

CONTRIBUTIONS TO THE KNOWLEDGE OF EXTREME NORTH-EASTERN LABRADOR

By BERNHARD HANTZSCH

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(Continued from page 146)

AS ALREADY remarked, the one large room in a small wooden house on the hill with a ground-room had been turned over to me, where the results of my collecting activity continued to pile up. Since the little house had the disadvantage of not being rain proof, a polar bear skin and several dog skins were spread out over my bed, which had been hammered together from a large box; there was often not a single dry spot on the ceiling, until finally they covered the roof partly with tin, and had the north and west sides of the house covered with protecting walls of pieces of sod. From then on it was comfortable in my room, especially when the fire was still crackling in the little iron stove and the lamp was burning in the evening. The doors had to be opened now and then in order to renew the air—the one small window was not arranged for that; then the drying bird skins, skulls, human bones from graves, plants, moss for packing, etc., caused a mixture of many different odours. Besides I had visits very frequently from Eskimos, who were not entirely odourless, often as many as eight to ten people at the same time in the evening, who warmed themselves in my place and dried themselves, got tobacco and raisins, looked at me and Paksau at our work, calmed the children in windy weather, brought me some kind of natural history object, or were invited in the evenings to tell me stories. Those were pleasant hours with smoking pipes, when an intelligent half-Eskimo woman, Mrs. Clara Lane, or the mission trade assistant, Mr. Voicy, an inhabitant of my house, and a half-blood also, served as interpreters, since they knew English. At other times I visited the people in their tents, giving them great pleasure, as they considered it an honour. For hours at a time I would sit with them, and felt quite satisfied in the circle of these unpretentious people. There was always something to do. I arose with the break of day and often went to bed at midnight. When the others had left me, and the family of my neighbour had

long been sleeping the sleep of the righteous, I was still sitting there, writing or doing other work in which I did not wish to be disturbed. As a rule I had my meals with the kind-hearted mission people, who were very busy with the building of the house; at other times only on Sunday did I have the opportunity to be with them longer. They helped me in my work, as much as their time and their views permitted them to do. They took much trouble on my account, so I did not like to bother them. All this I acknowledge in the most grateful manner.

In addition to my domestic duties, whenever possible, I spent the forenoon or afternoon of every day in hunting excursions or trips of observation. Only in an occasional case did I remain entire days or even two days at home continuously, then joining the Eskimos. One time I travelled with two men and a woman, who were to gather driftwood for the missionaries, quite a distance down Ungava bay. On the way home on the second day we had to take refuge in an inlet on account of the weather, where our party grew to perhaps twenty-five persons. Five families came with children and dogs from George River, apparently from the caribou hunt. [P. 122]

Paksau, too, who with three large boys had been away a couple of days in my boat to gather winter wood also, came madly along with full sail, so that we were anxious and afraid for him. The coast has so many reefs, and the old boat would not have stood a hard knock. He was, however, just as strong as clever; we waved to him joyously and celebrated a wet, but happy reunion. Also the "Kablunak" (my nick-name), was welcomed with friendly handshaking on all sides, and this I permitted with great pleasure. The old custom of rubbing noses is no longer in vogue. I pitied the poor children and women, who did not have a dry thread on them. Since the men had fastened their four kayaks to the wooden boat the last part of the trip, and had climbed into the boat, partly to be more protected, and partly to lend a hand with the oars, and sail, the heavily-laden little boat sank so deep into the water, that the waves threw spray over everybody and of course they had to bail out of the boat continually. The dogs, also dripping, were a pitiful sight. They slunk about in a depressed mood, whined, yawned, and shook themselves.

It was an especially interesting excursion which took me after the one mentioned to Ikke-asak country, to the north-west peninsula, enclosed

by Ikkerasak and Tunnusuatsuk, which for ages has been a chief dwelling place of the northern Eskimos. I joined three families, who had been residents there a few years before. They now intended to pitch their tents for some weeks in the innermost corner of the Tunnusuatsuk, and from this place the men intended to carry their kayaks across the mountain range to the Tunnusuksoak and there hunt, particularly for seals. The people, who meanwhile had learned to know me better, and were never unapproachable to sensible explanations, offered voluntarily to take me to their former dwelling place and to be helpful to me, to hunt for some graves here also, with the purpose of emptying them. Naturally their good intent which of course was [P. 213] not entirely free from material motives, judging from previous experiences, was correspondingly rewarded. A strong young man as well as a clever girl rowed my boat, while another followed heavily loaded with wife and children, the three men accompanied us in their kayaks. At last I set foot upon the land of Tunnusuatsuk, seen previously, filled with curious feelings and recollections concerning the past of this peculiar people, that lived here for many generations, until now it is approaching its ruin and destruction. It is a shame, that my companions could not tell me what traditions they associate with the venerable place where, perhaps, they were born. For near and far there were no other such fresh green valleys, covered with high grass, in which ancient paths lead. Besides some well-preserved earth houses, one saw whole rows of fallen ruins, in which the drift-wood spars and whale bones had sunk together, which once may have covered many families protectingly. There were tent rings, fire places and naturally heaps of bones in great numbers. We visited perhaps a dozen graves; some of them were relatively speaking well preserved. I should have liked to stay a couple of days in this interesting locality, in which we were everywhere surrounded by silent and yet such eloquent witnesses of human past, in order to undertake a thorough inquiry, and make as complete collections as possible, in order to rescue all that was of ethnographical interest, but I had to be careful not to lose the confidence of the people by too great demands. Had more time been at my disposal, everything would have been accomplished gradually. So I contented myself with the collection of some old skulls and pelvis bones from fallen graves, as well as a mouldy and a well preserved skeleton, the latter of which belonged to the aunt of my kind guides (now baptized Christians). Also a quantity of tools were found, the number of which could have been increased considerably

by a diligent search, in which my little companion proved to be very wise and clever. Approaching evening [P. 214] forced me finally to leave the place, and in a splendid phosphorence of the sea, which threw up sparks in our pathway wherever our oars struck the water, sparkling like a thousand pearls, I journeyed homeward with the young Eskimo man through the night, and the slowly descending fog.

Gradually the weather became rougher and more unfavourable, the days shorter, the stay in the open less productive of results. But the autumn of 1906 was said to be especially mild and favourable. But the regular snowfall and cold would have pleased me more than the continuing rain and storms with a few degrees of warmth. The second half of October, after I had left Killinek, beautiful late autumn days are said to have come which compensated in a measure for the unfavourable summer; the Killinek bay was not entirely free of ice until September 22nd, aside from some icebergs, which running aground have stood their watch there for years. The bay did not freeze over until November 29th, a thing that seldom happens so late (*Missionsblatt der Brüdergemeine*, 1907, p. 271). A rather heavy snowfall set in at Killinek in the middle of September, but the white covering vanished again before the end of the month, at least in deeper locations and on the southern slopes. In the autumn of 1905 half a meter of snow had fallen by September 15th that did not go away at all. In the beginning of October, 1906, the snow was more abundant, and the ponds began to freeze over slowly. But a sled journey could not be thought of up to the time of my departure on October 11th, because the snow was too clear and loose.

From July 27th until October 11th I noted temperature observations as regularly as possible, but refrain from publication of these, first, because a little meteorological station was established from 1906 on through the efforts of the missionary, Mr. Waldman, the results from which are being published in London; secondly, the readings without a fixed point of observation are very changeable and therefore uncertain. I almost always carried one or two thermometers with me, in order to take the temperature more frequently than the regular notations of 8 o'clock in the morning, 2 o'clock and 9 o'clock [P. 215]. Then it is soon shown what conditional value even the most scrupulous observations may have. At my little house, which was situated scarcely 20 to 25 meters higher than the mission building, it was not seldom 1° to 2° C. (1.8° to 3.6° F.) colder than there, but if I ascended to the edge of the highland, perhaps 80 to 120 meters above the sea,

the temperature sank occasionally 1° to 2° more. If this had remained a regular thing, the observations would have retained their value. The contrary often was the case. Whenever the tide or the wind filled the bay with ice, and it began to blow across this to the land, Mr. Waldmann in his little observation station close by the beach often had a few degrees less warmth than I up on the mountain heights, where the sunbeams of the long summer days did their work uninfluenced. Elsewhere there were sunless lake valleys, in which icy cave temperature prevailed, not far from grassy gorges with southern exposures, where the thermometer rose at once. Also windy and wind-protected places afforded, when measured without sunshine or in shady places, many kinds of different results. So I lost faith in the temperature notes possible for me to take, which even in neighbouring localities now and then showed quite different results, not like one another at all. In August the temperature varied, aside from the ice-covered sea and without regard for passing exceptional cases, (also measured only in the day not at night after 9 o'clock,) in general between $+4^{\circ}$ and $+8^{\circ}$ C. [39.2° and 46.4° F.]. Only on the 16th did it rise at noon in a sky slightly overcast up to 11° C. [51.8° F.], on 17th in quite clear sunny weather even up to 14° C. [57.2° F.] warmth; on this day even at 9 o'clock in the evening. At 9 o'clock $+10^{\circ}$ C. [50° F.] but sank on the next morning to $+4^{\circ}$ C. [39.2° F.]. 1st half of September: 0° C. [32° F.] to 4° C. [39.2° F.], 2nd half of September: -2° [28.4° F.] to 5° C. [41° F.]. October 1st to 11th: -5° C. [23° F.] to $+3^{\circ}$ C. [37.4° F.]. In the winter months December to March the temperature is said according to the reports of Rev. Perrett and the missionary, Mr. Waldmann, as a rule to waver between -10° C. [14° F.] and -25° C. [-13° F.], only occasionally to sink -25° -35° C. [-13° to -31° F.] and, as an exception, to still lower degrees. (Compare also Mr. Waldmann's table of temperatures from December 1st, 1904, to August 17th, 1905, in Report of an official visit, etc., 1906, p. 76 [P. 216].

In April the influence of the sun begins to make itself felt, which becomes so strong in May and June, that even the Eskimos have to shade their eyes with snow glasses. July and August are the warmest months, which melt the snow and ice on most levels sooner or later. Indeed the weather in those parts is just as undependable and different as in our districts. The traveller always has to reckon with this fact.

Winds blow almost continually, occasionally for days from the same direction; during my stay in the country often from the west; frequently inside of a few hours they will take an entirely different

direction. Now and then they are so violent, that it is difficult, even dangerous to travel overland, hence a boat voyage on the sea is quite impossible. It happens often that people removed a few hours from Killinek, but on the other side of Ikkerasak, have to wait days, even weeks, before they are able to reach the station. Now and then shortage of food results as the cause of this. In stormy weather, it seems as if the land animals were all blown away. I have taken half-day excursions with Paksau, without seeing even a bird. And as a kayak traveller the Labrador Eskimo of the present time ventures little. Calms very seldom last any length of time, but often occur about noon or evening or at other times between the change of the directions of the wind.

Rain belongs to the everyday occurrences even if as a rule it brings to earth only a small quantity of water. Quite rainless days with a clear sky were rare, at least during my stay in north-eastern Labrador, several such following after one another being observed only twice or three times. Usually the weather changed every few hours; early in the morning, fog; noon, rain; evening, sunshine, in case it did not prefer to sweep its gloomy gray mood over the whole day. At best the August weeks were in a measure invariable. But you could never praise the day before the evening. At night an abundance of dew formed in clear weather, which forced us to cover carefully all the tools, also the fire-wood [P. 217] or to take them into the tent; later in the year heavy hoar-frost. The characteristic forms of precipitation consisted mostly of moist fog or fine drizzling rain, which soaked everything. Thick, chilly fog appeared suddenly on the sea also in sunny weather, to vanish as a rule after a certain length of time. Now and then you saw sharply bordered cloud masses rolling away on the sea. Heavy rain in very large drops was somewhat rarer than the fine, drizzling rain, but several times continued for days, and brought an abundance of water to earth, which everywhere ran to the valleys in rivulets and small streams. From the beginning of September snowfalls began, became more frequent in the middle of the month, often alternated with rain. At the beginning of October considerable amounts of snow fell several times. But they vanished quickly under the influence of sunshine and wind. At this time of the year the change in the weather was peculiar. I remember many a hunting trip for ptarmigan when at one time the maddest snow storm was whirling about us, and the clear snow flakes were flying before us, sweeping over the plateaus, and covering the slopes so deeply, that you sank far into it, if you did not pay close attention where you were going;

a quarter of an hour later, though, the wide landscape lay before our enchanted eyes in a complete calm, the laughing sunshine fell across the blinding white levels, while dark blue shadows spread mysteriously across the gorges and rocky precipices. After a short time the splendour was gone again, the heavens became gloomy, and the wild dance began anew. The often repeated "bad" weather lessened a great deal the results of work, theoretically possible. Many times hours and days came, which brought full recompense for all the lack of good days; hours so delightful and bright, that you cannot imagine more beautiful ones; hours, for one of which I gladly took the days full of rain and storm. Then I sat up in the grass and looked down, looked on the sparkling, trembling sea, where the little, light waves chased each other in merry play, looked out across to the distant white mountain tops, which towered up so far away and yet so [P. 218] tangibly clear in the clear, bluish air, allowed myself to be fanned caressingly by the greeting sunshine, which probably came from home, from gaily moving streets to me, dreaming in my loneliness.

There is the following to report concerning special phenomena in the sky. Thunder and lightning with the exception of those slight discharges on July 26th were not perceived with certainty. Mirages were rarer also than in the ice. Several times toward noon in somewhat hazy air indistinct mock suns [parhelia] became visible. In the wide ring, which surrounded the true sun, the two mock suns standing horizontally from it, became visible. The phenomenon seemed peculiar, but in no way beautiful. The moon though appeared in more beautiful splendour. It was surrounded very often by rings and halos, which appeared much clearer and with more colour than in our country. More rarely I observed in the centre of the ring mock moons [paraselene]. The beaming light of the constellations appeared to me to be stronger than here at home; repeatedly I could write with little lead-pencil letters in my note book and read this clearly besides seeing far into the distance, as far as Kallaruselik and the southern peninsula Nuvualuk. The brilliancy of the stars, sparkling so splendidly paled then in the presence of the queen of the night. Almost every evening, before I went to sleep, I stood outside a little while and looked up at the sky, filled always in clear weather by the same admiration of the shining northern firmament until disturbed by the howling of the dogs that followed conscientiously with their disagreeable voices not only the rising of the moon, at least of the full moon, to speak accurately, but also its further course. Their excitable nervous system

seems to be influenced strongly by the moonlight. Not until the latter part of the Autumn do the northern lights appear frequently, and mostly also only in those white veil-like streamers, like moonlight, which cross the sky in undulating bands, strips and clouds, often shining brightly and then turning into flickering lights, so that the whole firmament flames up, then subsides or appears only here and there more clearly. I did not observe completely formed crowns of lights [P. 219]; also the greenish and reddish colour of the streamers and bands showed slight intensity. In spite of this the observation of the changing sky charmed me so, that I often forgot weariness. Were they then truly the souls of the departed, who, as the Eskimos say, whisk about up there? In August I have observed wonderful sunsets several times in which flaming rays continued until far into the darkness. They reminded me of the northern lights. In general the changing play of colour of the sky by day and by night belongs to the most beautiful phenomena of these lands. The reason for this is perhaps the purity and clearness of the air.

The development of the flora is dependent entirely upon the climatic conditions. It has been explained that this is unfavourable in these districts, compared with neighbouring localities. The reason for this may partly lie in the exposed insular situation in the middle of a sea, free of ice only a few months of the year, partly in the almost completely rocky nature of the district. As a rule the development of plants does not begin before June, even if some specially sheltered sunny places may show exceptions. The vegetation unfolds noticeably in July with great speed, so that it has reached a high point by the end of the month. Some species, as *Pyrola rotundifolia*, do not bloom as a rule before August; as a rule though this month represents the time of formation of the seed. As shorter days and cooler temperatures come, certain tender flowers perish very quickly, for example, the yellow Arctic poppy (*Papaver nudicaule*); others, for example, the Alpine five-fingered grass (*Potentilla alpestris*) until late in the autumn display a surprisingly abundant development of six, ten, and still more foliated blossoms, which are not easily killed by days of snow and frosty weather. If September is warm in the vicinity of Killinek, large quantities of berries ripen. I found such especially in *Arctostaphylos alpina*. It only pays to gather them in exceptional years, however much this is done by the Eskimos in districts of Labrador situated farther south. [P. 220] As a consequence of my late arrival in the country and travelling until the middle of September my plant collection was a

very incomplete one, though quite a number grew mouldy in my wet dwelling and on journeys, lost leaves and blossoms, were thrown away but later were not replaced by other specimens. I join, therefore, in order to give an approximate presentation of the flora of our district, the list of the plants collected by me with that of L. E. Borden, who collected on July 28th and 29th, 1904, likewise in the vicinity.¹

The Eskimos of Killinek, to a number of the most intelligent of whom I showed my little herbarium, knew names for only a few species, which I add. The missionary, Mr. Hettasch in Hoffenthal, who has been busy with the flora of Labrador for years, maintained the same also for the other mission stations. Use of the plants takes place in slight degree; I add this also with what was told me about it.

List of a number of species of plants collected in the most north-eastern part of Labrador

XXX *Alectorina ochrolenca* var. *cincinata* (Fr.)—Tingaujat.

XXX *Cladonia sylvatica* (Hoffm) REINDEER LICHEN, [Renntierflechte] Nerkagasek ?

XXX *Cladonia bellidiflora* Ach.

XXX *Dactylina arctica* (Hook) Nyl.—Nerkat.

XXX *Siphula ceratitidis* (Wbg.) Fr.—Nijaurasat. -

XXX *Cetraria nivalis* (L.) Ach.—[Tartschen flechte], TARGET LICHEN, Nerkagasek. Is eaten in exceptional cases.

XXX *Nephroma arcticum* (L.) Koajaut.

XXX *Racomitrium lanuginosum* (Ehrh.) Brid.—[Astmoos], BRANCH MOSS, Mannik—Used as lampwick.

XXX *Cystopteris fragilis* Bernh.—[Blasenfarn].

XXX *Equisetum arvense* L. var. *campestre* Milden [Schachtelhalm]. box culm.

XXX *Lycopodium Selago* L.—[Bärlapp]—BEAR MOSS, Kakkilanatut.

XXX *Trisetum subspicatum* P. B.—Nappakotaujok.

X *Hierochloa alpina* R. & S.—[Darr Grass] HOLY GRASS.

XXX *Poa alpina* L. [Rispelgras] MEADOW GRASS.

XX *Poa arctica* R.Br.

XXX *Festuca ovina* L. var. *alpina* (Gaud.) Koch. and *F. borealis* Lge.—[Schwingelgras] FESCUE GRASS, Iviksukak.

¹ List of Plants collected in 1904 during the cruise of the *Neptune*. By L. E. Borden, M.D., and named by Mr. J. M. Macoun—Appendix III, p. 320, to A. P. Low, Cruise of the *Neptune*, Ottawa, 1906.

XXX Collected by me alone.

XX Collected by Borden and myself.

X Collected by Borden alone.

The identification of the Phanerogams and the vascular Cryptogams collected by me was done most kindly by Dr. Th. Wolf and Dr. B. Schoeler in Dresden, that of the willows by Mr. O. V. Seemen in Berlin, that of the lichens by Dr. A. Zahlbruckner in Vienna.

XXX *Elymus arenarius* L. var. *villosus* E. Mey. —[Haargras] HAIR GRASS, Singailit—Placed in boots.

XXX *Eriophorum angustifolium* Roth.—[Wollgras] COTTON GRASS, Killingnatut.

XXX *Eriophorum Scheuchzeri* Hopp—Pualungoak—Placed in mittens.

X *Eriophorum vaginatum* L.

XXX *Carex rigida* Good.—[Riedgras] SEDGE.

XX *Carex hyperborea* Wahlbg.

X *Tofieldia borealis* Wahlbg. [Kelke] ?

X *Salix anglorum* Cham. [Weide] WILLOW—The willow cotton is used occasionally for starting fires.

X *Salix herbacea* L.

X *Salix Labradorica* Rydb.

XX *Salix reticulata* L. Kigutanginagutit.

X *Salix Uva-ursi* Pursh.

XXX *Salix Cutleri* Tuckerm. Orpit.

XX *Oxyria digyna* Hill.—[Ampfer] SORREL. Kungulik—Leaves eaten raw as relish.

XX *Polygonum viviparum* L.—[Knöterich], KNOT GRASS, Tuglat—Leaves eaten as a relish mixed with seal oil as a salad.

XXX *Silene acaulis* L.—[Leimkraut] SILENE.

X *Lychnis apetala* L.—[Lichtnelke] CROW FLOWER.

XXX *Stellaria humifusa* Rottb.—[Mière] CHICKWEED.

XXX *Stellaria cerastioides* L.

X *Stellaria longipes* Goldie.

XX *Cerastium alpinum* L.—[Hornkraut] MOUSE-EAR CHICKWEED. Pilluk—Entire plant eaten.

XXX *Alsine verna* L. var. *propinqua* Rich.—[Meirich.]

XXX *Ranunculus nivalis* L. [Hahnenfuss] CROW-FOOT.

XX *Ranunculus pygmaeus* Wahlbg.

XXX *Papaver nudicaule* L. [Mohn] POPPY.

XXX *Cochlearia grænlantica* L.—[Löffelkraut] SPOON-WORT. Kungalëujat—Eaten.

XXX *Cardamine pratensis* L. (Schaukraut) ?

X *Draba Bellii* M.H.M. [Hungerblümchen] HUNGERFLOWER.

XX *Arabis alpina* L. [Gänsekraut] WALL CRESS.

XX *Rhodiola rosea* L.—[Sedum], Tuglerunak—Put on wounds and also eaten.

XXX *Saxifraga cæspitosa* Kch. var. *grænlantica* (L.) [Steinbrech].

X *Saxifraga cernua* L.

XXX *Potentilla nivea* L. var. *macrophylla* Lehm. —[Fingerkraut], FIVE-FINGERED GRASS.

XX *Potentilla emarginata* Pursh.

XX *Potentilla alpestris* Hall. P. (= *maculata* auct. var.)

XX *Dryas octopetala* L. var. *integrifolia* (Vahl).

- X *Astragalus alpinus* L. [Tragant] TRAGACANTH.
 X *Empetrum nigrum* L.—[Krähenbeere].
 X *Epilobium latifolium* L. [Weidenröschen] WILLOW HERB.
 X *Epilobium spicatum* Lam.
 XX *Pyrola rotundifolia* L. var. *grandiflora* (Rad.) D.C. (= *pumila* Hook ?)—[Birnkraut] PEAR-WEED.
 XX *Arctostaphylos alpina* Spr.—[Bärentraube] BEAR BERRY, Kallakotit—Berries of this and other species eaten with relish; prophylactic for rash (Kallak).
 X *Vaccinium uliginosum* L. [Trunkelbeere] Kigutangerek.
 X *Bryanthis Taxifolius* Gray.
 X *Diapensia Lapponica* L.
- XX *Armeria vulgaris* Willd. var. *Labradorica* Wahlbg. [Grasnelke].
 XX *Veronica alpina* L. [Ehrenpreis]
 XX *Pedicularis flammea* L. [Rodel.]
 XX *Campanula uniflora* L. [Glockenblume] BELL-FLOWER.
 XX *Erigeron uniflorus* L. [Berufkraut] Ussat.
 X *Erigeron debilis* Gray.
 XX *Antennaria alpina* R. Br. [Katzenpfötchen]. EVERLASTING.
 XX *Taraxacum officinale* Webb. var. *ceratophorum* (Ledeb.) D.C.—[Löwenzahn] DANDELION. Missaktak—Leaves and stems eaten.

(To be continued)

AN ANNOTATED LIST OF VASCULAR PLANTS COLLECTED ON THE NORTH SHORE OF THE GULF OF ST. LAWRENCE, 1927-1930

By HARRISON F. LEWIS

(Continued from page 135)

THAT the elevation of this coast that has gone on since the last glaciation is still in progress, and that at a fairly rapid rate, at least on the part of the coast between Natashquan and Bradore Bay, is readily observed. It impresses itself very strongly on the local fishermen, who, while lacking any generalized ideas on the subject of such movements, are forced by their experience, much to their own perplexity, to recognize the local reality of this one. Shoals that gradually rise above sea-level, passages and harbours that become too shallow for use, and structures built at the shore that gradually become removed from it are among the indisputable signs of such a change that they see.

The most definite evidence of the present rate of rise of this coast that has come to my attention is furnished by certain iron ring-bolts set in the solid rock at La Tabatière to furnish attachments for heavy nets used in the important seal-netting practised at that place. This netting is carried on in November and December, and in order to avoid as far as possible any disturbance of the nets by the new ice that frequently forms at that time of year, every endeavour is made to keep the nets and their fastenings below the level of the ice. Among other precautions, the ring-bolts that form the shore fastenings of the nets are set in the rock just as low down as it is possible to get a suitable uncovered rock surface to work on at extreme low water of the lowest spring tides. The continual rise of the coast, however, brings these ring-bolts higher and higher, until they

reach positions where they are uncovered for a considerable period at every low tide, spring or neap, when so much trouble with ice in the season of the seal-fishery results that a new set of holes must be drilled lower down in the rock and new bolts must be set in them. This process is repeated again and again at intervals of 20 to 30 years. Seal-fishing by this method has been carried on at La Tabatière for more than 100 years, and I have seen there old bolt-ends, much eaten away by rust, that were presumably set at the lowest accessible point at low water of spring tides, and that, while still fast in their places in solid rock, are now above the highest point reached by the sea at high tide.

In 1928 Mr. Hiram Robertson, who conducts a seal-fishery at La Tabatière, showed me a ring-bolt in place that he personally had set in the rock 22 years before and that he was about to replace by a new ring-bolt set at a lower level, as far down as he could place it at the lowest tide. The vertical distance between the center of the old ring-bolt and the point where the center of the new one was to be was 29 inches. If we consider this as indicating roughly the amount of rise that this part of the coast has undergone in 22 years we find that the rate of rise is more than an inch a year, or is nearly eleven feet in a century! Possibly local factors, such as the configuration of the rock surface at the point in question, influenced somewhat the precise points chosen by Mr. Robertson for the setting of these two bolts and so the rate of rise may be somewhat less than that stated, but all the data on the subject that



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