Jany 5th 1868 – Specimens of fish teeth sent to Mr. St. John

1	Petalodus destructor –	1 Sp. Rockbluff
1	Diplodus	Milo Neb.
2	Cladodus	Rockford
1	Cladodus (fragment)	Rockbluff
1	Ctenoptychius	Bellevue Neb

of the method proposed, and not

ages & Periods, as follows:

Age
11. Chemung Period
 11a. Portage Epoch
 11b. Chemung Epoch
12. Catskill Period

Carboniferous Age,
13. Subcarboniferous Period
 13a. Lower – (Black Lingula Shale, Burlington Limestone, Encrinital Limestone of Mo., Siliceous beds of Tenn.
 13b. Upper. Lower Archimedes & beds above
14. Carboniferous Period
 14a. Ep. of Millstone Grit
 14b. " Lower Coal Measures
 14c. " Upper Coal Measures
15. Permian Period

Reptilian Age.
16. Triassic Period
17. Jurassic Period
18. Cretaceous Period

Mammalian Age.
19. Tertiary Period
 19a. Claiborne Epoch, or Ep. of Lower Eocene
 19b. Vicksburg Epoch or Ep. of Upper Eocene
 19c. Yorktown Epoch or Ep. of Miocene
? 19d Ep. of Pliocene
20. Post-tertiary Period.

on the

be

Cretaceous


Fort Benton
Sandstone &c. No 1.?
Judith River
Tertiary
Sandstone &c No 1.?
Cretaceous No 4.
Muscle Shell river
Cretaceous No 4 & 5
Tertiary
Milk River
Tertiary
Mouth Yellow Stone
Tertiary
Tertiary
Little Missouri
Tertiary
Knife river
Tertiary
Sqr. Butte
Heart River
Tertiary
No 5. Cretaceous
Cannon ball river
Cretaceous No 5
Cret. No 4
Grand river
5
Cret. No 4.
Moreau river
Cretaceous No 4
Cheyenne River
Medicine butte
Cretaceous No. 4.
No 5. Cret.
White earth river
Bijou Hill
T.
Cret. No 4
Cretaceous No 3.
L'eau qui court river
Cret. No 3.
James River
No 3.
No 3
No 2. Cret.
Big Sioux river
Bluff formation or drift deposit
Cretaceous? No 1.
Platte river
Bluff formation
upper carboniferous

on the Cretaceous & Tertiary
The numbers might as well be omitted.

This is intended as a specimen of the method proposed, and not as accurate in geology. —

The numbers refer to the Ages & Periods, as follows:

1. . . Azoic Age

Silurian Age.

Lower Silurian

2. Potsdam Period
   - 2 a. Epoch of the Potsdam Sandstone
   - 2b. Epoch of the Calc. Sandrock
3. Trenton Period
   - 3a. Epoch of Chazy L.
   - 3b. " Birdseye L.
   - 3c. " Black River L.
   - 3d. " Trenton L.
4. Hudson Period
   - 4a. Epoch of Utica Slate
   - 4b. " Hudson R. Gr.

Upper Silurian

5. Niagara Period
   - 5a. Epoch of Oneida Cong.
   - 5b. " of Medina Sandstone
   - 5c. " Clinton Gr.
   - 5d. " Niagara Gr.
6. Onondaga Period
7. Lower Helderberg Period

Devonian Age

Lower Devonian

8. Oriskany Period
   - 8a Ep. of Orisk. Sands.
   - 8b. " Cauda-Galli G.
9. Upper Helderberg Period
   - 9a Ep. of Schoharie G.
   - 9b. " Upper Helderberg
   - ? 9c. " Corniferous

Upper

10. Hamilton Period
    - 10a. Ep. of Marcellus shales
    - 10b " Hamilton Gr.
    - 10c " Genesee Slate
11. Chemung Period
    - 11a. Portage Epoch
    - 11b. Chemung Epoch
12. Catskill Period

Carboniferous Age

13. Subcarboniferous Period
    - 13a. Lower — (Black Lingula Shale, Burlington Limestone, Encrinital limestone of Mo., Siliceous beds of Tenn.
    - 13b. Upper. Lower Archimedes & beds above
14. Carboniferous Period
    - 14a. Ep. of Millstone Grit
    - 14b. " Lower Coal Measures
    - 14c. " Upper Coal Measures
15. Permian Period

Reptilian Age.

16. Triassic Period
17. Jurassic Period
18. Cretaceous Period

Mammalian Age.

19. Tertiary Period
    - 19a. Claiborne Epoch, or Ep. of Lower Eocene
    - 19b. Vicksburg Epoch or Ep. of Upper Eocene
    - 19c. Yorktown Epoch or Ep. of Miocene
    - ? 19d Ep. of Pliocene
20. Post-tertiary Period.

The plan consists of —

1. Numbers for each Period, according to the Table — These numbers will not change ~~[illegible]~~ ~~hereafter~~, whatever the changes that may take place hereafter in American Geology. The lettering for Epochs may differ in different regions.

2. Distinguishing the ages by a difference of Color. — I propose for the Azoic Carmine — the Silurian purple — the Devonian, burnt Sienna — the Carboniferous, blue — the first two Periods of the Reptilian age, a brownish red (Dragon's blood is used); the last, or Cretaceous Period, green — the Tertiary, yellow. — There is no objection to changing if it is thought best.

3. making a heavy black line as the limits of the ages —

4. a heavy dotted line thus ------, as the limits between the Periods

5. a fine dotted line, as the limits of the Epochs, thus .... ; ~~when~~ when it is thought best to insert these. They are on the regions 13 & 5 & 19.

6. Distinguishing the Lower & Upper Silurian by ~~no~~ lining the Lower thus ///// — the Upper thus \\\\\ ; also the Upper Devonian from the Lower (making this division for the convenience of the maps) by lining the Lower thus ||||||||||, & the Upper ≡≡≡

7. Distinguishing the Periods in the Lower Silurian by making the lining of the Potsdam very close, & thereby dark; of the Trenton, less close; of the Hudson much less close and thereby quite light. The lining in the Specimen is of this kind, but the distances between the lines are made too great for the engraving. — So for the Upper Silurian, the same distinctions between the three Periods in order. — So also a like distinction for the Devonian, between the regions 8 & 9, and between 10, 11, 12. There is no ~~need~~ need of any lining on No 12 and so it is left in the Specimen.

Period 8. Distinguishing the Carboniferous as in the Specimen.

9. On 16, 17 no lining seems to be necessary; but it can be used on one of them if best. For the Eastern Triassico-Jurassic — the Color is all that would be required.

10. For the Cretaceous & Tertiary ~~only~~ Color alone is necessary.

11. The boundaries of the States had better be inserted but not their names. Also the larger rivers & some names of places of geological interest.

Jany 8th 1868 – Specimens of fish teeth sent to Mr. St. John

1	Petalodus distructor – 1 Sp.	Rockbluff
1	Diplodus	Rulo. Neb.
2	Cladodus	Rockford
1	Cladodus (fragment)	Rockbluff
1	Ctenoptychius	Bellevue Neb

Memorandum July 11th 1860
Rec'd from [illegible] a note
Mr. Scarb[illegible] against [illegible] for $200
[illegible]
in March 1859

Also from Mr. Scarborough Aug
4th 1862 one hundred dollars
and Aug 26th 1862, two hundred
dollars and ~~$ 64 [illegible]~~
May 1863 [illegible] 120 [illegible] but [illegible]
[illegible]

[illegible]

Tuesday, 20

[illegible]

[illegible]

[illegible]

25

[illegible] are [illegible]
a good [illegible]
and [illegible]

[illegible]

[illegible]

[illegible]

15 [illegible]

[illegible]

[illegible]

2. [illegible]

2

61

60

219

5

[illegible], [illegible] thus [illegible] animals
[illegible] now [illegible]
[illegible]
[illegible]
[illegible]

[illegible] critical [illegible]

[illegible] of the

[illegible] ation [illegible]

[illegible]

[illegible]

O. [illegible]

[illegible]

[illegible]

[illegible]

[illegible] principles of the [illegible]

[illegible]

[illegible] Walbrow

[illegible]

13

3

[illegible]

4

[illegible]

Arrived at Nebraska City at 2 Oclk P.M.
Friday June 8th

Section 10th Bluff at Nebraska city

10	Loess	80 to 90
No 9	Yellowish gray micaceous sandstone with a laminated structure or in thin layers with ripple marked surfaces	10 f
" 8	Yellowish ash colored and drab laminated clays	18 ft

+ the lower 12 to 15 inches of No 9 sometimes becomes very hard like quartzite

3d B of Marcou

semistriato, Nadina, dorsoconvexa, Sickelli
bialbicostato, semipunctis cuenistria, Ou-
mbilicus [illegible], [illegible] [illegible] [illegible],
[illegible] [illegible] [illegible], Rotella [illegible]
[illegible] [illegible] [illegible], Deltoid tooth
[illegible] [illegible]

[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]

[illegible] 2 H
coal
[illegible] [illegible]
Ash [illegible] day

1827

[illegible] Wabash [illegible]

[illegible] the

[illegible]

[illegible] seen more

[illegible]

Section

[illegible]

[illegible] some [illegible]

[illegible]

Co[illegible]

[illegible]

[illegible]

And

[illegible]

Monday June [illegible]

White and party concluded to accompany us to Omaha with the team and camp things. After [illegible] a supply of provisions [illegible] at [illegible], and came on up to [illegible]. Saw here the following

Section 15 [illegible] Wyoming

[illegible] brown [illegible] gravel [illegible]

Hard impure gray siliceous limestone. Fossiliferous. } 2 feet

Ash colored clay 3½ ft.

Massive bed siliceous (yellow-stone impure), more arg. below [illegible] [illegible] Pernonia } 4 ft

Laminated whitish ash colored clay 5 ft

[illegible] clay, [illegible] down [illegible] sandstone [illegible] [illegible], and concretionary } 4 ft

[illegible]

[illegible] and a long [illegible]

[illegible], on

[illegible] [illegible] Beetles, [illegible] joints

In [illegible], [illegible] [illegible] in [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

J. [illegible] 6. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] 6. [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] or [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

In the [illegible] [illegible] 3 [illegible] [illegible] [illegible] were seen [illegible] [illegible] [illegible] in the track of [illegible] [illegible] [illegible] seen [illegible] [illegible] [illegible] they were cavities, but it was found that they were filled with arenaceous material that [illegible] was [illegible]. They [illegible] [illegible] [illegible] [illegible] thus

[illegible] each limb of the [illegible] [illegible] is about 5 mm. wide [illegible] my [illegible] in [illegible] well as in the sand.

[illegible] about 2 m. beyond Wyoming

Camped in a School House.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

— [illegible] 16. —

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

See page 63 & 64

[illegible] (Whitworth)

[illegible]

[illegible]

[illegible] mill [illegible] Fusulina, [illegible]

[illegible] the [illegible] &

[illegible] siliceous [illegible] beds with

[illegible] shaly [illegible]

[illegible]

[illegible] shaly calcareous [illegible]

[illegible]

[illegible] Black shale. [illegible] 2y

[illegible]

[illegible]

Sandy and [illegible] of light [illegible] with partings and interrelations [illegible] 7

[illegible] 9

[illegible]

See p. 63 & 64

63 & 64 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] siliceous [illegible]

[illegible]

[illegible] calcareous [illegible]

[illegible]

~~[illegible]~~

[illegible] 13th June

[illegible]

[illegible] Canon[illegible]

[illegible]

[illegible] 12 [illegible]

[illegible] miles above [illegible] the [illegible]

[illegible]

[illegible]

6 [illegible]

[illegible] 5

[illegible] 6

[illegible] 1

[illegible] 1

[illegible] 7

[illegible] 7

P. semireticulatus, P. punctatus

[illegible] river [illegible]
[illegible] seems
[illegible]
[illegible] apparently [illegible] the
[illegible] Prairie
[illegible] there [illegible]

[illegible]
[illegible] Hunting [illegible]
[illegible]
[illegible] Secondary road ~~[illegible]~~ [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] river [illegible]
[illegible]
[illegible]
[illegible]
[illegible] side [illegible]
[illegible]
[illegible] here [illegible]
[illegible] which [illegible] from

the river) [illegible] for 20 or [illegible] back on
the road towards [illegible], the surface
seems almost imperceptibly for 16 or 12
miles on the north side [illegible] to
the [illegible] the same
[illegible]
[illegible]
[illegible] weather. [illegible]
[illegible] a low range [illegible]
[illegible]
[illegible] trees [illegible]
[illegible]
[illegible]
[illegible] water [illegible] wells [illegible]
[illegible]
[illegible], but [illegible]
[illegible]
[illegible]

[illegible]

[illegible]
[illegible]
[illegible]

[illegible]

[illegible] seem to [illegible]

[illegible]

[illegible] there was also [illegible]

[illegible]

~~[illegible]~~ doors a day. [illegible] distance [illegible]

[illegible] branches, there are [illegible] 150 [illegible] feet above the [illegible]

[illegible]

[illegible]

[illegible] time to start [illegible]

[illegible]

[illegible]

[illegible]

Be[illegible]

[illegible]

[illegible]

[illegible]

June [illegible]

[illegible]

No 1[illegible]

[illegible]

6ft. clay

[illegible]

[illegible] base of this [illegible] is on a level with the Platte valley, which cannot be more than two or 3 ft. above the present level of the Missouri at the mouth of the Platte, the former river [illegible] now some 8 or 9 ft. above its medium height. The locality is 5 m. in a direction some [illegible] N. of S. from Bellevue, and about 1 m. N. of [illegible] City.

Quarries a mile S. of [illegible] locality, on the [illegible] place, [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] containing greater numbers of fossils [illegible] I got some fine specimens [illegible] [illegible] [illegible] [illegible]

[illegible] surface of this [illegible] [illegible] by glacial agencies, almost [illegible] plane, [illegible] when [illegible] [illegible] the surface is [illegible] dressed [illegible] seen in the [illegible] [illegible] these are [illegible] [illegible]

so far as could be seen, [illegible] range N 10° E, S 10 W. As far as the [illegible] was exposed [illegible] (except 15 feet for 30 to forty yards [illegible] whole upper surface is [illegible] planed off, and I have no doubt [illegible] [illegible] of area [illegible] are in the same condition. These [illegible] show a declination of 2° or 3° to N. or [illegible] a little E.

I also saw here a 6 [illegible] bed of [illegible] [illegible] No. [illegible] the last section, that [illegible] [illegible] may have been [illegible] from the bed No. 1, of the last sec. [illegible] here, in addition to the [illegible] the following [illegible] [illegible]

From [illegible] a 1/2 mile farther along the [illegible] [illegible] more [illegible] [illegible] apparently [illegible]

[illegible] the following section –
[illegible]

Section 20. [illegible]

[illegible] No 3 Sec. 14 [illegible]

No 1 of Sec. 14, brown 4. feet
very hard dark gray compact [illegible]
~~[illegible] Shale~~
[illegible] col. mineral [illegible]
[illegible] material
Black [illegible]
[illegible]
[illegible] red, [illegible]
[illegible] limestone [illegible]

[illegible] ash col. somewhat [illegible]
[illegible] material
[illegible] above [illegible]
[illegible], same as base [illegible]
[illegible] [illegible]

[illegible] bluish ash col.
[illegible] above but becoming harder
[illegible] thicker [illegible]
[illegible]
[illegible] mainly [illegible]
[illegible]
[illegible]
[illegible] occur
[illegible]
[illegible] continuous, [illegible]
[illegible]

Black [illegible]

No 1 very Hard bluish compact 4 feet
ash. col. [illegible]

The base of this sec. is about 20 feet above the Platte valley, and probably 20 [illegible] above the [illegible] of the Missouri [illegible] [illegible] [illegible] Thick [illegible] [illegible] above the [illegible] below [illegible] equivalent of No 8 [illegible] [illegible] that with the exception of some [illegible] of the [illegible] [illegible] are [illegible]. [illegible] this sec. [illegible] feet [illegible] above [illegible] about [illegible] about 6 to 7 [illegible] 20 [illegible] S. [illegible]

— S. E.

[illegible] are [illegible] 10 or 15 [illegible] S. of [illegible]

[illegible]

Cloudy day and a little rain at 6 o'clock [illegible] [illegible] [illegible] [illegible] Bellevue [illegible] [illegible]

[illegible]

[illegible] 2 [illegible]

[illegible] yellowish [illegible]

[illegible]

water

[illegible]

[illegible] or [illegible]

[illegible]

Limestone

[illegible] 2 foot thick [illegible] 5 ~~8~~ [illegible] above No 6 [illegible] [illegible] dark shale under it [illegible]

2

Chippy limestone [illegible]

[illegible] occidentally [illegible] dark [illegible]

[illegible] grey limestone [illegible]

[illegible] 2 feet thick [illegible] 5 or 6 ft [illegible]

[illegible]

[illegible] 18

[illegible] the [illegible] or points

[illegible] we [illegible] very [illegible] the [illegible] flats and [illegible] of [illegible] to do this [illegible]

[illegible] which [illegible] is [illegible] passed over.

[illegible] can be [illegible]

[illegible] must [illegible] with clay [illegible]

[illegible]

[illegible] have taken [illegible] on p. 30 [illegible] very difficult. [illegible] become [illegible] I am now [illegible] could [illegible] in the place [illegible]

[illegible]

Hard [illegible] bright.

[illegible] clay with [illegible] 12 [illegible]

[illegible] 8

[illegible] 10

[illegible] colored [illegible]

[illegible] 18

~~[illegible]~~ clay

Yellowish [illegible] 33 [illegible]

[illegible] 12 inches thick [illegible] with the [illegible] 12

[illegible] 1 [illegible] Below [illegible] with [illegible]

The base [illegible]

[illegible] limestone [illegible]

[illegible] [illegible] when [illegible] [illegible] [illegible]

[illegible] [illegible], [illegible] a [illegible], [illegible]

[illegible]

[illegible]

[illegible] are [illegible]

Sunday June 23.

Morning somewhat cloudy; warm, with south [illegible] wind. Went down to the [illegible] bluff and [illegible] [illegible] morning [illegible].

Section 23. Rock Bluff

[illegible] ft.

[illegible] yellow [illegible] and [illegible] [illegible], v 102 [illegible]

[illegible] Limestone [illegible] v 102 [illegible]

[illegible] v 10 [illegible]

[illegible] of gray [illegible] [illegible]

[illegible] v 107 — 8 [illegible]

[illegible] with gray [illegible] [illegible] v 110 — [illegible]

[illegible] v 112 15 [illegible]

[illegible] [illegible] [illegible] 11½ [illegible]

[illegible] [illegible], [illegible], [illegible]

[illegible] col. [illegible], with [illegible] middle [illegible] v 112 — 8 [illegible]

[illegible] in [illegible] [illegible]

[illegible] Sec.

[illegible] occurs [illegible] 2 [illegible]
[illegible] Ozarkian [illegible]

[illegible] [illegible] 1 [illegible]

[illegible] coral [illegible] 1 [illegible]

[illegible] eol clay
[illegible] 13

[illegible] with [illegible]
[illegible] but lighter and more [illegible]

[illegible] black [illegible] 2 [illegible]

[illegible] 3 [illegible]

[illegible] 6 [illegible]

[illegible] 5 inches

[illegible] 5 [illegible]

[illegible] inches

[illegible] 11 [illegible]

I think [illegible] of this [illegible]
the [illegible] beginning [illegible] water [illegible]
[illegible] are the [illegible]
[illegible] and [illegible]
[illegible] Blow [illegible] below [illegible]
identify the same [illegible] over [illegible]
[illegible]
[illegible]
[illegible] ⟵ ⟵
[illegible] water [illegible]
[illegible] much, [illegible] according to [illegible]
[illegible]
[illegible]
[illegible] came on [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] 4 [illegible] 5 [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] near [illegible]
[illegible] edge

68

2 to 3 [illegible] thick above, with many [illegible]
[illegible] along the slope just below
[illegible] giving a dark gray appearance on the
weathered [illegible] face, [illegible] reminds me very much
of the outcrop of the same rocks seen
along Smoky Hill river above Fort Riley
[illegible] general features of the country
are [illegible] same [illegible]
[illegible] the timber along the streams.
[illegible] limestone again the water is [illegible]
[illegible] many coal seams [illegible]
[illegible] rocks near the base of the
[illegible] bluffs as well as [illegible]
[illegible] mile above [illegible]
[illegible] have been dug [illegible]
[illegible] ledges of
[illegible] coal [illegible]
[illegible] One [illegible] of the
[illegible] feet above the [illegible]
[illegible]
[illegible] No. [illegible]
[illegible] in [illegible]
[illegible] Scott
[illegible] Iowa

([illegible])

about 40 miles) [illegible] ville, [illegible]
[illegible] vegetation, [illegible]
[illegible]
[illegible]
[illegible] mouth [illegible] Scott [illegible]
[illegible]

Section 24

Hard light gray [illegible] limestone [illegible] 20 ft
[illegible]
[illegible]

[illegible] Slope [illegible]

22 [illegible] 8 [illegible]

21 [illegible]

[illegible] light [illegible]

[illegible]

[illegible] material, [illegible] light [illegible]

[illegible] Slope [illegible]

16 [illegible]
limestone

Cedar Bluff sec. Cont.

[illegible] 3 ft

[illegible] with [illegible] 1 ft

[illegible] whitish [illegible] } 2 ft

[illegible] yellow clay 2 ft

[illegible] 3 [illegible]

[illegible] clay

[illegible] clay [illegible] yel. [illegible] 1 ft

[illegible]

[illegible]

[illegible] Clay [illegible] 15 [illegible]

[illegible] 8 [illegible]

[illegible]

[illegible] and

[illegible] the highest [illegible]

[illegible] A [illegible] massive bed

72

light or whitish limestone weathering [illegible] rough present a [illegible] [illegible] crop out [illegible] 6½ feet in thickness [illegible] the little valley [illegible] side [illegible] Cedar bluff about [illegible] S. E. [illegible] feet out crop [illegible] above the [illegible], but not [illegible] 25 to 35 feet [illegible] S. E. [illegible] the [illegible] are [illegible] to believe [illegible] Cedar bluff [illegible] clay bed [illegible] and [illegible] Cedar bluff [illegible] N. Cedar [illegible] feet [illegible]

[illegible] some mos-
[illegible] mentioned
[illegible] probably a brown
[illegible] long [illegible]

[illegible] at 40 [illegible]
[illegible]
[illegible]
[illegible]
[illegible] become
[illegible] There are now
[illegible] have the
[illegible] on the
[illegible] ground by
[illegible]

Section 25 [illegible]
[illegible]

[illegible]
[illegible] wrong [illegible]
[illegible] Tage [illegible] water
[illegible]
[illegible] I saw the following

Section 25 ([illegible])
[illegible] stone [illegible]

[illegible]
[illegible]
[illegible]
Blue [illegible] rock, [illegible]
and compact. [illegible]
[illegible] abundant.
~~Blue [illegible]~~ [illegible]
[illegible]
[illegible]
[illegible] Kendrick.
[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] men [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

Section 26 (Wilson cont.)

[illegible] 6 feet to the } 0 5
[illegible] }

[illegible]
[illegible] [illegible], com[illegible] — Six teen
[illegible] 12 feet

[illegible] drab clay 17 feet [illegible] 12
6 [illegible]

[illegible] argill[illegible], Fusulina [illegible]
[illegible] (Hart [illegible]) 2 feet

Coal [illegible] black shale [illegible] 1 foot
[illegible]

[illegible] limestone [illegible] 2

The [illegible] this section is about 3 feet [illegible] [illegible] the [illegible] ~~[illegible]~~ ~~[illegible]~~ at a [illegible] 8 feet above Con[illegible] [illegible] 1 1/2 [illegible]. The [illegible] 65 dec. [illegible] that it goes [illegible] means of [illegible] [illegible] 6 to 8 [illegible] above [illegible]

at least

argillaceous [illegible]; where there [illegible] be, that [illegible] are probably more [illegible] in the creek below [illegible]. It is therefore obvious that we have here at [illegible] and Mr. Wills a Bed containing Fusulina, and numerous [illegible] Coal [illegible] above [illegible] [illegible] directly [illegible] [illegible] Shale [illegible]

Wednesday June 26

[illegible] cloudy this morning [illegible] [illegible] damage [illegible] he has had a 70 acre field [illegible] corn crop. [illegible] gentleman [illegible]

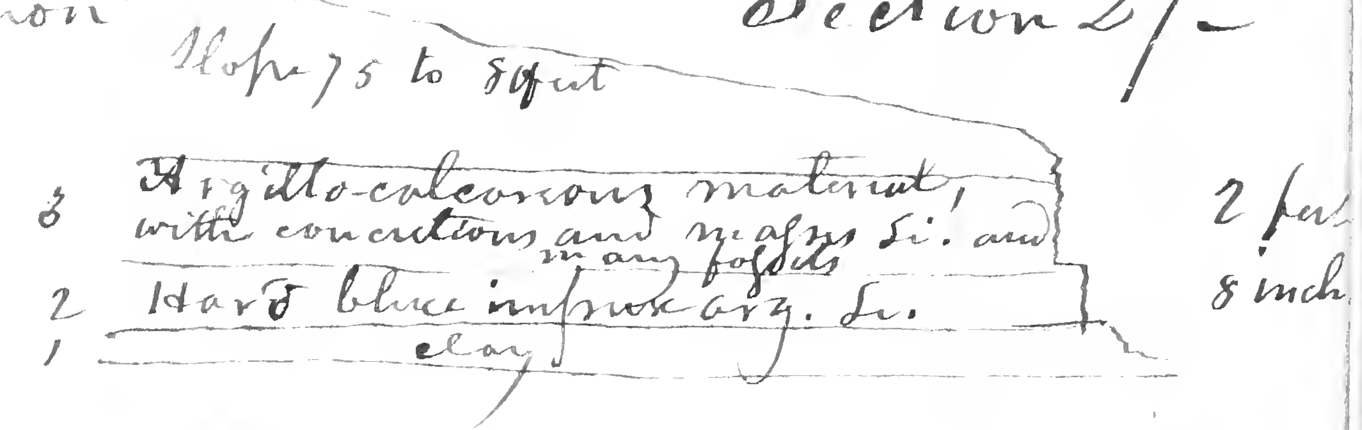
[illegible], and [illegible] they will [illegible] the crop. [illegible] have formed [illegible] districts [illegible] he has been here ten years [illegible] here until [illegible] too late [illegible] communi[illegible] [illegible]

[illegible]

[illegible] 9 miles out.

Was given the [illegible] at [illegible] 20 miles [illegible] Local [illegible] [illegible] Mo. [illegible] 250 [illegible], or about 420 feet above the level of the Mo. This little quarry shows the following section

Section 27.



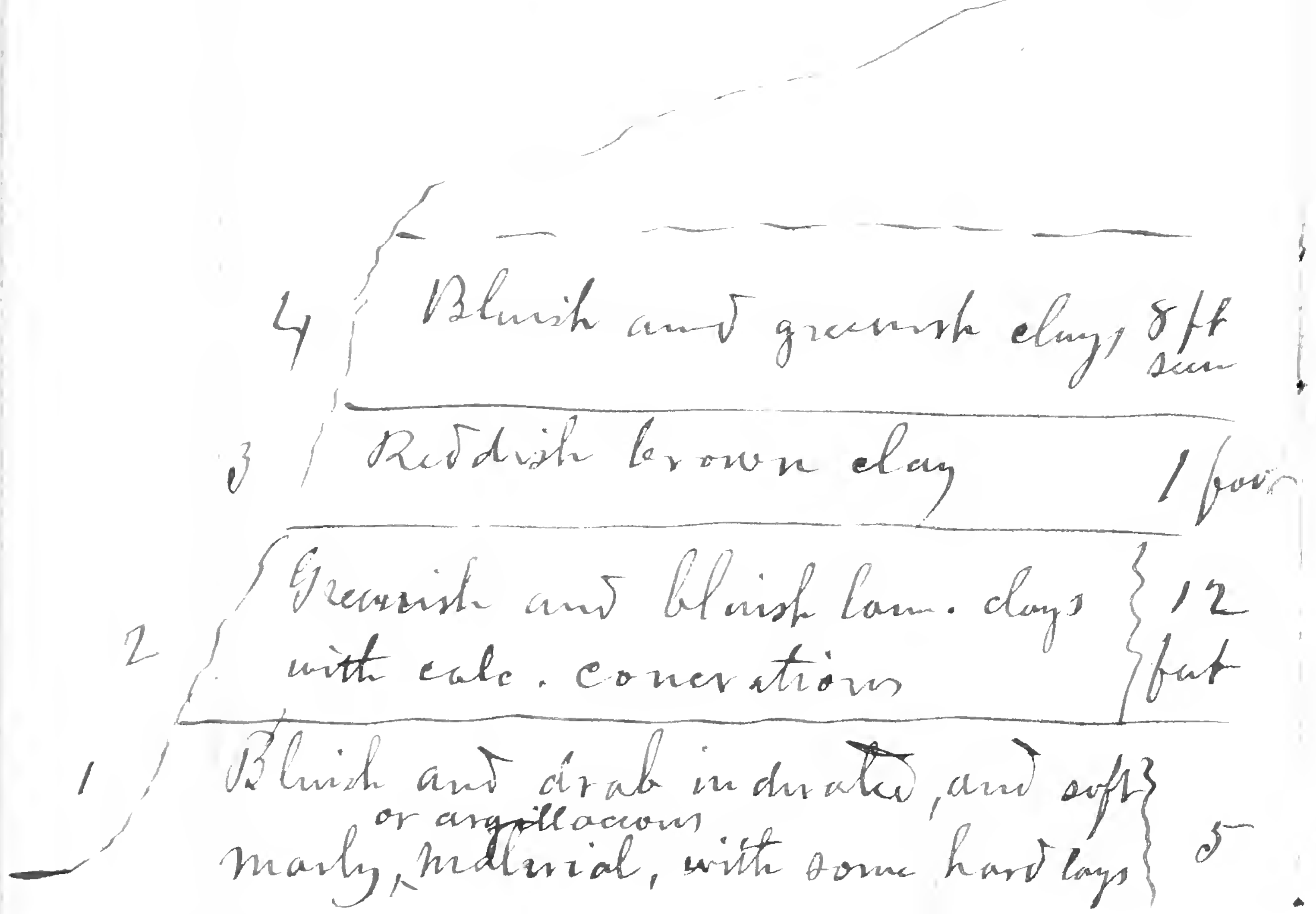
From No. 3 of this section we collected,

79

in addition to the fossils already mentioned Chonetes mucronata, C. verneuilian, Rhynchonella Uta, Orthis carbonaria, Productus longispinus, Prod. Prattenianus, Cyath. hemisphaerica, Spines Zeacrinus mucrospinus, plates and spines Archaeocidaris, Strept. crenistria, and a fragment of a pinna

About two miles N. of this, on a stream called the Nemaha (one of the Nemahas) and at about 25 to 30 feet lower horizon saw the following ~~Se~~.

Section 28.



4	Bluish and greenish clays	8 ft seen
3	Reddish brown clay	1 foot
2	Greenish and bluish lam. clays with calc. concretions	12 feet
1	Bluish and drab indurated, and soft marly, or argillaceous material, with some hard lays	5

80

Saw no fossils in any of these beds.— Was informed that similar outcrops are seen along this little creek for several miles up, at intervals.

In the upper part of No 1, saw many little thin argillo-calcareous flat whitish pieces more or less reticulated over with thin raised markings as if there had been clay between them that had craked, and the cracks had been filled with hard calc. matter, and the clay weathered out leaving the filling of the cracks projecting. This reminded me of similar appearances in the Permocarb. rocks of Kansas [illegible] Dec. 28

[illegible] 65 to 65 feet above [illegible]

[illegible] within [illegible]

[illegible] a [illegible]

[illegible]

[illegible] Dec. 2[illegible]

[illegible]

[illegible] at once [illegible] a [illegible]

[illegible]

[illegible] analysis [illegible]

[illegible]

[illegible]

[illegible] ~~[illegible]~~ [illegible]

[illegible] Dec. 28,

[illegible] a [illegible]

[illegible] Dec. 28, and [illegible]

[illegible]

[illegible]

[illegible] the [illegible], at a distance of [illegible] [illegible] a beautiful [illegible] of great [illegible] [illegible] rocks of [illegible] and other [illegible] [illegible] are found — [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 2 [illegible] [illegible] [illegible] [illegible] [illegible]

On Salt Creek S[illegible] [illegible] 30 [illegible] [illegible] [illegible]

Section 30

S[illegible] [illegible]

[illegible] greenish [illegible] 4 [illegible] 6[illegible]

[illegible] with some larger [illegible] [illegible] 25 [illegible]

5 [illegible] 3 feet

[illegible] yellow [illegible]

Bluish gray clay, crumbl[illegible] 1 [illegible]

[illegible] arg. [illegible] Ch. P. D. semidic[illegible]

[illegible] shale [illegible] [illegible]

Sand gray in [illegible], with many Fusulina — 14 inches

The base of this section is down nearly on a level with the water in Salt Creek which is [illegible] below the Summit [illegible] [illegible] of about 12[illegible] [illegible] South.

About 1 mile in [illegible] direction [illegible] the [illegible] mentioned above, [illegible] 30, and [illegible] the following Section:—

[illegible]

harder and more [illegible]

[illegible] and 6 [illegible]

Unexposed 30

[illegible] of the [illegible] region, [illegible] some
~~[illegible]~~ above the horizon of the
[illegible] [illegible], as there is a dip
of [illegible] from the [illegible] towards the
[illegible] [illegible] of not less than
a mile [illegible]. The [illegible] of [illegible]
[illegible] very much like those of the
[illegible] [illegible], and many [illegible]
[illegible] horizon.
[illegible] a very beautiful country
[illegible] on Salt Creek: the higher [illegible]
[illegible] the valley [illegible]
[illegible] back. Soil good, and
[illegible] Crops growing finely, and
[illegible] the [illegible] — the [illegible]
[illegible] the [illegible]
[illegible] — Some [illegible]
[illegible] between. [illegible]
[illegible] as [illegible], No [illegible]. Dry [illegible]
[illegible] near and far [illegible]
[illegible] [illegible] did not [illegible]
[illegible] the [illegible] [illegible]
[illegible]
[illegible] in [illegible] last year
[illegible]

Friday [illegible] 31
[illegible] [illegible] 13 miles from [illegible]
locality of [illegible] in a direction ~~[illegible]~~
saw at a lower elevation an outcrop of the
same [illegible]
[illegible] beds apparently [illegible] 3 [illegible]
[illegible] the hill [illegible] No 2.
W[illegible] the [illegible]
[illegible] with the [illegible]
Vermillion
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] one Salt Creek. [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
at least 60 [illegible] Dead
leaves [illegible] the [illegible], [illegible]
[illegible] 6 [illegible]
One Mile N. of the [illegible]

[illegible] is now a little [illegible]
Capacity and of about the same
[illegible] as the top of the red sand
stone at Salt City (a [illegible] well boring)
and the wells strike a white sandstone
[illegible] well penetrated this 45 feet [illegible]
[illegible] sandstone [illegible]
[illegible] and then 35 feet through
[illegible] sandstone [illegible]
[illegible] of 6 [illegible] and
[illegible] well [illegible] that it
[illegible]
salt creek.

[illegible]

[illegible] 25 [illegible] which is [illegible]

[illegible] as some [illegible]

[illegible] over the [illegible]

[illegible] so that one would [illegible]

[illegible] deep [illegible]

[illegible] would [illegible]

[illegible] resulting [illegible] all the pool
[illegible] face [illegible] springs were
[illegible] with a [illegible]
[illegible] distance [illegible]
a box [illegible] a [illegible]
[illegible] the [illegible]
[illegible]
[illegible] place [illegible]
[illegible] stand [illegible] the [illegible]
[illegible]

[illegible] together, and [illegible]
[illegible] creek. [illegible]
[illegible] water [illegible]
[illegible] 8 [illegible]
[illegible] Salt [illegible]

[illegible] sketch [illegible]

[illegible] scattered [illegible]

[illegible] valley [illegible] the

[illegible] palan[illegible]

[illegible] from old [illegible]

[illegible] [illegible] [illegible] 1[illegible]

[illegible] [illegible] the narrow

[illegible] than [illegible] we found

[illegible]

[illegible] the [illegible]

[illegible] the

[illegible]

[illegible] marble [illegible]

[illegible]

[illegible] June [illegible]

[illegible]

[illegible] and [illegible]

[illegible]

[illegible] are [illegible]

[illegible] within [illegible]

[illegible] there is very little [illegible]

[illegible] a little south [illegible]

[illegible] and the [illegible]

[illegible] July [illegible]

Morning [illegible] with [illegible]

warm day [illegible]

[illegible]

[illegible] morning [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] went [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] this morning [illegible]

[illegible] falls [illegible]

[illegible] locality. [illegible] rather [illegible]

[illegible] places [illegible] this [illegible]
[illegible] also [illegible] a [illegible] deposits
[illegible] much [illegible]
[illegible] on [illegible]
[illegible]

[illegible]

[illegible] 18[illegible]
[illegible]

Along the [illegible] of the creek [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] evidently [illegible]
[illegible] measures [illegible] 2 [illegible]
[illegible] probably the same [illegible]
[illegible] apparently
underlying the salt [illegible]

[illegible] salt creek. It seems to occupy much
of the country in this neighbourhood, and [illegible]
lower [illegible] Dakota [illegible]
[illegible] bearing sandstone.
[illegible] plastic clay [illegible]
the creek [illegible] belongs
[illegible] the [illegible]
[illegible] I think the [illegible]
[illegible]
[illegible]
[illegible]
[illegible] Came on 15 miles [illegible]

Sunday [illegible]

[illegible] with [illegible]
[illegible] came [illegible] where we camped
[illegible]

[illegible] 2

[illegible] with a [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

Section 33

[illegible]

One mile [illegible] with a [illegible] the following

Section [illegible]

[illegible] 50 h [illegible]

[illegible]

the [illegible] about [illegible]

[illegible]

Tuesday [illegible] 2

[illegible]

4

[illegible] ~~[illegible]~~ [illegible] fully [illegible] to play. [illegible]

[illegible] great [illegible] like places [illegible]

[illegible] the [illegible] up [illegible] the [illegible] airing [illegible] house [illegible] at the [illegible] so high [illegible]

[illegible] without [illegible]

[illegible] alone, a [illegible] the following [illegible]

[illegible] 33. Olive city

[illegible]

[illegible]

36.

[illegible]

[illegible] The same Law holds [illegible]

[illegible]

[illegible]

[illegible] 111 [illegible] rocks [illegible]
[illegible] clay [illegible] soft sandstone,
[illegible] material [illegible]
[illegible] in the [illegible] city
[illegible] the [illegible] in this
[illegible] the whole of [illegible]
[illegible]

[illegible]

[illegible] rather than the [illegible]

[illegible]

[illegible] the [illegible] consideration. [illegible]

[illegible], [illegible], [illegible] of the
[illegible], [illegible], [illegible]
Note, on sec. 36 – [illegible]
[illegible] where the [illegible]
[illegible]
[illegible] under the [illegible]
[illegible] with a [illegible]
[illegible]
[illegible] little [illegible]
[illegible]
[illegible]
[illegible]
[illegible] At some [illegible]
[illegible] this [illegible]
[illegible], it [illegible]
[illegible]

July 4 Thursday

[illegible]

111 Jan. 27

Village [illegible] almost [illegible] pieces almost [illegible] a height of [illegible] This [illegible] deposits [illegible] of yellow [illegible] light [illegible]

[illegible]

112

[illegible] have [illegible] at [illegible] angle [illegible] other places they are [illegible]

[illegible]

194

[illegible] , in

[illegible] N. [illegible]

[illegible]

[illegible] along the slope 90 to

[illegible] river, with also some

[illegible] clays [illegible]

[illegible] Cove [illegible]

[illegible]

[illegible] higher [illegible]

[illegible]

[illegible] may [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] is probably [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] that [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] the [illegible]

[illegible] them [illegible] of the [illegible]

[illegible] while a well sunk in the [illegible]

[illegible]

[illegible] with [illegible]

higher [illegible]

[illegible] in the [illegible]

[illegible]

W [illegible]

[illegible]

[illegible]

[illegible] some distance [illegible]

[illegible]

[illegible] in [illegible]

[illegible] been in [illegible]

[illegible] This is a [illegible]

[illegible] 18 inches [illegible]. In the [illegible]

[illegible] thrown out at this [illegible]

[illegible]

[illegible] Canal [illegible]

[illegible] Coal [illegible]

Perri

[illegible]

2/6 10/

12 [illegible] black [illegible] 6 fr

[illegible]

[illegible] 3/

[illegible] 1/

[illegible] 6/

[illegible]

Soft [illegible]

[illegible]

[illegible] we [illegible]

[illegible] that the yellowish and whitish [illegible] [illegible] [illegible] [illegible] supposed to [illegible] the Cretaceous [illegible] [illegible] here or [illegible]

The [illegible] [illegible] [illegible] [illegible] [illegible] of the [illegible] [illegible] the [illegible]

[illegible]

[illegible] of this [illegible] [illegible] by [illegible]

[illegible] [illegible] [illegible] [illegible] and [illegible] more than 100 [illegible] S.E. direction from the [illegible] of the Brown [illegible] [illegible] the [illegible] [illegible] of greenish [illegible] clay [illegible] by about the same thickness of [illegible]. Just above the [illegible] [illegible] whitish [illegible] with [illegible] [illegible] Pop. Lemnet. fragm[illegible] [illegible] very [illegible] [illegible] the latter the [illegible] along the slope. [illegible]

are some thick [illegible] [illegible] clay, and some greenish. Above all about 5 [illegible] feet above high water of the [illegible]. [illegible] crumbly [illegible] [illegible] [illegible] clays, among [illegible] fragments of the latter [illegible] [illegible] Pod. Lemnet. [illegible] [illegible] [illegible] no [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

From these [illegible] it is evident that this [illegible] is [illegible] [illegible] and is entirely different from [illegible] [illegible] above the village [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Co[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] miles [illegible] Brown
& [illegible] lite of Blinks [illegible]
[illegible] village, [illegible]
[illegible]
[illegible]
[illegible] distance [illegible]

[illegible]

[illegible] the upper
[illegible] 16 [illegible] two feet, with
[illegible]
[illegible] the upper
[illegible] and the lower [illegible]
[illegible]

[illegible] Brownsville [illegible]

Section 10

[illegible]

Str. crenistria, [illegible], Allorisma subcuneata [illegible]
Schizodus [illegible]
[illegible]

[illegible]

11 Red Clay
12 Black [illegible] Clay
[illegible]

[illegible]

1

[illegible]

2 [illegible]	22 x 24
2 [illegible]	5 feet
1 [illegible]	3 feet

[illegible] No 2. 3 [illegible]

[illegible] from [illegible] with all of the [illegible]

[illegible] a decided [illegible]

[illegible] the different [illegible]

[illegible] General

[illegible] S[illegible]

[illegible]

Section 41

[illegible]

[illegible]

Sect. 43

about 2 [illegible] No.,

(Indurated clay)

6 [illegible]

5 [illegible] 5) 12.6

[illegible] Limestone 4 [illegible]

3 [illegible] clay 8 12 feet

[illegible] stone

[illegible] clay [illegible] sand 12 feet

[illegible] section is [illegible]

[illegible] sec. of 2 — he says [illegible]

The fossils from No 5 [illegible] Spirifer [illegible] [illegible] Limestone [illegible]

Another shaft [illegible] 20 [illegible] 30 yds, sunk 17 feet struck [illegible] coal [illegible] chunks [illegible] not [illegible] on account of the [illegible] but this [illegible] seems [illegible]. Possibly there are [illegible] or faults here

Along the [illegible] 12 or 14 feet above the top of [illegible] 3) [illegible] of yellow [illegible] massive of [illegible]

[illegible] 867

[illegible] 4.[illegible]6

[illegible] .[illegible]8

[illegible]

[illegible] 2

[illegible]

1.[illegible]0

2.50

[illegible] 1.20

1.[illegible]

1.00

[illegible] 17.[illegible]

[illegible] 9.[illegible]

[illegible]

8.67

[illegible] 7

[illegible]

Pennsylvania [illegible] 10.[illegible]

[illegible]

[illegible] 00

[illegible]

[illegible] Mail [illegible] 6.[illegible]

July [illegible] to Johnson [illegible]

" 20 [illegible] 3.50

[illegible] 1880

[illegible] .55

[illegible] 7.75

[illegible] .65

[illegible]

[illegible]

Washington Nov 15th 185[illegible]

[illegible]

[illegible]

[illegible] 12[illegible]

Rec'd of Mr Lloyd [illegible]

[illegible]

5 [illegible]

[illegible] cc [illegible]

1896

[illegible]) arenaceous [illegible]

[illegible]

Omeh

[illegible] Elevation [illegible] 16 [illegible]

[illegible] 18 [illegible]

[illegible]

[illegible]

[illegible] and Pencil [illegible]

[illegible]

[illegible]

June 17th 1867

[illegible]

[illegible]

1 [illegible]

June 25

4 shirts

1 under s[illegible]

1 pr. Draw[illegible]

Drawers

[illegible]

58
11
47 56

[illegible]

[illegible]

58
14
47 50

[illegible]

Section of the rocks at Atchison and ~~Sumner~~ Riverside Kansas

(		Slope without exposures of rock to summit of hill (Prospect point)	27 feet
		Rough yellowish limestone splitting on weathered surfaces — great numbers Fusulina	2 feet
		Blue clay below, yellowish do. above	2 feet
19		Two layers hard impure yellowish gray limestone, with an 18 inch bed clay between	5½ feet
18		Ash col. clays, not well exposed (Chonetes found loose on surface of slope)	2½ feet
17		Black, thinly laminated bituminous shale	2½ feet
16		Hard impure yellowish gray limestone	2 feet
15		Blue clay	6 feet
14		Soft yellowish limestone	3 feet
13	Quarry rock?	Gray impure limestone weathering to yellow. Lower layer 20 inches thick, upper layer 1 foot. — Fusulina	2 feet 8 in
12	Riverside Sandstone	Bluish and ash colored more or less laminated, and sandy clays, with near the top a 2½ inch seam of impure coal, or carbonaceous matter	11½ feet
11		Yellowish and gray, or bluish gray sandstone. Some parts soft, and a few layers very hard, or almost like quartzite. generally soft, sometimes laminated, and other parts in 10 to 12 in. layers	23 feet seen probably thicker and occupying a part of the slope below
10		Slope with no rocks seen	17 feet
9		Hard bluish gray impure limestone — Prod. Nebrascensis, P. (small sp. with concentric wrinkles), Chonetes mucronata?, Athyris subtilita.	2½ feet
8		Slope, no rocks exposed	21 feet
7		Hard gray ~~rough~~ limestone with rough fracture — Prod. Nebrascensis, P. Prattenianus Athyris subtilita. (Some parts arenaceous limestone)	4 feet
6		Bluish laminated clay, with near the top two or three thin hard calc. layers	5 feet
5	Atchison	Yellowish ~~Bluish~~ and light gray limestone, weathering to yellowish, in irregular layers with thin gray and yellowish clay partings. — Many Fusulina, — Pinna peracuta Allorisma subcuneata, Prod. Nebrascensis, P. Prattenianus, Sp. cameratus, Sp. lineatus, Athyris subtilita, Schizodus, Cladodus, Syntrielasma hemiplicata	16 feet
4		Yellowish and ash colored laminated clay	30 inches
3		Black regularly laminated, bituminous shale	30 inches
2		Hard bluish limestone, weathering to yellowish gray. Fusulina, Chonetes glabra Prod. [illegible]icostatus, P. Nebrascensis, P. longispinus? Streptor. crenistria, Myalina, Schizodus, Fusulina (At Riverside 3 [illegible] base [illegible] 6 feet)	22 inches
1		Bluish and drab or ash colored more or less laminated clays, with near the top many Chonetes — Myalina, Lower ~~five or 6~~ 8 or 12 feet under high water and hidden by slope	42 feet

Hard rock called by workmen conglomerate (not seen being under water at Atchison and hidden by the slope at Riverside

(See over)

Sec. 42

At Acheson, the top of the bed No 5 is 65 feet above high water mark of the Missouri, while at Sumner 3 miles farther down the river (S of S) its top is 100 feet above the same. If we allow 3 feet for the fall in the Missouri river, this would leave a difference of 37 feet in the actural elevation of the corresponding beds at Acheson and Sumner — showing a dip to the north here of something over 12 feet to the mile.

Top of Mr. Scarborough's cistern at Riverside 152 feet above high water of M.

1/2 Miles west of Atchison there is a quarry of hard bluish gray limestone, bed, or beds (I only saw the rock as brought to Atchison). in 4 to 10 inch layer (or layers) — Bellerophon [illegible], Aviculop sec. Pleurophorus, large Productus. Myalina — &c.

One mile N. of St. Joseph, Missouri a Shaft has been sunk 100 feet for coal Commences perhaps 80 to 90 feet above the Mo. [illegible] more than half the depth is clay. [illegible] the clay [illegible] blue [illegible] or less [illegible] in some parts [illegible] [illegible] this evidently belongs to the coal series [illegible] from the [illegible] [illegible] 40 to 50 feet, a [illegible] horizon of the Mo. A few [illegible] of Coal Measures, were thrown out before they reached the clay [illegible] base and [illegible] forming a continuous [illegible] in the clay.

Boring 2 m. South St Joseph Mo. 60 ft. above high water [illegible]

[illegible] feet	Soil	
1/2 "	Blue Clay [illegible] mica	75
26 "	Sandstone	101
10 "	Soap Stone	120
4 "	Limestone	124
2 "	Soap Stone	126
2 "	Slate	128
1 1/2 "	Coal	129
6 "	Blue Slate	(135)
7 1/2 "	Limestone	(142)
5	Slate	(147)
6 "	Limestone	(153)
2 "	Blue Slate	(155)
4 1/2 "	Limestone	(160)
5 1/2 Black	Sandstone	(165)
1	Limestone	(166)
14	Slate	(180)
4 1/2 "	Limestone	(185)
3 "	Hard Soap Stone	(188)
2 "	Limestone	(190)
2 1/2 "	[illegible]	(193)
5 1/2 "	Highly ~~calcareous~~ ~~[illegible]~~ Limestone	198
24 Dark bluish	Slate	222
[illegible] "	Limestone	~~(246)~~
12 Bluish (gray)	Limestone	234
6 "	Slate	230
1 ft	Bit Shale	(231)
5 "	(Blue) Slate	(239)
4 "	Limestone	(243)
20 "	Slate [illegible]	(263)
6 Light gray or drab	Limestone	(269)
[illegible] Green	Slate	(280)
40 Bluish	Limestone & Clays	320
1 "	Coal	321
3 2/3 Blue	Soapstone	324
4 1/2 Bluish gray	Slate or indurated clay	(328)
18 1/2 Light bluish gray and darker do	Limestone	354
3 Light bluish	Soap Stone	357
2 "	~~Slate~~	360
9 Ash col.	Limestone	(369)
4 "	~~Sandstone~~ Limestone	(373)
[illegible] "	Limestone	376
2 1/2 "	Slate	378
2 1/2 White	Limestone	(381)
14 ft	Blue marly Clay	395
7 Bluish drab	Sand Stone	(402)
38 "	Slate	440
20 1/2 "	Limestone	460
15 "	Soap Stone	475
20 Light gray	Limestone	475
285 ft		

J D Hockley