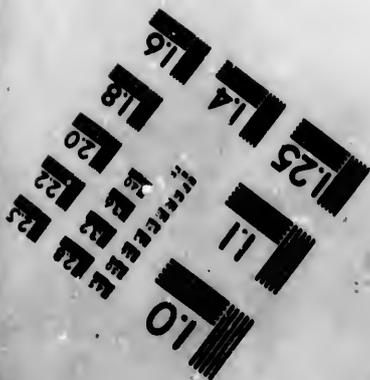
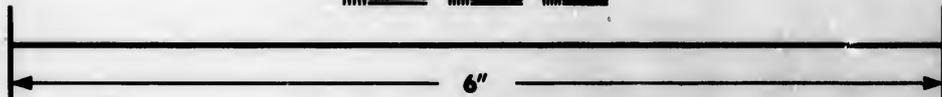
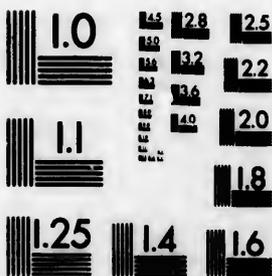


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN ST. 1ST
WEBSTER, N.Y. 14580
(716) 872-4800

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1983

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

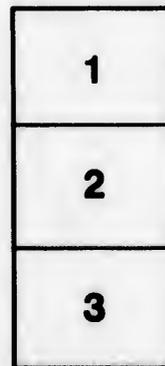
Library,
Geological Survey of Canada

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

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

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

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



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

Bibliothèque,
Commission Géologique du Canada

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

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

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

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

aire
détails
ues du
modifier
ger une
filmage

ées

re

y errata
nd to

nt
ne pelure,
çon à



G82
T46
PAMS



The Excursion of Members of the British Association from Montreal to the Rocky Mountains,

September, 1884.

By THOMAS HENRY THOMAS, R.C.A.,
PRESIDENT-ELECT CARDIFF NATURALISTS' SOCIETY.
SPECIAL ARTIST OF THE "GRAPHIC" WITH THE BRITISH ASSOCIATION
IN CANADA.

Read before the Society, March 3rd, 1887.

NOTE.—The wood-engravings accompanying this paper are added by the courteous permission of the proprietors of the *Graphic*, through Mr. Carmichael Thomas.

In illustration of the paper, a collection of minerals, maps, and publications was kindly lent by Mr. Archer Baker, of Liverpool. A small herbarium of Canadian plants, kindly named by Prof. John Macoun, M.A., of Ottawa, and a series of sketches by the writer, also photographs by Mr. R. G. Brooks, of St. Helens, and Mr. E. W. Sollas, of London, were exhibited.

ON the afternoon of the first of September, 1884, Colonel Crawford, one of the Hon. Secretaries of the British Association in Montreal, whose energies, with those of his colleague Mr. Watts, were ever acting for the welfare of the Members visiting that city, handed me a slip of paper, saying, "Take that to the Agent and he will hand you your ticket for the Rocky Mountains Special Excursion Train." Among many favours, this was the greatest vouchsafed to Members of the Association during their visit to Canada, the trip being planned on a scale almost unexampled even among the "big things" of the Western world.

Breathlessly I sought the Agent and became the proud possessor of a multiple ticket of about a yard long, divided into many coupon segments by lines of perforations, and reminding a naturalist of a lengthy portion of some new specimen of *Tenia*. Extraordinary as the dimensions of the ticket were, it was not upon them my mind's eye dwelt. To parody the "great lexicographer" at the sale of Thrale's brewery, "I was not at the receipt of a piece of perforated paper tape, but about to enter upon a period of my life filled with mental excitement, surpassing the wildest dream of the Phrenzied Poet!"—An extraordinary period, during which, while sitting or lying in comfort or even luxury, a vast panorama of twice 2,400 miles in length was unfolded before me, rugged forest, mountains of basalt, the wave-worn shores and glacier-shapen islets, and thunder-

LIBRARY

GEOLOGICAL SURVEY

smitten cliffs of inland oceans; glimpses of pioneer life, of savage tribes; wide plains where from sunrise to sunset one could perceive scarcely an undulation except the mock hills and rivers formed by gleaming mirage; wide rivers, miles of wheat golden for harvest, echoing mountain cañons, snow-clad summits, lakes set in forest scarcely trodden by the white man, and glaciers shining in the groins of high alps. And, as if to heighten theatrically the effect, there was to be the alternation of darkness and dawn, moonlight upon seas, golden sunsets, lowering cloud and rolling thunder among the cliffs, blazing sunlight on vast plains where only the Indian, crouched on his saddle, made a spot of dark on the expanse; blackness of darkness in ravines filled with forest almost too dense to penetrate, or icy wind howling and bearing with it wild snow-storms. All this and more of beautiful, or strange, or contradictory, was meant by that queer slip of paper which was given a hundred Members of the British Association by the Directors of the "Colossus of the North," the Canadian Pacific Railway.

The real rendezvous of the Members' Rocky Mountain Excursion was Owen Sound, on Lake Huron, but the majority left Montreal on the morning of the 4th for Toronto, in company with a large number of other members and friends in response to an invitation from the municipality of that city. What we there saw has already been well described in Mr. Price's paper. I will only quote a sentence from the speech of welcome, delivered by Prof. Daniel Wilson, as being notable. "The visitors would see in Ontario's capital a city created entirely by English enterprise, and proud of the reputation of being the most English city on the American Continent. He hoped that the guests would remember that ninety-nine years ago Toronto's present site was a trackless forest, except near the lake shore, where a few bark wigwams marked the location of the present city."

A Briton must be touched by this sentence, but I confess I wish it were in the province of this paper to quote something as terse regarding the "City of Two Peoples," Montreal, where the welcome given us was not only in English, but also in the gracious tongue of France. And in this sense I should gratefully note my personal indebtedness for kindness and hospitality to Dr. McDonnell, of McGee College, and M. Alphonse Desjardins, M.P. for Hochelaga, and also to Mr. Wm. Bragg, of the *Montreal Daily Star*, for varied information and cheerful companionship in travel.

In both cities our welcome was "Canadian," which means all that is possible in cordiality of feeling and profusion of hospitality. At Toronto the visitors were driven to all the institutions of principal interest in the city, and a brilliant reception at the residence of the Lieut.-Governor of Ontario, the Hon. Beverley Robinson, terminated a most pleasant day. To me the day is also memorable for one hour at evening when a "square party" of us took a skiff and for the first time floated on the waters of Lake Ontario, as air and sea glowed and flamed with the colours of sunset—a poetic close to what had been to me a most pleasant companionship of travel—the morrow was to find two eastward, and two westward ho!

On the forenoon of the 5th September we found our limited excursion

YANBU

YANBU JACOB JACO



*Thunder Cape, Lake Superior, Trap Overflowing Rocks of Keweenaw Series.
Height 1,350 feet.*



In Kicking Horse Pass, Rocky Mountains. British Association Excursion Train.

tr
w
o
o
b
r
a
5
a
c
R
I
b
p
p
C
n
is
gl
li
w
(
st
th
sh
th
M
w
6
de
cu
th
A
ex
st
to
al
pe
sig
cu
ap
ab
an
lan
ab

train *en route* for Owen Sound, through a partially cultivated country where we could see the methods and become initiated into the meaning of "lumbering," "clearing," "firing," "snake-fencing," and other terms of Canadian farming.

Reaching Owen Sound, on Lake Huron, the members embarked on board the Canadian Pacific Steamer "Alberta," a fine vessel with saloon running from stem to stern, from which opened at either side well-appointed state rooms, all parts having electric light. At 4.30 p.m., Sept. 5th, we were speeding out into Georgian Bay, past the piles of lumber and the tall grain elevators of the flourishing port. During the night we crossed Lake Huron, and in the morning were passing into the St. Mary's River, the channel connecting Huron and Superior, with Manitoulin Island to the starboard. The River St. Marie is very picturesque; a background of hills clothed with pine forest, and a foreground of pine, poplar, and birch, upon which were many settlements with their landing places, and groups of boats and birch bark canoes. Here is, on the Canadian side, the Garden River Settlement of Ojibway Indians; they number some 10,000, and are the remnant of a great nation. Many low islets are dotted about our course, some showing bare and apparently glaciated rocks of Laurentian age; others crowned with quaint groups of living and dead pines. Upon the banks and islets many interesting trees were pointed out as we sailed by. One ornament was the Canada cedar (*Thuja occidentalis*). Many groups were seen of white pine (*Pinus strobus*), and *P. balsamea*, *Populus balsamea*, and *irenuloides* stirred in the breeze, and the white stems of the paper birch (*Betula papyracea*) shot up here and there, and occasionally a rare specimen was seen of the elm (*Ulmus Americana*).

This pleasant river sailing soon brings us to the celebrated Saulte St. Marie—the rapid known colloquially as the "Soo," over which the waters of Lake Superior fall to the lower level of Huron, the latter being 600 feet above sea-level, and Superior 630 feet. The rapid of the "Soo" descends 22 feet in a distance of three-fourths of a mile.

Our ship, with two others, entered the great lock by which the difficulty of the rapid is obviated, a vast engineering work performed by the United States Government, but the use of which is free to all vessels. After a short delay, we were afloat on Lake Superior, the greatest expanse of fresh water on the face of the earth, and our good ship was standing out north-westwards on her voyage of some 300 miles across it to Thunder Bay and Port Arthur. The day became gloomy as we sailed along, but it was fortunately calm, and we could observe in parts the perfect clearness of the water. At evening, when we were far out of sight of land, a very strange sunset effect developed at an opening in the curtain of cloud which veiled the sky. Golden rays, apparently vertical, appeared, and, intensely dark against the light, two tiny pyramids showed above the horizon; these rose gradually and finally shrouded as clouds and closed the opening.

The night passed, and in the morning we approached the grand headland of Thunder Cape, which shows a steep slope crowded with pines, above which enormous cliffs of trap, of strange form, tower to the height

of 1,350 feet. The driving storms of rain then falling, and the agitated sea, added to the sublimity of the scene, and, with almost theatrical aptness, as we rounded the cape towards Port Arthur, we heard the distant rumble of thunder, and saw flashes of lightning.

Arriving at Port Arthur we found ourselves destined to be delayed for 24 hours or more, in consequence of an injury to the line to Winnipeg. This gave us the opportunity for a little observation of what I may call a "timber city," and life therein. Port Arthur is one of those places which are "booming," or rapidly prospering. What with its selection as a central depôt by the great railway, the silver mines in the islands near, and the "sign" discovered of other mineral deposits, it was growing daily by the erection of the wooden slab houses which are so conveniently designed and manufactured in Canada and the States, that a family may be houseless on a Friday night, and in possession of a quite convenient and somewhat tasteful residence on Sunday morning before church-time. Such a city as Port Arthur has great interest to an Englishman, even if one sees it through a downfall of rain that would soak through anything but the natural cuticle—as we saw it. I attended so carefully to my duty of sketching, that I lost the scientific opportunities afforded by the geological excursion led by Dr. Dawson, and a botanical one under Professor Macoun; so, when my first work seemed done I started alone, keeping a straight line into the forest, to see what might turn up. It was most enjoyable, in spite of the rain. The ground ascended slightly, and soon gave one a wide view of the great freshwater sea, with its islands rich in metals. And at every step one found some new plant, or recognised with equal pleasure some western form of an European species. The trees were several species of fir, and poplar, with a great diversity of shrubs and deciduous trees of small growth; among these were several very pretty *Cratagi*, and a great variety of willows. Among the shrubs was the pretty *Symphoricarpos*, covered with its snowy berries, and *Berberis* with blue fruit, *Rubi* and *Pruni*, ferns, *Equeseta*, and mosses in masses of verdure. The time for most flowering plants had of course passed, but some blossoms still lingered, and many tall spikes of seed marked those out of bloom. Fine spikes of *Epilobium hirsutum* were still in flower. Under the trees trailed the beautiful sprays of the bear-berry (*Arctostaphylus uva ursi*), with a red berry here and there, and, a delight to see for the first time growing, the *Linnaea borealis*. On hillocks among the marsh was *Vaccinium vitis-idaea*, and the dryer clumps were blue with whortle-berries of the wonderfully fertile variety known as *Vaccinium Canadense* (Kalm). A beautiful little white star here and there studded the ground, which I found to be *Cornus canadense*, much like the European *Cornus suecica*. But the real prize for a stranger, curious as characteristic, growing in knots here and there in the marsh was the "side-saddle flower," a "pitcher plant" (*Sarracenia purpurea*) from amid the groups of which its very curious flower showed itself.

I got specimens of hosts of things, filled my pockets and hat with them in my enthusiasm, but I regret to say few got dried, owing to the extreme wetness of the weather, and, indeed, here I must apologise for

the bad condition of many specimens shown. Travelling rapidly, I could only here and there make a hasty 'grab' at plants, and the only way to dry them was to stuff them between leaves of newspapers or handbooks, put these under the carriage cushions and sit upon them. However, in this fashion the botanists of the party were very active, and a most admirable and instructive sight it was to see the collectors "sitting" upon their treasures, somewhat after the mode of penguins upon a rocky ledge. But in this way I managed to bring back what represents about 200 species, authentically named, for Professor Macoun, the first authority upon Canadian Botany, has done me the distinguished honour to add the nomenclature.

When the waning light warned me to return from the forest ramble, I found myself near a forlorn little enclosure, containing perhaps a score of graves, marked simply by pegs of wood stuck into the ground; some roughly inscribed in a language I had not before seen written, probably Finnish: one grave had a spray of China rose growing beside it. In the wretched dank spot there seemed a whole "Drama of Exile."

On return from this excursion, I found that the train from Winnipeg, so long delayed, had arrived, and a detachment of some fifty voyageurs were passing down to the "Algoma" steamship, on their way to Egypt. What they and their brave comrades did on the Nile soon afterwards is now "ancient history."

While awaiting our start for Winnipeg we had time to look at the quarters which we were to occupy for the next nine days and nights, for here we were to board the new cars of the great western section of the "Colossus of the North," as "*Harper's Magazine*" describes the Canadian Pacific Railway. I was quite astonished, being new to American travel, at the solidity and artistic finish of the cars composing what was called the "Solid Pullman" train, which consisted of four Pullman sleeping cars, and the private car of Mr. Egan, the Engineer of the Railway, under whose care we were now placed. The cars, with their beautiful fittings, carved with perfect taste, with metal work of fine bronze, and upper lights of thick agate glass, were quite unequalled by any cars I afterwards saw in the States, beautiful as many of them are. It is the custom in the states and Canada to name the Pullman cars, and thus, those of our train had the names of places on the line—"Portage-la-Prairie," "Brandon," "Wabigoon," and "Kananaskis." I certainly shall never forget the pleasant days spent aboard of the "Kananaskis," with its joyous company—but, as the novelists used to say, "I anticipate."

Leaving Port Arthur, the Old Hudson's Bay Co.'s port of Fort William is reached, and beyond it we saw "McKay Mountain," a bulk of trap or basalt, rising in quasi-columnar masses to a height of 1,300 feet, nearly equalling that of Thunder Cape. Its aspect is very strange as the enormous sheer cliffs of the upper part stand upon a sharply terraced base of gravel. Our route lay along the Kaministiquia river of dark peat water, often foaming among huge boulders and overshadowed by pines. Burnt forest, with goblin-like black and white fragments of tree-trunks, alternated with rough forest-land strewn with huge boulders, or

masses of glaciated rock protruded amidst thick undergrowth and fallen pines.

Occasionally halting for water we found ourselves at Savanne, near to an Indian wigwam, upon which the Members immediately charged, to the great affright of the squaw who was within, and who, snatching up the inevitable baby, retreated knee-deep into a river, and gazed defiantly from that post of vantage. There was no time to explain matters, for the conductors were calling "all aboard," and no doubt that poor Indian's untutored mind still misunderstands our enthusiasm for ethnology.

At one of these halting places I first gathered the interesting plant called Indian tea (*Ledum latifolium*), the infusion of which is much used as a beverage by Indians, voyageurs, and travellers in those regions. It was introduced at one time into England by the Hudson's Bay Co., under the name of "Labrador Tea."

The cause of our detention at Port Arthur was described as a "wash-out in a muskeg" near Barclay, which the dictionary of the Canadian language yet to be published will translate a "flood in a moving bog," with the addition that the flood must undermine the railway line. The "washout" must be one of the standing risks in this country of labyrinthine waterways, just as snow-slides form a risk upon Alpine railways. The net-work of lakes and streams of all sizes in this region is most astonishing and puzzling to one who wishes to understand the topography.

Near Barclay we came to the said "washout." A vast amount of land was inundated, and the train crawled along the mended line in the drenching rain, looking like a half-drowned caterpillar struggling in a pool.

The boulders and live rock in this district are of the ancient series, Laurentian and Huronian; and at Rat Portage the railway passes a most interesting point of junction of these ancient formations, and at the same place a glimpse is obtained of a glorious cataract, where the waters of the beautiful pine-fringed, islet-bestudded, "Lake of the Woods" breaks through the ravine to the river Winnipeg. Soon the rough land was left behind, and we approached that infant Hercules of a city, Winnipeg, seated upon its too soft bed of loam of 10 feet deep, at the junction of the Assiniboine and Red Rivers.

No stoppage was made, for our visit to the city is to be on the return journey, and in fact we pass during the night, but a party leaves us here *en route* for the Yellowstone National Park, one of whom is our friend and honorary member, Professor Sollas.

Hence to the Rocky Mountains there lie before us the plains of the "Great West!" a stretch of over 800 miles, which constitutes what a very few years ago was the "Lone Land" of Lord Milton and Dr. Cheadle. Now its mystery is solved, its loneliness broken into, and its riches proved. A glance at the map will show the chief peculiarities.

It will be seen that the frontier line of Canada and the United States, although struck right along a parallel of latitude, yet denotes, to some extent, natural water-parting; the great vale of the Red River of the

north tilts that river towards its outlet in Lake Winnipeg, the system of the Qu'Appelle River flows into Lake Manitoba, and while the affluents of the South Saskatchewan cut the frontier, they afterwards flow through the great plains north of the line as they wind towards the mouth of the great combined river at the head of Lake Winnipeg. To the southward of the frontier the waters of the Big Muddy, Milk River, &c. flow to the vast Missouri and Mississippi system.

The plains themselves are formed in three steppes, rising towards the Rocky Mountains; the lowest prairie is 700 feet above the sea level, and extends along the Canadian Pacific Railway about 200 miles, as far, that is, as the boundary of Manitoba; the second is 150 miles wide in the same line, ending at Regina; and the third and more irregular steppe extends to the foothills of the Rockies, at about 3,200 feet level, for 450 miles. The great rivers have worn deeply into the soil upon each steppe, and there are many beds of river branches now dry crossing the plains, which are known as couleés.

Along the level plain, here and there wooded prettily with deciduous trees, farms and villages now and then in sight, and with an occasional glimpse of the river Assiniboine, we were travelling along merrily in the morning, seeing at Portage la Prairie our first prairie town, with its wooden houses gaily painted, widely laid-out streets with houses having wide intervals between them, and were able to note the intense blackness of most of the soil.

At Brandon we reach a country with some undulation, and are at the point where the railway crosses the Assiniboine; this is to be one of the great towns of Manitoba. In 1881 the first house was erected: in 1884 there were 3,000 inhabitants, and a corporation. The excursionists here, as at all the principal towns where time allowed, were received by the chief officials of the place and hospitably entertained. Our leader, Sir Richard Temple, and others, acknowledging suitably the compliments paid.

At stoppage for water in this neighbourhood many interesting specimens, botanical, entomological, and animal, were obtained, and often picturesque groups of settlers and Indians were seen as we moved along, which Mr. De Hamel, one of our party, briefly notes, "Ospreys, harriers, martins and sparrow hawks, grèy and black ducks, widgeon and teal in the slues, and an occasional bittern in the marshes, with here and there a covey of prairie chickens, that flew heavily for a short distance and then re-alighted and ran, a trail of mounted Indians plying by, another group with their wagons, a couple driving a buckboard drawn by two mustangs, a colt running alongside, all gave a distinctive character to the landscape as our train ran quickly by."

At Broadview we found a number of Indians hanging about the station; they were great curiosities to our unaccustomed eyes. They belonged to the Cree race. I endeavoured to make notes of some of them, but they were apt to retire into their blankets at once when they saw one drawing. One of the young squaws was, however, good enough to gaze at me long enough for a slight sketch. She was a handsome girl in her way, and she heightened her beauty by, first, what an

artist would call "a general wash of warm colour over the subject." The warm colour was yellow ochre; then she had painted the parting of her hair vermilion, the red line ending neatly upon her forehead in a nicely drawn angle; a little touch of dark seemed to have been placed about her eyes, and her cheeks were reddened lustroously. She had slight tattoo marks on her lips and chin, such as one sees in pictures of Egyptian girls.

The papooses were funny little objects, bound up tightly in a kind of swaddling band, and apparently quite content with that treatment; their brilliant little black eyes rested on us with a preternatural air of wisdom. They too were carefully rubbed with ochre and touches of red by their fond mammas. One amiable Member of our company, touched with the memory of a small white papoose away over the big water, kissed one of these little brownies; all the newspaper men hastened to record the astounding event, and it was published *urbis et orbis*, so far are we yet from universal brotherhood.

Broadview is in Assininiboia, and we were well upon the second steppe of the great plains, a region which is only a little less rich, as a wheat-growing country, than Manitoba. At Indian Head, the next principal station, is the great Experimental Farm, called the Bell Farm, which we had an opportunity of driving over—a wonderful sight it was; the long procession of brickboards and other vehicles led by Major Bell, and winding about among the vast sea of wheat which seemed boundless. 7,000 acres of wheat, of which more than half was still standing, surrounded us, besides vast crops of oats and flax. The average yield was considered to be $22\frac{1}{2}$ bushels per acre. For reaping this harvest 27 horse-reapers were at work then, and other machines were drawn up in a sort of military fashion at the house. The quality of the grain is what is there called Red Fife, No. 1 hard. "No. 1 Hard," is a phrase of the Manitoba grain standard, which reads—"No. 1 Hard spring wheat shall be Red Fife wheat, containing not more than 10 per cent. admixture of softer varieties, must be sound, well cleaned, and weigh not less than 60 lbs. to the measured Imperial Bushel." The grain is so dry that it is threshed on the ground and at once stored in the granary.

The farm is worked in five divisions, and Major Bell telephones instructions to the foreman each evening from his residence. All matters connected with this vast experiment were gone into very thoroughly by our fellow-travellers, Professors Sheldon and Fream, of Downton Agricultural College, each of whom gives his imprimatur to the encouraging statements made by the farm authorities.

I have given briefly the results upon this prairie land, when it is "tickled with a plough and laughs into harvest."

To the botanist the untouched areas are full of interest, and, although in September all the early flush of blossom is past, there is much to please the eye, more especially the huge spaces filled with various golden Composite—Yellow Marguerites of many species gilding the plain in groups of an acre at a time. These are *Gaillardia aristata* (Pursh) *Helianthem autumnale* (Linn), *Helianthus giganteus* (Linn), and *H. Nuttallii*, but perhaps the curious *Rudbeckia columnaris* (Pursh), with columnar

subject."
...rting of
...rehead
...ve been
...y. She
...ictures

kind of
...tment ;
...ral air
...ches of
...mpany,
...the big
...er men
...urbi's et

second
...ch, as a
...e next
...Farm,
...it was ;
...or Bell,
...ndless.
...g, sur-
...eld was
...horse-
...sort of
...e called
...nitoba
...e Red
...softer
...lbs. to
...hed on

nes in
...matters
...hly by
...n Agri-
...raging

n it is

hough
...uch to
...golden
...lain in
...Pursh)
...stattii,
...umnar



Blackfoot Chief. Cree Squaws.



Blackfoot Chief and Teepees.

cen
is
bloo
in
sky
bear
gras
espe
Prot
foun
oligo
alwa
buffa
there
with
look
clove
calle
swee
and
area
Mou
and
is siti
name
prepa
heaps
bones

Th
under
force

We
seeme
visitor
tribes
from
wall, g
wah, S
Thigh

Liq
punish
little,
alcohol
and pr
West
marked
change

But
pleasan

central mass and reflexed petals, chiefly contributes to this effect, which is supplemented by *Bigeloria graveolens* (Gray), and other yellow blooms. These, with the generally fulvous tint of the prairie sod in autumn stretching away under the clear air till it meets a sky of American blue, places before the eye a spectacle of strange beauty which is worth the 4,000 miles of travel to see. Among the grasses there are many of interest, *Spartina gracilis* and *S. Cynosioides* especially struck me as graceful and handsome; and one day, seeing Professor Macoun suddenly pounce upon some prey, we ran to him and found he had the buffalo grass of the South to show us (*Bouteloua oligostachya*) a small sweet grass to pastures of which buffalo would always congregate. *Stipa Spartea*, which was the favourite pasturage of buffalo on the northern prairies, covered the higher ground. Here and there we met groups of old friends, as for instance, the harebell, or met with beautiful native species of which I may mention the "æsthetic" looking *Coccineum malvastrum* (Gray), the bright, so-called "Prairie clover" *Petalostomum violaceus* (Mich), and the very handsome plant called the "Blazing Star," *Liatris punctata* (Hooker). Of the great sweep of country composing the second steppe, Regina is the chief town and seat of government for the North West Territories, comprising an area of 2,500,000 square miles. Here is the head quarters of the Mounted Police. Magnificent soil for wheat growing stretches around, and branches of the Canadian Pacific run to the North and South. It is situated on the "Pile of Bones" river, a translation of the Indian name, Wascana. In old times it was a resort of buffalo hunters, who prepared their winter meat there from the slain buffalo; in time, vast heaps of bones accumulated. When settlers came, they packed off the bones down the Railway for fertilising.

The Mounted Police are the army of the country. They are in all under 1,000 in number. Their organisation is very complete, and the force is quite effectual.

We visited the barracks, and saw some Indian prisoners. They seemed to be bearing their durance with philosophy, and looked at the visitors with little apparent interest. They were of the Sioux and Cree tribes; none were great malefactors, but "sent up" for horse stealing from other Indians, and for minor offences. A list, placarded on the wall, gave me the names of some of these braves, as follows:—Ka-hawah, Sitting Back, Single Man, The Rat, The Rock, Little Fish, Frog's Thigh, The Sky, and one had the jove-like title of Day Thunder.

Liquor-selling in Alberta, and especially to Indians, is heavily punished. The noble savage is said to become intoxicated with very little, and yet to drink, at once, all he can get. When he becomes alcoholised he usually totally discards his clothing, mounts his steed, and proceeds to "paint the town red," as the language of the North West has it, until probably, as a gentleman of Dacotah suggestively remarked, he "gets buried—because he is dead," the method of the change being left to the imagination.

But such tragedy is not, I believe, at all the Canadian way, and it was pleasant to hear a good character given to the Indians by a trooper of ex-

perience with whom I conversed, and who considered them, in the main, law-abiding; and he added he should feel no hesitation in going alone into a reservation to arrest a man, certain of respect being paid to his scarlet coat, which they considered the colour and badge of the "Great Old Mother," as they term Queen Victoria.

The teetotal regime to which I have referred is enforced over the whole of Assiniboia and Alberta. A drink called "Moose Jaw Beer" has been invented, but is not considered a success by experts. They say "it does not go the spot." I was told that some over-thirsty souls had taken to schnaps in the form of doses of Perry Davis' Pain Killer, some exhilarating property having been discovered in that compound.

At the place incidentally mentioned—"Moose Jaw," which is "short for" the Place-where-the-pale-faces-mended-their-wagon-with-a-Moose-Jaw-bone—the full title of this growing town—the Railway ascends a slope known as the Missouri Coteau, which is the eastern edge of the third prairie steppe, which attains a height of about 3000 feet above the sea level, and extends westward over 200 miles. The railway ascent is by a river hollow called Thunder Creek, and passes a narrow lake called Pelican Lake. The whole of the Coteau belt is broken with ridges and small lakes and ponds. The level of the third steppe is reached at Secretan.

The principal towns between this point and the Rocky Mountains are Medicine Hat and Calgary. Medicine Hat is upon the south branch of the Great Saskatchewan River, and in order to find a fitting place for the passage, the railway is taken down a long coulée into pretty low lands, where crossing is made by a fine iron bridge, one span of which swings to allow river traffic to pass. The Saskatchewan runs between high clay cliffs, and in some of the sections great quantities of coal crop out, varying in quality from lignites to true coals of good value economically. Here-about fine Deinosaurian remains have been discovered. Here old buffalo trails become common, and many buffalo bones are lying white on the prairie; a "buffalo trail" is the path made by the thousands of buffalos which used to travel in single file across the land, and so beat the ground together that herbage does not grow upon it. Alas for the extinction of this grand beast! No great herd exists, all have been wantonly exterminated.

Along the whole route there has been a line of old meat-cans beside the line; these contained the rations of the great army which built the railway, and it was sometimes strange to see a whitened buffalo skull apparently scrutinising out of its goggle eye-sockets the new Chicago canned meat brands.

At Gleichen we had the pleasure of seeing an Indian Chief of celebrity, and one who must be one of great wisdom and moral courage. He is the Chief of the Blackfeet, called Crowfoot, his Indian name being *Se-po-much-si-cow*. He came, together with three wives, an interpreter, and followed by many bucks and squaws, to see our leader Sir Richard Temple, and to prefer, through him, a request to the Queen. Crowfoot is rather tall, but stands in the somewhat crouched Indian attitude; his face, with the prominent brows, aquiline nose and wide hard mouth,

with well-curved lips and watchful eyes, was of perfect Indian type. He stood, wrapped in his blanket, with long beaded tobacco pouch over his arm, mocassins on his feet, and his scalp-lock plaited up with the head of a hawk, and sent his message. He "desired his humble duty to his Great Old Mother, and wished her to know that the food the Agent supplied to the Blackfeet was infernally bad."

I have said this Chief possesses great moral courage. I judge so, from the fact that many years ago he made a treaty with the British, which he has ever kept with perfect faith. Away in that great territory, the master of some 4,000 tried braves, all well armed, and possessing all the traditions of that great fighting nation, seeing the buffalo lessen and parties of whites encroaching, he must have often had every temptation, as he had the power, to put the North West into a blaze.

One hard winter, Professor Macoun, on one of his expeditions, came to Crowfoot's camp; he found the tribe in a state almost of starvation, yet the Chief would not allow of any raiding, and not one item of stores was missing during his stay with the Blackfeet.

I was told, that at present Crowfoot probably could bring together 2,000 fighting men, as he has feudatory rights over the Pieigan, Sarssee and Blood tribes also.

Here, as at other points, when we met Indians, the Members of the British Association were seized with a scientific frenzy. Everything Indian was at a premium. We denuded the warlike Blackfeet, at quite fancy prices, of everything ornamental, and of all but the very last vestige of what is useful; nor do I altogether disbelieve the tradition which existed during the latter part of the journey that a whole family of Crees, fit in all respects but beauty for models of Greek art, remained shivering on the railway track to signalise the departure of the predatory pale-face, but paradoxically rejoicing in the possession of capital they could not pocket; and it is as true as Macaulay's History of England that Gleichen is now known to the Blackfeet by the name (in Indian of course) of "The-wooden-wigwam-where-the-pale-face-stripped-the-Indian-and-danced-big-medicine-dance." I bought nothing for myself, but I may confide to you that I had a great desire to purchase a papoose. Their brilliant black beads of eyes, neatly tinted faces and bland smile always "fetched" me greatly.

We reached Calgary in pouring rain, and it was only on our return that we saw the grand panorama which is to be seen thence. On we went amid grand scenery seen under effects of storm, and our ascent of the Rocky Mountains was amidst wild weather and gathering darkness. One scene will live ever in my memory. The strong engines were straining their utmost, the air was full of whirling snow, when we slowly hauled past a huge gap in the mountains, with enormous cliffs almost sheer, below which a black lake slept hidden from the storm wind. In its placid bosom, the dark cliffs, the snow-clad heights, and the snow hurtling among the pines, were all perfectly, yet most darkly, mirrored. I have seen no other sight so beautiful and so dreary. The lake had the black calm of the heart of a lost angel.

In the early morning our train was drawing towards the western

limit of our long journey, a little station called Laggan, beyond which the line was only in construction. The porter of our car had been almost silent during the journey, but he astonished us when calling us up, by a long oration, "Rocky Mountains, gentlemen, breakfast ready, all lovely, duck! prairie chicken! cakes! spec'm'ns! silver! gold! diamonds! All lovely in the Rocky Mount'ns."

Laggan consisted of a few log huts and tents, most of them hanging out abnormally large signs. In front of one stopping place was in large letters, T. Gray, Fashionable Tailor. Some of the other signs were still more Western, as for instance, at a general store, "Godly Books and Gimblets."

The train drew on to Stephen, the highest point of the Kicking Horse Pass, and stopped near Kicking Horse Lake, amidst beautiful Alpine scenery, when we found ourselves at last on the "Great Divide" and looked upon the torrent which was fiercely leaping down the gorge towards the Pacific Ocean. On either hand towered snowy mountains, their flanks covered with dense pine.

Descending from the carriages, we looked with astonishment upon the scenes around us; one of these formed a grand picture. From the torrent, almost clogged with pines, among which the water snapped and snarled, rose funereal masses of Douglas and Black Pine, closely serried and spreading upwards for hundreds of feet, till hidden in the white whirl of snow squalls driving through the mountains. But, about a thousand feet above, the cloud had opened and we saw a beautifully shapen snowy peak, shining with light against the celestial blue.

The day was "all before us where to choose." We were told we could go to the end of the track on the construction wagons, but warned that it was distinctly at our own risk. Most of us climbed on one or other of them and dared the descent towards the Columbia, and certainly a very risky proceeding it seemed; the grade was stiff, the railway running along a nick in the rocky side of the pass; every here and there a siding, with ascending grade, was cut, into which to shunt runaway trains. The trucks went down with an engine at both ends for safety. The scenery was magnificent, and at points about Mount Stephen and down to the wide shingle bed of the Columbia river, was especially sublime; but the density of the forest, chiefly of Douglas Pine, mantling the valleys and flanks of the mountains in such an unbroken garb of the sombrest green, gives it a melancholy aspect which differs from the Alps of Europe.

The summit of Kicking Horse Pass is 5,296 ft., and the peaks tower up to 10,000 ft. in Cascade Mountain, 11,650 in M. Lefroy, and similar elevation in Mount Hector, Goat Mountain, etc. In descending the grade to the Columbia the mountain masses are seen in their full stature, and are most impressive.

The mountain sides above the railway were explored by Professor Macoun, who described the sequence of the vegetation as follows:—Starting from the track itself, 5,000 feet above the sea at this point, passing through the dense masses of the Douglas Fir (*Pseudotsuga douglasii*) he entered and passed a zone of Engelmann's spruce (*Picea*

hich
een
g us
ady,
old!

ging
large
still
and

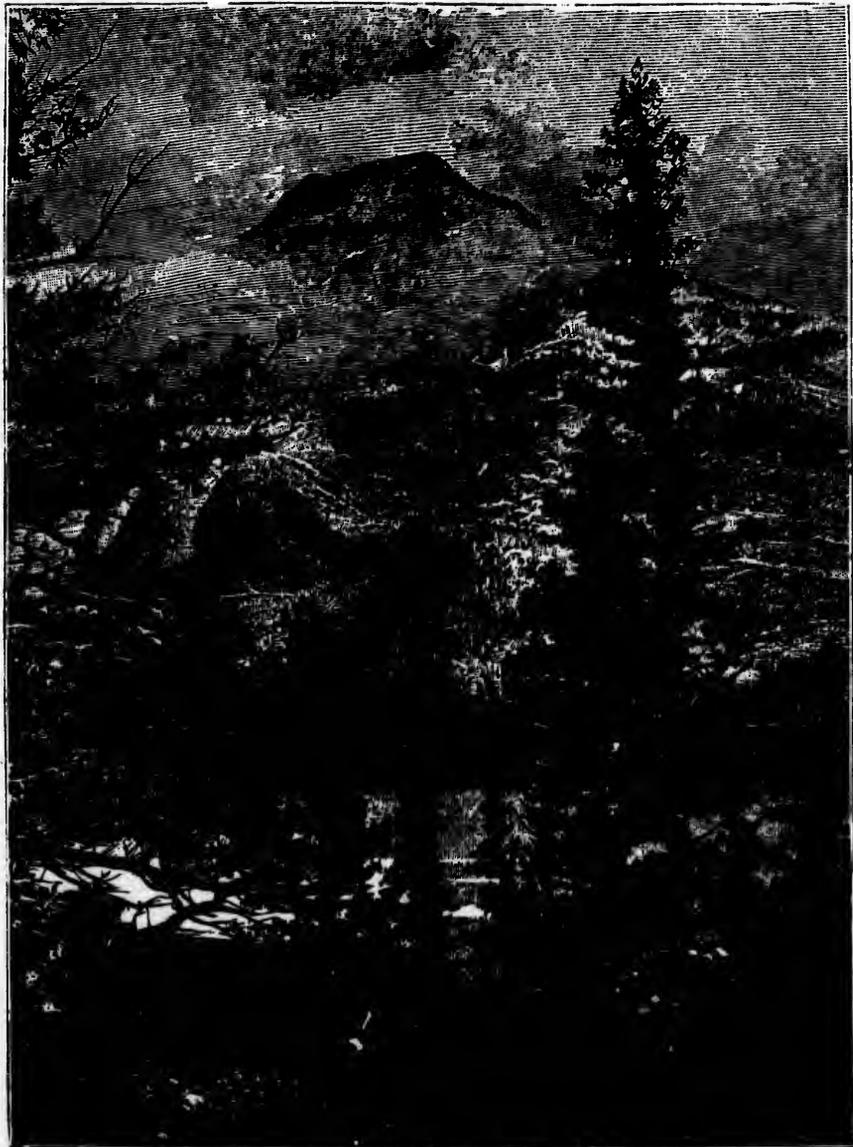
orse
pine
and
e to-
ains,

upon
n the
and
erried
white
out a
ifully

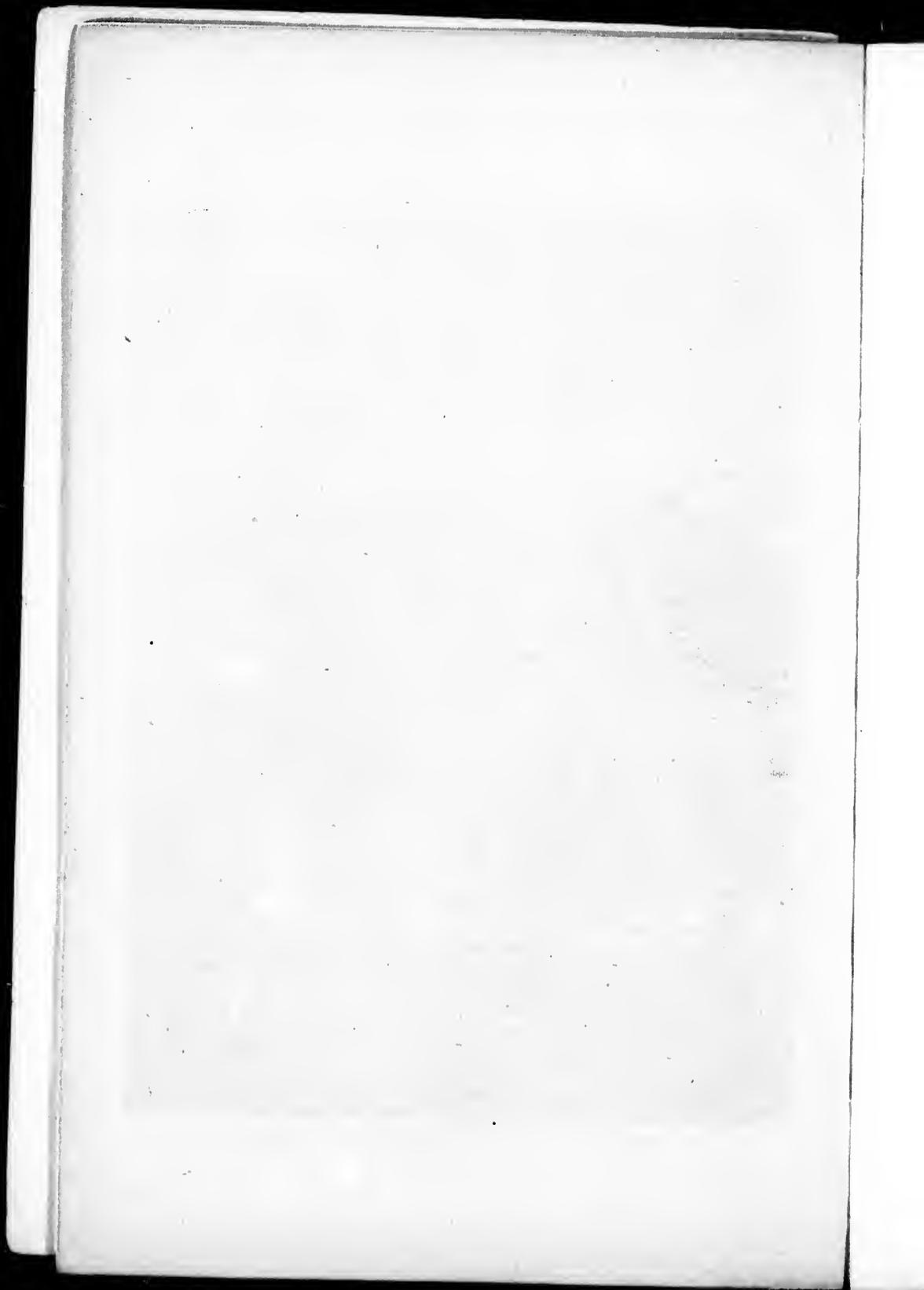
d we
rned
ne or
cer-
ilway
there
away
afety.
and
cially
tling
f the
Alps

ower
simi-
g the
ature,

essor
s:—
oint,
suga
Picea



View upon the Bow River : Pinus Douglasi in foreground.



engelmanni), and among the rocks some interesting ferns, *Polypodium dryopteris* and *Woodsia oregona*, low trees, and shrubs, *Cornus caudense* among the latter, the pure white *Rhododendron nudiflorum* (Torr) and *Menziesia ferruginea*. Ascending, a region characterised by larch (*Larix lyalli*) was reached, followed by a belt of smaller pines of the specie *Pinus albicaulis*. At this elevation the slopes were bright with beautiful masses of heath of the species *Bryanthus empetriflorus* (Gr.) *glanduliflorus* and *Grahami*. On the land bare of trees above the pines, a distinctly Alpine flora was found containing forms, for the most part not dissimilar from those of Europe. Altogether upon this ramble not less than 200 species were collected and identified.

The excursionists broke up into little groups, each following its own desires and meeting with its own adventures. Some went to the last bars laid on the line to see the strange sight of a railroad projected far ahead of civilization, and being hewn through a wilderness almost unknown by a vast army of peaceful toilers.

As the afternoon waned all were drawing up the grade towards the train, except two who had determined to find their way through the mountains to the Pacific, these, Mr. R. Barrington and Rev. Mr. Swanzey, we met as we returned, walking down the line, each with a sack of stores on his shoulder, making their way to the end of the track where they hoped to find pack horses and someone to accompany them on their 250 miles expedition through the mountains. We gazed on them with that respectful interest which Englishmen always feel towards particularly reckless persons, and, knowing the fate of one who had previously attempted the route, speculated whether B. was fated to eat S. or S. to eat B. Happily no tragedy occurred, but, after a fortnight of arduous labour and peril, our friends re-appeared at Kamloops, and the Western papers were full of their exploits, which I have since had the pleasure of talking over with one of the adventurers among the beauties of his native hills of Wicklow.

The next morning we were again *en route*, but Eastward, descending the Atlantic slope down the beautiful ravines of the waters of the Bow River, and on our return to Montreal.

On our arrival at Winnipeg, on September 13th, we were in a position to appreciate more fully the exhibition which the Historical Society of Winnipeg had prepared in a commodious hall, for the examination of the Members.

This collection was most tastefully arranged, and represented the vast resources and the scientific interest of the great North-West in a striking way. Very fine samples of grain were shown, showing that Manitoba may head any region of America in wheat and oats. Hardly any of our English vegetables were absent, and I was interested to see some fine hops and to learn that the hop is indigenous. Here the lands of the Canadian Pacific were fully represented.

But perhaps the geological department was the one of highest scientific interest. The collections were arranged with careful regard to the order of rocks, taking in succession the Laurentian, Huronian, Silurian, the Cretaceous, and Laramie Series, all of which were finely

displayed on a map of the line from Port Arthur to the Rocky Mountains, which had been prepared by Professor Panton.

The deeper strata, Laurentian and Huronian, afforded fine minerals from the Lake of the Woods and Lake Winnipeg, among which the George Heenan Mining Company showed some fine specimens of gold. The Silurian, in its various American divisions, yielded a grand series of fossils, especially from the Red River Railway. There were magnificent Cephalopods, and a huge trilobite, exhibited by Mr. McCharles, was a centre of attraction. In iron ores, the International Mining and Smelting Company showed fine specimens of botryoidal specular and hematite, from Big Island, Lake Winnipeg, where they claim that 40,000,000 tons of ore may be raised and manufactured.

Above the Silurian a vast hiatus occurred, and the Devonian, carboniferous, Triassic, and Jurassic epochs, had no representative in the exhibition, even as they leave no traces in the region. But we come to a most interesting assemblage of Cretaceous fossils, Ammonites, and a most sensational Baculite of some four feet in length, taken from the clays of the Saskatchewan, by surveyors of the Canadian Pacific Railway. A fine series of bones of Deinosaurus from near Medicine Hat were of great interest to me, considering the traces we have found of these creatures in this locality, and there were several specimens of huge Turtle Carapaces from the Irving River, found by Professor Panton. The Ammonites were often of great beauty as objects, the nacre having retained its brilliance, exceeding even the lustrous *Planorbis* of our Penarth and Watchet beds in some instances.

A most interesting series of coals came from Medicine Hat, Crowfoot Crossing, Galt, Cascade Mountain, and other seams, all apparently of good quality, and all, I believe, cretaceous in age.

The Laramie fossils were chiefly from the flanks of the Rocky Mountains near Calgary; interesting fresh-water shells and beautiful fossil leaves here chiefly struck the visitor.

The fauna of the districts was well shown, and when tired of stuffed bear, moose, elk, and deer, we could go and look at a herd of real living bison, near the Manitoba Penitentiary at Stony Mountain, an elevation of some 50 or 60 feet, which, in these plains, does duty for a mountain, and where a small herd of buffalo is kept, the only representatives of the ancient *Bos Americanus* now living on the prairies, where fifty years ago they may have been in tens if not hundreds of thousands.

This and the many sights of Winnipeg I saw under the guidance of Thomas Spence, Esq., Clerk of the Legislative Assembly of Manitoba, who gave much time and trouble to the task of *cicerone*, and whose intimate knowledge of the Great West, and powers of vivid description, rendered the hours passed in his company hours to be long remembered.

Here, with a most pleasant travelling companion, Mr. H. G. Brooks, of St. Helens, whose capital instantaneous photographs of our route are laid before our Society, I left my companions of our nine days' and nights' excursion, and proceeded south-west to the wondrous Yellowstone "National Park," which Mr. Whitmell has so well described for us in his published paper.

NS.

y Moun-

minerals
which the
s of gold.
and series
magnificent
es, was a
nd Smelt-
hematite,
,000 tons

Devonian,
representative
on. But
as fossils,
n length,
Canadian
Medicine
found of
of huge
Panton.
e having
s of our

t, Crow-
pparently

y Moun-
ful fossil

f stuffed
eal living
elevation
ountain,
atives of
ere fifty
nds.
dance of
anitoba,
l whose
descrip-
e long

Brooks,
oute are
ays' and
owstone
or us in

