1881

Ellert Sandon Ness
, 98 Strand W.C

Private Diary
— " —
George M. Dawson
Geol. Survey of Canada
1881.

May 10. 1881. Leave Montreal by 10 P.M. train for Toronto & west. W. come down to station, where met assistant Mr Connell with his luggage. Fleet, Moffat & Nichols at station to say good bye.

May 11. Somewhat behind time when reach Toronto. Leave late. Very warm day & dusty travelling across peninsula of out. Supper at Sarnia. Cool breeze from the lake affording some relief. Blocks of ice floating down the river now & then. Steamers in all directions & clouds of smoke curling to spots on lake. A sweet outlet after all for the fresh air and seas. Pass Customs at Port Huron with little trouble. Night exceedingly warm.

May 12. Reach Chicago late, & get to C & NW Ry, Wisconsin division station, just in time to see train worry out. Could have got on board, but without baggage. Left goods in cloak room. Street cars to Tremont. Dinner. Heat excessive was 86 in Chicago yesterday, today? but not less. Clothes water heavy. Headache from heat. Spend P.M. reading & sleeping & finite letter in Svg. Walk round streets & then to station with some difficulty. We are seems to know the Wisconsin division station which separate from the main C. & N.W. Station full of Scandinavian emigrants with strong odour of sleeping bags on them & Babylonish jargon in their mouths. As much as can do to utter "Wisconsin" or "Michigan" in such way as to be understood as direction to train. Here the rude elements of western greatness with golden hopes born to be disappointed. Here the individuals who write that the world (viz. New England Yankee &c) may grow more & more.

SIX DOLLARS PER ANNUM.
SINGLE NUMBERS 3 CENTS

THE LAND BILL.

The compromise—Press opinion of the situation.

NEW YORK, August 16.—The *World* special says:—The Radical press is aggressive and defiant. The *Pall Mall Gazette*, *Daily News* and leading Liberal journals of Leeds, Manchester and Birmingham are urging the Ministry not to negotiate a compromise, but to stand out against the Lords and force that body into surrender. Certain London weeklies which have an enormous circulation among the working classes, as *Lloyd's Weekly*, *Reynolds'* and *Weekly Despatch*, are furious, and headlong minor Radical organs, such as the *Echo* and *Chronicle*, do not mince matters, but call on Mr. Gladstone to follow M. Gambetta's example and begin a crusade against the Upper House without delay. Conservative circles are astonished at the popular excitement, and the last thing the Tory leaders now think of is to force Mr. Gladstone to appeal to the country. There are dissensions in the Tory camp, and Lord Cairns and Sir Stafford Northcote, who are working to bring about a compromise, find that Mr. Gladstone is disposed to meet them on any reasonable basis.

The *Herald's* special dated 3 a. m. to-day says:—The Liberals have surrendered and the Lords have scored a dangerous triumph. In the House of Commons, as soon as the Land bill was announced as the order of the day, Mr. Parnell asked Mr. Gladstone to make a general statement what course Government intended to take in reference to the Lords' amendments. Mr. Gladstone evasively replied that the amendments would be dealt with *seriatim*. This reply convinced the House that the rumors of a compromise were well founded. The Irish benches immediately gave vent to the feelings of anger, and a sense of discouragement became visible through the Radical ranks. The Irish accused the Government of a base surrender of the tenants interests, and the Radicals protested that they would not support the Ministry if serious concessions were made to the Lords. Over all the House the feeling spread that the game was up, and that the members were engaged in playing out the farce of a force all the situations having

Literature.

EUTHANASIA.

"O Life, O Beyond
Thou art strange; thou art sweet!"
—*Mrs. Browning.*

Dread phantom, with pale finger on thy lips,
Who dost unclose the awful doors for each,
That ope but once and are unclosed no more
Turn the key gently in the mystic ward,
And silently unclose the silver cord;
Lay thy chill seal of silence upon speech,
And mutely beckon through the soundless do r
To endless night and silence and eclipse.

Even now the soul unfaltered may explore
On its swift wing beyond the gates of morn,
(Unravelled all the weary round of years),
And stand unfenced of time and crowding space,
With love's fond instinct in that primal place,
The distant northern isle where she was born;
She sees the bay, the wave's deep voice she hears,
And babbles of the forms that are no more.

They are the dead, long laid in foreign graves,
One with his sword upon his loyal breast,
And one in tropic lands beneath the palm;
The sea rolls dark between these hemispheres,
And all the long procession of thy years,
Since last those warm young hands she fondly pressed,
And heard through mute farewells, the funeral psalm,
The "nevermore" of the dividing waves.

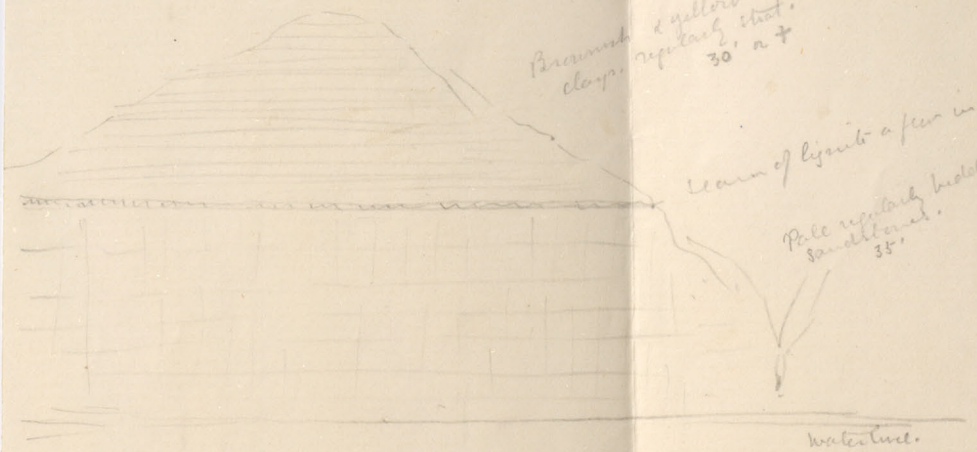
The record of a life is writ between;
The new world's story supplements the old;
The heathery hills, the rapture of the morn,
The fisher's hut, the chieftain's castle gray,
And the smooth crescent of the land-locked bay
These, the long hunger of the heart outworn,
New scenes replace, and the once strange and cold
Become like those kept in the memory green.

But thou hast found already that dread place,
And thy lost loved ones in that unknown goal,
Ere thou hast quite put off the scrip and shell,
And gathered up thy feet into the bed;
And closed thine eyes, the last prayers being said;
Thy lips more dumbly, thy delaying soul
Passes in salutation, not farewell,
To join the heroes of thine ancient race.

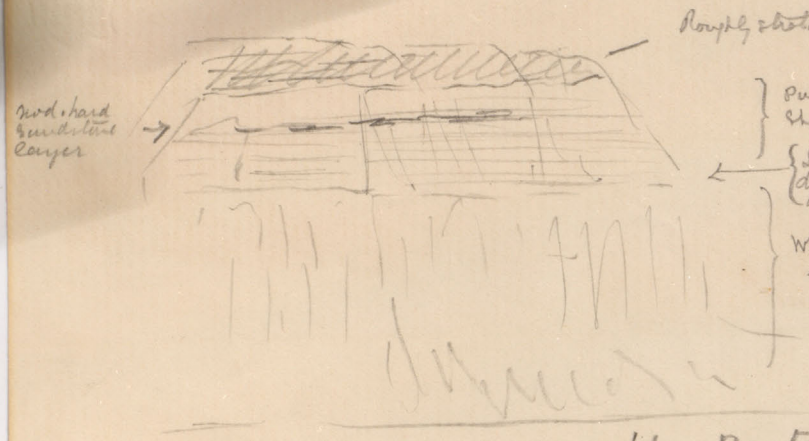
Unoutlined shadow, angel of release,
Whose cool hand stills the fever in the veins,
And all the tumult of life's crowding cares—
Ambition, envy, love and fear and hate,
Hope's eager prophecies fulfilled too late,
And fierce desires and sorrows and d spairs—
Thou wav'st thy mystic wand and there remain
Sleep and forgetfulness and utter peace.

Why should we fear thy shadow at the door,
O thou mysterious Death? Art thou not sweet
To the worn pilgrim of life's toilsome day,
Who com'st at evening time, and show'st instead
Of pilgrim tent, and prilgrim pallet spread,
The doors of that vast caravansera
Where all the pilgrims of the ages meet,
And rest together, and return no more?
(From "The Coming of the Pr ncess and other Poems," by Kate Seymour Maclean.)

Hill to say 300' above water purplish & dark colored shales or shaly sands. Supposed to pass upward into, or represent lower part of Chet No. 4.



Section 20 m. above Little Rock Ck. Missouri.



Section at Coal banks 60 m. below Benton. 31-5-81

396 = 1 m.

186.9
17
168.9

169 m.
15
184
28
212

2100
6960

21000
6960
~~5~~040
14040

2100
6960
396 | 14040 |

83000
6960
396 | 76040 | 2.
792

21000
6960
396 | 14040 |

8300
2100
6280
396
2240
~~22~~
76
1980
2600
2376
224

185.6

101.6
69.4
50.9
221.9

15.6
12.9
28.5

12100
6960
396 | 5140 | 13
396
1100
1188

222.0
36.1
185.9
28.5
214.4

222.9
~~26~~
36.0
186.95
28
215.4

Spitzer Conley
& Chacanton Bee Co.
Attend Office

Belly in vicinity of Coal Banks cuts 300' at plain gives 200' measures 100' dept on average. Dept deeper in immediate vicinity of Coal seams. A pre-glacial valley. Probably formed along line of outcrop of seams.

Coal seams were a less perfect structure for — under below Coal Banks forming a shallow synclinal jointly fractured and cataclysmically riven. Above Coal Banks, anticlinal, outcropping north N at unknown distance & appearing again on other side of anticlinal at Mt H Marys. Coal here more thick. dangerous for present purpose. In accord with this. thickness mentioned, as seen by unfavorable gradients in detail.

Rig sections on Wm & Carleys which seldom show roll 1/4 m. from river. Plains around undulating, or flat, grassy, treeless, & no water except in swampy forks in long summer.

While the Coal basin a syn. jointly fractured from the run. Dips seldom = 10° but very light but undulating & so though part of synclinal may project a long way S. before going at it actual return in that direction must run on mountain till Taring. Any shafting in prairie must go through 100' drift. Rings = shaft 300' deep in worthy Coal should be adopted. Beds run in, or small shafts built on pits & coal worked up to crop below drift. Rocks underlying. Rocks overlying. In part of synclinal cut much flat. Brown Coal, etc. no great drift anywhere.

details of thickness & localities.

Blackfoot names of rivers

Oldmans R. Ni-ye-th-tai
Belly other old man. Nes-Tes-sun-sis-ti-tai
= Belly River.

Sp. Grassy. Pa-took-si-o-pis-Tsun
Little Bow Na-mesh-tai
Bow River Soc-ah-pow-kun-tish-tai.

Bottom Coal
Very hard rock Pun-o-ka-tes-ooh-tai
= Bottom Coal Creek

Medicine Creek Ots-i-pat-ok-i-tun-ai-kois
= Medicine Creek

S. T. P. W.

May 13 A pleasantly cool though dusty journey all morning through rather sandy & poor looking country. In part densely wooded but mostly apparently originally part prairie. Real villages & towns. Cross Chippewa R, brown, rapid & broad with many saw-logs. St Croix either naturally lake-like, or dammed up where crossed on long curved trestle. Arrive at St Paul on time (1.30) in smart shower. Bus to Merchants Hotel. Shopping & looking about town. Leave at 7 Rem. by N. P. Ry. Sleeper full & only one berth to had for the two, but subsequently find an obliging individual with a berth to spare.
A party of American officers on board, some with wives & families bound to western posts on the upper Missouri & Yellowstone. Talk copious, animated, — noisy, frivolous.
May 14 Breakfast at Fargo D.T. just across the Red R. This place has improved much & grown to quite a town since I saw it last in 1874. The Red R looks very small & ditch-like up here, scarcely large enough to float the great stern wheel steamers which lie at the bank. A heavy train, one car being nearly filled with US Soldiers going to Bismark to ship for posts up the Yellowstone. Track in very bad order in many places, gradients originally heavy curves stiff & road all through of most slimsy description. Rails old & warm. Seems anomaly on a piece with other western anomalies to go through this dreary looking country jolting & swaying about on uneven rails in a new & handsome "chair car" with rattan seats & tastefully panelled with maple. Continue those time as we go west. Dinner at Jamestown, not long since called "Jimtown" but having now attained some size the inhabitants insulted by use of old name. Soon after leaving

holes from Fargo westward. Bar. readings wrong, probably all read backward from 29.02 inward 28.0

Fargo 8.40 a.m. 29.02

Wheatland 27 m. W. 29.075 - rolls with gravel & false bedded sands, with about 2 feet silty soil on top.

New Buffalo. 36. m. 10.55 a.m. 29.28 Cuts through boulder clay & gravel this.

Tower City 42. m. 11.20 a.m. 29.24

Summit S. of Valley City. 29.47. Many boulders, Laurentian & limestone. gravel. thin soil

Valley City. 29.27 58 m. W. from last to here hilly country. great profusion of boulders & stones.

Sanborn 70 m. 1.25 P.m. 29.52 undulating not particularly stony

Jamestown. 93. m. 3.45 P.m. 29.50 Banks of valley 50' above river. boulders on banks.

Alsop 110 m. 5.20 P.m. 29.91 Hilly.

Crystal springs 6.10 P.m. 29.87 Hilly country. lakes.

Troy farm. 6.35 P.m. 29.84 Extension nearly flat region. good land

Steele farm. 151 m. 7.10 P.m. 29.92 flats & gently rolling.

Sixteenth siding. (summit) 29.93 Rolling prairie boulders moderately abundant in cuts.

Clarke. 181 miles. 29.80

Bismarck. (Ry line.) 10 P.m. 29.73.

come to train off the track, delaying half an hour or so while the lot of the broken cars got out of the way. Very now & then noise of firing from car windows, some of the soldiers amusing themselves with blazing at ducks &c with shot guns & revolvers. In some way W. of Fargo good farming country. Red River plain, though much thro spring under water owing to quantity of snow of last winter. The Dalrymple & several other large farms & much cultivated land. Quite treeless. At Wheatland 27 m. west of river come to rolling gravelly ridges, but no very definite boundary of valley. From here to Bismarck land more variable in quality. Some places very bouldery, & the greater part not suited for anything but grazing though quite large good tracts of rainfall sufficient. No trees except in River valleys. Cuts from this onward show boulder clay, with in some places strat. Gravels above. Cross summit between Red & Sheyenne R, which flows into former. Then between Valley & James, very to Missouri, then highest summit between James & Missouri. Country in general rolling, even hilly, many ponds & swamps often alkaline. Resembles county W. of Turtle Mt to W, but often rougher & even like coteau, though no great tracts covered densely with boulders. Reach Bismarck about 9 P. & McC & self get room & bed between us at Sheridan House. Endeavour to find out about boats, but find not much can be done till morning.

May 15. Up early & drive down to landing, about 1¼ m. from town, where steamers lie. Find the Red Cloud, Benton & C.K. Peck ready to leave for Benton. Red Cloud however is to wait for police, who can hardly get here before Wednesday. Benton seems likely to leave first, but no accommodation but shake-downs left. Secure room & lower wide berth for two on the Peck & get luggage down & take possession. Though Sunday all hands hard at work getting in lot of freight, with a rough loud-voiced &

profane enough mate bossing them, speaking to & driving them like a lot of slaves. Work from early morning to & long after dark, with occasionally braziers to give light, making curious picture. Last shipment a lot of mules, many of which object strongly to going on board & have to be roped & drawn forcibly in over the gangplank.

Bismarck. So called about the time of the Franco-Prussian war, when the name in everyones mouth, established on E. bank of the Missouri where the N.P. Ry Crosses. No bridge as yet, but one about to be built. Chicago a rough unsavoury place enough eastern eyes, St Paul worse, but Bismarck & similar western towns very much worse. Two or three wide streets, or rather one wide street with a number of potential wide cross streets. Square board fronted shops built close end to street, with projecting verandas or roofs nearly covering the side walks. Every second shop a "liquor store" or "Saloon" of some sort. Rough dusty reckless-looking men lounging about, or carrying on business or pleasure each with cigar stuck in mouth. Few women & these not of the best in appearance or character. No object in life but to make money anyhow & keep well supplied with whisky & tobacco. What must the ideas of anyone brought up in such a place be? Inoculated thus in capolle of rational or even decent enjoyment under any circumstances.

Missouri River here a wide & very muddy stream rapid & evidently not very deep. Fringed often with groves of Cottonwood along the immediate banks. The sides of the main valley, several miles in width, bare rounded grassy or nearly dry slopes, & like all the secondary country quite treeless. The flats in some places yield hay, but the floods of this spring have brought great quantities of fine

sand & silt over them. Today as the strong afternoon wind blows the whole valley full of clouds of dust blown up from this.
May 16. Steamer Benton got away at very early hour this a.m. The Peck followed at about 7 a.m. Left the other steamers loaded down to the guards with every conceivable species of goods, the spring supply of the upper country. There not only in the shallow hold of the stern wheeler, but piled from end to end of the lower deck, with the exception of the space – small enough considering their numbers – reserved for the mules. Pressed hay, boxes of bacon & ball cartridge for U.S. troops, waggon wheels & misc. freight in boxes crates & sacks piled promiscuously together. Next deck on which cabins &c stacked with boxes or in similar manner, leaving scarcely room to walk by narrow passages between. Certain discretion allowed in putting here such boxes of fruit, biscuits, canned foods &c as might be broached by crew if not under immediate eye of clerk & other officials. Bacon &c for use on board corded away aft, behind the cabins. Third or hurricane deck piled with waggon bodies, scats & other lighter goods. Two tall black funnels & a high box-like pilot house between them towering all. The exhaust steam escaping with pop alternately up the right & left funnels & showering showers of sparks, while the ponderous stern wheel revolves behind, leaving a wake which would do credit to an ocean steamer. Great boilers like those of mine or mill on lower deck, with huge fire-places fed with great sticks of wood crooked & rough just cut short enough to go in, & consisting chiefly of drift cottonwood. No regular supply cut for the steamers, which depend on what can be gathered as they go, or on hauling wood cut on spec. by inhabitants along banks

The glare of the fires beneath the boilers falling on piles of boxes of ammunition not very reassuring. Insurance premiums should be high on these lives. Meals fair as to quality, but cooked & served poorly enough, & "gone through" in double quick time by the passengers. Water dipped from the river of colour of pea soup, not inviting in appearance but wholesome enough doubtless. A barbers chair in saloon on which strong & dour pititure dreaming. Also a "Store" at which drinks, cigars, tobacco, confectionary, canned goods, calico, thread &c. &c. can be had. A dried up individual like an antiquated sarilla being the presiding genius.

Quite oppressively warm about middle of day, but clouded in P.M. & before supper in midst of heavy cold rain & wind ran on sand bank. The whole river shallow, & Sto Benton already aground near same place. The use of the peculiar apparatus attached to the front of the steamer now becomes apparent. Projecting forward at angle of about 30° from bow at each side long & strong spar. To each attached by block a second lone spar, not so long, which can be raised or lowered by means of rope running in blocks aforesaid. The second spar attached to staple in side of deck by swing block & tackle. It is first raised & dropped to the bottom, the top is then lowered till the requisite slant is given, & the large block & tackle then put in requisition, the rope being drawn in by a Capstan worked by a small donkey engine, or "monkey" placed below the deck. The whole in fact a sort of poling by steam. Hard at work at this till after dark, when at last get off & tie up to

bank. The Benton had already got clear & gone ahead.

May 17 Steaming up river all day without any special incidents or accidents. Monotonous banks of valley varying somewhat in height, & toward evening, near Fort Stevenson becoming somewhat bolder, often scarped, & showing exposures of bright "Fort Union" yellowish & grey sands & sandy clays with irregular layers & nodules & lignites. Thickest seam observed about 3 feet. Some bare scarps point water, & here & there incipient bad lands & bare clayey places. Grass generally covers country. Short & crisp, not yet going above old grass of last year. Spring late, but Cottonwoods already in young leaf & shows green & throwing a little shade. Extensive farm some miles below Ft Stevenson, where $5000 worth goats raised last year. Said that oats, wheat, potatoes or second in valley advisable. Perhaps also on higher plains though there doubtless drier. All good pasture land though grass short & little shelter except in gorges in river valley. Inside sand bank lying bare along convex bends of river.

Three or four sharp whistles from a small steam whistle near the boilers every few hours indicate approach to a wood-pile. The owner of the wood generally on hand to bargain as to sale, & if colloquy started between steamer & bank satisfactory, gangway run out, & all hands at work for ten or fifteen minutes carrying in wood. The clerk, measuring stick in hand, among the first to go ashore & measure up the pile. The wood sometimes dry Cottonwood, sometimes ash (= Negundo?) & varies in price from $3.50 to $4.50 on the part of river. Steamers said to burn from 20 to 40 cords per diem. Economy very desirable, & when a good chance prevents the steamer run into the bank & all hands sent out on general scrummage for dry logs. Male starling from upper deck to hasten their movements & direct them to run ahead to next point where steamer will pick them up. Animated scene for a time, & then saws & axes to work on lower deck to cut to size for furnaces.

See Lacha De Sevet? on History of Missouri.

Sternwheelers used on river said to cost about $20,000 dollars to build.

Each trip "Knocks a $10 000 bill all to pieces" for wood & wages.

Freight on general merchandise Bismarck to Benton about $1.75 per hundred.

Charge on mules, which go on board $20.00 each to Benton.

Cattle in Montana - say about Benton - $17.00 per head all round exclusive of Calves.

When Cattle taken down river to Bismarck rate say about $4.00 Pack.

Buffalo robes now worth about $6.00 all round.

About 8 years ago, two steamers some way above Bertold had to fight their way up the river against hostile Indians. The first steamer attacked & obliged to wait for the second to combine forces.

Said the now 15 steamers on the Missouri & Yellowstone above Bismarck.

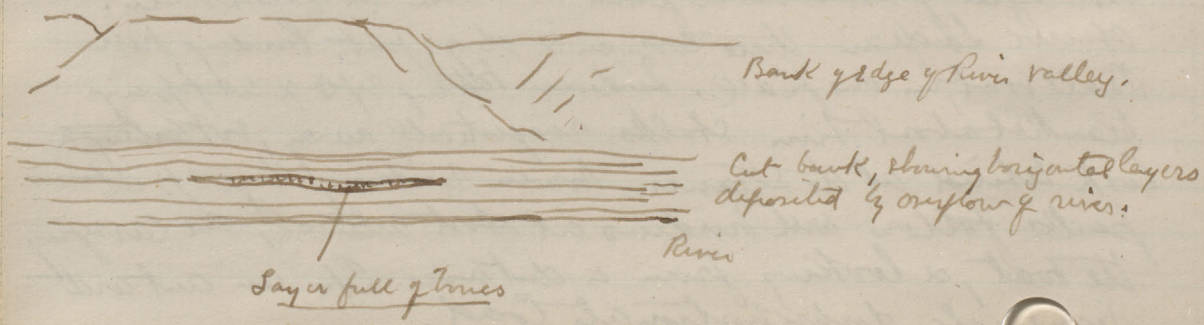
a chute on the bell rope & then sets a couple prisoners to work sawing on each side of log with poles, a third means an edge gripper dell pressing wood up to the pilot house.

Ft Stevenson reached during night. Three companies of 6th infantry now quartered here. The Arickaree Indian agency about 10 m. down & land (20 & water) under general supervision of this garrison.

May 18 Called this morning at Ft Berthold. No military post maintained here now but extensive Indian agency. Told that Indians chiefly Arickarees. A number of houses of simple construction & a steam mill, with large cultivated patches, lower down the river, a mile & a mile & a half higher the site of the old fort on a commanding point, formerly by Lg. Lent. 20 cks. Some of buildings gold fort still remaining. Handsome Agent's house, & crowd of Indian tents & tepees. Many piled above with earth, & resembling the drawings of Mandan & Arickaree homes given by Catlin. Crowd of gay blanketed & leggined Indians on bank. Bare legged urchins with little bows & arrows, & women with babies on back. Two white women & a few men belonging to the agency, with a white baby in perambulator. See several "Bull boats" of cow hide stretched on frame precisely like a cradle. Had thought these antique, but apparently not so. Constitute one of items in Catlin's argument for origin of Mandans from Madoc the Welshman!

Observe Indian three squaws & dog just landing from Bull boat in one place. Indian taking rifle & wrapping blanket about him stalks majestically away, but continually look behind at the steamer. Women working, they strip off packs follow with burdens at short interval, one carrying the boat, & looking from a distance like an ant with immensely disproportionate load.

Noticed in river bank a layer of bones, probably buffalo, & doubtless resulting from trampling under of part of herd in mire in endeavour to cross the river.



Stopped at several wood piles during the day, cut by Indians, the pinchers carried only show of fingers to indicate number of dollars per cord.
At intervals during day approach high banks gradually scarped hills, little buttes & 'bad lands' of upper tertiary. Country evidently growing much drier, & sage very abundant with alkali patches thus being about 40 m. above Berthold.

May 19. A dies non. Had scarcely got away from place where tied up last night when came to place where river spread very widely. Got on bar & occupied all day trying to get over it. "Sparring" along ahead & tacking. Lev Rev. steamer Eclipse here in sight. Soon also ashore, but drawing less water got over & left us. By getting out rope ashore, hauling on it & sparring managed to get over before dark. Steamed on up river till long after dark looking for wood, which nearly exhausted. A brazier supplied with pine chips held on lower deck & cooking carried. Place on banks till at last reach a place where can tie up, with enough wood lying about to give us start in warming. Day fine bright & warm.
May 20. Make a good day, getting along steadily & not tying up tonight. Coming up through 'the narrows' nearly all day. The banks generally high pine groups of buttes & hills of the 'bad lands' kind, formed by the weathering away of the edge of the Tertiary plateau. Stripped irregularly in various colours, occasional lignites, some burnt. Scored by water sides from tops to bottom. Much sage & other thinly-green vegetation. Country evidently much drier as we go on, & often little grass on the hills. Forward sweep. Hills should lower, & wide flats 20 feet or so above river. 'The narrows' may perhaps be the S.E. extension of the higher plateaux proper but S.E. very like it in vegetation & rocks. Occasional distant remnants of higher plateaux still, forming [illegible] Sins & Bad-ass Buttes S.E.

May 21. Set along without any serious interruption today, & travel on during night. Valley of river probably five miles wide, the river going in great loops from side to side. Flats sometimes open, prairie & willow coppice. Generally Cottonwood. High bare bluffs of Sig. tert. Beautifully striped & strat. quite horizontal. Sig. Coal beds often burnt out. Prairie away from river probably everywhere quite bare & open. Dry country met short buffalo grass. Location. Common saying that if sun shines on river for a couple of hours you begin to see the dust flying from surface. Refers to muddy character of stream, but so far true that eyes may be filled with dust blown from dry bars, while on board steamer. Captain shouts down from pilot-house. "Bill, tell those men if they want gunpowder to fire up with to raise steam we'll call in at Buford & buy some."

May 22. River banks today not so interesting. Chiefly more or less completely grassed & not very high. Cottonwood & willow flats as the river sweep round them in interminable curves. Reach Ft Buford near mouth of Yellowstone River this evening. Stay some hours landing & taking on freight. Then steam about 4 m. up river, where men at work much of night landing some large poles which perforce get stretching a telegraph line across the river. Str. Eclipse stole at Buford, & before we left the Govt. Steamer Gen. Sherman arrived from the Yellowstone. At Buford now 7 companies of infantry (2 being mounted infantry. 2 companies cavalry. The post just reinforced by latter on account of great number of Indians here. About 200 tepees on slope near river, occupied by 1100 scouts of different bands & 200 to 300 arickarees. These men nearly all been out with Sitting Bull, & some have surrendered others have been captured. Of noted chiefs there are here now Gall,

Low dog, Long dog, Crow Kind & Running Antelope. The two first two of Rattling Bear's chief men. The Indians are actuated on tiff, corn &c, & strictly guarded, being in fact in durance here. Their ponies & arms have been taken by the fort, though in many cases the Indians coming in surrender only a few poor ponies, reserving the rest somewhere for future use. One of Indians trying to break away two nights ago was shot. Chief Gall also tried lately to run away but was captured. It is proposed to move these Indians from here down to Standing Rock, below Bismarck, & trouble is feared in consequence. At steamer landing mostly crowd Indians of both sexes & all ages dressed in blankets & sandy rags. Some painted & with feathers in hair. Red-stone pipes, & one or two with fantastic clubs. American soldiers & miscellaneous onlookers. Buildings of fort & barracks extensive, covering considerable area. Said that some Indians surrendering on Poplar R. last winter burnt arms sooner than give them up.

US. recruits on Eclipse going about with hunks of bread & boiled corned beef constituting rations. Recruits have a pretty hard time till join their regiment. Conversation of people here & on board boat with regard to Indians brutal & disgusting. In what respect are they better themselves?

May 23. Get along well all day after starting, though detained till 11 a.m. cleaning out boilers & furnaces. Pass country like that seen before. Bare tertiary bluffs & bad-land hills with great flats & tongues round which river flows. Prairie, willow or cottonwood. Just after sunset white carmine glow in west, meet steamer "For West" of this line on way down river. Lie beside her for a few moments exchanging greetings &c. Zee up

for night shortly after, the sky being cloudy & too dark to go on. Said the numerous buffalo about a days ride South of this. Indians here lately been stealing some stock on this part of the river.

May 24. Stood steadily on all day, the banks during the afternoon becoming lower, & the Lignitic rocks changing considerably in appearance. Dark olive greenish grey & brownish tints now prevail over the light yellows & drabs of further East. Bentonite abundant. Similar change observed westward on 49th parallel. Probably connected with approach to base of the formation. Two or three buffalo seen on hillside today. Stopped this eve. about sundown at Poplar Point, or Poplar Creek Indian agency, where some freight to put off. There are here 6000 or 7000 Indians, almost all Sioux & mostly Yanktonais. Counted 235 tepees in one camp, & probably many more not seen. Usual motley crowd to see landing of boat. Competition among small boys in shooting for "nickels" with bows & arrows. Buy blankets, pipes, dentalium necklaces. Bells & studded with brass nails. These Indians partly relieved by Govt. partly have to provide themselves. Scarcely coming on now, & will probably have to go out after buffalo, which reported in great numbers 30 or 40 miles to the south, & retreating westward nearly to Bozeman. These Indians last year got nearly 10,000 buffalo robes. They have 200 acres of bottom land under cultivation & grow excellent potatoes. Also Indian corn &c. The corn said to ripen. No irrigation, though the ploughed field originally covered with scattered growth of Artemisia tridentata? with little grass. Intensity as example.

At mouth of pt. 40 or 50 miles higher up the river 200 acres again under crop, & 160 acres at another place near former.

May 25. Called at Wolf Pt. Indian agency this am. Here several thousand Indians, Chiefly Assiniboines, are quartered. Made good progress up river all day, the banks of valley almost uniformly low. Some beds of Lignitic dark in colour, & some miles below mouth of Milk R the underlying Cret. (Potalz No. 4.) comes to surface, forming dark slate-coloured barren-looking hills. No well marked exhibition of the Fort Hill Sandstones observed. Only excitement today in picking up a landing stage from one of the barges. Through Chimneys passed and up through Cabin floor against bank. —

May 26. Winding up the river all day, without special incident. Cottonwood & sage flats. Hills all of Cret. No. 4., sometimes capped by No. 5. in higher buttes. Dark shales with crinoids of No. 4. seen in cut banks along river. Apparently horizontal where not disturbed by slides. The hills of No. 4. of most barren aspect, & generally nearly bare of vegetation. Begin to see abundant pine trees toward evening on higher buttes. See several small herds of buffalo, have often pretty close.

May 27. Similar Cretaceous hills of No. 4., overlaid by No. 5. Toward evening overlying beds became thicker, & paler in colour, & may in places include some of base of Tertiary. Barren looking & with little vegetation of any kind. Scattered pines toward summits. Pass Tavern & Round Buttes, noted landmarks on the river, about noon. About 8 p.m. pass cut bank at point known as Boucher's grave. A half-breed gets name killed here by Indians in early days. Botaldt two hours in P.M., owing to break down of part of machinery.

See several small bands of buffalo today, & just-

Capt. says he has seen just 200 men who have been
Scouts with Custer, & far away at time of massacre,
& can tell all about fight. Said that some of party
escaped.
Coming up river one day in steamer hear shooting, &
presently skiff comes in sight, coming down stream.
Man taken on board. Rip-roaring Jim. Says
Indians, Indians, did he see them. No. Why
7000 hidden in gully back there a little way. Must
land & take wood at his yard or steamer will be
captured. Wooding. Man appears who had been
~~[illegible]~~ (laying back) Rifle. Sat down on log,
"playing Indian" sluck attitude. Just worthy
to Captain don't we know "Curly Jack" the great Capt.
had not heard of him but "jumped to it" & said
yes, this Curly Jack! Have not seen him for ten
years. Curly Jack also reported 7000 Indians in
gully not far off. Whole thing "put up job" to induce
Captain to buy wood at this point.

before dark catch sight of about 30 together, on the far side of a broad sage-brush-covered flat. A party with rifles land & walk across point & endeavors to get shot at them. Some party on other side of point heated & tormented by mosquitoes, just got out to come on board, when catch sight of the buffalo in the river about 1/4 m. up. Steam up stream while hunting party go along shore through belt of cottonwood. Buffalo become frightened, & while most others cross stream 3 turn back, & land close to place where hunters waiting pattern, nearly dark. Heavy & rapid firing. Steamer brought to bank. Great excitement so much so that Captain finds it hard to get necessary orders for making boat fast obeyed. Several rush to same place. Young bull buffalo found dead, while others still pitching up at bells in pursuit of another wounded. Rope made fast to head & whole carcass hauled to bank. Butchered in short order. Long after dark party who had gone in search of buffalo b.c. come back but unsuccessful. Buffalo & Indian stories in order during rest of evening.

28. Nothing noteworthy. Bluffs not high nor picturesque, & somewhere compared of Cat. No. 4. A beautiful evening. Run on till after midnight, when stop at Carroll. This place was starting point yesterday but for west, but this now given up, & "town" little or nothing.

May 29. Arrive early this morning at Mc James & m. above Carroll. A camp with a few soldiers. Homes about the pickets & just established. Road hence to Sweet to Fort Mc James a 5 company post. Make several long stops today for wood, wait which boat now perfectly loaded. At noon by Little Rocky Creek, pale yellowish beds

Rocks supposed ~~the~~ at base generally. Very thick pale
Sandstones shales &c. Fossil found.

31. Rocks like avg. 29th. Sea sometimes shales & dark Half-
Colour below. P. Local or Barlow & Sketch Survey
appearance & low produced.

appear. Rocks all apparently horizontal, & scarcely can be a doubt but there run under No. 4. In coming up river there has risen in the banks. Hills alone capped by dark which doubtless base of No. 4. Near Grand Island at river 30 to 40 feet pale sandstone. Thin lignite above, & then 50 feet or more of brownish earthy beds. Further up yellowish sandstone overlies earthy & second lignite zone underlying first mentioned pale sandstone. Under this ashy strat. beds. Bedding gentle seems very regular. See ripple marked sandstone slabs. Stars with little doubt represents that seen by me in Valley W. of E. Fork Milk R. on line to N. A few miles above Grand Island, & between it & Cow Island, there rocks for some distance much disturbed. Folded & fenelist in most irregular & picturesque manner. See no distinctly intrusive rock. Disturbance ends, in going up river as rapidly as it commenced. Cannot be accounted for by slides, on much too large a scale. Lignite zones continue well marked up to Cow Island, at least, & appear to thicken westward, though never, probably of economic value.

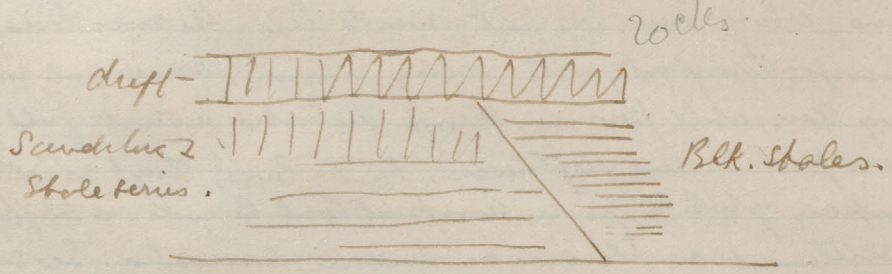
May 30. The river valley today quite narrow as compared to former appearance not over 1½ m. from bluff to bluff & in some places less. Bordering hills high & bare. Stream rapid, several rapids having names attached. At mouth of Judith River opens out to wide known as Judith Basin. Another Judith basin traverses up on the Judith R. We some hours a short distance below Judith repairing machinery, which put wrong during ascent of rapids, when all possible steam on. Tied up at dark & lay all night to clean boilers. Day warm & fine.

May 31. Start at daylight & go on steadily all day, reaching "Coal Banks" at 4.30 P.M. Coal Banks is the landing place for

ft. Assiniboine, a large new V.S. post, near the line. The river today moderately swift throughout, & the valley narrow. Wonderful rock scenery during afn., while passing through disturbed district full of dykes & igneous protrusions. Afterwards banks lower, though usually bare. A company of R.S. troops in camp at Coal Banks. a telegraph station. Now settlement as place in an Indian reservation. See several little herds of Mountain sheep on the hillsides.

Rocks of 30 & 31. The rocks to point a few miles above the Judith, & all the way below since daylight of 30th. are rather jaded (generally) sandstones & shales, apparently of same series before mentioned as probably underlying No. 4. A great thickness of these rocks, & though generally nearly flat, sometimes disturbed. At point a few miles above the up point of night of 30-31. rocks seem supposed to be the same, but very closely resemble those first seen below No. 4. A white generally soft, often calcareous sandstone in bank all day, & at Coal Banks base below water level. Very persistent. Can see no rocks of 'Judith basin' Tertiary unless the series now traced up, & supposed to be below No. 4. really of this age. Find, however, at Drowned Man Rapid, a few miles above mouth of Judith, in crumbling rock nearly in place, large angular masses in crumbling clay bank, baculites a rather large form. (Can the Judith R. beds be really Cut. No 3 & = to Dunvegan series?) But below & above Eagle Cr. (all afn. of 31) rocks much disturbed full of dykes & protrusions of dark ig. rocks. Hard, & standing up like walls or jutting needles & pinnacles of striking shapes.

June 1. Men at work nearly all night getting out freight. The discharge of the four miles but slowly, after being cooped up so long, itself as good as a play. Get away between 9 & 10 a.m. but after steaming some miles have to stop for an hour while wheel put in order. The Red Cloud landed M-P recruits at Coal Banks yesterday evg, &


rocks.
drift
Scandinavian
Shale series.
Blk. Shales.

went on up river at 11 P.M. thus passing us though she did not leave Bismarck till May 20. Has made a very quick trip. Banks somewhat lower & pretty well greased since leaving Coal Banks.

June 1. About 4 miles from Coal banks the anticlinal section seen in which black ink shales brought by fault down? on rocks of Coal banks as described. These dark beds may be Fort Pierre. The Sandstones do appear to have in gain upwards on the river, but are shortly replaced by blackish shales, often well strat. which continue at intervals to appear to Benton & are doubtless the Benton group. Further west sandstones do merely seen, not again shown. Seems probable that these sandstones Cret. & perhaps = Niobrara. Hayden in G & M. Sep. mentions occurrence of Cret. fossils near the Judith. Seems uncertain as to position of beds.

June 2. Arrived about 1 am at Benton. Breakfast on boat. Then to Choteau House. Go to J. G. Baker & Co. & get to work at preparations generally. Provisions, Horses, Carts & waggons do to be looked up & men to be engaged. Very busy all day weather very hot. See Maj. Walker late of Nev. N.G. Capt Neil who brought recruits from Ottawa & now returning to Ottawa.

June 3. Continue preparations. Attention today chiefly given to horses. Dined on shore this evg. Prices of animals broken to harness high. Half-breeds who only have carts did not come in today. Promise to come tomorrow early. Provoking delays everywhere. This a very depressing out fitting point.

June 4. Can get all I really need without much trouble save carts. A half-breed who promised me some of these came into town today but to my disgust had sold all his carts which I use to another. Even waggons of light build are scarce & dear. Delay exceedingly annoying.
June 5. Sunday. Went to see some horses & carts. Bought one Toledo cart at $45. Endeavoured to buy some more in different carts at high price but the breed raised the price beyond all reason, so let him go. Dubois answer from Broadwater at Assiniboine to whom I wired had telegraphed for carts. order the carts if they can be had & hope to hear tomorrow.
June 6. No news this morning about carts from Broadwater. See a waggon & horses which might suit, but can give no answer about them or the lots the men, who intercept me at all corners, till I hear about the carts.
June 7 Send telegram asking definite answer about carts & in about an hour hear that cannot be had. Go about getting waggons & remainder of things which no easy job. Busily about town all day, but succeed in getting nearly everything.
June 8 Hoped to leave this morn, but find repairs on waggons & carts so which the promised d'g am. Then at 2 Pm. Not really ready till about 3 Pm. Go over stuff & pack into waggons including at least to pull out to Teton, but heavy thunder storm comes on prevents completion & made roads very bad. Get teams hitched up & wheeled waggons into corral owing horses horribly balky, & utterly refused to work in cart. Circus in street behind Bakers store.
June 9 Up early this am & actually get off at 8.30 Am. Stopped for noon on the Teton, & camped after crossing that

river about 13 miles from Benton. The trail crosses a plateau perhaps a little below the general prairie level between the two rivers. Follows the Teton for some miles, & then descends again to the prairie level crossing several coulées & coming down a very bad hill to the ford. The Teton valley here just about wide flat bottomed bottom. River very muddy, fringed with trees & bushes. Several ranches. Irrigation in progress. Where trail crosses valley the usual character, much narrower say half a mile wide. Numerous alkali dotted on prairies. Roads pretty, some difficulty in crossing, water coming up almost into wagon totes. Heavy thunder & rain storm in Pm. Cool this evening. Much trouble from stampede of bobbly white horses in one of wagons.

Where Teton first reached little cottonwoods at mouth of valley, which may be 200 feet deep, yellowish drift. Valley becomes narrow & rougher where trail leaves it as above stated. Benton shales appear about 2/3 up the banks at same time. Benton shales with selenite at hill coming down to crossing. Plateau higher than any ground about here runs along to the north of the Teton for ten miles from it. Fine views of Highwood & Bear's Paw mountains. Rocky mts seen clear, but very distant to west from highest points reached.

Outfit: consists of 2 light wagons. One Greenbud Kleds Cart. 1 Bedboard. 3 men besides McCrell & self & Mr Garnett, an Englishman taking passage to McLeod.

June 10. Up at 5 am. Leave camp about 7 am. Travel till 10.30. Leave at 1.45. Travel till about 8 Pm. Changed horses & got teams & along pretty today. Trail leaves the Teton valley at crossing where camped last night & runs 9 miles over prairie. Descends again to valley. Follows for about

2 m. & finally leaves Zeton. Valley when last seen nearly as before. Scarps all yellowish drift. Several ranches. Better day for sure crops without irrigation. Cactus & some sage on flats. Travel 13.7 miles from lunch point, (where trail first comes down to Zeton bank) N.W. about 1 mile of travel actually along river. Camp on a wide neck separating two flat-topped hills to W. from main plateau to East. Plateau 28 seen widely to consist in parts of sandstones & rocks much paler than Benton. Prairie N. of Zeton stony or clayey. Too dry for anything but buffalo grass. Clumps of Cactus. See several antelope & one wolf today.

June 11. Leave camp 7.15 - am. Travel 9 m. to Coulée which informed called Pend Oreille springs. Observe here for first time since leaving Benton many circles of stones marking old Indian tepees. Go 4.3 m. to another end of coulee where good iced brook rising. Have some trouble & lose about an hour getting through. Soft mud on banks. Go on till 6.45 - travelling later than would looking for water. Camped at small swamp. Many mosquitoes. Fine day. Cold west wind. Showers lying in Rem in Rocky Mts & gradually scattering out across plain as afternoon wears on. Did not reach so far as last year's route. Rolling prairie all day. Soil generally clayey. Many stones. Sec 3 Buttes seen after leaving camp this morn, & two in sight next day. Fine trees also of Rocky Mts, when a good deal of snow. Meet men 6 days out from McLeod, going S.

June 12. Sunday. Leave at 6.20 am. Travel 11.6 m. to the Maria's R. Get ferried over & down on N. bank. Travel 10.5 m & camp at first coulée. Fine day, bell weather or N.W. wind. Fine view of Buttes, blue & purple in distance. Train many camp to Maria's R. Country apparently not so dry as before. Little cactus. Good grass. Some on N bank of

Marias to Camp. Probably owing to climatic difference. Irrigation, farming, ranching in Marias Valley, where a number of stock ranches.

The Marias valley is a rough large irregular hollow, with innumerable steep sided lateral coulees in which denudation is still actively in progress. Bare banks & vertical cliffs of blackish cut. shales & yellowish drift give it a wild rugged aspect. Trees along the river. Buy wood here to last for a six days till reach Belly R.

June 13. Monday. Leave camp 7.10 A.M. Drive 14.4 miles to lunch over rather dry & in places very stony rolling prairie. Several coulees running off to left, but few with water now. Meet two teamsters with loggans at lunch stop. From Mr Leod. Say that Indians to be feared in this region from Marias to beyond Milk R. Several parties of Bloods out for horse stealing, nominally against the Crows, ~~but~~ but probably not particular. Must keep a close look out over horses & not venture unarmed far from the party. Drive 11.5 miles in afternoon from noon camp, to stream coming from Rocky Spring, which rises in upper part of valley in which we are camped, which runs up into the Swift Hd. Nat Gte Map. There really a bold escarpment with points & bays running E & West. In front yet a wide hollow with lakes (probably alkaline) called the alkali flat. Soil clayey & sandy, greasewood, cactus, & sage. Sparse grass. quite decerted like in places & evidently a bad mud hole in the spring. Mosquitoes very bad at evening camp. Line recrossing yet to Buttes. Blue, clear cut & massive across the brown green or in distance purple plains all day. The Indians use these as watch towers, & with the aid of glasses overlook a great extent of country. Some parties of Bloods supposed to be in the Buttes, or near about them just now.

June 14. Went this afn. from camp about 1½ m. to N.E. to escarped point of edge of Snake Hd. Plateau to examine section. Occupied about two hours on trip. Collected fossils &c. Hitched up on return & travelled till 11 aft. making 7 m. Stopped at pool on summit of plateau where we brained for S. morning. Packed fossils. Went up track some. Travelled 9.3 m. to crossing of 1st Branch of Milk R. Called Red R. by the Commissioners. Camp near on the liv. bank. Examined sections in valley, wrote up notes, repairs photo, Owners Stout waters. Above &c. A fine day, strong threatening storm at one time, & rain being over the Butte, while fire & smoke in direction of Rocky Mts. See Chief Mt from Summit of Snake Mt Plateau. Snake Hd Mts of range are edge of plateau which slopes back gradually northward & is not more than about 100 feet above river at present camp. Character of country changes on ascending plateau. Fine grass everywhere, many pools & swamps. Rolling prairie most besides burn alone mentioned, a waggon wheel tracks, going S.

June 15. Rain heavily during latter part of night, & in afn. Camp slept rather late. Called by Steele from Benton on way to McSeed on horseback alone. Asked him to take breakfast. Rain clearing set away at 8.30 & home without stopping to crossing of Milk R (12 m.) Lunch & then set out up river on horseback with Garnet to look at rocks & explore valley. Got about 5 m. up & return at 6 Rain threatening back at last to escape heavy thunder storm from west. McC. explores down valley at same time on buckboard. Rather tired this Rain from buckboard exercise & foot ride.

Today's journey rolling prairie everywhere well covered with grass, deep in hollows. Valley of Milk R. wide shallow depression gravy banks. few scarps. River very tortuous. Clear stream of 50 to 70 feet wide. Roped in places. No timber whatever. Flats bear fine growth of grass, small rare Elaeagnus & willow bushes. Valley very different from lower part near live, & climate here evidently much more humid. Prairie dry in many places. Little or no Cactus.

June 16. Horses heavy strayed to some distance did not get away early. Travelled 8.5 miles to "9 M. Coulee" Then 7.7 m. to Coulee. Kipp's Coulee ?. Travelling all day along the North Eastern edge of a pretty well defined plateau numerous little coulees begining at foot of plateau & running northward. Drains to N. all lower than trail, & form Camps this evg. Level sea-like horizon as far as eye can reach. No Cactus seen today & little sage. Tree grass almost everywhere, ~~almost~~ long enough to Cut for hay in low hollows. Stop early & go to Mr Cornwell rode North after supper to ~~of~~ explore lower part of Coulee & found main Coulee runs S. which probably receives all the smaller ones we have seen. Strong cold wind all night N. Clouds late evg. when fell calm & mosquitoes come out in great numbers. Rocks here appear to be Tertiary. Moisture in this region must be in excess of what seen before. If not too cold at night might probably be cultivated.

June 17. Just leaving camp this a.m., when two men in waggon going to Benton come up. Informed that this Coulee in which camp not Kipp's as had supposed, but Deadman's. In going on cross middle Coulee & then Kipp's proper. Lunch at Kipp's Coulee & get lat. obsn. Meet train of waggons near 15 m. Halte & Camp at small lake a few miles beyond. Day fine, chilly in morning, warm in afn. with strong breeze. Face peeling satisfactorily after first sunburning. Mosquitoes very numerous. Country all well grassed a very fine feed. Cactus almost absent. Two or three yellow bell-like species in flower seen. Climate probably humid enough for crops without irrigation, if so might prove good agricultural country. No wood! Towards. Soil generally good, brownish in colour, white subsoil. Some good hay swamps. Prairie green, & gay with flowers. Geranium, Penstemons, Cleome &c. Exclusion of dry country plants previously abundant.
Plateau continues in sight 2-5. through leaving trail. All level to the N.

Wed. Not irrigation not absolutely necessary in valley of Bell, US Coal Banks, but crops not really safe without. Valley beautiful with trees, Elaeagnus, choke cherry &c in thickets, & scattered cottonwood trees

June 18. Off about 7 a.m. Travel to Belly R. in one drive. Showers all day. Signal to ferryman & get all stuff taken over during Pm. Have to take waggons apart, & swim horses. Spend early Pm at "Coal Bank" examining section, collecting fossils, & taking photo. of outcrop. Country passed over this afn. for the most part rolling. Many small hay swamps. Soil generally good, in some places a little dry & stunted looking, & on approaching the valley tends to become sandy, though never poor. Good growth of grass everywhere. Glad to feast our eyes once more on growing green trees & bushes in the valley, after having travelled from the Maria's without meeting a stick large enough for a walking cane, at any rate. Pine & willow bushes in the milk valley the nearest approach. While at dinner before crossing river Cartwright two men arrives. These have been sent on from Walsh by Col. Irvine in answer to letter from Min. of Int. written at my request & asking for discharged police men what good characters. Had travelled to Hammondvale but heard by telegraph that I had left. Returned to Cypress & followed us on here. Engaged them, stipulating that not for whole summer unless convenient. Purpose now to divide forty at once, putting one division in charge of McConnell to cover more ground. Must be careful however not to wear men out.

June 19. Day showery & cold with tempting wind. Measured width of river & made topo. sketch, geologically. Pulled up long hill out of valley, & travelled on 15 m. to point from the bank of Belly R. Finding no water use some from keg for tea. Go down about a mile across river flat to secure rocks seen there & find a number of fossils. Stop collecting some time. Drive on 6 1/2 miles, & finding no water turn off about 1/2 a mile to bank of Goldman's R, & Camp. Running rocks in banks. The valley of Belly here about 300' deep, with steep banks, often scarped. Rivers are slightly muddy water,

running over 3 m. an hour. Prairie to Belly Camp all more or less rolling. Soil varies light sandy loam, brown in colour, & generally supporting but poor & dry growth of grass. Very few swamps. Country in parts to the S. of river. Valley of Oldman's R., at Camp with scarped sides showing strata of sandstones & clays. Valley 100 feet deep. Water same colour as Belly R., & sharp. No wood but scrubby bushes & willows on flats.
Blackboard shaft broken in crossing, needed thus then & for work to Stoganoppe.

Fri 20 Return to trail, & travel in to Fort Macleod in one drive, arriving at noon. Day cold & showery. Country passed over an undulating or in places nearly level prairie. Oldman's R. to right southward or southward at small distance. Soil good to fair, about equal proportions 1st & 2nd qualities. Occasional stony patches & ridges. Cementum material still abundant. On arriving at brink of valley find wide low sign stretching out. At Macleod & Camp of Survey party (C.P.R.), in new Fort miles distant on the bottom. Come down to Willow Cr, at foot of hill, a large turbid stream about 50' wide. Try the ford, & finding it not too deep cross & drive on to bank of Oldman's R. near the Fort. Rest, cross & see Capt. Crozier in command. Make various arrangements. Get a small mail, some of which arrived this afn. from Cypress.

June 21. Raining very heavily & stormy this afn., Camp slept late. Arranging various matters during afn., & getting Canvas boat put together. Find the boat good for purpose, & decide to go down Oldman's & Belly R., meeting the toboggans at the Coal banks, & possibly afterwards going further. Cross in afn., see Crozier, who kindly helps in all possible ways

getting blacksmith to repair waggons, spring to lend saddles &c. See Davies, repeatedly Belle & Co, & get extra supplies from him for past trip. Which decide to make Eastward, while she plant water on the plains, & to connect with B. Comm work to S. Get stuff passed through Customs, having to agree to pay duty on it; get most of stuff repacked & arranged for trip. Buy a saddle horse for own use from Christie at $55.00 Arrange about departure for morn, selecting McCarty & Wilson as Canoe men. Day cold wet & miserable.

June 22. Intended dividing stuff into what required & what not at present needed, & leaving here thus Pen., but steady downpour again all day with cold & high wind. This the people think represents the June or spring rains, but later than usual. These rains sometimes continue several weeks, & the cloudy & showery weather we have experienced for some days is part of the same phenomenon. They have these rains in Montana, & also in Manitoba, so they must be wide spread & general in cause. A man from Bow River assures me that it has been raining to the north all the while that it has but been cloudy here. The river has risen about a foot during the night. Seeing that it was useless to try to leave, occupied reading & idlestying about camp during am. Pen., got the stuff separated, & one waggon & all to be left taken over to Davies Store. Finally decide on prelim. plan of operations which as follows. Self to go down Oldman & Belly in Canvas boat to Coal Banks. There to meet McC, who starts simultaneously with one waggon, one cart, the buckboard & horses. If the boat acts well wish to go on further down the Belly say to mouth of Bow, there making second trip with McC. In this way see all coals on Lower Belly & try to connect sections of rocks generally. Then all travel south to Chin Coulee, &

Lake Rotopo, then to Milk R, connecting with the B. Comm. work near the Bottles. Then travel along Milk R. west & so back to Wacleod. When in Milk R. Country expect to have to guard our horses. Wet elevations of plan may be necessary. time will show. Wrote home & to Mr Selwyn this mg. Enclosing the letter statement of payment of Custom duties amounting to a large sum which exacted here.

June 23. Got boat put in order & sent down to Willow Cr., to see if it can be forded & the wagon &c before leaving. Report that deep but possible. Pack up & launch off in canoe shortly after 9 am, Mr C, Garnett & the men away ahead to us as we have an on Somewhat hazardous voyage. Mr Crosby, Indian & self constitute crew. Boat behaves splendidly, & carries us & our damage proof. Go on down river track surveying & stopping to examine rocks. Stop for lunch, when find some turtle remains in the clays, & left of a human paw lying on the surface. Discover that forc. has forgotten to put in tea & all things, but have a can of milk which, with a little sugar makes "Coulent" palatable enough but weak. Pass camp of 19-20 in Glen, & camp where hard pressed (19 ct) land down to river to examine rocks from lunch camp that day, mosquitoes fearfully bad at camp. Delightful gliding down stream, fine day. See some ducks & a few geese & tracks of antilope Tyrant fly-catchers swarming on bough along the stream & occasional clusters of swallows' 'clay built sheds' in the rocks above. Rocks interesting & numerous fossils in places

June 24. Embarked on river at good hour, & travelled on down stream, examining rocks & making track Survey. In trying to cross at head of one rapid got drawn in, & carried right down the middle in heavy sea, but,

Canoe behaved very well. Dashed ashore at last but came sideways on a rock in doing so. Landed stuff, & portaged to bottom of rapid. Had a bad headache & suffered from extreme drowsiness. Slept about half an hour at lunch stop, an hour & a half at portage. Passed mouths of Belly & St Mary's Rivers, & about 8 P.M. arrived safely at Coal Banks. Found rest of party camped, having just arrived overland. They had it seems some trouble in crossing Willow Creek. Waggon & Cart slewed partly round by current but came through all right, buckboard, however, carried away & overturned, & with the horse rolled over & over in the stream. Mountain army stuck to the rig manfully, & at length by exertions of all buckboard, horse & stored. Tents, cushions &c on traps picked up down stream. Loss appears to be. Whip, two Sol. hammers. One bridle, Wardan's cut carbine, blanket & coat. Dash board broken & part of harness. Good for one was drowned. Sorg. at work on specimens, & making preparations for second start tomorrow.

June 25 – Got stuff & waggons ferried across the Belly R, during afn. Secured bones &c. observed for time & latitude meanwhile. After lunch got all ready & Mc Connell & his detachment of party off. Then with Wadson & Mc Crutty started down river in our boat to meet the others at mouth of Bow River in about four days. Day fine & warm. Pleasant voyage down stream. See a deer today, but no ducks or geese though now prepared for them. Will have more than enough time to read mudgeons before the horses, so need not hurry. Camp at 4.30, & examine rocks of neighbourhood. Tried fishing but, without success. Wrote up notes.

Had a long palaver with a Blood Indian at the Ferry. Carried on chiefly by signs, but partly in Cree, with which he was slightly, self very slightly familiar.

June 26. Awakened last night by falling of the fly upon us, a very strong southerly wind having risen. It being impossible to get the fly up again in the gale we slept remainder of night with it lying on us as it fell. Travel on during day, but made long stop at lunch point & camped about 4 P.M. One need not hurry to get to the meeting place before the others can possibly be there. Got lat. at noon, & examined a number of rock sections during day. Fired away 10 cartridges, killing 3 geese, all poor as this is the moulting season, & they are unable to fly. A deer seen opposite camp this aftn. McCurdy fired several shots at it but unsuccessfully. The high wind which continues all day makes canoeing unpleasant, & in places a little risky.

The valley from Coal Banks is a wide trough, with meandering river. The river is stiff, however & divides winding the trough, & its bends are consequently not confined to the flat valley bottom, but very frequently at their concave sides show bare scarps & cliffs, with fine sections of rocks. Cottonwood & shrubbery on nearly all flats. The climate is much drier eastward. The disc-headed cactus becoming abundant on northern slopes, & now beginning to flower.

June 27 Travelled down river all day, camping near 7 Pin Ferry to go further than worked out by want of wood for many miles. Very calm prosperous & without accident. See an Indian today, running up the bank of the valley & then shortly reappearing with his horse. Beckoned to us to stop, but we went on, not having anything particular to say. The shing wind fell today & in the Calm the effect of the silence & solitude of this great valley almost oppressive. Broken now & then by the twitter of some swallows with a colony of bottle-shaped nests stuck on the face yon cliff; or perhaps the shrill scream of a hawk haunting the vicinity of the nests. Now & then from far upstream a rushing noise, presently heard rapid, as the water broken its swift course, & boiling over a stone in mid channel

The astragalus in its different varieties is evidently the flower of this region at this season, & renders the banks & flats in many places quite gay. The Valley has lower banks today, frequently for long distances grassy, & with low & imperfect sections compared to those yesterday. Wood is quite scarce, & for many miles, as marked in survey, quite wanting. Camped in a little bend yesterday at sunset & spent a cold night. Wind ceased & drift. A bear or two plunging about in the water after dark. Went out some lines in hubes but could not get them ashore for a shot. Observe a fine comet under the pole star this Evg. The wood in the valley in bottoms when there is moisture enough is to be replenished by the cottonwood pressure fires. The islands e.g. are wooded whenever high enough, or woods elsewhere.

June 28 On down the river, speedily some lines at several sections & stopping to take lat. at noon. Come unexpectedly into our camp about a mile & a half at ye the Bow. The Blood Indian & family seen at Coal Banks has travelled with them & shown them a straight track, avoiding the Cypress hill altogether, & enabling them to make time. The Bloods child is very sick & he comes to me for medicine which I do what I can to supply. The child seems to be suffering from inflammation of lungs, or some longer standing lung complaint. Put on a mustard plaster & give gumme & water with a little brandy. The Indian shot several antelope yesterday. We saw & fired at two on the river today. The Indian also saw across the mountain where this same Indians who fired the Sioux, & fired a bullet after him without a word. On arriving at camp we covered a number of geese we had been chasing down stream for some hours. Seeing the birds by undercurrent & turn back, but we headed them off, shooting one, while those in camp, chaffy the 3 Indians, set up a

The canon 300' above river at camp. Prairie level generally considerably less. Prairie ridden on partly sandy sand hills, partly dry hard sparsely grassed soil. Near edge of valley plenty boulders. The river below here changes character. Banks recently bad-lands, plain on both sides, with small slopes covered with sage & grass from base of bluffs to water.

regular fusilade on the gorge squadron as it passed, killing four. Our camp with the addition of two tepees & a dozen of Indian ponies, & rude stages on which drying antelope meat hung, presents a picturesque appearance. The river valley meadows some character from yesterday, but has no trees whatever except on lower end of Wolf Island, from camp of this afternoon to here, also a small grove. Bluffs grassy, with occasional high scarps which chiefly of drift. Cut rocks lying out in low sequences way hence & there. The country seems very above will probably be found near land journey June 26. There are curious rapids within a few miles above the present camp, & if there can be surmounted a steamer can ascend for up as far as the land point.

June 29. Do not shift camp today. Neg. pack specimens, & then spend morning afternoon on the bluffs just above camp, finding some Dinosaurian & turtle bones, with Sr Robinson to camp in time for Pat. at noon. Take photo. of bluffs & camp, & then ride out with Mr C, & Indian to see the celebrated cairn near the confluence of the Bow & Belly. This occupies the top of a gentle knoll near the bank of the river, which rises somewhat above the surrounding country. From cairn see a little level prairie on all sides as far as eye can reach, & cairn consequently a prominent landmark. Known to all the Indians, who have, however, no tradition about it that I can learn. Mentioned by Hector 1859. About 5 m. from camp, & 3 below the mouth of the Bow. Base of cairn seems very old, top appears to have been lately renewed. Height about 6 feet, diameter 15'. Saw a large rattlesnake among the stones. Have heard some story about the Montana Historical Society(?) offering reward to any one pulling down the cairn for the purpose of searching for lost papers supposed by them to have been deposited here by early French explorers. Went by

to find out foundation of this story. Got back to Camp about 6.30 after a smart ride of nearly 3 hours, a little tiring to me as novice in saddle for the season. Packed specimens, wrote up notes, a lot of observation for time before turning in.

June 30. Arrange that Mr C. goes down river in canoe to meet us this evg. at mouth of Cherry Coulee with maps. Self to go overland with entire party. Spend one an hour in getting stuff up the steep bank from river to plateau level, tiring to double up, & make several trips. Indian allies accompany us, & the party, with the addition of twelve or fifteen Indian horses, lodge-poles & travailles, the Indians themselves, blankets & picturesquely costumed, with a couple of squaws, one fat & little girl, with a broad leather Mexican-studded belt, presents a peculiar appearance. The sick child which I have been doctoring packed in a bundle on a travaille, & apparently goes along comfortably enough. The men scout out on both sides occupying hill tops & examine the country with telescopes. One of them killed an antelope, near by, & soon the marrow bones being split up & the marrow eaten raw as a tit bit. The meat hung on the horses to carry to camp & soon after getting in all sliced up to dry, & the skin pegged down near the tepee. See a couple of buffalo on plain north of river. Does communication with the Indians entirely by signs. Joe can speak the sign language well, but says the northern Indians not proficient in it, but for the most part invent signs on the spot. Wonderful however, how much can be communicated. Canoe arrived soon after we got to camp. Pack it up now & put away in the waggon. A perfect cloud of mosquitoes, rendering observing this evg. very difficult. Fish caught in the river this evg. Same as number caught at last camp, of an appearance between a shad & a whitefish. Also another small heavy, coarse bodied fish, with small scales. ? what.

July 1. Travel southward, & at first near the Cherry Coulee, then across open undulating prairie, dotted with small pools & swamps. Indian friends came along with us, & camp beside at noon. Afterwards, signals flashed by mirrors from some of men on ridge ahead announce buffalo, & stole Indians off on route different from ours. Horse-flies very bad this a.m., tormenting teams & day very warm. Shortly round of bearings from little hill near camp see some mount specks in Seven Persons Coulee, which on telescopic inspection prove to be mounted men, one seen apparently coming toward camp, (which they cannot have seen) but did not come in. Hunted all in morning backward in Pen, keeping track-survey of route.

July 2 mosquitoes terrible last night. Drove the horses up from feeding in the swamp, & the animals wandered about camp, tripping upon tent ropes & making themselves otherwise disagreeable all night. Had no wood to spare to make smudge for them. In early morning pen horses, drove quite cold by the mosquitoes, went off. All morning spent in looking for them, & three greenaway horses pretty well tired out. Day very warm & horse flies innumerable. Horses at last descried on top of swell about 2 miles off, all the same distance County having been scoured. Had to wait some time for return of men. Left camp at 2 & travelled 9.4 miles south-southward, very abandoned country. Came in sight of McC, who visited 7 Persons Coulee & reported no rocks to be seen. Coulee about 8 miles from camp. Got lat. at noon. Two young Indian friends came in & stayed some time at camp. Got a number of Blood names of places, & several information about Bull Shield. Indians really killed his buffalo yesterday, & greatly elated in consequence. Mosquitoes very bad again at evg. camp, but collect Buffalo chips wash

Buffalo chips moderately abundant everywhere, but several years old, all away from Belly R, near mouth of Bow R., & the Mc C. reports also moderately abundant from Coal Banks to first mentioned place. Jy. 3. Also abundant today

Blood Indian names of places. —

Pa-Kow-Ki Bad water Lake

Ki-tsuk-i-a-ta-pē 7 Person's Coulee. So called from 7 Fence Killed here by Bloods say 30 years ago.

In-e-o-to-Ka Bull's Head a Buffalo Hd, Hill.

Ai-e-Kun-e-Kwe Cypress Hills

Kat-e-is, Sweetgrass Hills = 3 Buttes

Ke-nuh-si-suht Little Run = Milk R.

Mo-Ki-a-mis Blood R. = Belly River

Soy-ah-pch-To Blackfoot R = Bow R.

Forks of 7 Person's & Sarbatchewan Sa-a-mis.

to make smudge for fuses. The horses evidently very much appreciating it. A heavy thunder storm sweeping over the Buttes, & the coulee, gives us a few drops from its edge, & for a short time a refreshing cool breeze. At morning camp young grasshoppers pretty abundant. Flies the first seen in any quantity. The Indian Bob Shield confided to us by Sampy an heavy horse lost, that doubtless stolen by Sioux, traces of whom he had found in the neighbourhood. The presence of a flag of tobacco tower induced him to go out in search.

July 3. Struck south eastward to bank of Pierson's Coulee, & then southward reaching the Cypress trail in a few miles. Stopped for lunch at crossing of trail & Coulee. Took photo, & got down for lat. Then set off on bearing of S to E., (mag) in search of Pa-kow-ki or Bad water lake. Travelled ten miles, & camped at small grassy swamp at base of plateau. Had a shot at an antilope, but discovers in the evg. that sight on rifle shifted. Weather warm to hot. Rain, with thunder storms to S, & squalls of wind the latter resulting in nearly a gale after camping. Leave a note to P. on stick beside Cypress trail in hope that someone may find it & carry it to meet at Mac Leod or Walsh

July 4. Ascended the front of the plateau on diffuse ridge at which camped last night, & found a wide undulating region, bounded by a second parallel ridge, or series of low hills. At 11. bore off to a few sand hills, which at first from distance resembled cut bank of a stream. Rode up one of the more prominent knolls, & saw stretched out away to the South the long tabled of Pa-kow-ki, or Bad water Lake. The water, muddy in colour scarcely well distinguished from the brownish green of the bare plains, but the lake evidently of great size, long at least 15 m to the SE from here, & very wide. Numerous small Islands. Took round of bearings & sketch of lake. The Buttes

The occurrence of pools & swamps with water in association with little hollows & hilly regions very marked. Want of hollows holding water on these plains must have been original depressions in the drift. Hills or ridges nearly always stony & boulders, & all river valleys & depressions not marked by alluvium same. Boulders concentrated by bearing away of drift, this stony region probably thus where denudation in one form or other has operated.

looming up, purple & blue, still further to the South. Rode down to shore of lake, & tasted water, which surprised & pained not at all, or scarcely perceptibly salive, but all muddy. Shores towards sandy gravelly or muddy & hard. Seals flowing over lake. Stopped for lunch at what appeared to be W. end of lake. Took lat. & bearings. Horses nearly drowned by horse-flies, so got away again at 1.30, but found that a long arm ran W. Followed this up & end, where muddy creek or sluggish little river enters it. Followed this some miles looking for crossing, which unable to find. Camp at 4.30 on N. bank on a little stony ridge where is a small Cairn of stones. Almost every stone in this valley must have been handled at one time or another, but still remains in more or less perfect circles marking sites of old lodges. The valley holding this arm of lake looks evidently that of an old river, into which ponded back. Banks abrupt & steep to S, & pretty on, on both sides. Valley with similar width & appearance going on W, from head of lake. Higher land with ridges & bad lands toward S.S. end of lake. Very. Change plot plates. Made up notes. Here established guard on horses now being in the worst 'Indian Country'. Guard from 10 to 1, then from 1 to 4, latter calling Cook & Camp. Saw one antelope today. Daughter to horses & pots of buffalo. Chips moderately abundant. Selection area of sand hills & spurs of blown sand about N.E. angle of lake, & retreat on transit put S. of the hill ridge bordering valley to N. Thickets of sweet smelling bushes in full flower on the sand hills.

July 5. Went up stream about a mile from Camp, & there succeeded in crossing the creek which runs up valley from lake, but not without difficulty, the ford being very & stony. Pulled up by side valley to top of bank about 100 feet above valley bottom, & steered S.S. a few miles across plain. Stopped for lunch at small pool of rain water. Took lat. Changed course to nearly due South, &

travelled about 11 miles, camping at another small swamp, a few miles from Milk R, the cut banks of which in plain view to south. Country crossed an undulating prairie, rolling in places, but fair to good feed everywhere, & many little pools & swamps holding water from recent rains. Catch glimpses from time to time of the great lake to the N.E. Very hot in the middle of the day, & flies terribly bad for the horses, some grass & many dried wild. At sunset the mosquitoes came out in myriads, but these can be kept off by a smudge of buffalo chips. See but a single antelope today, feeding at a great distance. Take photo. of Butte after getting into camp. At evening camp, besides the small caches mentioned yesterday, find several little breastworks of stones. These bespeak recently been an Indian fight here at one time.

July 6. Travelled on southward for a few miles when reached brink of great valley running into that of Milk River, & holding a lake, or remnants of the great lake previously seen. Mr C & Indian set out up the valley to find out which of these streams, correct, while the rest continue on to Milk River, camping on bank shortly after 10 A.M. Our camp situated on a remarkable little knoll of yellowish rock by the brink of the stream. Heat excessive when we first arrive. Visit section in bank about 1/4 m. above, which appears the Benton. Very hot. but some clouds put at noon. Take photos of valley, & set out down valley with Mr Conley as guide to examine the valley & sections. Have a hot rough ride, the valley being so broken that impossible to keep at any one level, & occupied in sliding or climbing on the banks till 6.30 P.M. See a large rattlesnake while leading horses down a bank, & McConnell believes he heard one in his tent on entering last night. At notes & dropping fossils in evg. Set observ. on plants for lat, & turn in, tired enough. Fight the mosquitoes in perfect myriads all

The lake seen in the great dry valley is a branch of the large Pa-Kow-Ke, so reported by Mr C. on his return. The water rose to send it to unseen where ~~water~~ tested at northern part of lake. The great valley has evidently constituted the old outlet, & that some water may still drain underground, or on surface at flood times, now w marked bed. Can only be swampy at end. Valley averages fully a mile wide, not quite flat-bottomed, but slopes up to sides from west from hills. Now cultivated a fine grazing tract, with good soil, & sufficient moisture for cultivation. At junction with Milk R. valley, the old valley appears the wider, tho' being partly filled, not so deep. The Milk R valley is bounded by steep sided & partly bare banks about 300 feet high, & could seldom be disturbed but or assailed from by heights. It would be impossible continuing to follow the valley on either side even on horseback. The stream cuts very low & then cut high bare banks. River very tortuous, fringed often with small vegetation, that thus about the upward limit of the wood. Fine grassy flats & magnificent feed everywhere. Would among Indians as a winter range, & would be a good place for stock farms, but for the scarcity of wood. Although in valley anywhere that many years to come.

day without a moments intermission.

July 7. Occupied a little while this am collecting fossils in Benton's bank, were pretty good bought to last for a week or more. Leave just before 8 am., drive up St valley a short way, then turn to W by Grand Coulee & gain level country. Drive parallel to Milk R all day, but pretty numerous to for from the river reach it, Camped in a coulee to the north, with splendid feed & sloping grassy banks. The character of the main valley has also changed, the sharper & bare sides have given place to grassy slopes & low banks. Few trees of the Buttes all day. Day windy, cold & rainy, with several showers with lightning about dark.

July 8. Travelled back to bank of river, & followed stream up at variable distance all day, camping on N. bank in evening. Forced away by numerous coulees, several gulches crossed, but none very bad. The river appears to have an old wide bed to S. of that which it at present follows for many miles of today's travel. Can this change be accounted for by slight resumption of elevation of Buttes? Trees & bushes again met in the valley at evg. camp. Sharpened banks, & alone this point cliffs of Sandstone, quite picturesque. Pretty hard work keeping ahead of train & pioneering route to be followed. Accidental & interesting at one place, where the good old valley runs on, the new smaller valley holding the river. Forde the latter at first for a tributary from the N. See several antelope today. Now so near Buttes & live that necessary to take very care of times. Buffalo chips moderately abundant.

July 9. Left Camp, with Mr Cornell & Kensig at 6.55, & rode 6 or 7 miles south to the W. Butte, to establish connection with B. Lewis works, & age of black shales of W. flank of Butte, on which age of beds now so long followed, depends. Occupied some time collecting & examining. Lunch. Then climb up flank of Butte to

edge of volcanic rocks. Collect specimen of pine & observe highest tertiary drift. Ride back to Camp, arriving at 3.30 P.M. Find among other fossils in the Black Holes, bones of large rhinoceros, which cannot be got out except in fragments, which collect a few. See four pure black tailed deer, & shoot at them without capture result. A fine day, not too warm, & cloudy in the afternoon. Fine view from flank of Butte, embracing L. Pa-kow-ke, the valley of Milk R. above like, with the plain on each side scored with ramifying coulees, studded with lakes & ponds, & the gulches frame Bonyton ranging in the distance to purple & pale blue. See a large unmapped lake to N., & a second on great coulee opening to Milk R. above where we are. The great bone land indeed. We have not seen anyone beyond our own party & the Bloods who travelled with us for a few days, since leaving Old Banks. Here born in the Fort Game Country near the Buttes not a trace of an Indian to be seen. Two strange, & apparently long strayed, horses found this evening. Guard on horses two every night. 10 P.M. to 1 A.M., & 1 A.M. to 4 A.M. when cook called-up. Any stray party of Indians going north might take our horses across the line, as the Buttes form a good name.

July 10. Broke Camp & travelled on along Milk River. Stopped this a.m. to take a couple of photographs of remarkable cuttelloted & monumental sandstones which line the valley, & are well shown in all the lateral coulees. Stopped for lunch on N. bank of valley, fork flat, & cook photo. At 4.30 P.M. struck a great old valley from the N.W., in which lake had been seen from Butte. McLowell went on ahead to look up & explore, while we follow the river valley on. This now quite narrow & crooked, & evidently recent formation compared to the great valley. Mr C. on return reports lake about 3 mi long. Camp on rich flat at 5.30. Very pretty

but wind not lucky. Kill a large porcupine in the bank of the stream. Hare (Rabbit) being strayed away, Indian goes back for it. The Milk R. here a rapid stream flowing on gravelly bottom & often wooded rocky banks.

July 11. Fine day with cool westerly breeze. Travelled 17.5 miles up Milk R, camping at 5.45, about a mile & a half below Benton Trail Crossing, where passed North June 15. Rivers rather crooked, but nothing serious happened. Saw several antelope, & McC shot a goose on the river. Valley expands widely & becomes shallow in upper part. The W Butte showing blue in distance as we leave it, though still a fine prominent landmark.

July 12. McConnell despatched with mountain, the buckboard & 3 mules to survey North to Chin Coulee, down Coulee to Cypress Trail, & so back to Coal Banks. To meet us there in about 8 days. Self with rest of party steer westward along N. bank of Milk R intending to go to St Mary's R, & if possible descend it in the canvas boat. Turned away from the ridge of numerous bad coulees, & altogether been rather a rough day's travel & do not make great distance. Camp at 5.45 at a small lake about 1.5 m north of the junction of two forks of Milk River. Day fine, with strong westerly breeze.

July 13. Got away early. Made about 14 miles & camped at 5 pm on bank of river. Good luck on the whole in finding road, travelling for most of the morning in the valley bottom, during the afternoon on the hills above. Seemed for some time uncertain whether the old g.t. valley at mouth of which we are camped was that of the main stream & did not know which to steer for. On going 2 or 3 miles beyond the character of the old valley became apparent. Caught a fish which Joe says is called a 'hickory shad' in river at noon. Tried fishing again at night, but without success. Endeavoured to get wet at noon, but clouds prevented. Day cool & breezy, with little sun. See no four footed animal yesterday or today. The country seems absolutely desolate & void. Rare yellowish

Buffalo chips moderately abundant through all this County.

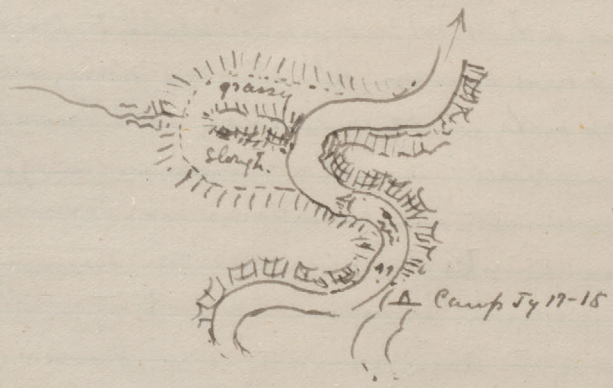
banks of valley, verdant green bottoms, fragments of simple plateau overlooking the plains. Dark green patches of swamps, & now & then the sharp snowy crested peaks of the rockies fringing the distant horizon. A cart waggon & a few men & horses wandering slowly over the face of the lonely land. Changed photo. plates & took lat. obsn. before turning in.

July 14. Made 7.5 miles up the valley this morning, travelling chiefly on the high ground above. My horse in one place fell completely mired in a springy piece of ground, & had to relieve him of saddle before he could get out. By lat. at noon halt found ourselves 6½ miles north of the line, so that, with the aunt. jaunting of the valley, we can hardly reach there tonight. Camped at small steep sided stream about ½ m. from river at 5 Pm, after making our 8 m. Saw a fine herd of Antilope today, bucks, does & kids. McCurdy killed a jack rabbit & a teal, which added to supper bill of fare. The rocks seen in a few places today, though not equal to those seen down above Milk R, are still very remarkable & curiously weathered. Strolled down stream on which we are, after camping to near river, where the sandstones resembled ruins, & overhang an angle of the valley. Sat there a while watching the shadows lengthen in the valley, & the swallows as they twitter & fossick in the air about their rocky stronghold. A ruined hawk's nest of sticks, years old, perched on one of the crags, but besides the swallows no living thing round. Sides of the valley cutted by the paths of the buffalo, so lately passed away, while on the flat above circle upon circle of stones attest the former camping places of the Indian.

July 15: A distinct war paint this am, but by noon very warm & sultry. Travelled on up Milk R, crossing numerous troublesome steep-sided coulees, which forced us back from the stream. Occupied in this way till 11 am, when stopped for lunch, finding we had crossed the Boundary Commission trail, which I was in search, without observing it. Picked up points on B. Comm. map, & found that we

we in valley about 2 m. S of the trail. Examined bank at mouth of valley on beam river, & found some is exactly similar as Scarp bed fossils, & that mentioned in B.Comm. report. Decide to travel west on the valley in which we are & spend no more time looking for the old trail. Good food going, & camp on the old trail where it passes between two little lakes. Many ducks, but too shy for my gun. Magnificent view of Chief Mt. & the rockies from camp. The mosquitoes few at first, we ~~take~~ in a swarm about dark, coming up out the valley & the lakes like a rising tide. Nearly maddened the horses. Had to collect buffalo chips & weeds & make a smudge for them. Vegetation in all valleys & low places exceedingly luxuriant. Geranium Fremontii, yellow Castilleja (seen first today) blue lupin. Astragalus sp. (only was), Geum triflorum, & a host of others.

July 16. Travel on to St Marys River, reaching it at 10.30. Looks quite unfamiliar to me, & I do not know how relative to crossing of line trail. Take latd noon & find position 49° 37'' north of line. Halt for time, & in afn ride up valley about 4 miles. Leave at 3 Pm & return at 7 Pm. Examine rocks & collect fossils. Measure section. Get all preparations made for start down stream in canvas boat tomorrow, teams to go overland to Cool Banks. The river is very swift, & shallow in places, but appears navigable. We mean at least to try it. Days for valley warm, & sun often dark pleasants cool. Passed one beautiful country today, rolling irregular small hills with innumerable pools & lakes. Fine grass & flowers. Splendid stock ranges. Glorious views of the Rockies with fantastic shadows of clouds creeping over them. Stopped & took photo from brow of hill before descending to valley. Fishing in mountain trout, which very abundant & easily caught.



Sketch at Camp. Showing wearing down of tongue of land, & its final severance.

July 17. Joe & Cusick set out with horses to fr Coal Banks, while McCurty, Wolven, & self embark on our rather adventurous descent of the St Mary's River. Do not know that it has ever been navigated, or whether it is considered navigable or otherwise. Know only when it falls into the Belly, & that the descent must be great. Looks rather unpleasantly swift here at starting point. We have left our bags, blankets, & must "make the riffle". For some miles almost continuous rapids among innumerable islands & sloughs. River probably about ¼ m. wide. After this were tranquil. Try fishing at lunch point, but pools poor. Get latitude & go on. Camp where river in fairly Canon, with high scarped banks on both sides. Try fishing, but no trout. Now we have got down where water begins to be a little turbid. Glorious day, not excessively warm.

July 18. On down river. Make pretty good progress this morn, though stream quite rapid. At noon in Lat 49° 22'. Pass. get into a series of bad rapids, between Canon-like banks. River very crooked. See no trail get to the head water. Camp at lower end of portage round rapids. The port where made, though in several places too bad to use the line. See a number of geese today, & McC. manages to shoot three young ones. A very fine day, being calm, & quite warm in River. Supper in sound quite nasty waters & prepare a hard day's work tomorrow. Climb a point to the bank, but cannot see Chief Mt, owing to the Rockies for higher intervening ground. Get a good belt in the river, & collect a number of fossils from large loose blocks, in excellent preservation. The barometer is the same this evg. as in the morning, indicated steady our great descent. Water must be causing it to fall. Canoe took several heavy bumps in some of rapids, & shipped much water, wetting us all more or less. She appears as yet quite uninjured. We very fortunately stopped to look her in one place just above a heavy waterfall into which we would otherwise certainly have run. See a dead fish on beach today, which appeared to be an Ameia, about 18 inches long.

July 19. Began the day by running across the river in an ugly place at the head of a rapid. Then portaged at one operation past this rapid, & a fall of about 4 feet immediately below it. Tracked down several rapids, but saw most, & had no more portages to make. River continues very rapid all day, but after getting out of Canon-like portion, which we did in a few miles, water not so bad, though rapids all full of boulders. Stream exceedingly crooked. This afternoon our survey in a straight line is only about 3½ miles. Got a number of fossils, & found majority now in genuine Pierre beds, which gives something definite to go by. River makes a very peculiar & sharp bend where it crosses Fort Hall's sandstones. Canoe took several pretty heavy grounds over rocks today, but appears to have sustained no real damage, though she now makes a little water. Mr C C shot several geese. Day fine, & not too warm. Partly clouded, interfering somewhat with good observation, & air full of smoke from some prairie fire. Observe a few groups of Ponderosa trees, usually shelled by fire, on steep bank today. They seem to be Douglas firs. Had some difficulty in showing fossils, as paper all done. Hope however to reach Coal Banks tomorrow.

July 20 On down the St Mary's clearing up during morning the relation between the Pierre & Coal beds of Coal Banks. In Pen, at crossing of Trail to Wachood find train of wagons camped for noon. The first strangers we have seen since leaving Coal Banks works ago. Near mouth of St Mary's find Mr Cornell, skinning rocks, being ridden over from Camp at Coal Banks. He had arrived there yesterday. Stopped to fix him some lunch, & then on down the Belly, stopping at two places to search for fossils in the rocks. Find the teams at Coal Banks, they having arrived this afn. Now all together again. Day generally overcast, clearing toward eve. with rising barometer. The part of St Mary's occupied by Pierre beds shows lofty scarped banks of pale sandstone shales, sometimes almost vert. cliffs, capped by pale drift. Numerous heavy shales at alluvium bends. From the trail

Chiefs of Tribes.

Blackfeet.	Chief Crowfoot
Peagans	Big Plume
Bloods	Red Crow
Sarcees	Bulls Head

Crowfoot now acknowledged by Govt. as Chief of the Blackfeet only. Formerly pretended some control of the whole confederacy.

Blackfoot reservation at Blackfoot Crossing of Bow Riv.
Peagan reservation on the S. side of the Porcupine Hills 15 m. west of Macleod.
Bloods on Belly R. 20 m. from Macleod.
Sarcees on Bow R. 6 m. above Blackfoot Crossing.

Buffalo.

In Spring & winter of 1876 herds all over Country north to 52nd parallel about upper part of Red Deer R., & more or less abundant down to the mouth. Herds also along the 49th parallel as far east as the S. end of Woody Mt. Dispersed, till in 1878 the herds were confined to the region between & about Woody Mt. & Cypress Hills, & S. of 50°. In 1876 no herds of buffalo were to be found south of the line to the Yellowstone. In that year all the upper Missouri tribes came N. of line to hunt. Remained at peace, & held a great combined Sun dance on Medicine Coulee, N. of the Cypress Hills, joining with the Canadian tribes. In 1877 the Yanktons & Santee Sioux combined & & extending themselves across the prairie eastward to Woody Mt, & for the most part S. of the line. In 1878 as above stated they disappeared from the Northern Country, & it is now the northern herd which is between the Missouri & Yellowstone

Crossing the valley is wider, sometimes with a considerable amt. of bottom land, & many sloughs & islands & bars. River state swift. Prairie about 150 to 200' above river.
Here thus concludes great circular bend of country to east, & feel indined to strike for Macleod to get any mail that may be there, & prepare for fresh start.
July 21. Get away at 8.30. Examine drift fences above "Coal Banks". Go on to St Mary's (14.4 miles) in one drive, arriving there at 2 P.M. Finding it impossible to reach Macleod tomorrow without making two long drives, & being uncertain about water ahead, Camp. Take photo. looking down valley. Just before reaching St Mary's meet messrs. Cochrane, McEleven, Maj. Walker & others on way back to Benton from the ~~Old~~ Bow River country. Wait a short note time, & then hurry on to see about crossing the river. Fort up to waggon tot, but not many to swim the horses. Get across safely & early.
July 22. Leave early, & drive 11 miles. In P.M. travel 8 miles, Camping just after crossing the Belly River. A warm day, with distant passing thunder storms. Country between rivers rather dry, but pasturage very fair. Belly valley very wide, with groves of trees & thick coppice very refreshing to the eyes after the bare plains. Bell & Patterson have a ranch here. About 300 head of stock. Large tracts of cultivated land. Grow chiefly oats, but also potatoes & some wheat. Indian corn opens in some seasons. At present, with only garden vegetables looking rather backward. Bell says a dry season & crops not good in consequence. Soil of flat a sandy loam. Peas with some pods filled out fully. Take two photos of valley from edge of bank, & then go to tent. A cloud of mosquitoes after dark.
July 23. Travel on about nine miles to Fort Macleod. Have some difficulty in a mud hole in the Belly Valley at start. On arriving at Macleod ride over to Fort & get mail. Observe for lat. at noon

Same objection to putting plain Ladrones to stock raising. If provided with a few animals or buy a few before increase sufficient to provide much or any food. Also now have very many horses, which object unless in last extreme to sell. These herds and numerous sat spots of quite shut & are themselves almost starving. Quite unfit the whole neighbourhood for cattle feeding, agriculture e.g. potatoes, immediate return of food.

See Davies of Baker & Co. Capt Cryer &c. & make general arrangements about next trip. In the Evg. visited by Col. & Mrs. Macleod. Take obsn. for time, & on Pole star & turn in, reading a few received letters after doing so, & taking a trip into the valley of the Shadow.

July 24 Sunday. For the most part a holiday. Attending to various Camp duties. Got West of horses shod, & very early the wagon to be reset tomorrow. Dined with Col. Macleod. Working hours &c.

July 25. Got all pressens &c gone over, & made out two sets of Everything for Self & McConnell. Wagon & very tyres reset on wheels. Compared barometer. Try to put right the bar. belonging to Meteo. dept. at Fort &c. Very writing. Yesterday & today both fine & warm. A number of Blood Indians making a dance today in the quadrangle of the fort. A party in the Centre drumming, the rest in a wider circle, two or three getting up every now & then, & in a body stooping attitude going through a shuffling sort of dance, chanting monotonously all the time. All painted up with red black &c. Dealers in hair & all pirizon. Object of the whole to get a little present of food, which given to them by Capt. Cryer.

July 26. Leave camp at 8.30, after the usual final delays. Separate from McConnell, who with Wolson & Mountain goes South to the country between the St Mary's & Belly, while I with rest of party intend to go up W. side of Kootanie or Waterton R. to the Lake. Travel by the Stand off trail, camping between 5 & 6 on the bank of the Waterton River a stream smaller than the Belly or St Marys, probably smaller even than the Old Man. Clear blue water rapid, & with stony bed. Travel with groves of Cottonwood. Get a delicious bath in a hole in the river before supper. Day very warm & dry but with a South West wind which prevented it being oppressive. Air hazy & smoky. Thunder storm & lightning away behind the Belly Buttes tonight, & sky clouded, preventing observation.

July 27. Travel along W. bank of Wolverton or Kootenie River all day. Pass over benches, generally good going & with very coulées. Get Sat. at noon. Had a bad night for mosquitoes last night, & late start this morn. Travel till 6 P.M. Day very warm & thirsty but a fine stiff S.W. wind in P.M. prevents it being oppressive. Meet a Blood Ind., & wife riding to meet Lord today, the women with a whole butcher's shop of antelope meat hung to her saddle. Five trout for supper. Air hazy as though from slight smoke all day. Rocky's in consequence rather dim & far looking. Must turn in early for sleep. Up last night observing till 12.

July 28. Morning overcast. P.M. partly clouded with strong W. wind. Showers & ragged clouds about the mountains, which now look quite near to us. Travelled all day along the W. bank as near as coulées &c would allow. Fine country, with luxuriance of grass &c in the valleys which we have not yet seen equalled. Valley continues wooded in belts groves, thickets &c. Trees chiefly cottonwood. Trees also on Dry wood Fork see a white tailed or jumping deer in the valley today. Splendid views yesterday mountains across green foot hills, among which many little seventy pools. This day last year set out for Metz en route for England.

July 29. Travelled on up river, camping at mouth of North Fork. A short distance, but heavy pulling up & down steep hills, & horses tired a fine day. Partly clouded in the afternoon with heavy clouds & local storms in mountains, from which received a few drops. Sheltered peaks pulling up into the dark grey nebulous cloud wreaths very fine. Secure quiet luxuriance of grass & herbage. Fine groves of cottonwood along river though in places burnt. Took panoramic view of rats. on two plates this am. Then lunch went rode across river about 2 m. to rocky ridge, to see sunset compared. After camp rode a mile up the N. Fork to see rocks in Canon. Nine hours actually in saddle today. Joe continues to catch fine stringers of beautiful trout at every stoppage.

July 30. Hoped to reach the lake in morning drive, but at 11 a.m. reach tributary, broke with cataracts! weks stormy. Stop for lunch a while there man on bmback appears who turns out to be Mr Brown, Kanoni's partner in ranch at Fort Yoke. An Irishman of some education apparently, but very strange & varied antecedents. Has been years all over Brit. Columbia in various capacities. Generally known as "Hunter Brown" but now no more game to be found & has to settle down farming. Set out at noon. Path very bad when nearing it. Camp at foot near Brown's house. Set to work on pack-saddles. Calculating grand trip for first time this summer. Crops generally appear to be doing well, though suffering from drought, & fatal complaints everywhere. Potatoes injured with frost some time ago, but growing up again well. This frost felt over the whole region. At Mac Leod, & probably some experienced frs at Nicola R. Wheat, barley, oats, peas, cabbage, beets, pumps, onions, corn (very small but not frost killed) turnips &c. All seed put in rather late. Oats when cut as good as those seen at Bella Coola. Some potatoes ready for use when earliest planted. Whitefish, trout of 3 kinds, pike & suckers according to Brown in lake. Not very plenty but of good size. Whitefish generally 5 lbs. Brown has a number of nets & carries fish in to sell at Mac Leod (Lorn).

July 31. Very fine & grand thing up last night about 11 P.M. Up three times fagging & keeping tent from blowing down. Went finally white at Trickfort. Repitched it in a new & more sheltered place but had great deal of trouble in keeping it standing. Gale with heavy squalls & occasional showers of cold rain all day, blowing out of valley like a funnel. Renders ascent of Sheep hill, which had planned, quite impracticable. A miserable day in camp. Cold stormy & dusty from soil blown under edge of tent. Went at work on pack saddles. Why does a strong cold wind appear to deprive one of energies so utterly?

Aug 1. Monday. 1881. Pack saddles still incomplete this morning, but got all hands to work on them. Rode down to head of foot hills into Mr Browne to see him draw his nets. Day very windy little yesterday, but fine, & calming toward evening. Got all packed & finally away at 4 P.M. & travel about 4½ miles northward along the mountains, camping in the foot hills. A little valley with pools & swamps separating the western ridge of the undulating foot hill country from the actual rocky slopes of the nets. Have now 5 horses, two carrying cross tree packs. Joe & McCarty. Aspen & willow thickets in hollows & many small hills rising from springs, & flowing northward. As I sit here the last say, of the sun on the Wolsey Range, tipping its steel grey summits with pink, while the near valley with its luxuriant foliage begins to look sombre. There is quite a different feeling in being away thus sleeping under the open sky & in actual contact with the mountains, from any produced by more distant views, however fine

Aug 2. Travel on about 11 m. northward along immediate base of nets. Crossing high grassy spurs which run out between the brook valleys, & are evident moraines. Valleys & some of slopes thick. old Cottonwood & aspen windfall with gray moss, & rank weeds coming up. Some swamps, & innumerable small lakes & pools everywhere. Have been terrible in clearing little ditch like rills & brooks among willows. Morning pretty mild, with occasional flurries of rain & wind during pass. Eve. clear, with light wind drawing down valley. Camped on a small stream, rising day, which comes from a fine valley in the nets. Uncertain yet, whether it runs to Drywood fork of Waterton, or toward Rinches Creek. Tracks go large elk & elk near camp. Very stiff today turned out by bears in search of ants. See a few grouse but no other game. Old buffalo chips here & there everywhere, & occasional bones, but should judge none killed among these foot hills for ten years at least. Clouds permit my getting lat at noon. must set up & try for one tonight.

Aug 3. Made a fair days journey, though getting into some very rough country in a few places by following too close to base of nets. Deep ravines & windfall. Spruce & pine woods. The foot hills have been pretty thickly wooded in many places, but all has been burnt, & now in some places second growth coming up. Take one photo. during morning

journey, one at lunch point, & two at every camp. Busy all day from sunrise till present, as I write this by light nearly spent. Lat at noon. Sketches of lots, pioneering, trail-survey, prospecting at lunch camps. The edge of the lots fall back westward here in deep bay. Camp is at the angle where small stream which we have followed flows large rough brook, & bth turn to NW. Deep canon with Cret. rocks. This is probably one of the branches perhaps the main stream of Pincher Creek.

Aug 4. Awakened about dawn this mg. by rain pattering in my face. Got up & put waterproof sheet over blankets, & covered rifle &c. & then turned in again for an hour. Morning showery & overcast. Travelled on down stream, the valley expanding. Saw some men driving logs on opposite bank, about a mile away. Said McCrosky on to ask them some questions. Learn that this Mill Creek, & that that in which stopped for lunch yesterday head waters of Pincher Creek. Men driving the logs called White mg. Informs us of plenty of coal on this stream. Stop for lunch & go to next coal, which away down at side of river, necessitating prolonged scramble among wet weeds & bushes. Rain. power. Try for lat at lunch camp, but cloud intervenes. Travel on to mile of Indian department. Intended pass on to Pincher Cr. but find some fossils; so stop for remainder of afn & dust to clearing section & looking for more pieces. Get some Inoceramus, & in beds analogous? Sand leaves & ferns: Potatoes here look backward. Here was passed outside the succession of high ridges formed of interstratified bands of sandstones &c. Valley expands & about 1.5 m. below joins the S. branch of the Old Man. Wide terraces. In morning passed some trees of Douglas fir about 3' diameter, many specimens of P. contorta. Feed good mixture, & soil also good but? if not too high & near lots for my municipal farm.

Aug. 5: Travelled along waggon trail to Crossing of Pincher Creek, Stopped there for noon & got lat. Crossing at Pete Prevost's ranch. Then on about a mile to Police farm, in charge of Capt. Shorchy(?) & then about 7 miles east to Indian supply farm, in charge of Mr Bruce. Camp on Creek just above the house. Took supper with Bruce & his farm hands

The ridges, scantily wooded but pine or near hill flatten out to level or nearly level country near Pincher Creek. On Pincher Creek 6 or 8 ranches. Creek bottom cultivated & in many places wide. Present is thus far trying the upper ranch, & so far apparently met good success. The Polis farm a large area under cultivation, 300 acres & good looking buildings. Capt. S. says crops look well. Supply farm situated in western extension of same wide valley with last, working out crops of Willow Cr. beds. At Sudeen farm crops of all sorts & nice garden corn (backward) & pumpkins (also backward) not injured by frost. Large field of potatoes touched but frost pretty badly last Tuesday. Crops will be considerably reduced. On corner of field escaped & all the potatoes in the garden, which lie on sloping hillside. Though some mistake seed could only be got for about half the area planted at the farm. Barley not yet beginning to turn at any of farms, while about Montreal would be yellow. Growth slow. Seed put in very early, in some cases in March. Wheat at Sudeen farm beginning to fill. Crops at Sud. farm & generally over the country injured last year, 6 to 8 inches of snow falling one day in August. Some early grain however escaped. Seems a similar misfortune experienced on the Missouri, & crops on Saskatchewan also said to have failed.

Aug. 6. Made a boom mark for Bruce & got specimen of coal from him, & directions to find the bed. Set off to hunt. Became cool bed & continue on. Stops for lunch on small stream running S. Very hot. Spread blankets out to dry. They have been very damp owing to the rain & heavy dew of last few nights. Trace on to Dry Wood Fork, follow it up some miles & then strike across to North Fork of Waterton R. Camp in afternoon relieving the heat. Had a good bath in the stream. Pleasant camp under cottonwood trees near edge of river. Few mosquitoes. They were pretty bad last night. Country all magnificent for stock. Fine growth of bunch grass everywhere over higher plains & in hollows rank feather grass & [illegible].

Aug 7. Trace southward to N. Fork, & then follow stream up for some miles. At lunch point take two photos of mountains. Travel on

to southward & reach camp at foot of Waterton Lake at 4.30 P.M. Find Mr Cornell & rest of party there, having got in two days before us. Day fine in aft., clouded at noon & clearing again this evening.

Aug 8. Mr Cornell rode out west Nelson to find position of Palaeozoic bars & characteristic rocks between here & Belly R. I remained in camp, attending to various little matters, writing up notes &c. Got good lat. observation at noon. Rev. went to upper end of main lake west buckboard & riding horse, took Camera & got a couple of views. Revisited the Cascade to see the Crown rocks there again. Day generally fine & clear. fresh fair wind wet too warm. Lake looking beautiful among the mountains.

Aug 9. Start up the Kootanie pass with Mr Cornell, 3 men & two packs. Walk to get a chance to collect mountain flora, map geology of hills as far as possible, & collect specimens of rocks. Travel up to within a mile of Forks. Take two photos. Travel on to last feed at foot of ascent to pass summit. Make track serving to sketch mountains & rocks. The hills not sufficiently well defined down on B. Coun. Map, Take photo at Camp, & after dark change plates to be ready for tomorrow as hope for some good views on summit. A splendid camp under thick spruce trees. Meet 6 men & two women of Kootenay persuasion on way back. Speak but little Chinook & hard to communicate with them, though Joe says the talk signs well.

Trees Douglas fir but not large, in valley of pass. Pinus Contorta & P. — with 5 leaves. A. Engelmanni? & A. Subalpina (?) Lower part of pass very dry. Here at camp evidence of considerable humidity. Plants Etc. In lower part raspberries ripe. Here Heracleum, & Xerophyllum tenax in flower.

Aug 10. Take Camera & plant boards on pack & ride to summit of pass. Mr C. goes S. to triangulate. Take photos, & then go north along watershed ridge & ascend peak nearly 8000' high. Take sketch of hills & distribution of rocks. Very cold stiff wind blowing & fearfully cloudy all aft., hands so cold that difficult to sketch

on the summit. Return to horses, & have tea & hard lunch, rather snow & make the tea. Mr C. comes in shortly after, & goes off to footings in another valley on way down. Spend about an hour pressing plants which too many for vasculum. Trunk started of Nuts. Constant squally of snow during Pm, with stronger wind. Over Lodhram fords pass on way back. Get about 5 o'clock on fire. Very glad at length to have taken on summit, & get back to camp among woods, though the snow flurries of the summit then represented by rain.

Magnificent view of sea of snow clad peaks forming axial summits of range, with ten & then a sharp craggy mass formed of weathered limestone. Dark round-bottomed wooded valleys lying between them, with alpine valleys verdant with short herbage when snow has too long for trees to live.

Trees. Stunted trees nearly up to 5000' where sheltered, flat & scrubby near the ground. A. Sabalpina, A. Engelmanni, ? Pinus —, & the larch occur on & about the summit ridge of pass, & run up to greater heights as above stated.

Aug. 11. A cold stormy night, with a little rain, & wind rustling among the spruces. Up early this morn., & help Mr C., to press a great number of plants got yesterday. As soon as done set off. Collecting rocks &c on way down. Stop for lunch & take photo. at forks of brook in pass. Then on down pass. Stop at one place for photo. Get to Camp about 6 Pm. pack rock specimens, write up notes &c. The mare left behind has been very sick, & it is evident she cannot do any more work for a long time to come. A fine day, not too warm, & with strong westerly wind & a few scattered cl. clouds. We were very unlucky not to have such a day yesterday. Feel reluctant to leave this spot, so much yet to be done in geology of Nuts, but cannot enter into it this year. Must stick to newer formations. Also good water & feed, fine scenery & other advantages which likely now to miss on the plains.

The valley of the Belly, from what I have observed, & what McC. tells me about its upper course is a much more important one structurally than that of either the St Mary or the Kootanie (Waterton). The flats are wide, & offer good sites for farming, while rock exposures are few & small, compared particularly to those of the St Mary. Both the St Mary & Kootanie are still actively engaged in cutting of the Fort & Cut Banks at their head, while the Belly is not so. The flat at the junction of the Kootanie & Belly is a large one. good soil. Saw it about 6 m. long by average of one wide.

Aug. 12. Break up Camp at Frozen Lake, & after the unavoidable delays incident to moving Camp of more than one night's duration, set away. Travel northward, after crossing the river, by the usual trail toward Mac Leod. Make about 14½ miles, & Camp on Belly River bank about 1.45 P.M. from trail nearly opposite the "Rocky Butte" A fine clear day, rather warm in Afn. Shot a couple of ducks on way. Very many an some of small ponds & lakes passed.

Aug 13. Rode across river to examine some rocks. Then followed train. Shot a duck & caught up to train again. Wolves howling to slept & for int. fowl to get the bird out. Travelled on to bank of Waterton or Kootenie, stating it as had intended near French point of Aug 28, about noon. Left again at 3 P.M. Followed river with McCarrell, & struck Camp in midst of rain storm about 6 P.M. Evening clearing & cool. Camp nearly opposite on outward bind Camp of Jy 27–28.

Aug. 14. Continue on down the river, make a late start owing to heavy rain & wind in the morning, & reach Camp at Crossing near the Belly R. Late. Make arrangements to despatch McCarrell to Kip, to examine the pass by the Belly R. & get seen. He will reach McLeod a day after us. Takes mountain & the track toward Evening Chill & windy, but clear. A fine cool day.

Aug 15. Came in to Mac Leod in one drive, arriving about 2.30 P.M. Camped on S. bank of river about half a mile below the Fort. Got mail of papers & letters to Fehr, & to agency in afternoon about Crooks & North, despatch sent by P.M. As we came into town a large concourse of mounted Indians seen on a little hill speechifying apparently going on. Then settle with some party of rifles, & ~~[illegible]~~ Terry tied up horses begins a dance in front of Dy. Baker & Co's Store. All dressed in feathers & full paint & war red & black &c. Some with rifles. A few

with bows & arrows, but evidently for purposes of show merely. Some almost naked, bodies ochred all over, & one striped as well, presenting most peculiar appearance. After a little palavering came into the store & squatted all round in the floor, hoping some present would be forthcoming. As Davies had put them, however, but two days before, on similar occasions of trying trade, seemed to avoid not offering that again, & so the Indians disappointed. Two small stores besides that of Bolter & Co to that same opportunity & invitation as to who should meet the Indians first. The treaty payment has just been completed, with the exception of a few of the Bloods. The Indians here had then $5 a head & are spending it fast, though not so fast as before, being scant the value of money. Most of them gay in blue, yellow, red or green blankets, besides beaded buckskin, red flannel in lots, fancy sewed cotton handkerchiefs tied round head to fancy beaver and coloured feathers, police helmets, or cinnabar &c &c.

Aug 16 & 17. At McLeod. Got specimens packed, supplies gone over & looked out. Trade the sick man for a horse, with Cochrane, & arrange the multitudinous things to be hung up in safe places. Mr Connell & Wolsey arrive on evg. of 16th.

Aug 18. Hoped to have got away early this morning, but one of mules had strayed. Detained so long that had lunch before going. Finally got away at 3 Pm. Drove 12 miles, camping on the bank of Willow Creek. A calm warm & clear day. Road dusty & prairie very dry looking the grass here now all brown as seen from a distance.

Aug 19. A long day. Had to travel about sixteen miles this morning before getting water. Willow Creek lying so far off to the left-hand way. Stop for lunch at "the Springs" of Willow Cr. after 1 Pm

Aug. 19. See tonight a comet, which it appears can scarcely be that before observed. It is in Ursa Major as shown on diagram, & to the eye is as bright as ψ Ursae, though when viewed with binocular glasses not so brilliant a point as the Star. The tail rather faint, but the sky being remarkably clear, can be made out to be at least as long as the distance between δ & γ Ursae. Outline, slightly diverging from the nucleus.

a party of half-breeds with Carts also encamping there. They are taking up Supplies from Hds. Baker Co for the Gov. Gen's. party. The breed in charge says "Some Governor is coming along" does not seem to have much clear idea of the matter. His concern merely to get his Carts through. Afternoon drove about 9 miles, camping after sundown at a swampy lake, again in company with our friends the breeds. A splendid day & though with a few white clouds here & there, the sky tonight as clear as possible. Porcupine Hills purple & yellow in the afternoon seem very pretty.

Aug 20. Drove about sixteen miles to Spring Creek, camping for lunch about 1 P.M. Journey from Half breeds that 16 m. passing to well water, except that of Wosquito Creek (= Little Bow) 1 m. ahead, were on to the Wosquito Camp early. Took opportunity to get a good plunge in the stream & read some of newspapers &c. No rocks in sight, as other means of occupation. Half breeds camps with us being occupied mostly in mending a broken Cart on the river bank. Meet a police man going to Wac Food from Calgary carrying dispatch. Hay appears to be nearly 'played' & doubtful whether we will reach McC Knight as he hopes. A fine & warm day, almost Cloudless, but strong wind to prevent its being very oppressive. Are now at the north end of the Porcupine Hills, & have in view across a comparatively low country a considerable sweep of the distant Rockys.

Aug 21 From Wosquito Creek to Highwood River, & then on to Sheep Co. making in all a long day's drive. Morning fine. In afternoon high veering wind springs up suddenly with fleet cumulous clouds rising in dome shaped masses & dark shades scud flying in the W.N.W. very cold piercing wind, ending in rain during the night. Glad to get round a good fire in the sheltered valley of the Creek. Meet Mr Hugel going to Mc Food on horseback about 2½ m. of Camp.

Aug 22. Follow valley of Creek for a mile or more, on the trail, then climb up bank, & follow fairly well ascending for several miles to rough hilly summit region between Sheep & Pine Creeks. Take wrong trail near summit, & stop for lunch near a fine spring. Return for most to old trail & on to valley of Pine Creek. Camping shortly there. Ride up valley looking for rocks, but see only a few small sandstone exposures. Country not specially good all day today. Clumps of willow & aspen reminded of Grande Prairie region on Peace River. Are again with asters, Solidagoes & other autumn flowers. A fine day with light winds & not warm. Mosquitoes still bad on arrival here, but night soon becomes too cold for them. Clear starlight. Disappointed so far in seeing any letter of structure of Country on trail. Fine view of bends of Bow River from summit S. of Camp, the pale yellowish prairie grass showing the flush green timber skirting along the banks of the stream in the great valley in fine relief. Few cut banks in this part of course of river, which implicate for future geol. investigation.

Aug 23. Travel on to Calgary, crossing Fish Creek, where a good looking farm belonging to a Mr Ellen. Cross the Elbow River & camp at the angle between it & the Bella on a piece of flat separated from the rest of it by a small slough. Visit Mr King, in charge of Dr. Baker's stock here. He has a nice garden, with potatoes scarcely if at all touched by the frost. Tubers ripe & vines with well grown balls. Turnips, cabbages, beets, carrots & all doing really well. Corn about two feet high, but not likely to come to anything. Squash, slightly touched by the frost. Tomatoes in hot beds, not yet ripe, though promising to ripen, with care. They are covered up every night. Calgary quite a large stockadded post, built about seven years ago, & now almost abandoned, but ten or eleven men here now, & the Union Jack flying. Endeavoring to put the old buildings in some sort of order before the visit of the Gov. General. This building,

with H.B. Bakers store, & buildings attached, situated on fine large flat
to S. of Bow River & W. of entrance of Elbow R. On the angle at E. side
of Elbow the Hudson's Bay post. Two or three cotton tents & tepees,
surrounded by Carts, & a few half breed & Wtes houses in the vicinity,
constitute Calgary. Took two photos. of the fort in Pkn. Making inquiries
as to trail to Morleyville, & country generally.

Aug. 24. Leave the Cart & harness to be sent back to McLeod with a
half breed train, as we have no further use for it here. Get all packed
into the waggon & start, though rather late. Camp about 15 miles from
Calgary on the trail to Morleyville on S. side of Bow, & not far from the
Elbow River. The whole country very beautiful, covered with fine bunch-grass
yet quite green, occasional small thickets of willow & aspen on the prairie.
The Elbow valley a wide hollow depression with gently sloping sides of
several miles in extent. Fine groves of Cottonwood & Spruce along the bottoms
The clear river glittering everywhere & there in the sun, & leading the eye on from
point to point to the distant serrated line of blue peaked hills & there with snow, which the Rockies have above the foreign. Evidently
too here a series of ridges formed of upturned mesozoic rocks before
the main palaeozoic range is reached. No wood at Camp, but
Wolverton taking horse down towards Elbow R., soon returned with
a good bundle of faggots across his (the horses) back, presenting a
most amusing picture. A cold northerly wind sprang up suddenly
after we had reached Camp.

Aug 25: Travelled nine & a half miles today, but the road so
rough & hilly that did not reach Morleyville, but Camped some miles
out at small pond on top of hill at 6.30 P.M. Day fine & not too
warm. A magnificent calm & clear night. Feels as though it
might freeze. A heavy dew fell on the ground this morning.
Country like that passed over before, & most little wood or brush as far as
the Jumping Pound River. Thence a series of parallel ridges

formed of interstratified sandstones, with intervening valleys, generally wooded bottomed & grassy, with small lakes & ponds here & there. Coppice & small patches of primeval wood increasing & now might soon be put on the edge of the generally wooded region. Many prairie chickens seen today & some killed, nothing of potable water this evening. Mink rats & ducks swimming in lake near camp. Rockies growing nearer, & beginning to show their ragged outlines clearly

Aug 26. Start early & travel on to bank of Bow R. opposite Morleyville. arriving shortly after 9 Am. Cross the river in fort. boat & try to find Mr McDougall, but without success, follow him to hay field but find he had gone on. Return to Camp, & after lunch again cross river. We are seen on opposite bank. Visit Mr D. McDougal to inquire about pack saddles, & find there Col Irvine, Capt Cotton & Mr Denys, who here just arrived to make some preparations for forg. sens visit to this part of Country. After tea visit Mr (Rev) McDougal, & discuss various matters getting much information as to routes &c. Borrow a pack saddle & return to Camp. Dog. Change photo. plates. A heavy thunder storm gathers as I write (9 Pm.) A very fine view of the Bow valley from the Crest of the hill just before beginning descent into it. The Rocky lots at its head wild & picturesque, though still distant. Rivers here very just fordable. The frosts of last two nights here affected the valley here, cutting potatoes badly. Tender garden flowers in Mr D McDougal's garden cut down. Petunias, poly-pods, marigolds, Portulacca & slate flowers. Barley here begins to ripen. Never seen known from seven frosts so near the western. Mr McD says considers barley & oats sure crops. Wheat scarcely tried. Potatoes planted in sheltered spots in little patches far up the slopes here escaped just so far. Indian potatoes nipped. Indians disgusted immediately gave up weeding & hoeing, even the turnips, & went here some away to hunt.

Both, Mr. Storey's & ourselves have been here (accordg to
Mrs Mc Dougal) & this region within memory (say 40 years)
from the County about head waters of Sackatchewan & Athabasca.
Storey's have inhabited here from time immemorial. Now
hunt along Mts. S. of the boundary line. —

Aug 27. Very heavy rain & thunder storm before midnight, & occasional showers later. Left Camp after 8 Rev. with the 4 horses, two packs (one saddle borrowed from Rev. Mr McDougal) Mr Crosby & Wolcan. Travelled about 7 m. & stopped when could get good photo, & examine rocks. Drove on up to Swift River, which comes from Kananaskis Pass. & followed it down to the Bow, where the falls are. Camped near falls. Took photo. & examined rocks. Day cool & strong westward, which does not suting the away at sundown. Travel along grassy terraces, but stony & dry, not rather poor feed. Spruce & aspen thickets increasing westward. Hills bristly valley now all wooded. River swift & rough in very places passed. Swift River bears at mouth. Falls just below entrance of Swift River. Rapids above, then leap of about 25' forming fine cascade, between cliffs of Cretaceous sandstone. Roar of the fall coming up through the spruce trees ~~round~~ on the bank as I write. Mountains about entrance of pass very rough & bold.

Aug 28. Occupied sketching rocks & taking bearings till packs ready. Cold wind for fingers in early morning. Felt a little doubtful about ford of Swift R, after seeing it last night, but crossed this morn. safely enough. Then looked for the reported ford of main Bow R, above the rapid, & after a little time found it. Crossed & drove on up north bank to Syndicate depot Camp. Found there Messrs Padmore & White. Stopped only a few minutes to ask about trail, & then travelled on up the Bow River pass, making about 12 miles before camping for night. Examining rocks, sketching the rocks & taking photos. Scenery wild & rugged, the new snow of two nights ago still lasting on higher peaks. Geol. features seem at first exceedingly complicated, but now that the rocks seen from many points of view, begin to unravel & show intensely different from rocks on the line, to the south. Sorry to leave these rocks now after just - partly out what might be done in the various passes & valleys about here, by help of Indian guides. Obliged however to find edge of

moraine & relations to old rocks of lake, & glacial outline merely of structure of S. edge of plateau. This now sewed, & must return to Fort-Kells & plains. Bear run appears to be wonderfully tranquil so far up the pass. Several lakes on it. Valley wide & generally flat-bottomed. Douglas fir & Pinus contorta abundant, also the black? spruce. Camp on bank of river. Sketches. Charge plates. 9 P.M. bed. Starlight, nearly calm. Cheerful sermons camp-fire. Unseen presence of the mountains about us. Last Camp in the heart of the Rockies.

Aug 29. A dull overcast morning with mountains hidden in mist. Very provoking as it renders photography impossible. Set out on return, making track survey & examining rocks. Stop on ridge over which trail passes to take view down the valley, where nearly free from clouds. Stop for lunch beside second or upper lake. Manage to take sketch of the mountains by waiting for glimpses between clouds. P.M. set in rain turns wet. Cold & very disagreable. Glad about 6 P.M. to reach the syndicate depot Stanfort mouth pass, where hospitably received by Mr Padmore in charge. Shortly after our arrival Mr Sett came in with two Indians, having ridden forty miles down the pass, coming in express from the Kicking Horse valley where he is running a line. Reports very rough country & needs more men as all must be packed along by hand.

Aug 30. Awakened early this morning by shout from outside. Mr Hegel Harry arrived with mail for syndicate parties. Could not find the ford last night, after dark & so obliged to camp in the wet bracken without blanket, & glad enough to get in to 'Padmore' this morning. No chance of photography or sketching the Gap' today all being hidden in clouds. Set out on return. Drive down to the falls on ~~the~~ my side, but find the view poor & decide not to take it. Get back to Wolseley ville about 5 P.M. & as the ford able very deep, cross the stuff in the boat & swim the horses over. Writing letters till

late to send on by Mrs Hengel, who returns ~~today~~ tomorrow toward McLeod, & will pass for in the road or perhaps camp within at jumping Pound River ~~tonight~~ tomorrow night.

Aug 31. Boat boat put together this am, & supplies looked out, & would have made a moderately early start, but times being ~~strayed~~ away, detained. Shortly before noon got off Self Watson & McCurdy going down river in boat, while for mt. waggon & horses returns to Calgary overland. Stop for lunch after going a few miles & then go on as far as Coal Creek, which appears to require some excavation & rain storm just coming on camp before 5 Rm. Continues rainy till dark. Secure coal, which a swell unworkable seam, though good fuel. River rapid with pleny white water all way down, not good for HB boats. Most rapid just below mouth of Sheep River. Splendid bunch grass country on both sides of river. Hills wooded & lower & shrubbers timber as we descend. Send letter to Wheeler & note to Foster meet for today. Hengle planning to pass him on the road en route for Mac Leod.

September 1. Run on down stream, arriving about 8 Rm at Calgary, & camping at old spot at junction of Elbow R. afternoon wet & disagreeable cold. Arrive soaked through & wood being scarce have but a poor fire. Meet Mag Walker, & Hengle coming in, to transfer my letters to him. He is going through to Benton in 7 days, starting early tomorrow morning. Visit Mrs Kennedy, who has been surveying townships on Aldus' lines, & now camped here.

River valley continues to be wooded with spruce & douglas fir on steep north-facing banks, to within a few miles of Calgary. From Jumping Pound R down, some good bottoms. Fine bunch grass country everywhere.

Sept. 2. Detained at Calgary all day, for not arriving until the 1 way on the 6 in the afternoon. Take dinner &

Aug. 29.

tea with Col. Irvine & Capt. Cotton at the fort, & discuss a number of late papers which arrive by special mail just about dark. Much horse stealing going on about McLeod, & at Col Irvine's suggestion put on irons in the corral at the fort for the night, a number of doubtful characters being about, brought up here as crew for Gov. Jens' trip down the Bow, which now it seems be abandoned. Take observations & at noon for latitude. Settle bill at King's store, get bread baked & supplies all ready for early start.
A very fine day. The mountains after several days concealment uncover & reveal themselves glittering along the western horizon in parts showing which at this distance appears to cover them nearly to the base.
Sep. 3. Up early. Heavy bad reports of the trail, or rather of the country in the absence of a trail to the south. The road between this & Blackfoot Crossing, had decided to ferry waggon across river. Being told, however this morn., by man who has just come up pass coming that quite feasible to South, & that his waggon track can be followed, change plan, sending Joe by S. route. Set off in canoe South after stopping for lunch come to fort. Supply farm see McHugh, in charge & also find there Mr Norman McLeod & Simpson? Joe nearly near farm. Arrange for a feude & and to drive horses to Crossing, for half-breed boy $8 for the trip. He to use his own horse. Go on down river nearly to mouth of Pine Creek, camping on small island early. The weather hot & wet that impossible to keep good notes. Joe & waggon camp on bank abreast. Very early this morn shoot teal and, bringing up

Sep. 3. See Mr Kerr at Calgary this afn
Says he could board Mc C for winter at
about $15.00 a month, give him a room
also would winter & care for our eight horses
for $50.00.

mass of stratus clouds. Drizzly rain throughout am, but a steady drizzle in pm. Chilly & disagreeable. Appears clearing this pm. as I write, about 8 Pm.
Barley at fort. farm harvested & good crop. Oats ready to harvest. Potatoes completely cut down, & have been nipped by frost five times during summer. Roots known, nearly ripe, & about a half crop. McHugh, who has farmed at Edmonton says climate here much superior for farming. Crops not a total failure at Edmonton last year, though snow-storm there also in August, as over whole north west.
Continued five fine fires early this morn today. Cottonwood fringing the stream, but no cottonwood fires, & Sides of valley generally grassy. Timber being scarcer as we descend.
Sep. 4. Continue on down river. Day overcast, though trying to clear up; wind rather strong N. wind in pm. Pm. Chilly & unpleasant, particularly as boots & feet generally soaked from yesterday, & this morning in the wet grass. Lunch at mouth of Highwood R, where we go up to see the reported Coal, Surprise a lodge of Blood Indians. Camp at 4.45 Pm. Glad to get inside a fire! Very pelting wet fly, but wind in luck. Get lat. at noon at Highwood, through flying clouds. Fires continues good as far as can be seen from river.
Sep. 5. Continue on down river. Camp rather early to examine an interesting section showing junction of fresh-water & marine conditions a fine day. Observe aurora in evening.
Sep. 6. On down river. Stop for lunch & get latitude at noon a few miles above the Blackfoot Crossing. Begin to see many Indians. Women out berrying, collecting choke-cherries

Just write fear
Bow R. & venus & give general note
a. b. C of.
working loc.

Notes on Coal deposit at Coulee about 5 m. from Camp near Blackfoot Crossing. Sep. 7. 1881. (See surveys & sections in field book).

The outcrop which has been worked to a small extent is situated about 6 miles east of the Blackfoot Crossing on Bow R, on a Coulée which runs northward toward the Bow. The deposit here ~~has~~ consists of two seams, the upper averaging about 1' 8" in thickness, the lower 3', the two being separated by about a foot of Carb. shale. Here, as elsewhere in the Coulee, the ~~seams too~~ seams may be regarded as practically horizontal, they having light undulating dips at angles not exceeding about 5°.

Coal about 70' above Bow River

At this spot the seams can be traced for a little over 500' in natural sections, ~~partly~~ increased in size by the removal of a few tons from the outcrop. The ~~outcrop~~ base of the seam at the lowest point on the stream (here) is about 10' above the water, at the highest, below the water level. The thickness of the seams continues nearly uniform in this place, giving say 4' 6" ~~good~~ coal, the whole of which could be worked at once.

In following down the Coulée ~~sections~~ on the right, or east bank exists. I show the Coal at frequent intervals for about a mile, proving its continuity for this distance, when the Coulée opens out into a wider valley, with fears from sides. As before stated the beds are nearly horizontal, while the ~~bed of the stream in the~~ bottom of the Coulée descending toward the river slopes down so that near its mouth the Coals are about 30' above the level of the stream. The banks of the Coulée are about 80' high, the upper two thirds being composed of boulder clay & other drift deposits, which cut on a wavy undulating surface of the Coal deposits below. There appears however, to be a sufficient depth of cover to ensure the continuity of the

along the banks. Men looking after horses, which straying about in large bands. Uncertain as to exact place of crossing, so proceed cautiously, causing often to look up the bank. A large Pegan Camp on reserve. Make learn from an old woman down at the water's edge that. Wakatagan Memoria Wahio. See at last the log buildings of the agency. Land & meet that McC & entire party camped about 2 miles down stream, Joe having also arrived. Unload on & get into camp about 3.30 Pm. Take obs. for time, & in evening for latitude on altair. Some mail here, which arrived at McLeod before Mountain left. Papers to Aug. 6.

Sep. 7. Set off with Indian guide for the Coal deposit which has been worked to a small extent on a certain part of this place. McC on buckboard with Odometer to measure distance. Self riding. Examine the coal & then decide to go down stream & round to camp by river, McC returning across country with buck-board. Walk on down the stream, & then ride back to camp at good rate, racing part of way with the Indians. Indians on scrubby little horses, & with no other clothing but a blanket apiece, talking in language quite unintelligible to me. After getting breakfast to set about 5 Pm. Cross river in canoe & survey an old Indian? fortification, & look at the 'Indian farm'. The fortification does not bear marks of great antiquity, but is extensive, & implies a good deal of work. The steepness of the slopes of the ditch & hollows dug within it seem to show that they have not been made a very long time ago. See plan in note book. The Indian farm seems to show bad management. Fields poorly cultivated, big weeds & fences bad. Indian horses have broken in & eaten down all crops. Land like trodden down bars of great coats. Evening writing up notes & packing forbids. A fine & warm day, but heavy thunder storm with much rain about dark. Here a chief the second in importance here,

seams. The general level of the surrounding prairie is about 110' above the bottom of the Coal, ~~which is~~
In the Coulee natural exposure on the Coulee the upper small seam is not well seen; but the lower shows a few inches over 4' of good coal. In an intermediate locality - the upper seam is 8" thick, the shales 1' & the lower seam 4' 4"
The seams are underlain by at least twenty feet of soft-shrinkish sandstone. The roof of the upper seam is formed of lead-colored clay shales.
This seam would be most easily opened & worked on the lower part of the Coulee where its height above the stream would be sufficient for easy drainage, & there would be room to form a dump of the waste. A level or levels should be driven in on the Coal only. Owing to the underlying clays there would occasionally be partings in the roof or floor, but from these pillar & stall workings might be extended into the Coal ~~on both directions~~.
The coulee valley is about 1/4 mile in width. A tramway might be easily constructed to the bank of Bow River over nearly level ground, the distance being about ' miles.
~~The water away in the Coulee is~~ There is seemingly very little water in the Coulee in Summer & in hot years it might be quite dry. There is no timber nearer than the bank of Bow River.
Limestone occurs in association with the beds, but not in sufficient quantity to be of economic value.

& called 'Yellow Horse' to Jasper. Gave him the holiday number of the Illustrated, 'That beautiful wretch' to look at. The young lady decided he resembled as a Mewassin squaw.

Sep. 8. Intended setting out down river in canoe this mg. while McCowell with waggons & rest of party go overland to mouth of river, examining country there. Rain began, however, about 6 a.m. & continued heavy & without the least intermission till dark. Cold & miserable enough in Camp, wood being scarce & wet. Read & wrote a little & turned in early, glad to seek warmth in blankets. Treated now & then by some dripping & malodorous Indian out searching for horses or some such errand & glad to crowd in a corner of one of the tents for a time.

Sep. 9. A fine morning. Set away after breakfast myself with McCrosky & Wolson, a weeks provisions, blankets, one tent, seat out & oars in canoe. McCowell with teams overland. Cloudy, cool & drizzling day, & river exceedingly crooked. See many ducks & geese, but no luck in shooting. Valley continues wooded, well watered, but large enough for pasture. Soil generally a fine greyish silt, based at greater or less depth on river gravels. Plains above with short close growth of Buffalo grass. Great abundance of Shepherdia argentea covered with red berries on flat at Camp, also traces of a hut or some such shelter which Indians have been attempting to build some years ago, but which has apparently remained unfinished. Number of fresh antilope tracks in slough.

Nov. The only really swift water seen today is about a mile & a half below Camp, & there could probably be ascended by steamer. Easily at least by pulling a line out. River today everywhere passable for steamer drawing 3' water.

A pretty Camp among young cottonwoods on a grassy flat, moon rising over river, & gentle murmur of descending water.

Drift. The material in the river bed not a good criterion of that on the plains. Quartzites are drawn down by streams in preponderant quantity. At Blackfoot Crossing nearly all river drift quartzite are from Rocky, while in Coal Creek & elsewhere many large Sandstone boulders, & show preponderance of lamination. The stony deposits of the creeks are on the plains, result from the wearing away of the Boulder Clay proper.

Another Camp. Sp. 10.-11.

Sp. 10. Made a good day on the river, but owing to bends total distance not great. Day fine, generally clear & mild with Lt. W. wind. Pass the last bend shortly after leaving camp, & soon pass into a region of numbers Cretaceous clays. Sides of valley often almost bare or covered with scattered sage bushes, & some-what alkaline chenopodiaceous plants. Cactus becoming abundant. Small willows here & there along sage & on little islands. Utter solitude, with the sound of the Crickets among the dry grass continuing as we pass along. The appearance of the country now shows that even where the soil good, as on flats, & probably on the plains away from the valley, it is too dry for cultivation. See many ducks & geese, but all very shy & do not come within shot. See a few band of 6 or 7 antelope where we camp, but they soon disappeared over the hills. Plenty drift-wood along the banks for fires, but the general trend of the country, with high bluff shaly banks & barren hillsides, mournful & depressing.

Sp. 11. Made a good day, the river being tolerably straight. Banks lower & better grassed & general appearance not so gloomy. Still no trees. See a number of antelope. Kill four ducks. Day warm & fine, with little or no wind. Find the Cowls at base of Pierre, & whitish fresh-water formation below following in proper order. See smoke of a large prairie fire to S.S. this p.m.

Sep. Rivers gentle & today all navigable for steamer drawing about 3' water. No strong rapids. Some large boulders here & there might be removed, but probably room to pass in any case.

Sp. 12. A fine warm Indian summer like day, with air full of smoke from prairie fire to south. Ascend the river. A most monotonous dreary stretch this am, without either scenery or rocks. Low barren looking banks, covered with scanty short grass. River pretty straight today, & valley & broken country toward very. See a large flock of waveys, shoot two teal & three golden

Ye Storm No. 2. Sp. 13.

plover. See two antelope, & several large grey wolves. Fire a couple of shots at the latter, & give an idea they name a "Close Call" in this Country. No fossils or rock specimens today, & provokingly poor specimens of the rocks.

Nov. River all good & tranquil. A few boulders in places.

Sep 13. On down river hoping to reach mouth & report rest of party in evg, but many to delay from two storms of rain & wind, & bends in river, obliged to camp just before sundown on a little island still some distance from the mouth. See one band of antelope today. Very few ducks or geese. River with grassy banks. Rather picturesque bad lands at one place. Shoot a couple of teal, but gun scatters too much. A fine tranquil starlight night. Not so many boulders this p.m. Trees begin again in the valley a few miles above camp. Cottonwoods of good size, but rather low & broken down looking. Most of the trees which have been dotted along the river & on the islands here have been felled by Indians, & left of the smaller branches cut off.

Sep 14. Find by latitude obsn. last night, that we are just a mile & a half South of the 50th parallel, & must be quite near the forks. In about 5 miles down stream reach the Forks, & find McCorvell & party camped. Take obsn. for time & at noon Fix lat. Get some wood from a small island, & start away last about p.30. Camp near opposite East end of Wolf Island, on top of bank of Belly, about 200' above water. Travel over dry bare prairie, with short mossy grass Bouteloua oligostachya &c. party surface bare. Poor grazing country. Shoot a prairie chicken with rifle, & afterwards an antilope! See several antelopes, & as McCorvell keeping survey, ride ahead greyhounds. Buck gradually approaches while others made off. Dismount & stay behind horse till antelope within about 150 yards. Comes from behind horse to turned to look

& as he stood I fired taking him in the more body way up
Ballet passing out by back of neck. Dropped at once, & never
appeared to rise again. Got the Indian Jim, who went his
squaw & young baby is travelling west partly, to skin it in such
way that it may be stuffed. A young buck antelope was very
good.

Sp. 15. A fine warm summer-like day. Travel to large Coulee which
joins the river at the N.E. angle gives great North bend. Find little
water in pools here & carry the journey to the river. Return now on a few
miles to N.W. angle of bend to shorten driving next day. Thence at least
17 miles or to Little Bow R, not no water whatever. Examine
rocks below Camp, & find some good fossils. See a number of antilope
& several Coyotes today.

Plain an undulating prairie with short grass now almost dry, &
quite yellow everywhere. On leaving Camp just below Wolf I. ascend a gentle ridge,
which runs out here, & appears to go north. Grass improves somewhat
on crossing it, & meets little depressions which here held good
swamp grass, but now dry. Feed may be called on whole rather
poor.

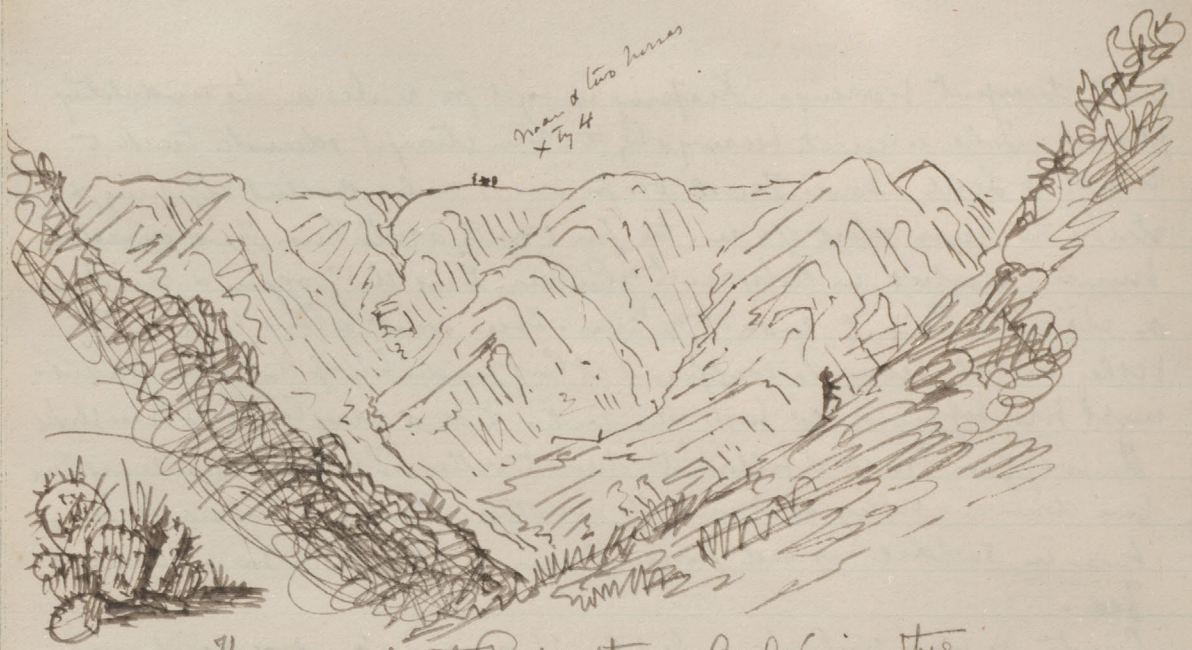
Navigation. The water has fallen much since we came down river
in Canoe, leaves, for instance, channel to S. of Wolf Island quite
dry. Just below Camp near Wolf I. a rapid which shallow & stony & scarcely possible
to pass with steamer at this season. Also at Dry Camp, (Sp 15-16)
a rapid, apparently now impossible.

Sp. 16. Another fine warm day. Make arrangements & divide party,
McCarrell going off to strike the Little Bow about 10 m from mouth,
to examine the valley to former punctured by him, then back to
McLeod. Self to go to McLeod via Coal Banks, doing some
necessary work there about coals en route. Get away on our two

quite divergent bearings, keeping in sight for miles on the undulating plain. Take a accurate bearing & try to run straight across the track to mouth of Little Bow. Travel on for over 17 miles, without stopping, & strike the river about 1/4 m. too far to south, a rather low. Land wooded, however, involved in labyrinth of Coulees. Leave the waggon & pace down on straight line to mouth of river. Then went a long time in the valley without seeing the waggon & at last under belief that some accident must have happened go back two miles to head of big Coulee. Then strike the waggon track & follow it down to valley. The waggon must have gone down one valley as I went up another. Camp about dark, being been in saddle or wet horse from 8.15 to 6.30. Supper & Bed. —

Country. A few miles from last camp ascend front of foothills or 'ridge', & then continue gradually ascending for a long way. Several miles before reaching Little Bow again begin gradually descending. Feed short & now dry, but may be called generally fair.

Sep. 17. Find ford across Little Bow. Send Wolvan down to look for ford on Main River, but none can be found. ~~Went Upper~~ Keep along N. bank instead of cutting across bend to south. Make about 8 m. to bend of river for Camp lunch. Stop on edge nearly 300' above river. Go down to look at rocks. Travel on about 3 miles & camp abreast of upper end of Big Island, running against a trouble Coulee. Again about 300' above river. Horses appear quite leg weary, & can hardly make over 2 m. an hour over level prairie. See Coal Bed, however, which must be examined in the morning, so delay not quite useless. Jim killed two antelope today with my rifle, & came out Camp with horse loaded down with meat. See a number of antelope today. They seem very abundant in all this Belly R. region. Grass improving, now fairly good feed on general prairie surface. Prairie quite undulating.



They modestly Call this a Coulée in this part of the Country.

Sp. 18. Leave Camp before 8 a.m. but loose nearly three quarters of an hour while Mr Curley trying to find way for my horse & his own across a great Coulee. Waggon goes on on prairie away from river to Coal Banks. Ride along River until Mr Curley to same place, arriving upon a hard day at 5.30 P.m. Stop only half an hour for lunch & horses never unsaddled. Extremely rough country, & obliged to travel now on flats, then on prairie nearly 300 feet above, crossing immense steep sided Coulees & gorges with wind banks fringed. Satisfactory journey, in regard to departure of Coal, which now much clearer. Start two herds of Antilope, from altered Coulees, but they off away before any chance of shooting. Choke-cherries very abundant on some of flats. See a specimen of ~~Sheep~~ Shepherdia argentea which has grown into quite a tree, with stem 5 inches through. Cottonwoods which have been turning in places since about first of month, now begin to present decidedly yellow general aspect. Nav. River in places seen today seems quite unnavigable at this season, at least, & at all seasons, in this upper part very rapid.

Sp. 19. Heavy rain during part of night & morning, preventing early start which I had intended. Set away with Nelson about 9 a.m. & rides East, making track survey to cover proposed Coal areas on prairie. Prairie almost absolutely level, & scarcely anything large enough to fix the eye on to keep course. Strike down for the river, & get involved in a maze of diabolical Coulees, impossible to cross even by leading horses. Read river flat at last, & travel back along it. Get into Camp at 4.15 P.m. hungry & ready enough for supper. Extensive stales of at Coal Mine, but can find very few & poor vegetable fossils. Day fine after the rain, but strong & rather chilly shifting wind.

Finis.

Notes on the Coal at or near Coal Banks, Belly River.

from examination of Sts. 18 - 19. —

The Belly River, in the vicinity of Coal Banks, cuts about 300 feet into the prairie, the valley probably averaging a mile in width, the river pursuing a more or less tortuous course, with flats of some size, in this part of the river. The drift deposits, consisting chiefly of Boulder Clay are about 100 feet thick on the average, & pretty uniformly spread; the measures holding the coal are thus generally cut into to a depth of about 200' by the river. The drift covering appears to be locally somewhat deeper in the immediate vicinity of Coal Banks, probably owing to the filling up during the glacial period of a hollow along the edge of outcrop of the Pierre, which has not coincided with the present river valley. Numerous Coulées or lateral ravines gash the banks of the river valley on both sides, but these are cut out for the most part in the drift, & seldom expose the underlying rocks for as much as 1/4 m. from their mouths.

The Coal seam is more or less perfectly exposed at intervals along this part of the river for a distance of about 12 miles, or from the Coal Banks workings to Big Island. Above the Coal Banks, the beds are affected by a light anticlinal swell, which brings up older rocks, & the Coal outcrop runs round to the west cutting the river again near the mouth of the St Mary. The seam at this latter locality is not so good as at the Coal Banks, & may for present be disregarded. In correspondence with the increased size of the seam to the N.E. ward between the St Mary & Coal Banks, it is found of still greater dimensions further down the river, as will be evident on scaning the detailed sections.

Sep. 20. Travel to site of old Fort Pitt, burnt about a year ago. Leave the trail to north of old Man's River previously travelled, & crossed the old Man, following the trail usually travelled in summer. The ford, however, still above a horse's belly & full of big stones. A fine day but rather cold wind. Occupied during p.m. just notes &c. Dep in river. Take lat. & altair. Last little piece of candle just going. Cool night. Now calm.

Sep. 21. A very cold cloudy morning with spitting of rain now & then. Set away, & travel pretty fast in to Mac Leod, about 15 miles, along a good & straight trail. Country fairly passed & may be classed as good grazing. Arrived about 1 P.M., Mr Connell & party getting in about two hours later. No letter in p.m., but discuss plans & meals. The mail, however, rather a slim one to you as I am concerned, there being but one letter. A cold clear starlight night with heavy frost.

Sep. 22. Making arrangements for fresh start to the west. Set supplies &c looked out. Pay McCrosker off, he wishing to return to Benton & thence to Winnipeg at once. Convening now done so can dispense with his services. Try to find two pack saddles but unsuccessfully so have to order two made. Will not be ready before tomorrow night. Crowds of Indians in town from Blackfoot Crossing, having come down to meet the Gov. Gen, & not yet returned. Continued hubbub in the store, & difficult to get anything attended to. Horrible worry coming out place like this, always gives me a headache & knocks me up generally. Correspondence not yet attended to but must be overcome tomorrow, together with much general packing.

Sept 23. At Mac Leod housed by a hundred little matters connected with outfitting. Mem. also pronounced pack saddles failed. Gladstone, who sent to Lees one, on enquiry relates that his woman took it last night, 'lit out' & crossed the

The part of the Coal between Coal Banks & Big Island lies in a minor synclinal hollow in the edge of the main outcrop which runs up toward Bear River, & Cuches it. Through this little synclinal projection the Belly River Cuts, hence the great display of coal on it. The rocks are seen only on the river & in the Coulees quite near it, never on the plains, which are as above stated about 300' higher, & form undulating or nearly flat grassy prairie, with fair feed everywhere, treeless, & with no water except in occasional small swampy ponds which dry up pretty early in the summer. The extension of the point of the synclinal pucker can thus only be estimated by the exposures on the river, (unless boring resorted to). The deps there are generally quite low, seldom equalling 10°, & are moreover undulating & inconstant. So far as can be judged, however, the point of said synclinal does not extend many miles eastward from the river valley. The beds overlying the Coal are dark clay shales of the lower part of the Pierre, & between the outcrops near Coal Banks, & those toward Big Island are nearly flat, so that even in the centre of the synclinal the Coal cannot be at any great depth. The rocks below the Coal are soft sandstones or fine clays pale in colour, & by this lithological difference from those above offer a ready means of distinguishing the Coal horizon, wherever they are seen.

In working the Coal the river valley should be utilized. Any shaft sunk on the plains would have to pass through at least 100 feet of boulder clay or before even reaching the measures while the valley is practically as good as a shaft 200' deep. Small workings might not be opened by a level or levels run into the seam following the strike, from which the coal could be

line. Finally procure one from Kanaas. No rope of any kind in town or to be had. Obliged to buy a dressed buffalo skin & cut up for lashing. Writing letters between times. A cloudy cool day, tent flapping & covering everything with clouds of dust. See Dendrey who came in this Rm from Pincher Creek.

Sept. 24. Get stuff taken up which is the left. Company barometers put letters & print appears. Relieved by a Globe correspondent who has followed the Gov. Gen. So far & offered to take him for save time. Get away at night at 12.30. Make 15 miles to Scott's Coulee; when camp. Small supply of wood. Cloudy stormy & cold weather and all day which seems to pass straight through all clothes as we ride. Dried away after dark. Boxes. Sept 5 boxes packed, to be addressed & forwarded to Benton. Telegr. to await my arrival, when arrangements may be made to forward them out.

Country passed over shows ~~from~~ to good feed anywhere though we have not yet reached the Bunch grass country proper.

Sept. 25. Horses strayed away this morning, & caused some delay. Drive on to Pincher Creek & camp at the crossing. Ride up the stream one mile, scanning the rocks. The formation (old man) is regular, & it appears that there must be close on 3000' exposed here. McConnell found some fossils; quite usual - fresh - water types.

Sept. 26. Yesterday cold & raw. Snow began to pelter on the tent after dark, & continued falling all night. This morning means three inches of light damp snow on the ground, & still snowing. Stay in camp till 1 Pm. Heavy cleared set off & cross to Mill Creek, camping on flat we slept on when on way from mountains before. Sun cloudy with clouds during afternoon, but now overcast again.

Visited this morning by Nelson, who has a farm on the

worked up its slope to the base of the drift deposits. More extensive mines might be opened & shafts sunk on the river flats, for which numerous good sites offer, coal worked up slopes of synclinal from there. Either of these modes would render unnecessary the expense of a tramway to the river, if the coal is to be used for steamers. On the premises above there is no water room for use of engines, unless struck in progress of work. Even for boiling would be necessary to haul water up from river to begin with at least. A moderate supply of wood on the river flats, & more could easily be rafted down from tributaries to position of workings.

north fork of the Old man. Brought a specimen of gold which he found in a cow's stomach last year, & which caused some excitement & prospecting in the vicinity of Pincher Creek. The gold coarse like mine I have seen in this country. Must be a vein of same kind. He states the timber colours about everywhere, but agrees that they run out towards the mountains. States that a very large seam of coal occurs in the forest Saskatchewan about 30 m. above the mouth of Red Deer River. Says the coal good. Has travelled all along Red Deer R. States that it is a much swifter stream than those flowing from the mountains about here. Varies six inches of water in places in late summer. Not very rapid. Sandy & mud quicksand. Banks of valley steep & Canon like. Bad lands very rugged about sixty miles from Blackfoot Crossing of Bow, C.P.R. Here follow forest mostly of pine for 9 miles & then about 4 miles back. Found there many bones & large logs, also silicified trees &c. Thus widening a place worth visiting.
Snow this morning has entirely disappeared except in the higher hills. Rocky Mts covered with clouds.

Sept. 27. Up early & at work getting ready for packing trip along base of mts to north. A dense mist conceals everything this morning. Complete arrangements & start out shortly after 9 a.m., the mist being lifted enough to allow bearings. Agree to meet McCrimmle about the 12th again in 7 to 10 days. Drive across to forest Fork of old Man's River. Party consisting of Joe & Nelson, with two packs & three riding animals. Reach Barnett's Ranch about noon & stop for lunch. Find only the lad who travelled up from Benton with us. Had hoped to see his brothers who have lived some time in the country & should know something about trails. The part of the valley about Barnetts' very beautiful, opening out &c.

Crops. Isaacs & Johnstone's barley has ripened. Potatoes a fair crop. Isaacs wheat put in late not ripe nor oats. Johnstones wheat poor ripe but frost cannot say ripen completely. seed mixed. Oats not ripe but not so frost. On the whole remarkable favourable & hay not yet been put in cock. Fruit trees good in both cases.

to wide terrace flats, with flowered grass everywhere. rugged foot-hills to westward, partly wooded & behind all the gigantic mountains, now white apparently from base to summit with new fallen snow. About noon weather seemed to be changing for good. Ragged clouds still clinging to & rolling over the mountains, but warm sunlight breaking through between & great rifts of blue sky. A magnificent transformation scene. The great mountains white capped with blue. The foot-hills in places with a light covering of new fallen snow, & coloured with yellows & red browns of the changing leaves, dappled with the dark green of the firs. Before long, however a gust of cold wind from the north with a mass of black clouds & clouds of snow concealing everything. Snowed for an hour or more, delaying start. Got away at last & called at Mountain's about half a mile on. Found him out, & again disappointed in getting information about the road & country. Drive across the country between S & Middle Fork, & camp about 5 P.M. on the Middle Fork. Spitting snow during p.m., & mountains all concealed. Cold & bleak, & exceedingly unpleasant. A good camp-fire & tent pitched take a tepé on some lodge poles we found. Skies cloudy & showery a little snow & then a very chance of getting decided drs. for lot.

Sept. 28 - A calm night & apparently promising fine as numerous stars showing. Before daylight however strong wind rose, & by the time we were ready to leave camp very threatening looking. Bar. falling rapidly. Mountains covered with clouds & the icy wind sweeping down the valley. Travel about six miles, stopping for lunch just outside the gap where commences the pass proper. Flurries of snow but not very thick, all hills covered. P.M. travel up the pass & camp at the lake which lies near the summit. Meet a couple of men looking for horses down the valley. They are prospecting & working over to the other side of the mountains, & camped at present near the lake where we now are. They, unfortunately do not know much about the country & cannot therefore give us much information.

Exceedingly cold & bleak, & facing the storm and roaring down the pass all day very trying. Even the lower hills thickly covered with new snow and shows little disinclination to melt. Dec 20 Little tools all day. Owing to cold & wind & the concealment of nuts, almost impossible to make good track survey. Camp in a well sheltered spot among Douglas firs, sleeping without any tent. The wind falls about sundown & some appearance of clearing, but heavy clouds afterwards conceal white sky & prevent observation. Try fishing at lunch point but without luck & fare also unlucky on the lake after camping, coming back after dark with 20 fish.

The valley from upper camp to the entrance to the pass, averages about a mile in width between the hills, but is rough in the bottom from projecting masses of rock & also probably from irregular distributed morainic matter. The river probably cuts pretty deeply into the bottom of the valley in some places, but the trail does not follow close to it. Valley partly wooded & partly grassy with good pasture. A wide flat bench just outside the gap, & a large basin coming in from the west parallel to the chute of the rocks & the line between the sandstones & fine-grained crystalline limestones. It falls to south of valley broken, with much rock showing & partly wooded but with some good grass, bare higher & more towards the pass. Hill to south may be called mountains rises to top but rough rocky scarped in places & not forested. Much higher than those to N. These mountains are formed for the most part of hard of pol. limestones, while the opposite hills are of compressed folds of sandstone with partially shaly layers though these seldom show. The strike changes markedly in these hills at entrance to pass. All dips westward, but contours range broken through where the angle of change occurs. A depile with limestone continuing stepped, about 1/4 m wide & 1/2 long leads through this range. River tortuous & surrounded by flat swampy land. Passing the depile the valley again opens & becomes at first

a mile wide, most high, generally wooded & grassy hills to the north, rougher & generally wooded hills to the south, but all lower than the range passed through, & composed of sandstones & shaly beds dipping regularly west & overlying the limestones of the pass range. Large bottoms, which become swampy & brushy near a tortuous stream through them in upper part. Terraces bordering the bottoms at height of 100' or more above them. A number of considerable tributary brooks pass the shoulder of rocks to the north, & were computing small when issues from lower end of lake (River about 50' wide & rapid & 1 foot deep at many places.) A mass of porphyry rock the relations of which could not accurately determine today, at a few miles from the lake, forms a high range of hills, which contract the valley & force the trail up on the west side. Valley most pure bred pines & partly wooded, generally with douglas fir & aspen, the latter in places very abundant together. Less snow & higher on the hills bounding the valley than on those outside the first limestone range. Higher peaks which should visible from the valley almost altogether concealed. Hope to get sketches yet in going back. Also some photographs if possible. Scenery north pass the valley itself beautiful. Trail often miles gaps brushy & in places boggy, requiring clearing out & corduroying to make it good.

Sept. 29. Weathered during the night by finding about half an inch of snow over everything & still falling. Drew the fly, which had been left near on purpose, over blankets. Nearly 3 inches of snow by morning, & snow continued falling nearly all day, though not increasing much on ground as melting away from below. Flakes filling the air & descending in the most provokingly leisurely way. No chance of travelling to do any good. Pitched the fly, & made ourselves as comfortable as we can, most fire in front, & smoke too often drawing straight through the fly. Read much up to date, locomotion being impossible from the wet character of the snow which thickly covers all trees & bushes. Glimpses of watery sunshine in the afternoon. Joe goes fishing & returns with three fine trout. About 3 P.M. walked up the trail about one mile along the lake, skirting the rocks

stop at the spring, just as had been told. This may be the main source of the middle Fork of the Old man. Forms a large brook which runs in a few feet into the lake. Issues along a horizontal line formed by joints or crack in formation on a bold cliff at height of about 20' above lake. Climbed out recess from which the spring comes, a large overhang grotto, in which a deep blue pool. An Indian device scratched in red on the rock. (see note book) a dry channel out the rock to right of main opening. Crept in a short distance, but as narrow & crooked & I had only a few matches to make light, turned back. Could not see into the main opening without falling into the water. Seems like clearing at last this Run

Sept 30. Day very doubtful looking & barometer low, but having been told by one of the prospectors (who are camped near us) who has been over the trail once before, that it is but about 4 miles to summit of pass, decide to move on at least that far, & if weather holds good strike on in the afternoon for the reported coal on Mitchell Creek. Will thus be able to examine whole section along lake, & determine whether the Mesozoic sandstones come in again to north as strongly suspect. The lake about two miles long, a perfect jewel amid the mountains but sullen looking under the leaden skies of today. Drive on about four miles very slowly, the trail being rough & marked by the rocky along the lake narrowly cut out on the faces of little rock slides. Snow added to moraines peculiar slums renders looking of knees precarious. Stop at a little paradise beyond a second lake in the same valley. It appears originally to have been part of the first but to have been separated by detritus brought in by a stream from the S.W. Sun very dim through snow clouds & a few flakes falling, but try for lat. at noon & get a rough approx. one. ('That nebulous star we call the sun' running through my head.) The prospectors who have also moved, pass us when we are halted, & often lead we let off again. Snow now falling fast, but suppose the second will soon give off, so keep on. Drive about 7 miles through

a thick snowstorm, & over a very hilly & slippery trail, the last three miles through a dense wood beyond the summit, made up of A. Engelmanni? A. Subalpina, Pseudotsuga Douglassii, & P. contorta. Obliged to go on as no opening and feed for the horses appears. Joe going ahead finds the track for large grizzly on the trail, the animal very evidently just turned off to avoid meeting us. Nothing often for suddenly slopes & walking for horse, says 'Brush crackling ahead' evidently expects to see the bear but hears a voice and our perfectly friends camped under a very dense clump of spruce trees. Glad enough to warm ourselves at their fire, make a cup of tea, & afterwards get a camp & fire of our own & begin to try & dry our clothes & blankets. Snow continues fairly thickly, straight down in great flakes among the giant spruces & firs which crowd each other in this narrow valley. Trees heavily loaded & our fire brings down avalanches though when the branches begin to warm. Not sorry to see the snow cease to fall so fast after dark, being some fear that we may be snowed in here altogether.
After passing the Columbia near the lake the Mergere sandstones come in again as suspected, & continue as far as we have gone. The coal must be in there, but here our weather has not inclined us to go further in search yet. Until the mountains to that comes it may be 20 miles off yet. The country all burnt wood here & there thick forest of P. contorta comes up, pass like belt across the summit. On outside first as described, with green & verdure of wood greater humidity. The feeders of the lakes above mentioned rise in a wide hilly country composed of sandstone ridges & moraines, the latter generally flat topped at different levels & some pressed up against the mountain sides. This forms a depressed area among the mountains & even difficult to tell where the actual watershed occurs, a deep

narrow valley among the mountains or running to S.E. of the trail.
Oct. 1. Ground covered with over 6 inches of light snow & trees heavily laden with snow & horses clothed on every twig. Barometer going up, but evident storm or no storm must start back at once to avoid possible entire blockade of trail. Packers all frozen & snow or ice over everything making start difficult enough. Get away at last, horses sliding & falling up at every step, & sky still completely overcast. The narrow trail winding through the muffled world of green for the first few miles singularly weird. Sun after a while struggles through & now & then a glimpse of blue sky. Travel back to lunch camp of yesterday, & stop there for about an hour & a half to warm & dry out. Snow about second scarcely drawing & a keen wind. About two miles from noon camp, riding ahead, find the track of our grizzly again, evidently going along just ahead of us, & leaving the dirty marks of his great broad feet & claws on the snow, not scarcely a new flake on them. Travel on as silently as we can, hoping to overtake him, but in about half a mile find he had left the trail, hung out the back again to avoid us. Snow flurries in afternoon. Walk back most of way scaring the rocks. Shot a grouse. Joe stays behind for about half an hour at the spring & comes at camp shortly after us with a dozen fine trout, one being a large lake trout. Glad to get back to this side of the mountains, a place in which the trees evidently share. The snow here not nearly so deep as across. Supper of broiled lake trout.
Oct. 2. Snowing this A.M., mountains all covered. Stay in camp till noon & try unsuccessfully for latitude through drifting snow-clouds. Get horses in & move down the valley nearly to the gap. Snow on

ground deeper eastward & light cutting Eastery wind blowing. altogether quite wintry. Camp under some sheltering Douglas firs.

Oct 3. Snowing in night & snowing heavily all day ground covered thickly wet soft wet snow & trees & bushes everywhere loaded. Wet-wet while moving Camp. Plenty fire-wood but cabin wet smoke all day. Reading & writing as circumstances permit. Bar. going up. This weather must surely soon come to an end.

Oct. 4. Determine to move Camp today in any event, & morning actually looking a little better than usual, though everything still covered wet clouds & mist, & snow falling at intervals. Travel down through 'the Gap' Air warmer & snow all very wet. Fully eight inches on the ground & trees & bushes absolutely heaped wet snow. The trail in the Gap is very crooked but exceedingly beauty wet thick willows. These completely drench us all in spray. We going head first through whole mounds of snow. Mountain too again reminiscences. Travel on down the valley nearly to Camp of Sept 27-28. Camp in a sheltered valley; get a great fire going & endeavour to dry out. A miserable day indeed.

Oct. 5. Skies cloudy this am., but veering wind & during night sky for a long time clear. Set traces in packed up & off, but everything goes very slowly as men cold & wet & by no means keen about moving at all. A smart shower of rain as we set off but this did not last long & before noon very indication of clear off for good wet actual sunshine now & then. Travel four hours down the valley, deciding not to cut across to North Fork as high up as first intended as snow so deep on the hills, though now walking fairly. Camp shortly after 2 p.m. on a pretty flat with Cottonwood trees. Afternoon fine & clear. Examine rocks of neighbourhood & find two 31 seams of good coal. Joe going fishing catches 33 fine trout, including two large salmon trout. There not only very little of game but from

substantial addition to supplies, will not intended for so long a trip as we are proud to make. In doubt this cam, whether to go back to Mill Creek as this about date attempted pressed to meet Mr C. then, but finally decide that as the favorable weather of the last week is likely also to have interfered with his work, that had better finish the northern trip as far as possible before returning. Set a photo. of the snowy mountains & foot hills. & in the evg. a latitude? or altitude. We are abt 49° 35' At this camp just beyond the ridges formed of the flexed rocks, though the rocks still sharply folded where cut out by the river. A clear cold frosty night, but quite delightful to be dry once more, & cam enjoyed our fine cottonwood fire. Best camp of the trip yet. Hennes finally well played out by cold wet weather & little to eat, but well filled up, & hope rested here this p.m.

Oct. 6. A fine day! warm about noon, & with little wind. Travel eastward & strike a stream which at first imagine to be the North Fork, but on climbing hill beyond see the dist bank of the real North Fork about 3 miles off. Drive across to it & stop for lunch. Get. latitude. Drive on up North Fork, camping at 5.15 on a small stream abt quarter of a mile from the river. The North Fork about equal in size to the South Fork & both larger than the Middle Fork, though the course of the latter so long. Camp without patching flys. Bright full moon by which I write. Get. lat. or altitude at 6.30 Beautiful moon of the note & foot hills glittering with the freshly fallen snow, the country about here now nearly all bare again. Pass Nelson's ranch, & see Nelson. Tells me of coal about 10 miles up stream. The main Canon like to Nelson's place. Then a fine bottom well suited for agriculture & with good soil. Say 3 m. long & half a mile wide. Flats above not so large or good, though still cultivable. Fine grazing country everywhere, particularly on flat bottom north of North Fork. Find an Indian arrow head on the prairie just off the Canon Creek point.

Oct 7. Another fine day, though a strong cold westerly wind which sprang up during night continued till sunset. Got away a little earlier than yesterday, & camped at night near the gap by which the North Fork issues from the mountains. A little snow still on the ground about our camp. Got two photos, & changed plates after dark. Got lat. by Altair. Rode several miles further than the packs travel but Ben & Ben endeavouring to find coal & following wind levels for that purpose. This strong cold wind really a Chinook & is making the snow vanish fast on the foot hills. Pines very gnarled stunted & picturesque along river in many places today. Apparently semi five-leaved species pred in S. Kootanay pass & elsewhere. (see specimens). To Change plates the fire & room being too bright, my up buffalo robe on some sticks of wood & work under it - on knees. Appearance of a fine night & so we fly pitched. Pass continues to show bottom of same width most of way, or benches below them bottoms. Soil good, but probably too high for farming. Stream very rough & rapid with quick descent.

Oct 8. Had intended driving up to the Gap, examining limestone rocks there & taking photos, but task again at noon. On awaking morning, found ourselves covered with half an inch or so of new snow & the air full of descending flakes with no apparent prospect of clearing. The weather seems to have got into a hopeless relapsing state & our provisions will not stand much longer delay. Decided to strike down stream at once & get out of the mountains at any rate as snow likely to be lost sooner & longer there than elsewhere. Got off & travelled down on S. side of N. Fork about 10 miles, from 9 Am to 1.45 Pm. Camp on N bank about 1.5 m. above the bend southward. Cover thick with dry snow all day & foggy

hard. Miserably cold unpleasant work travelling. Joe almost mutinous about moving camp at all, but had a few words with him which put things right. Air full of immense flocks of waveys & other geese & ducks. Rain. Examined rocks above camp, & chatted musters by light of fire in evening.

Oct. 9. Looked like clearing last night, but all signs fail. Snow again in the night & air thick with light dry snow this morning. Weather very cold. The letter were freezing wherever water taken & quantities of ice & slush moving down stream. Every appearance of perfect winter except that green & yellow leaves hang abundantly yet & many quite turn. Certainly extraordinary & provoking weather. Struck somewhat across low bordering ridges of foot hills, steering by compass as well as possible in thick snow. Travel about sixteen miles & camp at old camp yesterday 5–6. at 3 Rem. All glad enough to get a fire going. The new snow light & very letter in the valleys, but on the hills passed over mud of the old state underlies the new rendering the going heavy. Hand compass sluggish today owing to cold, & obliged to carry it in shirt pocket to keep it nimble enough. Passed two small lakes absolutely crowded with waveys & ducks. One not 1/4 m. long estimated that at least 1000 waveys & an equal number of ducks. No cover along edges & too cold & cramped to get to camp to wait, but took a few rifle shots into the crowd, of course unsuccessfully.

Oct 10. No snow when we first got up this morning but soon commenced again in earnest, & so thick & the trees so set the horses in that I decided to wait a few hours & see if it would not clear, as the distance in to Mill Creek could not be great. Got away at noon but with little abatement of the snow, which continued falling thinner & thicker all rest of day. Keen northerly wind to which, however, we were able to turn our backs.

this time. Take a compass course across the foot-hills, steering nearly due South & striking the South Fork at our old crossing just above the Canyon. On topping the hill above Mill Creek see the tent of the rest of party pitched near where we had left it. Snow very deep about here, fully a foot over whole country & part of the old snow of first storm still lying below today's. Got damage, patient tent which pitched after our arrival & a small fire going in front, which burning the quite diabolical behaviour of the smoke, made life endurable. The weather has been terrible here too, wet rain snow sleet & we have had penalty McCrivell from doing much work. Turn in early with the snow still coming down.

Oct. 11. Several inches of fresh snow on the tent this morning & still snowing. Turn all hands to break through all day, horses, & labor & light snow falling in afternoon. Take today in camp to rest horses & men, McDyer very late & dodge smoke round the Camp fire until Pete. Write & read a little. Shoot a prairie chicken which incautiously ventured too near, & take a photo of our snow-bound Camp.

Oct. 12. A little snow falling this am., but evidently clearing. Get camp struck, waggon cart & buckboard brought down & all prepared & move off, driving loose horses in front to break the track. Snow one foot to 1½ foot deep & hard to follow the road, which quite unbroken. Toil slowly across the hills & Camp about a mile beyond the Fort. Farm just before dark. Afternoon very fine & warm clear & cold. The thermometer running down rapidly. Set up year slightly frozen. Make a small Camp fire, wood being scarce, & do the best for milk to keep warm. The crops on the Fort. farm not taken in & under the snow immense flocks of waryo & geese feeding on them, tame enough to be easily shot. Get a small mail at the farm.

Oct. 13. A clear cold day without a cloud & very little wind. Set a late start & travel slowly on through snow, now 2 feet less in depth, to Scott's Coulee, — about 15 miles — reaching there about 7 pm in bright starlight. Min. at zero last night. Thermt +8° when we arrive at the Coulee. Pitch the two tents so as to face & put one small fire of the wood we have brought along with us, between them. Set up round the fire till 11 Pm. Temperature ameliorating & sky clouding over.

Oct. 14. A heavy snowstorm in progress this am, set packed up & off by 9 am. & travel in to Macleod, making camp at 3 Pm. Snow ceases falling in the afternoon but glare from belg concealed sun very trying to the eyes. Camp beside an indian grave about half a mile below the fort. Visit town in Pm, & endeavour to make arrangements for getting to Benton, & McConnell's wintering here. Manage to borrow a camp stove from Major Crozier, which makes tent much more comfortable.

Oct. 15. Sight snow again this am. Start town making arrangements for breaking up party. Finally decide that McConnell goes to Calgary, & self with Steele to Benton.

Oct. 16. Set all stuff gone over & separated, & provisions looked out. Day cold. Generally overcast. After some difficulty get moccasins & mits through kindness of Capt Crozier. Dine with Col Mac Leod. Go over & settle up acct. at Davis' set credit of $200 for McC. with King at Calgary. Draw $300 to pay off Mountain & Molson.

Oct. 17. Snowing again this morning. Busy making final preparations for break-up & start. Horses lost & everything looking very blue for a move off. Seems regular winter. Have arranged with Whiteley, who is here from Bow

River to return to Calgary with McConnell & the teams. He has an Indian with him & between them they will be able to drive through if the snow does not turn out too bad. Can get no oats for the animals, though they are rather played out with summers work & the late hard weather. At High River (63 m.) they may be able to get oats & can at least feed hay. Whitely's Indian & horse also lost, but before I leave our horses, Whitely & his Indian on hand & everything looking well for a move on McConnell's part. McC goes credited with $200.00 with King of D.G. B & Co. King offered to winter the horses & board McC when I saw him same time ago, & I hope it will be all right. Steele, it turns out has ~~six~~ five, including himself to go to Benton. Self with Quick & Joe added to travel in wagon & buckboard. Two little horses for the wagon, two for the buckboard & two loose. One of Steele's passengers an Indian with sore eyes, who has been some years on Bow River & is now going East. Two others men who have been up north herding cattle for Cochrane. Altogether a motley camp am. Set away about 2 P.M., & travel in a couple of hours over to Bell & Pattisons Ranch (slide out) on Belly River. Day very cold camp & clear with snow not very heavy on the ground. Pattison travels along with us in his own wagon & after finding the key which froze in on a tree above the door lets us into his cabin where after making a fire & getting supper cooked we spread down, finding just room enough on the floor to do so

Oct. 18. Call at 4.15 Am, breakfast about five & moving off at 7. Snowy fast & a couple inches of new snow on

Wrap Lep. 20' above Belly R.

Oct-18.	8.45-Pm.	B =	27.10
19.	12.45-Pm.	B =	26.915
"	6 Pm		26.87
20	9 Am.		26.85
"	Noon		26.84
"	7 Pm.		26.88
21	10 Am.		27.02
"	2.15-Pm		26.93
"	6 Pm.		26.88

the ground. Wagon now pretty full with luggage & wood & oats taken in here for the long uninhabited stretch to the Maria's River. Have some difficulty in crossing the river, which partly frozen over, & cannot pull up the hill beyond with the bad roads & untrained little horses. Have to haul the wagon up light & carry up the load. Get away again at 9 a.m., & travel on through very thick dark mountain, just able to follow the trail. Sky & prairie inseparable mixed & no horizon. See now & then a darker streak which appears to be on the sky but on approach turns out to be some line of pines tops standing above the snow. Seek at length shelter to strike for Wood's up, where can get shelter & feed for horses. Arrive at the old fort at 4.30 p.m., & glad to get inside, where hospitably received by Atkins who is living here. The snow has now got so deep that scarcely possible to get along & hear very discouraging accounts of the road ahead, brought in by old Bull Shield, who arrived yesterday on horseback from the Maria's. Decide to remain here over tomorrow & see whether it may not improve either by thaw & settling of the snow or strong wind.

Oct. 20. At Wood's up all day. A fine bright day but no particular change in the snow though softening a little in the sun & settling down. Hear this morning that a mule train has reached the upper crossing of the river on way in from ~~[illegible]~~ Mac Leod to Benton. Try to induce Dr Akers to go in to Benton with us & take part of the road. Take a couple of photos. Writing & reading. Started this morning with purpose of getting runners

Red Crow Chief of Bloods says at first treaty was given money worth $5 each, now worth only $1. What is the matter. Wants as many as given him of ones, but all fives. Says why making the money right as well make it worth five as one!—

Oct 22.	Wrote up. 7 Am.	B:	26.97
" "	Prairie at hd. of 9 m. Coulee		25.75
" "	Kipp's Coulee 7.30 Pm.	"	26.60
Oct 23.	7 Am Kipp's Coulee	B =	2.495
"	8.30 Pm. Milk R flat		26.17
24	7.30 Am. " "		28.15
"	Noon Old Camp at Red R.		26.03
"	Camp at Rocky Spring 7.40 Pm.		25.68
25	" " " 7 Am		25.60
"	Prairie N. of Marias R 8 Pm		26.28
26	" " " " 7.45 Am.		26.18
"	Prairie above Sandy of Marias Valley 1 Pm.		25.70
"	Prairie between Marias & Teton 7.30 Pm.		25.97
27	" " " " 7.30 Am		26.06
"	Summit between Marias & Teton		25.96
"	Camp. Prairie N. of Teton 8 Pm		26.20
28	" " " " 7.30 Am		26.10
"	Flat 10 above Teton at Crossing 11 Am.		26.37

put under the waggon & so go in, but after search can find no trees of proper sort in vicinity. So at last three who went out to search say

Oct 21. Another long weary day at Whoop Up. Had decided last night to pull out this morning in any event unless wagons they had but Akers consenting to go with us to Benton & divide the load & we will wait a day determines us to wait. Day fine, drawing in seem like yesterday. Write out letter on stock-raising County for Gazette. Take another photo. of group of Indians. Amuse myself by taking notes of establishment of whisky trading posts from Akers. Read a little & by degrees day slips away. A lot of Indians come in today to trade. Place swarming with them so that they can scarcely find accommodation in the buildings. Rooms now full of them. Bullers Chief, a sketch of whose profile made, send to me one of the most influential of the Blood Chiefs.

Oct. 22. Got away from Whoop up about 9 am. Bill Akers with light waggon & pair of good mules joining us, & taking me & one of men with part of baggage: Snow now considerably settled & melting in the sun. A splendid clear day with light westerly breeze. Stopped for noon when we caught up to a couple of teams on way to Benton. Got to Kipp's Coulee long after dark. Tent pitched & supper. Enjoying after sundown. A fine clear sky over the Rockys with golden yellow glow over the clear cut peaks & orange clouds above

Oct. 23. Up before day & started about sunrise. Travel on to milk River, getting in again after dark. Fine views of the Buttes. Snow again melting & a fine warm day with light westerly or south-westerly wind. Snow, however still deep on the ground in milk R. Valley.

Oct. 24. Leave Milk R, crossing it on the ice, & drive 12 m. to Red R, finding the snow less than we had anticipated from a distant view yesterday ridge between. On again up the long western slope of the Rocky Spring plateau. Camp before dark on patch of bare ground at the Rocky Spring See some abandoned oc. wagons at the Cent of the Rocky Spring Ridge.. A fine warm day. Snow going fast. Absolutely Cloudless.

Oct 25 Off at 7 am & travelled fast on down grade to alkali flat, leaving no snow on the ground. Then struck snow again, which continued growing worse, & becoming badly crusted as we approached the Marias. Continued on however, at good rate, & camped after dark at the mouth of Coulee on the Marias. Much snow on Maria's bottoms. Light winds during day. Heavy lightg late latter afternoon. Wet-drivers going back cont often from the Marias & the wagons we had seen yesterday. Tell us, among other items, that there had been a fight between Indians at the Battles Ford about six days before. Crees vs. Piegans from the Marias, latter victors & brought in two Crees scalps. Several Piegans however, wounded. Have a bad cold & cough unpleasant at night.

Oct 26 Crossed the Marias. No ice to stop waggons, but ford pretty deep. Stopped a few minutes to replenish supplies at the little trading post there, but could get no oats, the crops having been covered up by snow, which has been on the ground here 15 days & still lies in broad patches. Climb the very hill out of the valley & stop for lunch on top, then drive on late 4.30, Camping on Edge of a Coulee on muddy partly snow covered & disappearing ground.

Comparison of Barometers Benton N.H.
Oct 29. 1881

9.50 a.m.

Mercurial, Corrected	27.108
Aneroid 207	26.88

Height of observation point 2839 feet

Oct. 27. Drive on all day over prairie between Marias & Teton, camping about sixteen miles from "Leavys" of Teton on an open prairie near edge of Coulée. Meet a heavy ox train on way out to Mac Leod with supplies for I.G. Bakers agency.

Oct 28 Weather cool early start & drove down to "Leavys" of Teton where got some oats. Then drove on about seven miles, turned round & stopped for lunch. Got into Benton about 4 P.m., & put up at Choteau House, leaving boxes &c in Baker's store. An overcast day with a few drops of rain & lt. variable winds. Snow still lying in patches wherever any shade. Got letter from home, but cannot telegraph as the wires are down. Bath & barber with a civilized meal greatly improve matters. Reading papers &c.

Oct. 29. Send telegram home. Pay off Joe & Carick. Ship boxes of specimens by team going to Helena. Go over accounts, memoranda & papers. Write letters &c. Decide to leave on Tuesday morning. Not easy to get everything ready by Monday, & besides wish to get rid of cold if possible.

Oct. 30. Sunday. At Benton. Reading writing &c & generally resting.

Oct. 31. At Benton. Close acct at I.G. Baker's, giving draft on Mr Selwyn. Make arrangements for passage on stage &c

Nov. 1. Leave by stage at 7 a.m. for Helena, about 150 miles. Stop for dinner at 28 m. springs. Supper at 'Leavings' of Sun River. Showers of snow at intervals all day, but little lying on the ground. Get almost hopelessly stuck in the mud near a lake between 28 m springs & Sun R. The most tremendous mud I have ever seen.

Nov 2 Drive on all night. Cold & unpleasant with occasional light snow. Leave stables at Eagle Rock at 3 am & crawl up to & over the summit between the Sun River & the Dearborn. Get down to Dearborn about 8:30 a.m., breakfast & on again. Drive up through the Prickly Pear Canon also very fine scenery. Pinus ponderosa & Douglas fir abundant. Our axles heated & wheel jammed on this afternoon, keeping us about three quarters an hour before we could get it off & cooled, but luckily that no worse. Reach Helena about 10.30 p.m., very tired & sleepy. Put up at Cosmopolitan & have a few oysters for supper before turning in. Cold rather worse this evening.

All may be classed as foot-hill country from Eagle Rock, & from there to Prickly Pear Canon sandstones & shales sharply folded as in foot-hills to north. Coal seed to occur on Sun R, & also near Dearborn & in other places. In Canon older rocks appear but cannot tell much about them. A zone of red & purplish sandstones & argillites, perhaps Triassic, very prominent.

Nov 3. Cal Helena all day. See Mr Ashby on friendly of Mrs Greenwood. Draw money & arrange about tickets East, look round town. Call on Mr Sanders to show letter of introduction from Col MacLeod, but find him out. Mr Cullen & Mr Sanders call on me at hotel in evg. Get letter of introduc to Mr Clarke at Butte, & copy of the publication of the Montana Hist. Soc'ty.

Nov 4. Secure stage at 6 a.m. full cargo of passengers & luggage. Drive from Helena to Boulder for dinner. Cross spur summit of about 5400'. Change coaches at Boulder & after some delay set off again & drive to Butte. Cross summit in "pass" of perhaps about 6500' Douglas fir & P. ponderosa evergreens from Helena. P. contorta begins on second summit at about 5000 feet. Stop for supper at a little stage station in the pass. Snow small nowhere deep & drifted. Resemblance to Cariboo country. Granite rocks change poured on. forested & weathered into peculiar forms also

Boulder, giving name to stream. Difficulty of finding accommodation at Butte. General lack of civilization & character of people rather not in travelling repulsive.

Nov 25. Up in good time & go about Butte city arranging for shipment of baggage to Sy, & making a few purchases, Call on Mr Clarke, banker, to whom had letter of introduct. from Cullen. Get from him letters to managers of Moulton, Alice Mines & one of Smelting works. Hire buggy & pair of bones, & after lunch set out first Mr Burdick. Go thoroughly over the ~~Alice~~ Moulton mine & works with Mr Clarke's brother, the manager. Mill not yet in operation but just completed, a very perfect piece of work. Alice mine down to a depth of 700' steps in operation only about 5 years. After looking over these works drive down to smelter, where

ores containing antimony, zinc &c &
not suited for dry milling are smelted
to form of matte & sent thus to Colorado.
Two reverberatory furnaces. In mines
here valuing under $20 a ton taken out
& hardly called paying ore unless
about $40 va. In Mountain the gold &
silver does not run with the galena
& black jack, the pay streak holding
these being poor, but associated
carbonate manganese. Turn in
early this eve. as we have to get up
for stage leaving at 2.30.

Nov 6. Up at 2.30 & off by stage in a
blinding flurry of snow. Reach depot, ~~got~~
at Silver Bow, the present terminus & get
baggage checked. Off at 5.15 hence & thence a
long wait for breakfast. Ride southward
all day through dry valleys of greater or
less width with P. Madrona & Douglas
fir woods on the bordering hills & mts.
Some cattle & a little cultivation
here & there with irrigation. Enter the

broad valley of Snake R. but cannot
see the 3 Tetons owing to clouds
a little snow lying about everywhere.
Good new handsome narrow
gage pedimen. Cross Snake R.
aftn. dark. Sage cactus &
little water, everywhere. Rye grass.
Nov 7. Salt Lake silvery sheet in midst
of snowy mts & plains in sight when got
up this a.m. Reach Ogden for breakfast.
& leave about two hours there, meet Dr.
Higgins of Mr Strauss of Victoria on
the overland going East. Dine at
Evanston & Supper at Green R. More
or less snow everywhere & occasionally
snowing
Nov 8. Road frozen hard. Breakfast at
Rock Cr. Dinner at Cheyenne, Supper at
Sydney. Day fine. No snow on
ground after getting down from Sherman
Summit.

Nov 9. Breakfast at Grand Island
Dinner at Fremont. Arrive in time
at Omaha & Council Bluffs. See baggage
transferred & get pullman by C B & Q
Ry. Say good bye to Bendick, Rowe,
& Brady.

Nov 10 Arrive in Chicago a little
late, but train East does not leave
till 9.15 P.M. Omnibus to station. Leave
baggage & take Car to Grand Pacific
Hotel, visit Strauss. Walk round
the streets. Stroll off heard. Dinner.
Cab to station.

Nov 11. Road (Chicago & Grand Trunk)
very rough last night. Some time late at
length nearly 2 hours late. Breakfast at
Flint. At Sarnia being too late for the
regular train sent on as extra to
Toronto. Run very fast with few stops
& nearly make up time before reaching
Toronto. Dinner late in afternoon
at Stratford. Supper at Toronto.
Telegraph home from Guelph.

ESTATE NOTICE

Auction Sales.

By Shaw & Gowdey.

ANNUAL FALL TRADE SALE LAMP GOODS.

By order of the EXCELSIOR GLASS CO. (Limited) we will sell at their Factory, Parthenais, near corner St. Catherine street,

On Tuesday Next, 6th September, in the afternoon :—

2,500 Cases LAMP CHIMNEYS (assorted),
2,000 Dozen LAMPS,
1,000 " LANTERN GLOBES

and other goods. Terms Cash.

☞ The Company assures the trade every lot will be sold; nothing will be withdrawn. Large dealers will find it to their interest to attend.

Sale at THREE o'clock sharp.

SHAW & GOWDEY,
Auctioneers.

210

SUTHERLAND & CO.,

SUCCESSORS TO

Scott, Sutherland & Co.,
TORONTO.

REGULAR SEMI-WEEKLY SALES

— OF —

Dry Goods,
Clothing,
Boots and Shoes and General Merchandise

throughout the season. Next sale on

Tuesday, 13th Instant.

Auction Sales.

By Benning & Barsalou.

SALE OF Damaged Goods.

The Subscribers will sell at their Stores, Nos. 86 and 88 St. Peter street, for account of Underwriters or others concerned, on

Wednesday, 7th September,

P. K. & Co. M. (in diamond) 67

Montreal.

ONE CASE SEALSKIN

Damaged on voyage of importation ex. SS. "SARMATIAN."

Sale at TWELVE o'clock noon.

BENNING & BARSALOU,
Auctioneers.

212

By Thomas J. Potter.

REAL ESTATE NOTICE

CAPITALISTS

Desiring to make good REAL ESTATE INVESTMENTS will have ample opportunity during THIS FALL at Subscriber's Room.

AND FOLLOWING DAYS.

CONSIGNMENTS SOLICITED.

☞ *Advances made in Cash when requested.*

Our Mr. J. C. JEFFERIES will be at the St. Lawrence Hall on MONDAY and TUESDAY, the 5th and 6th inst., and will be glad to see parties having goods to sell.

SUTHERLAND & CO.,
TRADE AUCTIONEERS,
211 **TORONTO.**

Tenders.

CANADIAN PACIFIC RAILWAY.

TENDERS FOR STORES.

Tenders will be received by the undersigned until September 7th, 1881, for the supply of GENERAL STORES required for use on the Western Division of the Canadian Pacific Railway, Winnipeg, during the ensuing twelve months.

Forms of tender and full information may be obtained on application at the Office of the Company, No. 123 St. James Street, Montreal.

The lowest or any tender will not necessarily be accepted.

CHARLES DRINKWATER,
Secretary.

Montreal, 27th August, 1881. 206

Tenders for Straw.

TENDERS FOR

Furnishing Straw to Exhibitors

During the whole time of the Exhibition will be received at No. **63 ST. GABRIEL Street**, until

12 o'clock WEDNESDAY, 7th Inst.

(By order.)

GEORGES LECLERE,
211 Secretary.

Road Department

SEALED TENDERS addressed to the undersigned and endorsed "Tenders for Sewers," will be received at the office of the City Clerk until NOON on WEDNESDAY, the [illegible] for the construction of sewers in [illegible]

Total amount of sales made by me during the past year, by auction and private contract, HALF A MILLION DOLLARS. No disputes; no dissatisfaction.

Nearly one hundred Properties sold from $1,000 to $3,000 in value, and many large parcels $5,000 to $40,000.

EVERY DEED PASSED. NO BOGUS SALES. TRANSFERS (where property has been simply handed over to satisfy Mortgages) NOT REPORTED AS ACTUAL SALES.

THOMAS J. POTTER,
REAL ESTATE & GENERAL AUCTIONEER.
Real Estate a Specialty.

August 13 193

AUCTION SALE
—OF—
VALUABLE TIMBER LIMITS,
Situated near Lake Nipissing.

NOTICE is hereby given that (if not previously disposed of by private bargain) the following Valuable Timber Limits will be offered for sale at Public Auction, in the

CITY OF OTTAWA,
—ON—
THURSDAY, the 22nd day of September next,
VIZ.:

	Square Miles.
Berth No. 23, on the River Bueve, near Lake Nipissing, comprising	36
Berth No. 43, on the River Wannapitac, near Lake Nipissing, comprising.....	36
Berth No. 51, on the River Wannapitac, near Lake Nipissing, comprising.....	36
In all.....	108

These limits contain, in the aggregate, a large quantity of magnificent pine timber.

Berth No. 23 is estimated—as the result of a recent exploration—to contain a quantity of trees sufficient to produce at least half a million cubic feet of square timber, besides two hundred and fifty thousand standard saw logs. The river is available for driving to Lake Nipissing.

There is a good mill-site on the Bueve River, about three miles from Lake Nipissing.

Lumber could be transferred thence by water to the Callendar Station of the Canada Central Railway, the line of which is projected to pass directly through this limit.

Lumbermen and others desirous of acquiring limits are invited to examine these berths in the interval preceding the day of sale.

The owners reserve the right to dispose of either or all of them by private bargain in the meantime, and will be ready to consider any offers that may be made.

Terms of purchase will be liberal, and will be made known before the sale, the place and hour of which will be duly advertised.

Persons desiring further particulars are invited to communicate with the undersigned,

Stewart, Chrysler & Gormully,
SOLICITORS, OTTAWA.

Ottawa, 28th July, 1881.

Financial.

THE SHAREHOLDERS

—(OF THE)—

MOLSONS' BANK

Are hereby notified that a Dividend of

THREE PER CENT.

upon the Capital Stock has been declared for the **current half-year,** and that the same will be payable at the office of the Bank in Montreal, on and after the

First day of October next.

The Transfer Books will be closed from the 16th to 30th September, both days inclusive.

THE ANNUAL GENERAL MEETING

Of the Shareholders of the Bank will be held at its Banking House in this city, on

Monday, the 10th of October next,

at THREE o'clock in the afternoon.

By order of the Board,

F. Wolferstan Thomas,
General Manager.

Montreal, 25th August, 1881. 207

Credit Foncier Franco Canadien.

CAPITAL - $5,000,000

President..HON. E. DUCLERC, Senator, Paris.
Vice President....HON. JOS. A. CHAPLEAU.

OFFICE AT MONTREAL.

114 ST. JAMES STREET.

The Company will make long term loans on mortgage, with progressive sinking fund, and short term loans without sinking fund. Interest at Six per cent.

For particulars apply to

E. J. BARBEAU,
Manager.

JACKSON RAE,

OFFICE:

Royal Insurance Chambers,

NOTRE DAME STREET,

General Financial, Investment and Commission Agent.

Municipal or other Bonds and Stocks bought and sold.

Loans on Mortgages or other Securities effected.

Advances on Stocks, Merchandize or Commercial paper negotiated

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205

THE BENTON TRAIL.

[FROM OUR SPECIAL CORRESPONDENT.]

Benton, sometimes still called Fort Benton, at the head of steamboat navigation on the Missouri, is a busy little town of about six hundred inhabitants. From an important fur trading port, with an immense export of buffalo robes and other furs in old times, it has of late years developed into a potential "city," with the usual complement of bars, billiard saloons and other means of recreation for the miner and teamster. The town is situated on the brink of the river but the absence of trees from the valley and its generally arid appearance are displeasing to the eye. The old adobe fort of the fur trading company still remains as a dilapidated ruin, while extensive buildings of red brick begin to grow up on the main streets of the new town. In describing the climate of this part of Montana an "old-timer" is said to have stated a traveller's requisites as a buffalo coat, and palm-leaf fan, and it is true it is subject to great extremes of heat and cold, and further that the seasons are exceedingly variable.

Waggon-trails radiate from Benton in all directions for the supply of the neighboring country, and "freighting" over there with trains of waggons drawn by oxen or horses constitutes the employment of a large floating population. Stretching away to the north is what is familiarly known in Canadian territory as the Benton Trail," but sometimes also called the "Whoop Up Trail," from the name of a whisky-trading post to which it led before the territories were under police supervision. This trail constitutes at present [illegible]

of which lies a dreary expanse of clayey, arid land known as the Alkali Flat, with here and there a little saline lake. Climbing the front of the plateau through a rocky gorge, an elevated undulating region is gained, with fine grass and many little pools of good water. This slopes gradually northward to Red Creek, just beyond which is the International Boundary line, surveyed and marked out by the Boundary Commission Expedition in 1874. The line is defined by cairns of stones at intervals of a few miles, one of which at a distance of a couple of miles may be seen from the trail, but looks exceedingly small in the midst of the great world of prairie. Eleven miles north of the line the trail crosses the Milk River, another northern tributary of the Missouri, which, further down, assumes the muddy character which has given it its name, and north of the Three Buttes has excavated a very deep and rugged valley. It is here a small winding stream of clear water in the midst of a shallow depression several miles wide.

Five days of ordinary travel brought us to the crossing of Belly River at the "Coal Bank," where the dark, glossy green foliage of the trees and shrubbery in the valley strikes one as particularly inviting after the treeless uniformity of the plains. The Coal Bank crossing of the Belly is situated below the mouth of the St. Mary's River. There is a second and more direct route to Fort Macleod which crosses these streams above their junction, but as there are no ferries it is impracticable during the high water. At Coal Bank the crossing is effected in a large flat-bottomed boat, but it is necessary to unload, and take waggons and carts to pieces to carry them over, a

sometimes also called the "Whoop Up Trail," from the name of a whisky-trading post to which it led before the territories were under police supervision. This trail constitutes at present one of the main avenues to a considerable portion of the Canadian Northwest, and an immense quantity of freight is annually carried over it.

We were informed at Benton that we were likely to meet with many and serious difficulties in going into what was usually referred to as "that country," but with the exception of flooded rivers most of these proved illusory. Not sorry to leave Benton, with such an outfit of horses and waggons as we could procure, we climbed the high bank of the Missouri valley and struck out across a dry grassy plain with occasional patches of low-growing cactus. Meeting a team a few miles out, we enquired as to the stage of water in the Teton River, likely to be our first trouble, and looked dubiously at our light rigs when the driver informed us that it was nearly up to the tops of his waggon wheels. There is no ferry at the Teton, and so even though in flood, it must be forded. This we managed successfully, however, and made our first camp on its north bank.

From the point at which the Teton is finally left, to the Maria's River, a distance of fifty-five miles, the route lies over an undulating grassy plain, without a tree to relieve its monotony. Herds of cattle are to be seen, however, scattered here and there over it, for there are a number of stock ranches on both rivers. At the Maria's is a regular ferry, running on a wire rope stretched from bank to bank, the charge for crossing being $2.50 for each wheeled vehicle. Naturally the teamsters prefer to ford when they can, and this is easy later in the summer, when the snow has in great part disappeared from the Rocky Mountains. Farming on a limited scale is carried on in the valleys of the Teton and Maria, though crops are not sure without irrigation, which is only possible in some places, and, of course, implies considerable expense in ditching. At the Maria's Crossing we leave the inhabited part of Montana, and thence to the Belly River, a distance of over 100 miles, the country is a solitude, without even a bush large enough to make a whipstock, and nothing to break the monotonous pale yellowish-green of the prairie but here and there a swampy patch more vivid in color, the blue shadows in an occasional deep-seamed coulée or brook valley, or the edge of some distant low ridge. In travelling over the rolling and undulated surface, however, magnificent

impracticable during the high water. At Coal Bank the crossing is effected in a large flat-bottomed boat, but it is necessary to unload, and take waggons and carts to pieces to carry them over, a process tedious enough. The horses are obliged to swim.

The coal bed which has given this part of the Belly its name has been worked to some extent along the outcrop, and coal is not only supplied for use at Fort Macleod, but taken by light waggons, returning to Benton, where it sells for $14 a ton, $10 going as freight.

All the way from the Maria's the prairie affords very fair pasturage, and though some of the before-quoted "old-timers" in Montana maintain that the country is being overstocked and the grass eaten out, we could see no sign of it on this route, even near the settlements, while a great tract is altogether unoccupied. Northward from the line we evidently enter a country with more moisture. The grass is more luxuriant, and the cactus almost disappears. Yet this is but an outlying district, and is scarcely included in the choice stock-raising region of the Northwest.

Thirty-six miles further by trail along the north banks of the Belly and Old Man Rivers, bring us to Fort Macleod, or rather to the north bank of the Old Man River, opposite the Fort. Here the Mounted Police finished their long and adventurous march from Red River, and established themselves for the winter in October, 1874. The Fort was built on the north side of the river, but since that time the stream has changed its bed, opening out a new channel to the south, and leaving the Fort on an island, with a slough marking the position of the old river course. A few low-roofed log houses, sufficient in number to partially define a "street" have grown up near the Fort, and constitute the town of Macleod, our long-anticipated destination.

G. M. DAWSON.

undulated surface, however, magnificent views are caught now and then from the higher points of distant mountain ranges. The Rockys are yet far, and form a very dim blue serrated line on the horizon, but away south of the Missouri stand the Highwood Mountains, a rugged mass, with a little snow still clinging to them in the early summer. The Bear's Paw Mountains can be seen far to the east, and after crossing to the northern slope of the prairie plateau, very striking views are continually gained of the Three Buttes or Sweet Grass Hills, which form another of the remarkable isolated ranges of this part of the country. An antelope may now and then be seen taking a steady enquiring look for a moment from some little elevation, and then showing as a white spot upon the prairie as he turns tail and bounds away; or a flock of noisy curlews disturbed in some marshy spot, but otherwise the great plains are now lifeless, the scattered bones of the buffalo or circles of stones where Indian lodges have stood years ago, serving only to give them an additional air of desolation. Scarcely a day passed, however, in which we did not meet some travellers on the road, generally glad to stop a moment for conversation, ready with information as to points at which water could be found for camping, and more often than not with some disquieting rumors about the Indians. A war party of Bloods had gone to the Sweet Grass Hills on their way south to steal horses from the Crows, but might not be careful to respect any travellers they might meet; a party of Sioux were supposed to be coming north to steal horses from the Bloods; all the Indians north of the line were ready to break out at any moment, and so on. These, however, as might be supposed, turned out to be mere fables, the moral intended to be conveyed by all being that we should take particularly good care of our horses, which we of course did. For the greater part of two days we had before us what appeared to be a high crested ridg easily recognized as the Snake's Head Mountains of the map, though quite erroneously laid down as to latitude. Instead of a ridge, too, it proved on nearer approach to be the scarped front of a plateau, to the south

Stylopodpic

Engage
McCurtey
~~Heusig~~
Cusick
Joe. Farsaint } June 8. at Benton

McCurtey acts as Cook to Macleod June 22.

Engage
Molson
Mountain } June 18. at Bellcursing

Prisoner to send Reports to
E. V. Warren
Hospital Sergeant
H. Macleod.

To Major Cryer for Fort Sibley

Map of Mr for Dear. akers.