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ART. I.—*Remarks on the Climate and Vegetable Productions of the Hudson's Bay Countries.* By JOHN RICHARDSON, M. D., Member of the Wernerian Society. Communicated by the Author *.

THE following observations have been thrown together, and the subjoined tables drawn up, principally with the view of making public the few facts collected during Captain Franklin's late expedition through the Hudson Bay territories, that relate to the inquiry so ably prosecuted by Baron Humboldt, into the *geographical distribution of vegetable forms*, and on which so much light has been thrown by the observations of our learned countryman Mr Brown. Occasion has also been taken, in the course of the paper, to insert as many circumstances relative to the *climate* of these northern countries as were known to us.

The expedition landed at York Factory, Hudson's Bay, in Lat. 57° Long. 92°, (a few miles to the westward of the line of no variation of the magnetic needle, and nearly in the longitude assigned by Dr Brewster to *one of the poles of cold*, but 23° to the southward of it), and travelling on a W.S.W. direction, reached Carlton House, on the Saskatchawan, distant in a direct line, about 430 geographical miles. This place is in Lat. 53° Long. 106° W., and lies nearly midway between the Pacific and

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Hudson's Bay; the Continent here being about 33° of long., or 1000 miles wide. From Carlton House, the course, for 1000 miles, was north, inclining to the west, to the mouth of the Coppermine River, in Lat. 67° 47′ N. Long. 115°½ W.

All the plants collected up to this point, amounting, *Agamæ* inclusive, to nearly 700 species, and to at least 5000 specimens, were brought home, and form the ground-work of the subjoined tables of natural families. About 500 miles of sea-coast, including the circumnavigation of the bays and inlets, were visited to the eastward of the Coppermine River, and the latitude of 68° 18′ N. attained at Point Turn-again; but the whole of the plants collected during this part of the voyage were left behind, owing to the hardships encountered in the subsequent return across the barren grounds. This loss has been supplied, as far as regards the purpose of the present paper, by the collections made during Captain Parry's second voyage in the same parallels of latitude, and at no great distance to the eastward.

In making a few desultory remarks upon the circumstances which are likely to influence the vegetation of the districts, I shall begin with their altitude above the sea; and it is almost superfluous to remark, that we have few precise data on this subject, and must for the present be content with rude approximations. The line of country travelled through is destitute of lofty mountains, table-lands, or great plains; except that Carlton House may be said to stand on the northern boundary of a sandy plain, which opening to the south, and extending to the confines of Mexico, is favourable to the migration of plants to the northward; but our stay in that quarter being confined to ten days at the commencement of spring, during which only thirty species of plants were gathered, few of these southern plants find a place in our list. Few hills were seen during the whole voyage, rising beyond 300 or 400 feet above the level of the surrounding country, and none exceeding 800, except on one part of the Coppermine River, where a range was observed to rise, on a rough estimation, to 1200 or 1500 feet; but even this was free from snow in the beginning of July.

Indeed, our route being by the great rivers, and almost uninterrupted water communications of the districts, was necessarily through the lower part of the country. Our barometer was

rendered useless soon after leaving York Factory; so that I can only state in general terms, that, from the shores of Hudson's Bay to the Rocky Mountains, (a continuation of the Andes), the ascent appears to be gentle, most rapid, however, about fifty miles from Hudson's Bay, where the rivers, in crossing a ridge of primitive mountains, form a quick succession of cascades and rapids.

Carlton House, the south-west limit of our journey, I estimate to be 1000 feet above the sea of Hudson's Bay. From this spot, our route to the north lay nearly parallel to the Rocky Mountain chain.

The summit of Portage La Loche or Methy Portage, which lies in 56° 43′ N. Lat., and 109° 52′ W. Long., and is about 250 miles from Carlton House, I estimated at 1500 feet. Methy Lake, the commencement on the south of this portage, of the water communication with Hudson's Bay, at 1000 feet, and Clearwater River, which flows from the north side of the portage uninterruptedly to the Arctic Sea, under the names of Athabasca, Slave River and Lake, and Mackenzie's River, at 800 feet. Slave Lake at 400 feet above the Arctic Sea. The height of land to the north of Fort Enterprize, from whence the descent of the Coppermine River to the Arctic Sea, is gradual, at 900 feet. The data from which these altitudes have been deduced are not precise enough to be worthy of detail; but the results, imperfect as they are, may be sufficient to shew that the elevation alone of these districts is not great enough to give a decided character to their vegetation.

The peculiarities of the Hudson's Bay climate, which have a more marked influence on the vegetable productions, may be, in some measure, collected from the following tables, and the remarks appended to them. The tables are formed on the model of those given by Humboldt, and the deeply interesting memoir of that illustrious man on the *Distribution of Heat*, published in the *Mémoires d'Arcueil*, or its translation in the 3d, 4th, and 5th volumes of the Edinburgh Philosophical Journal, may be referred to, for the original views which prompted the formation of such tables, and the many interesting deductions that may be made from them.

TABLE I. *Exhibiting the Mean Temperatures in various Latitudes.*

Months.	Mean Temperature of the Air in the Shade.				
	Cumberland House, Lat. 54° Long. 102¼′ W.	Near Fort Enterprize, Lat. 64° Long. 113° 6′ W.	Winter Island, Lat. 66¼° Long.	Igloolik, Lat. 69½° Long.	Melville Island, Lat. 74¾° N. Long.
	1819—20.	1820—21.	1821—22.	1822—23.	1819—20.
September, -	+ 49°.20	+ 34°.30	+ 29°.06	+ 22°.45	+ 22°.54
October, -	+ 36.68	+ 23.94	+ 10.21	+ 10.29	— 6.96
November, -	+ 14.60	— 0.23	+ 4.75	— 23 37	— 25 60
December, -	+ 2.14	— 29.12	— 16.94	— 32.80	— 26.79
January, -	— 14.19	— 15,08	— 27.96	— 22.07	— 35.09
February, -	— 1.82	— 24.80	— 29.97	— 25.41	— 37.19
Mareh, -	+ 11.09	— 11.07	— 15.64	— 24.75	— 23.10
April, - -	+ 33.97	+ 5.11	+ 2.51	— 4.68	— 11.87
May, - -	+ 49.05	+ 32.11	+ 21.09	+ 22.85	+ 14.16
June, - -	+ 59.88	+ 46.62	+ 31.97	+ 30.16	+ 34.24
July, - -	+ 69.80	+ 53.20	+ 36.34	+ 40.04	+ 42.41
August, - -	+ 73.73	+ 55.36	+ 36.68	+ 33.68	+ 32.68
Annual Means,	+ 32.01	+ 14.19	+ 6.84	+ 2.20	— 1.71

Remarks upon Table I.

The temperatures for Lats. 54° and 64°, were deduced from Captain Franklin's observations; those in the three remaining columns are copied from Captain Parry's journals, with the modifications noticed below.

Cumberland House is situated in Lat. 53° 57′ N., Long. 102° 17′ W., in a flat limestone country, covered with wood, and abounding in swamps and lakes. The month of September was occupied in travelling from Lat. 57° to 54°, for which an allowance has been made in the table at the rate of 1°.8 of temperature for each degree of latitude, by which the place of observation exceeded 54°; and the same addition was made to the recorded temperatures for June, July, and August 1820, during which months we travelled from Cumberland House to Lat. 64¼° N. The allowance of 1°.8 here used, is greater than that which Humboldt specifies for the same parallel of latitude; but

it was obtained from a comparison of the mean annual temperatures of Cumberland House and Fort Enterprize, which are $10\frac{1}{2}$ degrees of latitude apart. The observations for the other months in the Cumberland House column, were made within the stockade of the fort, and a deduction of 1° has been made from each recorded observation, to compensate for the radiation from the neighbouring buildings, an allowance which corresponded with the few observations we made upon the subject. The means for some of the months were deduced from three or more observations each day, taking into account the length of the intervals. In the rest of the months, the means of the extremes have been used, which differ only in a fraction of a degree from the more correct mode of taking the intervals into account.

The temperatures in the column for Lat. 64° were (except those for the latter end of June, the month of July, and the beginning of August,) taken at Fort Enterprize, in a shaded situation, on a northerly exposure, and not subject to any material radiation from warm buildings, and an addition of 0°.5 has been made to the registered temperatures, as a reduction to Lat. 64°; Fort Enterprize being actually 28 miles north of that latitude. The temperatures for July, and the early part of August, in this column, having been observed during the journey from the parallel of $55\frac{1}{2}$°, an allowance of from 1°.5 to to 1°.8 has been deducted for each degree of latitude, according to the situations of the places of observation. The temperatures for June, after the 10th, were taken in Lat. 65°, and have therefore been corrected for Lat. 64° by an addition of 1°.5 Fahr.

With regard to the temperatures in the three remaining columns, Captain Parry observes, " that the thermometer, when placed on the shore, or on the ice, at a distance from the ship, invariably stood from 3° to 4° or 5°, and on some occasions 7° lower than the temperature registered on board;" and he in consequence deducts 3° from the mean temperature for the year. In the above table an attempt has been made to proportion the compensation for the warm atmosphere of the ships, amongst the months, so that the greater allowance is made when the difference of temperature between the atmosphere and ship was greatest, or, in other words, in the coldest months. Thus, in July and August, when the radiation of the earth is supposed to

be nearly equal to that of the ship, the registered temperatures are used without alteration. In the other months, a deduction has been made, increasing from 2° to 5°, as their mean temperatures decreased. The annual means thus obtained are nearly the same with Captain Parry's corrected temperatures; but the differences betwixt the summers and winters a little exceed those given by his tables.

The means were obtained by Captain Parry from the twelve daily observations, made at intervals of two hours, or from 4380 observations in the year, and thus possess a degree of accuracy which is very rarely attained.

TABLE II. *Shewing the Distribution of Heat in the different Seasons, in various Latitudes.*

Seasons.	*Mean Temperature of the Air in the Shade.*				
	Cumberland House, Lat. 54°.	Near Fort Enterprize, Lat. 66°.	Winter Island, Lat. 64¼°.	Igloolik, Lat. 69⅓°.	Melville Island, Lat. 74⅔°.
Six Summer Months, April—September,	+ 55°.97	+ 37°.78	+ 26°.28	+ 24°.08	+ 22°.36
Six Winter Months, October—March,	+ 8.12	— 9.39	— 12.59	— 19.68	— 25.79
Spring,—March, April, May,	+ 31.37	+ 8.72	+ 2.65	— 2.19	— 6.94
Summer,—June, July, August,	+ 67.80	+ 51.71	+ 35.00	+ 34.63	+ 36.44
Autumn,—September, Oct. Nov.	+ 33.49	+ 19.34	+ 14.67	+ 3.12	— 3.34
Winter,—December, Jan. Feb.	— 4.62	— 23.03	— 24.96	— 26.76	— 33.02
Mean Annual Temperatures, ...	+ 32°.01	+ 14°.19	+ 6°.84	+ 2°.20	— 1°.71

Table III.

Places.	Position. Lat. N.	Position. Long. W.	Height in Feet.	Mean Annual Temperature.	Distribution of Heat in Seasons. Mean Temp. of Spring.	Mean Temp. of Summer.	Mean Temp. of Autumn.	Mean Temp. of Winter.	Mean Temp. of warmest month.	Mean Temp. of coldest month.	Diff. betwixt 3 summer and 3 winter months.	Diff. betwixt hottest and coldest months.	Highest Temp. observed.	Lowest Temp. observed.	Diff. or extreme annual range.
Cumberland House,	53° 57′	102° 17′	800	+ 32.01	+ 31.37	+ 67.80	+ 33.49	— 4.62	+ 73.73	— 14.19	72.42	87.92	+ 87°	— 44°	131°
Near Fort Enterprize,	54 0	113 6	850	+ 14.19	+ 8.72	+ 51.71	+ 19.34	— 23.03	+ 55.36	— 29.12	74.74	84.48	+ 78	— 57	135
Winter Island, -	66 11	83 30	0	+ 6.84	+ 2.65	+ 35.00	+ 14.67	— 24.96	+ 36.68	— 29.97	59.96	66.65	+ 54	— 42½	96½
Igloolik, - -	69 19	82 30	0	+ 2.20	— 2.19	+ 34.63	+ 3.12	— 26.76	+ 40.04	— 32.80	61.39	72.84	+ 50	— 50	100
Melville Island, -	74 45	11 0	0	— 1.71	— 6.94	+ 36.44	— 3.34	— 33.02	+ 42.41	— 37.19	69.46	79.60	+ 60	— 55	115
From Humboldt:															
Transatlantic region,	... {	58 to 72	{ 0	32	...	+ 55.40	...	+ 1.40	...	...	54.00				
Labrador, -	53 0	57 40	0			+ 51.80	...	+ 3.20	...	...	48.00	63·00			
Labrador, Nain,	57 08	61 20	0	+ 26.42	+ 23.90	+ 48.38	+ 33.44	— 0.60	+ 51.80	— 11.20	48.98				
Churchill, Huds. Bay,	59 02		0	+ 25.03		+ 52.20		— 6.80			59.00				
Europe:															
Enontekies, -	68 30	20 47	1356	+ 26.96	+ 24.98	+ 54.86	+ 27.32	+ 0.68	+ 59.54	— 0.58	54.18	60.12			
Hospice de St Gothard,	46 30	8 23	6390	+ 30.38	+ 26.42	+ 44.96	+ 31.82	+ 18.32	+ 46.22	+ 15.08	26.64	31.14			
North Cape, -	71 0	25 50	0	+ 32.00	+ 29.66	+ 43.34	+ 32.08	+ 23.72	+ 46.58	+ 22.10	19.62	24.48			
Umeo, - -	65 50	20 16	0	+ 33.26	+ 33.80	+ 54.86	+ 33.44	+ 12.92	+ 62.60	+ 11.48	41.94	51.12			
Uleo, - -	65 3	25 26	0	+ 35.08	+ 27.14	+ 57.74	+ 35.96	+ 11.84	+ 61.52	+ 7.50	45.90	54.02			

TABLE IV. *Shewing the Increase of Vernal Temperature.*

NAMES OF PLACES.	Latitude.	March.	April.	May.	June.	Difference of the Temperatures of the Four Months.			Mean Temp. of the year.
Continental Climate:	° ′	°	°	°	°	°	°	°	°
Umeo, - -	63 50	+ 23.0	+ 34.2	+ 43.7	+ 55.0	11.2	9.5	11.3	33.3
Uleo, - -	65 0	+ 14.0	+ 26.2	+ 41.0	+ 55.0	12.2	14.8	14.0	33.1
Enontekies,	68 30	+ 11.5	+ 26.6	+ 36.5	+ 49.5	15.1	9.9	13.0	27.0
Cumberland House,	53 57	+ 11.1	+ 34.0	+ 49.1	+ 59.9	23.0	15.1	10.8	32.0
Fort Enterprize,	64 0	— 11.1	+ 5.1	+ 32.1	+ 46.6	16.2	27.0	14.5	14.2
Climate of Coast:									
Winter Island,	66 11	— 15.6	+ 2.5	+ 21.1	+ 32.0	18.1	18.6	11.0	6.8
Igloolik, -	69 19	— 24.7	— 4.7	+ 22.0	+ 30.2	20.0	26.7	10.0	2.2
Melville Island,	74 45	— 23.1	— 11.9	+ 14.2	+ 34.2	11.2	26.1	20.0	— 1.7
North Cape,	71 0	+ 25.0	+ 30.0	+ 34.0	+ 40.0	5.2	4.0	6.1	+ 32.0

TABLE V. *Comparing the number of days that reach temperature* 51°.8 *and the Warmest Months of various Latitudes, and Isotherma Lines (Lines of equal Annual Temperature).*

Isother. Lines of	NAMES OF PLACES.	Lat.	Mean Temp. of the year.	Sum of the Temperatures of the Months that reach 51°.8.	Number of those Months.	Mean Temp. of days which reach 51°.8.	Mean Temp. of warmest months.	OBSERVATIONS.
		° ′	°			°	°	
32°	Umeo -	59 56	38.8	236	4	59.0	65.7	East of Europe.
		53 50	33.3	118	2	59.0	62.6	Gulf of Bothnia, east coast.
	North Cape,	71 0	32.0	0	0	0	46.6	Interior climate.
	Enontekies,	68 30	27.0	116	2	58.1	59.5	Continental climate.
	Cumberland House,	53 57	32.0	213	3	66.5	73.7	Continental climate.
59	Nismes,	43 50	60.3	593	9	65.8	78.3	Basin of Mediterranean.
53.6	Philadelphia,	39 56	53.4	463	7	66.2	77.0	
50	Buda, -	47 29	51.1	323	5	64.6	72.0	Interior climate.
41	Upsal, -	59 51	41.9	229	4	57.2	61.9	
10	Fort Enterprize,	64 28	13.7	108	2	uncertain	54.6	Continental climate.
	Winter Island,	61 11	6.8	0	0	0	36.7	Coast.
Zero,	Igloolik,	69 19	2.2	0	0	51.8 1 day	40.0	Coast.
	Melville Isl.,	74 45	— 1.7	0	0	51.1 1 day	42.4	Partly interior climate.

Remarks on the preceding Tables, principally with a reference to the Climate of Cumberland House.

Humboldt informs us, that "in all places whose mean temperature is below 62°.6, the revival of nature takes place in spring, in that month whose mean temperature reaches 42°.8 or 46°.4. When a month rises to

41°.9, the peach-tree *(Amygdalus Persica)* blossoms;
46 .8, the plum-tree *(Prunus domestica)* blossoms;
51 .8, the birch-tree *(Betula alba)* pushes out leaves.

"Barley, in order to be cultivated to advantage, requires during ninety days, a mean temperature of from 47°.3 to 48°.2.

"In reference to the culture of useful vegetables, we must discuss three things for each climate; the mean temperature of the entire summer, that of the warmest month, and that of the coldest month.

"By adding the mean temperatures of the months that rise above 51°.8, that is the temperature of the months in which trees with deciduous leaves vegetate, we shall have a sufficiently exact measure of the strength and continuance of vegetation."

Wahlenberg has also remarked in his *Flora Lapponica*, that "the air must acquire a mean temperature of 4° centigrade, or 39°.20 Fahr., before the frozen rivers break completely up."

The River Saskatchawan, which flows about two miles an hour at Cumberland House, broke up on the 28th April 1820, the mean temperature of the ten preceding days having reached only 36°; but it is to be noticed, that one of the principal branches of this river rises in a more southerly latitude.

The narrow but deep streams which flow from Pine Island Lake, on which Cumberland House stands, into the Saskatchawan, did not freeze at any time during the winter; a circumstance to be attributed to their receiving a constant supply of warm water from the bottom of the lake. The lake itself was covered with ice about three feet thick.

The phenomena of spring, however, are perhaps most readily exhibited in a tabular form.

TABLE VI.—*Tabular View of the Phenomena marking the Progress of Spring at Cumberland House, Lat. 58° 57′, Long. 102° 17′ W.*

Date.	*Means for the Month and 10 days preceding the respective Phenomena.*				Highest Temperature observed within 10 preceding days.	PHENOMENA.
	Mean Temp. of preceding month.	Mean Temp. of preceding 10 days.	Means of Maxima for 10 days.	Means of Minima for 10 days.		
1820.						
Mar. 8.	...	...	...	...	...	The snow covering the ground to the depth of 3 feet, was first observed to moisten in the sun, the temperature in the shade having risen to + 27° Fahr.
10.	...	+ 1.0°	+ 11.0°	— 9.0°	+ 27°	
12.	...	...	...	...	...	Temp. in the shade rose to 30°, and the melting snow began to drop from the eaves of the houses.
20.	...	+ 18.0	+ 27.6	+ 7.6	+ 39½	
21.	...	...	...	...	...	The temp. this day rose in the shade to 40°, patches of earth became visible from the wasting of the snow, and the River Saskatchawan broke up partially.
22.	...	...	..	...	...	On the 22d the highest temperature of the air was + 26°; but the surface of the snow, which was moist in the sun, was observed to assume a bluish hue, from myriads of minute hemipterous insects, which made their way through it with great rapidity, and were, without injury to their vital powers, frozen up with the snow after sunset.
24.	...	...	...	...	...	A white-headed eagle seen. Temp. 50°.
28.	...	...	...	...	...	Temp. in the shade 29°. Many grasses and bents *(Carices)* were observed shedding their seeds, which had withstood the winter firmly grasped in their glumes. This circumstance, and the sap still remaining in the culms, renders the hay or grass of the swamps nutritious to cattle in the winter of these climates.
31.	+ 11.1	+ 15.2	+ 24.2	+ 6.3	+ 50	
April 2.	...	...	...	...	...	The temperature sunk yesterday to — 14°, and did not rise to-day above + 20°. The River Saskatchawan is again frozen up.

TABLE VI.—*Continued.*

Date.	*Mean for the Month and* 10 *days preceding the respective Phenomena.* Mean Temp. of preceding month.	Mean Temp. of preceding 10 days.	Means of Maxima for 10 days.	Means of Minima for 10 days.	Highest Temperature observed within 10 preceding days.	PHENOMENA.
1820.						
April 7.	...	...	...	...	...	Rooks seen to-day.
9.	...	...	...	...	...	A merganser seen.
10.	...	+ 25 0	+ 35.0	+ 15.0	+ 49	Willow catkins beginning to burst.
12.	...	...	...	...	...	Geese and swans seen. Temp. in shade + 51°. Wind SE.
13.	...	...	...	...	...	Poplar catkins bursting. Temp. + 54°.
14.	...	...	...	...	...	Duck killed. Temp. in shade +62°.
17.	...	...	...	...	...	Plovers, grackles, and orioles seen. Temp. in shade + 75°.
18.	...	...	...	...	...	Canadian jays and flycatchers seen. Highest temp. to-day + 38°, and at midnight on the 19th the thermometer sunk to + 21°.
20.	...	+ 50.6	+ 60.5	+ 40.9	+ 75	Tussilago flowering. Highest temperature to-day + 34°.
26.	...	...	...	...	...	Alder (*Alnus glutinosa*) flowering. Temp. + 46°.
28.	...	...	...	...	...	River Saskatchawan completely broken up.
30.	+ 34.0	+ 35.5	+ 43.0	+ 28.0	+ 54	
May 1.	...	...	...	...	...	*Anemone Ludoviciana* flowering, its leaves not yet evolved. Mosquitoes first seen, and in a few days afterwards severely felt.—Sugar harvest commenced about 20th of April, and lasted till the 10th of May, shewing the period during which the sap flowed freely in the sugar maple (*Negundo fraxinifolium*, DeC.) The mean temperature of these two decades was + 36½° Fahr.; but it is to be remarked, that the sugar boilers observe the flow of sap not to be so immediately influenced by a high mean temperature, as by the power of the direct rays of the sun. Most sap is collected when a smart frost during night is succeeded by a warm sun-shining day.
10.	...	+ 38.0	+ 46.2	+ 29.6	+ 67	
14.	...	...	...	...	...	Sugar maple and gooseberry bushes flowering.
17.	...	...	...	...	...	Willows, gooseberries, and aspens (*Populus trepida*), in leaf. Various *Drabæ* in flower.

TABLE VI.—*Continued.*

Date.	*Means for the Month and 10 days preceding the respective Phenomena.*				Highest Temperature observed within 10 preceding days.	PHENOMENA.
	Mean Temp. of preceding month.	Mean Temp. of preceding 10 days.	Means of Maxima for 10 days.	Means of Minima for 10 days.		
1820.						
May 20.	...	+ 51.0	+ 60.4	+ 41.0	+ 84°	
25.	...	...	...	...	...	Pine Island Lake clear of ice.
28.	...	...	...	...	...	*Prunus virginiana*, *Prunus pennsylvanica*, and *Aronia ovalis*, flowering.
31.	+ 49°.1	+ 60.0	+ 70.0	+ 51.0	+ 80	The mean temperature of this month being only 49°, is nearly 3° below that which Baron Humboldt considered necessary for the evolution of deciduous leaves; but the influence of the direct rays of the sun was at this time very great, and the high temperature of the last decade of the month compensated for the defect of the first.

In the course of the month of May, ground was prepared at Cumberland House; and towards the end of it, barley sown, to be reaped again in August, after an interval of about 90 days, whose mean temperature may be stated at 67°.8. This latitude is therefore well adapted for the cultivation of barley and of spring wheat. Maize ripens readily here, although it frequently fails in the climate of Britain. At Edinburgh, for instance, in Lat. 56°, where the mean temperature of the year is 47°.8, and there are five months that reach a mean of 51°.8, maize rarely ripens except in very favourable situations, and under the shelter and reflection of a wall, because the mean temperature of these warm days does not exceed 55°.8, or 12° below the summer temperature of Cumberland House.

The great plains on the Saskatchawan and Red Rivers, immediately to the north of the United States boundary line, are extremely favourable to the cultivation of the Cerealia, the crops seldom suffering from late frosts or heavy rains, and at a future period may provide for a redundant population. At Carlton

House, which is only sixty-six miles to the southward of Cumberland House, but where the sandy soil speedily feels the influence of the sun's rays, and where the presence of an icy lake, such as Pine Island Lake, does not moderate the spring heats, barley and wheat were sown in April, and by the middle of May the fields were green with the young blade.

These extensive plains are, however, at present subject to a great scourge,—a periodical visit of locusts or grasshoppers, at intervals of twenty years.

At Cumberland House there were 7 days in September 1819, 3 in April 1820, 16 in May, the whole of June and July, and 27 days in August, which exceeded 51°.8 of mean temperature, making in all 114, the sum of whose mean temperature is 7584, which give a general mean of 66°.53, as in Table V.

The largest pine-trees and balsam-poplars (*Pinus alba* and *Populus balsamifera*) were between eight and nine feet in circumference. The Saskatchawan River, or Lat. 54°, and perhaps the isothermal line of 32°, is the most northerly limit, in the longitude of Cumberland House of the sugar-maple (*Negundo fraxinifolium*), elm, and ash (species unknown), hazel (*Corylus Americana*), and Arbor-vitæ tree (*Thuya occidentalis*). At Carlton House the maple goes to about fifty miles north of the river, so as nearly to reach the latitude of Cumberland House. Oak and beech (species unknown) terminate about 4° to the southward in Lat. 50°, within the limits of the Red River Colony. The mean annual temperature of that colony cannot be much wide of +38° Fahrenheit, but the mean temperature of the three summer months may perhaps rise to 72°, a degree of heat sufficient for ripening the vine, if the shortness of its duration and the severity of the winter do not preclude the cultivation of that plant. The natural families of *Polemoniaceæ* and *Lineæ* seem also to have their northern limit at Lat. 54° in these longitudes, a solitary species of each being found on the banks of the Saskatchawan. The *Cisteæ*, *Geraniaceæ*, *Rhamneæ*, *Umbelliferæ*, *Araliæ*, *Apocineæ*, *Valerianeæ*, *Hydrophylleæ*, *Chenopodeæ*, *Santaleæ*, *Urticeæ*, *Aroideæ*, and *Asparageæ*, send some straggling species a few degrees farther north, on a rude estimate not passing beyond the isothermal line of + 27°.

It will be seen by an inspection of Table I., that, in the year

1819–20, the month whose mean temperature, at Cumberland House, approached nearest to the mean of the year, was April; but perhaps, the mean of observations continued for a series of years, might point out the month of October as approaching more nearly to the mean of the year. Baron Humboldt observes, that this last month coincides generally within a degree of that of the year on the isothermal line of + 35.6° Fahrenheit. The mean of the spring and autumn temperatures at Cumberland House + 32.4° coincides very nearly with the annual mean, and the same thing occurred at Fort Enterprize, and also at Melville Island, within the fraction of a degree. At Igloolik and Winter Island, the climate being more of a maritime nature, the coincidence was not so exact. Melville Island, lying directly north of the centre of the Continent, must be warmed in the summer by occasional southerly breezes, which may account for its greater proportional summer temperature, when compared with Igloolik and Winter Island.

The mean temperatures for the last ten days of October at Cumberland House, and for the last ten days of April at Fort Enterprize, correspond very nearly with the mean annual temperatures at the respective places. Baron Humboldt remarks, that "it is an object of importance for travellers, whose observations are necessarily limited as to time, to know the ratios that exist between the temperatures of certain portions of the year and the mean annual temperature;" and although observations for a single year, in high latitudes, are not to be depended upon, yet they may form the groundwork for future correction or verification; and we trust that the expeditions of Parry and Franklin will supply much that is wanting.

On comparing the seasons at Cumberland House with the seasons found on different isothermal lines in Europe, as laid down by Baron Humboldt, we find that the winter of Cumberland House, in Lat. 54°, and isothermal line of + 32°, is colder than that of Enontekies, in Lat. 68°, on the isothermal line of + 27°; that the *isocheimal line*, or line of equal winters, at Cumberland House —4°.6 passes to the north of Europe, being much colder than that of the North Cape in Lat. 71°, which has a maritime climate, and 4° below that of Enontekies, which has a more interior climate, and higher elevation above the sea.

The *isothæral* line, or line of equal summer-heats, which in this instance is + 67.8°, on the contrary, when carried across the Atlantic, diverges to the southward nearly three degrees of latitude, passing to the southward of London, Brussels, and Paris, which lie in the isothermal band of from 50° to 52°. In more interior continental situations, however, the isothæral line again curves to the north, passing to the north of Warsaw in Lat. 52.25°, on the isothermal line of +49°, and to the south of Moscow in Lat. 55.75°, and on the isothermal line of +40. In the interior of Siberia, the severity of the winter being great, it is more than probable that an entirely similar climate may be found. Humboldt, in one of his tables, has assigned the mean summer-heat of Cumberland House to Central Russia, in Lat. 58° 30′, and Long. 36° 20′ E., and to Canada, in Lat. 47°, Long. 71° W., on the isothermal line of 41. The low summer-heat here assigned to Long. 71°, in Canada, may be ascribed to its much more maritime climate, when compared to the interior situation of Cumberland House. The differences of these climates may be rendered more manifest by the following tabular view.

TABLE VII.

Difference of Summer and Winter on the Isothermal Line of +32°.

Situation.	Winter.	Summer.	Difference
Cisatlantic Region, Long. 1° W. and 17° E.	+14.0° Fah.	+53.6°	39.6°
Transatlantic Region, Long. 58° W.—72° W.	+ 1.4 —	+55.4	54.0
Cumberland House (*Continental*) 102¼ W.	— 4.6 —	+67.8	72.4

The effects of the Cumberland House climate, which may be considered as a perfect specimen of the *interior continental climate*, seems to be, as Baron Humboldt has somewhere remarked, that, after a long and severe winter, there is generated a great degree of irritability, both in animals and vegetables, which renders them more susceptible of the succeeding summer-heats. It may be, that it is this excess, as it were, of irritability, that renders the puncture of the mosquito so much more distressing at Hudson's Bay than in any other part of the world, and not the more poisonous nature of the insect itself.

The following *Cree names of the months* are indicative of certain natural phenomena which recur with the returning seasons.

March,	*Meegeshew-eepæshim,*	Eagle-moon.
April,	*Neesca-'pæshim,*	Goose-moon.
May,	*Atheek-eepæshim,*	Frog-moon.
June,	*Opuskow-eepæshim,*	Hatching-moon.
July,	*Opceneyoo-eepæshim,*	Moulting-moon.
July, August,	*Opakow-eepæshim,*	Flying-moon.
August, September,	*Atteehteh-eepæshim,*	Ripe-berry-moon.
September, October,	*Tawkquaggan-eepæshim,*	Fall-moon (Fall of the leaf).
October, November,	*Onotcheehtow-eepæshim,*	Rutting-moon (of moose-deer).
November, December,	*Weetheekopeyoo-eepæshim,*	Hoar-frost-moon.
December, January,	*Keesheh-pawattagganum,*	The great-dreaming-moon, the moon in which the sun travels low.
January, February,	*Keesheh-pawattagganawsees,*	Lesser-dreaming-moon.

The February moon, including part of March, is sometimes termed *Keesheh 'peeshim,* or Great Moon. The names of the months are by no means fixed in the Indian languages, varying with the nature of the district the hunter resides in, and perhaps with the fancy of the individual who speaks.

Remarks upon the Climate of Athabasca and Slave Lakes.

HAVING discussed as many facts respecting the Cumberland House climate as we could collect, I shall, before proceeding to details regarding the climate of Fort Enterprize, notice some circumstances connected with two intermediate spots, namely, Fort Chepewyan, on the Athabasca Lake, in Lat. 58° 43′ N., and Long. 111° 18′ W., and the Little Lake, near the *debouche* of Slave River into Slave Lake, in Lat. 61°12′N., Long. 113°12′W., because, at the former, barley, and I believe wheat, are advantageously cultivated, and the latter is the most northerly fur-post, at which, as far as my information goes, barley has been tried, and succeeded. We possess no observations of the temperatures of these districts for an entire year; but the summer temperatures of 1820, were obtained whilst we were travelling through them,

and agree sufficiently near with the following interpolations; from which, however, the chilling effect of the icy covering of both lakes, in spring, is excluded.

TABLE VIII. *Interpolated from* TABLE II.

SEASONS.	Athabasa, Lat. 58¾ N. Long. 111½ W.	Slave Lake, Lat. 61¼ N. Long. 113½ W.
Six summer months. April,—September,	+ 47°·33	+ 43°·24
Six winter months. October,—March,	— 0 ·40	— 4 ·14
Spring. March, April, and May.	+ 20 ·61	+ 15 ·52
Summer. June, July, August,	+ 60 ·16	+ 57 · 0
Autumn. September, October, November,	+ 26 ·87	+ 23 ·59
Winter. December, January, February,	— 13 ·36	— 18 ·00
Mean annual temperature,	+ 23°·56	+ 19°·53

TABLE IX. *Interpolated from* TABLE I.

SITUATION.	MEAN TEMPERATURES.			
	May.	June.	July.	Aug.
Athabasca, Lat. 58¾ N.,	41°·0	53°·6	62°·0	64°·5
Slave Lake, 61¼ N.,	37 ·2	50 ·6	60 ·5	60 ·0

These Tables shew, that, at Athabasca, there are three months which reach 51°·8, and that their united mean temperatures amount to 180°. At Slave Lake, there are only two months that attain that height; and the sum of their mean temperatures is 120°. At Slave Lake, in the year 1822, it was nearly the end of May before the mean temperature of any considerable number of days reached the vernal temperature of 42°·8. On the 25th of that month, Slave River broke up, the passage of the lake over the ice being at that time considered unsafe. From the 25th of May to the 2d of June, we observed, on the voyage to Fort Chepewyan, willows, gooseberries, the *Anemone Nuttalliana* (D.C.), *Aronia ovalis*, *Prunus Virginiana*, and *Hippophäe Canadensis*, flowering nearly in the order in which they are here mentioned. The leaves were also rapidly evolving at this period, in perfect accordance with Humboldt's observations as to the temperature required.

The *Prunus Virginiana* was not observed to the north of Slave Lake; and the *Pinus balsamea* also terminates there; although, farther to the westward on Mackenzie's River, it is said to attain a higher latitude. The *Populus balsamifera* sends straggling trees as far north as Lat. 63°; and the *Populus trepida* grew in pretty large clumps half a degree farther north, beyond which, however, it was not seen. The *Populus balsamifera* forms a large proportion of the drift-timber observed on the shores of that part of the Arctic Sea which we visited, and is supposed to come principally from the south branch of Mackenzie's River, named also *Rivière aux liards.*

Remarks upon the Climate of Fort Enterprize.

Fort Enterprize (now dismantled) stood in a district of primitive rocks, about $2\frac{1}{4}$° N. of Slave Lake, and $3\frac{1}{4}$° south of the Arctic Sea, above which it was supposed to be elevated about 800 feet. The banks of Winter River, upon which it was built, are ornamented with groves of the *white spruce-tree (Pinus alba)*, and flanked on each side by an irregular marshy plain, varying in breadth from one to three or four miles, somewhat broken by abrupt elevations of coarse gravel, and bounded by an amphitheatre of disconnected hills. The summits of these hills generally consist of naked, smooth, rounded masses of *gneiss:* their sides are very thinly covered with a loose gravelly soil, and frequently exhibit accumulations of large cubical fragments of gneiss, which are the *debris* of mural precipices of various heights. In the upper parts of the inclined valleys, at the bases of the hills, there is commonly a thin stratum of mountain peat, but the bottom of almost every valley is occupied by a lake. Many of these lakes are of a considerable depth, but a large proportion of them are entirely land-locked, communicating with each other only when flooded by the melted snow. Winter River is merely a succession of small rapids, connecting lakes of various magnitude with each other. This is the case with all the rivers that traverse the *barren grounds;* and the features of the description here given are characteristic of the whole district. The sides of the hills, and all the drier spots of the valleys, are clothed with a beautiful carpet of the lichens, which form the favourite food of the rein-deer, amongst

which the *Cenomyce rangiferina*, *Cetraria nivalis* and *cucullata*, and *Cornicularia ochroleuca*, are predominant. The principal shrubs are the *Vaccinium uliginosum*, *Empetrum nigrum*, *Ledum palustre*, *Betula glandulosa*, and several *Salices*. The *Vaccinium vitis Idæa*, *Arbutus Uva Ursi* and *alpina*, are very common, and the *Andromeda polifolia*, and *Kalmia glauca*, occur in almost every peaty spot. In sheltered situations, where the peat is deeper than usual, there are frequently a few starved *larches* and *black spruces* scattered. There are also some thin clumps of the *Betula papyracea*, upon the borders of the rapids. The *white spruce* itself, which thrives better here than any other tree, is found only in sandy spots by the side of the river, or in valleys upon the borders of the lakes. Farther to the eastward, and more within the *barren grounds*, the trees disappear altogether; but a little to the westward, upon the secondary and transition strata of the Coppermine River, the white spruce, in scattered clumps, attains the Lat. of 67° 34′ N., within 13 miles of the Arctic Sea. Amongst the spruces cut down at Fort Enterprize one of

16 inches in circumference,		had 45	annual rings.
18	ditto,	90	ditto.
21	ditto,	90	ditto.
36	ditto,	130	ditto;

the greatest increase being an inch of circumference in three years, and the least an inch in five years. The average is four rings or years, to an increase of 1 inch in circumference, or about 1 inch of diameter in twelve years. The tree above mentioned, which measured 36 inches, was one of the best grown that was observed; but some, with short crooked trunks, measured more. Our house was 24 feet wide; and considerable difficulty was experienced in obtaining half a dozen transverse beams long enough to support the roof, most of the trees tapering too much. The spruces seen near the mouth of the Coppermine, were about one-third of the size of those which grew at Fort Enterprize. In a few sheltered alluvial spots on the barren grounds, the *Betula glandulosa* was about 4 feet high, and in a warm crevice at the mouth of Hood's River, Lat. 67 1/3°, the *Alnus glutinosa* was found growing to the height of 5 or 6 feet.

Names of the Months in the Copper Indian Language, adapted to the meridian of Fort Enterprize.

1.	March, April,	*Det-anee-chazah.* Eagle-moon.
2.	April,	*Bennee-thleeng-thillah.* Dog-rump Moon. The month in which deer are run down with a dog, owing to a crust having formed upon the ice, sufficiently strong to bear a dog, but through which the deer break, and are impeded. Termed also Crust-moon.
	April, May,	*Khtunsee-hawzing-nawræ-zelleh.* The month in which the icicles with crooked tips hang from the rocks.
3.	May, June,	*Bennee-akkawzæ.* Egg-moon. Laying-moon.
4.	July,	*Bennee-atchilhæh.* Moulting-moon.
5.	August,	*Bennee assitzillæh.* The month in which the female rein-deer pass during the dewy nights with their young from the coast.
6.	September,	*Bennee-arasseetcho.* The moon in which the large or male rein-deer arrive from the coast.
7.	October,	*Bennee-awrhawnteh.* Rutting-moon.
8.	November,	*Bennee-tsee-ch' ellyee.* The moon in which the fœtus floats.
9.	November, December,	*Nea-ts-tsaillah.* Hoar-frost-moon. Trees covered with festoons of snow.
10.	January,	*Nee-tsa-tchoh.* The big moon of the earth. The long moon. Half the winter.
11.	January, February,	*Nintzee-za-tsillah.* The moon of light winds.
12.	February, March,	*Nintee-za-tchoh.* Big windy moon.

Table X.

Tabular view of the Progress of Spring in the year 1821 *at Fort Enterprize, Lat.* 64° 28′ *N. Long.* 116° 6′ *W.*

Date,	Mean Temperatures. Of preceding Month.	Of 10 preceding Days.	Of maximum for 10 Darys.	Of minimum for 10 Days.	Highest temperature within 10 Days.	Phenomena.
1821.						
Mar. 7.						Coloured spirit thermometer in the sun + 39°. In the shade + 6°
10.		—8.10	+ 2.10	—18.30	+ 15°	+ 2 — 2
20.		—23.55	—13.80	—33.30	—1	
26.						+ 46 + 5
31.	—11.73	—3.54	+ 8.73	—15.82	+24	+ 32 + 24
April 1.	...	...	...	...	...	+ 63 + 40
						Smart thaw all day. The snow at this time was nearly 3 feet deep on the lakes, and the ravines were nearly filled.
10.	...	+ 8.20	+ 18.70	—2.30	+ 40	Eagles seen. Rein-deer making a northerly movement. The fineness of the weather at this time induced the Indians to think that the spring, and consequent migration of the deer towards the coast, had commenced, but their hopes were deferred by the subsequent cold weather.
20.	...	—7.90	+ 3.20	—19.00	+ 21	Arctic hares copulating, and beginning to change their fur.
30.	+ 4.70	+13.80	+ 27.20	—0.10	+ 45	
May 3.	...	...	...	...	...	Temperature in the shade + 42. Hawks first seen. Young in the nests of the cinereous crow (*Corvus canadensis*). Down of the American hare becoming grey. Trees thawed. Sap beginning to flow.
5.	...	...	...	...	...	Twilight all night. Snow melted from the summits of the hills. Ptarmigan pairing. Temperature in the shade + 46.
7.	...	...	...	...	...	Large patches of ground on the sides of the hills visible, 7 weeks later than the same occurrence at Cumberland House, 10½ degrees more to the southward. Snow everywhere moist. Temperature in the shade + 41°.
8.	...	...	...	...	...	A house-fly seen.
9.	...	...	...	...	...	A merganser seen. Rein-deer migrating northwards, exactly a month later than the Indians had predicted, from the fine weather in April.

TABLE X.—*Continued.*

Date.	Mean Temperatures. Of preceding Month.	Of 10 preceding Days.	Of maximum for 10 days.	Of minimum for 10 Days.	Highest temperature within 10 Days.	PHENOMENA.
1821.						
May 10.	...	+ 31.75°	+ 42.90°	+ 20.40°	+ 52°	Two gulls seen. Berries of t *Vaccinium Vitis Idæa, Empetr nigrum*, and *Arbutus alpina* m now be gathered abundantly, h ving withstood the winter. T berries of the *Vaccinium uligi sum* are also very fine in flavo at present, but so ripe and te der, that they can scarcely plucked without crushing bene the finger. The ground is s frozen, but the snow thaws rap ly in the sunshine. Many of *Musci* are beginning to spro and the *calyptræ* of some *Jung manniæ* are already visible.
11.	...	...	...	...	...	Loons (*Colymbus glacialis*) arrive
17.	...	...	...	...	...	Teals (*Anas crecca*) killed. Th crops were filled with inse which now swarm in the su rivers.
20.	...	+ 26.55	+ 37.20	+ 15.90	+ 52	The weather for ten days past been disagreeably cold and bl ing, but the arrival of the s mer birds shews, that the weather has set in to the sou ward; and we were informe the natives, that, on the north shores of Great Slave Lake, 2½° to the southward, the s was quite gone before the of the month. A differenc nearly 10 days in the progr spring was noticed in the foll ing month, on advancing only miles to the northward. cold weather experienced at period at Fort Enterprize, s from northerly winds, caus suppose, by the heating of earth, and consequently of atmosphere to the southw This cause of northerly terminated this year about 20th of June, by the groun the northward being clear snow, and getting rapidly l Up to this date, there was n ternal appearance of veget amongst the phenogamous p except the gradual evolut the willow catkins.

TABLE X.—*Continued.*

Date.	Mean Temperatures. Of preceding Month.	Of 10 preceding Days.	Of maximum for 10 days.	Of minimum for 10 Days.	Highest temperature within 10 Days.	PHENOMENA.
1821.						
May 21.	...	...	...	...	...	Geese arrived (*Anas Canadensis*, and *hyperborea*). Temp. + 39°.
28.	...	...	...	...	...	Temp. in shade + 68°. Plovers seen (*Charadrius pluvialis*). *Eriophorum* flowering.
31.	+ 31.60°	+ 36.50°	+ 48.27°	+ 24.73°	+ 68°	Snow nearly gone at Fort Enterprize, but on Point Lake half a degree farther north, and at the same elevation above the sea, scarcely begun to melt.
June 7.	...	...	...	...	...	On the 7th, in Lat. 55°, about 32 miles directly north from Fort Enterprize, and about 150 feet of greater elevation, the snow had scarcely diminished, except on the sides and summits of the hills which are all of small elevation. The first, or female band of reindeer passed Lat. 65° at this time, their progress over the *barren grounds* being regulated by the uncovering of the lichens. When the thaw is farther advanced, the lichens become too tender and pulpy, and the deer resort to the swamps to feed upon the hay or grass, which, frozen up in the end of autumn, retains its sap and nutritive qualities, on the snow first melting from around it in the spring. In a few days, however, the culms become dry, and the seeds are shed, the deer by that time having reached the sea-coast, where the sprouting *carices* form their food, but are not so fattening as the lichens.
8.	...	...	...	...	...	Sudden thaw at Point Lake, Lat. 65° 10′. *Eriophorum* just bursting forth there. It flowered ten days earlier at Fort Enterprize.
						Note. The temperatures up to the 10th, are from the register kept at Fort Enterprize; the following observations were made on Point Lake, Lat. 65°–66° N. Long. 113°–114° W.
10.	...	+ 41.55	+ 52.80	+ 30.30	+ 73	

Table X.—*Continued.*

Date.	Mean Temperatures. Of preceding Month.	Of 10 preceding Days.	Of maximum for 10 Days.	Of minimum for 10 Days.	Highest temperature within 10 Days.	Phenomena.
1821.						
June 12.	...	...	...	...	...	Thermometer at Point Lake ros to 78° in the shade. Hard rain Small lakes broken up. Poin Lake still covered with ice fiv feet thick. Robins (*Turdus mi gratorius*), Godwits *Limosa Fedoa* and ducks hatching. A specie of martin arrived. It builds nest on the rocky precipices o the barren grounds, similar t the nests ef the house-martin i England.
14.	...	...	...	...	...	Temperature + 56°. Calm an fine weather. Snow melting fast It lies at present only under th steep cliffs. The radiation o heat from the rocks that boun Point Lake is such, that the ic is perforated by large holes unde every precipice. By these hol the water from the melted sno runs off. The diminution of ic on the lakes proceeds most r pidly on its under surface, fro the contact of the warmer wate The *Salix desertorum* burst it catkins to-day.
15.	...	...	...	...	...	Temperature 60°. The stream that issue from the melting sno under the precipices and sides o the hills, are now pretty larg some of them scarcely fordabl and all the valleys are flooded The *Arbutus alpina* began t flower to-day. All the small bird are hatching.
17.	...	...	...	...	...	Snow and sleet. Temperature 30 to 35°.
19.	...	...	...	...	...	Temperature 54°. Ice on the lak honey-combed from the action o the sun. *Anemone cuneifolia* i flower.
20.	...	+ 43.35°	+ 52.10°	+ 34.60°	+ 78°	
21.	...	...	...	...	...	*Midsummer-day.* Dwarf-birch (*B tula glandulosa*) opened its bud to-day. The last or male band of deer have passed to the nort a few stragglers only remaining
30.	+ 42.05°	+ 47.10	+ 35.40	+ 41.25	+ 56	The ice on Point Lake much d cayed and honey-combed.

TABLE X.—*Continued.*

Date.	*Mean Temperatures.* Of preceding Month.	Of 10 preceding Days.	Of maximum for 10 Days.	Of minimum for 10 Days.	Highest temperature within 10 Days.	PHENOMENA.
1821.						
Juy 4.	...	...	...	...	...	The ice on the larger lakes in Lat. 66°, Long. 114° completely broken up. About the 18th or 19th of this month, the sea-ice at the mouth of the Coppermine River, in Lat. 67° 45′, is supposed to have broken up. The *Dryas integrifolia*, *Stellaria Edwardsii* and *Equisetum arvense*, flowered to-day. *Epilobium spicatum* sending up young shoots.
6.	...	...	...	...	...	In Lat. 66° 30′N. *Salix reticulata*, *Alnus glutinosa*, *Hippophaë Canadensis*, *Andromeda tetragona*, *Draba* —? *Draba aizoides* and *alpina*, *Pyrola rotundifolia Saxifraga cernua*, *nivalis*, *hirculus*, and *oppositifolia*, *Tofielda palustris*, *Phaca astragalina*, *Pedicularis Nelsonii*, *hirsuta*, and *Lapponica*, *Silene acaulis* and various Willows and Carices were observed in flower to-day. The *Juniperus communis* grows in the hills here, but was not seen in flower.
Aug. 17.	...	...	...	...	...	In Lat. 68° on the coast, we had a severe storm this day, which, with frosty weather and snow, continued for several days. The snow that fell at this time disappeared again, but on the 5th of September a storm set in, which clothed all the Barren Grounds from Lat. 65° to 68° with snow for the winter.
Sept. 5.	...	...	...	...	...	
Oct. 9.	...	...	...	...	...	On the 9th of October, the party walked over the small lakes between Point Lake and Fort Enterprize, which they had crossed on the ice in the middle of the preceding June, being an interval of 116 days. The ground was this year covered with snow a month before the lakes froze over, so that the snow lay for nine months, and there were occasional snow-showers in the three summer months.

By examination of Table III. we perceive that the summer temperature of Fort Enterprize is found at Churchill, in Latitude 59°; the neighbourhood of the ice which floats in Hudson's Bay until August, compensating, in this case, for a difference of 6½ degrees of latitude. The *isotheral line*, carried across to the Old Continent, passes near to Enontekies.

In no part of the barren grounds did we discover the ground to be perpetually frozen. The subsoil, however, at York-Factory is always frozen, a circumstance which is also to be attributed to the constant presence of ice in the Bay during the summer. The thaw at York (Latitude 57°) in September, was observed to penetrate three feet.

In Latitude 65° the sap of the spruce-tree freezes early in October, and in a short time the wood becomes as hard as a stone, the chips produced by a highly tempered hatchet being similar to saw-dust. The hatchets are speedily broken in this employment, which renders the Indians anxious to find dead and dry trees for winter use; and to procure a constant supply of this kind of fuel, they occasionally set fire to a clump of trees, expecting to find their trunks fit for use in two or three years.

At Slave Lake, where our attention was directed to this subject, the sap of all the other trees, and of the juniper-bush and other shrubs, was observed to freeze equally with that of the white spruce. The power of the direct rays of the sun upon the trees, causes them to shew signs of returning life before the earth acquires any warmth, and the ground about the roots of the larger trees is first cleared of snow, and thawed.

Having, in the preceding details of climate, mentioned the circumstances most likely to influence the distribution and growth of vegetables in the districts travelled through, I may remark, that the agency of man, so powerful in modifying the appearance of the vegetable kingdom in other quarters of the globe, is scarcely to be detected in these remote lands. Cultivation of the ground is entirely confined to a few small gardens at the fur-posts, and the utmost effect that can be ascribed to it, is the introduction of a few herbs from Canada and Europe, along with the *Cerealea* and culinary vegetables. The majority of the introduced plants is perhaps comprised in the following brief list of the species, which were found only in the direct

trading route; but several, even of these, may nevertheless be indigenous. *Blitum capitatum, Veronica peregrina, Lycopus Virginicus, Hordeum jubatum, Myosotis lappula, Rumex acutus, Cerastium viscosum, Spergula nodosa, Euphrasia officinalis, Lepidium ruderale, Atriplex , Urtica gracilis.*

The only mode in which the arts and customs of the natives affect the vegetable kingdom, is by their setting fire, either accidentally or intentionally, to the forests. These fires, when they occur during summer in the woody district, spread rapidly through the dry moss, consuming the soil down to the rocks, and are only extinguished by heavy showers of rain. Several years elapse before any thing grows in the district thus laid waste. The blackened and branchless trunks of the trees are in a season or two stripped of their bark and bleached, if not sooner thrown down by the wind. The surface of the ground next acquires a little verdure from the *Funaria hygrometrica, Bryum pyriforme, Didymodon purpureum, Marchantia polymorpha* and *conica*, and some other *Musci* and *Hepaticæ*. By and by other vegetables take root, and in process of time the site of a pine-forest is occupied by dense thickets of slender aspens *(Populus trepida)*. The growth of this tree, instead of a renewal of the pine-forest, may be attributed either to a change in the nature of the soil, perhaps by the introduction of a greater quantity of alkaline matter,—to its winged seeds favouring its dispersion,—or to both causes conjoined. The ashes of the poplar yield much more alkali than those of any of the pines do.

Fires frequently spread amongst the dry grass in the plains of Carlton House; but their principal effect there seems to be the production of finer pasture in the following season. They do not seem in general severe enough to destroy the roots of the grass, or to burn the soil. The migrations of the herds of the bison or buffalo, are much influenced by the extent and direction of these fires.

TABLE XI. *Arrangement of Plants growing in the Hudson's Bay countries, and adjoining Lands, from* Lat. 53° N., *and to the westward of* Long. 116° W.

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
CL. I. ACOTYLEDONES, -	302	96	138	68
ORD. I. FUNGI.				
Sphæria,	2	2		
Hysterium,	1	1		
Agaricus,	3		3	
Cantharellus,	1		1	
Lycoperdon,	2	1		1
Schizophyllum,	1	1		
Dædalia,	1	1		
Polyporus,	5	5		
Hydnum,	1	1		
Thelephora,	2	2		
Tremella,	2		1	1
Peziza, -	2	2		
Erinæum,	1	1		
	24	17	5	2
II. LICHENES.				
Lepraria, -	2		1	1
Arthonia,	1	1		
Spiloma, -	1	1		
Solorina, -	1		1	
Gyalecta, -	1		1	
Lecidea, -	24	10	12	2
Calicium,	4	2		2
Gyrophora,	7		4	3
Opegrapha,	2	2		
Verrucaria,	2	2		
Endocarpon,	2		2	
Thelotrema,	1			1
Variolaria,	1		1	
Urceolaria,	1		1	
Lecanora,	22	3	14	5
Parmelia,	14	5	4	5
Borrera, -	3	1	1	1
Cetraria, -	7		4	3
Peltidea, -	2	1		1
Nephroma,	2	1		1
Evernia, -	1	1		
Dufourea,	2		2	
Cenomyce,	10		2	8
Cerania -	1		1	
Stereocaulon,	1			1
Sphærophoron,	1		1	
LICHENES.				
Alectoria,	1			1
Ramalina,	2			2
Cornicularia,	6		6	
Usnea, -	3	1	1	1
Collema, -	2		2	
	130	31	61	38
III. ALGÆ.				
Oscillatoria,	1			1
Conferva,	2	1	1	
Ulva, -	2		2	
Fucus, -	7	1	6	
	12	2	9	1
IV. CHARACEÆ.				
Chara, -	1	1		
V. HEPATICÆ.				
Riccia, -	1	1		
Jungermannia,	13	3	10	
Marchantia,	2	1		1
	16	5	10	1
VI. MUSCI.				
Voitia, -	1		1	
Andræa,	1		1	
Sphagnum,	2			2
Gymnostomum,	1		1	
Anictangium,	1			1
Tetraphis,	1	1		
Sphlachnum,	10	1	9	
Asplodon,	1		1	
Encalypta,	2			2
Weissia, -	1	1		
Grimmia,	3		2	1
Syntrichia, Barbula, Tortula,	4	1	2	1
Trichostomum,	1			1
Dicranum,	12	2	9	1
Fissidens,	1			1
Didymodon,	1		1	
Orthotrichum,	7	2	2	3

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
Musci.				
Bartramia,	3		3	
Webera, -	3	1	2	
Funaria, -	1	1		
Meesia, -	1		1	
Timmia, -	1		1	
Pohlia, -	3		3	
Bryum, -	5	1	2	2
Mnium, -	5	3		2
Climacium,	1	1		
Neckera,	1	1		
Leskea, -	1	1		
Hypnum,	17	12	3	2
Polytrichum,	9		7	2
	101	29	51	21
VII. Filices.				
Polypodium,	2	2		
Woodsia,	2	2		
Athyrium,	1	1		
Nephrodium,	1			1
Pteris, -	1	1		
Cryptogramma,	1	1		
	8	7		1
VIII. Lycopodineæ.				
Lycopodium,	5	1	1	3
IX. Equisetaceæ.				
Equisetum,	6	1	1	1
Cl. II. Monocotyledones,	113	70	26	17
Ord. I. Gramineæ.				
Hierochloe,	3	1	2	
Oryzopsis,	1	1		
Stipa, -	2	2		
Aira, -	1	1		
Trisetum,	1			1
Deschampsia,	1		1	
Dupontia,	1		1	
Pleuropogon,	2		2	
Elymus, -	3	2	1	
Festuca, -	3		2	1
Poa, -	8	3	3	2
Beckmannia,	1	1		
Avena, -	1	1		

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
Gramineæ.				
Bromus, -	1			1
Hordeum,	1	1		
Calamagrostis,	3	2	1	
Agrostis, -	1	1		
Colpodium,	1		1	
Phippsia,	1		1	
Alopecurus,	2	1	1	
	38	17	16	5
II. Cyperaceæ.				
Eriophorum,	4	1	1	2
Scirpus, -	4	3		1
Eleocharis,	1	1		
Kobresia,	1	1		
Carex, -	24	17	5	2
	34	23	6	5
III. Juncæ.				
Juncus, -	8	4	2	2
Luzula, -	3	1	1	1
	11	5	3	3
IV. Melanthaceæ.				
Tofieldia,	3	1	1	1
V. Asparageæ.				
Smilacina,	3	3		
VI. Asphodeleæ.				
Allium, -	2	2		
VII. Liliaceæ.				
Lilium, -	1	1		
Uvularia, -	1	1		
Zygadenus,	1	1		
	3	3		
VIII. Irideæ.				
Sisyrinchium,	1	1		
IX. Orchideæ.				
Habenaria,	5	5		
Neottia, -	1			1
Corallorhiza,	1	1		
Calypso, -	1	1		
Cypripedium,	3	3		
	11	10		1

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
X. Aroideæ.				
Calla,	1	1		
Lemna,	2	2		
Typha,	1	1		
	4	4		
XI. Juncagineæ.				
Triglochin,	2			2
XII. Fluviales.				
Potamogeton,	1	1		2
CL. III. DICOTYLEDONES,	425	278	85	62
Ord. I. Coniferæ.				
Pinus,	5	4		1
Juniperus,	2	1		1
Thuya,	1	1		
	8	6		2
II. Corylaceæ.				
Corylus,	1		1	
III. Salicinæ.				
Salix,	30	20	8	2
Populus,	2	2		
Alnus,	1			1
Betula,	3	2		1
Myrica,	1	1		
	37	25	8	4
IV. Urticeæ.				
Urtica,	1	1		
V. Eleagni.				
Eleagnus,	1	1		
Hippophaë,	1			1
	2	1		1
VI. Santaleæ.				
Comandra,	2	2		
VII. Polygoneæ.				
Polygonum,	2	1		1
Rumex,	3	2		1
Oxyria,	1		1	
	6	3	1	2

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
VIII. Chenopodeæ.				
Blitum,	1	1		
Atriplex,	1	1		
	2	2		
IX. Plantagineæ.				
Plantago,	3	2	1	
X. Plumbagineæ.				
Statice,	1			1
XI. Primulaceæ.				
Lysimachia,	1	1		
Primula,	4	3	1	
Androsace,	2		1	1
Dodecatheon,	1	1		
Trientalis,	1	1		
Glaux,	1			1
	10	6	2	2
XII. Lentibulariæ.				
Utricularia,	1	1		
Pinguicula,	2	1		1
	3	2		1
XIII. Labiatæ.				
Lycopus,	3	3		
Mentha,	1	1		
Stachys,	1	1		
Dracocephalum,	1	1		
Scutellaria,	1	1		
	7	7		
XIV. Scrophularinæ				
Euphrasia,	2	2		
Bartsia,	3	3		
Rhinanthus,	1	1		
Pedicularis,	10	3	6	1
Veronica,	1	1		
	17	10	6	1
XV. Boragineæ.				
Myosotis,	1	1		
Lithospermum,	4	3		1
	5	4		1

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
XVI. Hydrophylleæ				
Eutoca, -	1	1		
XVII. Polemoniaceæ				
Phlox, -	1	1		
XVIII. Gentianeæ.				
Swertia, -	1	1		
Gentiana,	4	4		
Menyanthes,	1	1		
	6	6		
XIX. Apocineæ.				
Apocynum,	1	1		
XX. Ericineæ.				
Kalmia, -	1			1
Rhododendron,	1		1	
Menziesia,	1	1		
Azalea, -	1			1
Andromeda,	4	1		3
Arbutus,	2			2
Ledum, -	2	1		1
Empetrum,	1			1
	13	3	1	9
XXI. Vaccineæ.				
Vaccinium,	5	3		2
Oxycoccos,	1			1
	6	3		3
XXII. Monotropeæ.				
Pyrola, -	5	3		2
XXIII. Campanulaceæ.				
Campanula,	3	2	1	
XXIV. Compositæ.				
1. *Cichoraceæ.*				
Sonchus, -	1	1		
Leontodon,	1			1
Troximon,	1	1		
Hieracium,	3	2	1	
Crepis, -	1		1	
2. *Cinarocephalæ.*				
Saussuria,	1		1	
3. *Corymbiferæ.*				
Tanacetum,	1	1		
Artemisia,	8	5	2	1

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
Compositæ.				
Antennaria,	3	2	1	
Erigeron,	6	5	1	
Tussilago,	4	2	1	1
Senecio, -	6	5	1	
Cineraria,	6	2	3	1
Aster, -	9	8	1	
Solidago,	9	9		
Arnica, -	2	1		1
Grindelia,	1	1		
Chrysanthemum,	2		2	
Achillea, -	2			2
	67	45	15	7
XXV. Valerianeæ.				
Valeriana,	2	2		
XXVI. Rubiaceæ.				
Galium, -	2	2		
XXVII. Caprifoliaceæ.				
Linnæa, -	1	1		
Caprifolium,	1	1		
Xylosteum,	3	3		
Symphorium,	1	1		
Viburnum,	2	2		
Cornus, -	2	2		
	10	10		
XXVIII. Araliæ.				
Aralia, -	1	1		
XXIX. Umbelliferæ				
Cicuta, -	2	2		
Smyrnium,	1	1		
Heracleum,	1	1		
	4	4		
XXX. Halorageæ.				
Hippuris,	2	2		
Myriophyllum,	1	1		
	3	3		
XXXI. Onagrariæ.				
Œnothera,	1	1		
Epilobium,	4	2	1	1
	5	3	1	1

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
XXXII. Papilionac.				
Thermopsis,	1	1		
Lupinus,	1			1
Lathyrus,	1	1		
Pisum,	1			1
Vicia,	1	1		
Hedysarum,	3	2		1
Phaca,	2	1		1
Oxytropus,	6	3	3	
Astragalus,	6	5	1	
	22	14	4	4
XXXIII. Rosaceæ.				
Sorbus,	1	1		
Aronia,	1	1		
Rosa,	1	1		
Rubus,	5	4		1
Geum,	1	1		
Sieversia,	3	2	1	
Potentilla,	13	9	3	1
Sibbaldia,	1	1		
Comarum,	1	1		
Dryas,	2	1		1
Prunus,	2	2		
Spiræa,	1	1		
	32	25	4	3
XXXIV. Grossular.				
Ribes,	9	9		
XXXV. Saxifrageæ.				
Saxifraga,	16	4	6	6
Chrysosplenium,	1			1
Parnassia,	2		1	1
Adoxa,	1	1		
Mitella,	1	1		
Heuchera,	1	1		
	22	7	7	8
XXXVI. Rhamneæ.				
Rhamnus,	1	1		
XXXVII. Aceraceæ.				
Acer,	1	1		
XXXVIII. Geraniac.				
Geranium,	1	1		
XXXIX. Lineæ.				
Linum,	1	1		
XL. Caryophylleæ.				
Silene,	1		1	
Lychnis,	3	1	2	

Classes and Families.	Total of Species.	Woody Region.	Barren Grounds.	Common to both districts.
Caryophylleæ.				
Spergula,	1	1		
Cerastium,	4	2	1	1
Arenaria,	8	3	5	
Stellaria,	7	4	2	1
	24	11	11	2
XLI. Cisteæ.				
Hudsonia,	1	1		
XLII. Violaceæ.				
Viola,	7	7		
XLIII. Polygaleæ.				
Polygala,	2	1		1
XLIV. Cruciferæ.				
Nasturtium,	1	1		
Barbarea,	1	1		
Braya,	1		1	
Platypetalum,	2		2	
Eutrema,	1		1	
Turritis,	1	1		
Arabis,	5	4	1	
Parrya,	1		1	
Cardamine,	4	1	2	1
Vesicaria,	2	1	1	
Draba,	11	3	7	1
Cochlearia,	1		1	
Capsella,	1	1		
Sisymbrium,	3	2		1
Erysimum,	1	1		
Lepidium,	1	1		
	37	17	17	3
XLV. Fumariæ.				
Corydalis,	2	2		
XLVI. Papaveraceæ.				
Papaver,	1		1	
XLVII. Nymphæac.				
Nuphar,	1	1		
Sarracenia,	1	1		
	2	2		
XLVIII. Ranuncul.				
Thalictrum,	1	1		
Anemone,	6	3	1	2
Ranunculus,	12	7	3	2
Caltha,	3	2	1	
Coptis,	1	1		
Aquilegia,	1	1		
Actæa,	1	1		
	25	16	5	4

Remarks upon Table XI.—The materials of the preceding Table are principally derived from the *Botanical Appendix* to Captain Franklin's *Narrative*, which has furnished upwards of 700 of the species. To these, 65 phænogamous plants have been added from Pursh, that were collected at Hudson's Bay by Tilden and others, and are preserved in the Sherardian and Banksian herbaria. The most northerly of Michaux's plants being collected to the southward of Latitude 53°, do not enter into our list; and the plants collected by Nelson and Menzies on the North-west coast, being from countries to the westward of the Rocky Mountains, and for the most part too far to the south, are also excluded. Thirty-three species, however, of phænogamous plants, from Mr Brown's *Botanical Appendix* to Captain Parry's first voyage, have been added to the column headed "Barren Grounds," together with seven from the herbaria made in Captain Parry's second voyage, and a few from Mr Brown's *List of the Plants* collected by Captain Ross, making the entire list in the Table amount to 840 plants.

The collections of Captains Parry and Ross compensate for the loss of the summer collection of 1821, in Captain Franklin's journey.

The structure of the Table is too simple to require explanation. The Woody Districts extend from Latitude 53½ or 54° to Latitude 64° south, or nearly to Fort Enterprize. The Barren Grounds from Latitude 64° to the most northerly parts visited, or to 74°. By adding the plants in the last column to those in either of the two preceding ones, the whole vegetation of that district, as far as detected, is found.

The phænogamous plants in the preceding Table stand thus:

Woody Region.	Barren Grounds.	Total.
427	190	538

there being 79 species common to the two districts.

Table XII.

Names of Families arranged in the order of the Numbers of their Species which inhabit the Woody District.	*Woody District, Lat.* 53½°—64°.		*Barren Grounds, Lat.* 64°—70°.		*Lancaster Straits, about Lat.* 74°.	
	No. of Species.	Prop. borne by a Family to all the Phenogamous Plants of the District.	No. of Species.	Prop. borne by a Family to all the Phenogamous Plants of the District.	No. of Species.	Prop. borne by a Family to all the Phenogamous Plants of the District.
Phanerogamæ,	427		190		70	
Dicotyledones,	340	1 : 1.26	147	1 : 1.29	50	1 : 1.40
Monocotyledones,	87	1 : 4.79	43	1 : 4.37	20	1 : 3.50
Compositæ,	52	1 : 8.21	22	1 : 8.64	5	1 : 14.00
Salicinæ,	29	1 : 14.72	12	1 : 15.83	1	1 : 70.00
Rosaceæ,	28	1 : 15.26	7	1 : 27.14	4	1 : 17.50
Cyperaceæ,	28	1 : 15.25	11	1 : 17.27	4	1 : 17.50
Gramineæ,	22	1 : 19.41	21	1 : 9.05	14	1 : 5.00
Cruciferæ,	20	1 : 21.35	20	1 : 9.50	11	1 : 6.36
Ranunculaceæ,	20	1 : 21.35	9	1 : 21.11	5	1 : 14.00
Papilionaceæ,	18	1 : 23.72	8	1 : 23.75	2	1 : 35.00
Saxifrageæ,	15	1 : 28.46	15	1 : 12.66	10	1 : 7.00
Caryophylleæ,	13	1 : 32.84	13	1 : 14.61	6	1 : 11.66
Ericinæ,	12	1 : 35.58	10	1 : 19.00	1	1 : 70.00
Scrophularinæ,	11	1 : 38.82	7	1 : 27.14	1	1 : 70.00
Orchideæ,	11	1 : 38.82	1	1 : 190.00	—	—
Caprifoliaceæ,	10	1 : 42.70	—	—	—	—
Grossulariæ,	9	1 : 47.44	—	—	—	—
Junceæ,	8	1 : 53.38	6	1 : 31.66	2	1 : 35.00
Primulaceæ,	8	1 : 53.38	4	1 : 47.50	—	—
Coniferæ,	8	1 : 53.38	2	1 : 95.00	—	—
Labiatæ,	7	1 : 61.00	—	—	—	—
Violaceæ,	7	1 : 61.00	—	—	—	—
Vaccineæ,	6	1 : 71.16	3	1 : 63.33	—	—
Gentianeæ,	6	1 : 71.16	—	—	—	—
Polygoneæ,	5	1 : 85.40	3	1 : 63.33	2	1 : 35.00
Monotropeæ,	5	1 : 85.40	2	1 : 95.00	—	—
Onagrariæ,	4	1 : 106.75	2	1 : 95.00	—	—
Umbelliferæ,	4	1 : 106.75	—	—	—	—
Aroideæ,	4	1 : 106.75	—	—	—	—
Lentibulariæ,	3	1 : 143.33	1	1 : 190.00	—	—
Melanthaceæ,	2	1 : 213.50	2	1 : 95.00	—	—
Juncagineæ,	2	1 : 213.50	2	2 : 95.00	—	—
Plantagineæ,	2	1 : 213.50	1	1 : 190.00	—	—
Campanulaceæ,	2	1 : 213.50	1	1 : 190.00	1	1 : 70.00
Elæagni,	2	1 : 213.50	1	1 : 190.00		
Polygaleæ,	2	1 : 213.50	1	1 : 190.00		
Plumbagineæ,	1	1 : 427.00	1	1 : 190.00		
Papaveraceæ,	—	—	1	1 : 190.00	1	1 : 70.00

The following families, as well as those distinguished in the preceding list by blank spaces in the column headed "Barren Ground," were not observed to extend beyond the wooded district.

7 families of two species,

Asphodeleæ	Santaleæ	Chenopodeæ
Valerianeæ	Rubiaceæ	Fumareæ
Nymphæaceæ		

And 13 families of one species,

Irideæ	Fluviales	Corylaceæ
Urticeæ	Hydrophylleæ	Polemoniaceæ
Apocineæ	Aralieæ	Rhamneæ
Aceraceæ	Geraniaceæ	Lineæ
Cisteæ		

Table XII. is compiled from Table XI. The column headed "Lancaster Straits" is from *Mr Brown's Botanical Appendix to Captain Parry's First Voyage*, with the addition of two *Cruciferæ* and one of the *Caryophylleæ* from his *List of Captain Ross's Plants.*

TABLE XIII.—*Principal Families of Plants in the Three Districts, arranged in the order of the Number of their Species.*

Woody District.	*Barren Grounds.*	*Lancaster Straits.*
Compositæ	Compositæ	Gramineæ
Salicinæ	Gramineæ	Cruciferæ
Rosaceæ	Cruciferæ	Saxifrageæ
Cyperaceæ	Saxifrageæ	Caryophylleæ
Gramineæ	Caryophylleæ	Compositæ
Cruciferæ	Salicinæ	Cyperaceæ
Ranunculaceæ	Cyperaceæ	Ranunculaceæ
Papilionaceæ	Ericinæ	Rosaceæ
Saxifrageæ	Ranunculaceæ	Papilionaceæ
Caryophylleæ	Papilionaceæ	Junceæ
Ericinæ	Rosaceæ	Polygoneæ
Scrophularinæ	Scrophularinæ	Salicinæ
Junceæ	Junceæ	Scrophularinæ
Polygoneæ	Polygoneæ	Ericinæ

CHATHAM,
January 1. 1825.

CORRIGENDA.

Page 200. Tab. I. *insert* Long. of Winter Island, 83½° W.; of Igloolik, 82½° W.; and of Melville Island, 111° W.

P. 202. Tab. II. col. 3. *for* Lat. 66° near Fort Enterprize, *read* Lat. 64°; and in col. 4. *for* Lat. 64½° *read* Lat. 66½° Winter Island.

P. 203. Tab. III. line Near Fort Enterprize, *for* Lat. 54° *read* Lat. 64°; and in line Melville Island, *for* Long. 11° *read* 111°; and in a line with *Europe* col. Long. *insert* E.

P. 206. Tab. VI. line 2d of title, *for* Lat. 58° 57′ *read* 63° 57′

P. 224. Tab. XI. line 2d of title, for *westward* read *eastward*

ART. II.—*Tables of Summer Temperatures observed in Spitzbergen by Captain* FRANKLIN *and Captain* BUCHAN.

THE following Tables of summer temperatures, observed during Captain Franklin's voyage to Spitzbergen with Captain Buchan, communicated to us for publication in the Philosophical Journal, are important, not only as connected with the climate of Spitzbergen, but also as illustrating some of the views taken of climate by Dr Richardson, in his very interesting and able memoir, "On the Climate and Vegetable Productions of the Hudson's Bay Countries," also published in the present Number.

TABLE of Temperatures taken on board H. M. S. Trent, Captain Franklin. Observations made every hour, and the daily means deduced from the 24 observations.

Lat. 80° N.; Long. 10° East.

Month.	Temp. Atmosphere.	Temp. Sea at surface.	Month.	Temp. Atmosphere.	Temp. Sea at surface.	Month.	Temp. Atmosphere.	Temp. Sea at surface.
	°	°		°	°		°	°
June 1.	24.8	27.7	July 1.	39.9	33.6	Aug. 1.	35.8	37.5
2.	22.8	28.1	2.	37.3	33.7	2.	31.0	36.9
3.	24.0	28.7	3.	36.6	33.8	3.	34.6	37.5
4.	29.4	31.1	4.	36.2	34.1	4.	33.4	37.3
5.	32.4	33.5	5.	36.6	34.1	5.	33.9	37.3
6.	29.2	30.1	6.	34.6	34.3	6.	36.1	38.5
7.	30.8	31.1	7.	33.8	34.5	7.	36.6	37.3
8.	32.1	31.0	8.	34.8	32.0	8.	36.1	36.9
9.	32.5	27.6	9.	32.8	30.8	9.	37.3	37.1
10.	32.2	30.8	10.	36.1	31.2	10.	35.8	36.9
11.	37.4	34.9	11.	38.7	31.5	11.	37.3	37 0
12.	37.7	35.0	12.	36.7	31.5	12.	38.9	38.2
13.	34.8	30.2	13.	38.3	31.4	13.	30.7	36.5
14.	36.8	30.0	14.	39.1	32.2	14.	35.0	36.9
15.	43.0	30.8	15.	37.0	32.7	15.	37.4	36.9
16.	36.9	31.6	16.	36.8	32.3	16.	33.5	35.7
17.	35.5	30.3	17.	36.3	32.7	17.	32.1	36.9
18.	30.2	30.7	18.	36.4	32.8	18.	32.2	36.1
19.	36.9	30.5	19.	33.3	32.2	19.	31.9	35.9
20.	36.3	30.9	20.	34.9	32.3	20.	29.5	35.9
21.	36.4	30.5	21.	33.9	32.2	21.	31.6	34.0
22.	36.8	30.0	22.	33.2	31.8	22.	33.3	31.5
23.	36.3	30.7	23.	37.1	31.8	23.	31.5	35.5
24.	35.5	32.8	24.	35.8	32.0	24.	33.1	36.1
25.	31.5	32.7	25.	34.7	31.5	25.	37.6	37.3
26.	34.9	33.2	26.	33.6	31.8	26.	35.8	36.1
27.	32.4	32.7	27.	34.4	31.7	27.	30.7	35.2
28.	36.2	33.0	28.	36.2	31.6	28.	30.8	35.4
29.	37.3	33.0	29.	36.1	32.5	29.	31.4	35.5
30.	39.0	33.6	30.	39.8	35.1	30.	30.4	33.6
			31.	34.6	34.7	31.	31.3	35.8
Means,	33°.73	31°.22	Means,	35°.08	32°.60	Means,	33°.80	36°.40

Mean Temperature of the Air for 10 *or* 11 *days, taken on board H. M. S. Trent, Lieutenant Franklin, in the year* 1818, *at Spitzbergen.—Means deduced from hourly observations.*

Date.	Means of 10 days.	Situation.	
		Lat.	Long.
	°	° ′	° ′
May 20–31.	32.55	76 30	12 0 E.
June 1–10.	29.02	79 45	10 0
... 11–20.	36.55	79 55	10 0
... 21–30.	35.63	79 55	10 0
July 1–10.	35.78	80 0	10 15
... 11–20.	36.75	80 25	10 30
... 21–31.	35.40	80 15	11 15
Aug. 1–10.	35.06	79 45	9 45
... 11–20.	33.85	79 40	9 45
... 21–31.	32.50	79 40	9 45

Mean Temperatures for the Summer, *June, July and August, shewing that Latitude is of less importance in a Maritime Climate in Summer.*

Place.	Temp. of Atmosphere.	Latitude.	Longitude.	Year.
	°	° ′	° ′	
Spitzbergen, ...	34.50	80 0 N.	10 0 E.	1818
Melville Island,...	37.11	74 45	110 0 W.	1820
Winter Island,...	35.23	69 30	82 30	1822–3
Igloolik,.....	32.37	66 15	83 0	1821–2

Mean Temperature of Warmest Month.

Spitzbergen,.....35°.98 July.
Melville Island, ... 42.41 July, (climate partly continental).
Winter Island,.....40.00 July.
Igloolik,.....36.60 Aug. (July, 36°.50).

ART. III.—*Table of the Temperature of the Sea, at various depths, made during Captain* FRANKLIN's *Voyage to Spitzbergen with Captain* BUCHAN.

May 26.—IN Lat. 76° 48′ N., Long. 12° 26′ E., a bottle was attached to a line, and let down to the depth of 600 fathoms.

It came up filled with water, having a temperature of 43°, the temperature of water at the surface of the sea being then 33°, and of the atmosphere 29°. Small pieces of ice were floating round the ship, and the land of Spitzbergen was distant 6 or 7 leagues.

The following observations were made on water brought up from different depths, in a leaden-box prepared on the suggestion of Mr Fisher, with two valves which remained open in descending, but were closed in the ascent.

Date.	Lat.	Long.	Temp. of water at surface.	Temp. of water brought up.	Depth to which the vessel was let down.	Remarks.
1818,	° ′	° ′	°	°	Fathoms.	
June 20.	79 58 N.	11 25 E.	31.5 F.	31.0 F.	24	At the bottom.
21.	79 56	11 30	30.0	31.0	19	Do.; ship surrounded by ice.
22.	80 0	11 14	30.0	31.0	33	Do.
23.	79 59	10 12	31.5	32.5	21	Do.; beset by ice.
25.	79 51	10 0	33.0	34.0	60	At the bottom.
...	...	...	33.0	34.0	17	Clear water near the land.
26.	79 44	9 33	34.0	34.0	15	At the bottom. Clear water some miles from the ice.
27.	79 51½	10 0	34.0	34.5	72	
29.	79 51	10 0	34.0	34.0	17	
...	...	...	34.0	34.0	19	Near the land in a current.
July 6.	74 48	10 15	34.0	34.5	34	At the bottom.
7.	80 18	11 10	33.0	36.0	120	Do.; beset by ice.
8.	80 20	11 10	31.5	36.5	130	Do. do.
9.	80 20	10 55	30.5	35.5	110	Do. do.
10.	80 19	11 24	32.0	36.0	119	Do. do.
11.	80 22	10 30	32.0	36.0	120	Do. do.
12.	80 20	11 7	32.0	35.3	145	Do. do.
13.	80 22	10 2	32.0	35.5	235	Do.
14.	80 26	10 45	32.0	35.5	233	Do.; beset by ice.
15.	80 27	10 20	32.0	36.0	198	Do.
16.	80 26	11 25	36.5	36.3	173	Do.
17.	80 27	11 0	34.0	35.5	285	Do.; beset by ice.
18.	80 26	10 30	32.5	36.0	331	Do. do.
19.	80 24	11 14	31.5	36.5	103	Do. do.
20.	80 21	10 12	32.5	35.5	108	Do. do.
21.	80 14	11 12	32.5	35.3	95	Do. do.
22.	80 13	11 31	31.0	35.3	83	Do. do.
23.	80 15	11 36	32.5	36.3	73	Do. do.
25.	80 18	11 40	32.5	36.0	91½	Do. do.
26.	80 20	11 25	32.5	36.0	55	Do.