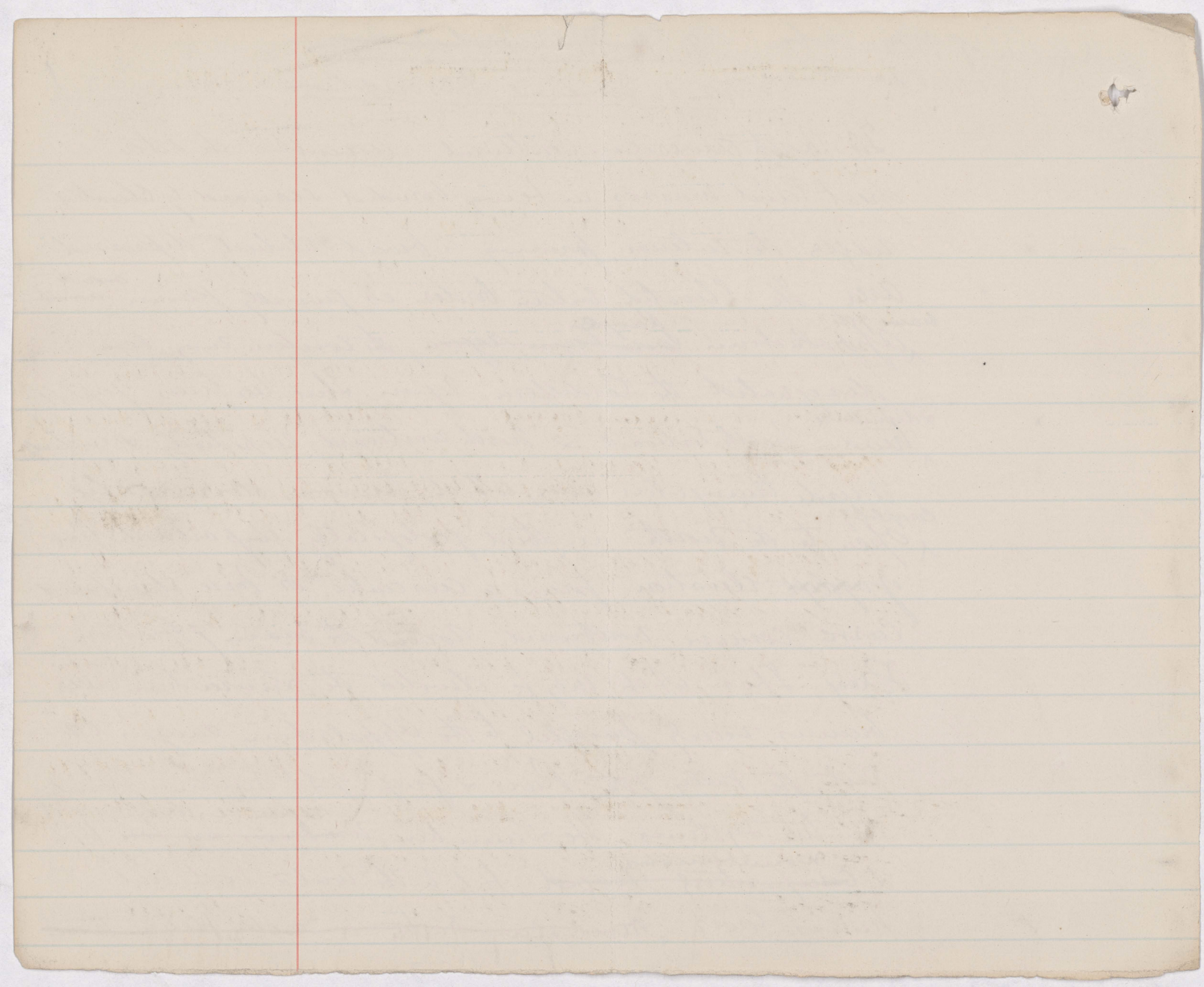


The North American Continent resembles the other great land masses in being bounded seaward by elevated ridges, the interior forming a broad relatively depressed area. The elevated eastern border is generally known <sup>under the</sup> as the Appalachian <sup>Ranges</sup> ~~mountain~~ region, the western may be designated the Cordillera region. These two lines of uplift <sup>& disturbance</sup> trend north eastward & north westward respectively & include a wide triangular area, which, however, does not lie <sup>completely</sup> open to the north. A third geologically important line of ~~uplift~~ elevation forms a concave or horse-shoe shaped curve concave northward around the basin of Hudson Bay. This, which may be devoted the Laurentian axis becomes nearly parallel to the Appalachian ranges to the east, the valley of the River & Gulf of St. Lawrence separating the two systems. The Laurentian <sup>region is here</sup> ~~mountains~~ are ~~very~~ high & ~~generally~~ <sup>mountainous</sup> rugged but to the west & north-west becomes lower, ~~resembling rather a rocky plain than~~



2

A ~~mountain~~ ~~gap~~ range. In consequence of  
the position of the Laurentian axis the wide low interior  
<sup>plain</sup> region of the Continent becomes narrowed near the  
western end of the Great Lakes & occupies thence to the  
Arctic ocean a gradually narrowing region between  
Laurentian plateau & the Rocky Mountains.

This region, to the south, is generally one of plain &  
prairie a circumstance dependant on the small ramp of  
~~the~~ which it receives, & other causes. Further north it  
becomes highly & at length <sup>along a line nearly following the N. Saskatchewan River</sup> densely forested. ~~It~~ Where  
it crosses the 49th parallel, which constitutes the political  
boundary between the United States & Canada, the interior  
plain or plateau of the Continent is included in  
longitude between the 96th & 114th meridians, with  
a width of about 800 miles. Its eastern boundary is  
formed by the <sup>western</sup> slope of the ~~Laurentian axis~~ ~~above~~ ~~referred~~ ~~to~~. old crystalline  
nucleus of the continent, which though it doubtless holds  
throughout now a less extensive areas of Haroun

*[Faint, illegible handwriting on lined paper, possibly bleed-through from the reverse side.]*

Rocks may be referred to as above as the Laurentian axis.  
 This in this to northwestern extension it is not yet the  
 nature of the Mountain range, <sup>but is rather an extensive rocky plateau</sup> it has an average breadth  
 of about 250 miles, ~~it is described as Chama which is~~  
 increased to about 400 miles? When it terminates at  
 the Arctic ocean. Its average altitude north of Lake  
 Superior & east of Lake Winnipeg is probably not over 1500  
 to 2000 feet, while still further westward it is even less.  
 Nor is it ~~altogether~~ an altogether continuous barrier, for it  
 is crossed by a wide depressed area near the north end  
 of Lake Winnipeg where the Nelson & Churchill Rivers  
 traverse it to reach Hudson Bay. There is a well defined  
 high ground between the two systems draining the Laurentian  
 district, the water shed following a very sinuous course among  
 the innumerable lakes, small & great, which cover a large  
 part of its surface.

3a.

The Rocky Mountains to the west of the Interior Continental



Its character is in general extremely barren, the  
 maculated rocky surface being in its original  
 condition generally thickly covered by pretty small  
 growth, rooted in a scanty soil, but forest & soil  
 together have frequently over extensive areas been  
 removed by fire. The valleys of the Nelson & Churchill  
 & associated river valleys appear to occupy  
 a wide transverse depression in the  
 Laurentian plateau, in which though the granite  
 & gneiss rocks are to a great extent covered  
 with boulder clay & other deposits referable to the  
 glacial period. Still further to the north the  
 plateau though broken here & there by ranges of  
 hills is still low, or spreads widely as the  
 'barren grounds' which Fore Fern so graphically  
 described by Hearn, Richardson & others.

The most striking feature of the whole Laurentian  
 plateau is the unattractive systems of rivers & <sup>lakes</sup>

& though there are  
 everywhere many of the  
 of glacial beauty  
 with fine rivulets  
 & waterfalls this  
 region can scarcely  
 be said to have any  
 economic importance except  
 by the mineral wealth  
 it may contain, or  
 the product of the  
 fur chase & the  
 fishery

already written in  
also with which is surface is ~~transferred~~ ~~inverted~~



Valley or plateau rise abruptly from the elevated plains  
 at their base; presently to the east, near the 49th parallel  
 almost perpendicular walls of rock. They are composed,  
 not of a single upheaved ridge, but of a number of more  
 or less nearly parallel ranges, which have <sup>the same</sup> a <sup>several</sup> <sup>direction</sup>  
 direction a little west of north, & a breadth of over  
 sixty miles, extending from the margin of the great  
 plains to the valleys of the Kootenai, Columbia &  
 upper Fraser Rivers. The geological continuity of the  
 country is generally as sharply broken by the line of their  
 eastern base as its physical character, & we pass  
~~Sudden~~ at once from the little altered or disturbed beds of  
 Tertiary or Cretaceous age to scarped mountains sides  
 composed of metamorphosed & folded Palaeozoic rocks.  
 The rocky mountains near the 49th parallel seldom  
 much exceed 9000 feet in altitude, they appear to  
 culminate northward between the fifty-first & fifty-



second parallels where peaks & what a considerable  
~~fraction~~ height considerably greater has been assigned,  
 are situated. They are comparatively low & narrow  
 in the Peace River country, & become still lower &  
 more diffuse toward the Arctic ocean, ~~where they are~~  
~~alleged to represent~~ ~~by~~ ~~ranges~~ ~~of~~ ~~low~~ ~~hills~~. Northward  
 from the Peace River to the bend of the Mackenzie River  
 near ~~latitude 63~~ ~~the~~ ~~56th~~ 63rd parallel the eastern  
 base of the Mountains ~~now~~ appears to run nearly due  
 north, while beyond this point it again ~~takes~~ <sup>assumes</sup> its  
 north westward course.

In intimate connection with the change in character  
 of the Rocky Mountains to the north west <sup>the remarkable fact</sup> is, that the  
 rivers flowing eastward from them here their sources  
 further back among the Mountains as we proceed  
 northward. Near the 49th parallel the tributaries of the  
 Missouri & South Saskatchewan rise in the abrupt

The first part of the paper is devoted to a general  
 description of the country and its resources. It  
 is the first time that a general description of  
 the country has been given. The paper is  
 divided into three parts. The first part  
 describes the general features of the  
 country. The second part describes the  
 resources of the country. The third part  
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 the population of the country.

6

Eastern valleys of the first range. The Kananisick River, one hundred miles to the north, rises in the first longitudinal valley, as at the foot of the second component range; Bow River from the third range; the north Saskatchewan from the fourth range; the Altamaha from the fifth; while the Peace & Liard Rivers from their sources quite to the west, & drain both slopes of the Rocky Mountains.

The Tuleen region of the eastern slopes gradually extends from the elevated plains lying at the foot of the Rocky Mountains, to the foot of the Laurentian Highlands; & though the inclination is more abrupt on approaching the Mountains it is not so much so as to attract special attention. In the tract embraced between the forty-ninth & fifty-fourth degrees of latitude, however, along two lines which are in a general way parallel, & hold a north-west & south-east course across the plains, remarkable step-like rises occur. These escarpments from the eastern edges



of the two higher prairie steppes or plateaux, & the <sup>7</sup>  
West Eastern of them overlooks the lowest prairie level,  
or that of the Red River valley. The three prairie steppes  
thus defined differ much in age & character. They  
have been impressed on the soft formations of the plains  
by the action of sub-aerial denudation, of the sea, &  
of former great lakes, & though the prairie mode of their  
formation is now fully discredited elsewhere, they  
deserve notice here as being among the great primary  
features of the country.

The actual increase of elevation accumulated in the  
two escarpments is, however, slight compared with that  
due to the unimpeded Eastward slope of the plains. The  
direction of greatest inclination is in this region toward  
the north-east & a line drawn from the intersection of  
the forty-ninth parallel with the base of the Rocky Mountains,  
to a point on the lowest prairie level north of Lake Winnipeg,  
will be found to cross the escarpments ~~and~~ at right  
~~angles~~ nearly a right angle, & to have an average





8

slope of 5.38 feet to the mile. From the same initial point, in a due east line to the lowest part of the valley of the Red River, the average slope is 4.48 feet per mile.

The first or lowest prairie level is that of which the southern part lies along the Red River & which northward embraces Lake Winnipeg & associated lakes & the flat land surrounding them. A great part of its eastern border is continuous with that of Lake Winnipeg, & joined by the rocky front of the Laurentian, but east of the Red River it is bounded by the high-lying terraces of drift terraces which surround the table of the Woods & form a part of the drift plateau of northern Minnesota. To the west it is limited by the more or less abrupt edge of the second prairie level, which though very regular in some parts of its length has been broken through by the broad valleys of the Assiniboine & other rivers. The escarpment in the southern part of

slope of 3.88 feet to the mile. From the same  
 will not present in a line but in the same  
 the way of the road then, the average slope is 4.28 feet  
 per mile  
 the first or lowest portion level is the grade of the road  
 portion along the line has a slight downward  
 like a ramping & connected with the hill  
 a narrow strip has a great part of the  
 continuation west that of the ramping a piece of  
 the road part of the continuation, but part of the  
 line is a border of the high ground  
 portion which descended the slope of the road a  
 of part of the steep part of the  
 the road is a continuation of the same  
 slope of the second portion level which drops to  
 appear in some part of the length of the  
 through the road valley the continuation  
 the road, the continuation on the

1

Manitoba is known as Pembina Mountain, &  
 is continued northward by the Riding, Duck, Parlapine  
 & Basquia Hills. South of the forty-ninth parallel  
 the valley of the Red River extends, with gradually  
 narrowing dimensions to Traverse Lake, a distance  
 of ~~—~~ miles. The average <sup>elevation</sup> height above the sea  
 of this lowest part of the entire continental region, is  
 about 800 feet, the lowest part being that surrounding  
 the Winnipeg group of lakes which stand at about  
 700 feet. The edges of this great valley are also —  
 network standing its apparent horizontality — Considerably  
 more elevated than its central line which follows  
 the Red River. Its width on the 49th parallel is  
 fifty-two miles. Its area north of that line may be  
 estimated at 55,600 square miles, of which the Great  
 system of lakes in its northern part — including  
 Lakes Winnipeg, Winnipegosis, Manitoba, Cedar &

9.

The first part of the column contains  
about 600 feet, the second part being  
the remaining part of the lower  
700 feet. The upper part of the  
column shows the appearance of the  
two strata that the latter can  
be seen below. The rocks in this  
part are under the same  
strata at 2500 feet, and the  
system of the same part is  
also known as the same part.

2

St Martins — occupies over 13,000 Square miles.  
 A great part of this prairie level is wooded more or  
 less densely, & ~~much of the low lying land near the~~  
~~great lakes appears to be swamped & liable to flood.~~  
 The Southern part, extending from the 49th parallel nearly  
 to the south end of Lake Winnipeg, includes the <sup>exceedingly fertile</sup> prairie of  
 the Red River Valley.

The superficial deposits of this stage are chiefly those of a great  
 lake, which ~~Mr Warren Upham~~ proposes to call Lake  
 Agassiz occupied its area ~~up~~ toward the close of the  
 glacial period, & which Mr Warren Upham proposes  
 to call Lake Agassiz. This must have united all  
 the lakes now found in the region into a single sheet  
 of water, which extended with narrowing dimensions  
 about two hundred miles south of the 49th parallel.  
 The Red & Assiniboine Rivers & their tributaries have  
 not yet cut very deeply into the alluvial deposits of



The plain & its surface is level & little furrowed<sup>11</sup>  
by denudation.

The Second steppe of the plains is bounded to the east  
as already indicated, & to the west by the Missouri  
Coteau or edge of the third prairie level. It has a  
width on the 49th parallel of two hundred & fifty miles  
but before reaching the 34th parallel the distinction between  
the second & third steppes appears to be nearly broken  
down, the edge of the third steppe being scarcely clearly traceable  
beyond the North Saskatchewan. The southern <sup>part</sup> ~~portion~~  
of the second steppe joins the eastern portion of the great  
~~prairie~~ western plains. These have an area  
of 71,300 square miles. To the south the boundaries  
of this region also appear to become more indefinite,  
& in the southern part of the country the three primary  
levels of the country here defined are probably  
scarcely distinguishable. The rivers have acted on this  
region for a much longer time than on the last, &  
are now found flowing with uniform, though generally rapid,

The first thing I noticed when I stepped  
 out of the plane was the fresh air. It felt  
 like a warm blanket after a long winter.  
 The sun was shining brightly, and the  
 birds were chirping happily. I took a  
 deep breath and felt a sense of peace.  
 The world was so beautiful, and I was  
 so lucky to be here. I smiled and  
 looked up at the sky. The clouds were  
 white and fluffy, and the sun was  
 shining so brightly. I felt like I was  
 in a dream. The world was so beautiful,  
 and I was so lucky to be here. I  
 smiled and looked up at the sky. The  
 clouds were white and fluffy, and the  
 sun was shining so brightly. I felt  
 like I was in a dream. The world was  
 so beautiful, and I was so lucky to be  
 here. I smiled and looked up at the  
 sky. The clouds were white and fluffy,  
 and the sun was shining so brightly.



Currents in wide trough-like valleys excavated <sup>12</sup>  
in the soft material of the plains & often depressed from  
one hundred to three hundred feet below the general  
surface. In these the comparatively insignificant streams  
wander from side to side in tortuous channels.

The surface of this prairie steppe is also more diversified  
than the last, being broken into gentle swells &  
undulations, partly, no doubt, by the action of ordinary  
denudation but in part also, as would appear, by the  
original unequal deposition by currents & ice of the drift  
material which here constitutes the superficial formation.

The average altitude of this region may be taken at  
1600 feet, & the character of its soil & its adaptability  
for agriculture differ much in its different portions.

The third or highest prairie steppe, may be said to  
have a general normal altitude of 3000 feet,  
though its eastern edge is sometimes little over 2000  
feet, & it attains a maximum elevation of 4200

present in each trap - the latter is present  
 in the soft material of the spine & of the  
 one hundred & three hundred feet below the former  
 surface. In the the composition of the  
 number from 100 to 100 in between 1000  
 The surface of the former with 500 to 1000  
 feet the last, being broken out from the  
 indications, part of the last of the  
 material, but in fact, as was shown, of the  
 original surface of the surface of the  
 material which has been established in the  
 the more distant of the surface, may be taken at  
 1000 feet, or the thickness of the soil & of the  
 for a distance of 1000 feet in its present position  
 The last of the surface of the soil is said to  
 have a general surface of 1000 feet  
 though the surface of the soil is broken  
 feet & the distance of the surface of the soil

at the foot of the Rocky Mountains near the 49th parallel. Owing to the indefinite character of the dividing line between this region & the East, to the north, it is difficult to state its whole area between the 49 & 52th parallels. Of this steppe, however, it is estimated that an area of about 114,000 square miles, ~~is also~~ constituting its entire southern part, is almost entirely devoid of forest, the wooded region being confined to a small portion of its northern extension ~~in~~ about the North Saskatchewan River & its tributaries. The breadth of this steppe on the 49th parallel is four hundred & sixty-five miles, & its eastern boundary is well marked, being the broken hilly country known as the Coteau de Missouri or great Coteau, which crosses the 49th parallel near the 104th meridian, & runs thence north-westward, near the Elbow of the South



Saskatchewan. It is then continued westward by  
to the north by a range of high lands, of which the  
Eagle Hills west of Fort Carlton constitute a part.  
This portion of the great plains was doubtless the first  
to emerge from the submergence which occurred  
during the glacial period, & has long been subject to the  
wearing influences of rain & rivers in both pre-  
glacial & post-glacial times. These portions yet which  
still remain but little modified, form table-lands,  
more or less completely <sup>separated</sup> isolated by lower ground. The  
immense amount of denudation which has taken  
place is evidenced by the <sup>great</sup> size & depth of the valleys of  
the rivers & streams, both of pre-glacial & post-glacial  
age, the great terraces & gullies which have been cut  
& are still retreating themselves among the soft  
sandstones & clays of the district, & the isolated  
plateaux & 'buttes' which now stand far out on



plains of ~~new~~ lower level, strewed with 15-  
newer systems of coulees & gorges. Deposits  
~~bluffs~~ due to the glacial period are found on this  
highest steppe, but are not spread with the same  
uniformity as on the lower levels, & a great part  
of the surface is based almost immediately on  
Cretaceous or ~~granite~~ <sup>Tertiary</sup> ~~beds~~ <sup>granitic</sup> beds, & varies in  
the character of its vegetation & appearance according  
to their composition. The agricultural value of the  
region is by no means so great as that of those  
before described, but is too varied to allow  
generalization. It embraces some lands of  
unimpaired fertility along the base of the mountains  
& also the northern extension of the desert region  
with the surface of sun-baked clay or sand  
scarcely supporting a thin growth of Cactus and  
Stipa.

The region between the 54th & 49th parallels, though

The region between the 24th & 25th parallels  
is characterized by a high degree of  
uniformity in the distribution of the  
various species of plants & animals  
which are found in the region. The  
climate is generally warm and humid,  
with a high degree of rainfall. The  
soil is generally fertile and well-  
adapted to the growth of a wide  
variety of crops. The population is  
generally dense and well-developed,  
with a high degree of civilization.  
The region is generally well-watered  
and fertile, and is well-adapted to  
the growth of a wide variety of  
crops. The population is generally  
dense and well-developed, with a  
high degree of civilization.



Thus so simple & definite in its grand features,  
 shows many irregularities & exceptions in detail.  
 The second steppe has same elevations in its surface  
 as high as the edge of the third, & that part surrounding  
 the Assiniboine River & its tributaries has become  
 abnormally depressed, making some portions of  
 the eastern edge of the prairie level which overlook  
 Manitoba Lake, more to resemble outliers than  
 integral parts of it. The third steppe, though  
 so irregular in its details, also shows evidence  
 in the corresponding heights of the portions still  
 remaining of the original surface, of previous  
 uniformity. ~~The total area of that part of the~~  
~~great plains, or open treeless country between the~~  
~~44th & 54th parallels is about 192,900 square~~  
~~miles~~

187  
The first part of the paper is devoted to a  
discussion of the various methods of  
determining the true value of the  
interest rate. It is shown that the  
method of equating the present value  
of the interest payments to the  
present value of the principal is  
the most accurate method. The  
method of equating the interest  
payments to the principal is  
less accurate. The method of  
equating the interest payments to  
the principal is the least accurate.  
The method of equating the interest  
payments to the principal is the  
most accurate. The method of  
equating the interest payments to  
the principal is the least accurate.

North of the 54<sup>th</sup> the parallel the total area of 17  
prairie country properly so called is comparatively  
very small. Between the 54<sup>th</sup> & 49<sup>th</sup> parallels it may  
be estimated at 192,900 square miles. Though much of  
this vast region is not absolutely treeless like its southern  
portion, its aggregate tree-land area is quite insignificant  
as compared with that of its open plains.

The central portion of British North America, may  
therefore be regarded as a great shallow trough, of which  
the western edge is formed by the Rocky Mountain watershed,  
the eastern by the Laurentian plateau, but of which the  
western portion of the floor is now more elevated than  
its eastern rim. There are, however, two other transverse  
watersheds in the area in question, which are not  
marked by any grand physical features, but appear  
to ~~be caused~~ have been produced merely by low gentle  
rolls flexures in the strata. Of these one, in a general  
way follows the political boundary of the 49<sup>th</sup>

way follows the physical structure of the text  
 after phrases in the state. Other one in appearance  
 is concerned for two distinct levels of complexity  
 described by my friend physical features, but appears  
 distributed in the same in question, which are not  
 the Eastern line. There are, however, no other examples  
 between Eastern and Western. This is now more than  
 the Eastern of the Eastern. It is proposed to  
 the Western side a form of the body, however, in  
 therefore is regarded as a specific feature, which  
 the Eastern feature of British East African, being  
 as compared with that of the other forms.  
 feature of the Eastern line. This is now more than  
 the Eastern of the Eastern. It is proposed to  
 the Western side a form of the body, however, in  
 therefore is regarded as a specific feature, which  
 the Eastern feature of British East African, being  
 as compared with that of the other forms.  
 feature of the Eastern line. This is now more than  
 the Eastern of the Eastern. It is proposed to  
 the Western side a form of the body, however, in  
 therefore is regarded as a specific feature, which  
 the Eastern feature of British East African, being  
 as compared with that of the other forms.

The Eastern line. There are, however, no other examples  
 between Eastern and Western. This is now more than  
 the Eastern of the Eastern. It is proposed to  
 the Western side a form of the body, however, in  
 therefore is regarded as a specific feature, which  
 the Eastern feature of British East African, being  
 as compared with that of the other forms.

parallel. It separates the waters of the Red the Assiniboine & Saskatchewan Rivers (which find their way through Winnipeg Lake to Hudson's Bay) from those of the Mississippi & Missouri & their various tributaries. Beginning in that region of Swamp & Lake in northern Minnesota which feeds the variously destined head-waters of the Winnipeg, St Lawrence, Mississippi & Red rivers, it dips southward between the tributaries of the latter two streams, & passes between Lake Travers & Big Stone Lake with an altitude of 970 feet only, about 200 miles south of the ~~the~~ parallel Boundary line. Thence it pursues a general north-westerly course along the high lands formed by the Southern extensions of Pembina Escarpment & the Missouri Coteau, & becoming identified with the latter crosses the boundary-line three hundred miles west of Red River. Then falling south of the drift-ridge of the Missouri Coteau, it follows the

parallel. It appears the vector of the  
 (for the Casimir & Schrodinger's  
 first this top through winding side to the  
 from that of the Casimir & Schrodinger's  
 various distances. The winding is that  
 group & take as further winding to the  
 measure electric field-vector of the winding  
 It appears, Casimir & Schrodinger, it  
 structure between the first terms of the  
 of power between the second & third  
 an electric field of the first term  
 of the second term. Hence it appears  
 a general first-order vector winding  
 forms in the second term of the winding  
 & the third term, a winding structure  
 later terms the second term. The winding  
 first of the second term. The winding  
 of the second term, & the winding

Summit of the plateau of the Sigwite Tertiary fr. ✓  
 about 300 miles to the Cypress Hills, where it is  
 only 40 miles north of the boundary-line. Thence it  
 trends southward & crosses the line for the last time  
 about 30 miles east of the base of the Rocky Mountains.  
 The average altitude of this watershed region east of the  
 Red River is 1400 feet. In northern Dakota it may  
 be estimated at 2000 feet; & from this it rises till  
 near the mountains it has attained an elevation of  
 about 4000 feet.

~~The second transverse watershed crosses from the  
 Rocky Mountains to the Laurentian region near the  
 fifty-fourth parallel, which has consequently been chosen  
 as a constant northern boundary for the region now  
 described.~~

The second or northern transverse watershed region  
 is ~~now~~ more complicated. Leaving the Rocky Mountains





near their intersection with ~~them~~ the fifty three parallel,  
 the watershed runs North Eastward about two  
 hundred miles, where, west of Edmonton, it is found to  
 form an elevation of about 2500 feet, & is composed  
 of undulating hills of drift deposits, forming to the north  
 the tributaries of the Mackenzie to the South those of the  
 Saskatchewan. At this point it bifurcates, the  
 two arms stretching westward to the Laurentian  
 Plateau & including between them a low region  
 filled with lakes which drains toward Hudson's Bay  
 by the Churchill River. The height of the southern watershed,  
 between the Saskatchewan & Churchill is quite small.  
 It is crossed by the Canoe Route at Frog Portage. The  
 northern watershed between the last named river &  
 the tributaries of the Mackenzie when crossed by  
 the same route was, according to Sir J. Richardson  
 a height of 1566 feet.

was then introduced into the hill the fossils  
 the most common being small shells about two  
 hundred inches above level of the sea. It is found  
 in an elevation of about 2500 feet & is common  
 throughout the hills of drift deposits. This is the  
 the thickness of the strata to the west of the  
 Beakstran. At the point it separates the  
 two seems strikingly well marked to the southward  
 further & indicating that there is a gap in  
 the strata with some other things from the  
 of the Beakstran. At the point it separates the  
 shows the Beakstran a distinct in fact  
 the Beakstran of the same level that of the  
 Beakstran is marked between the Beakstran and  
 the thickness of the strata is not constant  
 the same level as, according to the Beakstran  
 a height of 2500 feet

The Silurian & succeeding deposits of the interior continental region seem to have accumulated on a great submarine plateau, stretching westward from the base of the Laurentian & Huronian ranges under a sea which was probably for a long time ~~open~~ in ~~free~~ communication with the ocean occupying the position of the Pacific of today. At various times the Laurentian & Huronian barrier may have been more or less completely overtopped by the newer newer deposits, which may have been joined to those surrounding Hudson's Bay, while the region now occupied by the western mountain ranges though not presenting a continuous land barrier was outlined by islands & areas of shoals & sand-banks at an early date. It appears to have been not deeply submerged in Devonian & Carboniferous times, while from the Cretaceous onward the elevation <sup>irregular</sup> ~~of~~ was

The following is a summary of the  
 historical facts which have been  
 established by the various writers  
 on the subject of the American  
 Revolution. It is not intended  
 to be a complete history, but  
 to give a general outline of the  
 events which led to the  
 independence of the United States.  
 The first part of the work  
 deals with the early years of  
 the Revolution, from 1763 to  
 1776. The second part deals  
 with the military operations  
 of the war, from 1776 to  
 1781. The third part deals  
 with the political events of the  
 war, from 1776 to 1781.  
 The fourth part deals with the  
 final years of the war, from  
 1781 to 1783. The fifth part  
 deals with the aftermath of the  
 war, from 1783 to 1787.  
 The sixth part deals with the  
 Constitution and the early years  
 of the new government, from  
 1787 to 1796. The seventh  
 part deals with the years from  
 1796 to 1800. The eighth  
 part deals with the years from  
 1800 to 1809. The ninth  
 part deals with the years from  
 1809 to 1815. The tenth  
 part deals with the years from  
 1815 to 1820. The eleventh  
 part deals with the years from  
 1820 to 1825. The twelfth  
 part deals with the years from  
 1825 to 1830. The thirteenth  
 part deals with the years from  
 1830 to 1835. The fourteenth  
 part deals with the years from  
 1835 to 1840. The fifteenth  
 part deals with the years from  
 1840 to 1845. The sixteenth  
 part deals with the years from  
 1845 to 1850. The seventeenth  
 part deals with the years from  
 1850 to 1855. The eighteenth  
 part deals with the years from  
 1855 to 1860. The nineteenth  
 part deals with the years from  
 1860 to 1865. The twentieth  
 part deals with the years from  
 1865 to 1870. The twenty-first  
 part deals with the years from  
 1870 to 1875. The twenty-second  
 part deals with the years from  
 1875 to 1880. The twenty-third  
 part deals with the years from  
 1880 to 1885. The twenty-fourth  
 part deals with the years from  
 1885 to 1890. The twenty-fifth  
 part deals with the years from  
 1890 to 1895. The twenty-sixth  
 part deals with the years from  
 1895 to 1900. The twenty-seventh  
 part deals with the years from  
 1900 to 1905. The twenty-eighth  
 part deals with the years from  
 1905 to 1910. The twenty-ninth  
 part deals with the years from  
 1910 to 1915. The thirtieth  
 part deals with the years from  
 1915 to 1920. The thirty-first  
 part deals with the years from  
 1920 to 1925. The thirty-second  
 part deals with the years from  
 1925 to 1930. The thirty-third  
 part deals with the years from  
 1930 to 1935. The thirty-fourth  
 part deals with the years from  
 1935 to 1940. The thirty-fifth  
 part deals with the years from  
 1940 to 1945. The thirty-sixth  
 part deals with the years from  
 1945 to 1950. The thirty-seventh  
 part deals with the years from  
 1950 to 1955. The thirty-eighth  
 part deals with the years from  
 1955 to 1960. The thirty-ninth  
 part deals with the years from  
 1960 to 1965. The fortieth  
 part deals with the years from  
 1965 to 1970. The forty-first  
 part deals with the years from  
 1970 to 1975. The forty-second  
 part deals with the years from  
 1975 to 1980. The forty-third  
 part deals with the years from  
 1980 to 1985. The forty-fourth  
 part deals with the years from  
 1985 to 1990. The forty-fifth  
 part deals with the years from  
 1990 to 1995. The forty-sixth  
 part deals with the years from  
 1995 to 2000. The forty-seventh  
 part deals with the years from  
 2000 to 2005. The forty-eighth  
 part deals with the years from  
 2005 to 2010. The forty-ninth  
 part deals with the years from  
 2010 to 2015. The fiftieth  
 part deals with the years from  
 2015 to 2020.

Such as to produce a complete land barrier.  
 From this time the formations accumulating between  
 the Cordilleras and ~~the~~ Laurentian regions, were those  
 of a great interior continental basin or trough, the  
 waters of which, at first in free communication  
 with the ocean to the south & north, were soon, by  
 the gradually increasing elevation of the continent,  
 cut off from it more or less completely; and, after  
 a period of transition became a great fresh  
 water lake or series of lakes. The <sup>well known (the)</sup> lignitic or  
 Laramie group is the newest formation <sup>of the</sup> ~~of the~~  
 north of the 49th parallel, to the south in lakes of  
 constantly decreasing size the sands & clays of  
 the later Tertiaries were laid down, including  
 in some places in great abundance the remains  
 of the various land animals which inhabited  
 the then extensive surface of the continent.

The first thing I noticed when I stepped  
 out of the plane was a beautiful view  
 of the mountains. The air was so fresh  
 and the scenery was so beautiful. I  
 had heard that the mountains were  
 beautiful, but I didn't realize how  
 beautiful they really were. The  
 mountains were so high and so  
 beautiful. I had never seen anything  
 like this before. The mountains were  
 so beautiful and so high. I had  
 never seen anything like this before.  
 The mountains were so beautiful and  
 so high. I had never seen anything  
 like this before. The mountains were  
 so beautiful and so high. I had  
 never seen anything like this before.  
 The mountains were so beautiful and  
 so high. I had never seen anything  
 like this before. The mountains were  
 so beautiful and so high. I had  
 never seen anything like this before.

Since the final exclusion of the sea from this area  
 in the latest Cretaceous or earliest Tertiary time, &  
 probably for the most part at an epoch long subsequent  
 to this, the beds in the vicinity of the forty-mile parallel  
 near the western margin of the interior continental  
 region have been lifted up almost horizontally to a  
 height of over 4000 feet above the sea, following the  
 upheaval of the Cordillera region & producing rise  
 to the Sierrita North Eastern slope of the plains. It is  
 interesting to observe that while the Cretaceous & Tertiary  
 beds of the interior have thus been raised en masse  
 by the slow exercise of immense force, their broken  
 remnants on the Pacific Coast have in many  
 places scarcely been elevated above the level of  
 the Pacific sea.

The Pacific Ocean  
 has been a source of  
 interest to the  
 world since the  
 discovery of the  
 continent of  
 America. The  
 discovery of the  
 continent of  
 America was  
 made by Christopher  
 Columbus in 1492.  
 The discovery of  
 the continent of  
 America was  
 made by Christopher  
 Columbus in 1492.  
 The discovery of  
 the continent of  
 America was  
 made by Christopher  
 Columbus in 1492.  
 The discovery of  
 the continent of  
 America was  
 made by Christopher  
 Columbus in 1492.



r
 The Laurentian & Huronian rocks forming the  
 both sides of the Duluth Anticline plain  
 do not differ in any marked way from those of  
 that portion of the same axis which stretches from  
 Lake Superior to Labrador, & which have already  
 been described (?). So far as yet known the Laurentian  
 is ~~formed~~ characterized by orthoclase feldspars &  
 granites like those of Logan's lower division, & it  
 occupies by far the greatest area. The Huronian  
 forms a series of parallel bands which occupy  
 synclinal troughs in the older formation, &  
 with standing the general north-west &  
 south-east course of the axis, run as a rule in  
 north-east & south-west bearings. In the Lake of  
 the Woods region, two great series of movements seem  
 to have conspired to ~~form~~ produce the present  
 complexity of the rocks, both post-Huronian in date.

Complete of the rocks of the ...  
 For comparison of the ...  
 the rocks have the ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...  
 part - part - part ...

Chapter II. The ...

25

The part of the series to the south produces folds which are very abrupt in character but involve great breadths of strata & run in a general course a few degrees north of west. The great masses of intrusive granite are probably ~~mainly~~ <sup>mainly</sup> parallel to closely connected with this series, & are mainly parallel to the folds, intersecting rocks of Sauvehan or Huronian age indifferently. ~~The~~ The subsequent North-East & South-West flexure of the rocks has been very violent in its character, producing vertical or overturned dips in both Sauvehan & Huronian rocks, & producing the ~~parallel~~ <sup>oblique</sup> troughs of the latter ~~series~~ alluded to. Sedologically, the Huronian rocks of the vicinity of the Lake of the Woods while unmetamorphosed in many respects the typical rocks of that series as described in Series Huron & Superior, differ markedly in some points. They consist of blackish & greenish



26

(?)  
Irontondic Schists, which become in very  
instances paler & almost varnicious in centre,  
probably by the development of hydrous micae.  
These are associated with massive cherts &  
quartzites, & with great bodies of 'structure  
unconformities' & allied rocks which are evidently  
agglomerates proper speaking agglomerates or  
volcanic breccias due to contemporaneous  
volcanic activity.

26  
The first part of the book is devoted to a description of the  
various forms of the disease, and the manner in which they  
are communicated. The second part contains a description of  
the various symptoms, and the manner in which they are  
produced. The third part contains a description of the  
various remedies, and the manner in which they are  
to be used. The fourth part contains a description of the  
various cases, and the manner in which they are to be  
treated.

In the Rocky Mountain region near the fortieth parallel ~~the series~~<sup>group</sup> is described by King as which appears to be <sup>the Saramie</sup> merely the western development of the Fort Union beds & is probably as strictly synchronous with them as portions of a single formation so widely separated in space usually are, is described by King as consisting of "a series of rather coarse sandstones, buff & grey, frequently striped with alternating strata of rusty red & carrying repeated intercalations of rusty clays & carbonaceous clays, & a considerable number of coal beds". The series is over 5000 feet in thickness in the Green River basin, & is characterized throughout by both salt & brackish-water types of mollusks & contains several important zones of plant-bearing beds. The line between the Fort Hill & Saramie is drawn where the true pelagic forms of mollusks are found to cease.





The economic importance of this group lies in the occurrence in it of ~~beds~~ numerous beds of ~~lignite~~ lignite & lignite-coal, on which some details are given on a succeeding page below. The eastern edge of the Lignite Tertiary is practically the same with the western of the ~~St. Pierre~~ Pierre group of the Cretaceous, outlined on a preceding page, & they doubtless occupy a great part of the Winnipeg prairie plateau, stretching ~~on~~ the forty-mile parallel to the west base of the Rocky Mountains. Notwithstanding the generally horizontal position of the beds the irregularities of the surface of the highest prairie level, & the excavation of deep river valleys in it has refused the underlying Cretaceous in many places, & it is as yet impossible to define the limits of the formations on the maps with any accuracy. The Lignite Tertiary, however, covers in the aggregate a very great area between the forty-mile parallel & the Saskatchewan, the edge of the



These seams dippe to the Rocky Mountains, & is almost  
 throughout everywhere found to yield coal or lignite-coal  
 in greater or less quantity. In the vicinity of  
 Woody Mountain & the Cypress Hills the tributaries  
 of the Missouri & South Saskatchewan have cut  
 down in many places to the clays of the Pierre group,  
 leaving the Lignite Tertiary as a more or less elevated  
 plateau like the various portions of a Caneos.

The Lignite Tertiary has been most carefully studied  
 in the vicinity of the forty-mile parallel, where  
 the highest beds are probably those occurring the  
 tributaries of the Quaking Ash between the 345 &  
 385 mile points west of Red River, known as  
 Partridge & Pyramid Creeks & the Great Valley.  
 In connection with the sections here exposed, numerous  
 & important beds of lignite occur, in association  
 with greyish, yellowish & purplish arenaceous



arenaceous clays, sands & little consolidated sandstones, & beds of ironstone. The default shows no trace of marine conditions or brackish-water conditions, & whenever remains of molluscs are found they are those of fresh-water. The lignites appear to prove the frequent elevation of parts of the area above the surface of the water, & the general prevalence of plant remains in the intervening sands & clays, proves that at no time were the land surfaces far removed.

It is probable that the highest beds seen in the Souris River district are below those just described, but differ little from them. The lower part of the section on the Souris River includes the nodular sandstones which give rise to the fantastically weathered Roche Percées. It was supposed at the time the Souris River sections were examined that the Roche Percée sandstones were

Respected Sir,  
 I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above mentioned matter.  
 I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration.  
 I am, Sir, very respectfully,  
 Your obedient servant,  
 J. M. [Name]

they near the base of the lignite Tertiary formation,  
 but subsequent findings by the Geological Survey  
 have shown that ~~it~~ this is not the case, & that the  
 Tertiary outcrop, though concealed & drift, probably  
 extends considerably further east than is indicated  
 in my Bowdler Commission report. Numerous  
 beds of lignite, as far as we see to seven feet in  
 thickness, occur in this district, & acquire some  
 importance as being the nearest known to the settled  
 country of Manitoba. Molluscs are found in a  
 few places, the most prominent being Uelania  
Nebrascensis, with a second species of this genus &  
goniobasis, fragments of unio & Corbula  
 (Potamomya) Maclurei, which must be  
 considered as a brackish water type form.  
 Further west than any of the localities yet mentioned  
 has yet been seen are others displayed in the  
 bad lands ~~South of the Woody Mountain~~ on the

It was the first of the first feeling of freedom  
 but subsequent groups of the spiritual nature  
 has shown that it is not the case at all the  
 Eastern people have received light. Indeed  
 within ourselves, perhaps that there is a  
 in the Eastern countries in which  
 they speak in their cases for their part in  
 the case even in the spirit of a degree that  
 importance as they have shown in the world  
 of the world. Indeed in part in a  
 has shown the movement from being  
 themselves but a true spirit of the world  
 the world is a true spirit of the world  
 (The world) the world is a true spirit of  
 movement in a world, and the  
 further that they are the world is a true spirit of  
 has shown the movement in the  
 but the world is a true spirit of the world



described & also of the Woody Mountain plateau.  
 They ~~are~~ ~~then~~ ~~found~~ have a somewhat different  
 appearance, & west of this point a gradual change  
 continues to take place, till in the region round the  
 Three Buttes the formation has assumed an  
 appearance so diverse from that of the Eastern  
 development, that were sections ~~in~~ ~~the~~ ~~from~~ the  
 two sections directly compared it would be difficult  
 to prove their equivalency. The beds but shown in  
 the Bad Lands are at the very base of the formation,  
 & lower than any seen part of this place, but their  
 difference when compared with those of the Sorris is not  
 very striking. In some of the lowest beds a pale  
 greenish-grey tint, not previously observed, ~~appears~~  
 appears, & the occurrence of reptilian bones is a  
 new feature, none having <sup>yet</sup> been found part of this  
 place in Canadian territory.  
 on the Milk River, where the next great series of

The first part of the paper is devoted to a  
 description of the various forms of the  
 language as they occur in the different  
 parts of the country. It is shown that  
 the language is not a single homogeneous  
 mass, but that it is composed of many  
 distinct dialects, each of which has  
 its own peculiar characteristics. The  
 author then proceeds to discuss the  
 historical development of the language,  
 and to show how it has been influenced  
 by the various tribes and nations  
 which have inhabited the country.  
 He also discusses the influence of  
 the English language, and shows how  
 it has been adopted and adapted to  
 the needs of the country. The paper  
 concludes with a list of the various  
 dialects, and a description of their  
 respective characteristics.

exposures of this formation occurs, its Character has undergone a further Change. The fossil remains here is now more pronounced, & characteristic of a greater thickness of the beds; & whole ~~well~~ fresh-water molluscs abound, they are mixed for the first time with the remains of Ostrea a marine form. Leptæta still occur, though not abundantly, & reptilian bones are found in certain layers.

In the vicinity of the Three Buttes, where by miles & Cartmains shales still occur, the beds hold shells of Ostrea in great numbers with a Dorthis (Peritina) & other marine or brackish-water forms. Still further west, near the first & second branches of the Milk River, there is a remarkable transition to fresh-water conditions, quite at variance with the general tendency to become more strictly



reference of the present record, if possible  
 has undergone a further change. It has been  
 stated in the first paragraph of the  
 a great distance of the road. A white  
 high-water table, however, about the same  
 for the first time with the remains of the  
 a distance from the high water table, that  
 (approximately) a distance from the  
 certain cases.

In the present case, the high water table, which is not  
 (approximately) the same, the high water table  
 of water in great quantities with high (rising)  
 & the present is high-water table. This  
 further part, but the first & second  
 the high water table to a considerable  
 to high-water table, and the present  
 with the present, the high water table,

Quarries westward, & perhaps indicating the 36  
occurrence of a higher position of the formation. Dinosaurian  
and other Reptilian bones, however, still occur  
in connection with Union near the First Branch,  
& on the Second Branch the bone-bearing beds appear  
to underlie a considerable thickness of strata holding  
Limnæa, Paludina, Planorbis & Sphaerium,  
some of which are identical with those of the well  
developed Eastern Fort Union beds. Greenish-grey  
arenaceous clays now constitute a large part of the  
series, coarse sandstones occur frequently, & a  
few beds of Conglomerate are noted. No lignites were  
found here in this part of the formation.

When next met with in going west, on the St  
Mary River, twenty-five miles east of the base  
of the main range of the Rocky Mountains, the  
beds seen may probably be considerably below  
those of the last localities. They still bore much  
the same general character, & greenish arenaceous



Clays are conspicuous. They are, however, more consolidated, & the coal found here differs considerably from the lignites of the Sardinian Coalfields, a circumstance probably connected with the disturbance ~~of~~ of the beds, which are here found at high angles. The molluscs include decidedly salt-water forms, & no reptilian remains were found in this neighborhood.

It would thus appear, that though the general tendency of the Sardinian Tertiary, is toward salt-water conditions westward & those of fresh-water lakes to the east, that there are important exceptions, & that while brackish-water forms spread westward in the lower beds as far as the Roche Percée, fresh-water species are scattered westward nearly to the base of the mountains.

In this latitude a zone of sandstones appears to be of very constant occurrence in the formation. It appears on the Sauris Pass at the Roche Percée

? if this zone is always the same?

Clays are conglomerates. The one however  
 was consolidated, & the one found here differs  
 considerably from the deposit of the same  
 a conglomerate having been cut out the  
 of the rock which are here found at high angles  
 of position which are strikingly set out  
 & in position remains now found in this  
 neighborhood.

It would have been that they the present  
 thickness of the bed is thinner but  
 with the same thickness & the same  
 beds taken to the fact that there are important  
 distinctions in the white bedded beds  
 several features in the lower beds as far as  
 the beds are, bed-bedded beds are scattered  
 throughout the base of the formation  
 in the thickness of the beds of the  
 of the important differences in the formation  
 throughout in the lower beds in the beds



38

In the Bad Lands it is about 150 feet  
above the Summit of the Fort Hill Group; in the  
valley of the Milk River about 200 feet above the  
base of the exposed section, & in the region  
surrounding the Buttes at several miles from the  
base of the Mountains, & therefore probably several  
hundred feet up in the Tertiary.

In the present state of our knowledge of the  
region between the forty ninth parallel & the  
Saskatchewan, in which, as above stated the Tertiary  
has not been distinctly outlined, ~~it is~~  
~~not necessary~~ ~~to~~ ~~describe~~ it would be possible  
to describe a number of isolated localities merely.

---

The Cretaceous rocks of the Peace River country,  
being separated from the region contiguous to  
the forty ninth parallel & northern portion of the  
Cretaceous area in Canadian territory by a  
wide tract of which Compacting little is known,



it is was convenient to ~~briefly~~ describe  
 separately. To the east of the Rocky Mountains,  
 which are very narrow & very high, & outcrop  
 on their Devonian & Triassic beds quite undisturbed,  
 are the Cretaceous rocks, which, between the mountains  
 & the Eastern outcrop.

of the Devonian rocks on the lower Peace, occupy a basin with  
 a width of nearly 350 miles, implying a Cretaceous sea of that  
 width.

The Rocky Mountains have here formed a shore-line in Creta-  
 ceous times, and the Cretaceous rocks along their eastern base  
 are almost entirely sandstones and conglomerates, the constituent  
 fragments of which can be traced to the cherts and quartzites  
 accompanying the limestones. The mountains are bordered to  
 the east by foot-hills, in which, on the upper part of Pine River,  
 for a distance of fifteen miles from the older rocks, the Creta-  
 ceous sandstones are folded and disturbed. The disturbance,  
 however, gradually diminishes on receding from the mountains,  
 and the beds at length become flat, or are affected by very slight  
 and broad undulations only. Shaly materials increase in im-  
 portance eastward, and the Cretaceous series eventually resolves  
 itself into the following sub-divisions, which are placed opposite  
 their supposed representatives in the Western States:

- Upper, or Wapiti River Sandstones . . . . Fox Hill (and Laramie?)
- Upper, or Smoky River Shales . . . . . Pierre,
- Lower, or Dunvegan Sandstones . . . . . Niobrara, } Colorado.
- Lower, or Fort St. John Shales . . . . . Benton, }



The correlation as above shown is based partly on palaeontological evidence, partly on lithological resemblance. The synchronism of the Upper States with the Puris group is quite clearly shown by the fossils, which were found in abundance <sup>in</sup> several places on Smoky River, & of which a list of several species is given in the Report of Progress of the Geological Survey for 1879-80 (p. 124 B.) No fossils have been obtained from the underlying member, which while its lower part doubtless represents the Fort Hill group, may pass some into the Laramie. The fossils of the lower Sandstones are peculiar, consisting chiefly of fresh-water & estuarine forms of molluscs & land plants. They have not yet been thoroughly examined but include Dicranurus, Pteria, Cyrena, Ostrea, Unio, Corbula, Goniobasis & among the plants Cycadites, Magnolia, Carya

The vegetation as shown in these parts  
 is characteristic of the region, and the  
 abundance of the species is the same as  
 that of the other parts of the same  
 region. The species of the same  
 genus are found in the same  
 parts of the same region. The  
 species of the same genus are  
 found in the same parts of the  
 same region. The species of the  
 same genus are found in the  
 same parts of the same region.

41  
Protophyllum, Salix, Glyptostrobus gracillimus,  
& Sequoia, forming a flora akin to that of the  
Dakota group, but older than that of the Coal-  
measures of Vancouver Island or the Laramie  
of the Plains. The fossils, collectively, are of great  
interest, growing as a number of fresh-water  
molluscs & land plants of a stage of the Cretaceous  
previously almost unrepresented in these respects.  
The molluscs closely resemble those of the Laramie group  
& might readily be mistaken for Tertiary forms.  
They resemble those described by me from a series  
of beds locally developed at Coalville Utah, which  
I must have been formed <sup>in</sup> ~~at~~ the edge of the Cretaceous  
sea at the mouth of a small river, but in  
the Peace River district we have, instead of a  
very local intercalation of this character, a  
widely extended series of Cretaceous beds persistently  
holding fresh-water & estuarine types of molluscs  
& land plants.

A large plant  
of which the leaves are  
very dark green and  
the flowers are yellow  
and the fruit is  
black. It is found  
in the lowlands of  
the district and is  
very common. It is  
used for food and  
for medicinal purposes.  
The leaves are eaten  
raw or cooked. The  
fruit is used to make  
a drink. It is also  
used to make a  
sauce. It is a very  
valuable plant and  
is found in many  
places. It is a very  
common plant and  
is found in many  
places.



In the Lower Stales, the most characteristic <sup>42</sup>  
form is a large ammonite, resembling Ammonites  
(Prionocyclus) Woolgari, but specifically distinct.  
No beds so low as the Dakota have yet been  
found to exist in this district.

Lithologically the Upper Sandstones, consist of  
soft often shaly sandstone, earthy shales & clays  
generally of yellowish & brownish colours. Some  
gypsum are included in the series. The upper  
shales are greyish & bluish to nearly black in  
colour, the latter tint being due to fine divided  
Carbonaceous matter, which, with disseminated  
pyrites causes the swoulding emburment of  
banks of these shales which has given its name to  
Swoky River. ~~Some~~ Fracture occurs in  
abundance in many places in nodules &  
nodular sheets. The lower Sandstones are often  
shaly & not infrequently concutaneous giving rise to  
curiously weathered rocks along the banks of

In the above states the first characteristic  
is a large amount of water, and the  
second is that the water is not  
free but is in the form of  
small particles in the air.

It is clear that the water is not  
free but is in the form of  
small particles in the air.  
This is the case with all  
the other states of matter.  
The only difference is that  
the particles are smaller  
and more numerous.  
In the case of the  
solid state, the particles  
are so close together  
that they are not  
free to move.  
In the case of the  
liquid state, the particles  
are so close together  
that they are not  
free to move.  
In the case of the  
gaseous state, the particles  
are so far apart  
that they are free  
to move.

ivers where they occur. They hold excellent <sup>43</sup>  
Coals in the vicinity of Pine River Forks &  
the mountains of Rocks of Peace River. The lower  
Shales almost surely resemble the upper shaly  
group, but are perhaps somewhat darker in  
several localities & sometimes include sandstones.

The circumstances of deposit & origin of the material  
of the several subdivisions of the Carbonaceous  
& Lignite Tertiary group is an interesting subject,  
& leads us to attempt to ~~reconstruct~~ realize  
the physical geography of the western portion  
of the Continent in Miocene times.

It would appear that the Carbonaceous period was a period  
of considerable land surface, shallow water, & current-driven  
sand banks, & that these circumstances were not only extended from the  
Nebraska region westward to the Wahsatch Mountains, but probably  
also to the Saskatchewan region & even further north. Similar  
conditions affected the Mississippi region described by Prof. Hilgard,  
& probably at the same time the coast deposits of New Jersey.

I have been thinking of you  
 and the friends of the  
 cause of the oppressed  
 and the poor. I have  
 been thinking of the  
 many who are suffering  
 and who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid.

I have been thinking of you  
 and the friends of the  
 cause of the oppressed  
 and the poor. I have  
 been thinking of the  
 many who are suffering  
 and who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid. I have  
 been thinking of the  
 many who are in need  
 of your aid.

This seems to have been followed in the interior <sup>44</sup>  
Continental region, by a general Subsidence,  
during which the Benton Shales were formed, the  
great quantity of fine Material required being,  
probably, brought into the region owing to the opening  
by the depression of wide avenues to the north through  
which currents flowed Southward. The conditions  
giving rise to the Benton Shales are now known to have  
obtained northward to the Peace River district. During  
a succeeding period of tranquility, in which but  
a small amount of detrital material was introduced  
over the Southern part of the area, the Chalk-like  
Nebraska Limestones of <sup>the</sup> Nebraska region were formed. ~~How~~  
~~far~~ In the Rocky Mountain region the Nebraska  
was a period of elevation, & calcareous beds are  
not so important, & it would now appear, if  
the correlation of the Devonian Sandstones with  
this group be correct, that in the region of the  
Peace River the elevation gave rise to widely

Nebraska

This seems to be a very faint document, possibly a letter or a report, written on lined paper. The text is extremely light and difficult to read, appearing as ghostly impressions of words and sentences. The handwriting is cursive and appears to be from the late 19th or early 20th century. The document is oriented vertically on the page, with the text running from top to bottom. There are several small stains and marks on the paper, particularly a prominent one near the center-left. The overall appearance is that of an old, well-preserved but very faded piece of paper.

extended tracts of low land. <sup>rather</sup> Here probably 45  
we find the ~~land~~ <sup>land</sup> barrier which shut out the sediment-  
bearing currents

In the Pierre shales, exceedingly fine in texture and of great thick-  
ness, we have evidence of a second considerable subsidence, which by  
again allowing the region to be traversed by marine currents, and  
perhaps also by bringing neighbouring decayed land surfaces under the  
action of the sea, supplied the necessary material. During this period,  
according to Meek and Hayden, a part of the clays and greensands of  
New Jersey were formed on the Atlantic coast; and in the Mississippi  
region, according to Hilgard, the Rotten-limestone Group was deposited.  
The fact that calcareous beds were being formed in the southern por-  
tion of the interior continental trough, while deposits so purely argil-  
laceous were produced in the northern, seems to verify the supposition

of the entrance of the sediment-bearing waters from the north. On the  
west coast, the subsidence appears to have allowed the Chico beds to  
spread to the foot of the Sierra, while land surfaces in Vancouver  
Island were brought down to the sea-level, and vegetable accumula-  
tions formed and covered by marine strata, giving rise to the valuable  
coal deposits of that region. Here the subsidence must have continued  
for a long period, while several thousand feet of strata were laid down.

In the interior continental region, either elevation followed the  
Pierre period, or the increase of sediments proceeded faster than the  
slow subsidence, for the succeeding Fox Hill period is again charac-  
terized by sands and similar shallow-water accumulations; and between  
the Rocky Mountains and the Wahsatch, near the western margin of  
the sea, land surfaces, evidenced by the occurrence of coals, existed.  
That the decreased depth over the interior continental region was due  
mainly to the filling up of the northern portion of the basin, rather  
than to elevation, seems to be indicated by the fact that limestones  
and marlites still continued to be deposited in the Mississippi region.

chalk-like Niobrara limestones of the Nebraska region were formed.  
These have now been found in several places along the eastern expo-  
sures of the Cretaceous north of the 49th parallel. In the Rocky Moun-  
tain region the Niobrara was a period of elevation, and calcareous beds

into an <sup>East on</sup>  
cut-off of  
Tertiary  
River of deposition  
of coals.  
Character of beds  
and has character of  
B.C. beds 134 B.  
limestones &  
scarcely success  
of East 2 feet.

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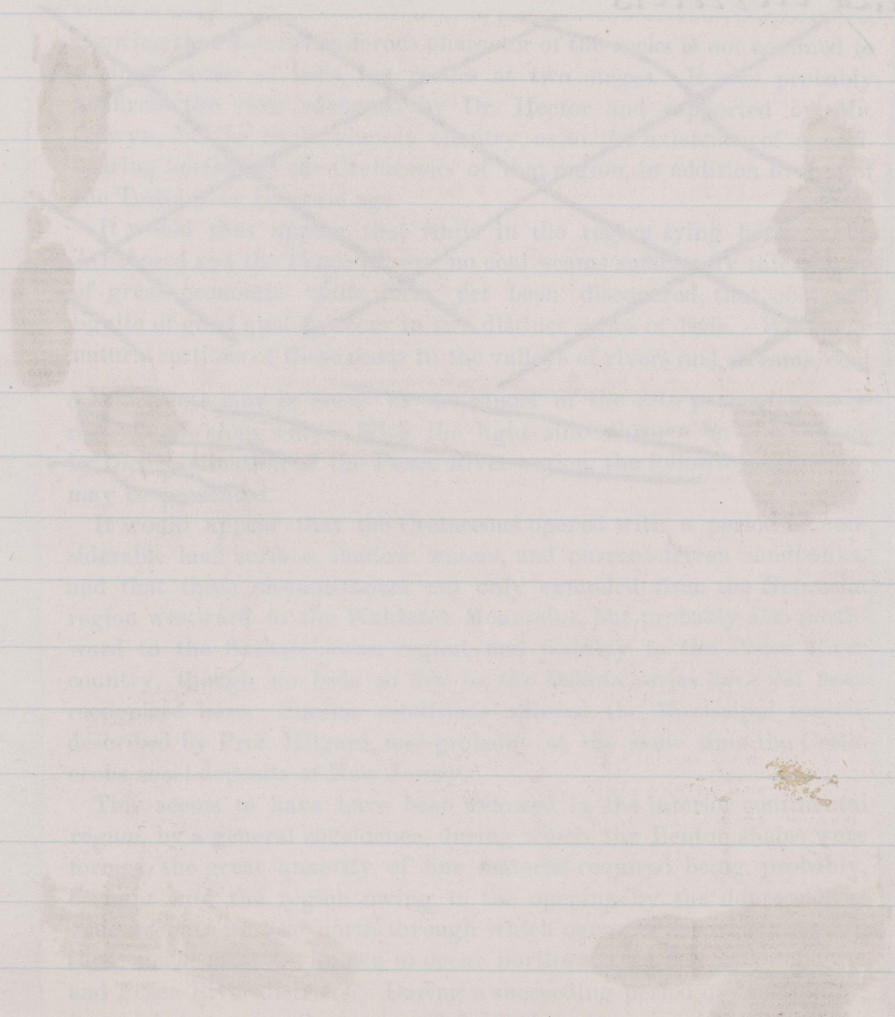
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and marlites still continued to be deposited in the Mississippi region.

During the deposition of the Upper Cretaceous, Transition or Eocene  
beds of the Laramie and Fort Union series, depression must have been  
steadily in progress, for while land surfaces are evidenced at many  
horizons, the thickness of the formation is very great. The accumula-  
tion of material, however, outstripped the slow sinking, for during  
this period marine conditions came to an end, the salt water being first  
excluded from the eastern, afterwards from the western part of the  
area.

But in Fort Union  
cut off by  
Sierran  
Rise of elevation  
of coals.  
Character of coals  
But has character of  
P.R. Rocks 134 B.  
Limestones &  
Succinea series  
of Fort Union.



12  
The first of the series which is the subject  
of the present paper is the  
series of the first series.



Notes on Richardson

with special. rep. to phys. geog. & geol. of N.W.

Slope of County eastward to Hudson Bay  
2 1/2 for rule p. 102.

spurs of Rocky Mts. crossing Mackenzie &  
nearly to Bear Lake. Sventen, General map  
of N.W. of Rocky Mts. p. 171

Navigation of the Mackenzie p. 208.

Saskatchewan & Mississippi in one great  
valley vol II. p. 199.

Size of the Prairie belts II p. 200.

Sketch of Geology of

Polina Central Region

1881

Em Dawson

Wants.

Note on possible resources of  
Lambton & Huron.

Description of resources (Salt, petroleum &c)

of Sil & Dev. rocks along boundary of  
lakes.

Spit water age of Lacarne.

Review of distribution of pools  
Character of pools

Resources & Resources purely  
of Salt & Fert.

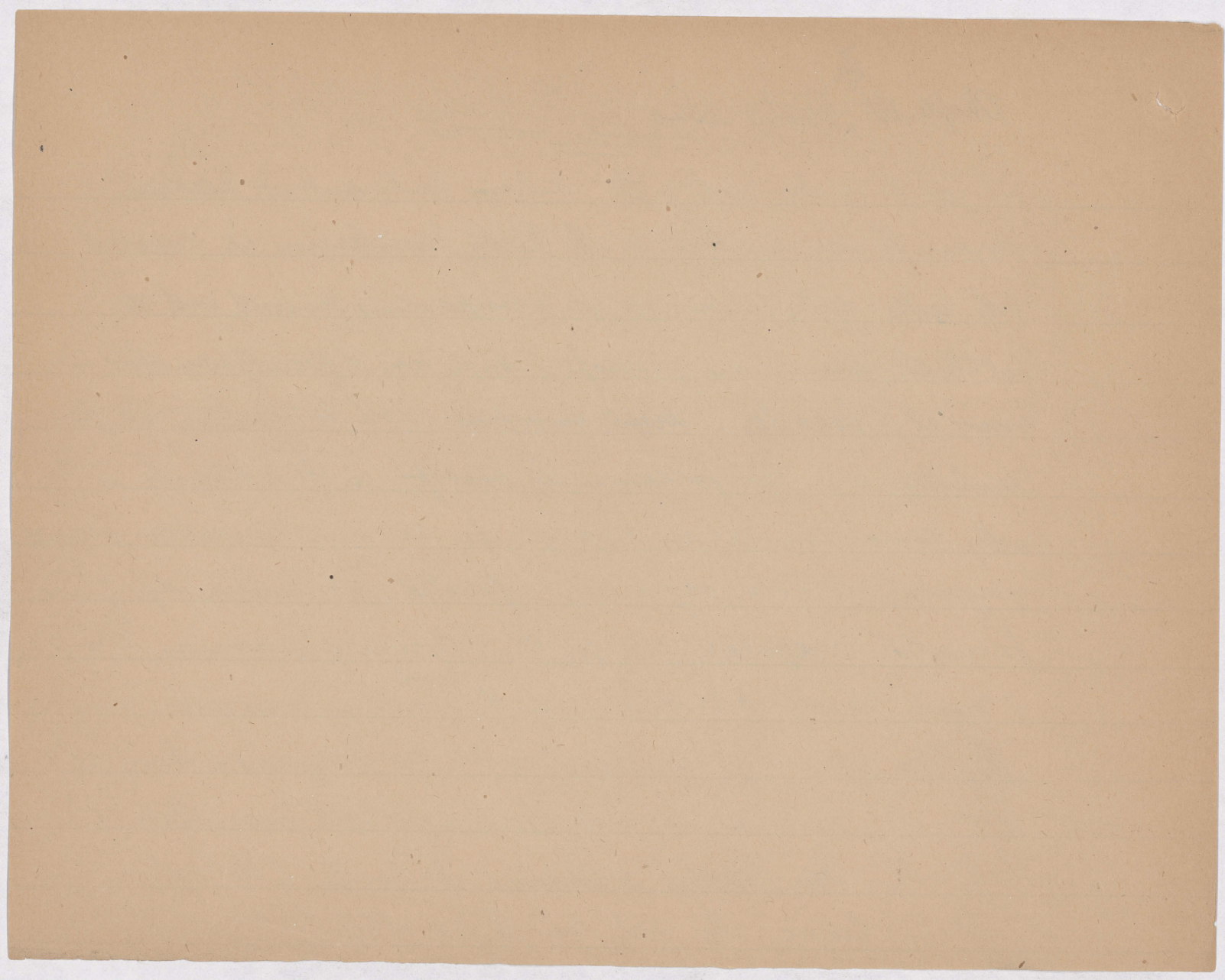
Drift - (? of Carboniferous  
General acc't including country  
W. of W.

for Lake Huron  
see Report 1879 or

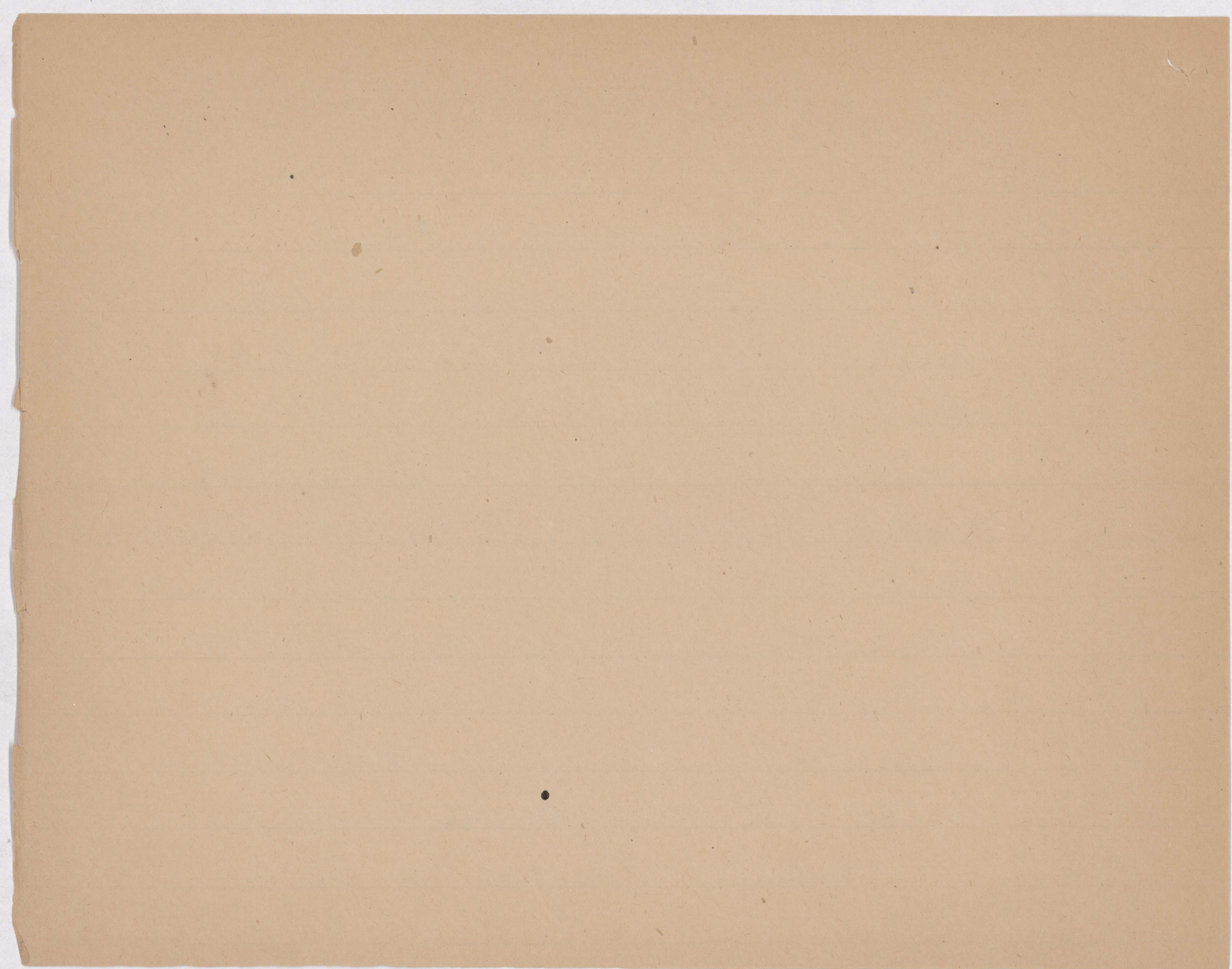
1.

The  
Chapter III, Cretaceous & Tertiary.

By far the greater part of the <sup>basin</sup> western Continent of ~~plains~~ between the Louisiana & the Rocky Mountains is covered with rocks of Cretaceous age, or corresponding generally with the great Chalk formations of Europe, though very different from these in mineral character. Except in a few localities, with the exception of a few localities, & a belt following the base of in the proximity of the Rocky Mountain region of uplift, they are still almost as perfectly horizontal as when originally deposited. The eastern edge of this formation irregularly overlaps the Silurian & Devonian limestone & runs nearly parallel with the <sup>South</sup> western base of the Louisiana plateau at a distance of about one hundred & thirty miles from it, between the fifty-third & fiftieth parallels of latitude. ~~It~~ Further southward it trends to the east, & probably crosses the forty-ninth parallel east of the Red River



While in South western Minnesota, Cretaceous rocks  
 appear in some places directly on granites which are  
 probably Laurentian. The general course of the Eastern  
 outcrop is consequently about north-south, & it is marked,  
 broadly, by a series of elevations & elevations, including,  
 - from south to north - Pembina, Piding, Deak, Parappin  
 & Basquia "Mountains". All these appear to be composed  
 for the most part, of 1st series, of Cretaceous rocks, though  
 the extreme edge of the formation may often stretch beyond  
 them. These so-called mountains, are, more correctly  
 speaking, as has been already shown - salient points  
 of the edge of the second ~~plateau~~ prairie plateau; & the  
 generally horizontal position of the beds thus suddenly cut  
 off to the east, attests the immense denudation which



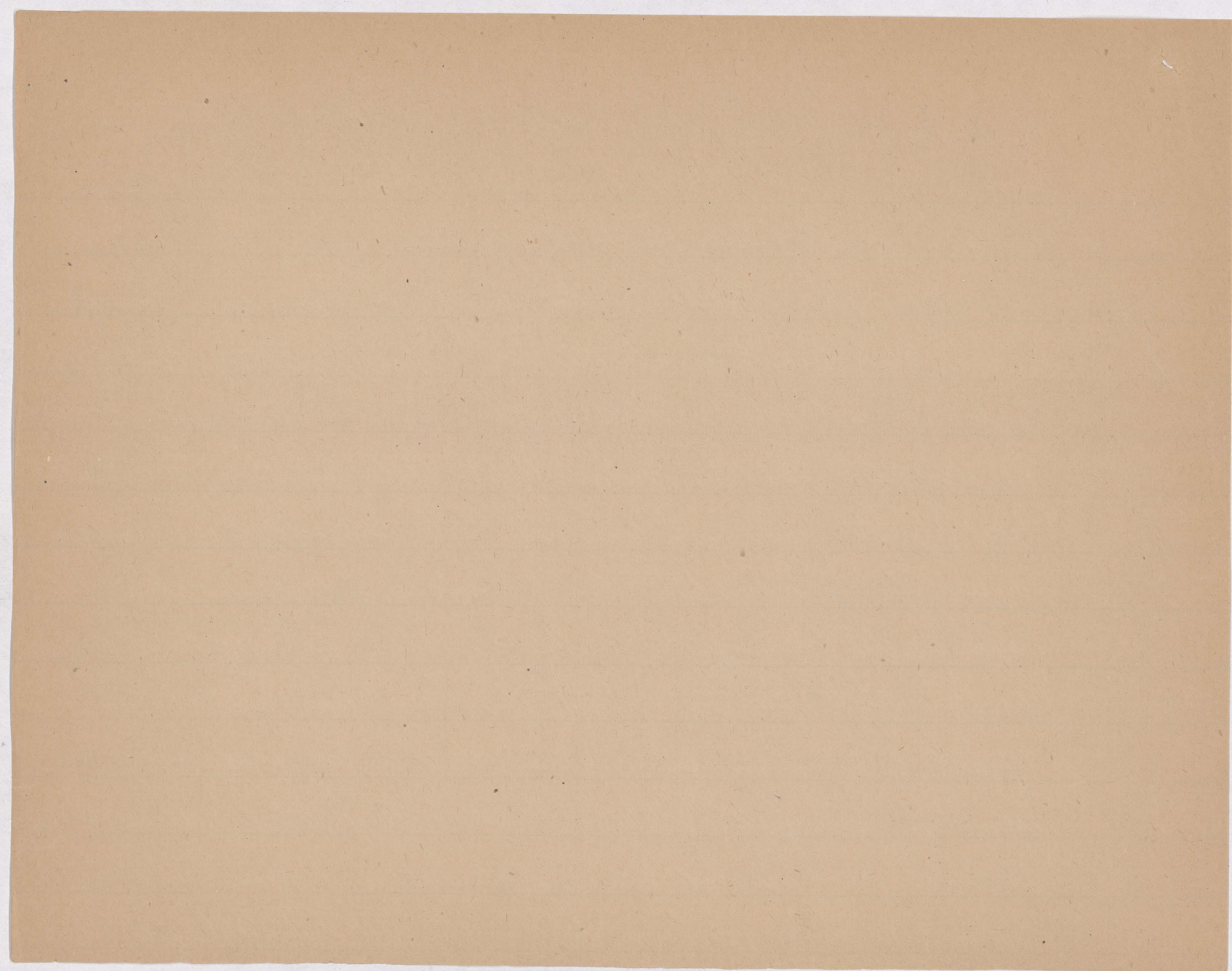
must have taken place in comparatively modern times.  
 West of the Basquia Mountain, from the very scanty  
 information we at present possess, the edge of the Cretaceous would  
 appear to run westward & cross the Sorlatchawan near Fort  
 à la Corne, where at Cole's Falls, a dark coloured shale  
 which has been referred to the lowest members of the series  
 occurs. It may probably be nearly continuous with the edge of  
 the Seneca plateau, which, according to Mr Selwyn, crosses  
 the river fifty-five miles below the fort. Still trending to  
 the north-west, the edge of the Cretaceous is next found on  
 the lower Peace River at a point a short distance above the  
 Falls, the exact distance between this & the last mentioned  
 locality being unknown. The western base of the formation  
 seems in most places to follow close along the base of the





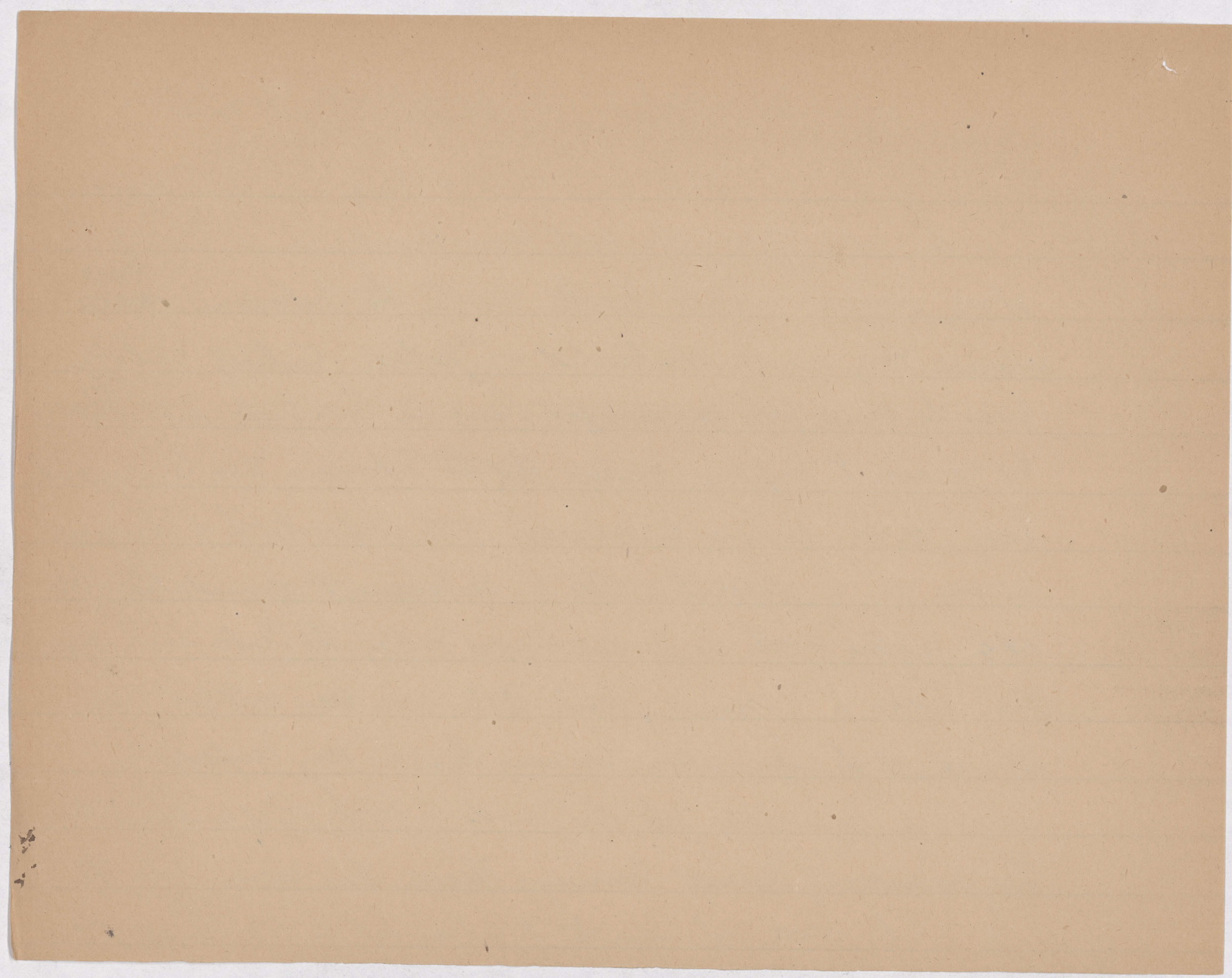
Rocky Mountains, but in some parts of the Range, according to Dr. Heaton, rocks of this age occur among the mountains, where they have been considerably altered. In Montana, Dr. Hayden supposes the Cretaceous rocks, including those of the Tertiary period to have passed completely across the region of the Rocky Mountains properly so called & to have been removed from them subsequent to their upheaval by denudation. This was also here observed in the Rocky Mountains universally west of the forty ninth parallel, but farther west, in the Peace River region the mountains here <sup>was of less continuous</sup> were a <sup>short</sup> line during the Cretaceous, & it is probable that even in the just mentioned regions the Cretaceous beds did not extend far west of the Range. Near the forty ninth parallel the Cretaceous deposits still have a width of over eight hundred miles, while in the Peace River region they still have a breadth, at

?



5

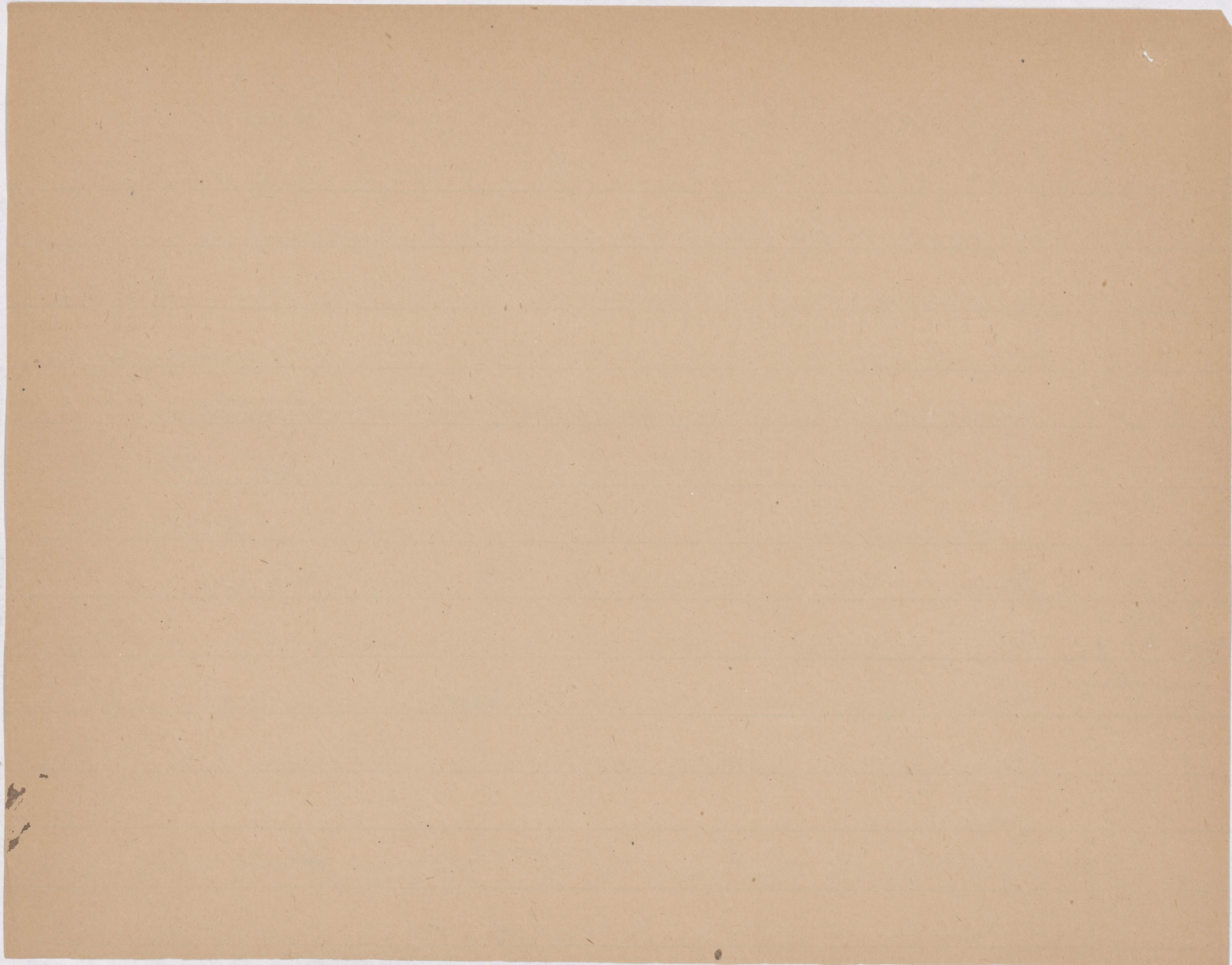
widened at right angles to the length of the  
trough of about three hundred & thirty miles; implying  
in each case a sea of width considerably in excess of the  
above figures. Still further north, the Cretaceous <sup>area</sup> ~~mass~~  
becomes very much constricted or <sup>is</sup> entirely cut off  
near the head of the Mackenzie River in latitude 63°. There is  
no reason to suppose, however, that the Cretaceous Sea terminated  
here, for the break in the continuity of the deposits, if it indeed  
occurs, — is doubtless due to subsequent denudation, for  
~~also~~ further north in the Mackenzie Valley the Cretaceous deposits  
are known to resume, though their area has not yet been  
defined, & the information concerning them is very imperfect,  
consisting principally of notes made by Sir J. Richardson during  
his numerous hurried journeys through this region. On the  
Bear Lake River, at near its junction with the Mackenzie Sir J.



Richardson discovered an Ammonite which among  
Sandstones & Shales which he states resemble those of the Coal  
measures. Prof. Meek has also found fragments of an Ammonite  
& Succinea in Mr Kemmick's Collections from the same  
place, & had previously described two species of Ammonites from  
specimens obtained in this neighborhood & submitted to him by  
Prof. Hind, as A. Barnstoni & A. Billingsii. It is well  
known, from Richardson's descriptions, & the information  
given to Meek by Kemmick that ~~the~~ beds of Cretaceous age,  
not only characterize the greater part of the Coast of Bear Lake  
River, but occupy a portion of the ~~same~~ western shores of Great  
Bear Lake & spread pretty widely in the region of the Mackenzie  
Estuary.

South of the Py north parallel the Cretaceous forms as well extends  
to the Mexican frontier & beyond, but is concealed over wide

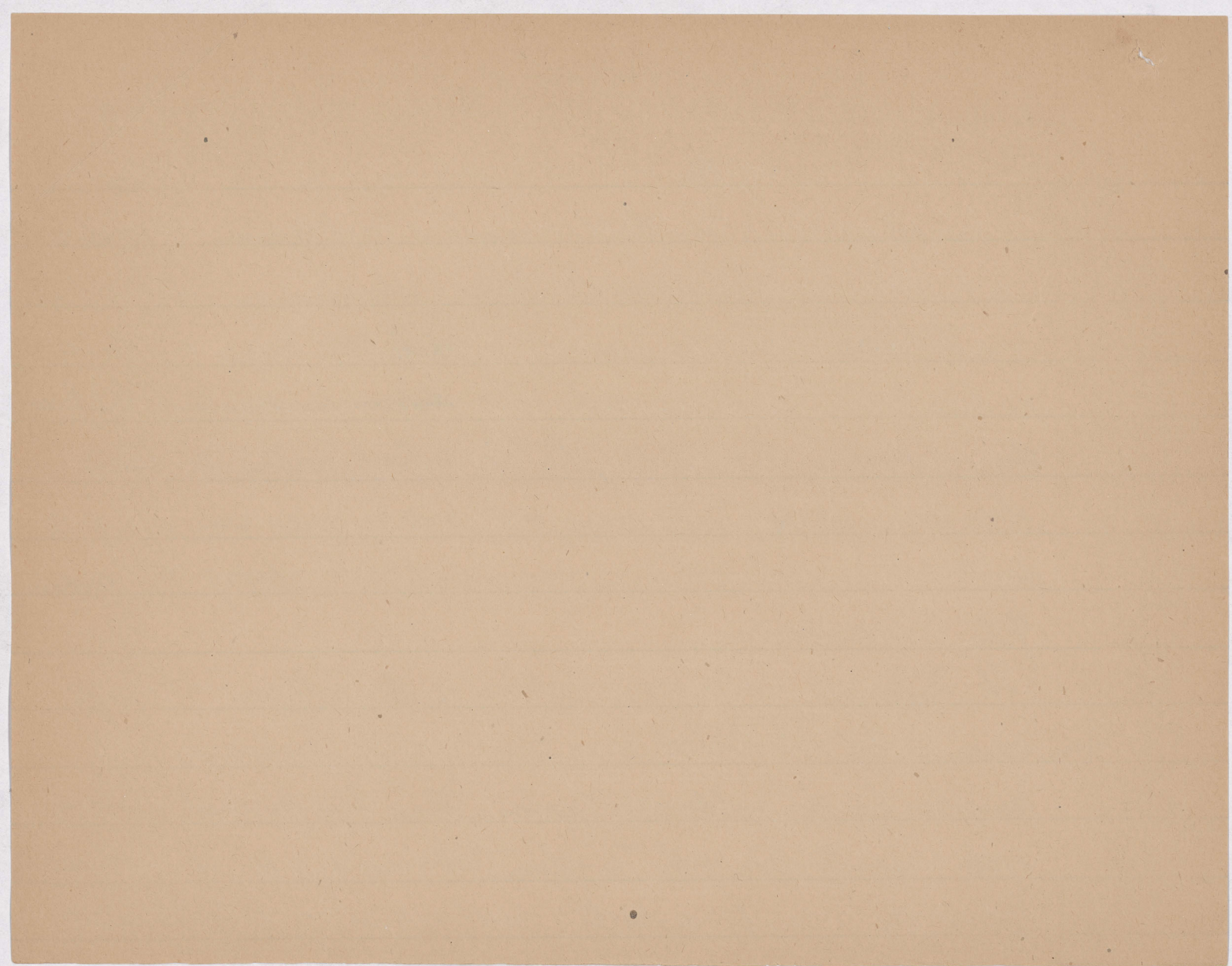
? see  
Vol. 1. p 92  
Trans. Geog.  
Acad. Sci.



7  
tracts of Campanian Late Tertiary deposits. In the  
regions here treated ~~of~~ with the exception of the deposits due to  
the period of glaciation, the Laramie & Fort Union beds, which  
have been variously classed as Upper Cretaceous or Eocene Tertiary,  
are the ~~most~~ <sup>present</sup> yet-discovered, & ~~which~~ <sup>though</sup> they cover a considerable  
portion of the Cretaceous rocks as ~~before understood~~ <sup>now</sup> here  
~~this~~ defined in this article, they lie entirely within the limits  
above given for the Cretaceous, & it will be more convenient to  
speak of their distribution in connection with that of the ~~subdivisions~~  
of the Cretaceous.

The typical Cretaceous section of the interior continental  
basin ~~region~~ is that established many years ago by Werner, Meek &  
Hayden in the Nebraska region. This has formed the basis  
of the investigation of the western Cretaceous, & as it is equally  
applicable to great districts north & south of the poly-mineral





parallel way be justified here. It is also included in the general comparison table of subdivisions at the <sup>close</sup> ~~end~~ of this Chapter. The section is as follows in descending order.

Later Cretaceous. —

No. 5. Fort Hill Beds. — Grey, porphyrous & yellowish Sandstones & arenaceous clays. Marine shells 500 feet

No. 4. Fort Pierre Group. — Dark grey & bluish plastic Clays. Marine shells & fish remains 700 feet

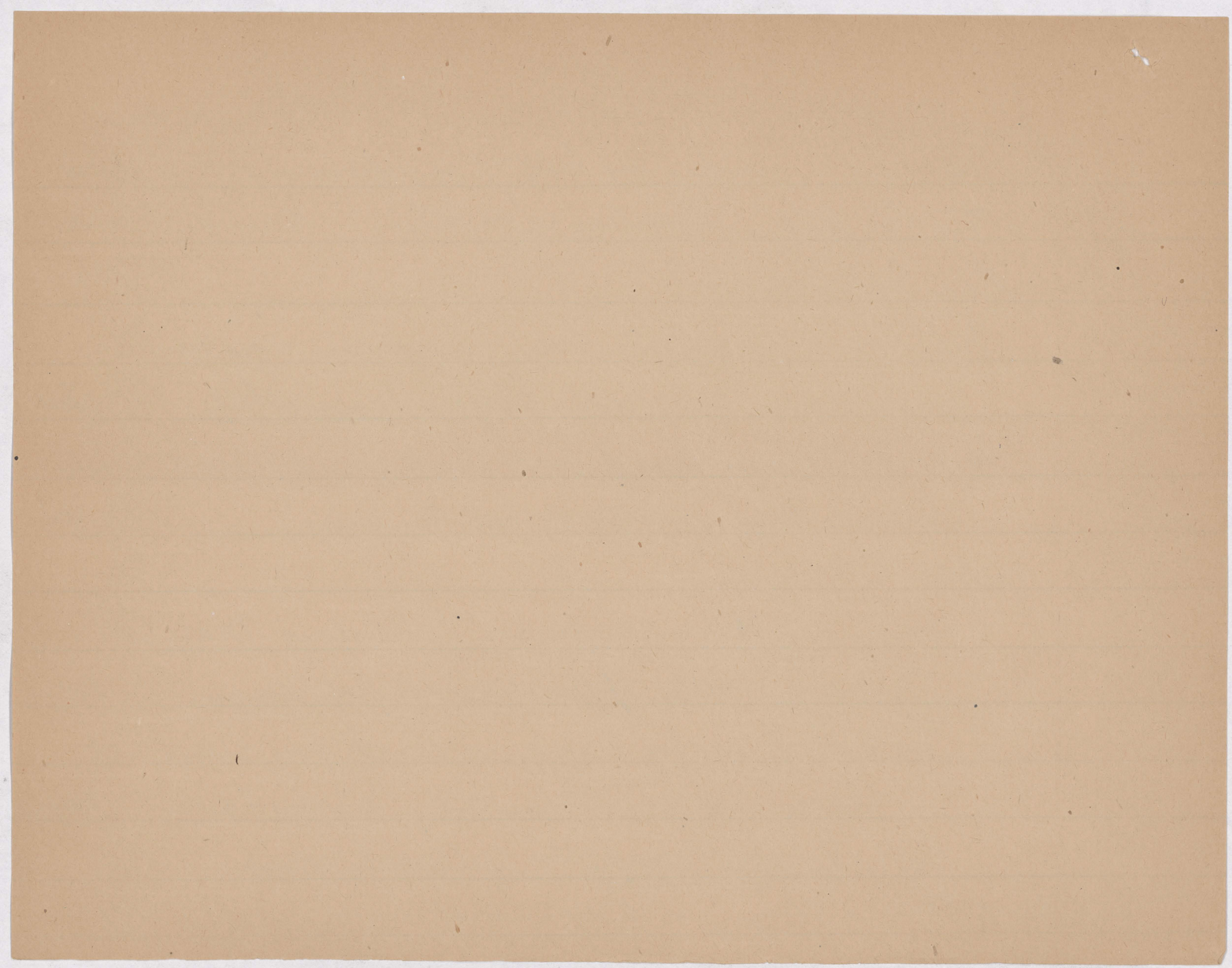
Earlier Cretaceous. —

No. 3. Niobrara Group. — Calcareous Marls.

Marine shells, Foraminifera, fish remains etc. 200 feet

No. 2. Fort Benton Group. — Dark grey laminated Clays, with some limestone. Marine shells 800 feet

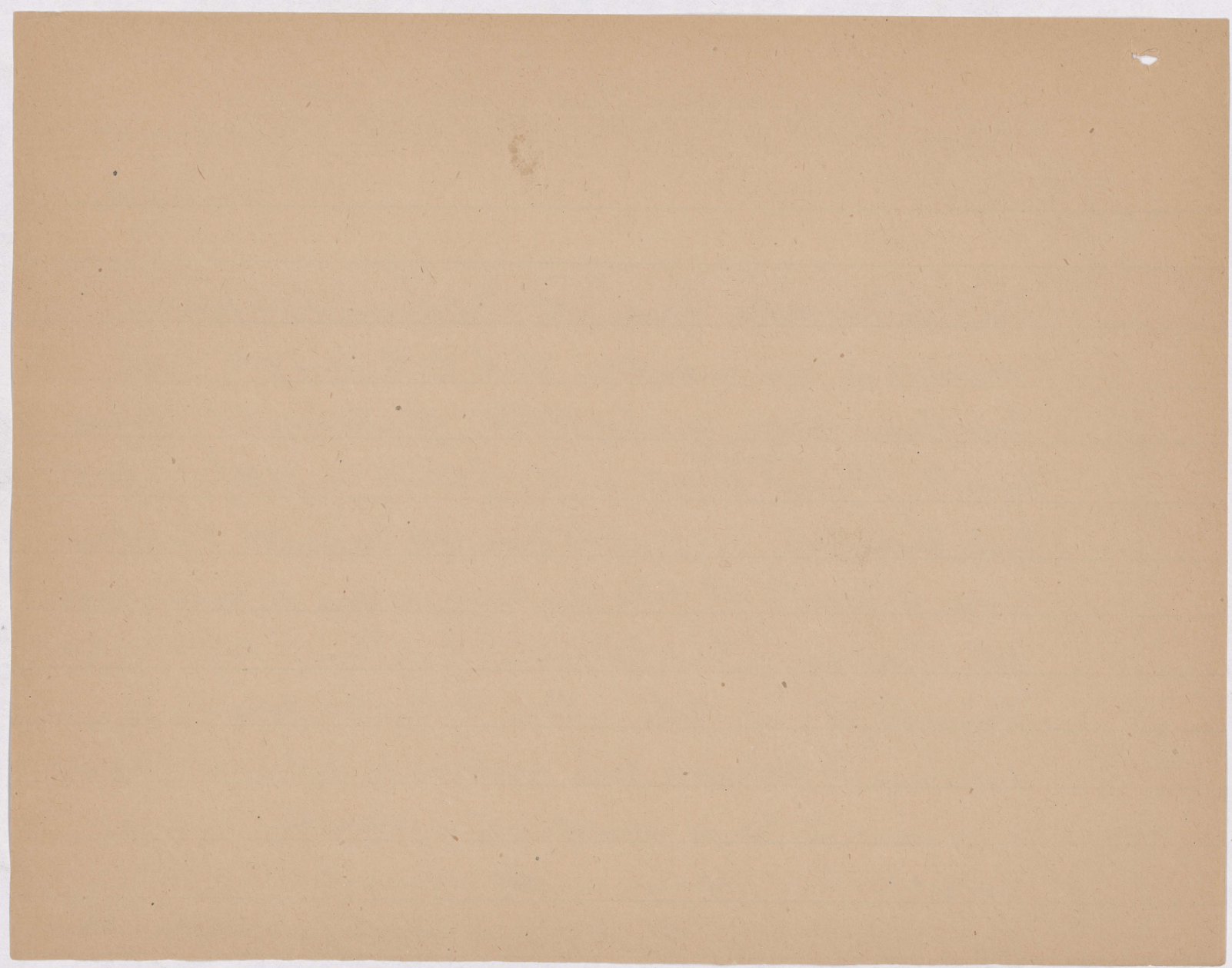
No. 1. Dakota Group. — Yellowish, reddish, & whitish Sandstones, & clays, with occasional lignite coals. Marine



& some fresh-water shells, & Angiospermous leaves.  
400 feet.

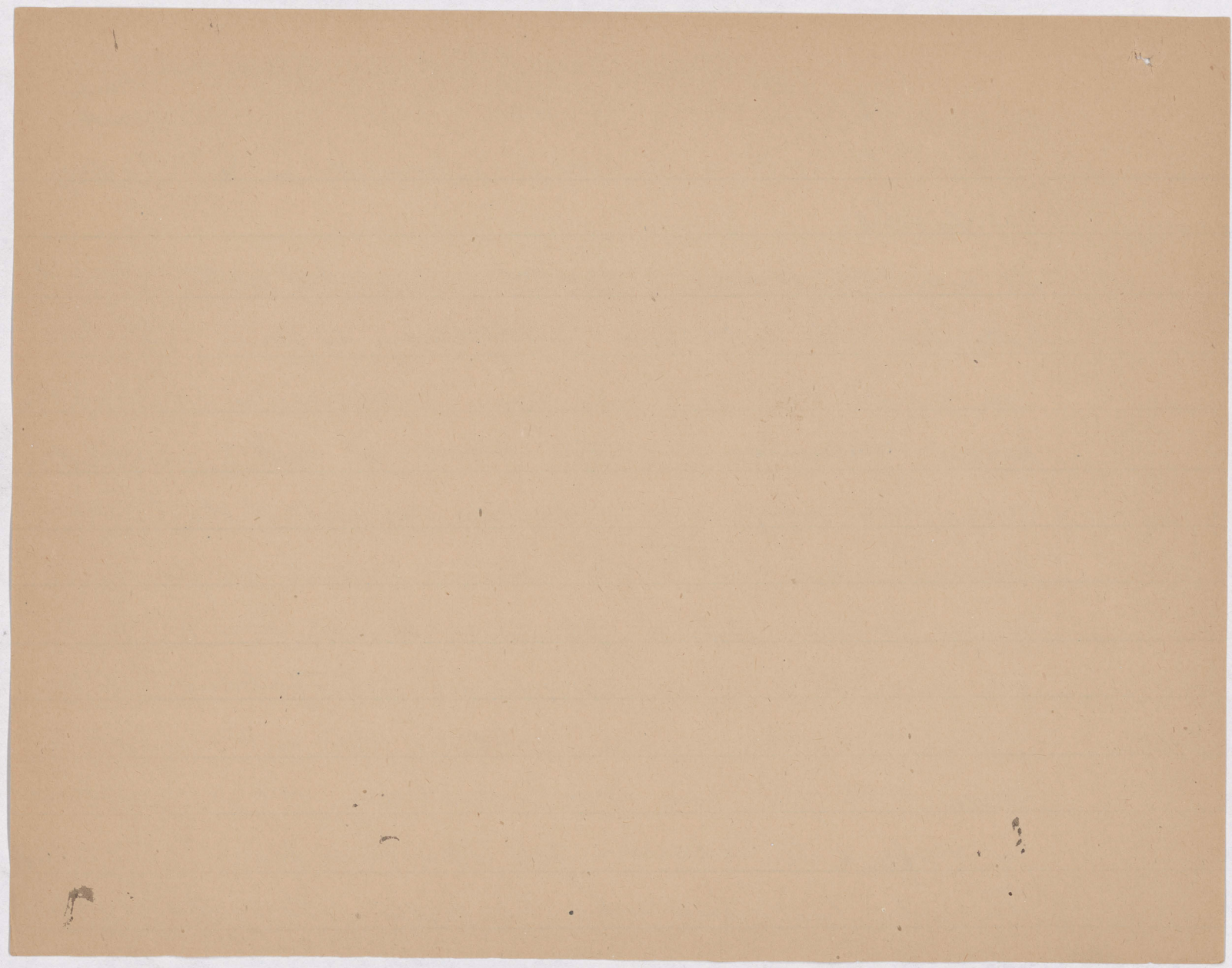
2,500 feet

From the Webster region, the Cretaceous beds stretch westward in an unbroken sheet to the base of the Rocky Mountains, though, as above stated, often concealed by newer deposits. They were <sup>originally</sup> found in this latitude completely across the Rocky Mountain range to the base of the Wasatch Mountains near the Great Salt Lake this range forming the western border of the "Cretaceous Mediterranean" as Clarence King has well designated the Sea of the interior Central Asian basin. In following the Cretaceous beds westward as they lead to the vicinity they are found to change considerably in character, becoming coarser & less regular in the character & thickness, & less perfectly differentiated by their fossils. A similar change is



observed ~~to~~ in travelling westward over the beds of this <sup>(10)</sup> period  
perhaps to the north, & is more fully described in the succeeding  
paragraphs.

We may now proceed to trace out in somewhat greater detail the  
distribution of the Cretaceous subdivisions so far as there have  
been made out in Canadian territory, in so far as our  
present ~~information~~ knowledge allows. The task is a difficult one  
owing to the infrequency of exposures over great districts of the  
plains, a fact due <sup>chiefly</sup> to the thick & generally uniform  
covering of drift deposits of the glacial period. This has so  
far prevented the satisfactory mapping of these subdivisions over  
a great part of the area here treated of. What is known for the  
region south of the line of the Saskatchewan will first be stated  
in brief, & the Cretaceous of the Peace River basin then described.  
Of the continuation of these rocks still farther to the north no details



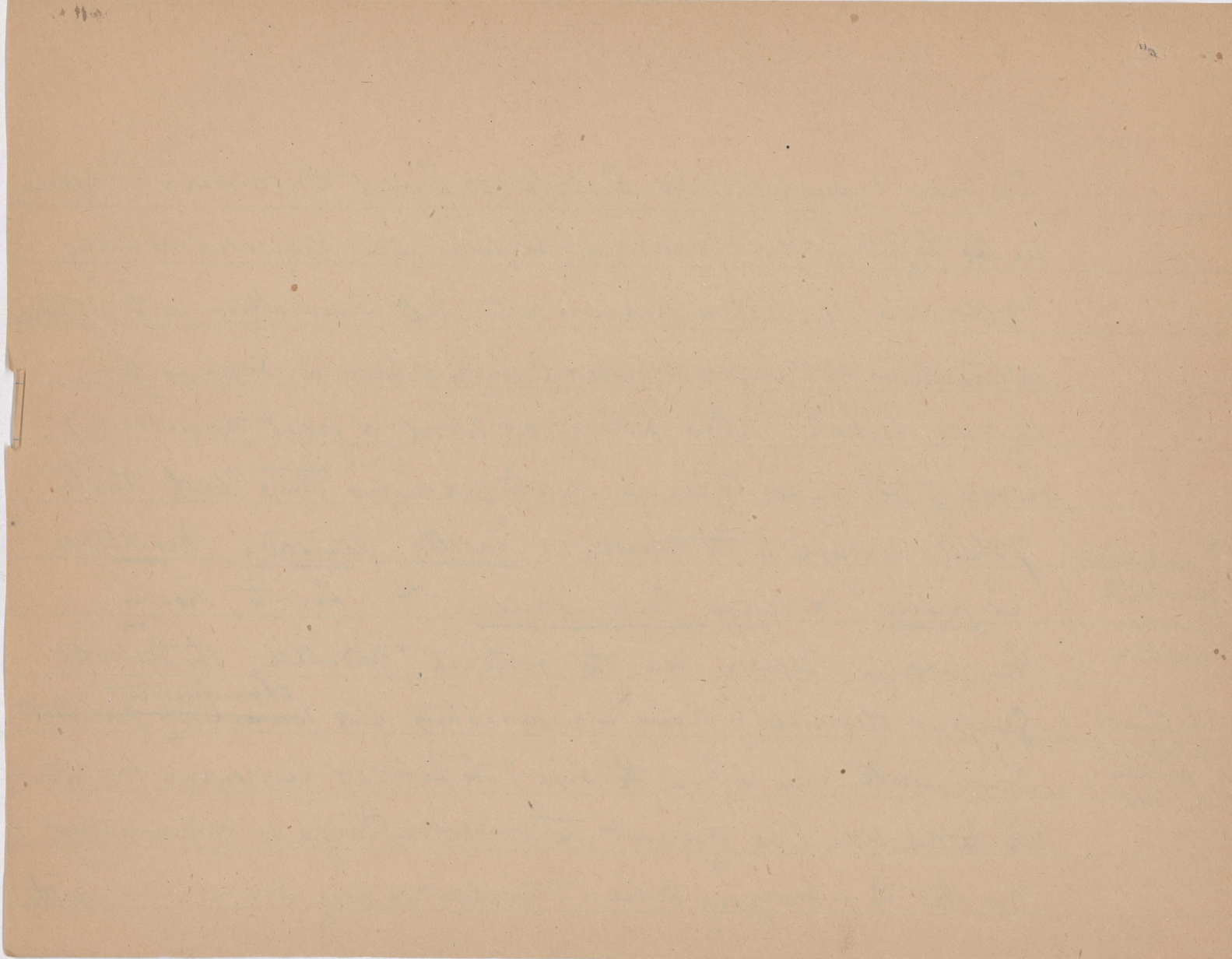
Can yet be given.

The beds representing the Dakota, or lower Cretaceous Subdivision, in the typical Missouri River Sections, are described as being "yellowish, reddish, & occasionally white Sandstones, with, at places, alternations of various coloured clays, & beds & seams of impure lignite; also silicified wood, & great numbers of leaves of the higher types of dicotyledonous trees" with "casts of shells referable to the genera Pharella, Alinaea, Mastra & Cyprina" & Unio nebrascensis. \* In the Rocky Mountain region near the fortieth parallel, the Dakota Group is described by King<sup>\*</sup> as consisting of a <sup>characteristic</sup> ~~remarkable~~ <sup>persistent</sup> conglomerate, in which the size of the pebbles increases westward as the old shore line against the Wahsatch Range is approached. Over this is a varying series of yellow & grey Sandstones, with,

\* Geol. Report  
Yellowstone &  
Missouri  
Expedition.

Septuaginta  
Geology 40th  
parallel  
p. 348

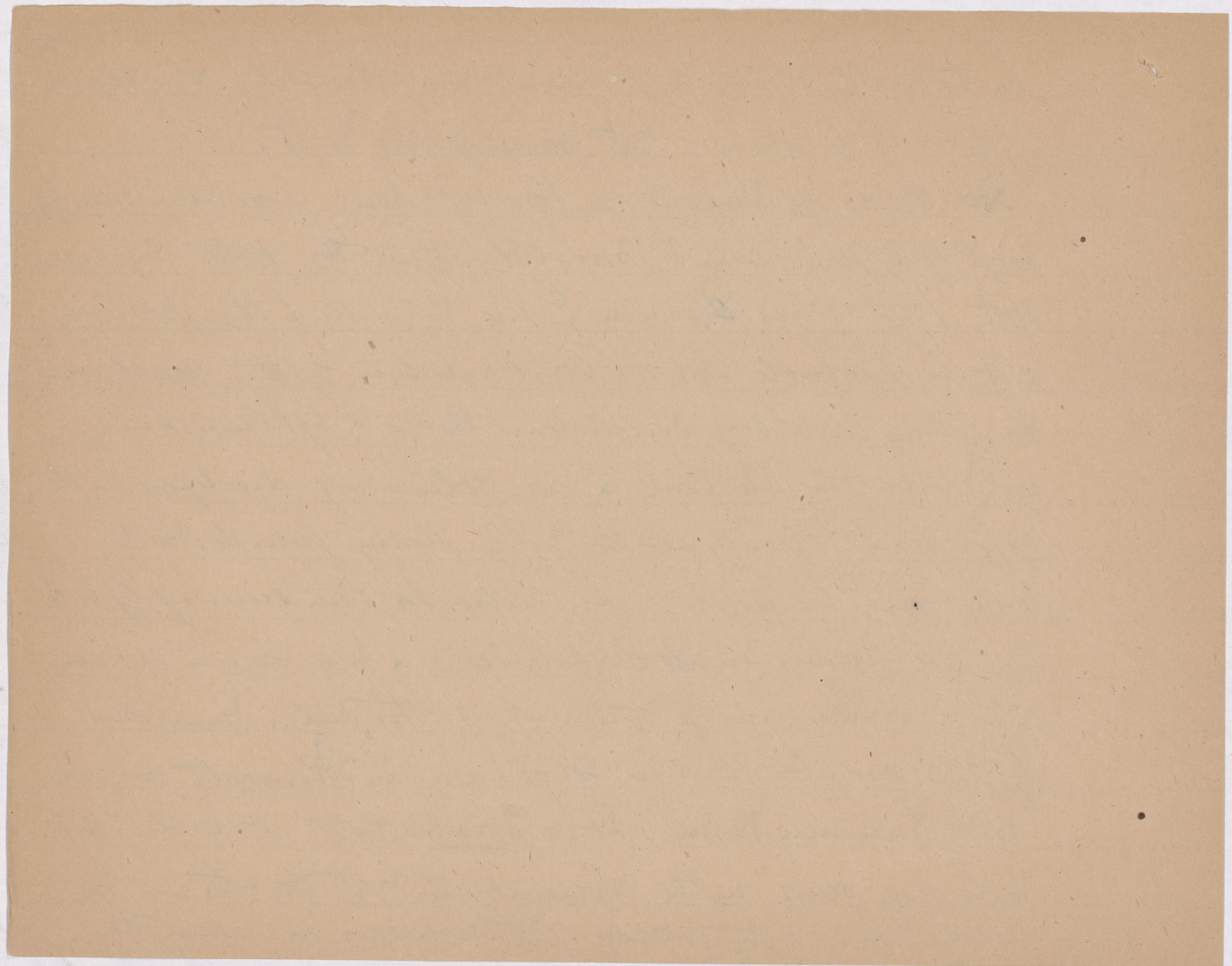




in the Uinta region a prominent bed of clay shale, & a seam of good coal, which is not found further East.

The Beds of Dakota are here not been positively identified south of the forty-ninth parallel, though Dr. Hector supposes that those of his Division E, are referable to this period, & it is probable that at least a portion of them really are so. The course of Sandstone Shales & soft limestones with beds of lignite coal & are extensively developed in the upper parts of nearly all the rivers flowing from the Rocky Mountains eastward. In Nebraska these seams of lignite coal are known in the Dakota beds & have been to some extent worked owing to the scarcity of other fuel. Similar lignites are also found in South-western Minnesota, but are not of economic value. It is possible that workable lignite beds may occur in the upper part of the Dakota at the eastern edge of the outcrop of the Cretaceous in Manitoba,

see subsequent  
winnipeg notes  
15/1881.

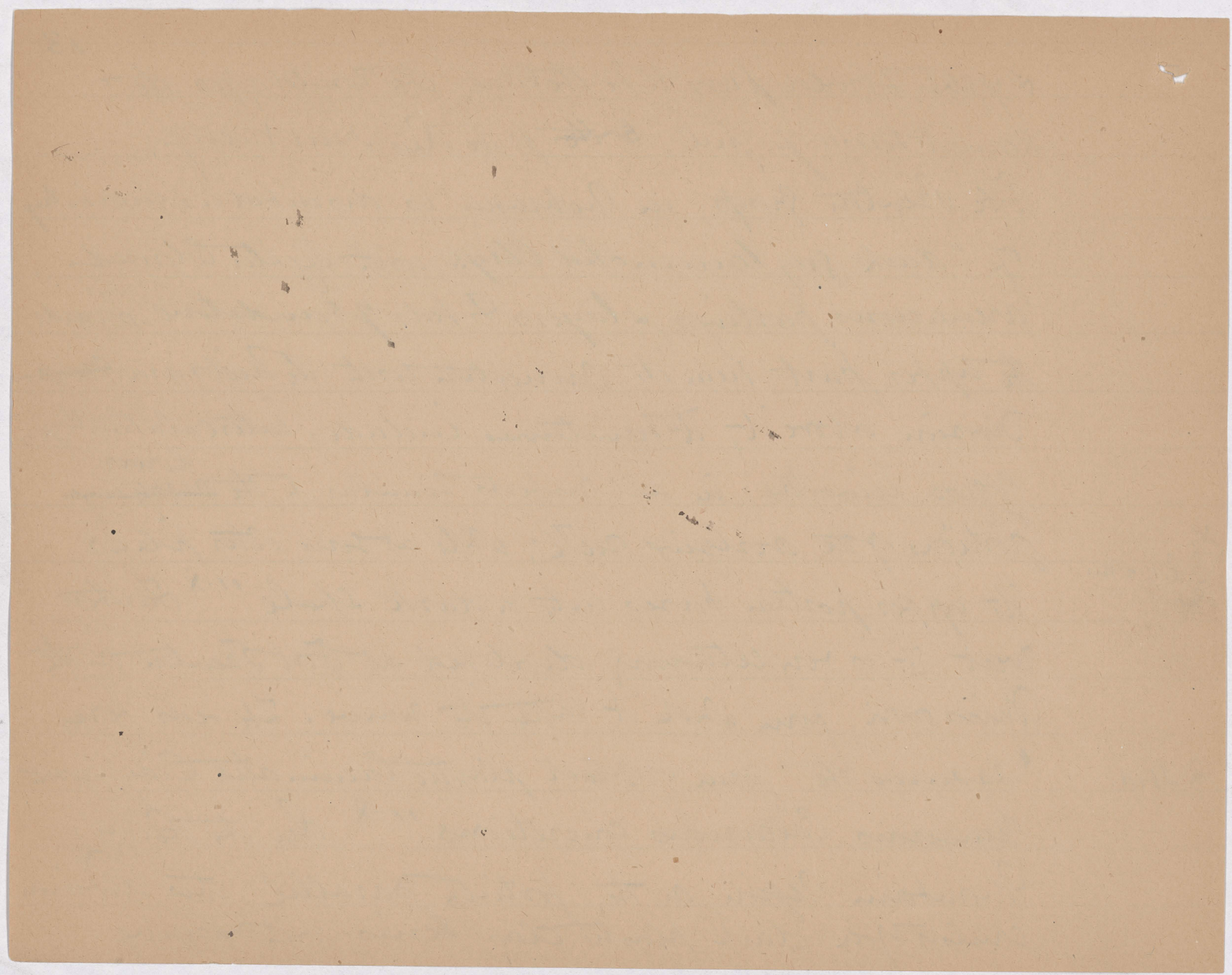


& if this should prove to be the case, it would offer the nearest source of fuel to the Red River Valley.

The Brenton Group, in Nebraska is described as consisting of "dark grey laminated Clays, with lighter colored arenaceous partings, & layers & beds of sandstone. Towards the upper part, near its connection with the Niobrara ~~group~~ Division above it, it sometimes includes intercalated layers of grey limestone, in all respects similar to the <sup>lower</sup> ~~overlying~~ portions of the overlying rock; while at some other places, its upper portion passes into a dark shale" \* Further west, it is very extensively developed at Fort Benton on the Missouri, from which it takes its name. The beds here "assume the form of black plastic laminated Clay, with numerous Calcareous concretions" \* In the Rocky Mountain Region on the fortieth parallel, this division consists of a dark plastic Clay Series, with varying

\* G. B. York  
Sep.

\* Ibid.



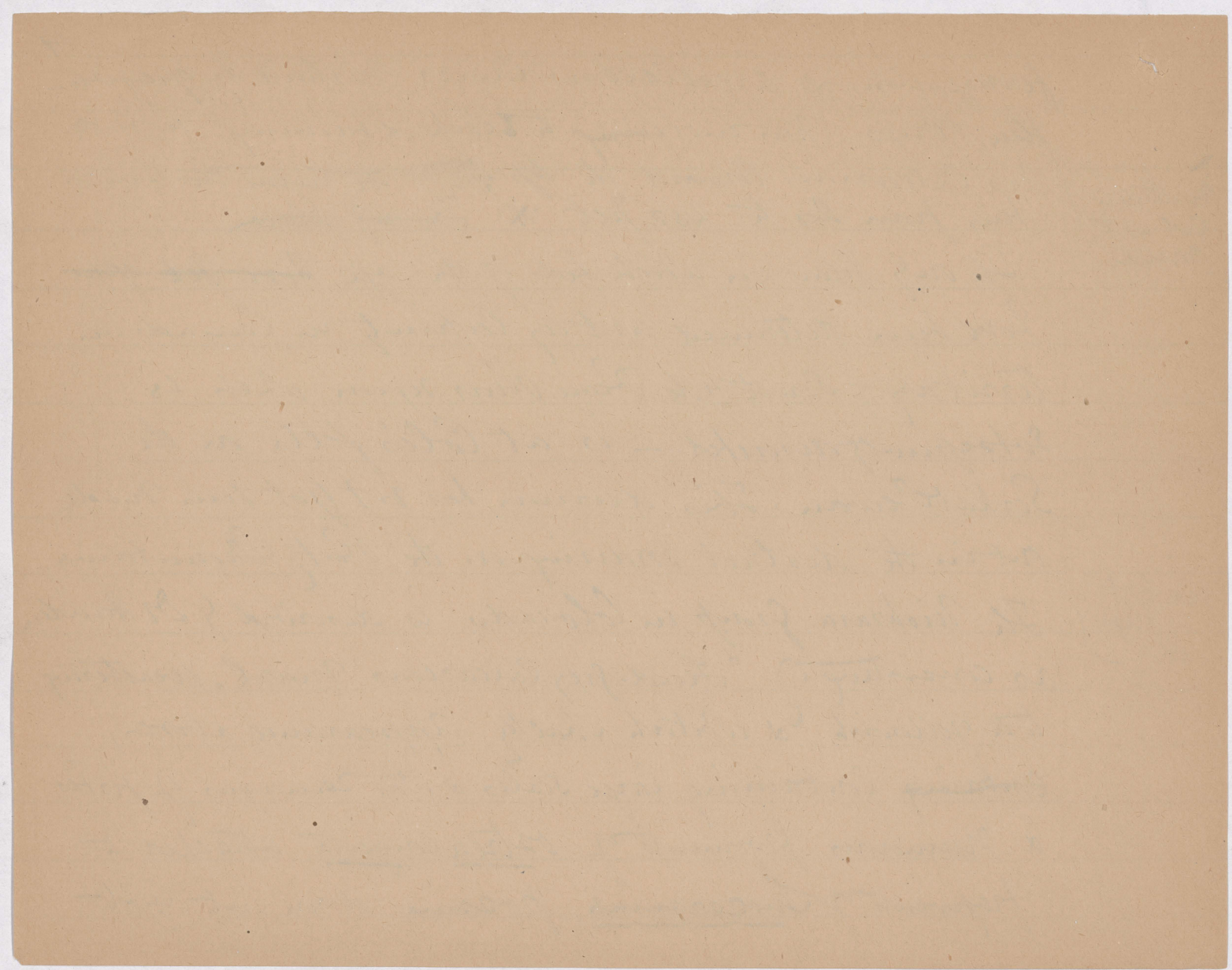
ferruginous & argillaceous layers, overlaid by greyish-blue clays, then inclining to black, & becoming more or less calcareous toward the top, the entire thickness being from 200 to 450 feet. ~~The only place~~

Systematic  
Sect. 400 ft  
parallel

The only place in which beds of this age have yet appeared have been determined with any certainty in Canadian territory - South of the Peace River region, which is subsequently described - is at Cole's falls on the Sorkatchewan. This discovery has not yet been made out in the district bordering on the Rocky Mountains.

see future  
expl.  
1881.

The Niobrara group in Colorado is described by Dr Hayden as consisting of "Lead-grey calcareous marl, weathering to a yellowish & whitish chalky appearance above, containing large scales & other remains of fishes & numerous fragments of ostrea congesta attached to fragments of Succoramus, passing down into light-



yellowish & whitish limestone<sup>the</sup> & blending with the  
 next lowest group, particularly in the Black Hills &  
 Rocky Mountain Region further west X. In the Rocky  
 Mountain region on the fortieth parallel the Niobrara  
 strata consists for the most part of argillaceous limestones &  
 marls, the series being from 100 to 200 feet thick.

\* Geol. Report  
 of the Expedition  
 p. 14

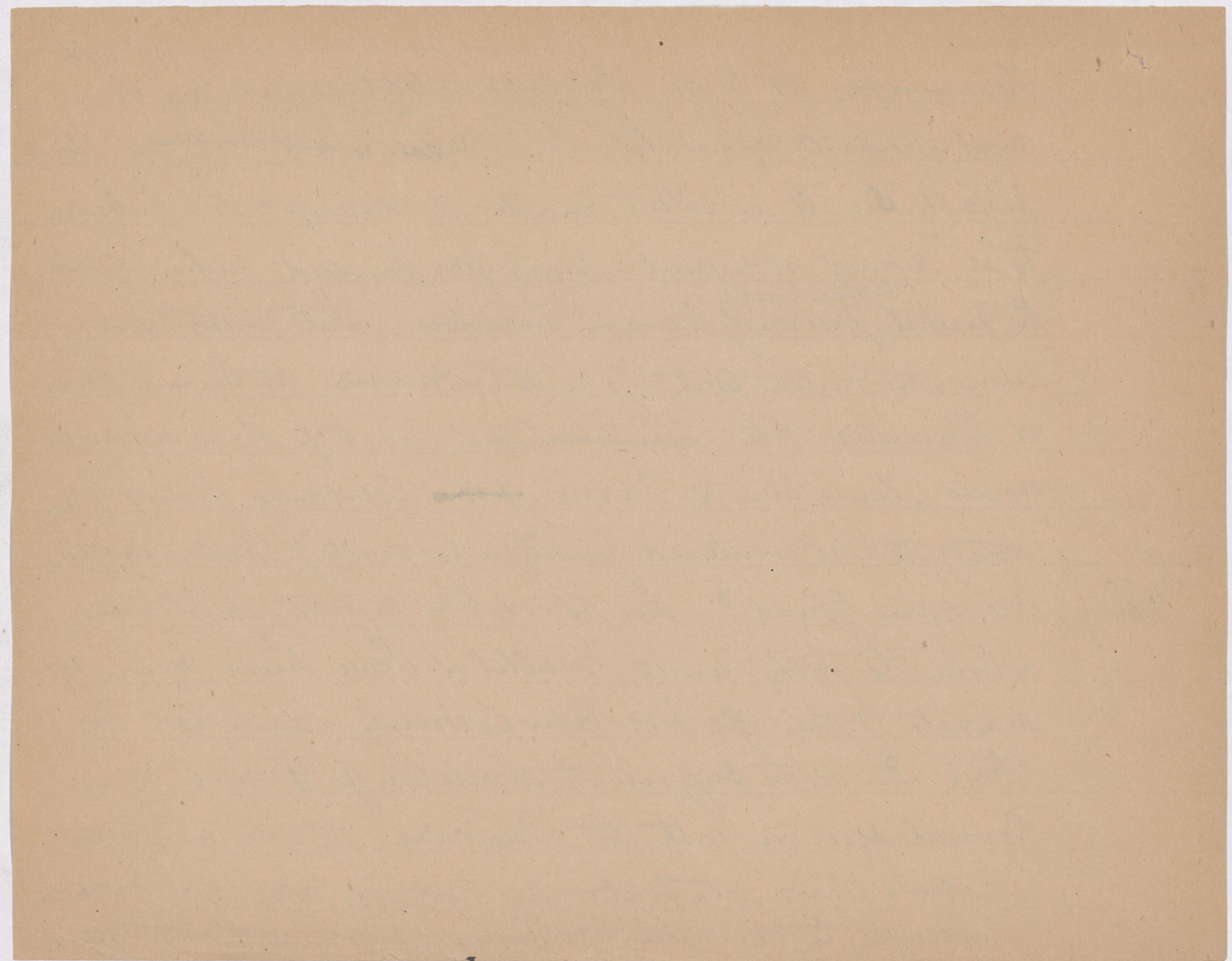
In Manitoba about twenty-five miles north of the boundary  
 line where the Boyne River cuts through the Pembina Escarpment,  
 beds clearly referable to the Niobrara group are known to occur,  
 & precisely resemble ~~the~~ lithologically & in their included  
 fossils those of <sup>the</sup> Nebraska <sup>region</sup>. The rock is a cream-colored  
 limestone chiefly composed of shells of Ducicerasmus & Obolus  
congesta, but <sup>occasionally</sup> in places a white chalky material ~~is~~  
 which under the microscope is resolved into a mass of Foraminif-  
 eral shells, Coccoliths & allied minute organisms. of the



*[Faint, illegible handwriting on aged paper]*

Foraminifera the genera Fatulania & Globiferina are the most abundantly represented. This exposure ~~of the Niobrara~~ though probably small in extent enables the outcrop of the Niobrara to be defined at a point nearly four hundred miles beyond the furthest <sup>Northern</sup> known localities. Still further west along this Eastern Outcrop of the Cretaceous at Swan River & Thunder Hill, ~~Minnesota~~ west of Lake Winnipegosis, ~~Minnesota~~ & Marls of the ~~Cretaceous~~ <sup>Cambrian</sup> fossils like those of the last mentioned locality & evidently of Niobrara age are again found. In the western portion of the plains between the forty-ninth parallel & Peace River region no deposits of this age have been certainly identified, for though Dr Hector suggests the correlation of Group C. of his several sections with the Niobrara, the rocks, consisting of dark clays with septarian nodules are more probably referable to the next overlying division; with regard

Ry. 8.  
 874-75  
 3.66.

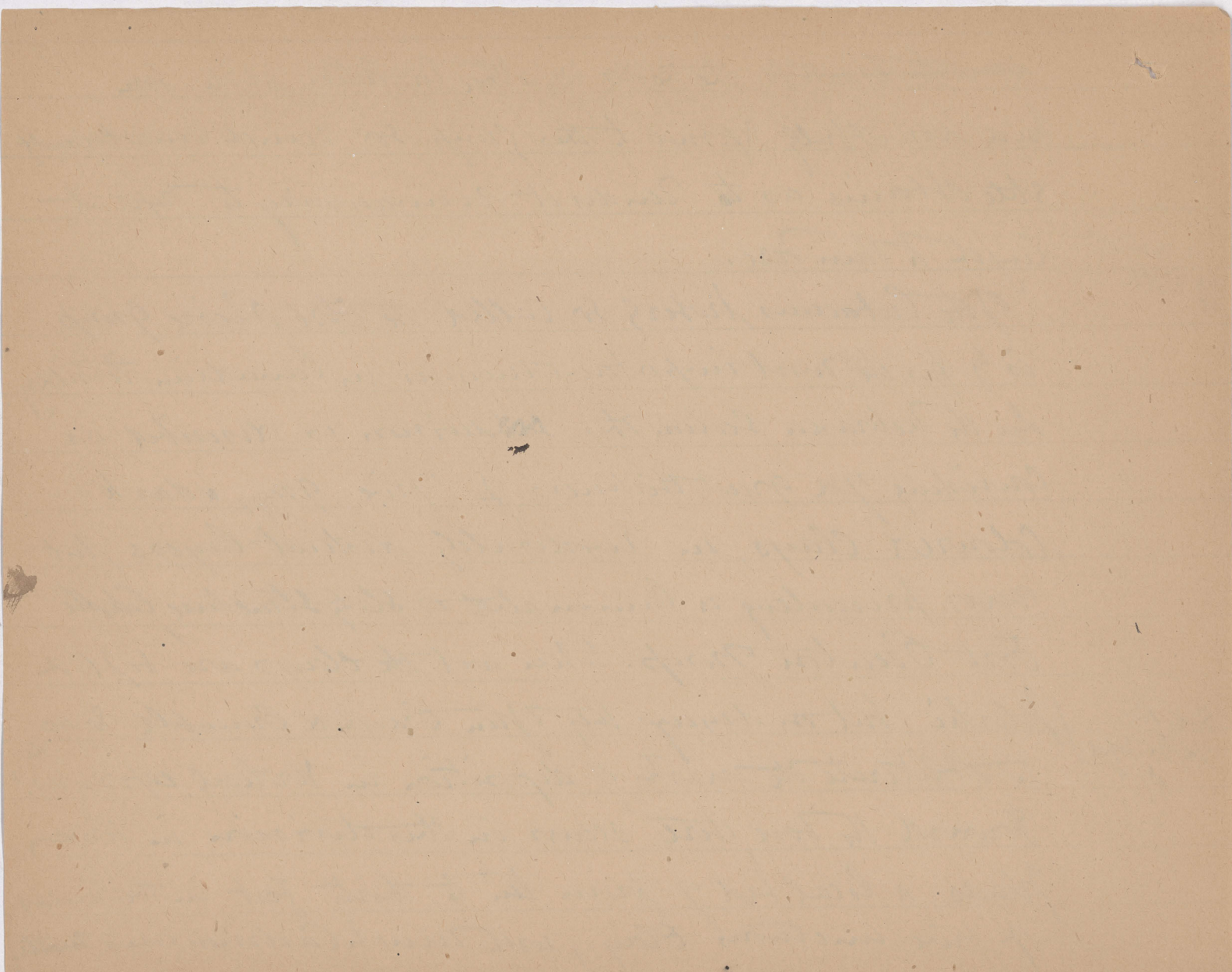


to ~~the~~ localities the rocks of other localities which have  
been doubtfully referred to this group, so much uncertainty  
still obtains as to render it unnecessary to refer at  
length to them here.

See results  
of 1889.

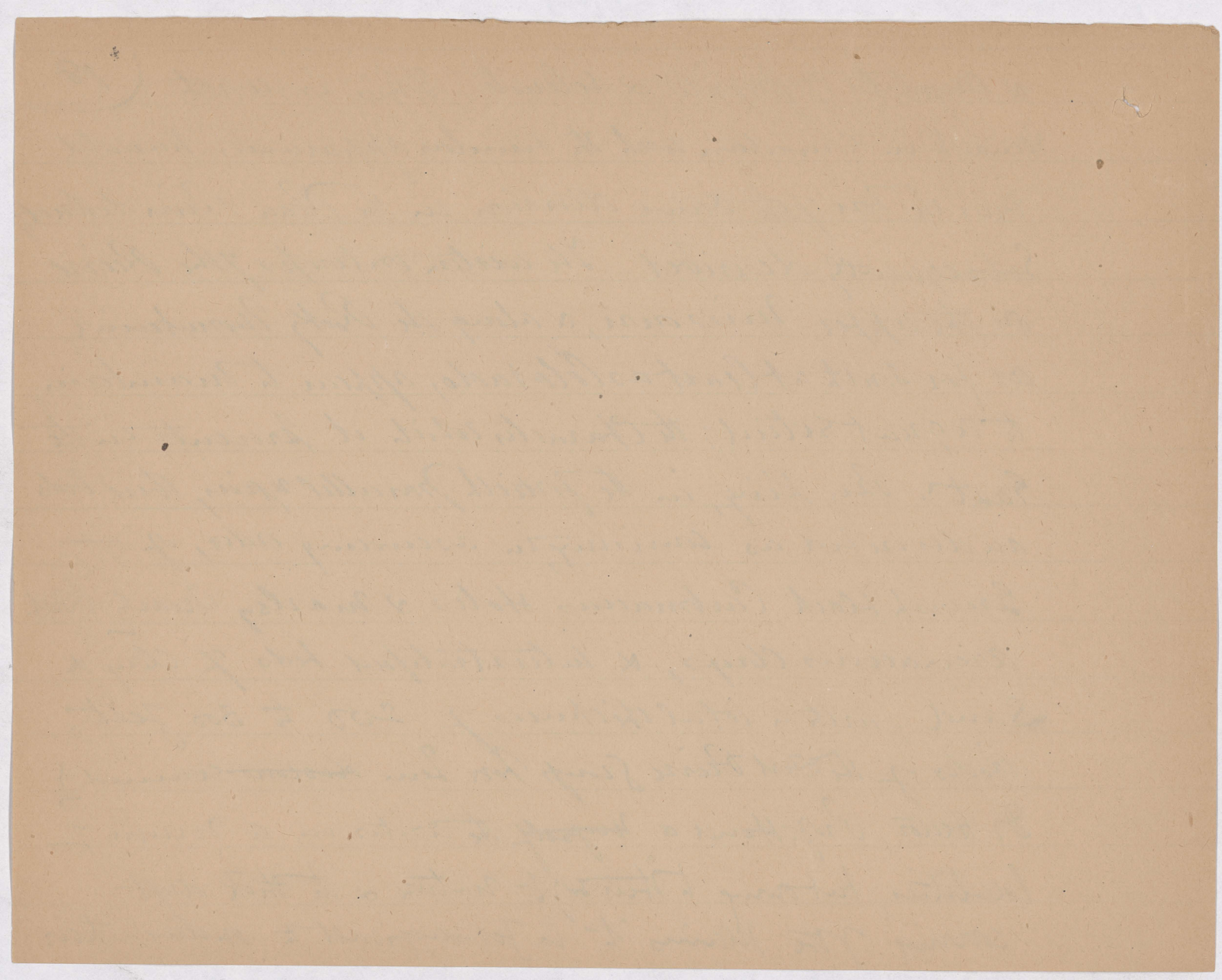
Of the Cretaceous rocks so-called the Fort Pierre group  
is by far the most important member in Canadian territory.  
In the Nebraska section this ~~sub~~ division is described as  
consisting of a great thickness of "fine, grey, & dark-  
coloured clays, in moderately distinct layers, but  
never presenting a laminated or slaty structure like the  
Fort Benton group. When wet the clays are soft &  
plastic, but on drying they often crack & crumble so as  
to delineate the marks of deposition in vertical exposures!"  
Toward the base there occurs in this division, in some  
places, a local bed of from ten to thirty feet in thickness  
of fine unctuous clay, with much carbonaceous matter.

Geol. Rep.  
4<sup>th</sup> No. Sept.  
p. 19.



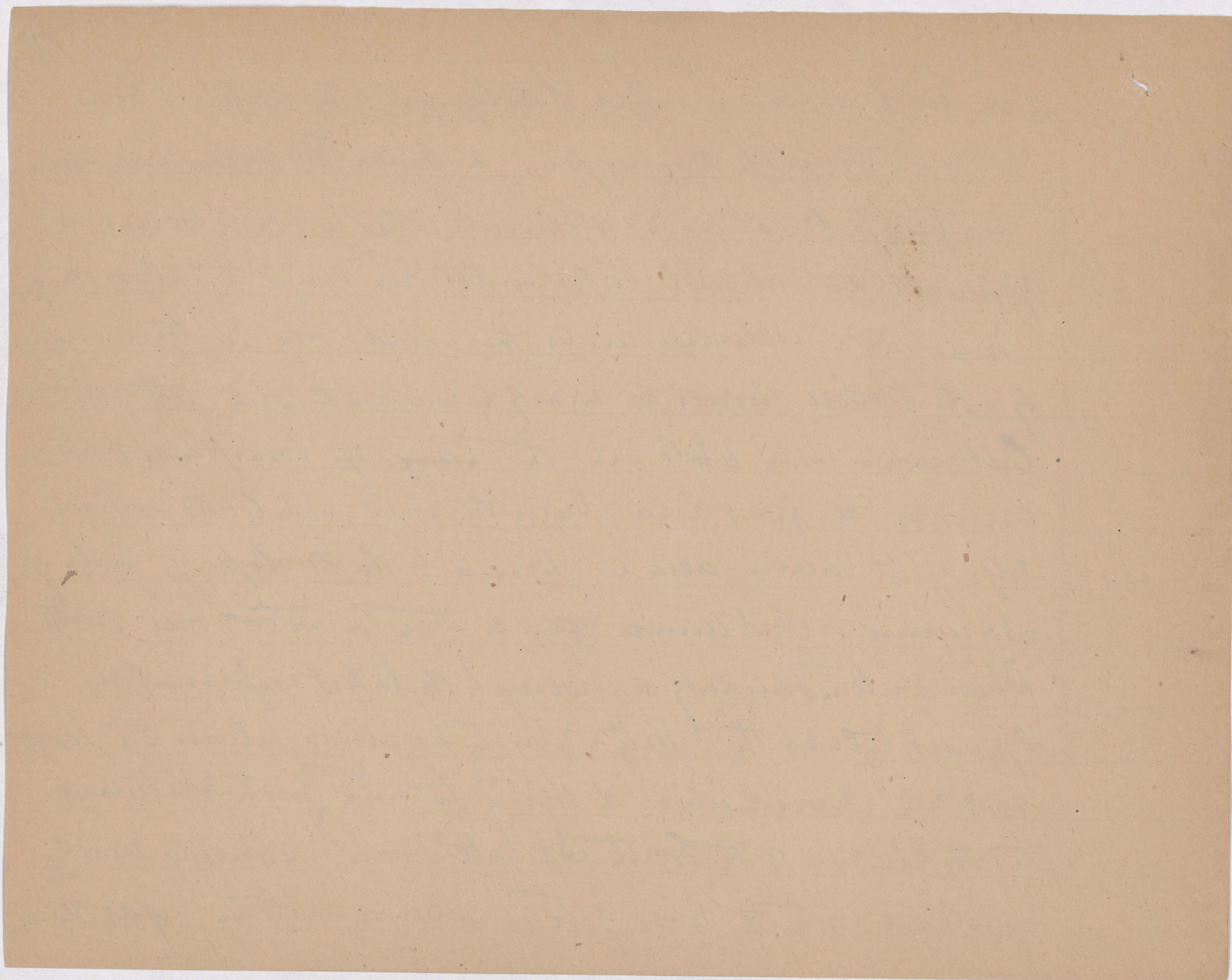
& Crystals of pyrite & selenite. This is worth (18  
Remark in connection with the similar appearances presented  
near the base of the same division in the Pease River district  
Subsequently described. The western outcrops of the Pierre  
on the upper Missouri, & along the Rocky Mountains  
as far south at least as Colorado, appear to maintain,  
to a great extent, the character which it presents in the  
East. By King, in the fortieth parallel region, these beds  
are described as consisting, in ascending order, of —  
Greyish black carbonaceous shales & marls, nearly black  
arenaceous clays, & interstratified beds of clay &  
Sand, with a total thickness of 250 to 300 feet.

Rocks of the Fort Pierre group have been ~~examined~~ examined by  
Dr. Hector, Prof. Heintz & myself the writer in a number of  
localities, but owing to their soft nature & the thick drift  
covering of the plains it is yet difficult to outline their



area with accuracy. The lithological character of these rocks is everywhere very uniform, & though Dr. Hutton considers his group B, alone as representative, this part of the series it appears now almost certain that his group C. also ~~may~~ must be included under this head. The Eastern boundary of the Prairie must be nearly coincident with that of the Cretaceous as a whole in the range of Escarpment which overlooks the Great Lakes from the west, while the western edge of its main area is formed by the overlap of beds of Laramie or Fort Union age & those of the Fort Hill group. This western boundary according to the latest information appears to cross the forty-ninth parallel between the 101st & 102nd meridians, & thence to run <sup>west-</sup> north-westward to the elbow of the South Saskatchewan, becoming nearly identified with the edge of the Missouri Coteau before reaching





that part of it called the Thunder Breeding Hills  
 on Palliser's Map, & probably, - according to  
 information obtained by Dr Hector forming a narrow  
 belt along the valley of the South Saskatchewan at  
 least as far as the Cypress Hills. West of the  
 Elbow the boundary is then probably continued along  
 the edge of the third prairie steppe to the North Saskatchewan  
 rocks of the age ~~stretching~~ <sup>stretching</sup> over from the whole breadth  
 of the second prairie steppe, with the possible exception  
 of outliers of the newer groups. These rocks are  
 characteristically displayed in the escarpment of  
 Pembina Mountain, & have been designated the  
 Pembina Mountain group in the Report on the forty-ninth  
 parallel. In the great scarcity of organic remains,  
 as well as in their lithological character they  
 resemble the typical series as represented at  
 Fort Pierre. Leptarium nodules from a prominent

The first part of the letter to the Hon. Secy of the  
 Interior is a brief history of the  
 Department of the Interior from its  
 origin to the present time. It is  
 divided into two parts. The first  
 part is a general history of the  
 Department, and the second part  
 is a history of the various  
 bureaus which are under its  
 control. The first part is  
 divided into three sections. The  
 first section is a history of the  
 Department from its origin to  
 the year 1849. The second  
 section is a history of the  
 Department from 1849 to 1860.  
 The third section is a history  
 of the Department from 1860  
 to the present time. The second  
 part of the letter is a list of  
 the various bureaus which are  
 under the control of the  
 Department. It is divided into  
 two parts. The first part is a  
 list of the bureaus which are  
 under the control of the  
 Department of the Interior.  
 The second part is a list of  
 the bureaus which are under  
 the control of the various  
 departments of the Government.  
 The first part of the letter is  
 a general history of the  
 Department, and the second  
 part is a list of the various  
 bureaus which are under its  
 control.

feature in a portion of the series seen near the base of the escarpment, but the shales are generally exceedingly fine & uniform in texture. Selenite frequently occurs as a secondary product in cracks & veins having been formed by the action consequent on the decomposition of pyrite.

Following the path, with parallel westward, north of this group ~~can~~ occur south of the Woody Mountain Tertiary plateau, with an appearance somewhat different from those of Pembina Mountain being on the whole more crumpling & earthy, though many parts of the series still so closely resembles the western development as to be indistinguishable from it. The septarian nodules are now found at several different levels in the section, characterizing narrow zones, & it is almost exclusively in connection with these that the fossils are found.

The first thing I noticed when I stepped  
 out of the plane was the fresh air. It  
 felt like I had been in a cocoon for  
 hours. The pilot smiled at me and  
 said, "Welcome to the island. We're  
 glad you're here." I nodded and  
 looked out the window. The ocean was  
 a beautiful blue, and the sky was  
 clear. I felt like I had reached a  
 new world. The pilot continued to  
 talk to me as we descended. He told  
 me about the history of the island and  
 the people who lived there. I was  
 fascinated by everything he said. As  
 we landed, I saw a group of people  
 waiting for us. They were all smiling  
 and waving. I felt like I had been  
 welcomed to a new home. The pilot  
 thanked me and said, "We'll see you  
 again soon." I nodded and said, "I  
 can't wait."

In cutting westward, after passing over a great plain based on Tertiary rocks, the Pierre group again appears upturned around the flanks of the Buttes, & still preserving - though now within a hundred miles of the base of the mountains - its old Characters, the only real change being the introduction of a few arenaceous layers, small in thickness & irregular in extent, but sufficient to vindicate the Character maintained through the whole of the Cretaceous period by the Rocky Mountain Region - that of deposit in shallows & more rapidly moving waters.

The Character impressed on the face of the Country, wherever the Pierre beds immediately underlie the surface, is unfavourable in the highest degree. Without the intermixture of foreign material, & debris of other rocks forms an exceedingly poor soil. Their fine unctuous Character prevents any

a boring carried to a depth of 570 feet at Fort Kelly on the Assiniboine River, by the geological survey, penetrated to the Pierre group for 250 feet, & then passed through calcareous beds probably Miocene age, ending in shales which may be supposed to be the Bentonite.

P. & P. 1875-76 p. 292

In writing history, the historian's first  
 duty is to select his material, to  
 choose his facts, and to arrange them  
 in a logical order. The historian's  
 second duty is to write in a clear  
 and concise style. The historian's  
 third duty is to be impartial and  
 objective. The historian's fourth  
 duty is to be accurate and to  
 cite his sources. The historian's  
 fifth duty is to be interesting and  
 to write in a way that captures  
 the reader's attention. The historian's  
 sixth duty is to be thorough and  
 to cover all aspects of the subject.  
 The historian's seventh duty is to be  
 honest and to admit when he is  
 uncertain. The historian's eighth  
 duty is to be respectful and to  
 avoid bias. The historian's ninth  
 duty is to be diligent and to  
 spend enough time on his work.  
 The historian's tenth duty is to be  
 creative and to find new ways to  
 present his material. The historian's  
 eleventh duty is to be patient and  
 to not rush his work. The historian's  
 twelfth duty is to be flexible and  
 to be able to change his mind when  
 necessary. The historian's thirteenth  
 duty is to be organized and to  
 keep his work in order. The historian's  
 fourteenth duty is to be persistent  
 and to not give up easily. The  
 historian's fifteenth duty is to be  
 curious and to always be learning.  
 The historian's sixteenth duty is to  
 be open-minded and to be able to  
 consider different perspectives. The  
 historian's seventeenth duty is to be  
 detail-oriented and to not miss any  
 important facts. The historian's  
 eighteenth duty is to be confident  
 and to believe in his work. The  
 historian's nineteenth duty is to be  
 hardworking and to put in the  
 necessary effort. The historian's  
 twentieth duty is to be a good  
 communicator and to be able to  
 explain his work to others.

The historian's first duty is to select his material, to choose his facts, and to arrange them in a logical order. The historian's second duty is to write in a clear and concise style. The historian's third duty is to be impartial and objective. The historian's fourth duty is to be accurate and to cite his sources. The historian's fifth duty is to be interesting and to write in a way that captures the reader's attention. The historian's sixth duty is to be thorough and to cover all aspects of the subject. The historian's seventh duty is to be honest and to admit when he is uncertain. The historian's eighth duty is to be respectful and to avoid bias. The historian's ninth duty is to be diligent and to spend enough time on his work. The historian's tenth duty is to be creative and to find new ways to present his material. The historian's eleventh duty is to be patient and to not rush his work. The historian's twelfth duty is to be flexible and to be able to change his mind when necessary. The historian's thirteenth duty is to be organized and to keep his work in order. The historian's fourteenth duty is to be persistent and to not give up easily. The historian's fifteenth duty is to be curious and to always be learning. The historian's sixteenth duty is to be open-minded and to be able to consider different perspectives. The historian's seventeenth duty is to be detail-oriented and to not miss any important facts. The historian's eighteenth duty is to be confident and to believe in his work. The historian's nineteenth duty is to be hardworking and to put in the necessary effort. The historian's twentieth duty is to be a good communicator and to be able to explain his work to others.

Drainage from below, & the plains based on them alternate with the season from the condition of the terraces, and to that of hard semi-cracked clay. The saline waters of springs issuing from the strata, impregnate the soil of the low grounds & valleys, & produce conditions favourable to the growth of Salicornia, Obione, Sarcobatus &c.

These remarks apply, however, in their entirety to the region south of the great transverse watershed, which approximately follows the forty-ninth parallel. Whenever the Causes which have produced the thick drift deposits of the plains have operated in their full intensity, the influence of the underlying beds on the soil, has been greatly modified by the addition of transported material, & this modifying action has perhaps nowhere been more effectual, than over the areas covered by the Pierre group, which from its composition & bedding character





Has been cut away into hollows & buried 24  
under great depths of travelled material. The improvement  
thus effected in the County is especially notable  
between Omburg Escarpment & the Missouri Coteau,  
over the second prairie steppe, where exposures of  
the underlying rocks are very seldom seen.

The Fox Hill Group is the highest of the Cretaceous  
Series of the West, probably so called, & is thus  
described in the Nebraska Register: — "This formation  
is generally more arenaceous than the Fort Pierre  
Group, & also differs in presenting a more yellowish  
& ferruginous tinge. Towards the base it consists of  
Sandy Clays, but as we ascend to the higher beds  
we find the arenaceous matter increasing, so  
that at some places the whole passes into a sandstone.  
It is not separated by any strongly defined line of  
demarcation from the formation below, the change  
from the fine clays of the latter to the more sandy  
material above being very gradual." ~~X~~ <sup>Quinton does</sup>

T. G. R. G. & M. Exp.  
p. 22.

24  
The first thing I noticed when I stepped  
out of the plane was the fresh air. It was  
so different from the stale air of the city.  
I had heard that the mountains were beautiful,  
and now I knew why. The view was  
stunning. The mountains were covered in  
green grass and small white flowers.  
The sky was a clear, bright blue. I  
felt like I had entered a new world.  
The people were friendly and welcoming.  
They had heard that I was from the city  
and they wanted to show me the best of  
the area. They took me to a small town  
where I could see the mountains up close.  
The town was built on a hillside and  
had a beautiful view of the valley. I  
was in luck. The weather was perfect.  
The mountains were just what I needed.  
I had heard that the mountains were  
beautiful, and now I knew why. The  
view was stunning. The mountains were  
covered in green grass and small white  
flowers. The sky was a clear, bright  
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They took me to a small town where I  
could see the mountains up close. The  
town was built on a hillside and had a  
beautiful view of the valley. I was in  
luck. The weather was perfect. The  
mountains were just what I needed.

10.1.1924  
p. 25

The transition appear to be marked by any great  
 change in life, as indeed this division might almost  
 as well be considered the Closing Epoch of the last,  
 but for the ~~persisting~~ <sup>of the</sup> Lithological beak &  
 the persisting of the Upper Sandstones in great  
 areas. The representative of the ~~Fort Pierre~~ Fort Pierre  
 group in the fortieth-parallel <sup>area</sup> ~~region~~ of the Rocky  
 Mountain Region is described by King as  
 consisting almost altogether of gray, rusty & buff  
 Sandstones, containing a few ~~sandy~~ clayey beds. It has  
 a thickness of 1500 feet near the western margin of the  
 Great Plains, but increases further west, near the  
 footslopes, to 3000 & 4000 feet. It is known to  
 hold one bed of coal immediately east of the Rocky  
 Mountain Range, proper, & several considerable beds  
 to the west.

As indicated in the table on another page, the  
 Benton, Niobrara, & ~~Fort Pierre~~ Fort Pierre groups here in

The American people are entitled to know  
 the truth about the things that are  
 going on in the world. The American  
 people are entitled to know the truth  
 about the things that are going on  
 in the world. The American people are  
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 The American people are entitled to  
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 in the world. The American people are  
 entitled to know the truth about the  
 things that are going on in the world.

the Rocky Western region being grouped together by King & Hayden under the single name of the Colorado. This has been done because of the difficulty found in recognizing & separating the far west three subdivisions which are distinct enough in Nebraska. The three subdivisions above mentioned are in the west naturally allied, forming the great clayey portion of the Cretaceous, which is ~~over~~ underlain by the Dakota Sandstones & ~~and~~ overlain by the Sandstones of the Fort Hill group ~~and~~ just described.

Though rocks ~~of this class~~ representing those of the Fort Hill group of Nebraska cannot meet border the eastern edge of the Lignite formation, they are not exposed near the forty-ninth parallel. One kind, however, whose thin occurrence in two places, — at the junction of the Eyebrow Hill stream with the Du'Appelle, where the ~~conit~~ ~~age~~ of ferruginous

The first part of the paper is devoted to a description of the  
 general character of the country, and the nature of the soil.  
 It is a fertile soil, and the climate is temperate.  
 The second part of the paper is devoted to a description of the  
 principal occupations of the country, and the manner in which  
 they are carried on. The principal occupations are agriculture,  
 stock raising, and commerce. Agriculture is the principal  
 occupation, and is carried on in a very successful manner.  
 Stock raising is also a very important occupation, and is  
 carried on in a very successful manner. Commerce is also a  
 very important occupation, and is carried on in a very  
 successful manner. The third part of the paper is devoted to  
 a description of the principal cities and towns of the country,  
 and the manner in which they are situated. The principal cities  
 and towns are situated in the following manner:

Clays & hard greenish Sandstones; & at  
 the Elbow of the South Fork of the river, as greenish &  
 yellowish grey sandstones, with some clays, ~~clays~~  
 The following fossils were recognized & much away  
 were collected from these exposures. - Scaphites Conradi,  
Nautilus Deckyi, Avicula linguiformis, Avicula  
Nebrascana, & Portellaria Americana.

South of the woody winter in ~~Platonic~~ Tertiary  
 Platonic, the Fox Hill beds are represented by  
 division of my "Bad Lands" Section, consisting  
 of yellowish & rusty <sup>silt</sup> sandstones in some places massive,  
 & with a total thickness of about eighty feet only. These  
 rocks are again seen further west, on White Sand or  
 Frenchman's River. They were not observed at the  
 junction of the Cretaceous & Tertiary east of Quilt  
 River, but their position ~~is~~ marked by sand hills  
 on the flanks of the Three Buttes they are again  
 brought to the surface, & consist of rather hard



Camp of the French, near the  
 mouth of the St. Lawrence, as  
 mentioned by the French, was  
 situated on the banks of the  
 river, about 10 miles from  
 the mouth of the river, and  
 was the scene of the  
 battle of the Clouds, in  
 1759. The French, under  
 the command of M. de  
 Montcalm, defeated the  
 British, under the command  
 of James Oglethorpe, and  
 took possession of the  
 city of Quebec. The  
 British, after the battle,  
 retreated to the mouth of  
 the river, and were  
 eventually evacuated to  
 England. The French, on  
 the other hand, remained  
 in possession of the city  
 until the end of the war.  
 The battle of the Clouds  
 was a decisive victory for  
 the French, and it was  
 the last battle of the  
 Seven Years' War in North  
 America.

Sandstone with some soft & some argillaceous beds near the base. This outcrop in the vicinity of the Rocky Mountains has not been defined.

The beds overlying those of the Fox Hill series belong to the 'Eocene Tertiary' Fort Union or Laramie series, & the assignment of these to the Cretaceous or Tertiary has given rise to a protracted controversy. As however ~~most~~ all are agreed as to the main facts of their character & position, it matters comparatively little whether the line between the Cretaceous & Tertiary, which must always be to some extent arbitrary & local in character be placed above or below them. The earliest portion of this great wide spread formation, as the Missouri near Fort Union is described as assigned a thickness of about 2000 feet, & described

see p. 227  
as  
thickness.

