii-iv.
1895.

BOTANY.

- Dall (W. H.) Report on the agricultural resources of Alaska.
U. S. Com'r Agriculture, Report for 1868, pp. 172-189. 1869.
- List of useful plants indigenous in the Territory of Alaska.
Alaska and its Resources, pp. 589-594. 1870.
- Arctic marine vegetation.
Nature, July 1, 1875, p. 166.
- Knowlton (F. H.) A review of the fossil flora of Alaska, with descriptions of new species.
Proc. U. S. Nat. Mus. 1894, pp. 207-240, pl. ix. *See also* Bull. Geol. Soc. Am., v, pp. 573-590. 1893.
- Lesquereux (Leo). Contributions to the Miocene flora of Alaska.
Proc. U. S. Nat. Mus. 1882, pp. 443-449, pl. vi-x. 1883.
- Mann (Horace, Jr.) Sketch of the flora of Alaska. Lichenes.
Smithsonian Report for 1867, pp. 462, 463. 1868.
- Rothrock (Joseph Trimble). Sketch of the flora of Alaska.
Smithsonian Report for 1867, pp. 433-461. 1868.
- List of and notes upon the lichens collected by Dr. T. H. Bean in Alaska and the adjacent region in 1880.
Proc. U. S. Nat. Mus. 1884, pp. 1-9, 1884.

