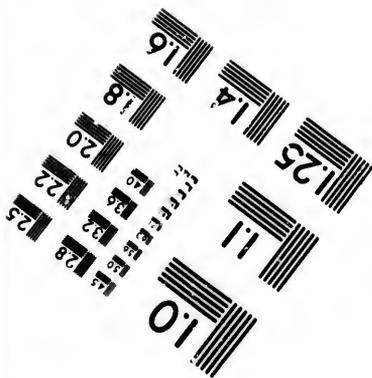
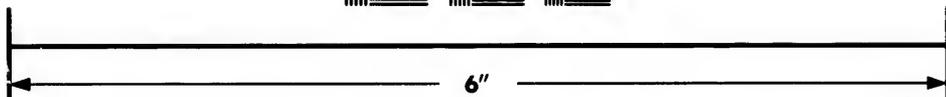
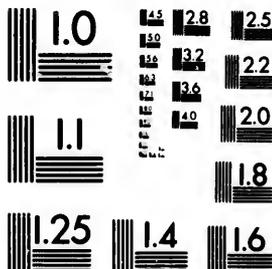


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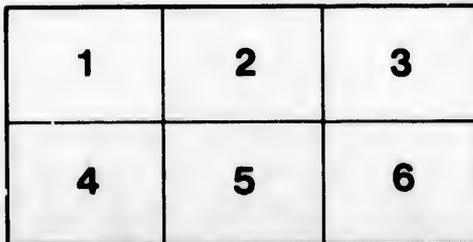
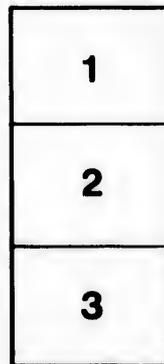
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SKETCH OF A JOURNEY
TO THE ROCKY MOUNTAINS AND TO THE COLUMBIA
RIVER IN NORTH AMERICA:

By THOMAS DRUMMOND, *Assistant Naturalist to the second Land Arctic Expedition, under the command of Captain Sir John Franklin, R. N.*

[It is scarcely necessary to preface the following journal of an excursion through a country hitherto unknown to the Naturalist with any observation, further than to say, that it embraces the period of time when Mr. Drummond quitted Sir John Franklin, Dr. Richardson, and the other officers of the Expedition, at Cumberland House, to that of his rejoining them at the same place.—ED.]

CUMBERLAND HOUSE, of which the latitude is $53^{\circ} 56' 40''$ N., longitude $102^{\circ} 16' 41''$ W., is situated upon a small island, called Pine Island, formed by the branching of the Saskatchewan, which divides into two channels, just before its junction with a lake, called Pine Island Lake. In times of high water, occasioned by the melting of the snow upon the mountains where it takes its rise, the river runs into the lake by the upper channel, and empties itself by the lower. During the time which elapsed between my arrival at Cumberland House, on the 28th of June, and the 10th of August, when the waters began to fall, the lake had risen six feet perpendicular, reducing the island, which is naturally low, to a very small compass, and destroying the corn which grew immediately around the fort. This was a very unusual circumstance, and I found, when afterwards ascending the Saskatchewan, that the waters had attained to upwards of twenty feet above their winter level. The country in the neighbourhood of Cumberland House is limestone, similar to that described by Dr. Richardson in the vicinity of Lake Winnipeg.

The following list comprises some of the plants which I collected during my stay at Cumberland House, but it cannot be considered as a full enumeration, since many of the spring flowers were past, and a still greater number must have escaped my memory:—*Hippuris vulgaris*, *Utricularia vulgaris* and *media*, *Veronica peregrina* and *scutellata*, a species of *Lycopus*? 2 species of *Scirpus*, a species of *Eriophorum*,

Alopecurus aristulatus, *Phleum pratense*, *Alopecurus* sp., a *Poa* resembling *P. distans* and *P. annua*, *Lolium perenne*, introduced? *Bromus* sp.? *Triticum* sp., *Elymus mollis* and another species, *Hordeum jubatum*, *Arundo colorata*, *A. phragmites*, *A. canadensis*, &c. with many other *Gramineæ*. *Galium septentrionale*, and 2 other species, *Potamogeton pectinatum*, *P. lucens*, *P. fluitans*, and 2 others. *Pulmonaria paniculata*, *Myosotis Lappula*, and another species, *Lysimachia thysiflora* and *L. ciliata*, *Apocynum androsæmifolium* and *A. cannabinum*, *Campanula rotundifolia*, *Lonicera flava*? *Diervilla œrulea*, *Symphoria race rosea*, and another species or variety, *Viola debilis* and *V. canaensis*, *Swertia difformis*? a *Gentiana*, with the habit of *G. campestris*, 4 or 5 species of *Chenopodium*, *Pastinaca sativa*, perhaps naturalized, and several other *Umbellifereæ*, of one of which the Indians eat the roots. *Fiburnum edule* and *V. oycoccos*, *Parnassia palustris*, *Drosera rotundifolia*, *Linnaea borealis*, *Cornus alba*, and *C. canadensis*, a species of *Allium*, *Convallaria bifolia*, *Acorus Calamus*, *Juncus hyfoniis*, and *J. gracilis*, &c., several species of *Rumex*, *Alisma* *Plantago*, *Vaccinium* *Vitis Idea*, and *V. Oycoccos*, *Polygonum amphibium*, *P. Persicaria*, *P. Convolvulus* and *P. aviculare*, *Monotropa uniflora*, *Pyrola secunda*, *P. elliptica*, with the flowers, pure, white, and very fragrant, *P. chlorantha* and *P. rotundifolia*, the latter differing from the British species in having rose-coloured blossoms, *Andromeda polifolia*, *Arbutus Uva ursi*, *Saxifraga tricuspidata*, *Mitella nuda*, *Stellaria lateriflora*, &c. *Aronia ovalis*, a species of *Prunus*, resembling *P. Cerasus*, *Spiræa salicifolia*, 3 varieties of *Rose*, a *Rubus*, resembling *R. Ideus*, *R. triflorus*, *Chamæmorus*, and *R. pistillaris*, *Fragaria canadensis* and *F. Vesca*, *Potentilla norvegica*? also a species with quinate and another with pinnate leaves, *Potentilla anserina*, *Genm strictum*, *Comarum palustre*, *Actæu americanu*, a *Nuphar* similar to *N. lucida*, *Aquilegia canadensis*, *Anemone dichotoma* and *A. multifida*, *Ranunculus Purshii*, *R. fluviatilis*, *R. scleratus*, and several other species, *Mentha canadensis*, *Scutellaria galericulata*, *Dracocephalum virginicum* and *D. parviflorum*, a species of *Melampyrum*, *Lepidium virginicum*, *Erysimum cheiranthoides*?

Sisymbrium canescens and *S. brachycarpum*, *Geranium carolinianum*, *Fonaria aurea*, *Lathyrus palustris* and another species, *Vicia canadensis* and *V. pisiformis*, an *Astragalus*, resembling *A. glycyphyllos*, *Hieracium sabaudum*, *Sonchus oleraceus* and 2 other species, a species of *Chicus*, of which I obtained no specimens, the inundation having destroyed them all before their time of flowering. *Verbesina alata*? with large yellow blossoms, a species of *Senecio* and another of *Bidens*, *Leontodon palustre*, *Gnaphalium* like *G. dioicum*, *Artemisia biennis*, several kinds of *Erigeron*, *Solidago multiradiata* and several others, many species of *Aster*, a *Tussilago*, *Achillea Millefolium* and another species. Pursh considers the *A. Millefolium* to be a naturalized plant, but this is certainly not the case, for it is frequently found near the summits of the Rocky Mountains. Of *Orchis* there are several kinds, *Corallorhiza innata*, *Cypripedium pubescens*, *Sparganium ramosum*, and *S. simplex*, *Carex Pseudo-Cyperus*, *C. filiformis*, *C. teretiusecula* and several others. *Typha latifolia*, *Urtica urens*? *Myriophyllum spicatum*, *Ceratophyllum demersum*, *Sagittaria sagittifolia*, *Calla palustris*, *Festuca fluviatilis*. *Urdaria puberula*, a species of *Impatiens*? *Epilobium angustifolium* and many others, a *Ribes* like *rubrum*, another with black hispid fruit, 2 species with black smooth fruit, and one resembling the gooseberry. *Lemna minor*, *L. trisulca*, *L. minor*, and *L. gibba*, *Equisetum palustre*, *E. arvense*, *E. sylvaticum*, and a species smaller than *E. variegatum*, &c. The only moss that I added to my collection here was *Bryum triquetrum*, found abundantly in the swamps. The following trees grow in this neighbourhood: *Pinus alba*, *P. nigra*, and *P. microcarpa*, *Populus tremula*, and the rough-barked species, *Populus balsamifera*, *Betula papyracea* and *B. glandulosa*, the latter is small and confined to the swamps; with a few species of *Willows*. There is also a species of *Fraxinus*, sparingly met with on the banks of the river Saskatchewan, and a species of *Elm*. This place may be considered as the highest northern limit of the genera *Ulmus* and *Fraxinus*.

The birds which I observed here offer comparatively little worthy of remark. The *Passenger Pigeon* is very common,

building its nest in the willow bushes on the margins of the lake, and feeding principally at this season upon the berries of *Cornus alba* and *C. canadensis*. A species of *Caprimulgus* is also common here and throughout all the country from Canada to the Rocky Mountains. It is called *Peesqua* by the natives, because its note consists of this word, which it repeats almost incessantly during the fine summer evenings, when it soars so high as to be almost imperceptible. In windy weather it flies lower, in pursuit of its food, probably insects, and it may then be sometimes taken, though this is always difficult, on account of the irregularity of its movements. It makes its nest, which much resembles that of the *common lapwing*, on the ground, and lays three or four eggs of a dirty brown, marked with darker coloured spots. I often met with it on the plains of the Saskatchewan, in the beginning of July.

The insects are not numerous: I observed *Papilio Atalanta*, *P. Urticae*, and *P. Comma-album*, and *P. Cardui*; also a species much resembling *P. Cardaminis*, but the sexes exactly similar, the male insect wanting the orange spot upon the wings; also another species, pure white, resembling *P. Napi*, and a large purple one with a white border; a large yellow butterfly of the swallow-tail kind, with black clouds and streaks; and a smaller yellow one, resembling *P. Rhamni*. In *Coleoptera*, the genera *Buprestis* and *Cerambyx* are numerous on the picquets of the fort: but many of the most common British genera are almost wanting, such as *Curculio*, *Scarabeus*, and *Staphylina*. The *Mosquitoes* are more plentiful here than I saw them anywhere else.

The country round Cumberland House is very flat and marshy. The only rising ground of any considerable elevation visible from it is the Basqua Hill, said to be about 40 or 50 miles distant. It was visited by the late Lieutenant Hood during the winter which that Expedition passed at Cumberland House, and from the information which the Indians gave me of the numerous plants that grow there exclusively, I regretted very much that it was not in my power to explore it.

The company's boats having arrived about the 20th of August, I left this place for Carlton House. On arriving at that post, Sept. 1st, the Indians were found to be in so unsettled a state, that it would have been very unsafe to make excursions in that neighbourhood, without the protection of a strong party; and I therefore decided upon proceeding with the brigade, until I should find a place better suited to my purpose. In ascending the river, the banks became gradually more elevated, seldom, however, precipitous, but rising gradually with broken undulating ground, sometimes for the space of a mile, before reaching the level of the surrounding country, which, at the junction of the south branch, may be estimated at from 150 to 200 feet above the bed of the river. This place may be considered as the commencement of those extensive plains which reach from hence to the Rocky Mountains, a distance of at least 700 or 800 miles, and, according to Indian information, are prolonged as far south as Mexico. The district is appropriately named by the Canadian Voyageurs, *la grande Prairie*. The woods which partially cover the country immediately contiguous to Carlton House, disappear at a distance of about 20 miles to the westward. The soil is generally sandy, and the vegetation becomes of a different and peculiar aspect, the tribe of *Papilionaceæ* prevailing to a considerable degree, and the genera *Phlox*, *Liatris*, *Malva*, and *Eriogonum*. Here I first observed a *Psoralea*, nearly allied to *P. esculenta* of Pursh, its roots, like that species, affording to the poor natives, in times of scarcity, a miserable substitute for animal food. The roots somewhat resemble those of the *Dahlia*, and the Indians are very expert at digging them up with a forked stick, which they use in the manner of a lever. They sometimes also eat the roots of a species of *Hedysarum*, the plant probably mentioned by Sir Alexander M'Kenzie under the appellation of *Liquorice*. Two or three kinds of *Umbelliferae* and *Asclepiadeæ*, which I found nowhere else in my route, grew in this neighbourhood, also 5 or 6 species of *Phascum*.*

* A genus of Mosses scarcely known hitherto as natives of America.

The plan I pursued for collecting was as follows. When the boats stopped to breakfast, I immediately went on shore with my vasculum, proceeding along the banks of the river, and making short excursions into the interior, taking care, however, to join the boats, if possible, at their encampment for the night. After supper, I commenced laying down the plants gathered in the day's excursion, changed and dried the papers of those collected previously; which operation generally occupied me till daybreak, when the boats started. I then went on board and slept till the breakfast hour, when I landed and proceeded as before. Thus I continued daily until we reached Edmonton House, a distance of about 400 miles, the vegetation having preserved much the same character all the way.

The *Aronia ovalis* is not uncommon about Carlton House, and its fruit is eaten by the natives, mixed with their pemmican, while they prefer the wood which it affords to every other kind for making their arrows. The species of *Prunus*, *Bird-Cherry*, or *Choke-Cherry*, is also frequently met with; and its fruit, when fully ripe, is not disagreeable. I found the fruit of the *Viburnum edule* to be very efficacious in allaying thirst. Several interesting animals of the deer kind occur in this vicinity. One of them, called by the traders the *short-tailed Jumping Deer*, is a creature about the size of a fallow deer. It has hair of a beautiful silvery grey colour. I killed a fine specimen of this animal on my journey to Carlton House, in the spring of 1827, but was under the painful necessity of using its skin, after having carried it 15 days, for food. It was a male, and had at that time (the middle of March,) shed its horns. There is another species, called in this country the *long-tailed Jumping Deer*, probably the *Mule Deer* of Lewis and Clarke, but it did not come under my own observation. The *prong-horned Antelope*, described by Dr. Richardson, in Captain Franklin's first Expedition, is a very beautiful little animal, of about the size and general appearance of the roebuck. It is considered the swiftest inhabitant of the plains. These creatures arrive in the neighbourhood of Carlton House about the end of April. They bring forth their young in May,

producing two at a birth, and are said to migrate to the south during the winter. The *Hare* of the plains is of very rare occurrence: in size it rather exceeds the British hare, and turns white during the winter. I killed a specimen of it on my journey to Edmonton House, in the autumn of 1825; it was a female, and giving suck at that time, (the middle of September,) and was of a much lighter grey than the English animal. Not being aware of the scarcity of this creature, and indeed confounding it with the common hare, I took but little care of its skin, which was lost in consequence.

Another very interesting animal is the *Badger* of the plains. Its general appearance resembles the European species, but it is not so large. These creatures burrow in the open plains, making their holes perpendicular at the entrance, which, when concealed by the growth of the grass, prove very troublesome to the pedestrian and dangerous to the mounted hunter, whose horse at full speed is often thrown by them, to the no small risk of the rider's neck. The badgers are very dexterous at concealing themselves in their burrows, and it is difficult to dig them out. We adopted the plan of filling their holes with water, which forced the animals to come out, when we secured them easily. The same method proved successful for catching the ground squirrels, but it is not likely that it would answer equally well when the earth is thoroughly thawed, as the water would then drain off, and the little creatures would dig deeper and deeper, throwing up the earth behind them, which would prevent the water from reaching them. The *Badgers* appear to be partly carnivorous, living on mice and ground squirrels, which their claws are admirably adapted for digging up.

The *Small Wolf*, or *Prairie Dog*, is a very common inhabitant of the plains. Its size is intermediate between the common wolf and the fox. Like the former of these animals, the *Prairie Dogs* hunt in packs of from 3 to 50 and more, and thus, from their number, they become an overmatch for the largest animals of the country; they are also so impudent that they will venture within a few yards of the hunter, and

carry away the game he may have killed, though a fire be lighted for its protection. I procured specimens of this animal at Carlton, in the spring of 1827.

There is another small species of *Fox* found in the plains, which the traders call the *Kit Fox*, it is the smallest of the genus that I have ever seen. The traders furnished us with skins of it, but it did not fall under my observation in a living state.

The different species of *Arctomys*, or *Ground Squirrel*, have been already described by Dr. Richardson. Three of them are found in the vicinity of Carlton House: they are the *Arctomys Franklinii*, *A. Richardsoni*, and *A. Hoodii*. All are lively and beautiful animals. The former, when pursued by dogs, will sometimes climb up a tree, but it is an unwieldy creature in such circumstances, when compared with the *Hudson's Bay Squirrel*, which it somewhat resembles.

The birds most worthy of notice are the *Tetrao Phasianellus*, the *Pheasant* of the traders, or *Pin-tailed Grouse*: these abound on the plains. They are about as big as the British grouse, of a much lighter colour, and having two of the tail feathers projecting about two inches beyond the rest, whence the name is derived. In habit, these birds resemble the common grouse, they make their nests on the ground, laying from five to ten or a dozen eggs, which are like those of a partridge. They keep in families until winter, when they congregate in large coveys. At pairing time, which is the month of May, the *Pin-tailed Grouse* select some little eminence, to which they resort at daybreak in great numbers, jumping, running round each other, chuckling, and performing many curious manœuvres; and this they continue to do for several weeks, until the ground is worn quite bare, when they separate in pairs for the season. Their flesh is well-flavoured, and the sportsman would find excellent amusement in following them.

Among the numerous species of *Duck* that frequent the lakes of the plain, may be particularised the *Ruddy Duck*, remarkable for the brilliant blue colour of the bill of the male, and the singular way in which, when courting or

caressing the female, it carries its tail, which is perfectly upright, giving the bird, at a little distance, the appearance of having two heads. It seems to breed in the neighbourhood of Carlton, as I killed a pair of them in the beginning of June, the female having eggs in her body ready for exclusion. Their plumage is remarkably thick and glossy, as that of the *Grebes*, and, like these birds when pursued or frightened, the ducks dive, and show only their bills above water.

The *Bittern* is frequently seen in the marshes about Carlton House; its habits are the same as those of the British species, and it possesses the same singular cry. The sound is very deceptive, frequently appearing as if quite near when really a mile distant. The *Bitterns* appear to have the power of inflating their necks and windpipes to a large size, and I feel no doubt that to this property alone they owe the extraordinary booming noise which they make.

There is also a species of *Curvirostra* common in the lakes of the plains, near which they breed. On approaching their haunts, they fly to meet you, giving, at the same time, the note of alarm to the rest, who immediately join, as if to chase away the intruder, by which means they are easily shot. The American *Curlew*, and several other species of that genus, have the same habit, as well as the *Lapwing* of our own country.

A beautiful little bird, *Phalaropus Wilsoni*, also inhabits those lakes. I procured several specimens about the middle of May, 1827. They swim with great ease, but generally frequent the shallow water.

There is also another small bird that deserves to be noticed for the courage with which it attacks all others that venture near its residence; it is a species of *Flycatcher*, about the size of a lark, and it is truly amusing to see it assault the *Falco borealis*, or any other large bird. It soars above them, then darting down on the back of the opponent, applies its beak, with all the strength that it possesses, to its head, sometimes remaining in this position for a minute or more, and then it returns in triumph to its station, on the top of

some neighbouring bush or small tree, where it resumes the occupation of watching for flies.

Many small birds are also seen here in their passage to more northerly regions, such as the *Emberiza nivalis*, *E. laponica*, &c. The large snowy owl is also met with, and a small brown species, called by the natives the *Beaver Owl*; but why so designated, I could not learn. I observed one of their nests near Carlton House, built on the ground among the bushes, containing two young ones, in the end of May.

Several *Lepidoptera* occurred in these districts, which I did not meet with in any other situations; but as their names are unknown to me, I cannot particularize them. The tribe of *Coleoptera* is scarce, which may, in some measure, be owing to the grass of the prairies being frequently set on fire. Amongst them I remarked a curious species of *Cicindela*, almost white, with a slight shade of a darker colour on the margin of each elytra; it inhabits sandy spots near the South Branch River. The following Mosses, and these only, were seen in the vicinity of Carlton House. *Phascum cuspidatum*, var. 2; *P. muticum*, *P. serratum*, *P. subsertum*, and *P. crispum*. *Gymnostomum tetragonum*, *G. latifolium*, *G. ovatum*, *G. phascoides*, and *G. sessile*, &c. I have already mentioned that there is little or no difference perceptible between the nature and productions of the country that lies between Carlton House and Edmonton. It is difficult to account for these plains being almost destitute of wood; but it may partly be owing to repeated conflagrations, which lay waste the land to a great extent, no deep ravines, extensive swamps, or elevated ground intervening to check the progress of the flames. Thus much is certain, that the vicinity of Edmonton House, for many miles round, was, twenty or thirty years ago, covered with trees, but by being frequently set on fire, it has become exactly similar to the rest.

There are few, if any, rocks visible from the banks of the river, between Cumberland and Edmonton, so that I am unable to decide where the junction takes place between the sandstone and limestone districts; probably it is where the

country begins to rise, before reaching the place where the South Branch River meets the Saskatchewan. Sandstone appears to prevail around Edmonton; it contains thin strata of coal, which is found to burn well, and is employed in the forge for working the iron necessary in boat-building.

The distance between the junction of the South Branch River with the Saskatchewan, and the Rocky Mountains House, may be estimated at from 700 to 800 miles. At Edmonton House, the brigade for the Columbia left the Saskatchewan, making a portage of 100 miles to the Red-Deer River, which falls into the Athabasca Lake; and as I still adhered to my resolution of accompanying it, I found it necessary to reduce my luggage into as small a compass as possible, and therefore left my specimens under the charge of the gentlemen at Edmonton House, only carrying with me a small stock of linen and a bale of paper.

The second day, after leaving Edmonton House, brought us to the commencement of the woody country, which continues all the way to the Rocky Mountains. The trees consist of *Populus balsamifera* and *P. trepida*; the *White Spruce Fir* and the *Birch*, with *Pinus Banksiana* occasionally in the drier situations, and then, more rarely, the *Balsam Poplar*. These are the only trees which occur north of this latitude, though in some localities, and in deep swamps, the *Pinus nigra* and *P. microcarpa* may occasionally be seen. Almost the only plants which we remarked as peculiar to this district, were a species of *Delphinium*, allied to *D. elatum*, and a curious aquatic, resembling in habit the *Hydrocharis Morsus Ranae*, of which I gathered no specimens at the time, for it was out of flower, and I never saw it again.

We crossed the Portage in six days, without meeting with any serious accident. The horse, however, which carried my bale of paper, unluckily fell down in crossing Papina River, by which the plants were thoroughly soaked; and as the speed with which the brigade proceeded precluded all hope of getting them dried by the way, I found myself unwillingly compelled to carry them on in a damp state, until we reached Fort Assinaboine, a small establishment belonging to the Company upon

Red-Deer River, where we spent two or three days preparing the canoes and cargo for our ascent of the river to the mountains. The Red-Deer River, on which this Fort is situated, is probably one of the most southern streams which empties its waters into the Frozen Ocean. The whole distance from Fort Assinaboyne to the Rocky Mountains, following the general course of the river, which runs in a nearly due west direction, may be estimated at about 200 miles. The country is thickly wooded with the same species of trees as were mentioned before; the *Pinus Banksiana* and *Populus balsamifera*, however, becoming much more frequent.

It was now ascertained that the canoes were so heavily laden, that it would be necessary for some of the party to go by land, and I gladly agreed to be one of these, in order to have the opportunity of seeing the country, and judging of its probable productions. We quitted the Fort accordingly, on the 1st or 2d of October, and started in high spirits for a journey on horseback. A heavy fall of snow, however, which took place on the 4th, put a final period to collecting for this season; it also rendered our progress through these trackless woods very unpleasant, our horses becoming soon jaded, when the only alternative was to walk, and drive them before us. To add to these misfortunes, the poor animals were continually sinking in the swamps, from which we found it no easy task to extricate them. The Red-Deer River is very rapid, so that its rise must be considerable, though not discernible when travelling through the woods which skirt it. The general appearance of the country is flat, intersected with lakes and swamps, and occasionally broken undulating ground. The weather during this part of our journey, proved very unfavourable; snow and a thick fog prevented my making much observation on the vegetation, which, however, appeared to bear the same character until we approached the mountains. It also forbade my getting any view whatever of the Rocky Mountains, until we actually reached them. We arrived at Jasper's House on the eleventh day, having travelled a distance of 200 miles since we quitted Assinaboyne Fort, under disadvantageous

circumstances; but all the party were in good health, and we were joined by the canoes on the day following. Jasper's Lake may be considered as the entrance to the Rocky Mountains. It is about 8 or 9 miles in length, and 2 or 3 in breadth, being, in fact, merely an expansion of the Red-Deer River. The Hudson's Bay Company have built a hut here for the accommodation of the person who takes charge of their horses, which are used for crossing the Portage to the Columbia; but the boats, after discharging part of their cargo at the head of the lake, proceed about 50 miles farther up the river, where the Portage commences, to the Upper House. The kindness of Lieut. Simpson, R. N., who was at this time employed in surveying the country, gave me the opportunity of ascertaining the latitude of the commencement and termination of the Rocky Mountains Portage. Jasper's House, or the beginning of the mountains, is in $53^{\circ} 18' 40''$ north latitude, $117^{\circ} 38' 36''$ west longitude. The commencement of the Portage $52^{\circ} 43' 10''$ north, $117^{\circ} 54' 46''$ west; the travelling distance he estimates at 54 miles. The latitude of the west end of the Portage, at the Columbia, is $52^{\circ} 7' 10''$, longitude $118^{\circ} 22' 30''$, and he calculates the travelling distance at 97 miles.

The height of one of the mountains, taken from the commencement of the Portage, Lieut. Simpson reckons at 5,900 feet above its apparent base, and he thinks that the altitude of the Rocky Mountains may be stated at about 16,000 feet above the level of the sea. The first indication which the vegetation afforded of our approach to the mountains, was the *Arbutus alpina* and *Dryas Drummondii*; the latter, with a beautiful yellow flower, was growing upon the gravelly batters formed by one of the mountain rivulets: *Dryas tenella* was also there, and an *Eriogonum* of considerable beauty. I also observed *Splachnum angustatum* and *S. mnioides*, growing commonly on the animal tracks in the woods, principally on the dung of the wolf or fox. I afterwards ascertained, though too late to profit by the information, that two of the largest and finest mosses that are known, the *Splachnum rubrum* and *S. luteum*, may be found in the

same vicinity. The *Cetraria nivalis* and *C. cucullata* abound in the pine woods, and here I first observed the *Pinus taxifolia*. That curious moss, the *Gymnostomum pulvinatum* is met with on the rocks, and also *Neckera Menziesii*, *nov. sp.*; the latter but rarely. At the head of Jasper's Lake, our tract led us over a rather lofty rock, where, besides the beautiful *Eriogonum* and *Dryas tenella*, I found a plant much resembling a *Saxifraga*, with roundish leaves and pale red flowers, and also several of the alpine species of *Fotentilla*. From this rock I obtained the first good view of the surrounding mountains, which gratified me extremely. The rocks are mountain limestone, and destitute of vegetation for about one-third of their height, but whether this is owing to their great elevation, or to a want of soil, I am unable to determine. The Red-Deer River at this place takes a bend to the south, which it continues for upwards of 70 miles, forming a narrow valley of about a mile in breadth, with a fine range of mountains on each side, or they may rather be called groupes of mountains, as they are frequently intersected with deep narrow valleys, running in almost every direction. Their general height, skirting the river, may be computed at from 3 to 7,000 feet above it; there is generally a secondary kind of range at their bases, probably formed by the gradual crumbling down of the more elevated parts; and almost always clothed with vegetation to the very top, while two-thirds or more of the highest range consists of nothing but bare rock, destitute of even a Lichen; a circumstance which I attribute more to the nature of the soil than to the altitude of the mountains. The rocks frequently rise perpendicularly to a considerable height, but their summits are so sloping as to render them mostly accessible. On the whole, I thought their vegetation less interesting than what I had remarked on the rocks about the head of Clova and Loch-na-gar in Scotland. The dry arid sides of the low hills are thickly covered with *Arbutus uva-ursi*, mixed sometimes with *Juniperus prostratus*, a plant which is also frequent on the steep and dry banks of the Saskatchewan. About half-way between Jasper's House and the commencement of the

Portage, we crossed the Assinaboyné River, which is a large branch of the Red-Deer River, and running at almost right angles with it, to the westward. I had afterwards an opportunity of following the course of this stream for 100 miles, but yet did not reach its source.

I here first met with a species of *Viscum* (?) on the *Pinus Banksiana*, and giving the branches of that tree a most curious appearance; also with *Splachnum mioides* and *S. angustatum*; and on the rocks grows *Gymnostomum pulvinatum*, which for some time I mistook for a variety of *Grimmia apocarpa*, to which it bears a considerable resemblance; *Hypnum obtusifolium*, *Didymodon rigidulum*, and *D. fragile*, also occur here.

On reaching the Portage, we halted for a day or two, to arrange the luggage, preparatory to crossing the Rocky Mountains. The very great difficulty with which this process was attended, compelled me to give up the resolution I had formed of going for the winter to the Columbia River, and decided me upon remaining among the Rocky Mountains, the gentleman who was in charge of the brigade having kindly promised to engage a hunter to remain with me during that time. He also provided me with horses to convey my luggage, but as I had left my tent and other necessaries at Edmonton House, I found myself but indifferently equipped for an American winter. My plan was to reach the Smoking River, where the Hudson's Bay Company has an establishment: but unforeseen circumstances prevented my accomplishing this design. The brigade left the Upper House on the 18th of October, and, for the first time in my life, I found myself alone with Indians; but every thing was so new to me, and I had such agreeable anticipations as to the result of my next summer's occupations, that I scarcely felt the solitariness of my situation. The snow again disappeared partially from some of the low grounds, and I was busily engaged in investigating, as far as possible, the promise of the ensuing spring. *Didymodon latifolium*, *Gymnostomum ovatum*, and a very handsome yellow *Lichen*, were growing upon the trees, likewise the curious parasitical plant,

which I mentioned before, as being probably a species of *Viscum*, was seen on the *Pinus Banksiana*. At the junction of the Assinaboine with the Red-Deer River, I was first gratified with a sight of the Rocky Mountain sheep. At this season their flesh is excellent, superior, in my opinion, to the best English mutton. After they have been once disturbed, they become so shy and vigilant, that it is difficult to approach them, taking refuge in the inaccessible precipices, but coming down to the grassy hills to feed, where the hunters frequently surprise them.

Our route now lay along the Assinaboine River, and we proceeded slowly, encamping at every 15 or 20 miles, and often remaining two or three days in the same spot, for the sake of hunting. The following is the circumstance which hindered our reaching the Smoking River. The hunter whom I had engaged was accompanied by his brother-in-law, an Iroquois Indian, whose wife was taken in labour. According to the custom of these tribes, the woman quitted the tent in which she had lodged, until she should be delivered, and owing to the extreme severity of the weather, the ground being covered with snow, and the mercury indicating 38 degrees below zero, both the mother and her infant perished. The despondency which this event excited in the minds of the survivors, was so deep, that ten or fifteen days elapsed before they could be induced to quit the spot. The snow, during this interval, was gradually increasing, so that the only places which I could investigate were the perpendicular sides of banks and rocks; for the trees, being chiefly of the fir tribe, produce but very few lichens. Here I observed *Dufourea arctica*, *Tortula brevifolia*, and *Dicranum latifolium*. It was the beginning of December before the hunter could be prevailed on to overcome his grief so far as to resume his occupation. We had ascended the Assinaboine River upwards of 100 miles, when it here takes a south-westerly course, intersecting the chain of the Rocky Mountains almost exactly across. The snow had become so deep, that the horses could proceed no farther in that direction, and we were, in consequence, compelled to

abandon altogether our hope of reaching the establishment on the Smoking River for this season. We therefore altered our route, keeping outside the mountains, and reached Baptiste River, so named after my hunter, who was in the habit of wintering there occasionally. This river falls into Red-Deer River, but it was the 1st of January, 1826, before we reached the station where we proposed to pass the winter. On the sandstone rocks of Baptiste River, I met with *Gymnostomum pusillum* and *Weissia Seligeri*. The spot which the hunter had selected was an extensive plain, abounding in dwarf Willows and *Betula glandulosa*; and the burnt woods which covered the country around afforded good grass for the horses, of which we had a large band, and sheltered also the *American Elk* or *Moose Deer*, and the *Wood Buffalo*, which choose those burnt woods as their favourite resort. These animals, if frequently disturbed, will quit the place, and we now found this to be the case; for our hunter, though considered one of the most expert shots in the country, found it difficult to procure enough for our supply, and was often obliged to travel for eight or ten days without seeing one of these creatures. As we were now likely to remain stationary for a short time, I set about building myself a brushwood hut, formed of the boughs of the *White Spruce*, and soon completed it. I had calculated upon being able to procure a good many specimens of birds during the winter, but here too I was disappointed, for most of them quit this country during the hard weather, and a very few kinds only remain, chiefly belonging to the genera *Tetrao*, *Picus*, *Stryx*, *Corvus*, &c. Among them I remarked two species of *Parus*, and the *Lesser Redpoll*. It is difficult to understand how these little creatures can resist the severity of cold in these high latitudes. A slight shower of rain fell about the 10th of January, which is a very rare phenomenon at this time of year; and it caused us great inconvenience, by moistening the surface of the snow for a few inches, when the succeeding night's frost formed it into a hard crust, by which travelling was rendered very laborious and difficult, and it became almost impossible to get near any animal, owing to the noise

made in walking, by the breaking of the crust. At this time, January 10th, the snow was about two feet deep, and it gradually increased till the 27th of March, its greatest average depth being from five to six feet. Our horses began to suffer considerably from the unusual severity of the winter: the hunters lost the whole of the young ones of the preceding year, and one which I had received from the Company died also. The animals of all kinds were becoming more and more scarce, so that my hunter resolved upon leaving this spot, and accordingly removed 80 or 100 miles farther down the river, but I preferred remaining where I was, though my situation became very lonely, being deprived of books or any source of amusement. When the weather permitted, I generally took a walk, to habituate myself to the use of snow shoes, but I added very little to my collections. The hunter returned about the beginning of March, bringing with him some venison, which proved a very acceptable supply, as the *Partridges*, *Tetrao canadensis*, and *T. rupestris*, the only game to be met with in my short rambles, were becoming difficult to be obtained. Nothing particular occurred until the 1st of April, when I determined upon going back to the Portage, in hopes of receiving letters from Captain Franklin or from home, as well as for the purpose of procuring specimens of the waterfowl which might then be expected to return to the many lakes in the vicinity. I left Baptiste River, accordingly, accompanied by the Indian who took charge of my horses, and carrying with me the few specimens of plants and birds that I had been able to obtain. In six days we reached Jasper's House, the distance in a direct line being from 150 to 200 miles, which was the greatest journey I had ever yet performed in snow shoes.

On the 9th I had the pleasure of meeting Mr. McMillan, who brought me, from Edmonton House, my tent, another supply of paper, and a little tea and sugar, by which my situation was rendered comparatively comfortable. The winter, he assured me, had been remarkably severe, and vegetation was a full month later than usual. The ducks and geese now began to return, so that my time was fully

occupied till the 6th of May, when the brigade arrived, having crossed the Rocky Mountains from the Columbia River. They found me encamped near a small lake, about half-way between Jasper's House and the commencement of the Portage, living upon *White Fish*, which, though small, are of an excellent quality, and which I did not observe in any other lake among the Rocky Mountains. I agreed to accompany the brigade as far as Jasper's House, and accordingly set out with them on horseback. Having crossed the Assinaboyné River, the party halted to breakfast, and I went on before them for a few miles, to procure specimens of a *Jungermannia*, which I had previously observed in a small rivulet on our track. On this occasion I had a narrow escape from the jaws of a grisly bear; for, while passing through a small open glade, intent upon discovering the moss of which I was in search, I was surprised by hearing a sudden rush and then a harsh growl, just behind me; and on looking round, I beheld a large bear approaching towards me, and two young ones making off in a contrary direction as fast as possible. My astonishment was great, for I had not calculated upon seeing these animals so early in the season, and this was the first I had met with. She halted within two or three yards of me, growling and rearing herself on her hind feet, then suddenly wheeled about, and went off in the direction the young ones had taken, probably to ascertain whether they were safe. During this momentary absence, I drew from my gun the small shot with which I had been firing at ducks during the morning, and which, I was well aware, would avail me nothing against so large and powerful a creature, and replaced it with ball. The bear, meanwhile, had advanced and retreated two or three times, apparently more furious than ever; halting at each interval within a shorter and shorter distance of me, always raising herself on her hind legs, and growling a horrible defiance, and at length approaching to within the length of my gun from me. Now was my time to fire: but judge of my alarm and mortification, when I found that my gun would not go off! The morning had been wet, and the damp had

brigade arrived, the Columbia small lake, about commencement of though small, not observe in . I agreed to House, and ac- Having crossed breakfast, and I re specimens of rved in a small had a narrow while passing discovering the by hearing a hind me; and ching towards rary direction at, for I had early in the She halted d rearing her- out, and went , probably to s momentary with which I and which, I so large and The bear, three times, each interval ways raising ble defiance, of my gun of my alarm would not damp had

communicated to the powder. My only resource was to plant myself firm and stationary, in the hope of disabling the bear by a blow on her head with the butt end of my gun, when she should throw herself on me to seize me. She had gone and returned ten or a dozen times, her rage apparently increasing with her additional confidence, and I momentarily expected to find myself in her gripe, when the dogs belonging to the brigade made their appearance, but on beholding the bear they fled with all possible speed. The horsemen were just behind, but such was the surprise and alarm of the whole party, that though there were several hunters and at least half-a-dozen guns among them, the bear made her escape unhurt, passing one of the horsemen, (whose gun, like mine, missed fire,) and apparently intimidated by the number of the party. For the future, I took care to keep my gun in better order, but I found, by future experience, that the best mode of getting rid of the bears when attacked by them, was to rattle my vasculum, or specimen box, when they immediately decamp. This is the animal described by Lewis and Clark in their Travels on the Missouri, and so much dreaded by the Indians. My adventure with the bear did not, however, prevent my accomplishing the collecting of the *Jungermannia*. It is No. 17 of the "American Mosses."

On the 7th of May, I found the first plant in flower, namely, the *Anemone Nuttalliana*; the *A. borealis* and *Saxifraga oppositifolia* soon followed, with *Alyssum arenosum* and *A. arcticum*, some species of *Draba* and *Carex*, &c.

Among the mosses, I must not omit *Neckera Menziesii*, *Didymodon latifolium*, *D. oblongifolium*, and *Weissia macrocarpa*, (the two latter growing on slate,) *Funaria Muhlenbergii*, *Hypnum Halleri*, and, though very sparingly, *Splachnum rubrum*, and *S. luteum*.

Immediately upon arriving at Jasper's House, I had despatched the Indian who took charge of my horses back to Baptiste River, there to take care of them until the season was sufficiently advanced to allow of their travelling. He arrived on the 17th, bringing the animals and the paper, &c. which I had left there, and charged also with the

unwelcome intelligence, that the hunter with whom I had spent the winter, and whom I had engaged to accompany me to the Rocky Mountains in the summer, had, with that fickleness which is characteristic of most Indians, changed his mind, and refused to go to the mountains this season. This circumstance caused me much uneasiness, and I had no other remedy but to remain with the old Canadian who had charge of the Company's horses for the Portage; and as he had only stated places where his animals could find pasturage, I was much more confined in my range than I should otherwise have been. Although I might possibly have killed as much game as was necessary for my own use and that of the person who kept the horses, yet the time which this would have occupied would have left me but little leisure for any other employment.

We remained in the vicinity of Jasper's House, until the 15th of June, making collections of all that the country afforded. The species of *Potentilla* and *Ranunculus*, which are numerous among the Rocky Mountains, were now coming into flower. *Arbutus alpina*, *Dryas tenella*, &c. were also in bloom, and the beautiful *Calypto borealis* ornamented the pine woods. On leaving Jasper's House, we skirted along the mountains to the north, halting occasionally for a day or two, until we reached the Lac-la-Pierre, a distance of perhaps 60 miles in a straight line. This lake is surrounded by what I have called secondary rocks, covered with vegetation, which was advancing rapidly, so that I had my hands completely full of employment, but I had now to encounter a formidable obstacle, and one of which I had formed very inadequate ideas, in the rise of the waters, caused by the melting of the snows. The smallest ravine, that had been dry for nine months of the year, becomes, under these circumstances, an impassable torrent. The larger rivers are flooded in proportion. A fall of the temperature certainly occasions a corresponding diminution of the waters, but these transitions are so sudden, that it is dangerous to trust to them, as I experienced more than once, when having succeeded in crossing a stream in the morning, I found it so

swollen on my return, that I was compelled to remain for days a prisoner on the other side, to the great hindrance of my plans, and injury of the plants collected. This difficulty could not be avoided but by having two or three men and a *skin canoe*. Many of the plants that grow here are very local, apparently often confined to one particular mountain or valley, and I am quite confident that if any one could penetrate farther into the interior than it was in my power to do, they would be amply repaid for the fatigue thereby incurred. It might be easily managed by carrying a sufficient quantity of *Pemmican*, made previously, or obtained from the flesh of the animals that occur here, and thus reaching the Height of Land before the melting of the snow. As an instance of the exclusive locality of some plants, I may mention what I observed in a small plain, surrounded by mountains, and situated about 30 miles west from Lac-la-Pierre, and called by the hunters the Wolf Plain. Here I gathered *Claytonia lanceolata*, *Anemone patens*, a large species of *Valeriana*, *Spergula saginoides*, *Veronica officinalis*, *Cineraria?* *Tussilago frigida*, *Lupinus perennis*, and new species of the genera *Ranunculus*, *Caltha*, *Trollius*, *Potentilla*, &c. &c.; most of these were in the greatest abundance, and scarcely observed anywhere else during my route. *Splachnum urceolatum* and *sphaericum* also grew there, and *Nephroma polaris*. Among the mosses which I saw in the vicinity of Jasper's House, were *Phascum cuspidatum*, *Gymnostomum Heimii*, *Weissia latifolia*, *Systylium splachnoides*, *Tayloria splachnoides*, &c.

The effects of the unusually cold winter were now observable in the excessive emaciation of the animals, which were reduced to skin and bone. All vegetation was extremely backward, and according to the assertion of the old Canadian, who had been resident for many years among the Rocky Mountains, the waters were higher than they had been for twenty years. To conclude, the mosquitoes were also dreadfully numerous, owing to the almost continual rain; for in dry weather, when the atmosphere is clear and frosty at night, these insects are much diminished in quantity. We

remained in the vicinity of Lac-la-Pierre, making excursions for 15 or 20 miles around, and then left the camp, and pitched our tent at *Grande Saline*, about 20 miles south-west of our last station. Here are a great number of salt springs; but I observed little that was peculiar in the vegetation. At this spot only I found *Splachnum heterophyllum*, and at about a day's ride, 60 miles west of this place, I first met with *Veratrum viride*, and several species of *Potentilla* and *Ranunculus* that I had not previously seen. About the 20th of July, we began to retrace our journey, as the Canadian had received orders to have his horses in readiness at Jasper's House by the 24th, as the Governor of the Hudson's Bay Company was expected to cross to the Columbia at this time. I therefore determined to return at the same period, hoping to be able to cross by the assistance of the Governor; but other arrangements having been effected, he did not arrive. After waiting for ten or twelve days in fruitless expectation, I was compelled to give up the scheme, as the waters were too high to be passed without the assistance of canoes, &c. Having here fallen in with several Indians, who had assembled to receive ammunition, &c. from the Governor, I engaged one of them to accompany me in a tour through the Rocky Mountains to the north, as far as the sources of Peau River. After depositing the specimens I had collected at Jasper's House, we again set off, taking Lac-la-Pierre in our route, for the purpose of obtaining the seeds of those plants which I had already observed there. Here we staid for a few days, in order to lay in provisions for our journey, but were very unsuccessful, only killing a single Rocky Mountain sheep, which was quickly devoured, as my hunter's family consisted of his wife, five children, and himself, besides me, and the person that took charge of my horses. We therefore determined upon proceeding, and of depending upon what we should meet with on the route, which proved very inadequate to our demands; however, we contrived to make shift, until we reached the Smoking River, one of the branches of Peau River, where we again met with some of the mountain sheep, and succeeded in killing a few, which

put a close to our state of comparative starvation. The Smoking River is about 200 miles, in a direct line, from Jasper's House. Here I first found *Rhododendron lapponicum*, *Mitella cordifolia*, and a new species? *Woodsia hyperborea*, a new *Caltha*, a species of *Trollius*, &c., *Conostomum boreale*, *Hymnum confertifolium*, *Eriophorum capitatum*, and several other rare species. Between Providence and Smoking River, we passed a chain of beautiful green grassy hills, much frequented by the buffaloes. This journey was not, on the whole, very productive. I found *Menziesia empetrifolia* and *M. globularis*, both in great abundance, also a new species of *Menziesia* with white flowers, two species of *Befaria*, *Rubus stellatus*, a *Minuclus* like *Levisii*, *Veratrum viride*, a small shrub with fine flavoured fruit, which also grew on the Height of Land, *Juncus biglumis* and *arcuatus*, and a new species, and *Tiarella cordifolia*. All the hills in this neighbourhood are covered with *Andromeda tetragona*. We had a considerable fall of snow on the 24th of August, which only partially left the ground afterwards, continuing to linger on the high spots, and it much impeded my operations. I remained here until the latter part of September, causing pemmican to be made of the buffaloes' flesh, which my hunter killed, with the intention of carrying it to the Columbia, where I hoped to spend the winter among the mountains; but letters that I received from Captain Franklin obliged me to alter my plans, and the frequency of snow showers compelled me to return to the Portage by a different route from that which I had pursued in going. One of my principal objects in visiting Providence had been to obtain specimens of the *Mouton blanc*, a kind of goat, but though I devoted several days exclusively to that pursuit, I had not the satisfaction of seeing one: although in some seasons of the year they are said to be plentiful. Little occurred worthy of remark on my return to Edmonton House, where I busied myself in gathering seeds of the plants I had formerly collected.

Now, however, I determined upon crossing the Portage, with the Columbia brigade, as I had formed a strong idea

that the vegetation would change considerably in its character, after passing the Height of Land. This surmise I found to be correct, as may be seen from the habitats affixed to the specimens from the Rocky Mountains. About 15 or 20 miles above the commencement of the Portage, we left the main branch of Red-Deer River, and followed a lesser stream that here joins it, winding along its banks, and not unfrequently scrambling in the bed of it, until we reached a small lake where it takes its source, and the Height of Land. The lake is not more than 200 yards in length, and is called the *Committee's Punch Bowl*. Out of its other extremity flows one of the tributary streams of the Columbia. On reaching the middle, I took a hearty draught, pleasing myself with the thought that some of the water I had tasted might have flowed either to the Frozen or Pacific Oceans.

I observed little change in the vegetation until within ten or a dozen miles of this lake: the trees were gradually diminishing in size, and, on the sides of the high ground, reduced to mere bushes, principally *White Spruce* and *Balsam Poplar*. I may enumerate a few of the plants, as far as I am able to do so from recollection. A *Saxifraga* like *S. trifida*, but with the foliage simple; another resembling *multifida*, the leaves much divided, with creeping shoots. *S. leucanthemifolia*? entirely viviparous; another species with nearly round foliage, and also viviparous; another plant belonging to this order, with oblongo-ovate leaves, approaching in habit *S. umbrosa*, but having the leaves distichous, and white underneath; a small plant, growing in spongy places, like an *Hippuris*, about two inches high; a diminutive creeping plant, exactly similar to *Anagallis tenella*, of which I preserved no specimens; a low procumbent shrub, with cordate foliage, and bearing very fine flavoured red berries; a hexandrous plant, probably a *Eritillaria*, only the stem and seed-vessels remaining, of which seeds were brought home, but I am ignorant whether they have vegetated, &c. The following mosses also occurred: *Dicranum Starkii*, *Trichostomum patens*, *T. sudeticum*, *T. aciculare*, and *T. lanuginosum*; *Hypnum molle*, *H. stramineum*, *Bryum Sierii*, and a species

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named by Dr. Hooker *B. Schleicheri*, which grows in the stream that falls into the Columbia, at its very efflux from the lake. When it is considered that we visited this place in the middle of October, and during a violent snow storm, which had already covered the ground to a depth of several inches, we may form some idea of what might be expected to be the productions of this country, lying at the very foot of the Rocky Mountains, during fine weather, and at an earlier season of the year, when so many peculiar plants were still observable, although I was obliged to keep up with the brigade, and we proceeded as quickly as possible. At the time of my return, the snow was so deep as to preclude the possibility of finding any thing. The first glacier I saw, was about twenty miles before reaching the lake; but I visited a very large one at ten miles nearer to the lake. I found the trees, or rather bushes, of *White Spruce* and *Balsam Poplar*, growing almost close to the ice. The only thing that repaid me for the trouble was a patch of *Trichostomum lanuginosum*, the only one I met with during the journey. To the plants I have already named, may be added *Tiarrella trifoliata*, *T. cordifolia*, and *T. Menziesii*, a species of *Spirea*, *Vaccinium hispidulum*, *Gaultheria scrypyllifolia*, and another *Vaccinium* allied to *V. Myrtillus*; none of these, however, were in flower. Amongst the *Cryptogamiæ*, I also found here *Adiantum pedatum*, and *Aspidium Louchitis*; *Polytrichum pallidisetum*, var., *Grimmia torquata*, a nondescript *Didymodon*, and doubtless many more which have escaped my memory, and which, with those enumerated, were scarcely seen any where else. When the lake is passed, you descend rather gently for about eight or ten miles, with a similar vegetation to that of the eastern side; but when the summit of the Great Hill, or Grand Côte, a few miles beyond the Height of Land, is attained, the change becomes most striking. Instead of the stunted miserable looking *Balsam* and *White Spruce* which grow on the eastern side, the *Pinus Strobus* and *P. canadensis*, with *Thuja occidentalis*, and several other trees, increasing in variety as you descend, and often attaining an enormous size, present themselves to view, their branches also covered

with *Sticta pulmonacea*, and *Cetraria glauca*, enhancing materially the novelty of their appearance. Here also I found a most troublesome kind of *Aralia*, the *A. erinacea*, Hook. in great abundance; also *Menziesia ferruginea*, and a large species of *Spiraea*, allied to *S. Aruncus*; two or three different *Uvulariæ*; a species of *Dracæna*, bearing only one berry of a blue colour; *Pyrola umbellata*, a very singular and new kind of umbelliferous plant; *Lycopodium Selago*, var., *Hypnum robustum*, (Hooker;) *H. vagans*, *tenax*, and *loreum*; *Dicranum heteromallum*, and *D. crispum*; *Polytrichum alpinum*, *urnigerum*, and *undulatum*, &c. The "Grande Côte" is of very steep and difficult descent for two or three miles. Upon reaching the base, we came upon Portage River, which has its rise in the lake called the Committee's Punch Bowl, and which, running through a small and narrow valley, perhaps 20 miles long, finally falls into the Columbia River. The stream is very winding, and it is necessary to cross it in many places, which, at this season of the year, was a very unpleasant operation, the water being often as high as a man's middle. The track leaves the river in two places, where the valley is quite filled with the current, or intercepted with rocks, and traverses the points of two woods, in which I observed *Pothos fetida*, which had not occurred since leaving New York, and, for the first time, *Mahonia pinnata*, and a shrub resembling *Box-wood*; two or three species of *Vaccinium* unknown to me, and growing two or three feet high, with large but not very well flavoured fruit; a species of *Noli-me-tangere*; *Circea alpina*; *Lycopodium Selago*; *Aspidium Lonchitis*, *aculeatum*, and *Phægopteris*; on rocks opposite the first wooded point, were *Hypnum neckeroides*, *Bryum hornum*, *Weissia acuta*, (likewise found on the Height of Land,) *Bartramia Halleriana*, *Dicranum pellucidum*; and on stones in the river, that most curious moss, *Scouleria aquatica* (of Hooker, in No. I. of the present work, t. 19,) while the "battures," or gravelly banks, left bare by the receding of the streams, were covered with *Dicranum julaceum*, *D. pellucidum*, &c. We reached the Boat Encampment on the Columbia, the 17th of October. On the following day, the brigade pursued their voyage, and

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I began to prepare for re-crossing the Rocky Mountains. I observed little that was interesting or peculiar in the vegetation about the Columbia. All the plants were out of flower, and most of them, indeed, in a state of decay. It was with much regret that I began to retrace my steps back to Jasper's House, with the person in charge of the horses; and till our arrival at the commencement of the Portage, the weather continued wet and stormy, the Height of Land being deeply covered with snow, so that my collections received no additions. On my journey, I met with Mr. Finnan McDonald, a gentleman who had been for upwards of twenty years in the Company's service, to the west of the mountains. From him I received much information relative to the districts south of the Columbia, which had been explored by himself only, and also an account of the enormous pine tree found in the Umpquha country, and of a tree smelling like *Laurus Camphora*, both, I understand, since introduced into Britain by Mr. D. Douglas. We arrived at Jasper's House on the 30th of October, and spent ten or fifteen days there in making arrangements for descending the river from Fort Assinaboyné, and in exploring the adjacent country. The most interesting object that I saw, was a species of *Pinus*, whose general habit bore a considerable resemblance to *Pinus Strobus*: the cones are about double the size of those of *P. sylvestris*, but blunter at the apex, and with seeds very large in proportion to the cone. The squirrels, or some bird, had devoured the greater part of them, and mutilated the remainder. Of this tree, I observed but very few individuals, and these were confined to the very highest parts of the secondary mountains, such as near the glacier which I visited at the Height of Land. *Pinus taxifolia* is common here, and attains a larger circumference at the base than any other species which occurs on the eastern side of the Rocky Mountains. Its shape resembles a sugar loaf, tapering very quickly to the top. The bark is remarkably thick and rough near the root, and is frequently covered with *Orthotricum obtusifolium*, and with a fine yellow *Lichen*, with brownish black shields, which the natives of this country use for dyeing. Its

cones resemble those of the *Spruce Fir*, but are rather smaller. The seeds are furnished with remarkably long wings, which protrude half-an-inch beyond every scale, giving the cones a very singular appearance. There is also in this vicinity a species of *Rubus*, resembling *R. odoratus*, but having white flowers, and a large and very insipid fruit; and the *Aster exscapus*, so called by Dr. Richardson, abounds here. It has a very singular habit, little like that of the genus *Aster*; the flower buds are formed in Autumn, and bear an exact similarity to those of *Globularia vulgaris*. I watched it long, with great interest, expecting it to produce something very handsome, but found the blossoms remarkably insignificant, the rays being small and nearly white. *Erigeron compositum* is plentiful, and a very pretty little *Astragalus*, which I saw no where else: also *Cryptogramma acrostichoides*, *Pteris gracilis*, and a species (?) of *Nephrodium*, with the fronds whitish beneath.

Having accomplished our preparations, I embarked my stock of specimens, and, with Mr. M'Donald and his family, began to descend the river. The winter had set in with all its rigour; the cold became severe, the river had subsided greatly, and being choked with snow, and full of rapids and shallows, we found great difficulty in proceeding, being often obliged to quit the boat and lift her over the stones. We, however, continued to drift along with the stream for a few days; but our boat was so large and heavy that she frequently struck against the shallows, and we were almost worn out with fatigue, with our being continually obliged to jump into the half frozen water to endeavour to force her along. Mr. M Donald's legs were much cut and bruised with the floating ice, and I, who kept on my stockings to avoid this misfortune, suffered on the other hand with frost, which rendered my wet clothes a most painful encumbrance. The ice and snow now became so intense and heavy, that though we had calculated on reaching Fort Assinaboyno before the river became wholly impassable, we found ourselves unable to proceed, and stuck fast on the seventh day, when not more than half-way on our voyage. As Mr.

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M'Donald's family were incapable of travelling, he agreed to encamp and remain with the luggage, while a clerk belonging to the Company and myself prosecuted our journey on foot to Fort Assinaboyn, whence we were to send horses to his assistance. We had calculated on reaching this place in three days, but it was the fifth evening before we arrived, having, however, met with no other hindrance than the unavoidable hardships of such a journey. On the way I remarked the *Scheuchzeria palustris* growing in a small lake, its seed-vessels only appearing above the ice. I met with this plant in no other situation. We received much kindness, on our arrival, from Mr. Harriot, the gentleman who has the charge of the Fort, who also sent horses, as soon as they could be procured, to the relief of Mr. M'Donald, who had suffered great anxiety from the delay occasioned by our long journey, and whose provisions were nearly exhausted. He reached us, happily, about the 1st of December, bringing with him the whole of the luggage in good order. After resting here for a few days, we prosecuted our journey to Edmonton House, where we intended to winter, and got there about the middle of December, being most kindly welcomed by J. Rowand, Esq. Superintendent of the Fort. I immediately applied myself to the examination and arrangement of my specimens, which, it gave me much pleasure to find, were in excellent preservation, and as I now considered the most hazardous part of the expedition to be over, I spent the three succeeding months in comparative ease and comfort. In the beginning of February, I received the agreeable intelligence from Dr. Richardson of the complete success of his undertaking, and that he expected to be at Carlton House in February, where he desired me to join him as soon as convenient. Accordingly, I quitted Edmonton House in the middle of March, taking with me a single specimen of every plant gathered among the Rocky Mountains; also a train of dogs, and a half-bred and Indian guide. Owing to some misunderstanding between the Hudson's Bay Company and the Indians of the plains, it was considered unsafe to pursue the usual track between the Posts, which very much

lengthened our route and caused us considerable inconvenience. We proceeded for a few days along the river, and then struck into the wooded country north of the Saskatchewan, to avoid encountering the hostile tribes. We shortly began to feel symptoms of snow blindness, which considerably retarded our progress, and although we had a sufficient supply of provisions for this journey in usual cases, we still found our stores considerably diminishing. The blindness became worse, and although we fired at several animals, we did not succeed in killing any. To add to our distresses, we now discovered that we had gone too far into the woods, by which the distance that we had to traverse was much increased. Our dogs became excessively fatigued, so that we were under the necessity of cutting up our sledge and carrying the luggage ourselves. The provisions were wholly spent, and I was compelled to destroy a fine specimen of the *Jumping Deer*, as I have before mentioned, although it was the only one we had been able to procure, and I had carried it all the way from the Columbia River, where I had killed it. As I had not been very particular in divesting this skin of the flesh, it proved the more valuable on that account. Our ignorance of the actual distance which lay between us and the Fort, prevented the Indians from desponding, for we expected to reach it every succeeding night; but we grew weak with exhaustion, and proceeded, therefore, but the more and more slowly. Within about a day's journey of the Fort, the half-bred Indian recognised the spot where we were, and we had the good fortune to kill a *Skunk*, an animal which I have omitted to mention in my former list, and which afforded us a comfortable meal. This creature, when hunted, discharges an intolerably fetid liquor upon its pursuers, and few dogs will afterwards attempt to destroy it. The one which we killed on the evening before we reached the Fort, proved tolerable eating, though it had a strong flavour of this obnoxious liquid. The distance being now so inconsiderable, I laid down my luggage, and we made our way to the Fort as quickly as possible. You may judge of my happiness at being first met on my approach by Dr.

Richardson, who had been looking for us some time, and had become very uneasy at our delay. I immediately experienced the hospitality of P. Prudens, Esq. Superintendent of the Fort, and I may safely say that I did justice to it; for after having more than once despatched all the victuals set before me, my voracity induced Dr. Richardson to inquire how long I had fasted, a question which I evaded for some time, under apprehension that he would use his authority to prevent the bad consequences which sometimes result from repletion after a long fast; however, I am happy to say that no uncomfortable effects ensued, and after a night's rest, I was almost fit for another journey. It was on the 5th of April that I arrived, and immediately set about gathering specimens of the different birds and animals found in the neighbourhood of Carlton House.

Having previously enumerated, so far as I could, the most remarkable plants, I shall now mention a few of the animals and birds that came under my observation. The one that claims the first attention is the *Rocky Mountain Sheep*, the animal called "*Big Horn*," by Lewis and Clark. In size it rather exceeds the largest English varieties of the common sheep. The rams are very remarkable for their immense and heavy horns, which turn round so as to form a volution and a half; and when this is the case, I have been assured that they often prove fatal to the animal, their points coming in contact with the ground, and preventing them from browsing. The female has small curved horns, like the common goat. Instead of wool, these sheep have hair like the moose deer. They are a timid inoffensive animal, herding in small flocks, and, on the approach of a dog, betaking themselves to some rocky precipice, whither the enemy cannot follow them; they then become an easy prey to the hunter, who may shoot them at his leisure. The female brings forth one and sometimes two young at a time, and hides them in some inaccessible place, where she visits them once or twice a-day, to give them suck, till they are strong enough to shift for themselves. They prefer the bare grassy mountains where there are steep rocks, to which they

may retreat in case of alarm, in winter descending lower, but never quitting the mountains. There is a kind of earth met with among slate-rocks, of which these sheep are remarkably fond; it is probably impregnated with salt, and by digging it out, they form caves of a considerable size. I have been repeatedly startled, when creeping along a narrow ledge of rock, to find a whole flock of them thus engaged; and as it sometimes happens that such spots are accessible only by one path, it is necessary to retreat as quickly as possible, or run the risk of being thrown down by them and dashed over the precipice. They appear to be tenacious of life, as they frequently make good their escape after being severely wounded. Their flesh is excellent, exactly resembling, both in appearance and flavour, the best English mutton. The *White Sheep*, which I mentioned before as having fruitlessly endeavoured to obtain, is another very interesting creature, and peculiar to the Rocky Mountains. It is said to resemble the common goat in every respect, except having a fine and beautiful wool intermixed among the hair, particularly along the back and buttocks. I have seen the skins of this animal, but was not so fortunate as to procure a good specimen. Although one of my main objects in going to the mountains north of the Smoking River, was to obtain the *White Sheep*, none were to be found, though at times they frequent that neighbourhood in considerable numbers.

The bears next claim our notice: and first, the *Gristly Bear*. As I have already mentioned the only instance of my being attacked by them, I have only to add that they are a very formidable creature, from their great size and strength, being said to prove an overmatch for every other animal inhabiting these regions, not excepting the Buffaloe. They are abundant about the Rocky Mountains, differing much in colour, varying from a light grey to a dark chocolate hue; the last kind being said to be more ferocious than the others. They abound among the mountains north of the Smoking River. Except in the first instance, I always found the bears disposed to retreat as fast as possible, without offering the least affront; and as I was but indifferently armed,

carrying only a single-barrelled gun, I considered it the safest plan to follow their example; particularly as there are generally two or more of these creatures in company. I therefore contented myself with procuring two fine specimens of their heads, my means of conveyance being altogether inadequate to the carrying a whole skin; but I was so unlucky as to lose one of these heads, which a Wolverine carried away while it was drying. The flesh is very bad eating, the very dogs refusing to touch it. Their food consists of flesh, berries, and roots: the berries of the *Hippophae canadensis* have a very obvious effect upon them, acting as a strong cathartic. They lie dormant for a few months in the depth of winter, and when they retire to their hiding-places, generally under a fallen tree, or some similar situation, they are extremely fat, and even when they first sally out, are in good condition, which, however, they soon lose. I saw several miserable objects, (proofs of their prowess,) at the various establishments of the Company, but as I have already detailed the particulars to Dr. Richardson, it will be unnecessary here to repeat them. The *Black Bear* is also an inhabitant of these mountains, but it is a much less formidable animal than the grisly bear. These are likewise subject to great variety of colour, and I have seen the skin of one nearly white, at least cream coloured; there is also a kind with a reddish snout, which the hunters consider the most ferocious, but they seldom or ever attack man, unless wounded, or when defending their young. Their food appears to consist principally of roots, and their flesh is tolerably good food, as I often had occasion to experience, the paws being considered a great delicacy by the Indians, who hunt them with avidity, while they are in great fear of the grisly bear. The description of them in Lewis and Clark's Travels, appears rather overcharged; but perhaps they are more ferocious on the Missouri than they are in more northern latitudes. A species of *Marmot* inhabits the Rocky Mountains, of which I am sorry to say that no specimen was obtained. It is called by the Canadians *Le Siffleur*, being remarkable for its whistling. I saw it occasionally,

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but never got near enough to shoot it; it appears to be about the size of a common cat, and resembles a badger in colour. These marmots are extremely vigilant, always placing a sentinel, who watches while the rest are feeding or cutting provisions for the winter; on being disturbed, he gives a shrill whistle, which is repeated from one to another along the whole side of the mountain which they inhabit. Their flesh is much esteemed by the natives, who take them in traps, and they are much more frequent on the western than the eastern side of the mountains. I observed them on the mountains near the Wolf's Plain, and also saw there the following little animal, *Arctomys Parryi*, which is abundant there, and in its manners appearing exactly to resemble those species which inhabit the plains about Carlton. Specimens of it were brought home. There is also another diminutive animal found among the Rocky Mountains, whose general form and appearance exactly resembles a young rabbit of five or six weeks old, having small round ears. It is probably another kind of marmot, and lives in rough stony places near the summits of the mountains. It has a weak cry, resembling that of a rabbit when hurt. Upon the approach of any one, it gives the alarm, disappearing among the stones, and soon showing itself again at a distance of fifteen or twenty yards from its first station. They appear to make no burrows of their own, but make their way among the interstices of the stones with great celerity. They live on grass, and probably sleep during the winter.

Among the birds of these regions; the *Calumet Eagle* is one of the scarcest. It is about the size of the common grey eagle of our mountains, and nearly of the same colour, the tail excepted, which is very beautiful,—black at both extremities, and white in the middle. They are highly prized by the natives, who decorate their war bonnets and the stems of their calumets with their feathers, whence I have adopted the name. It would appear that they are very rare, as I never saw any but the one I killed. It was a very old bird, and the plumage in bad order, having been shot in the summer-time, upon the summit of one of the mountains near

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Lac-la-Pierre. Had I but the pen of M. Audubon, I could give as striking a description of it as he gives of the "Bird of Washington." Of the genus *Tetrao* I remarked the following species: *Tetrao Phasianellus*, the one which I have already described as inhabiting the plains; *T. canadensis*, which frequents pine woods; *T. Umbellus*, or the *White Flesher*, a bird found among poplar woods, and remarkable for the curious beating that it makes with its wings, and always when seated on a fallen tree; another species of *Tetrao*, nearly allied to the last, and probably only a variety of it; *T. Richardsoni*:—this fine bird has been thus named by M. Louis Bonaparte, in honour of Dr. Richardson; it is the largest species that I saw, and appears to be peculiar to the Rocky Mountains; the back of the male is of a uniform dark brown, nearly black, with the breast and under part of a leaden colour, the space round the eyes, which is bare of feathers, is, in this bird, of a yellow colour. The usual station of the male, about the pairing time, is on some rocky eminence, or large stone, where he sits, swelling out his neck, spreading his tail, and repeating the cry, "*Coombe, Coombe,*" in the fine mornings. The hens much resemble the females of *Tetrao canadensis*, and are considerably smaller than the other sex. They live on berries and herbs of various kinds, and are very good eating. Of those species that turn white during winter, I saw three; they were easily distinguishable by one having the whole tail black, another has only two black feathers in it, and the other has a tail entirely white. Neither *Ptarmigans* nor *Willow-Grouse* occur among the mountains, and none of the species are migratory; but the winter residents are few in number. The following birds were seen: seven or eight species of *Woodpecker*, the *Golden Winged* species being the only one that migrates; three or four different *Owls*; the *Common Raven*, and the *Corvus canadensis*, (the *Uskashoan* of the Indians;) this bird is very familiar, generally making its appearance wherever you may chance to encamp, attracted doubtless by the hope of finding provisions. It is very fond of the fat of meat, which it will steal, and lay up *en cache* for a future

occasion. It begins to build early: I observed a pair collecting materials for a nest on the 18th of March, although the ground was covered at the time with five or six feet depth of snow. The *Lesser Redpoll*, and two species of *Parus* are also winter residents, which is astonishing, as the thermometer often sinks to 50 degrees below zero. One kind of *Falcon*, the *Falco palumbarius*, also remained all the year at the place where I first resided during the winter, on Baptiste River, about 60 or 80 miles from the Rocky Mountains: also the *Snow Bunting*, (*Emberiza nivalis*,) and a kind of *Water Onzel*, very similar to the British species, but without the white breast. Those birds which are migratory, quit this part of the country about the beginning of October, and reappear in the latter end of April. One of the first to return is the *White Headed Eagle*, and then follow the *Ducks* and *Geese*, with a whole host of small birds. The only songster is a species of *Turdus*, called by the Canadians the *Robin*; it resembles the common thrush, except in having a reddish breast. In the spring of 1826, immense flocks of the *Bohemian* or *Waxen Chatterer* were observed feeding on the berries of *Arbutus Uva-ursi*, but I do not think that they breed here, although a small flock of them was seen on the south branch of the Saskatchewan in June 1827.

The snow-shoe travelling, and the mode of encamping during winter has been so frequently described, that it is quite unnecessary for me to detail them here. One of the principal inducements for fixing upon any particular situation is when it affords dry wood in abundance. The snow is then cleared away with the assistance of the snow-shoes, and trees of a large size having been felled, they are divided into lengths fit for carrying. You may then, after lighting a fire collect a parcel of pine branches, the white spruce and balsam if procurable, are the best, with which a space is covered sufficient for a bed, and proceed to prepare supper. Pemmican is the best and most convenient food to be carried upon a journey. Without a pound of this and a little tea, no one should think of travelling in these desert wilds; it affords an excellent meal, and the hunter may afterwards

prepare for rest by rolling round him the blanket which he always takes with him. If the fire be occasionally renewed, the weather seldom causes much inconvenience. To a person accustomed to all the luxuries a civilized country can afford, this mode of life appears hard and uninviting, but the change takes place gradually, and is therefore but little felt. It seems strange, too, to live entirely on animal food, without any vegetables or salt, but it produces no inconvenience, as I can attest from an experience of about eighteen months, when I enjoyed a state of perfect health.

I found full employment in collecting the productions of the vicinity of Carlton House till the end of May, when Dr. Richardson quitted us to meet Captain Franklin at Cumberland House: thither Captain Back and I and the rest of the Expedition followed him in the beginning of July; but during my stay at Carlton House, I made several short excursions to the South Branch River, which rises considerably farther to the southward than the North Branch, but I did not find a single plant different from what are met with on the latter river. I also ascended the North Branch for upwards of a hundred miles, but saw little that was not equally common nearer to the Fort; from which circumstances, I was induced to conclude that little variation takes place for a considerable distance to the southward. Dr. Richardson having left his servant with me, we embarked in a small canoe on the 14th of July, picking up what specimens we could find along the river, and reached Cumberland House on the morning of the 19th, quite safe. As Captain Back was not yet arrived, I determined upon making an excursion as far north as Beaver Lake, where I added a few common plants to the collection; but as Dr. Richardson had already passed that way twice before, there was little left for me to do. I returned again to Cumberland House, and in a few days Captain Back and Lieutenant Kendall, with the rest of the people belonging to the Expedition, arrived in excellent health, and we immediately began preparing to embark for York Factory, on Hudson's Bay.

As we travelled with much despatch, my collections

received but little accessions of any importance. *Cyripedium arietinum* was found on the portage of the Grand Rapids, at the entrance of Lake Winnipeg; *Weissia calcarea* and *Tortula humilis* on the limestone rocks of the same lake; *Splachnum ampullaceum* was growing between Norway House and the Bay, while *Splachnum vasculosum* and *intermedium*, *Weissia turbinata*, *Cinclidium stygium*, &c. abounded near the Factory. Several phænogamous plants, not previously remarked, were met with, such as *Saxifraga Hirculus*, *Cardamine pratensis*, a species of *Tanacetum*, and two or three *Unbellifera*, one of them viviparous, with some *Syngenesious* plants, and *Aralia hispida*, &c. &c.

On the 1st of September, we encountered a dreadful storm in Hudson's Bay, from which we escaped as if by miracle. We had gone to visit the ship, which lay at five or six miles distance from the Fort; the party consisting of Captain Back, Lieutenant Kendall, Mr. D. Douglas, the Doctor belonging to the establishment, and myself, with eight men. On leaving the vessel to return to the Fort in the evening, the wind blew rather freshly, but little danger was apprehended; it suddenly, however, increased to a hurricane, and we were compelled to return if possible to the ship, but after several vain attempts, we found this to be impracticable. We, therefore, threw out an anchor until a boat should be sent to our assistance from the ship. This was immediately done, the boat being furnished with a tow line, and just as it had neared to within twenty or thirty yards of us, our anchor gave way, and we were driven off, at the mercy of the winds and waves. Our masts were almost immediately carried overboard, and after a dreadfully severe, but ineffectual attempt to approach the vessel by dint of rowing, we were compelled to give over, and to submit to being carried out to sea. By this time the water had become very rough, and our little bark was tossed about like an egg-shell, which caused all the men to get sick, and utterly incapacitated them from making the smallest effort to save themselves and us. We continued baling out the water with our hats, as much as we could. Lieutenant Kendall exerted himself to the

utmost, and he succeeded in setting up a temporary mast, which enabled Captain Back to keep the head of the boat to windward, and we continued to drive before the wind farther and farther out to sea. We had already lightened our little skiff by heaving overboard several casks of provision with which she had been loaded, and it was proposed to run her ashore, but most of the party opposed this, and it was resolved to continue out to sea. The night was dark in the extreme, with tremendous thunder and rain, the billows rolling mountains high, and breaking continually over us, which, added to the severe cold, caused us great suffering. Mr. Douglas became dreadfully ill, and the rest were in so benumbed a state, that it was hardly possible to make the necessary exertion to keep the boat from sinking, which could only be done by relieving her constantly from the water as fast as she filled. I shall never forget the sound of the waves as they approached us: sometimes, by the skill of our steersman, we partly avoided them, but much oftener did they dash over us with tremendous fury, and had two of these billows followed in quick succession, our instant destruction would have been inevitable, but by constant baling we kept the boat afloat. The storm continued without abating during the night, and at break of day we found ourselves rapidly drifting towards a lee shore. This we avoided by tacking, and we still continued to drive to sea. Towards the middle of the next day, the hurricane began to diminish a little in violence, but the sea was still dreadfully agitated, and it was not till the middle of the following night that our oars could be of the smallest service to us. At this time we were entirely out of sight of land, without compass to guide our course; the sun, too, was not visible. As the storm diminished, the men recovered from their sickness, and the oars were again plied, and with some success, as it afterwards appeared that we had gone to a distance of 60 or 70 miles in the Bay. With the aid of the tide and our oars we retraced our way back, and never shall I forget the joy that beamed on every countenance when the masts of the ship were again visible. Previous to this we had felt a return

of appetite, which was a sure sign that we considered ourselves comparatively out of danger, and a cask containing oatmeal was quickly broached, which, mixed with a little salt water, sufficed to allay our hunger; but I believe that Lieutenant Kendall and myself were the only partakers. We were soon espied from the ship, and a boat with plenty of provisions was sent to meet us, which proved very acceptable. The news of our having been swept out to sea had been speedily conveyed to the Factory, and Mr. M'Tavish, the Superintendent, lost no time in despatching Indians along each shore of the Bay, with provisions, &c. in case of our being cast ashore alive, for it was not considered possible that an open boat could have weathered so tremendous a storm; but when they found the casks of stores that we had thrown overboard, they almost all returned, and gave us up for lost. On reaching the vessel, we received the kindest attention from our fellow-sufferer, Captain Davidson, and likewise from Mr. M'Tavish, York Factory. Mr. Kendall and Mr. Douglas suffered severely, and did not recover the full use of their limbs until their landing in England. For my own part I endured little inconvenience, comparatively, and after enjoying a night's repose, I was able to take a walk as far as the North River, about five miles distant from the Fort, through a continued swamp the whole way, which was very laborious, for I sank up to my knees at every step, the underneath part of the ground being hard frozen, and the only plant which recompensed me for all my labour was *Polytrichum formosum*. Shortly after, we set sail for England in the Hudson's Bay Company's ship, the Prince of Wales, and having an excellent passage, arrived in London on the 15th of October, 1827, in good health.

I am sorry not to be qualified to speak of the mineral kingdom, and the only opportunity that occurred for investigation was unfortunately lost by spending the winter of 1825-6 distant from the Rocky Mountains. There appears, however, to be little variety; the high mountains consisting principally of primitive limestone on their eastern side. On reaching the Height of Land, these characters change, as the

changes of vegetation may testify, and the mountains are found to be formed of micaceous slate. The Columbia appears to flow through a country exactly similar, as at least one-third of its sand is composed of mica. I observed one large vein of secondary limestone, containing fossils, when crossing the Assinaboyné River, near a considerable waterfall, about 60 miles above its junction with Red-Deer River. The mountains which I explored north of the Smoking River are principally conglomerate sandstone, and below these, the country appears to be sandstone, containing coal, for at least 200 miles to the eastward, as far as Edmonton House on the Saskatchewan. At the eastern extremity of Lake Winnipeg, which is limestone, the primitive rocks again occur, and these probably continue to the sea.

LEDEBOUR'S ILLUSTRATIONS OF RUSSIAN PLANTS.

THIS work, which is so much desired by the scientific botanist, we are happy to learn from the author himself, is in a state of considerable forwardness, and will, under the title of "*Icones Plantarum Novarum vel imperfecte Cognitarum, Floram Rossicam, imprimis Altaicam Illustrantes,*" together with a complete *Flora Altaica*, and an account of the journey, speedily be published.

The *Altaic* plants were collected by the Counsellor of State, Ledebour, assisted by Dr. Bunge and Dr. Meyer, during a journey undertaken at the expense of the Russian Government, with the view to examine the natural productions of the *Altaic* Mountains, and a portion of the Chinese dominions bordering upon them. During the period that Ledebour was engaged in investigating that part of the *Steppe* situated between the *Ob* and the *Irtysch*, in crossing the lofty mountains to the west and south west of the *Altaic* range, the valley of the *Tscharysch*, the *Koksun*, the upper *Katunja*, and the *Buchtorma* on the Russian frontiers, the

eastern chain of the Altai were explored by Bunge, who passed a considerable length of time in the districts of the lower *Katunja*, the *Tschuja*, the *Baschkans*, and *Tschulyschman*, thence by the mouth of the river into the *Telezhischen Lake*, or *Sea*. Meyer, in the meantime, ascended the *Irtysch*, as far as *Noor-Saisan*, by which means he visited the eastern mountains of *Kurtschen*, situated in the Chinese Empire, as well as the *Dolen-kara* and *Ackaul*; thence, crossing it in a westerly direction, he passed through *Somgoripsa*, *Kirgisen steppe*, particularly the territories of *Ablaihit* and *Semipalatinsk*, and passed over the mountainous range of *Tschingistan*, *Kent*, *Ku*, and *Kar-karala*, to the *Altyn-tubé*, and to the sources of the *Nura*.

The "*Icones Plantarum*" will be published at Munich, and will comprise 500 plates in folio, executed in lithography by Seb. Minsinger. It will appear in 10 parts, each of 50 leaves, two of which parts will form a volume. The figures will chiefly represent new plants, discovered in the Altaic mountains and their environs. But a few other species of the Russian Asiatic Flora will also be admitted, which, if they have not altogether escaped the notice of former travellers, have as yet been imperfectly known, and either not at all, or very erroneously represented. The drawings, always made under the immediate inspection of the author, all from perfect and mostly living specimens, exhibit the plants of the natural size; and every where, when necessary, are added accurate and more or less magnified analyses of the parts of fructification. The text, given in Latin, will appear on beautiful vellum paper, and of the same size as the plates, and will be confined to the names, diagnoses, mention of the country, duration, and time of flowering of the plant, characters of the new genera, and explanations of the plates. The more full descriptions will appear in the *Flora Altaica* above mentioned, which will be published in octavo. This work, in three volumes, will enumerate all the plants found on the Altaic Mountains, and in the Steppes which extend along their southern and western bases, and will contain about 1700 species, arranged according to the Linnæan System in the Latin language.

The first volume includes the first 6 classes, with more than 100 new species;

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