

A TUNDRA TRIP IN ALASKA.

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Since the early gold rush to Alaska, the first boat of the season to venture into the Northwest Seas has left amid the cheers of crowds of people who thrilled at the thought of her adventures and came to wish her well; for something about travel in ice-laden seas appeals to the romantic spirit of even the most stolid. So it is that even today hundreds of people who are strangers to the country and to all the passengers still come to wave good-bye and good luck to the "Old Vict" when she leaves the dock. And well it is that they do, for I doubt if even the oldest of the old-timers go without some little twinge of wonder whether thru storms and ice she will reach Nome in safety. The *Victoria* steers a course almost due west to longitude of about 162°, and then turns north thru Unimak Pass into Bering Sea. This is the "outside" passage, in contrast to the line of travel which leads close to the coast and to the Southern part of Alaska. It is the course which the Oriental boats to Japan take; and few people realize that one is halfway to Japan before he turns north toward Arctic Alaska, and that possessions of the United States and of Russia are in one place only half a mile apart! It is in Bering Sea that the day lengthens until there is no night, and the watch for ice becomes vigilant. Since the days of wireless the danger from being caught in the ice is less, for word comes from the Yukon when the last ice goes, and from Nome as to the condition of her coast. But sometimes the ice is caught in drifts and is brought back again when unexpected; and so it was on our trip in 1922 when on June eleventh the first mate announced, "Ice ahead, sir." But the floe was well broken up and caused no delay, so that we landed at Nome within two days.

Nome is a city of renowned past, made famous by Rex Beach's *Spoilers* and by Sweepstake races on which bets were made around the world. She is now, tho, a city of dwindled population, of unpainted houses, of plank streets in need of repair, and of empty homes where the



Fig. 1. A kyack race of the Eskimos.

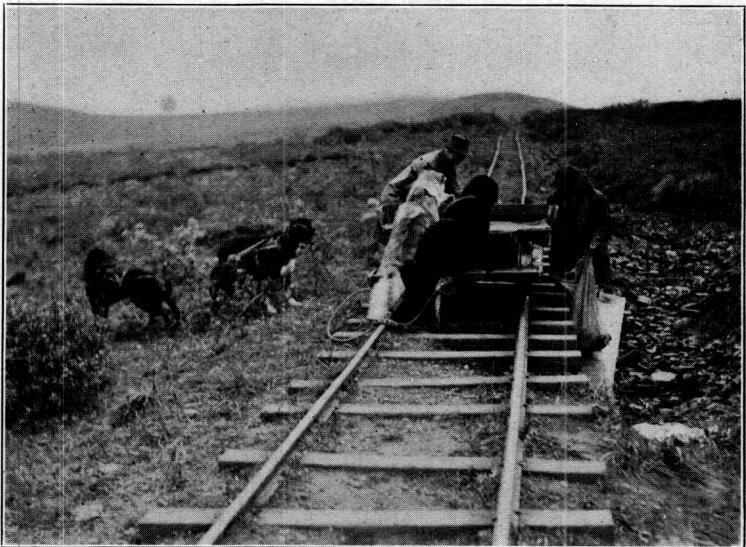


Fig. 2. Seward Peninsula railroad—called the "dogomobile."

destruction of a wall exposes furniture deserted in place. The population of the city varies; for the people are transient; they go into the hills to work their claims in summer, and by far the greatest number go "outside" on the last boat that returns to the States. Nome is a drab little mining town, straggling along a narrow coastal plain that borders the hill regions. Its people are occupied mostly in gold mining, and fishing for salmon and whales, and a few little shops supply the necessities of life. This is the town where women once wore Parisian gowns, and imported Corsican dancers were paid in showers of gold!

The Fourth of July in Nome is, even yet, a day of great celebration for both white people and Eskimos. It is a holiday of games, and the Eskimos particularly were very interesting in the originality and execution of their contests. Their walrus skin throwing is similar to blanket throwing of this country, except that the tautness of the skin makes it a more difficult accomplishment; but altho some who attempted it made funny spectacles of themselves, many of them succeeded in landing and rebounding with beautiful poise. A standing kick to touch with both feet a ball suspended about six feet three inches high was one of the novel feats; and a kyack race was an example of a very typical Eskimo sport. The "modern" Eskimo who took part in these sports is little different from the Eskimo of Steffanson's books so far as one can see. They are modern only in the substitution of calico trimmed in fur for the all-fur parka, and in the use of all kinds of expensive American perfumes to add to the odor of seal oil and blubber! Their women are very pretty when young, but age most rapidly, and the most lasting and appealing picture of Eskimo people is the sweet madonna face of the parka-dressed young Eskimo mother with one baby on her back and several holding her by hand. During the influenza epidemic, these people died by hundreds, so that in places their communities are almost depopulated, and the orphanages are crowded with children.

Travel in Alaska may be accomplished with ease only in winter, with dog team over packed ice. A summer

journey entails innumerable hardships, and especially in 1922 the late thaw and continued cold made it difficult to get into the hills. There are no trails, and one must go on foot or with team across unbroken, swampy country. We left Nome about the twenty-third of June to go to Teller on the *Sea Wolf*, but ice floes filled Port Clarence Bay and a storm made us anchor for protection behind a big iceberg; and in three days we had to return to Nome. After a month's delay there we set out again for Teller on the *Sea Wolf*. Truly, Alaska is the land of waiting, for there are no schedules for anything and the weather rules supreme. This delay in Nome and another in Teller when the storms racked the house over our heads made us almost despair of finishing our journey to the Kougarok. In Teller is the farthest north newspaper in the world, published every week or so (whenever there is any news!) by a boy of twelve years, who also builds his boats, fishes for the winter supply of dog feed, and helps his father with the reindeer herd.

We left Teller in the twilight of midnight and lull of the storm to cross the bay with the team which carried all our provisions for the distance of fifty miles. We ourselves walked, for the reason that horse feed is scarce in this country, and the horses were ill-fitted even for the load of necessities which they hauled. On our journey we made three stops, one when we were halted by a flood and camped on a gravel bar in the Agiapuk River, one at a tent of a miner, and one at a shack of an English prospector who was making his fire in a pan and letting the smoke out by a hole in his window! In fifty miles we saw one man, and there are many places on Seward Peninsula where one might travel and see none. It was the same story on our outward journey, too,—a claim with one miner, or a dredging camp with five or six men. An empty house, or an empty town were the signs of habitation that we passed. My aunt and I felt ourselves to be objects of curiosity when we came to camps because there are no women in this part of the hill country. One man we passed had not seen a woman for two years, and later I met a Scotchman who said he had lived for seventeen years without seeing a woman! Hospital-

ity, naturally, is the law of the land, and even in a house where the owner is away, a traveler may take what he wants, with the only obligation to leave the place in good condition with some food for the next fellow traveler. Deserted towns as well as houses are not rare. Shelton was a town on our home journey, and from the hill it looked to be quite populous with some dozen fine frame houses, and even two-story homes. But on our arrival we found it occupied by only two men, and both of them were transients!

Our journey of two months ended on July 30th when we crossed the Arctic Divide and saw the red mud roof of our cabin shining in the sunlight on a limestone hill that was part of Kougarok Mountain. It is a simple little cabin built of planks and made secure by bricks of peat. Within, its walls are made picturesque by papering of old magazine covers and pages of ancient date, so that one can read the early *Saturday Evening Post* stories of Mary Roberts Rhinehart as one eats. The furnishings are home-made things of board, with typical cabin "bunks" for beds and only benches to sit on. But there is the real luxury of a good stove with an oven that bakes bread exactly right if you watch it carefully. At first our cabin was damp and dismal with green mold covering wood and paper and fur robes; but fires and air cleared it out; fresh new curtains at the deepset square windows, and the few deft touches of my Aunt very soon made of our shack a cabin home.

Life is busy in house-keeping under primitive conditions. Fires made with willow twigs soon go out, and three substantial meals a day are necessities for vigorous, pioneer life. Nor are there stores nearby! The dried stuff and canned goods brought in must furnish all the food requirements, and bread must be made, and fresh meat killed. For our meat we lived on ptarmigan, with one delicious sandhill crane, and some reindeer that was given to us for variety. And in addition to the necessities of life, for a Botanist the identification of the countless new species of plants on the tundra is a lure which urges him to work with all the haste of civilization, even in this remote corner of the globe.

It is a country wholly different. It is a hill-country prairie, for it is treeless and lies in a region known as the "barren lands." These barrens extend from the Aleutian Peninsula to the region of the McKenzie River delta, the only point where trees border the Arctic Ocean. In truth it is not a barren territory, but is, instead, covered by a most diverse and abundant flora with a hundred or more species in a small area. In Seward Peninsula the area is one of interminable hills gloriously colored and rolling to infinite distances; and often, as one watches them, rainbows arch them over and touch the ground at each end where pots of gold may lie in truth. More than on the prairies does one have a feeling of immense spaciousness and vision to remote places. It is said that on a very clear day one may see from Kougarok Mountain into Siberia, over a hundred miles away. And the ability to see so far, yet the absence of any object of known size in that view by which one may estimate distances, leads the observer, as Steffanson explains, to make strange errors in judgments. Captain MacIntyre of the *Teddy Bear* told a story of mistaking an Arctic mouse for a polar bear, and certainly one of our party mistook a claim stake for our cabin, and was lost thereby. It is a curious country of misleading seeming-familiarity, a fascinating country which, in spite of all its dangers, compels love even from those who most loudly condemn the vagaries of climate and place.

The tundra, as stated before, is not barren but is covered by a carpet of hummocking plants overlying in most places centuries' accumulation of raw humus. Rock surfaces are exposed only on the highest mountains and comparatively recent faults, and in the creek beds of cutting streams. For the most part, it is a country of swampy conditions everywhere, so that to the newcomer "mush," used as it is in Alaska to mean "move on," "travel," would seem to have come into use from the suggestive character of the country rather than from its authentic derivation as a corruption of "marchon." The accumulation of humus which freezes and thus prevents drainage causes the hydrophytic conditions which, together with the cold, are responsible for the universal



Fig. 3. Reindeer lichen and the opposite-leaved Saxifrage of the "fell fields."

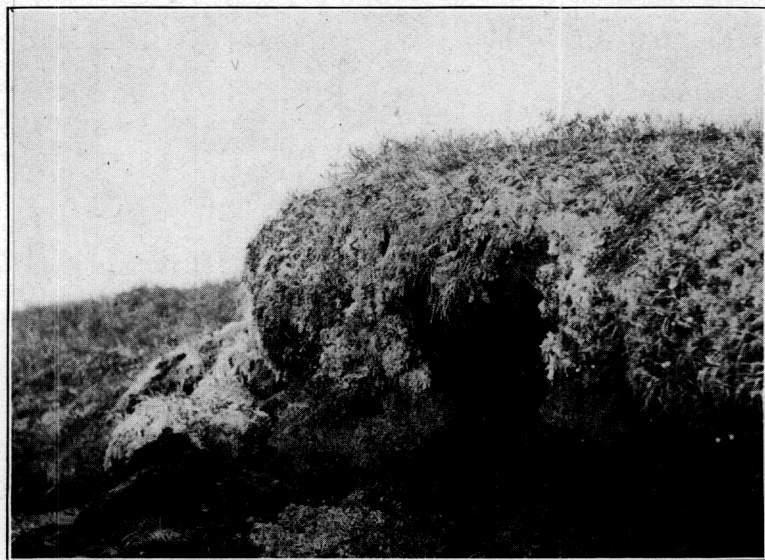


Fig. 4. Tundra of Sphagnum and heath collapsing because of thawing of the substratum by running water.

presence of sphagnum and plants of xeromorphic character. As is well known, the plants are all of the low-growing, dwarf habit, with many of them of cushion forms which retain their dead leaves and structures for some time. The flowers, tho small, are exquisitely vivid, even more beautiful than members of the same genera which are familiar in this region, such as *Dodecatheon*, *Myosotis*, and so forth.

Warming, in his *Oecology*, describes the fell fields, the moss tundra, the lichen tundra, and the dwarf shrub heath of Arctic regions; and he indicates the water relationships of these by putting the moss association as following the fell fields when the mosses gain the ascendancy, and the lichens as inhabiting the drier portions of any of these associations. Since then no work has been done to determine any further ecological relationships between these associations, tho a great deal has been done toward collection and identification of Arctic species. In the time that was possible the attention of the writer was directed toward the relationships and location of different type associations. But these observations can be regarded only as preliminary, almost as merely casual, for they were made over a very limited area, and also under atypical weather conditions. They make no claim other than to be just suggestive.

The types of tundra observed by the writer were (1) pioneer lichen associations, (2) open dwarf shrub associations, (3) closed dwarf shrub associations, (4) *Carex-Eriophorum* associations, (5) Spagnum-willow associations, and (6) the grass associations of the flood plains. The most important factor in influencing the rate of succession between these associations is apparently the wind, as the climate is apparently humid enough for the support of mesophytic forms. After the accumulation of humus by the early stages the water relations are affected by drainage, for the freezing of the peat deposits below prevents drainage and creates conditions productive of xeromorphic plant forms; but seepage of water from higher land above the peat tends to keep the substratum thawed and gives rise to swampy conditions described below in the Spagnum-willow association.

The descriptions of these formations given below are very brief and no species except type species are named. More detail concerning these will be given in a paper that is to be published.

On the rock uplands, the lichens are pioneers as they are elsewhere, but they are of shorter duration except on the perpendicular surfaces, for crevices and slopes are soon taken up with shrubs such as *Diapensia lapponica*, *Salix uva-ursa* (?), and *Dryas octopetala*; and these form the thin scattered cushions of vegetation called "fell fields" above. Their growth continues until they cover the ground with a thick carpet in which other plants intermingle. *Potentilla uniflora*, *P. biflora* are prominent in this situation, as are also *Arctostaphylos alpina*, *Andromeda polifolia*, *Cassiope tetragona*, *Rhododendron lapponica*. One or another of these may be dominant in any particular location, depending perhaps on priority of occupancy; and hence arise the names of *Dryas tundra*, etc., used by Warming. These shrubs may become so thickly intergrown in later stages with sedges and grasses and herbaceous plants that the shrubby character may be lost entirely, and in this situation the *Potentilla* and bearberry, perhaps, are the best survivals of the shrubs. This stage is regarded by the writer as a probable transition stage between the dwarf shrub and the *Sphagnum*-*Ericad* tundra mentioned below. The rapidity with which dwarf shrubs cover the ground and develop the thick carpet just described depends upon the protection from wind, as stated before. The windward and lee slopes of a hill offer strong contrasts to each other, and even on one boulder, the protected and exposed sides may show, in one case, a solid covering, and in the second, a perfectly bare surface except for a few lichens.

Succeeding the more open stages of the dwarf shrub associations there may be the cotton grass-sedge association, developed in situations made hydrophytic by configuration of the land and drainage influenced thus. These places show accumulations of rock soil and reveal on digging the frozen condition of this soil. *Dryas* may remain with the sedges, but it is infrequent, and the other shrubs are even still rarer, but mosses and herbaceous

plants are plentiful. The clump habit of these plants causes hummocks (what Alaskans call "nigger-heads") and reticulate ridges with puddles between where water often remains and *Nostoc* sp. and hydrophytic mosses are found.

The question of a climax is a difficult one. In the opinion of the writer it seems probable that the climax is the Sphagnum-Ericad tundra, (1) because it seems from the observations to be most extensive in conditions not made unusual by peculiar drainage conditions, and (2) because it was an association found in areas of greatest age, for example on the Arctic Divide. This association has Sphagnum abundant but not very conspicuous because of the larger size of the shrubs, the most important of which are *Ledum palustris*, *Vaccinium uliginosum*, *V. Vitis-idaea*, *Betula glandulosa*, and especially *Rubus Chamaemorus*. On the drier hummocks, which are still characteristic, are sedges and *Polytrichum*. Deep layers of peat are usually found beneath this association, and are frequently exposed by erosion of streams which cut thru it and expose the frozen, rock-like layers below.

So far as the writer observed the grasses have place only on flood plains of alluvial character, or of peat character, if the former tundra vegetation of the peat has not survived transplantation. It is a brief stage and apparently gives way to either the willows or to the sphagnum and heaths. The willows are particularly interesting in that they are distributed in regions where the ground is thawed and wet. This condition is brought about usually by seepage thru the peat of water draining from higher levels. The drainage lines are usually very conspicuous, and the line of extent of the willows coincides with these drainage lines. These shrubs are of the espalier habit described by Warming; they grow about five to six feet high and attain an inch or so in diameter in fifty to sixty years of growth. Growing beneath the willows are mesophytic mosses, sphagnum, and many herbaceous plants.

It is evident from this brief discussion that any change causing new drainage lines will cause changes in the plant associations; and because the peat is eroded easily this

frequently occurs. A gully developed by the spring freshets of one year is shown in the accompanying pictures. The down-cutting was creating marked changes in the topography. The lumps of peat dislodged frequently were deposited in short distances with their plants undisturbed, and these then continued their growth in their new situation. Retrogression due to drainage of a previously undrained area would naturally give rise to more xerophytic conditions. In locations where this had happened, a lichen association was found overgrowing the former plant association. The plants of this former association did not die completely, but continued to live in less vigorous condition and send occasional shoots above the overgrowing lichens.

These observations were made in the month of our stay in the Kougarok. We left there on the third of September and traveled overland to Nome, a "mush" of about one hundred fifty miles, with an Alaskan pack saddle carrying all our luggage. The weight was easy to carry because of the comfort of the pack in spite of the difficult walk; and the weather was the most beautiful of the whole summer. At Shelton we took the Seward Peninsula Railroad, an old track laid for use with gasoline engines in the days when Shelton hummed with gold prospects. Since then no one is left living in Shelton, and the railroad is unrepared. Its rails are frequently missing, and sometimes the tundra beneath the track has sunk out of sight; yet in spite of danger, it is easier travel than walking, and it is used by individuals who hitch their dogs to small hand cars and enjoy traveling at the greatest speed of five to six miles an hour on the up-grades and twenty miles an hour or more on the down-grades. For excitement and adventure, there can be no rival for the Seward Peninsula Railroad!

The journey of nearly four months resulted in only meager results. It was not primarily a Botanical expedition, altho that was the main interest of the writer. But it served as an introduction to a novel land of delight for all those who love adventuring in the open and a land of possibility for Botanists who wish an unexplored field. *The Northward Course of Empire* by Steffanson can

help one to a realization of the economic possibilities and a truer appreciation of the pleasures of this country. But no words of any pen can describe adequately the joys of the open hill-country to anyone who has been there and forever longs to go back.