Okoboji 1911

New Ulm Minn. 1911

Sioux Falls, "

Lyon co.

Carman's Letter

Des Moines, 1911

Apr. 13-1911

Collected Asclepias subcaudata
at Cedar Rapids

Apr. 14-1911

Left at 12.01 for
Emmetsburg. Stopped at
Normandy Hotel for
breakfast.
Left for Sheldon at 8.30
+ at 9.45 am for
Milford.
Took team at the Cutchens'
+ drove NW. — as far
as Lake.
Found Anemone patens
in flower on all the
higher hilltops. Also
Ulmus fulva + americana.
On return examined
cuts.

sec 2 - 98 - 37.

New Well cut
of sec. 2, new of Milford.
there is a road
cut 6 ft deep
during 2002 more
ft. of rusty
sandstone from
ground
& joins the Vision
pattern irregularly
(blanking) &
doesn't leave
extent of ground
like Aftonia.
The rock is
quite clayey here,
yellow (& slightly
greenish).

(Rock samples from cut on
N side of road west of this)

Rusty ground

Mile

The first end of deposit
(east of Coalton)
at Milford shown.

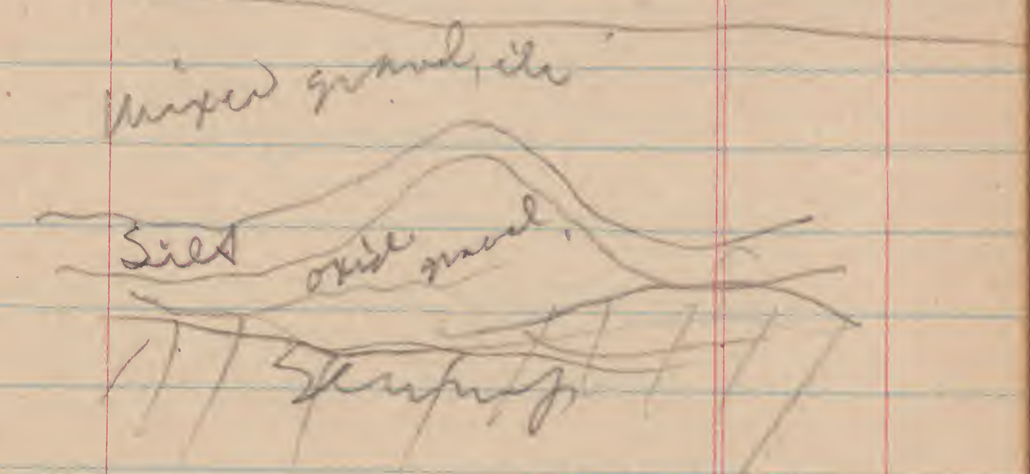
3 ft more or less
rusty marl.
Sandy ~~clay~~ silt 10 ft +
Sand & gravel.

Number four here both
not unlike the
upper pieces gravel
above Otto,
The upper 3 ft has
much rotten granite
(clasts) in it.
The silt is Carnarvon

near SW cor. of
sec, 31-99-37
There is cut about
5 ft. in this coarse
See sample.
This is slightly
grayish till.
It is all quite
uniform. Dug in.

Left Nielsons at
3:35 PM & went
to Hunt Lake.

Went to Hunt Lake &
walked N. to where road
jogs down a little hill.
Here, on W. side road, is a
gravel pit.
Some oxidized ground, with
rotten dark granite
boulders.
Mingles with it in all.
To the east, Wisconsin
drift
W. side



This is near where the road first
crosses close to Lake (E. Okobaji)

Left Spirit Lake
for Jolley at
6 P.M.
Stopped at Windsor
(Winger is post. name)
hotel for supper.
Left for Manhatto at
12.45 — am on

Apr. 15, 1911 (Saturday)
Left at 12:45 am and
reached Manhatto at 4:30 am.
Took breakfast & left
at 6:30 for homeward.
At Manhatto are great
ledges of rock, —
quarried most of here.
The range of hills (bluffs)
the W side of the
valley is here quite
distinctly wooded.
There is a plain
elevated above river, but
lower than bluffs,
which is thickly strewn
in places with boulders.
The rough bluffs and
valleys at the
Manhatto (E.) side of
the valley are also
timbered.
The bluffs at
Manhatto Jc. show
drift apparently
top (of extreme)
The bluffs above here
are mostly S. & W.
The timber on E. bluffs
(faces) is more scant
or wanting.

The E. bluffs are decidedly more bare below Mankato. They also seem to be lower & less rugged.

The border-stream plain continues down the river (N.) to Kasota.

Elevation at Kasota	500 ft
Bridge	480
at St. Peter	495
gradually ascended	
to plain	580
The low hills rise	
still higher,	
as we enter low	
bluffs —	610
Top of 2nd plain	650.
"	660

The RR runs to Kasota on this drift-strewn plain. The bluffs E. are low & mostly bare of trees

Rock-cuts & surface of plain at Kasota (& also South to Mankato)

after gradually rising from St. Peter we came upon a higher plain. Drift seems to emerge in this (with soil)

High woods, low bluffs & hills rise on west side of it — probably 30-40 ft as we entered this elevation = 610 ft

Drift shows &
surface in cuts.
We ascend to top
of plain (= top of
Oshawa) at 650 ft
660 ft
Drift comes &
surface (with soil)
on this uppermost
plain also,
This uppermost
plain is fine, fertile,
with numerous
artificial & natural
groves.
The R.R. runs
right on the
surface of this
plain.
Runs 660 ft. for
a long way.

At Oshawa = 655
A few large boulders
on surface just
west of Oshawa
Mostly west, Litchen
land up here as
to Oshawa.
Large swamps - tufts
vegetation —
at Nicolet 650
(Runs nearly level
all along)
near the lake 660
This is fine level
plain throughout.
The native groves
are around lake
& swamps or on
knolls on this
plain.

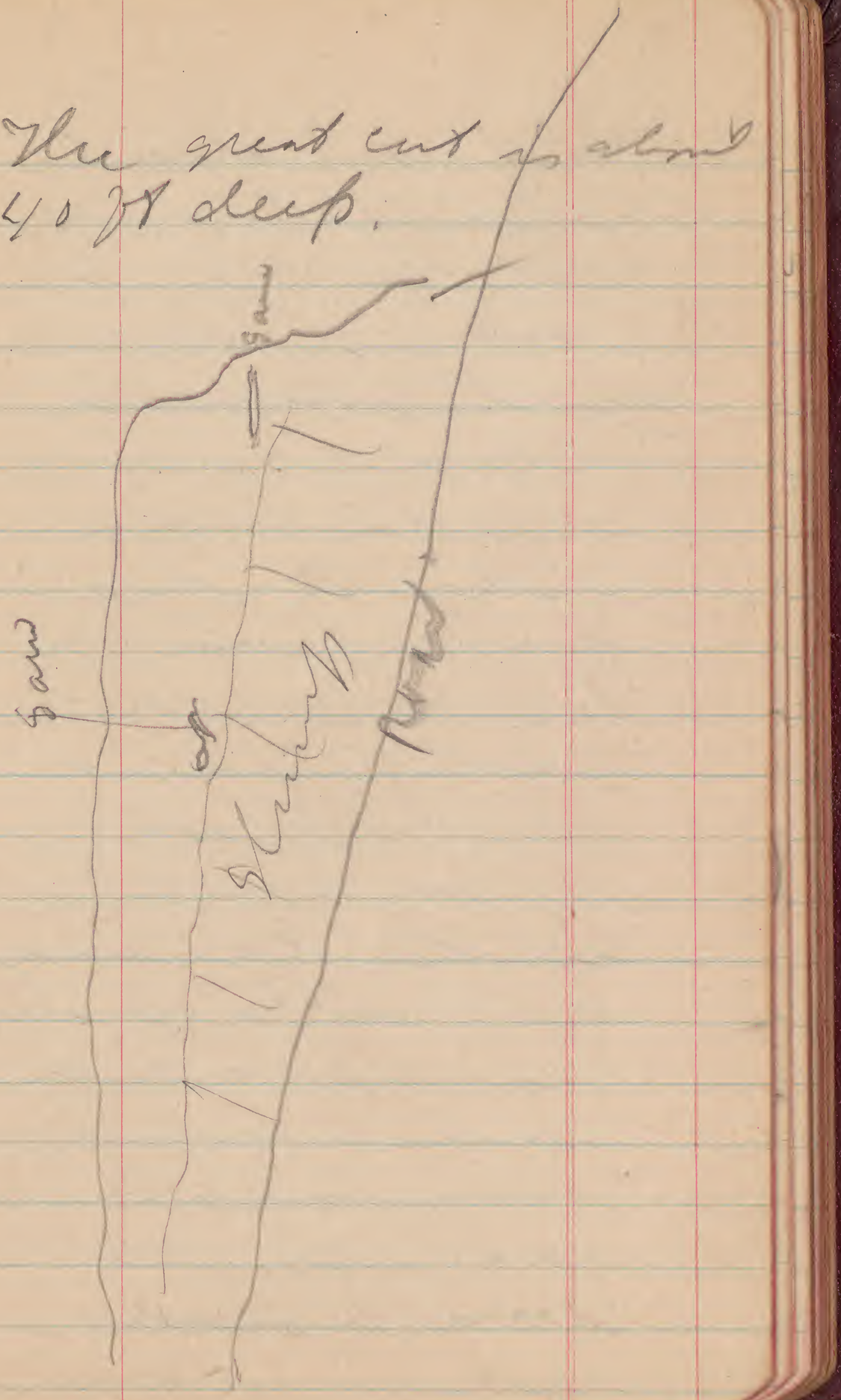
Swells more frequent
W. of Cabin.
Elevation 665
Ls rises rapidly
toward valley ∨
Ne begins to drop
rapidly, and
Confluence is 595 ft.
This is again on
a plain in river valley.

The bluffs on the
S. side are timbered
∨ those on N. side
bare & less rugged.

The lower plain
is higher above
river than at
Manbata, ∨ is
more or less
cut up by erosion
showing deep V
Terraces (gravel)
Mountains
Drops to 485
at bridge. (not
as high above river
as at Kasota)
Drops a flat
to 425, only
15 to 20 ft. above
river.
RR. at Newklum = 590

West west along
Centre street -
Below Ulm stands on
a spur of second plain
about 600 ft high.
The highest part (=
top of highest plain)
is 685 ft. -
There is a big cut
leading up hill
from the sag which
separates the plain
of Ulm from
the hills. The road
leads up to the (with
big cut) to water
reservoir.
2. If it is a part
park with great
statue of Schiller (?)
was a sort of 'Pagoda'

The great cut of about
40 ft deep.



the white till, running to till is yellow, more or less laminated or stratified with a few large boulders & some smaller ones, which (calcareous?) longitudinal streaks or thin layers. (See sample)
There are irregular streaks of iron, as if fissures up. The base of upper till just at E. end, above sand layer, is at 650 A
This upper till is not Kansan. It is too yellow, though hard & coarse jointed like Kansan. Also with some (a few) dark silica

folded.
The sand is loose & coarse, - like bar sand.
The till is quite calcareous at this end - effusions & efflorescences.

At E. end of bar are big slabs of gravel conglomerate, but which are in place (just above sand) or slumped from above is not clear.

On S. side of road at E. end the plateau conglomerate forms about 6-7 ft. above road

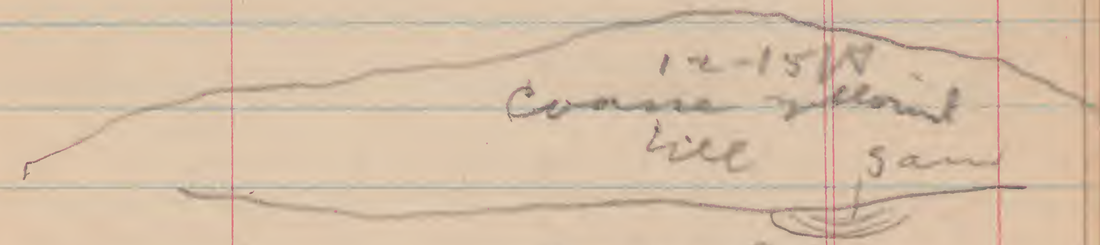
which is here known as this makes slabs on a side nearly same. The S. side extends down hill farther.

Below the slabs (on S. side) is a foot of red sand & gravel & below that a foot muchy, dark till. This dark till begin at an altitude of 615 ft. & I could follow it down only for a couple of feet. This dark till is muchy, coarse, & does not look like Nebraskan.

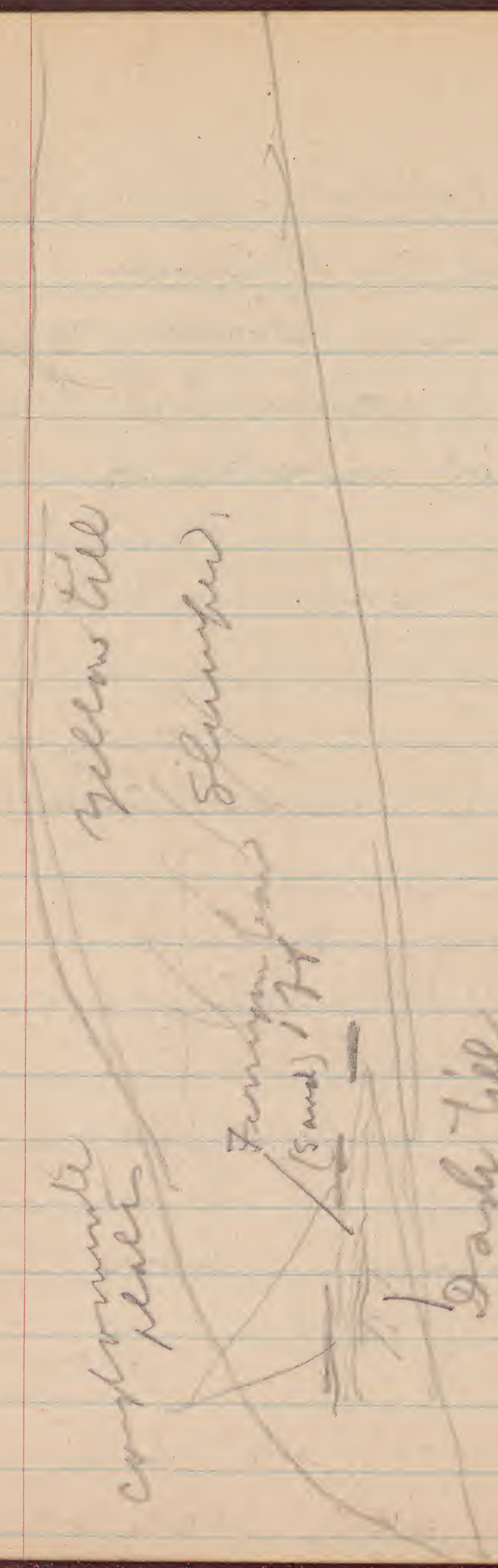
It is hardly possible that the upper is Kansan & the lower Nebraskan, but the "Kansan" is too yellow, looks young (like newer sand, with fresh pebble surfaces) & the Nebraskan is too coarse in fracture, muchy & not dark enough.

On extension of 5th North St.
street (n. of Center)
there are three gravel
cuts (gravel pits)
2 on N side & 1 on S.

The 1st pit W. on N.
side =



The gravel contains
boulders + a few sand
y sand. It does not
look quite like rice.



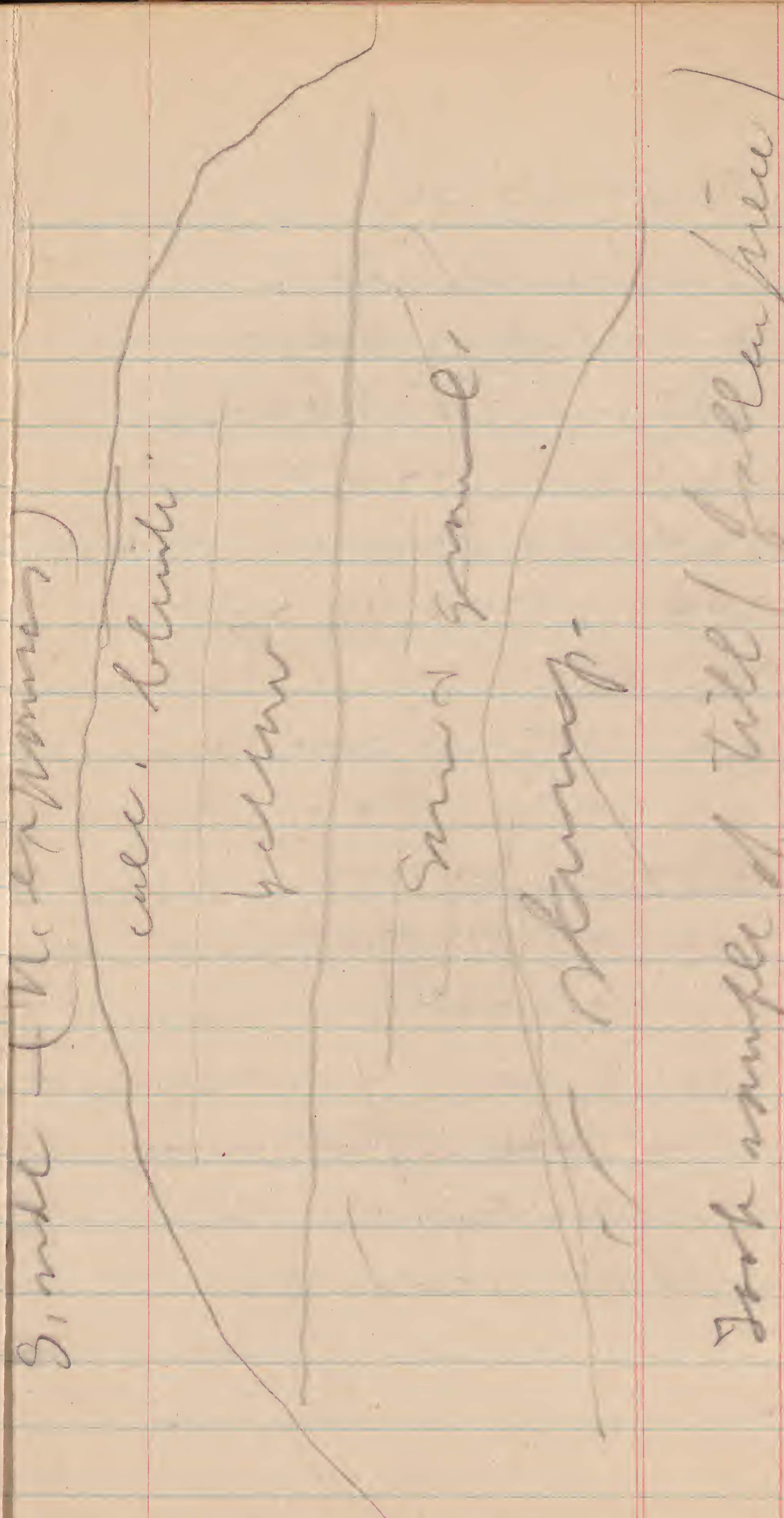
regular Alaska -
Sec Pelister 29 & 32
V 21 & 22.
The upper bin of
core is laminated,
shaly, with thin
veinlets of coal and.
Also fine drift ball,
(one sample)
Rock sample of
drift 2 ft -
above sand.

The till has a blue
coating (one sample)
but is yellow
underneath
It is very hard
above the sand.

Dark boulders, some
which are fossil
in appearance till
could not expose them
here.
This till is like upper
till on creek sta.
a layer of large
rocks down extends
along about 7 8/4
below top here.

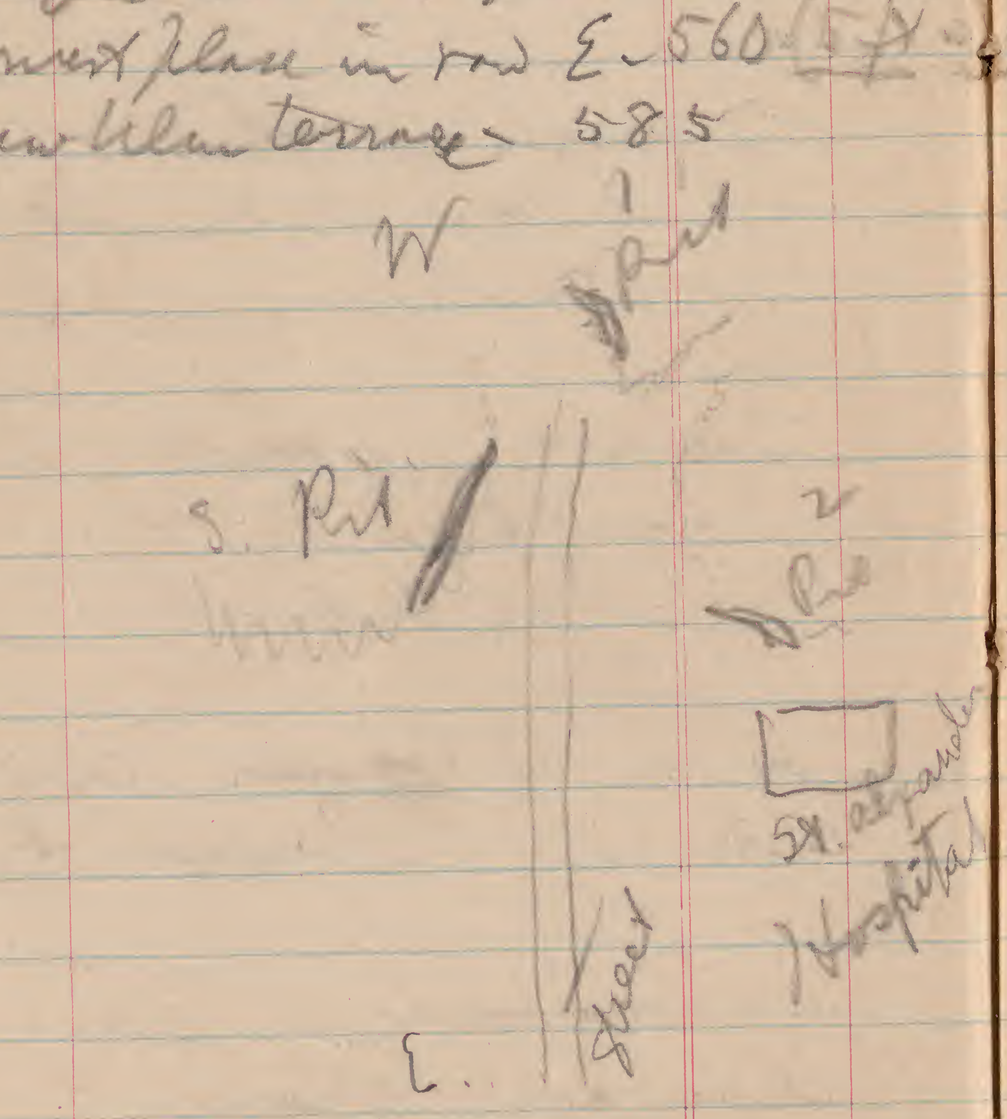
The 2nd outcrop (E)
(No exposure) is
badly decomposed - It
shows little drift.
There is a lot of
coarse boulder sand
here - below.

The cut on
S. side shows
12-15 ft of drift
(looks bluish above)
mostly yellow, coarse
graveled, very
calcareous above &
certainly looking like
many S.W. Kansas
(the upper half the
lower is yellow &
less calcareous.
The sand & gravel is
here more from higher
more like Afton[illegible])
18 ft exposed, &
then slump.



Cut S. side

Top of hill 665'
Top of gravel 625
Bottom of gravel (apron) 605
Road 590
Lowest place in road E. 560 (5 ft. above bottom)
New Ulm terrace 585



Old mg "Hollywood"
on W. bank Minnesota
1/6 5th North St.

Evidences show
that New Ulm beach
is sandy + gravelly

Pic is shown W. of
Franklin + S of
5th North St.

It is 5 blocks from
Center to 5th North street

Took sample of drift
(upper part) from
S. pit.

Left New Ulm at
12:15 pm. entering hills
Elevations - Large 590?
Top of plain 680
Searles (675-685) 670
Hamilton 685
La Salle 695
St. James 730.

It is very windy &
clouds of dust fill the
air!
This upland plain
is nearly flat, only
very gently rolling.
The Dew and
alkali drift to surface.
In a few places
large boulders are
on the surface.
There are also low
wet places.
Rose to high as
705 ft. Later
710 ft.

Left St. James at 2:20 pm
Elevation of station
(evidently barometer change)
= 775

Butterfield	850	bar. (rising)
Mountain Lake	905	
Bingham Lake	1045	
Windom	1025	2 maybe 11
Wilder		
Heron Lake	1085	
Milowa	1095	
Brewster		
Worthington	1235	

The prairie to Butterfield is of the same high flat type, with occasional bogs and sometimes uneven rolling. Rarely boulders appear in my fare. Beyond Brandon Lake the prairie is more rolling. It is more rolling all along to the right of the track. Beyond Hansons Lake again flatter, and remains so to Worthington, where I change cars for Sioux Falls.

Left Worthington at 4:27 P.M.

(Continued from 4:00)

4.	Worthington	1235
4.25	Ruskmore	1315
4.40	Adrian	1205
4.52	Magnolia	1185,
5.03	Warner	—
5.10	Luverne	1115
5.25	Beaver Creek, Mi.	1105
5.37	Valley Springs, S.D.	1055
5.50	Brandon (Alt. above sea = 1333)	995
6.10	Sioux Falls " " " = 1397)	1030

(Bridge over Big Sioux = 970
Above 415 ft above bottom.

Occasionally, as beyond Ruskmore, a little rolling again rolling beyond Adrian. This part is the most rolling of all the way today

except river bluffs
& later becomes
flatter again, - it
is after all only a
slight break in
great Plains.
At Magnolia
again slightly rolling
some distance out, to
right hand, I
can see big block
(large) of Sioux Qtz.
It rises as a round
elevation with
rocky, jagged edges.
This is the big
ledge above Luverne
near Luverne
rough & very
loose like stuff
strewn in into.

The Rullan river valley
is gouged out of
plains, & my cuts (2)
are near it's head-
west of Luverne
flat as town. South
but higher (continuation
of Sec 2, ridge) north.
Top of plain - near
1190. & continues
quite rolling
Continues quite rolling
to Beaver Creek.
Ry station is below
general plain, 1105 ft.
elevation
Falcons valley north
to Valley Springs -
below general plain
More & less rolling
as along.

Drops down in a
mt. valley to
990 (?) ft. to bottom
are ~~Big Sioux~~ creek
(mostly)

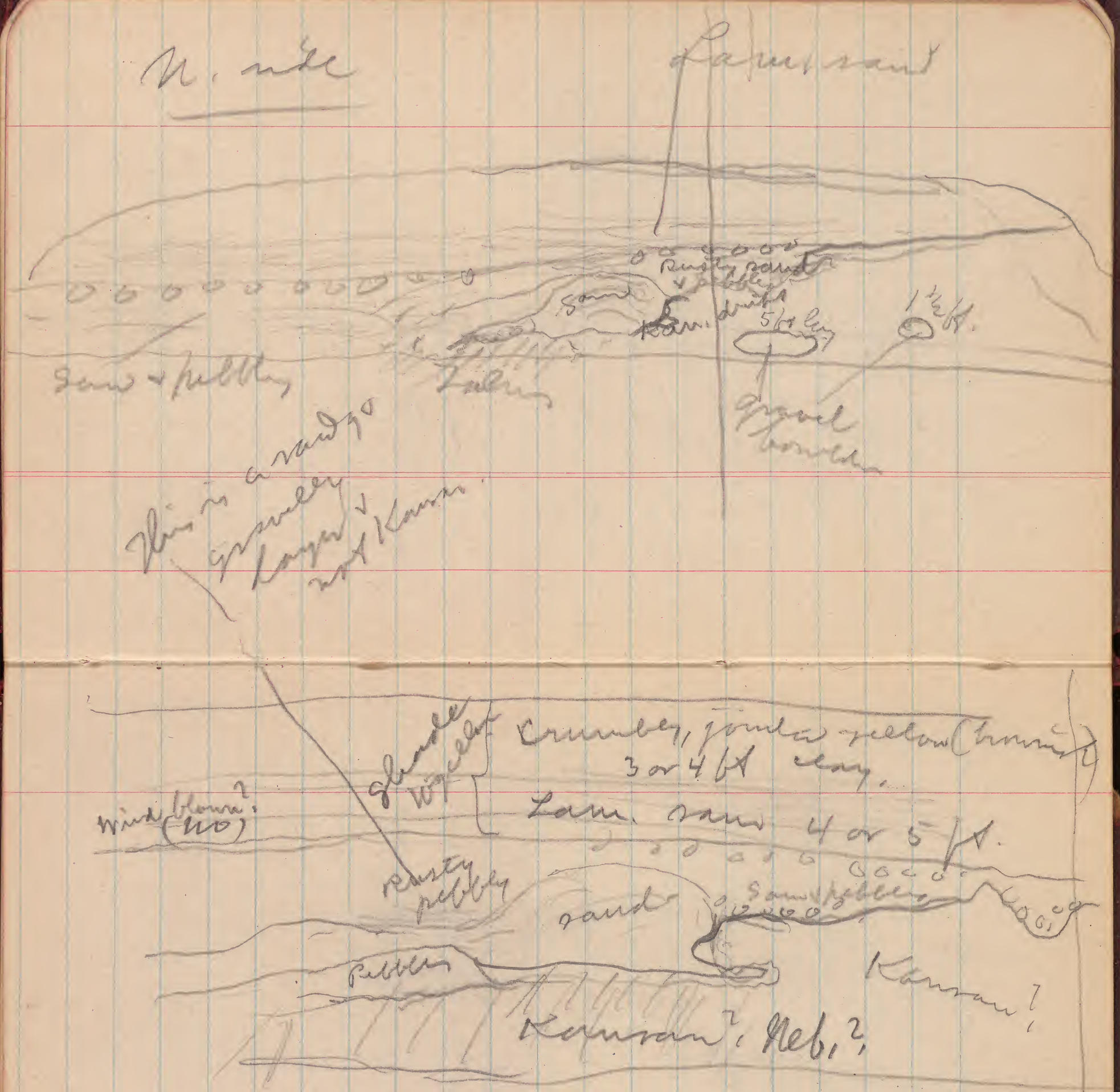
Road runs again
westerly, like
Tuesday east of
Sioux Falls,
across the hills
S. + E. of Sioux
Falls and most
of that general
direction of valley
ridges, & they
do not rise
very perceptibly
above the plain —
or not at all.)

Route across Big
Sioux is 970. +
along its narrow
rocky mystic bottom
This is about 15 ft
above bottoms.
From Brandon (near
~~the~~ the RR. runs on
a low terrace
with bluffs high
This runs 1020 ft
Beside river and
where RR comes
out close together
the RR then follows
valley down (or
rather up) to Sioux
Falls.

Apr. 16-1911

Drove out to road cut
east of Jct. east RR.
on S. side the stuff
above gravel looks is
underlain by black, & yields
(see sample from here)
It is very plastic &
has numerous white
soft calcareous blotches
& nodules, especially
above.
A few boulders are
scattered through the
mass. Erosion is
clearing abundant
muck & the drift here
is black gray

N. mile

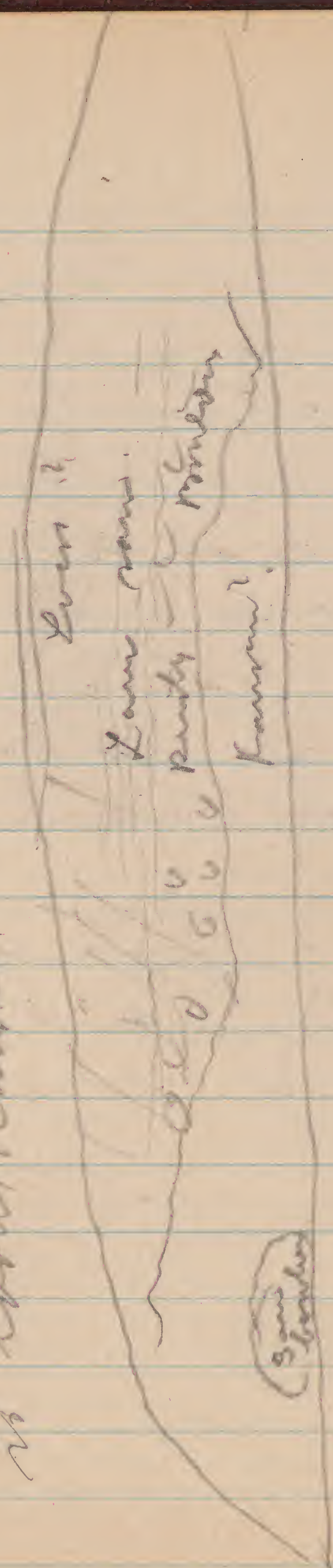

Rusty pebbly sand
Sand
Sand & pebbles
Pebbles
Gravel
Sand
Pebbly
Gravel
Sand
Pebbles
Sand & pebbles
Gravel

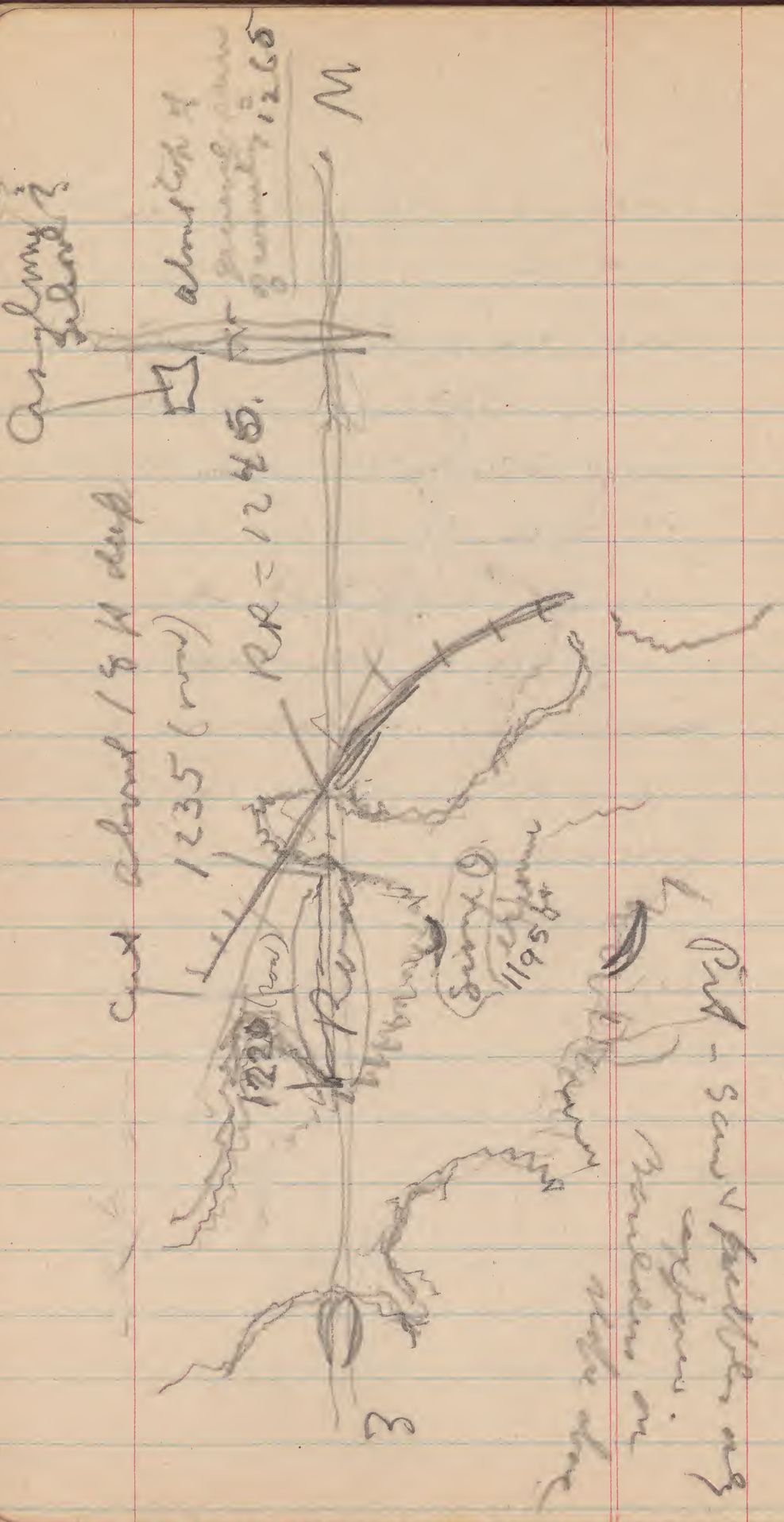
N. mile

The upper sand is probably water lain. There are streaks of small (very small) pebbles but it seems to me not coarser than coarser streaks from Chicago Dunes. There are pebbles in the lowest part. It is probable that at least lower part was water lain, & maybe all.

S. side.

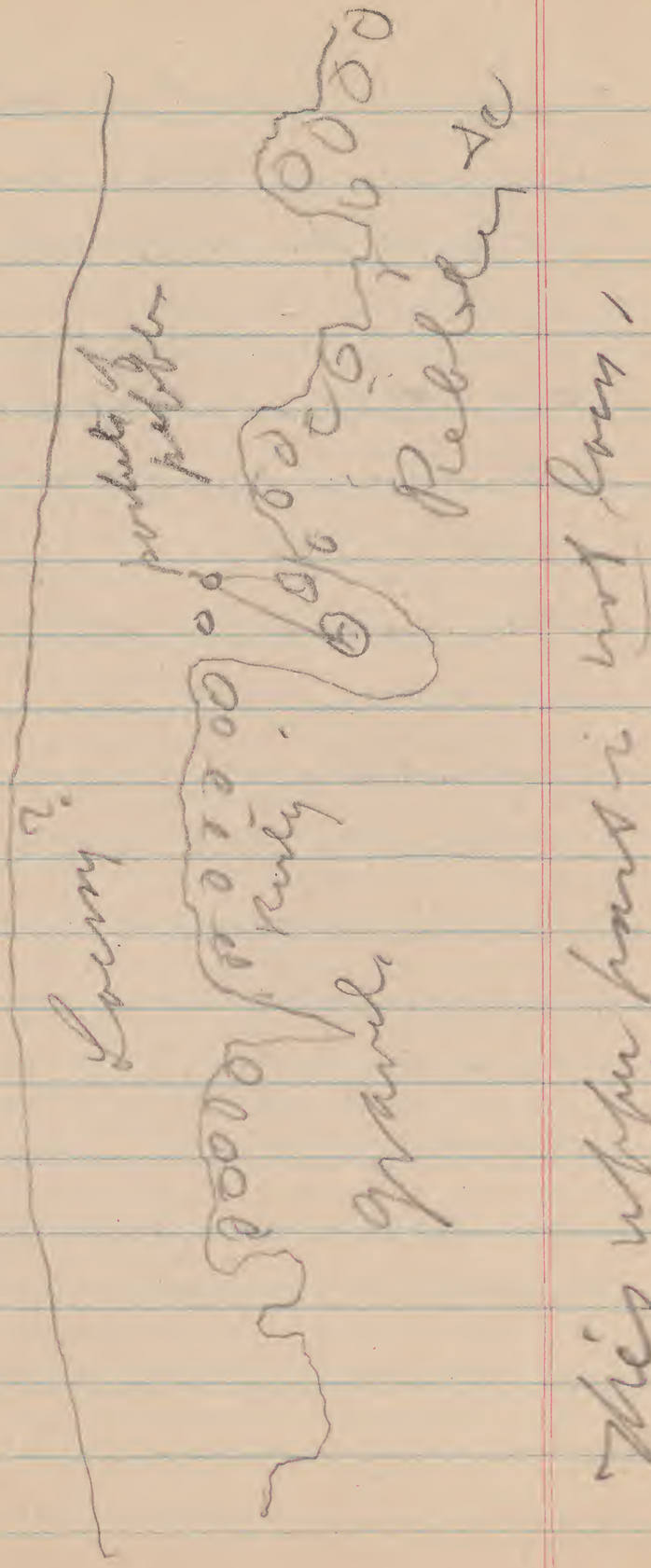
The drift on both sides is very thin, but is coarser.



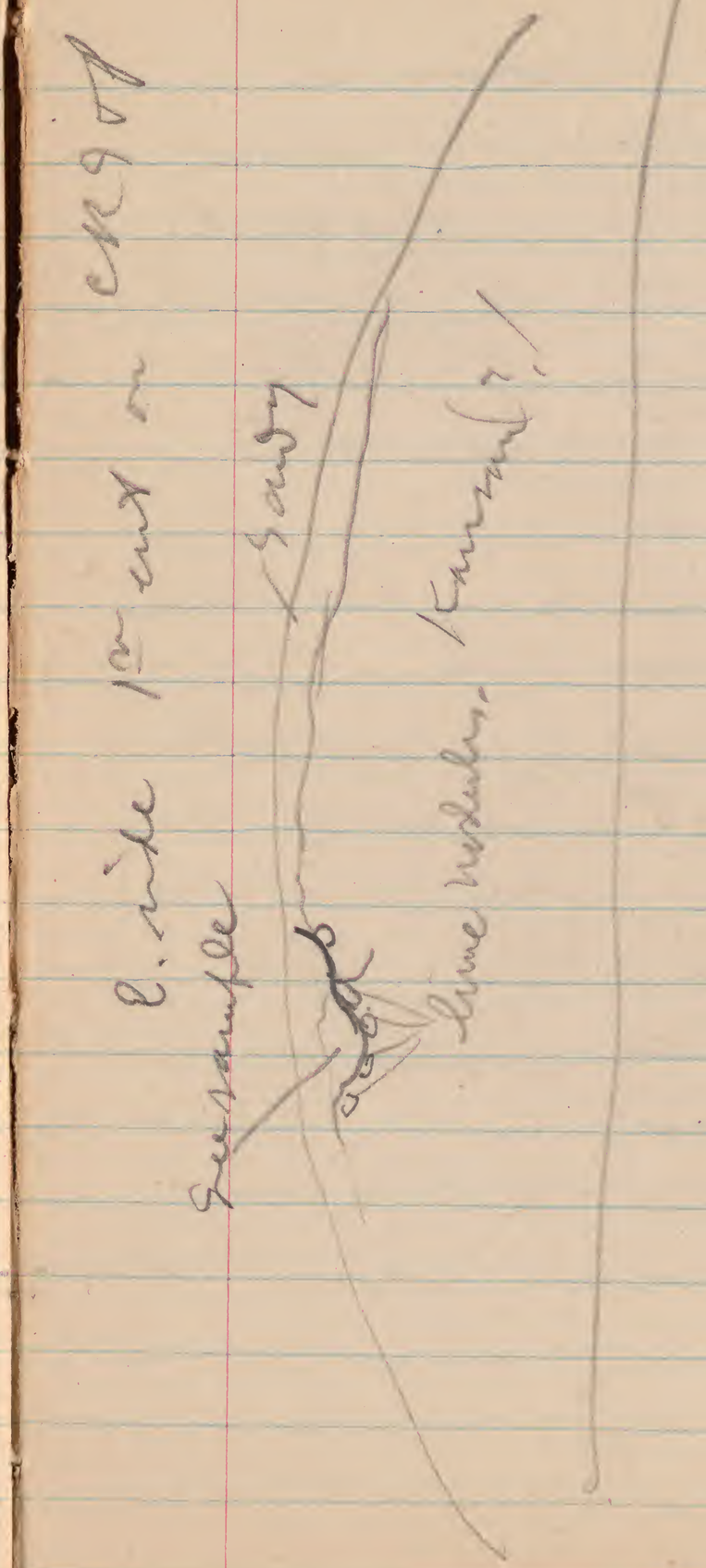


The terrace Q. extends north & my road cut just east of Ill. C. RR. is = 1195.
E. escarp (road) = 1235
N " " " = 1240
cut about 16 ft. deep
just W. of the anglum (deep cut) elevation is 1265. This is about general run of highest parts.

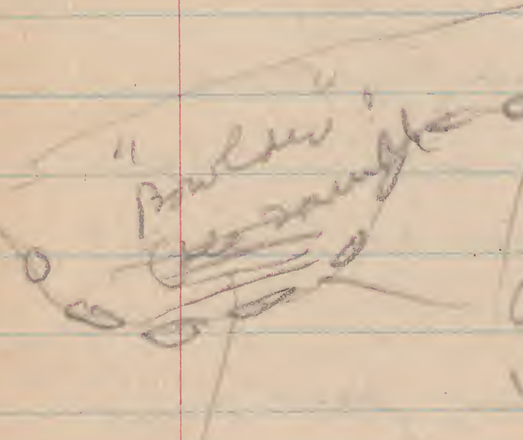
The first W. of W. Conn
Sec. 23 shows
2-4 ft of loose silty
stuff on top of the
second sand bank,
with 2-3 ft. very
rocky.
The loose stuff consists
of some boulders & occasional
pebbles, esp. in lower
part. (see sample)



The 1st cut out from Soo Falls on the C.R.I.&P. is about 25 ft. deep. Its walls 1-4 M. is sandy — more or less laminated. The greater part is Kansan(?) drift. Grindelia, much bluish stemless, clasped with ½ in., or partly, rarely some toothed, smaller, pubescent, dark. (See sample of drift) Upper part more calcareous

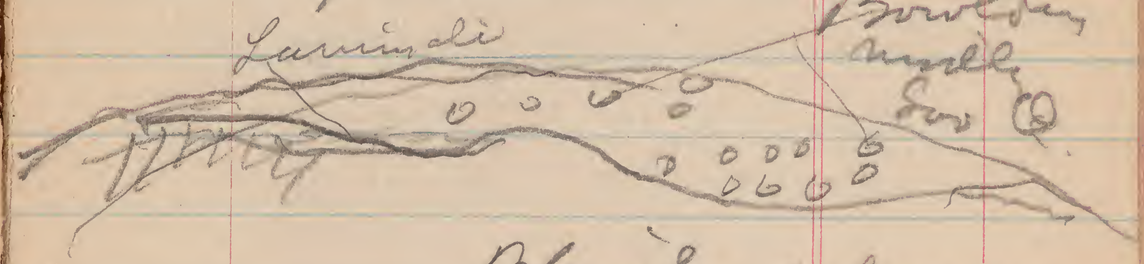


The "boulder" a mass at left is yellow may be later drift.



Laminated & more or less sandy.
(See sandbed)

2nd cut Calcareous C. M. & A.P. R.
Early in Wisconsin.



Black calcareous
Kame-like
Terrace sample
Its an hybrid

The lower part is
entirely sand & loam
The upper part = brown,
more or less laminated & blocky
crumbled mainly basaltic
Thoughts (making sand
& gravel)
There are 3-6 ft.
of the upper-
(Work complex).
This layer is laminated
calcareous - by water.

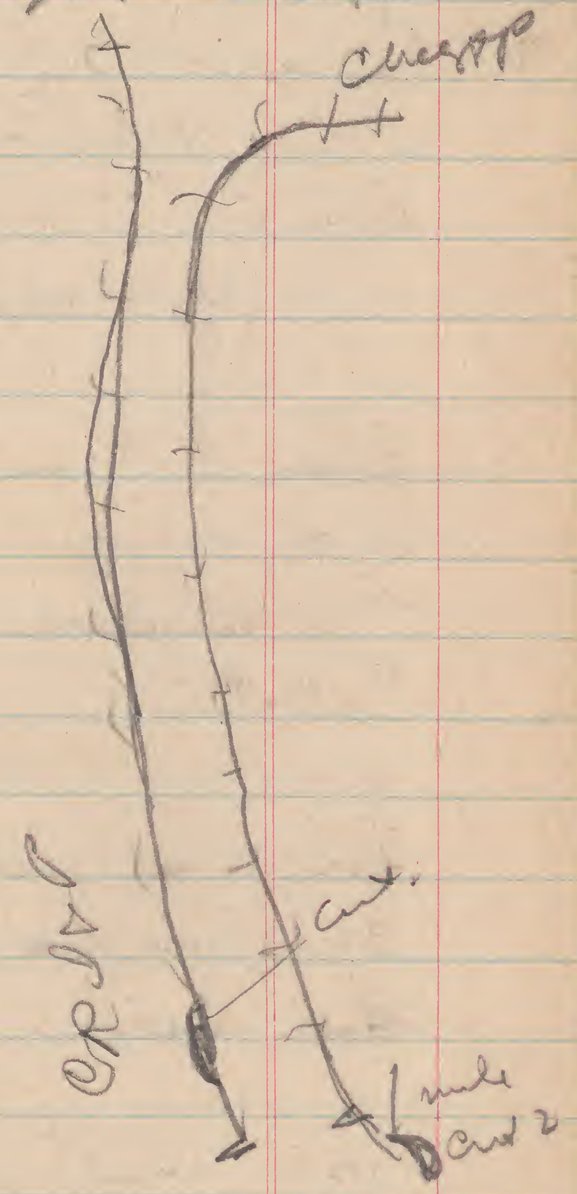
This cut runs
2% diff 2-4 ft -
up to Kansas - 12 ft to level of
CR 9 & P.
about 20 ft to level
of Cmstp-

This cut is just at 1/mile
to crossing Kansas on CR 9 & P.
& 1/mile crossing Kansas on
Cmstp.

The next cut extending
to & past way around on
big curve is over grown.

At 1 mile Kansas
CR 9 & P = 1240
Cmstp = 1232

Much too O. on all the
above slope lines.

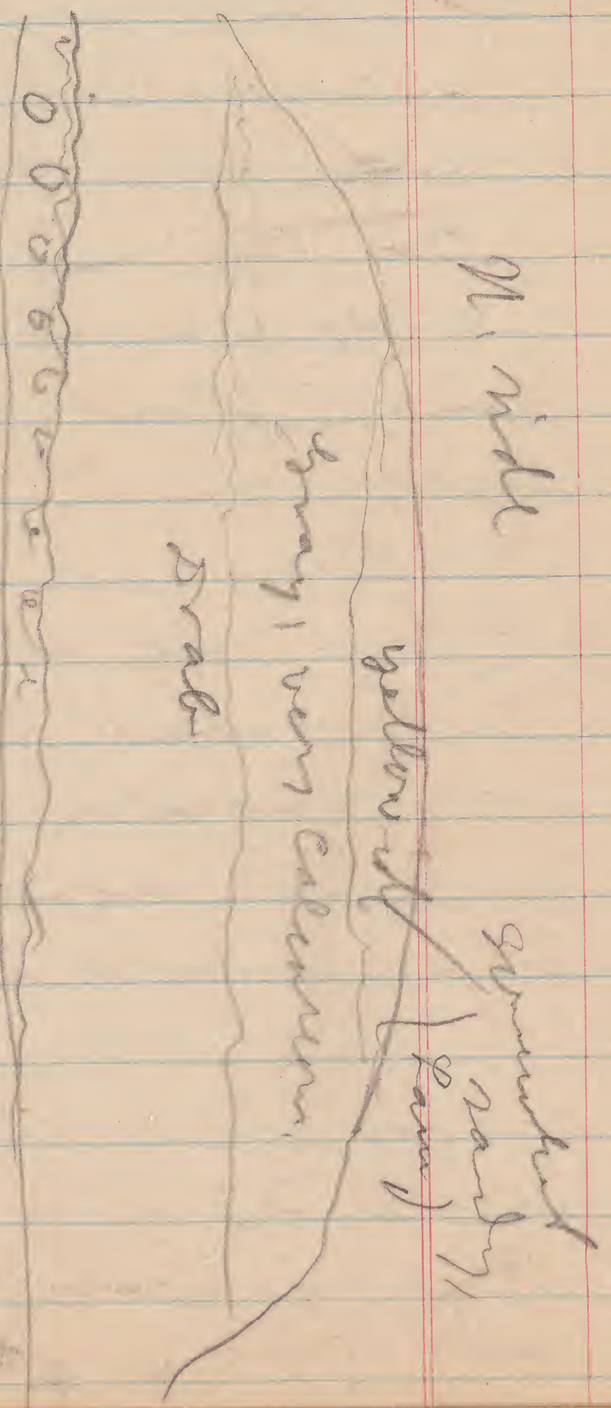


Read 1290 ¼ mi N.
road ½ mi N. of
Co. line between
sec. 35 & 36. Going S.
there elevations along
which I have been
working fade out just
at Co. line.
Then a great plain slopes
S & E.
The highest pt. W. of CM&St
P. RR (½ mi. +) = 1310.
This is highest point a
long ways around.
The surface soil on
this ridge is yellow &
sandy.
This high pt. is in sec. 34
at house on east side of
road one ½ mi N. of Co.
line strunk for Q. in
well at 20 ft

Cut 4 is on first knoll N. of
N 1/4 line sec 35 - 1049
1 ft shows many fossil Ls Corbulas
& one it lies a golden
reddish loess? about 2 ft.

Cut 5 on N. line of sec. 35
is on low ridge & shows
3 or 4 ft. of yellow reddish loess.

Went out along Rd. C.
RR.
Screw cut



At E end of 2nd cut on S. side near base in mixed sand & mud shells are most abundant. Found several very large Ammonites. They are quite common & when I could get out almost entire shell. They are very like A. cimbriki

What I call weathered Kansan is pebbly & very reddish gray. It lies above darker rock.

In cut 1/2 S. side just above rusty zone is a bed of (in places) very hard, jointy, blue

gray, pebbly & very calc. Marl which appears to be Kan. To the west (right) it frequently runs into softer gray calc. layers, just like that in cut (2), they are evidently same. (See sketch)

Way Nebraska in cut 1 is light, few pebbles, but crumbles in Mich. fashion. This is "rusty" in places & again gray.

Top on S. side shows yellow, loamy (sandy) stuff,

RR at cut 1 = 1290.
Pavement = 1215

The gravel terrace "islands" near cut 1 is about 50 ft. above river bottom

At cut 6 in sec. 2. down the river there are several rounded exposures Bottom land = 1210. Back of rocky ground 1270

Made excavation down slope. (See section on other side)

4-5 ft
Yellowish sandy Buff

3-4 ft Rusty gravel

Grayy till like
4 ft + that under gravel
in cut 1

Blue (dark)
till

Exposed 10 ft.

The lower dark part
is hard, pebbly, dark
blue - with brown
places where cracked.
It looks some like
Kansan, but very

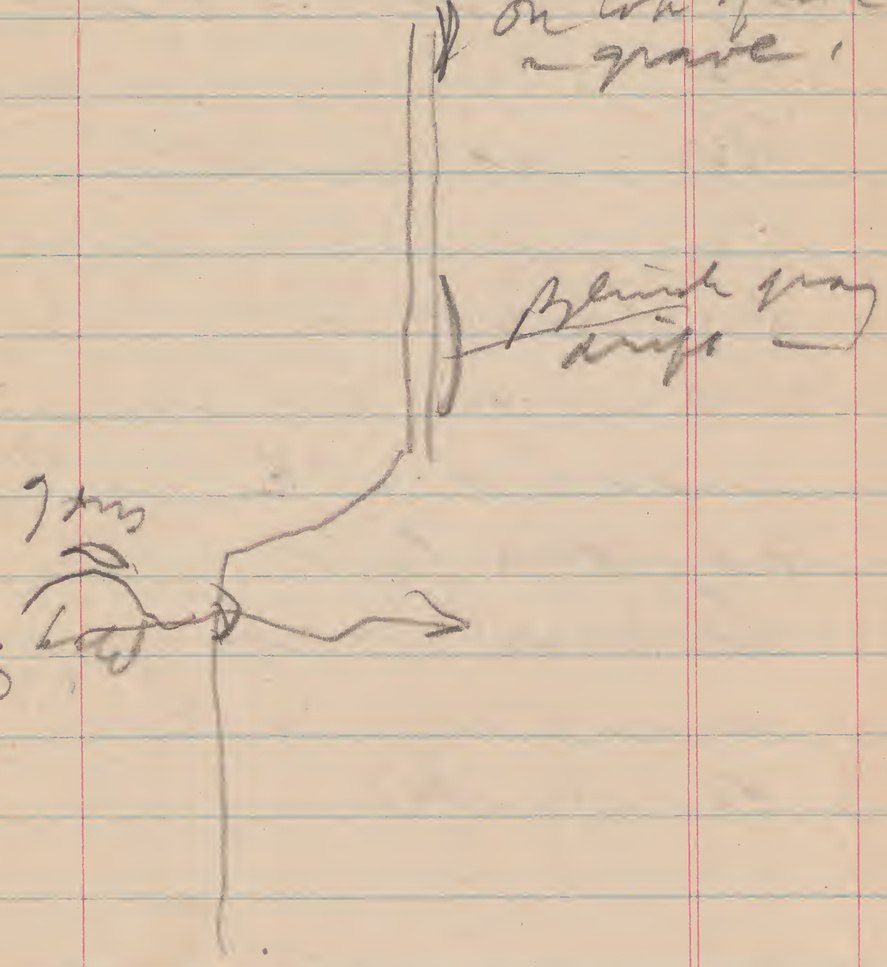
be Nebraskan.
Blue upper (4+ ft thick)
part is gray & rusty
like last just below
rusty gravel in cut 1
2d Cent. Pk.
On the gray till runs
3 or 4 ft of rusty gravel
& then 4-5 ft of
Yellow (yellowish) sandy
Loess.
Took samples of the till

In its usual pebbly, boulder
& jointed the lower till is
Nebraskan.
Its color is not much
darker than some Kansan
& fracture a little coarser
perhaps.

This agrees with cuts along Mt. Cent & creek which also show (some of them) darker till below,

The highest hills widely known as the Mts of sandy Plain N of Mt cent cuts - Looks as if noticeable wind throughout was due to this.

On road going N from bridge & E. of cut 6: on top of hill - gravel.



RR on S. side (Chicago
& Northwestern) = 1265
at about 1300 a
lot of gravel works
out.
The hill above is
covered with pebbles
& small boulders, -
a few larger.

At the head just
opposite 1 mi
crossing (mi. N. of Ewart
& Omaha RR) the
gravel runs to top
of hill = 1360

Top = 1390
Other hills N. rise
probably 40-50 ft. higher

For ½ mile back the
terrain is very
rough, but on the
ridges forming the
gravel runs to
near to top

Hill immediately N.
from 1265 to 1400
has veneer of pebbles
& boulders
Hill north is still
higher, - perhaps 20 ft
This very rough land
runs north to RR.
Across river country
does not seem quite
so rough. -
This is as high as
plain (or upland) S &
SW. but a little

high latitude timber
N.W.

Wind blew hard
strewn all the
S.W. hillside of bank
to the N.E.

These ridges seem to
be a mass of sand &
gravel & top (moss)

The valley extends
almost at right
from sand hills
on sides all
the way down

His great heap
may be moraine,—
but if so the
moraine must be
traced to S. Big
Bear.

Left for Canton
Wednesday morning.

Apr. 17 - Morning
drive South from Capitan
Town of ~~xxxx~~ (west of
S. again to cross
"morrain") the reading
is 1220' or plain!
Road going south cut (a)
runs up to 1350'
Overlooks from cut (a)
the "morraine" thin cut
& slopes are more grassed
But workmen the
territory seems to run up.

Cut a is a low cut
running up to 1350 DA
Shows a muddy till, with
rusty streaks, limey,
& some pebbles, ck.

cut b is a short distance
further S. at 1360 &
shows about 4 feet of
same till. Ck look
to me like western
Kansas.

cut c is a little further
(8 rods) south of (b) &
is much the same - 5-6'
This runs up to 1375
The highest point on this
row for one distance
is 3/4 mile S. in same region
~~the region~~ S. of cut c.
DA reads 1420 H.
Drift comes quite to
surface, & soil
overlies the morraine
shows out-crops.
Eastward it rises much
higher.

For a mile & one
S. there runs a plain
at about the same
level, which grades
down gradually to west,
but eastward, a mile &
so east, the plain
probably runs to the
forks of creek, for
beyond the hills rise
much higher quite
abruptly, - a gap
being made in them by
outlet of creek.

But the north elevation
runs into this on
which I am standing
at a point south
(the highest on this row)
and the north elevation
similarly runs into high
bank of incoming east &
west.
Cut d is in small knoll
between creek & tributary.
It is a low cut, .4-5 ft,
showing same calcareous
drift.
Cut e. Runs up to section
corner (SW. cor. 11-97-49).
The reading at the corner
= 1440, this being on
the rise to highest point
south.
The cut at N. end is
just at bridge, & on
S. side there is a
big natural cut, 10 ft
deep. It shows the
same rusty calcareous
drift, with numerous

line rounded, rather
few small pebbles, gray,
predominating, and
iron stainings. —
Where it is weathered
it shows bluish gray,
rich iron reddening,
but deeper in it is
chiefly somewhat sandy
or rather (coarse) yellow silt(?)
rusty clods & streaks.
This is the same
all the clay along
here.
On N side the cut along
road is clear, fresh, &
about 6 Ft deep from
bridge & then runs down
& upstream.
In this part (both sample

5 Ft. from top) the
outcrops material are fine
ye yellow & grayish-
Reddish, many gray &
dark, and scattered
among a few
boulders (1½-2½ Ft) those
in upper part, one Sec 8,
1 dark granite, another
dark, with veins of white
in it. Smaller ones
are also found, many
of them dark.
Occasional fine pebbles
are also scattered in
the matrix of adjacent
strata. Some of these
are dark - Notice no
Sec 8. boulders in matrix.
These boulders certainly
do not have a horizontal

80 12
56
14

They look quite Kansan.
This drift reminds me of
the New Mex rubber drift.
There are few small
Sw Q. boulders seen
in the exposures.
Out 9 is about 1/2 mile W.
of section corner.
At this about 6 ft
of same drift; but
rather more distinctly
bluish in mottlings &
streaks.
Out 9. is about 1/4 mile
west of 8. Shows about
6 ft on N. & 8 ft on
S side. A short
back out. Same as
before, with rather
more pronounced iron
stainings. Weathers grayish
& shows bluish gray
streaks & mottlings within.
The pebbles in 8. look
dk - many are dark,
some gray; almost
no trace of limestone.

While I makes here (a ½
a mile) the barometer
begins to make rapid
descent from 1480
to 1430.
Highest knoll along road
going S. is a little less
than ½ mile S. of
corner of sec. 11, & reads
1460. Southern in the
distance there seems to
be at least two other ridges
about (as nearly) as high.
Between the above is grassed

eastward also a
gradual rise, but probably
not more than 25 or 30 ft.
Turned east along S. side
Sec. 14. About 3/4 mi
east is the highest pt.
on the road, & near
the top of the earth for
this point (the hills near
rising only a few feet
higher.) Reads 1490.
Westward the country
looks much the same
high brown ridges, West &
S.W. The same gradual
slope downward
Eastward & S.E. It looks
from the high point
like typical rough
Kansan, with ridges
about on a level with the
general run of it.
The country S.E. & E &
N.E. is very broken
(along creek) & the general
aspect is that of a
rough Kansan area,
Top again, E. of Tuna
some big hollow, is
1450 ft.

creek is on the N. line
of Sec. 24,
It shows along rim.
depth 10 or more — slumps.
Shows blue loess with
very stony iron base, &
above that is a
yellower loess but
with blue streaks
(See samples.)

This is near Fort Kamas
small irregular calcareous
nodules are abundant
in upper part.

Cut i. The next cut on E side
of same ravine shows
unconformably the same clay

Cut j. Just over the ridge E—
only a few rods, another
ravine cuts in.
Cut j. as the cut in last
ridge, about 8 ft deep.
The upper bed is rusty
sandy, shows lamination
& is mottled with clay.
The lower is separated
by a distinct ferruginous
layer, has numerous
concretions, & is typical
Fort Kamas.

N. 1 mile cut k

Sandy yellowish gray

Blue clay 6 ft

Fort Kamas (one mile)

Yellowish gray sandy clay

Blue clay 6 ft

Fort Kamas (one mile)

The lower blue clay
contains numerous
concretions. Fossil fragments
in upper layers.

Cut R is on E. side of same ravine. Ditch appears in road in lower part. At top about 2 ft. deep — all the yellowy soft tuffs, here with few pumice rounded nodules. Better exposure on S. side R. side only 5 ft.

(At the corner, where road turns around ravine, a lot of loose Qt. boulders were piled up.

Just a little below top the rock has changed, with ferruginous band above, appears — pumice lapilli down — stumpy barley.

9. mile.

Cut R.

yellowish brown
2 ft.

pumice lens - pinches out 3-4 ft.

Bridge

Pleistocene

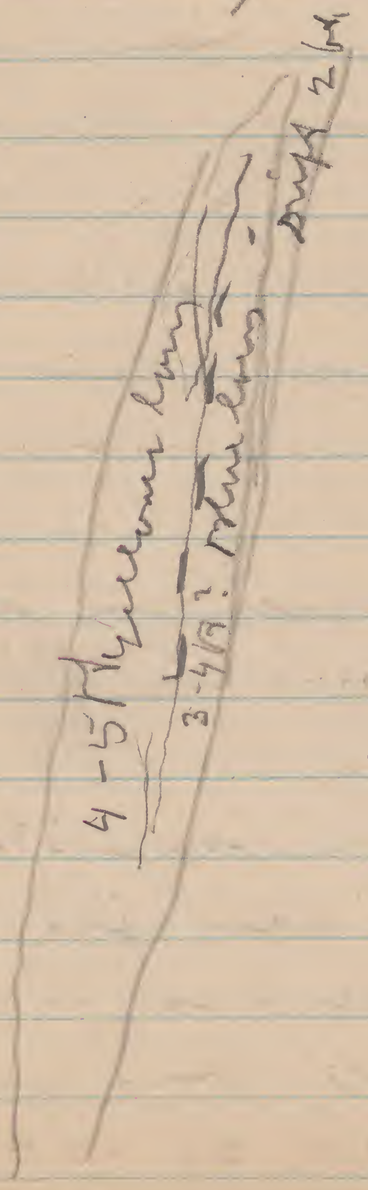
9-10 ft.

The cliff is very coherent like that on ravine from which I took boulder furnishing [illegible] ravine from [illegible] boulders + pebbles on [illegible] Third on [illegible] gray, &c.

One gravelly Sec Q.
boulder appears in
lower part near foot
of slope, but Sec Q.
is not much in evidence,
Lacey caps hills eastward
everywhere, but it
cannot be thick as
boulders (Kansan!) are
sparsely scattered over
all the slopes up to
within a few feet
of the top,
High point across a
20 a. west of Schoolhouse
= 1460 ± This is
about genuine level
E + SE.

North of town at schoolhouse,
on N. side of ridge which
begins to rise at corner, ½
less than ½ mi. north, in a
cut along road which is
cut L. - At base this
clay (i.e. on lower slope)
is drift, yellow again,
but white mottled
looking just like drift
(weathered) or "moraine"
Small boulders, pebbles, very
gray, are frequent. But
Sec Q. is absent.
The drift is not only
in upper part. Below
is is also yellowish, but
surely same as drift
or "moraine".
The beds are hardly
shumpies, but they are

clearly above drift
first a blue one with tubes
then the yellow, with
nodules.
The existing low is present-
down in flow.



cut w (S. of Kennedy's Camp)
a little cut just N,
across cricklet (or ravine)
shows drift (it is low)
& this drift is clearly
the yellow, blue streaks
calcareous drift of
the N & S road across
"moraine". (Tooth sample)

The pebbles scattered on
surface are gray, etc.
just like "moraine"
Mostly.
Loess appears in several
places northerly to turn
in road.
In going down the big
hill I saw first the
yellower loess, then blue
loess with large ice lobes
+ finally at 1440 drift

appearance. This is
again the same muddy,
yellowish, calcareous
till with rare blue
streaks, Pebbles
again same as
weathers surface.
It is gray when wetter,
has iron streaks, & in
every way is identical
with that on W. side of
ravine.

(Cable) see this drift
down to level of 1345 feet
then the ravine turns on a
~~bare knoll~~, level always
to cattleway & then drops.
The drift above the
pilot bed in the
cattleway cut is
the same yellowish
till, in all particulars.
The base of the drift
reads 1330.

At saw pit in front
of bluff the
drift runs down
to 1350, - 60 of sand

Drift also extends
headlands to Crow
Rocks, blueberry hill
sidehill.

Above the saw the
drift is in the 20ft
(non calcareous) bluish
(more so than in last)
calcareous, in every
way typical modern
gray Kansan. The

Pebbles on the eyfans
surfaces have the
same gray appearance
& have lost much blue
those in hills N &
S of Ten Falls.
The beds have a
northward inclination
or inwarting, which
suggests that it
came largely from
the Kansan
Ter. O. is rare, or at
least not common.

The bottom of the Cimarron
valley as which road runs
is 1270
This drops then to river
bottom, at little bridge,
which reads 1225

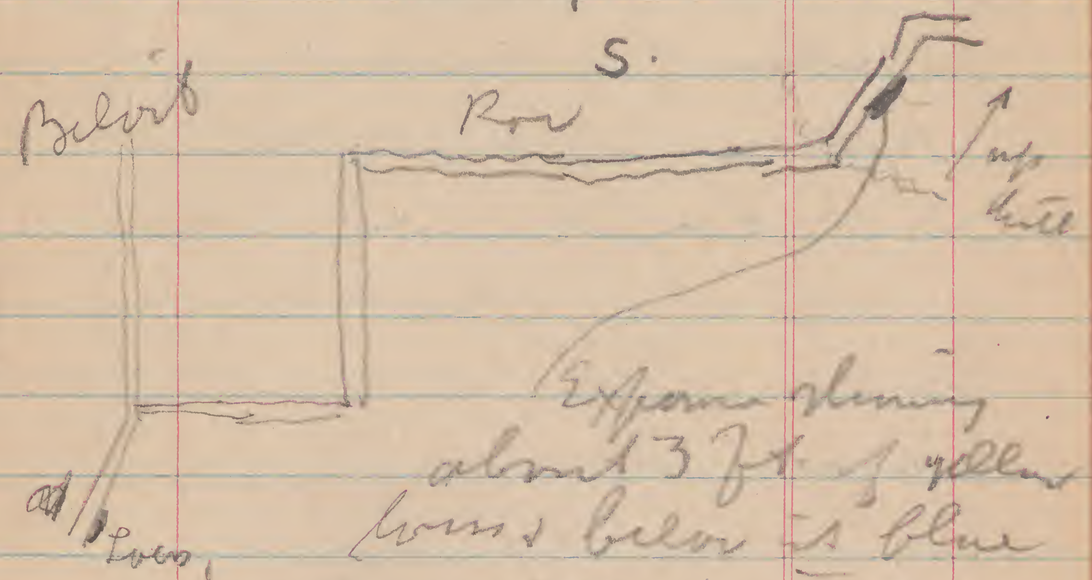
The last Jewel or
bottom rem 12/15.

The long Kansan cut
ion bend of road, as indic
to Kansan bench, rises
to 1330 ft. Exp. 10-15 ft deep
Parts are yellow & like
the yellower till on
W. side of mesa.
Parts have more blue.
The pebbles on surface
& the weathered parts
look exactly as
on W. part of mesa.
A few boulders
appear here & on
the nearby mesas,
& they are same
as ever.
All Kansan!

the 1330 level is
that of Kanosa beach,
dark boulders fringe
on this beach.
The ground level of
this beach runs at
1290 to shore-line,
beyond which it drops
to 1260.

Returned after 2 PM
& received telegram
announcing Prof
Calvin's death!
Too late for train!

Drove E. of Beloit to
hills north N.



Gathers Amarillo
Indian, Kansan,
great number of
Illinois fossils,
Felix discoidea, Helix
Texana,

There is a good road
along below (to right)
of creek (up the creek
which you go to
Encino). There
are below, Kansan
drift above & +
probably Afton
cave sheet.

In row E of Indian Asylum
(on row N of asylum)
there is a little cut
showing calcium
layer with gray
pebbles, etc.
This is on plain

along the road
east of Canton Insane
asylum (N row)
There are round
little exposures of
loamy drift, etc.
like we saw to Kansan

Top of knoll with
stand pipe on
Canton = 1395
plain east = 1350
Level of RR = 1305

N. B. Ivorson
Ivanhoe, Iowa.
Owner of farm.

(Mr. Herbert has not received this Co. report.)

Prof. J. H. Carman's
letter to Lee—

Thinks new drift in
Cherokee co. Post Kansan
N. of Cherokee
Along Little Sioux valley
Kansan frequently above
+ thin upper drift
sets on Nebraskan, which
is common to somewhere
in N. E. Cherokee co.
There are sandbeds
between the two drifts,
or the newer rests on
Nebraskan.
New drift difficult
to describe — from Kansan
It is slightly different
in color, but both show
great range; somewhere
different style N

breaking; a more
sandy clay; and
irregularly mixed with
many masses and
seams of sand.

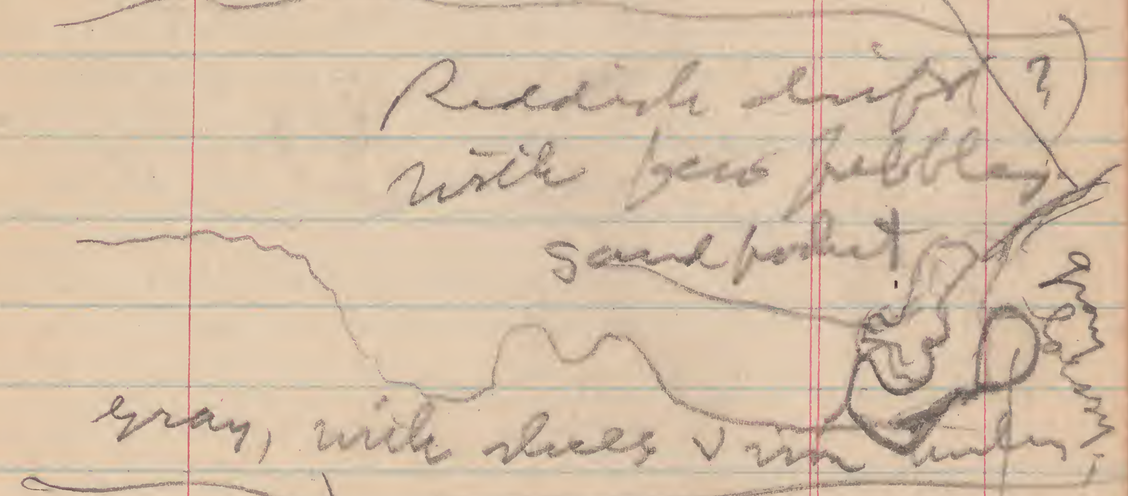
He walked from Buck
Grove to Arion,
about 1½ mi. W. of
Buck Grove in creek
just S. of RR. bridge
is black clay - Nebraskan?
It is overlain by a
boulder bed & then by
silts, some fossils -
and then sand &
bench 10 - 50 ft. above
black clay
Farther down the
valley (Sec. 6 - Washington
Twp.) is a

30 foot exposure of
sand and gravel containing
small shells and overlain
by fossiliferous loess.
As I understood Shimek
he called the sand just
S. E. of Denison Aftonian
because it contains
shells.
N. of Boyer village
I found fossiliferous
silts & sands and these
rested on what I
called Kansan drift.
He says I (B.S.) ~~thought~~
called ~~Aftonian~~
Belvidere beds
Aftonian & says
he cannot separate
Aftonian with certainty

Kansan ice.
He says he is skeptical about my claim along Big Sioux. That gravels rest on Wisconsin drift prove it, if nothing above.

Des Moines, Ia.
May 13, 1914
Went to C. N. Rawson's tile factory.
The section here shows upon reddish yellow clay with few small boulders & one pebble. Wisconsin.
There are about 4-6 ft of this.
Below this is a gray, partially pointed layer, quite hard, with pond snails in it. 5-12 ft
The lower part shows horizontal stripes or bands, = water.
Below this is a rusty hard pebbly drift. 5-7 ft.
(See samples.

Visited excavation for steam lines E. of High School, In block in center



Looking S

Looks like firm if rather dark.

5-12 P.M. Rain (heavy?) finer,

5-7 P.M.

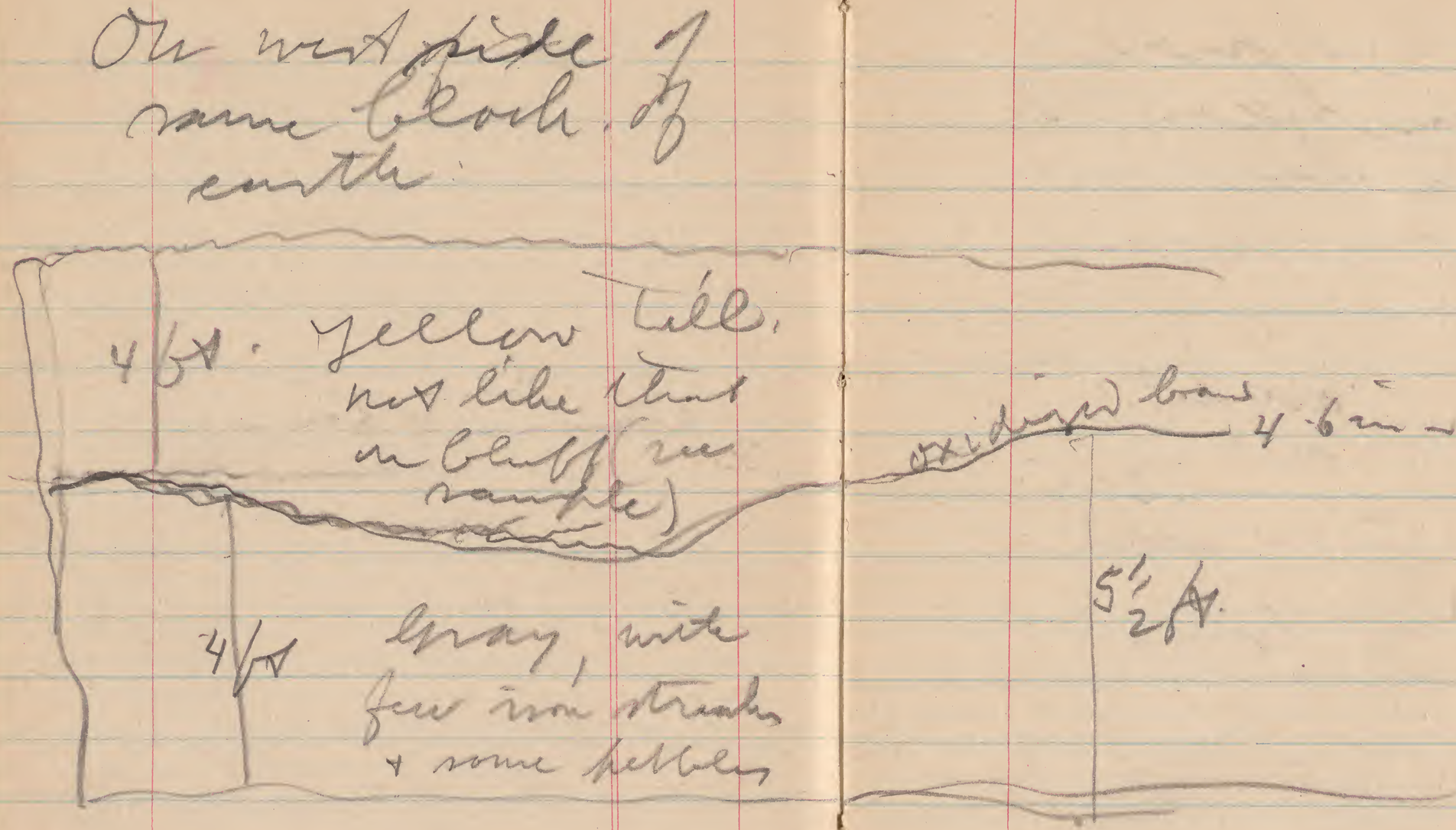
Rain almost over

5-11 P.M. Rain

Sample

9 beans counted
Same counted
Two beans

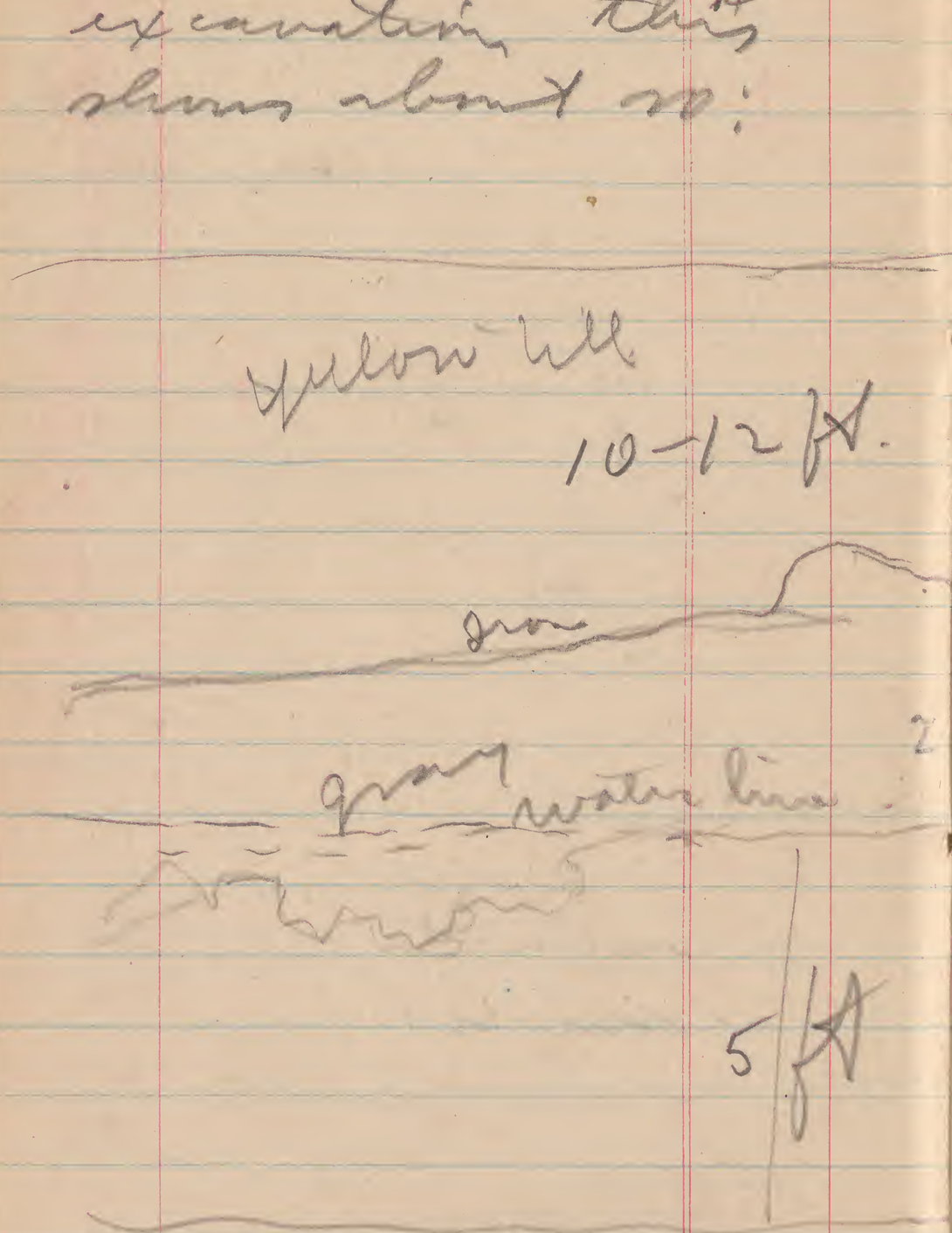
The grey bank is
to be a bluish gray
Mottled by brown

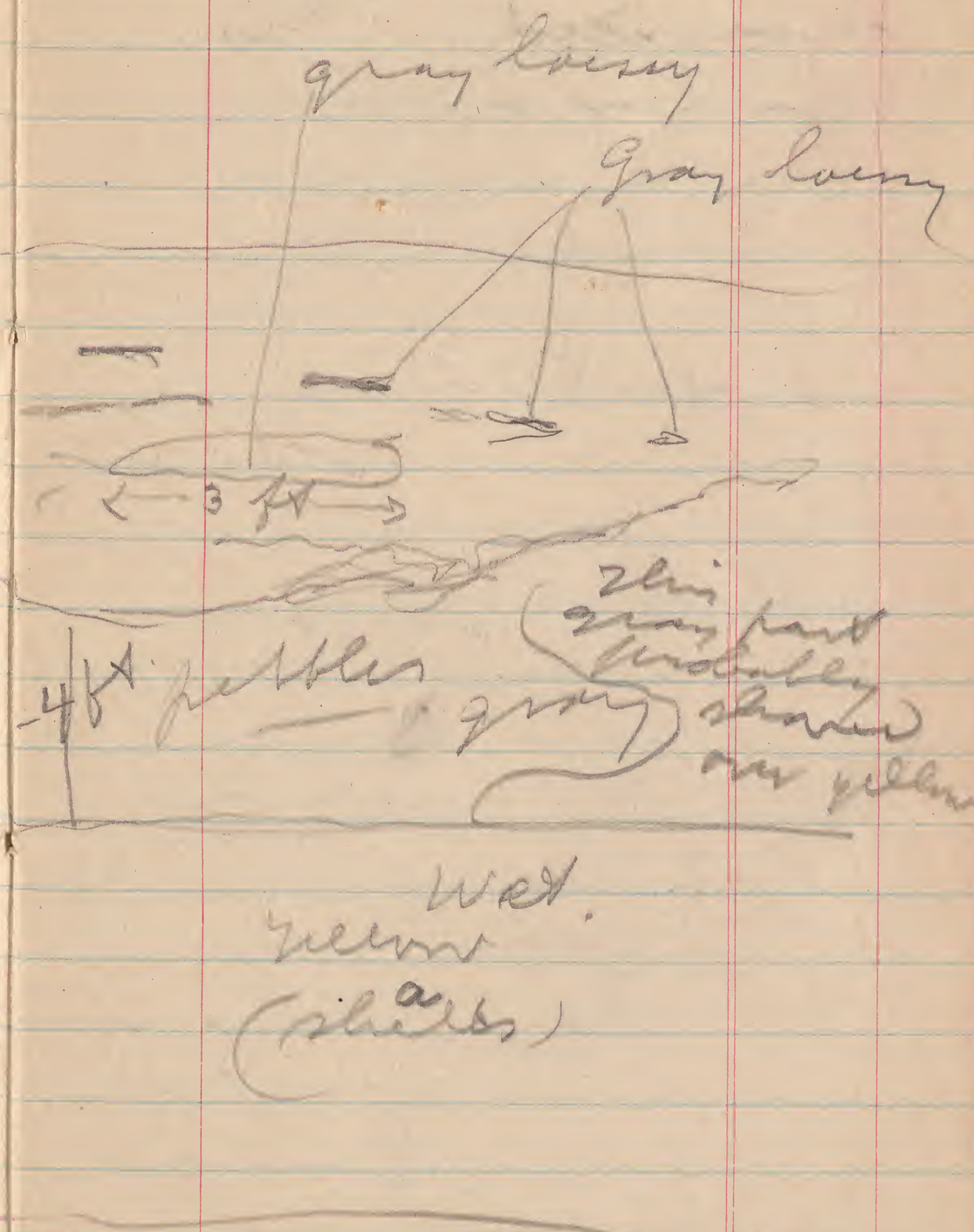


The upper till here is in its lower part, and less mixed with gray, in veins, and it is true. This is, evidently a case by Wisconsin ice, and brown, carries some of the

everywhere in the excavation, for several feet, more or which scattered pebbles that shells and fossils. volume the bones were flowed being at least in part shells entire.

On W. side of excavation this shows about so:





Found tree roots running down through drift deep into yellow beds. Total depth of cut = 17 ft, says workman.

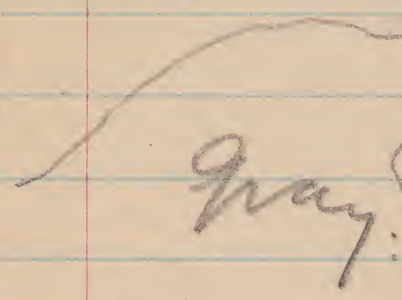
The upper yellow till has pebbles (few) scattered through it. The gray part has pebbles & iron tubes (many large) also some lime nodules. Some of the pebbles in gray part are worn limestone also other pebbles.—

The lower yellow part has no pebbles but contains nodules & a few shells. Took samples at points marked a [illegible] in this cut.

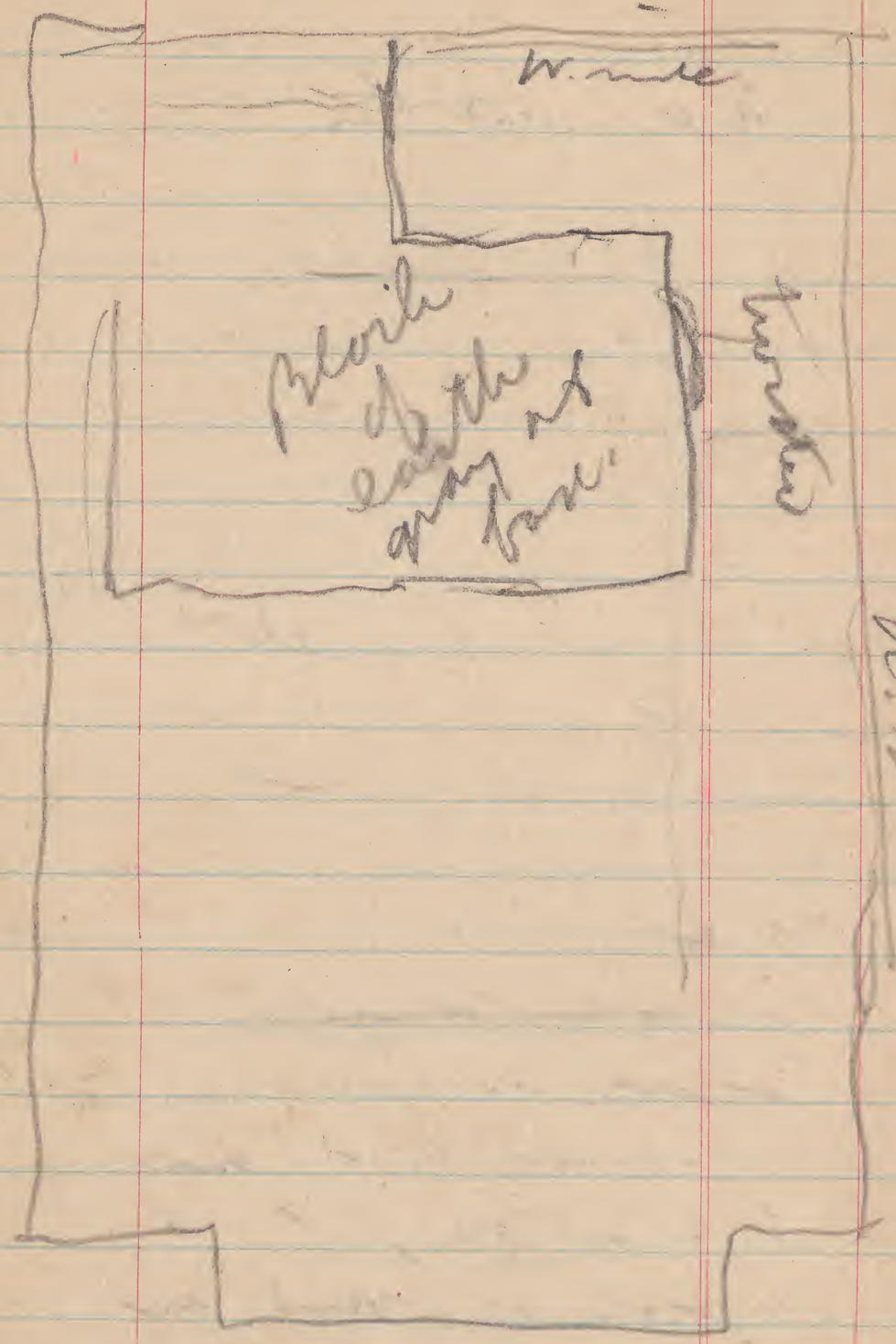
The upper red drift has few pebbles (see sample) but is not same in texture as at Tile works. It is more or less mixed with streaks, knots & mixes of gray, especially on it. Tile & shells are most abundant in red till. The west side shows a mixing of the gray & red till & streaks & knots of form bedding in latter. It may be one deposit, or the

gray has been
below by thaw.

On N. side (Ft. Travis
in block) there
is also folding.

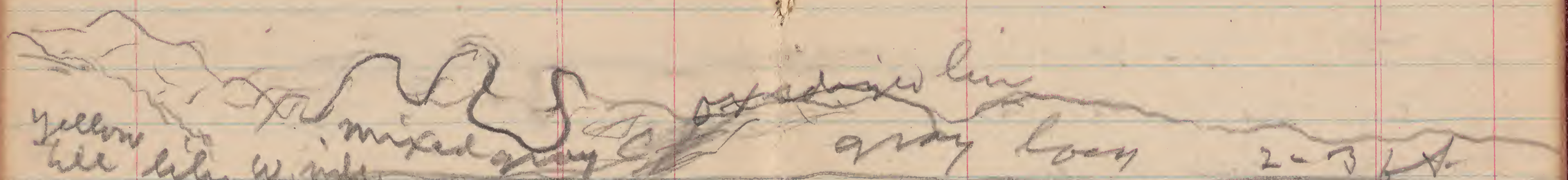


In front there seem
to be much of
this folding especially
in W. half of N. side.
In the yellow beds on
W. side I found a
dark shale band.
(See specimen)



along the N. side
the cut looks as:

yellow silt



along W. part the loess & silt blend & mix in part, but east of middle the silt is above & gray loess (no samples) is below. The snail tubes are common & fossils occur. Lime nodules are few. In the gray loess in E. half I saw no sign of pebbles or coarse sand grains. It is a fine loess (Post-Kansan).

The shells in
dead Tulle on N.
side are practically
wholly (wholly as
far as I can see)
in Covert 4-6 ft.
of the tide.
The gray dots is
separated from
still above by
an ondine bed,
distinct and dark
buff.
At Center
washes the
blue lower drop
down (also greater
elevation - 3 ft)
& is mixed stuff
to west.

Apr. 13 1911

	Fare & Cab to R.		.50
	" " Commercial Cars		3.69.
	Supper @ Rapids		.30
Apr. 14	Waverly Hotel Breakfast Orchestra		.50
	Brushes		.10
	Fare to Spencer		48.
	RR to Nielsons		26
	City Rest. " Drive		25
	Livery R. C. McCutcheon		1.50
	RR to Spirit Lake		14
	RR to Sibley		.68
	Windsor Hotel Supper Sibley,		.50
Apr. 15	RR to New Ulm		2.87
	Breakfast Mankato		.25
	Dinner Grand Hotel New Ulm		.50
	RR to St James		.53
	RR to Sioux Falls		2.59
Apr. 16	Hotel (Breakfast room)		1.00
	Fortune Livery		2.00
	Supper Boston Cafe		.35

	Breakfast - Morton Cafe	25
	Hotel Dacotah	
	Dinner room	1.00
	RR. to Canton	.62
Apr 17	RR to Hawarden	.67
	Living	3.00
	Hotel - Rudolph Brothers	.50
Apr 18	RR fare to Fern	1.76
	Breakfast + dinner Park	
	House, Omaha	1.00
	RR. to Mahaska	16+76.
	~~Jones~~	
	Supper Queen Hotel	.50
	RR. to Cedar Rapids	4.96

RR to Invalid - .50

Des Moines, May 13, 1911

	RR. to Des Moines	2.41
	Elliott Hotel - breakfast	.30
	dinner 45, supper 45	.90
May 14	Room 1.00 - breakfast	1.
	RR to Iowa City	2.41.

2176