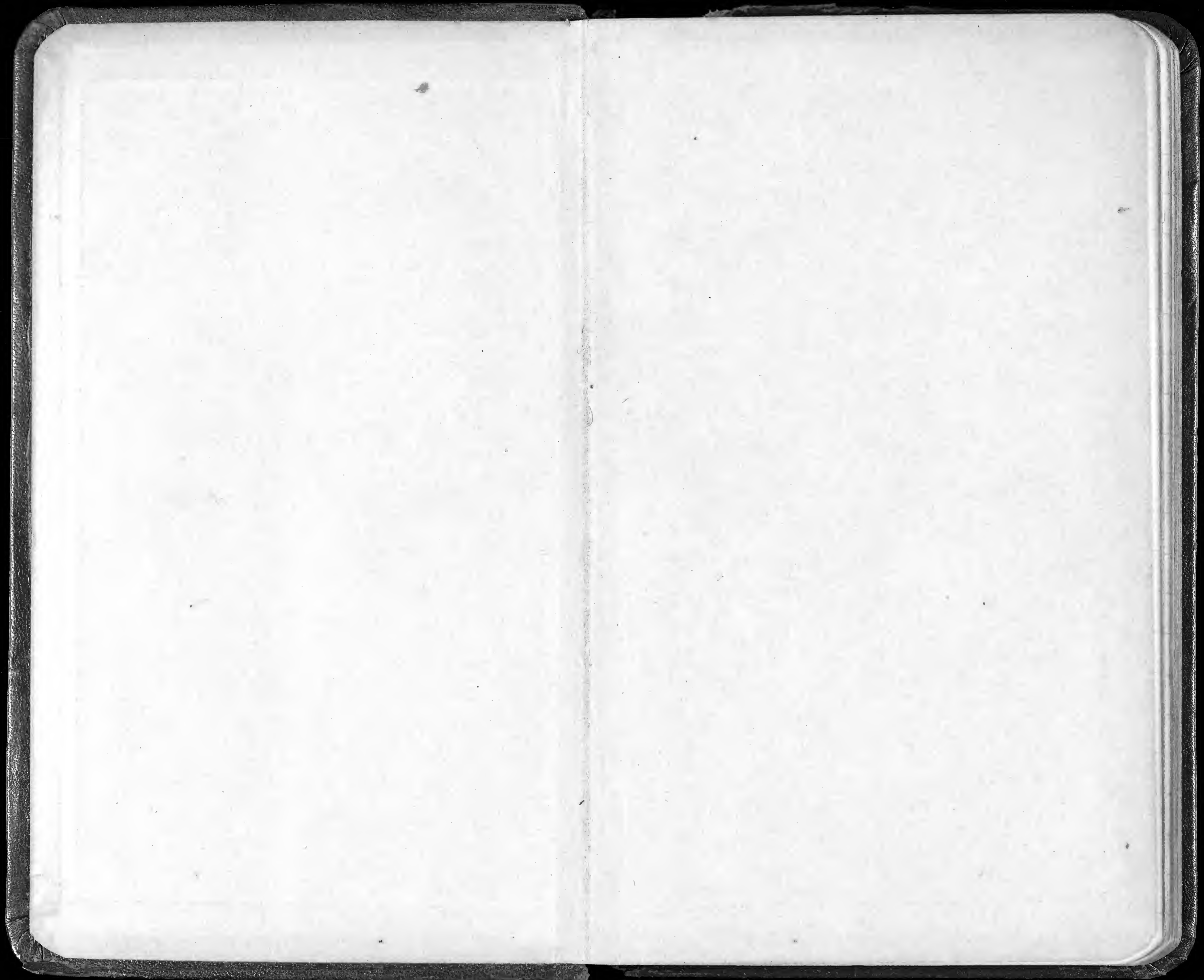


Okoboji 1911  
New Ulm Minn. 1911  
Sioux Falls, "  
Lyon co.  
Garman's letter  
Des Moines, 1911





Apr. 13-1911

Collected *Aspidogyne* subscriptions  
at Cedar Rapids

Apr. 14-1911

Left at 12.01 for  
Emmettsburg. Stopped at  
Waverly Hotel for  
breakfast.

Left for Spencerville at 8<sup>30</sup>  
& at 9<sup>45</sup> am. for  
Wilford.

Work team at McCutcheon's  
& drove NW. — as far  
as Lab.

Found *Aspidogyne* patches  
in flower on all the  
higher places. Also  
*Ulmus fulvus* americana.  
On return examined  
cuts.

sec. 2-98-37

near the corner  
of sec. 2, <sup>no. of the farm</sup>  
there is a road  
cut 6 ft deep  
during 2000  
ft. of gravel  
rather than  
gravel

It joins the horizon  
rather irregularly  
(blending) &  
does not have  
aspect of gravel  
like Aftonian  
The horizon  
quite clayey  
yellow (or slightly  
grayish)

(2000 sample from cut on  
N. side of road west of this)

The pit east of deposit  
(east of hollow)  
at the farm shows:

3 ft more or less

sandy silt 12 ft +

Sand & gravel

The upper part is very  
soft unlike the  
upper mixed gravel  
above Otse,

The uppermost layer has  
more silt than usually  
(dark) in it.

The silt is laminated

High ground

High

N

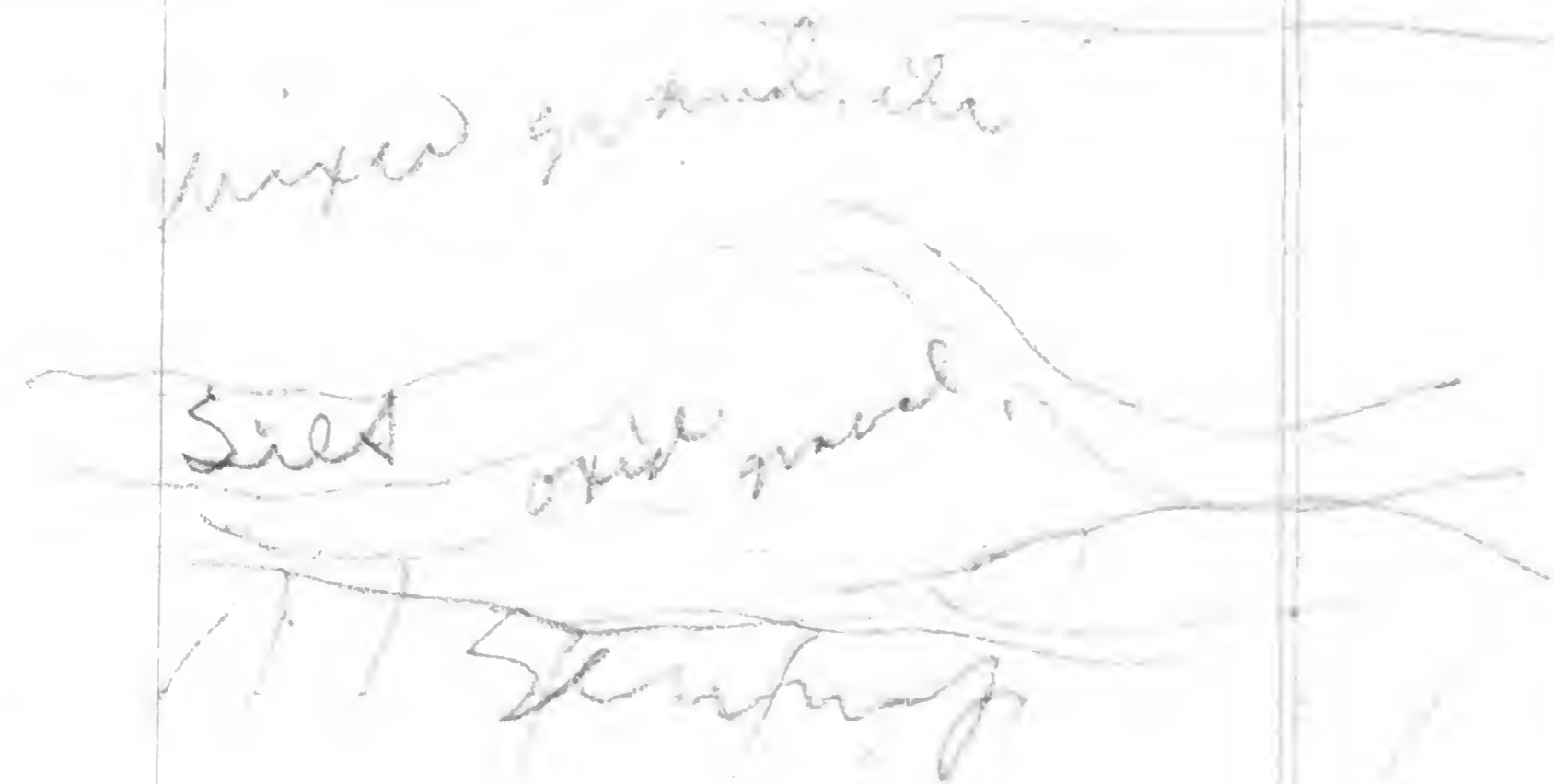
Near SW cor. of  
sec, 31-99-37  
There is cut about  
5 ft. in Wisconsin  
See sample.

This is slightly  
grayish till.  
It is all quite  
soft. Dry in.

Left Milford at  
3:35 PM went  
to Spirit Lake.

Went to Spirit Lake &  
walked N. to where road  
goes down a little slope.  
Here, on W. side road, is a  
gravel pit.  
Some oxidized gravel, with  
rotten dark granite  
boulders.  
Mixed with some silt.  
To the east, Wisconsin  
drift

W. side



This is near where the road first  
crosses to Lake (E. of Spirit)

Left Spring Lake  
for Tully at  
6 P.M.

Stopped at Windsor  
(Winger is prop. name)  
hotel for supper.  
Left for Manbato at  
12:45 am.

Apr. 15, 1911 (Saturday)

Left at 12:45 am. and  
reached Manbato at 4:30 am.  
Took breakfast & left  
at 5:30 for Newham.

at Manbato are great  
ledges of rock -  
quarries more or less.  
The range of hills <sup>(bluffs)</sup>  
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 on the  
Manbato (E.) side of  
the valley are also  
timbered.  
The bluffs at  
Manbato etc. show to  
drift apparently to  
top (of exposure).  
The bluffs along here  
are really S. & W.  
The timber on E. bluffs  
(faces) is more scant  
or wanting.

The E. bluffs are decidedly more bare below Maubach.

They also seem to be lower & less rugged.

The boulder-strewn plain continues down the river (N.) to Kasota.

Elevation at Kasota 500 ft

Bridge 480

at St. Peter 475

gradually ascended to plain 580

The low hills rise

still higher,

as we enter low bluffs

610

Top of 2<sup>nd</sup> plain 650

4 660

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

Rock comes to surface of plain at Kasota (It also shows toward Maubach)

After gradually rising from St. Peter we came upon a higher plain. Drift covers the surface in thin (with soil)

thin rounded low

bluffs & hills rise on west side of it -

probably 30-40 ft

as we entered their elevation = 610 ft

Drift shows to  
surface in cuts.  
We ascended to top  
of plain (= top of  
bluffs) at 650 ft  
660 ft  
Drift comes to  
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.  
Much wet, ditched  
land up here west  
of Oshawa.  
Large swamps - typical  
vegetation —  
at Woodcut 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  
mudflats on this  
plain.



Swells more frequent  
W. of lake.

Rhr here 665

It sets rough  
toward valley, &  
we begin to drop

rapidly, and  
courtland is = 595 ft.

This is again on  
a plain in river valley.

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

The lower plain  
is higher above  
river than at  
Mambata, & is  
more or less

cut up by erosion,  
showing drift &  
layers of gravel  
(quartz) are  
prominent.

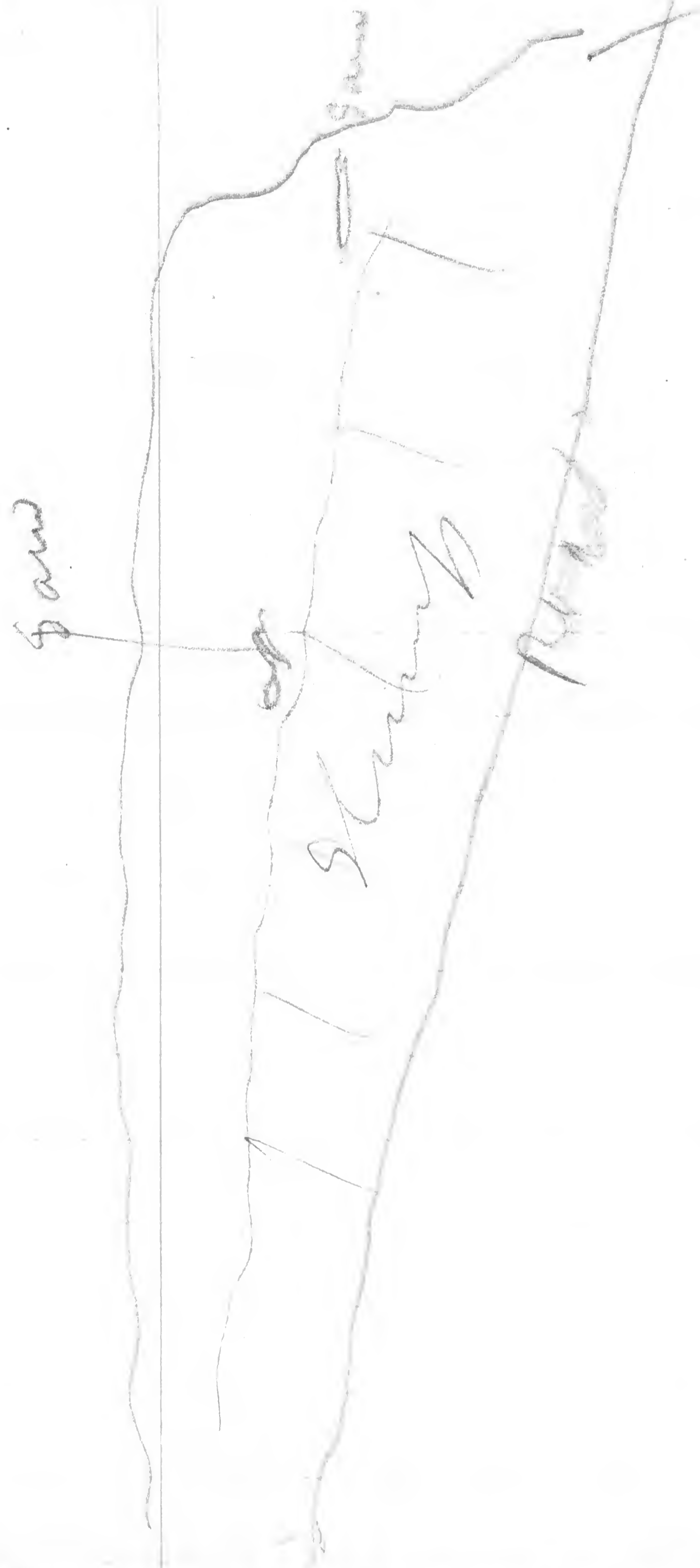
Dropped to 485  
at bridge. (Not  
as high above river  
as at Kasota)

Dropped on flat  
to 425, only  
15 or 20 ft. above  
river.

R.R. at Newblen = 590

Went west along  
 Center street.  
 Below the stands on  
 a sort 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 one which  
 separates the plain  
 of New York from  
 the hills. The road  
 leads up to top (with  
 big cut) to water  
 reservoir.  
 It is a sort of  
 park with great  
 statue of Schiller?  
 on a sort of 'pagoda'

The great cut is about  
 40 ft deep.



The upper till, running  
to top, is yellow, more  
or less laminated or  
bedded with a few  
large boulders & some  
smaller ones, whitish  
(calcareous?) horizontal  
streaks or thin layers.

(See sample)

There are ~~some~~  
streaks of sand as  
if pushed up.  
The base of upper till  
just at E. end, above  
sand layer, is at 650 ft.

This upper till is not  
Kansan. It is too  
yellow, though has a  
course pointed like  
Kansan. Also with  
some (a few) dark stones

pebbles.

The sand is coarse &  
course, - like the  
sand.

The till is quite calcareous  
at this end - buff color  
& effluence.

At E. end at base are  
big slabs of gravel  
conglomerate, but  
whether at that  
level (just above  
road) or thumped  
from above is not  
clear.

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

which is here lower &  
thin, makes slabs on  
the side nearly  
same. The S. side  
extends down hill  
rather.

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

It is barely 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 texture,  
mucky, & not dark  
enough.

compromised  
peach

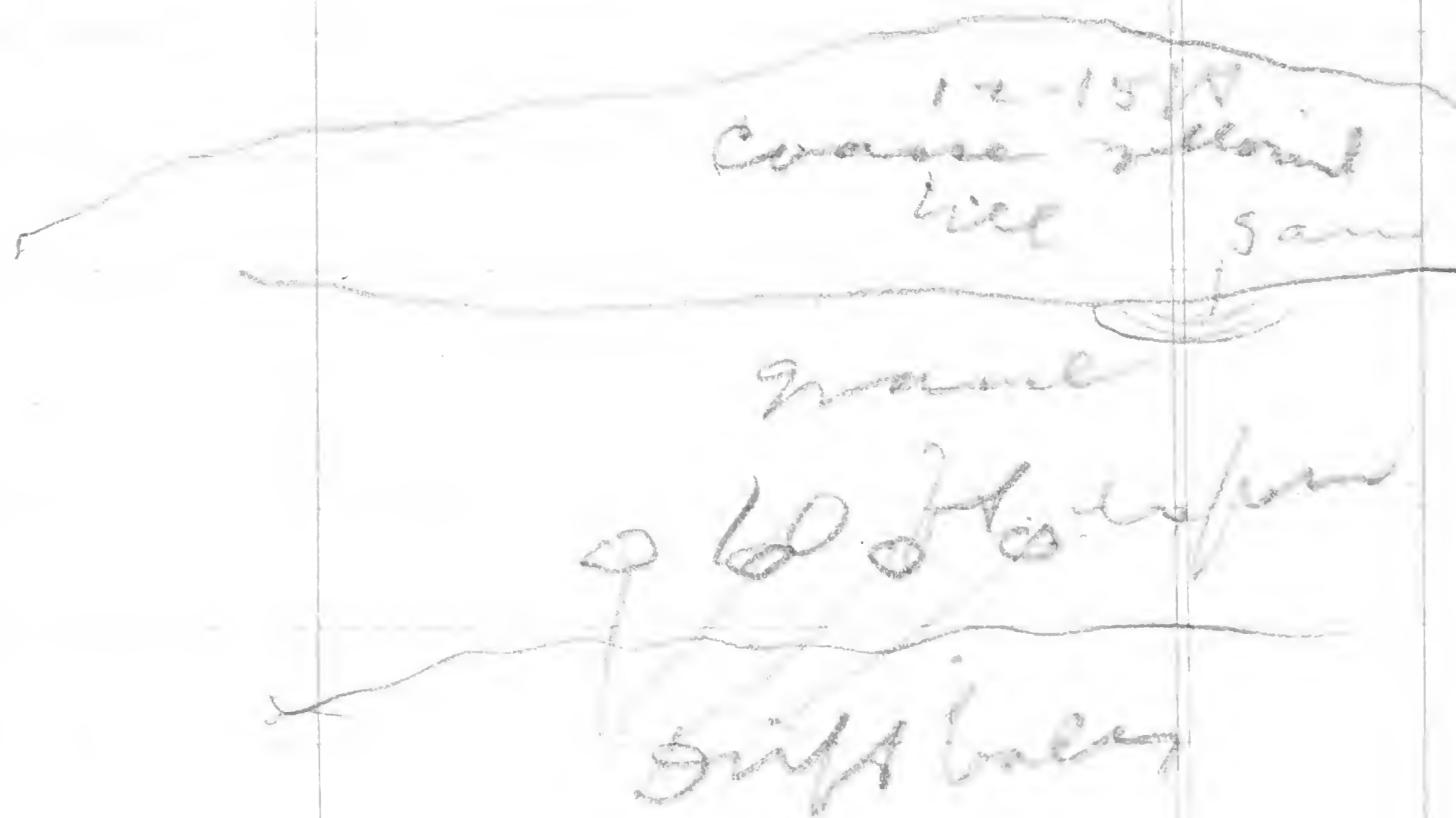
yellow till

blunped,

ferrous  
sand 174

Dark till

On extension of 5<sup>th</sup> North St.  
street (n. of center)  
there are three gravel  
cuts (gravel pits)  
2 on N side & 1 on S  
The 1<sup>st</sup> pit W. on N-  
side =



The gravel contains  
boulders + a pocket  
of sand. It does not  
look quite like mine.

regularly exposed.

See photos 29 & 30

✓ 2/22.

The upper line of  
sand is horizontal,  
sharp, with thin  
plate of conglomerate.  
Also found drift ball,  
(see sample)

Two samples of  
drift 7 ft  
above road.

The till has a bluish  
watering (see sample)  
but is yellow  
underneath.  
It is very hard  
above the road.

Dark boulders, some  
water, are found  
in upper till.  
Could not expose lower  
bed.

This till is like upper  
till on center str.

a layer of large  
trifid clasts extends  
along about 7.8/A  
below top line.

The 2<sup>nd</sup> cut on the side (E)  
(N. exposure) is  
badly slumped. It  
shows better drift.  
There is a lot of  
cross-bedded sand  
here - below.

The cut on  
 S. side shows  
 12-15 ft of drift  
 (looks much above  
 mostly yellow, coarse  
 jointed, very  
 calcareous above &  
 certainly looking like  
 very SW. Kansan.  
 The upper half the  
 lower is yellow &  
 less calcareous.  
 The sand & gravel is  
 here more iron like  
 more like C. of Kansan,  
 18 ft exposed, &  
 then slump.

Gravel - (H. sp. / 1000000)

calcareous blanda

yellow

same as gravel

downy

Took sample of "bill" (see piece)

Cut S. side

Top of hill 655  
Top of gravelly 625  
Bottom of gravel (cut) 605  
Road 590  
Lowest place in road E. 560  
New blue terrace 585

W

S. Pit

Street

2  
Hospita  
St. Andrews

All my <sup>a</sup> ~~notes~~ are of west prolongation  
of 5th North St.

above Boston

Exp. shows show that New blue bench is sandy & gravelly

Pit 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. enter hills  
 Elevations - bridge 590?  
 top of plain 680  
 Scarples (675-685) 670  
 Hardscrabble 685  
 La Salle 695  
 St. James 730.

It is very windy &  
 clouds of dust off  
 the fields fill the  
 air.  
 This upland plain  
 is nearly flat, only  
 very gently rising.  
 The few cuts  
 show drift to surface.  
 In a few places  
 lower beds are

on the surface  
 there are also low  
 wet places.  
 Run as high as  
 705 ft. later  
 710 ft.

Left St. James at 2:00 pm  
 Elevation of station  
 (evidently barometer changed)  
 = 775  
 Butterfield 850 bar. (rising)  
 Mountain Lake 905-  
 Bingham Lake 1045-  
 Windom 1025. } 2 maybe  
 Wilder }  
 Mason Lake 1085 }  
 Milwau 1095 }  
 Brewster  
 Worthington - 1235

The prairie to  
 Butterfield is of the  
 same high flat  
 type, with occasional  
 bays and sometimes  
 somewhat rolling.  
 Rarely boulders  
 appear on surface.  
 Beyond Burman  
 Lake the prairie  
 is more rolling.  
 It is more rolling  
 all along to the  
 right of the track.  
 Beyond Huron Lake  
 again flatter,  
 and remains so  
 to Waltham, where  
 I changed cars for  
 Lion Falls.

Left Waltham at 4:27 PM  
 (instead of 4:00)

4	Waltham	1235
4:25	Rushmore	1315
4:40	Adrian	1205
4:52	Magnolia	1185
5:03	Warner	—
5:10	Luverne	1115
5:25	Beaver Creek, M.	1105
5:37	Valley Springs, S.D.	1055
5:50	Brandon (alt. above sea = 1333)	995
6:10	Lion Falls " " " = 1397	1030

(bridge crossing river = 970  
 about 15 ft above water)

Occasionally, as beyond  
 Rushmore, a little  
 rolling.  
 Again rolling beyond  
 Adrian. This part  
 is the most rolling of  
 all I've seen today.

except river bluffs  
& later becomes  
flatter again, - it  
is after all only a  
slight break in  
great plain.

A Magnolia  
again slightly rolling,  
some distance out,  
on right hand, I  
can see big rock  
(ledge) of Snow Qute.  
It rises as a rounded  
elevation with  
rocky, ragged edges.  
This is the big  
ledge above Laverne  
near Laverne  
roughly & very  
loose like stuff  
appears in cuts.

The shallow river valley  
is gouged out of  
plain, & my cuts<sup>(see)</sup>  
are near its edge.  
West of Laverne  
flatter towards south  
but higher (continuation  
of E. side) with  
top of plain in  
1190'. It continues  
quite rolling  
continues quite rolling  
to Beaver Creek.  
The station is below  
general plain, 1105 ft.  
elevation  
Falcon's valley north  
to Valley Springs -  
below general plain  
More or less rolling  
all along.

Drops down in a  
sort of valley to  
990(?) on bridge  
over ~~Big~~ creek  
(not high)

West of river again  
rolling, like  
terrace east of  
Sims Falls.  
all the hills  
S. & E. of Sims  
Falls are part  
of that general  
series of rolling  
ridges, & they  
do not rise  
very prominently  
above the plain -  
or not at all.

Bridge across Big  
Sims is 970. &  
along its narrow  
valley valley walls  
this is about 15 ft  
above bottoms.  
From Brandon (near)  
the RR runs on  
a broad terrace  
with bluff heights.  
This runs 1020 ft  
beyond river end  
where RR crosses  
and close together.  
The RR then follows  
valley down (or  
rather up) to Sims  
Falls.

Apr. 16-1911

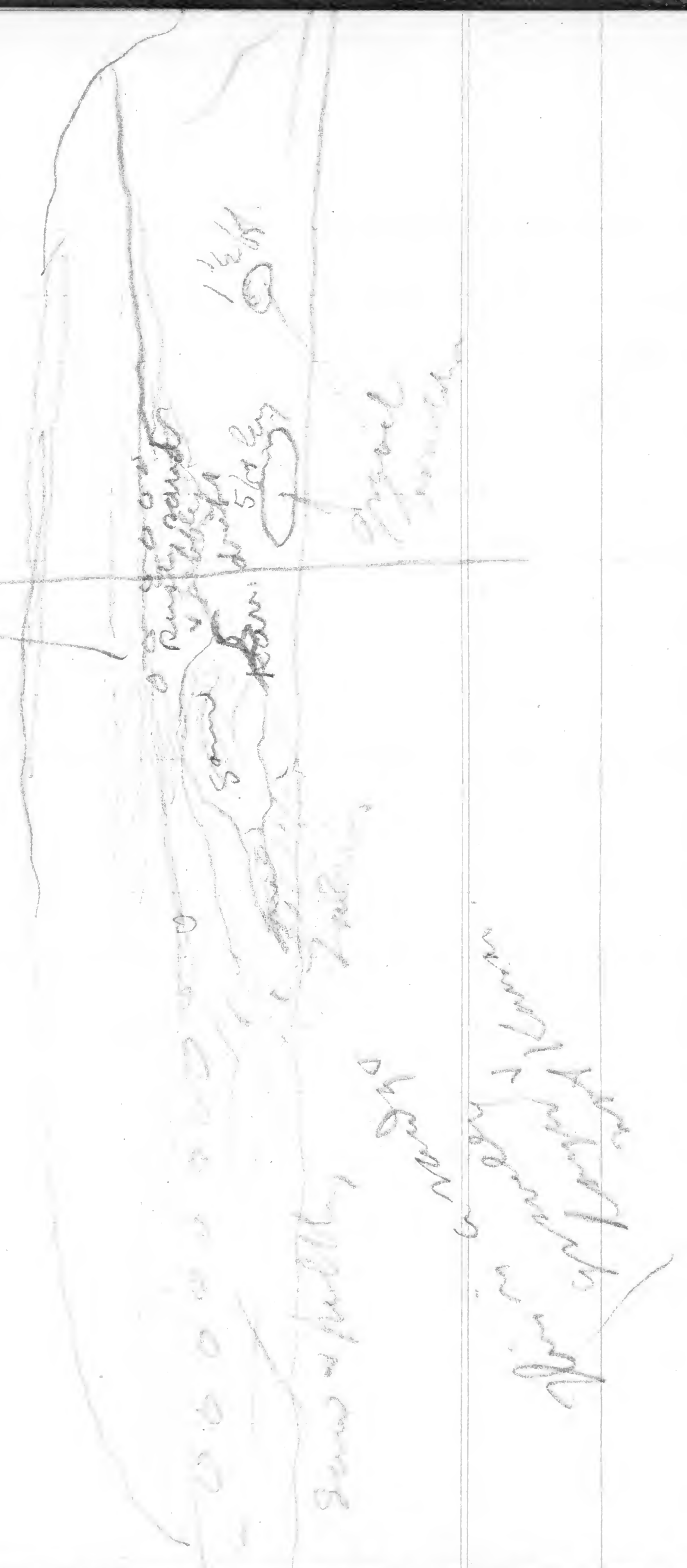
Drove out to road cut  
east of Ill. Cent RR.  
On S. side the stuff  
above gravel boulder is  
much of it black & gray  
(see sample from <sup>lower</sup> part)

It is iron streaked &  
has numerous rather  
soft calcareous plates  
& nodules, especially  
above.

A few boulders are  
scattered through this  
part. Iron streaks &  
clayings abundant  
Much of the drift here  
is black gray

N. side

Kapoor sand



Sands & pebbles

Mudstone

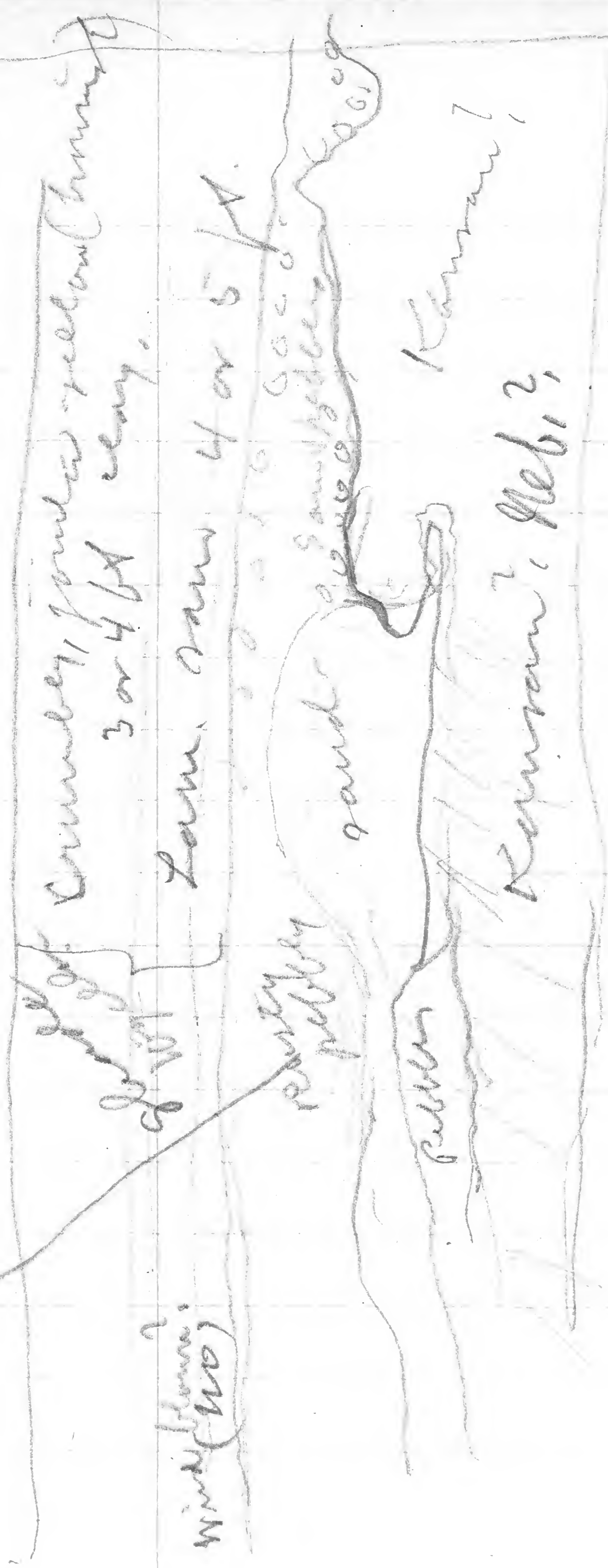
Thin pebbly layer

Rising sands

5 or 6 ft

Gravel trench

Windy (no)



Crumble, sand & pebbles (thin)  
3 or 4 ft clay

Lamin. sand 4 or 5 ft

pebbly sand

Kannan?

Kannan? Heb.?

N. side

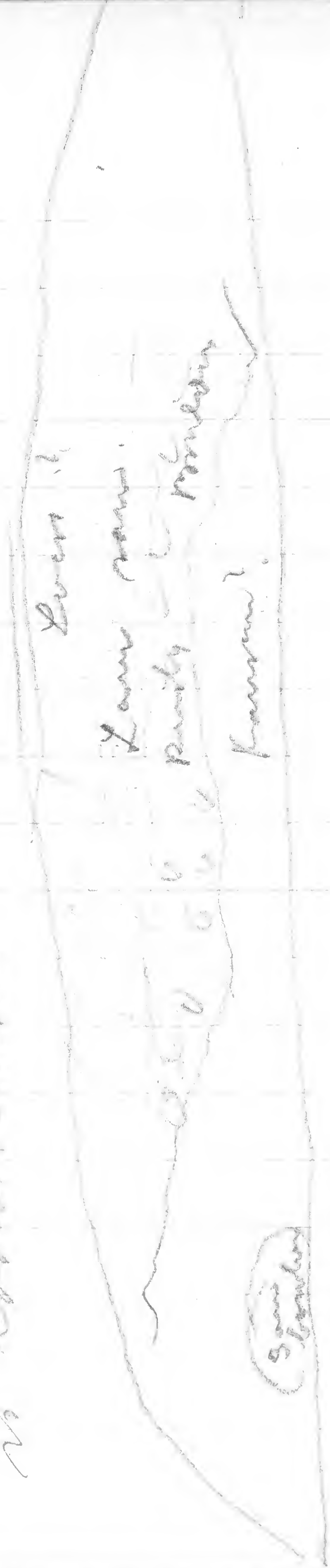
The upper part is  
 probably water  
 laid. There are  
 streaks of small  
 (very small) pebbles  
 but it seems to me  
 not coarser than  
 coarser streaks  
 from Chicago dunes.  
 There are pebbles in the  
 lowest part. It is  
 probable that at  
 least lower part was  
 water laid & may be

S. side:

The drift on both sides - is very low, but  
 it looks Canadian.

Lower it  
 Lane road  
 Parity  
 Pansum?

(S. side)



Asylum?

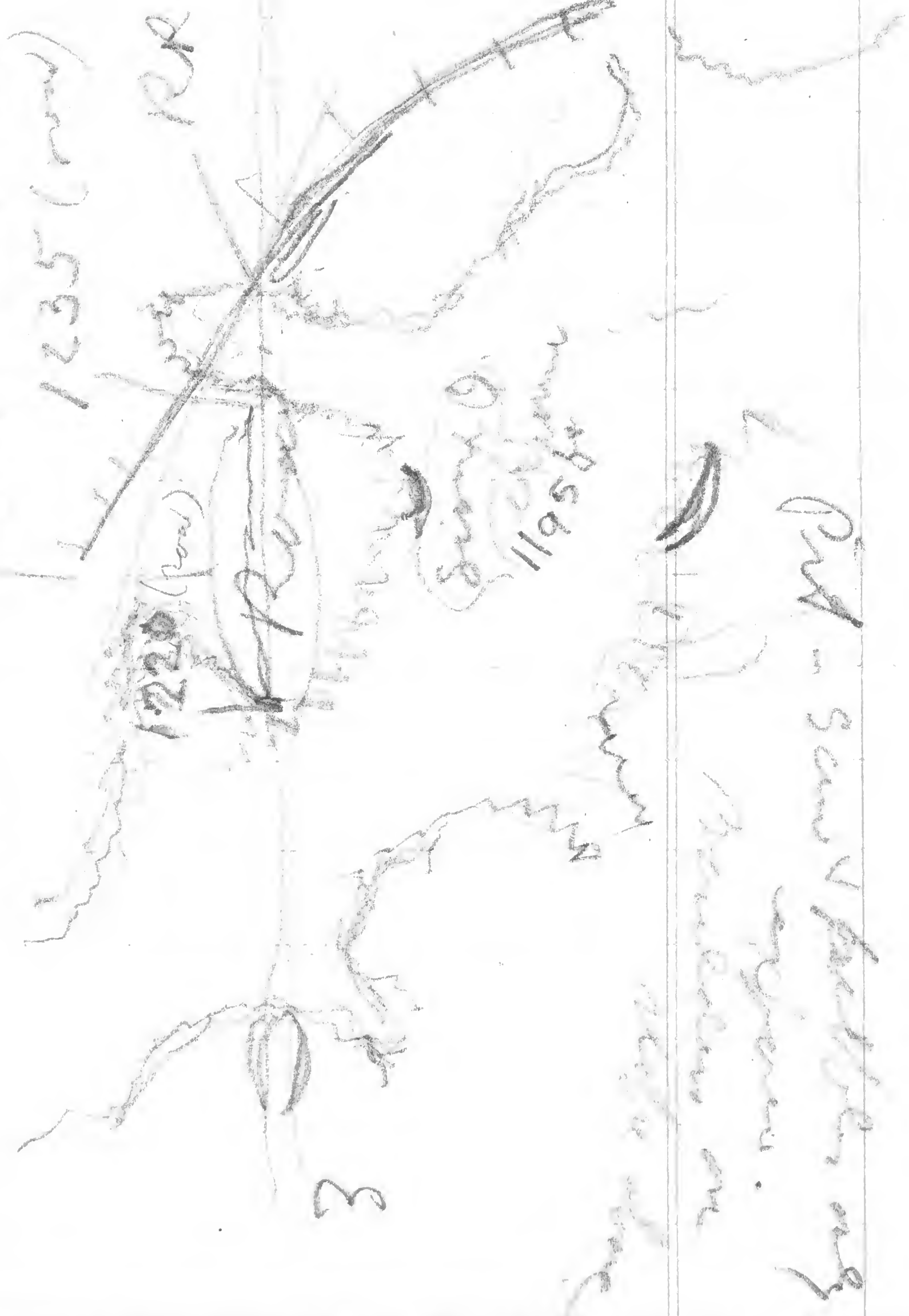
cut about 18 ft deep

1235 (row)

RR = 1245

about 1245

about 1265



W.

The Texas Q. exposure north of my road cut just east of Ill. C. RR. is = 1195.

E. road cut (row) = 1235

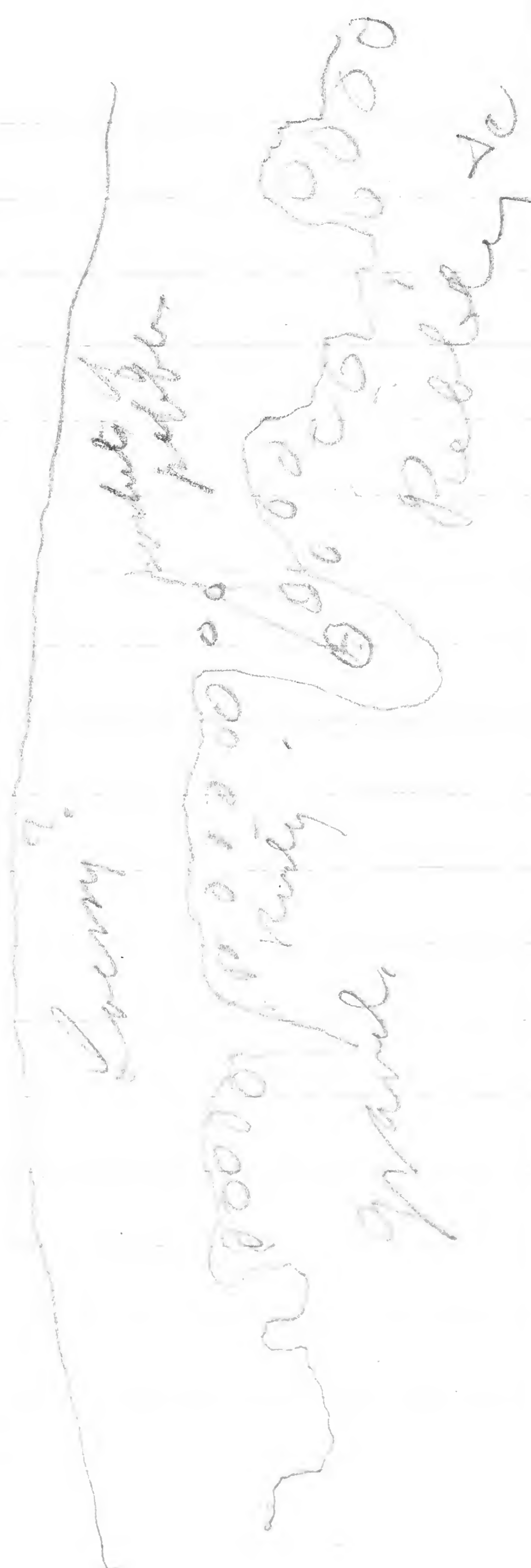
W. " " " = 1240

cut about 18 ft. deep. Just W. of the ~~cut~~ <sup>cut</sup> ~~cut~~ elevation is 1265. This is about general sum of highest parts.



The part W. of W. line  
 sec. 23 shows  
 2-4 ft of loess like  
 stuff on top & then  
 several feet of gravel,  
 upper 2-3 ft very  
 sandy.

The lower stuff has  
 fine sand & occasional  
 pebbles, esp. in lower  
 part (see sample)



This upper part is not loam,

The 1<sup>st</sup> cut out  
from Sod Falls in the  
CRD & P. is about  
25 ft deep.  
Its upper 1-4 ft. is  
sandy - more or less  
laminated.

The greater part is  
Kansan(?) drift.  
Fine clay, much bluish,  
stratified & clouded with  
iron, or parts with  
some small pebbles, some  
dark.

(See sample of drift  
at top part of excavation)

CR 907

1<sup>st</sup> cut in site

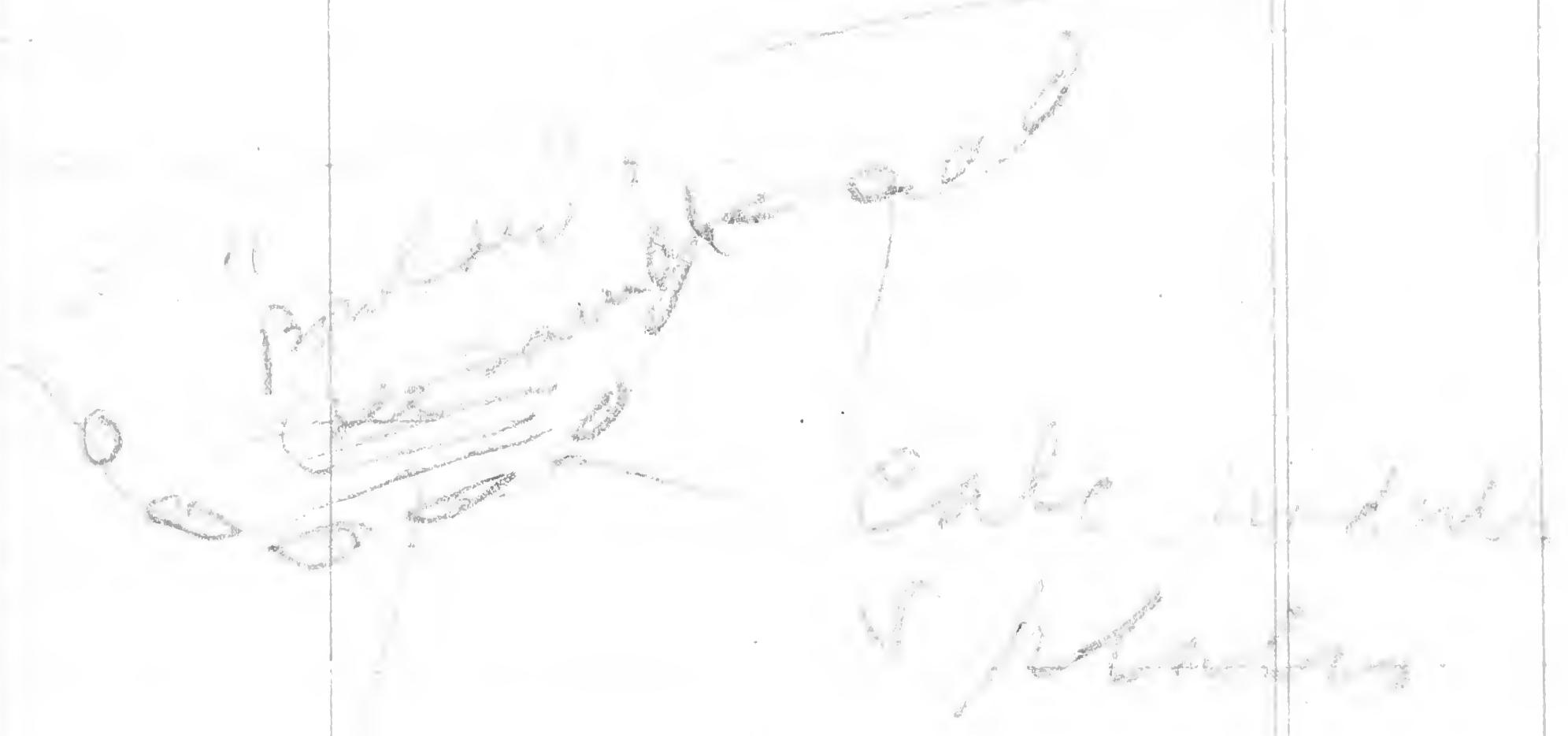
See sample

Sandy

CR 907

Lime nodules / Kansan? /

The "concretion" or mass  
at left is yellow  
may be later drift.



Laminated & more  
or less sandy.  
(See sample)

2<sup>nd</sup> cut (along C. M. & P. R.)  
(only in W. side.)



Bluish color.  
Kannon - seems  
like sample to be typical.

The lower part is  
certainly sand & Kannon  
The upper part - brown,  
more or less laminated & has  
crumbled waste boulders  
throughout (making sand  
& gravel)

There are 3-6 ft.  
of the upper -  
(see sample).  
This layer is laminated  
above - by water.

This cut shows  
2 ft drift 2-4 ft  
20 ft Kansan = 12 ft to level of  
CR 9 & P.

About 20 ft to level  
of CMSTP.

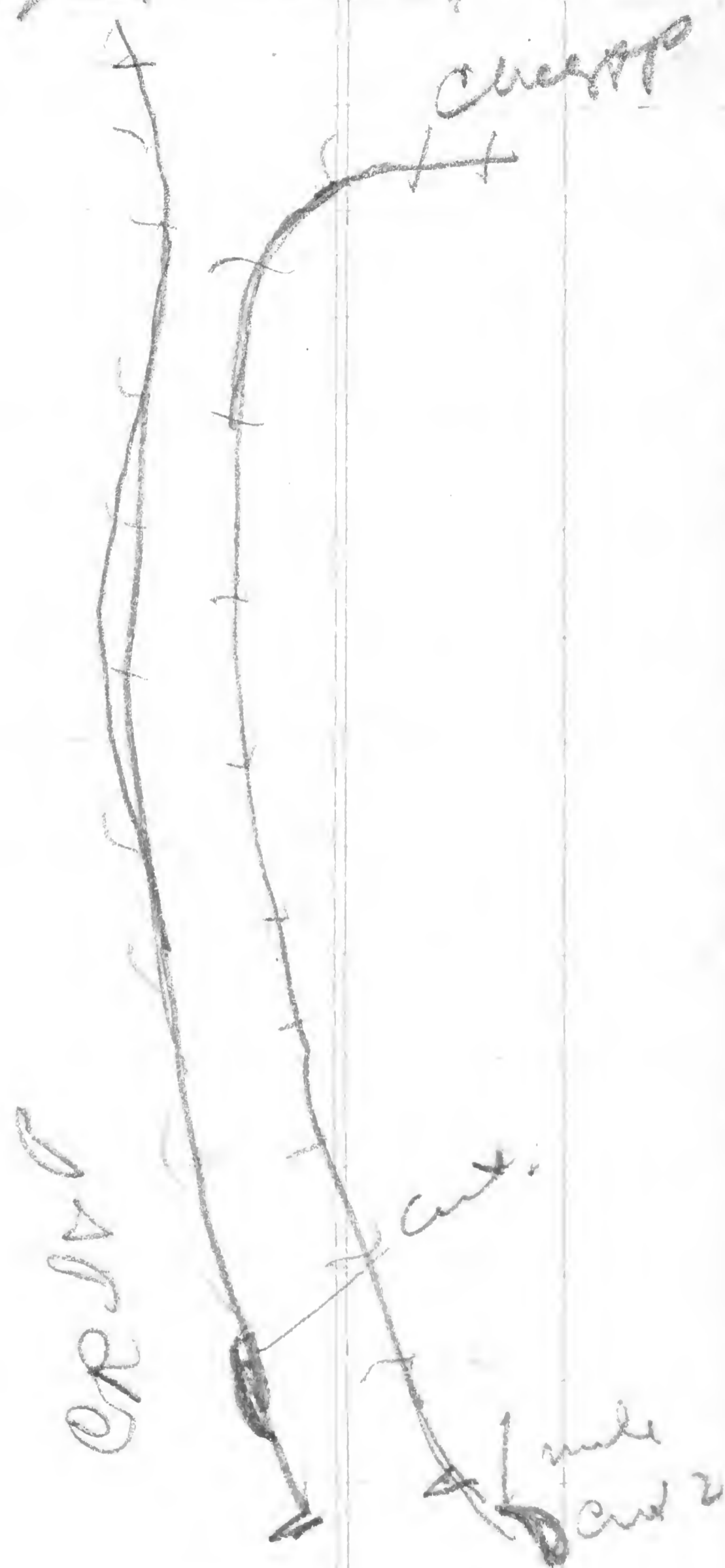
This cut is just at 1 mile  
to crossing beam on CR 9 & P.

+ 1 mile crossing beam on  
CMSTP.

The next cut extending  
to v part way around on  
big curve is over ground.

At 1 mile beam  
CR 9 & P = 12 40  
CMSTP = 12 32

Much Soc. Q. on all this  
upper slopes here.



Read 1290  $\frac{1}{4}$  mi N,  
road  $\frac{1}{2}$  mi N. of  
of Co. line between  
sec. 35 & 36. going S.  
Then 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 CROSS  
P. R. N. ( $\frac{1}{2}$  mi. +) = 1310.

This is highest point a  
long way across.

The surface soil on  
this ridge is yellow &  
sandy.

This high pt. is in sec. 34

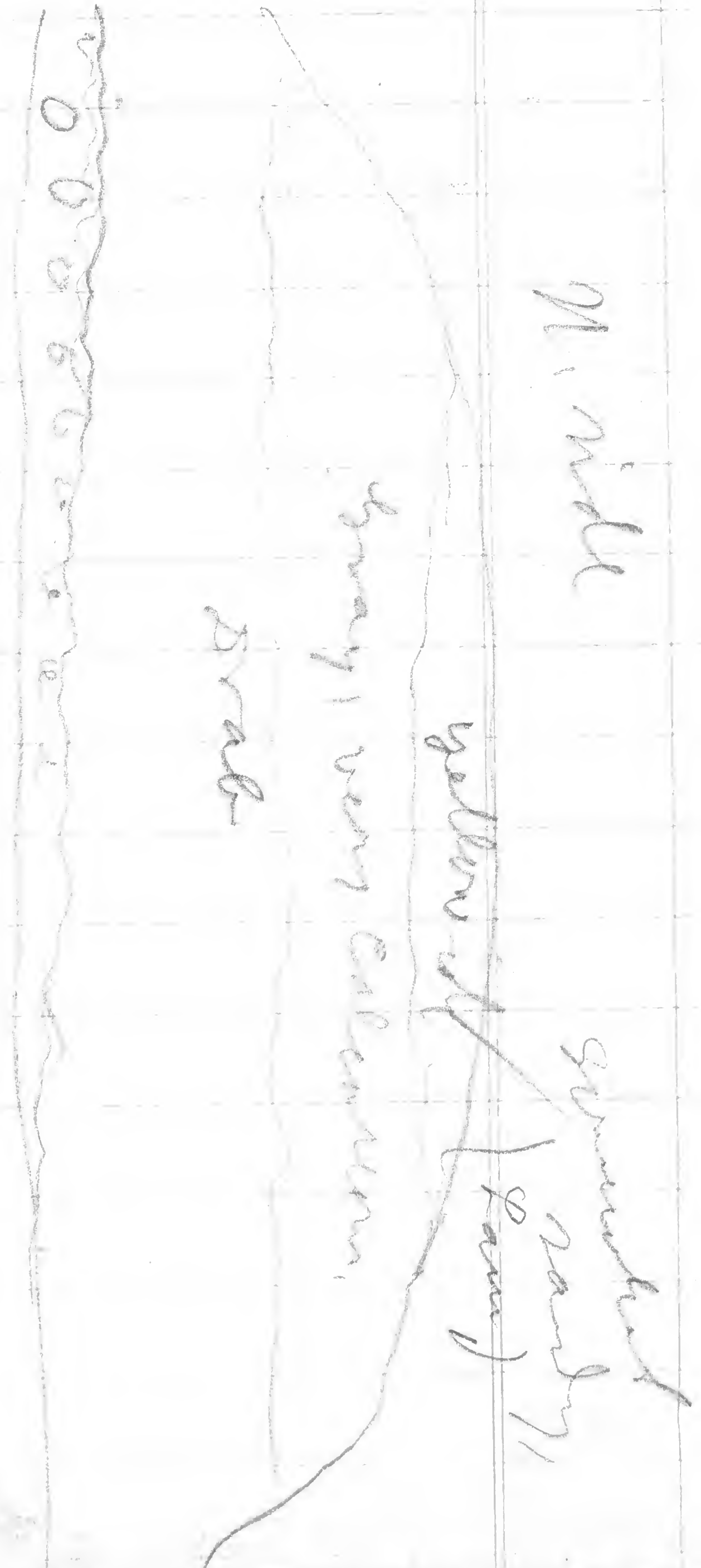
At house on east side of  
road over  $\frac{1}{2}$  mi N. of Co.  
line struck for Q. in  
well at 20 ft.

Cut 4 is on just N. of  
N  $\frac{1}{4}$  line of  
35 - 40149

It shows many too Q. boulders  
& over it lies a yellow  
nodular loess? about 2 ft.

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

Went out along H.C.  
 P.M.  
Secord cut



At E. end of 2<sup>nd</sup> cut on  
 S. side near base in  
 mixed sand & mud  
 shells are most abundant.  
 Fossils several very fine  
Ammodontia. They are  
 quite numerous & where  
 I could get out almost  
 entire shells they are  
 very like Ammodontia

What I call weathered  
 Kaman is pebbly &  
 very red, gray  
 It lies above  
 darker red.

In cut f- 5' side just  
 above rocky ground in a  
 bed of (in place) very  
 hard, jointy, bluish

gray, pebbly &  
very calc. stuff which  
appears to be the same  
to the west (right) it  
frequently runs into  
rather gray calc.  
layers, just like that  
in cut (2). They  
are evidently same.  
(see spec.)

Very pebbly in cut 1  
in light, few pebbles,  
but crumbles in  
M.C. fashion.

This is rusty in places  
& again gray.

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

RR at cut 1 = 1290.  
River bottom = 1215

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

At cut 6 in sec. 2, down  
the river there are  
several ragged exposures.  
Bottom land = 1210.  
Base of rusty gravel 1270

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

4-5 ft

yellowish sandy stuff

3-4 ft Rusty gravel

gray 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  
pieces where cracked.  
It looks some like  
Kansas, but may

be Nebraska.

The upper (4+ ft thick)  
part is gray & much  
like part just below  
rusty gravel in cut 1  
at Cent. Plk.

On the gray till are  
3 or 4 ft of rusty gravel  
& then 4-5 ft of  
lighter (yellowish) sandy  
stuff.

Took samples of 2 tills

In its sand pebbly, hardness  
& fracture the lower till is  
Nebraska.

Its color is not much  
darker than some Kansas  
& fracture a little coarser  
perhaps.



This agrees with cuts  
along Ill. Cent & nearby  
which also show (some  
of them) rather till below,

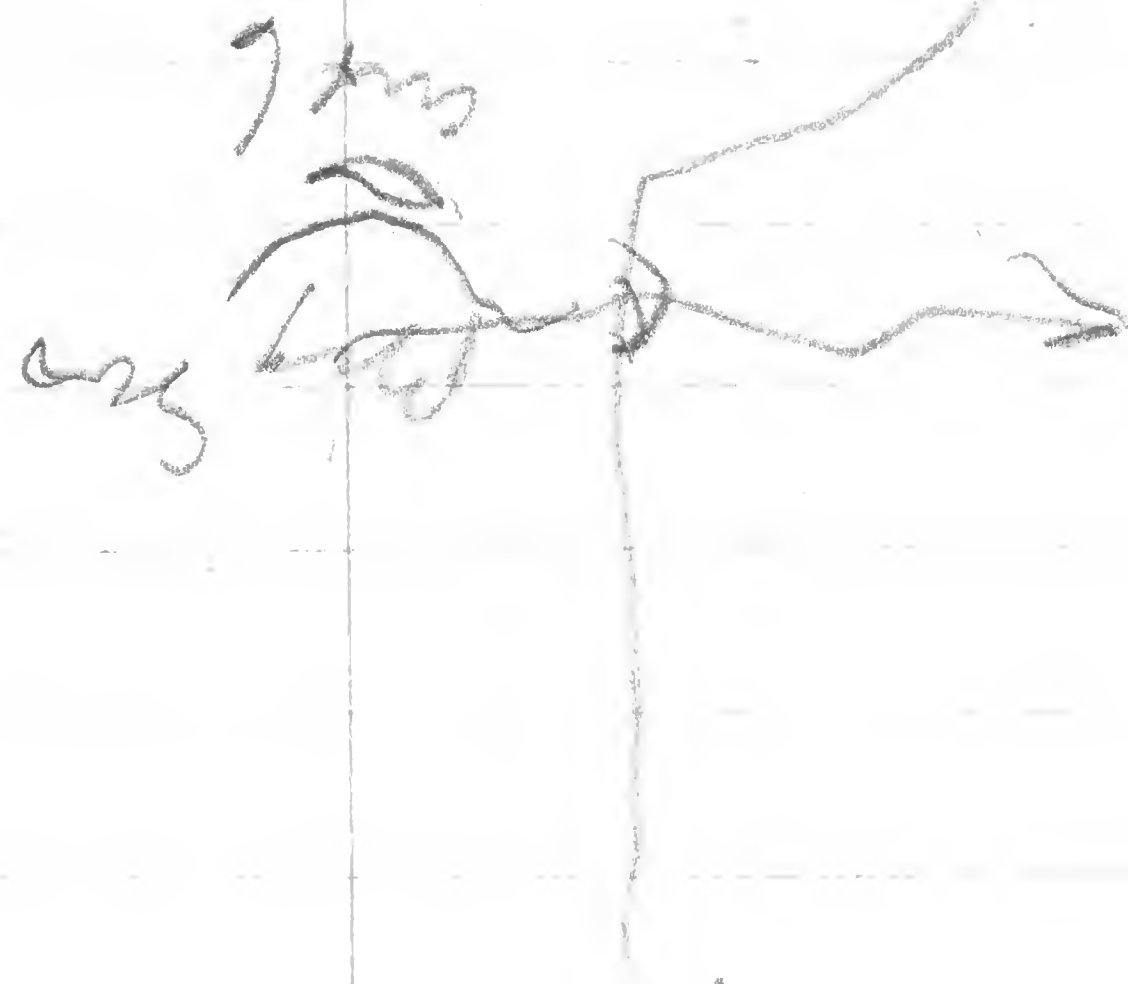
The highest hills, evidently  
fresh cones are NE of  
sandy plain N. of  
Ill. Cent cuts -

Looks as if noticeable  
wind topography may  
due to this

On road going N. from  
bridge & E. of cut 6:

on top of hill  
- grave -

Bluish gray  
drift



RR on S. side (Custer  
N.E. - south) = 1255  
(E. N. H.)

at about 1300 a  
lot of gravel works  
out

The hill above is  
covered with pebbles  
& small boulders -  
a few larger

At the road just  
opposite / mile  
crossing (N.E. - of E. N. H.)  
& Omaha RR) the  
gravel runs to top  
about = 1360

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

For 1/2 mile back the  
territory is very  
rough, but on the  
ridges forming the  
gravel runs to  
run to top

Hill immediately W.  
from 1385 to 1400  
has series of nodules  
seen

Hill north is still  
existing, - probably 20 ft  
this very rough hill  
was made to RR.

Across river country  
does not seem quite  
so rough.

This is as high as  
plain (or upland) S +  
W, but a little

higher than twenty  
m.w.

Wind blown sand  
streaks all the  
S.W. hillside opposite  
to the N.E.

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

The gully extending  
almost to N.E.  
shows sand stuff  
on sides all  
the way down

This great heap  
may be moraine, -  
but if so the  
moraine must be  
traced to S. Big  
Cave.

Left for Canton  
Monday morning.

Apr 17 - Monday  
Drove south <sup>from Carter</sup> at  
turn of road (west &  
S. again to cross  
"moraine") the reading  
is 1220' on plain.

On road going south cut (a)  
runs up to 1350

Westward from cut (a)  
the "moraine" thins out,  
& slopes are more gradual.  
But westward the  
terracing seems to run up.

Cut a is a low cut  
running up to 1350. It  
shows a rocky till, with  
rusty streaks, brassy,  
& some pebbles.

cut b is a short distance  
further S. at 1360 &  
shows about 4 feet of  
more till. It looks  
to me like weathered  
Kansan.

cut c is a little farther  
(8 rods) south of (b) &  
is much the same - 5-6 ft.  
This runs up to 1375

The highest point on this  
row for some distance  
is 3/4 mile S. in same reclin

~~the section S. of cut c.~~  
It reads 1420 H.

Drift comes quite to  
surface, & soil  
westward the moraine  
shows out - drops.  
Eastward it rises much  
higher.

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

Point the south elevation  
runs into this one  
which I am traveling  
at a point south  
(the highest on this side)  
and the north elevation

similarly runs into high  
part of mountain east of  
road.

Cut *d* is on small knoll  
between creek & its tributary.  
It is a low cut, 4-5 ft,  
showing some calcareous  
drift.

Cut *e*. Runs up to section  
corner (G.W. cor. 11-47-49).  
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 very calcareous  
loess, with numerous

lime nodules, rather  
few small pebbles, gray,  
predominating, and  
iron clonings.

When it is weathered  
it shows bluish gray,  
with some nodules,  
but deeper in it is  
chiefly somewhat rusty  
or rather (yellowish) <sup>brownish</sup> (with)  
rusty clonings & streaks.

This is the same  
all the way along  
here.

On the side the cut along  
road is clean, fresh, &  
about 6 ft deep under  
bridge & then runs down  
upward.

In this part (took sample

5 ft. from top) the  
surface weathering fine full  
are yellow & grayish.  
Pebbles, many gray, some  
dark, are scattered over  
surface. A few  
boulders (1 1/2 - 2 1/2 ft) seen  
in upper part, - one 500 lb.,  
1 dark granite, and the  
dark, with pieces of <sup>orthoclase</sup>  
in it. Smaller boulders  
are also found, many  
of them dark.  
Granitic gneiss boulders  
are also scattered on  
the surface of adjacent  
slopes. Some of these  
are dark - but we  
see 0. boulders on surface.  
These boulders certainly  
do not have a low iron content.

80 12  
56  
14

They look quite Kansan.  
This drift reminds me of  
the New Glen upper drift.  
There are few small  
sand & boulders seen  
in the exposures.

Out g. is about 12 rods W.  
of section corner.

It shows about 6 ft  
of same drift, here  
rather more distinctly  
bluish in weathering &  
striations.

Out g. is about 14 rods  
west of f. Shows about  
6 ft on N. & 8 ft on  
S. side. A short

beck cut. Same as  
before, with rather  
more prominent  
subangles. Weather generally

& shows bluish gray  
streaks & mottling within  
the boulders in g. looks  
old - many are dark,  
some gray, almost  
no trace of fine S.

While I worked here (at 2  
or more) the barometer  
dropped to make reading  
at sec. corner from 14 80  
to 14 30.

Highest point along road  
going S. is a little less  
than 6 rods S of  
corner of sec. 11, & reads  
14 60. Spent time in the  
distance there seems to  
be at least two other ridges  
about (a nearly) as high.  
Between the slope is gradual,

eastward also a  
gradual rise, but probably  
not more than 25 or 30 ft.  
Turned east along S. side  
of sec. 14. About  $\frac{3}{4}$  mi  
east is the highest pt.  
on the road, & near  
the top of the earth for  
this part (the hills near  
rising only a few feet  
higher.) Reads 1490.  
Westward the country  
looks much the same  
except brown ridge, but  
S.W. the same gradual  
slope downward.  
Eastward & S.E. it looks  
from the high point  
like typical rough  
Kansan, with ridge  
about on a level with the

general run of it.  
The country S.E. &  
N.E. is very broken  
(along creek) & the general  
aspect is that of a  
rough Kansan area,  
Top again, E. of turn  
around big hollow, is  
1450 ft

cut h is on the N. line  
of sec. 24,  
It shows along road.  
Depth 10 or more - stumps.  
Shows blue loam with  
very strong iron band  
above, at base, &  
above that is a  
yellow loam but  
with blue streaks  
(see samples.)

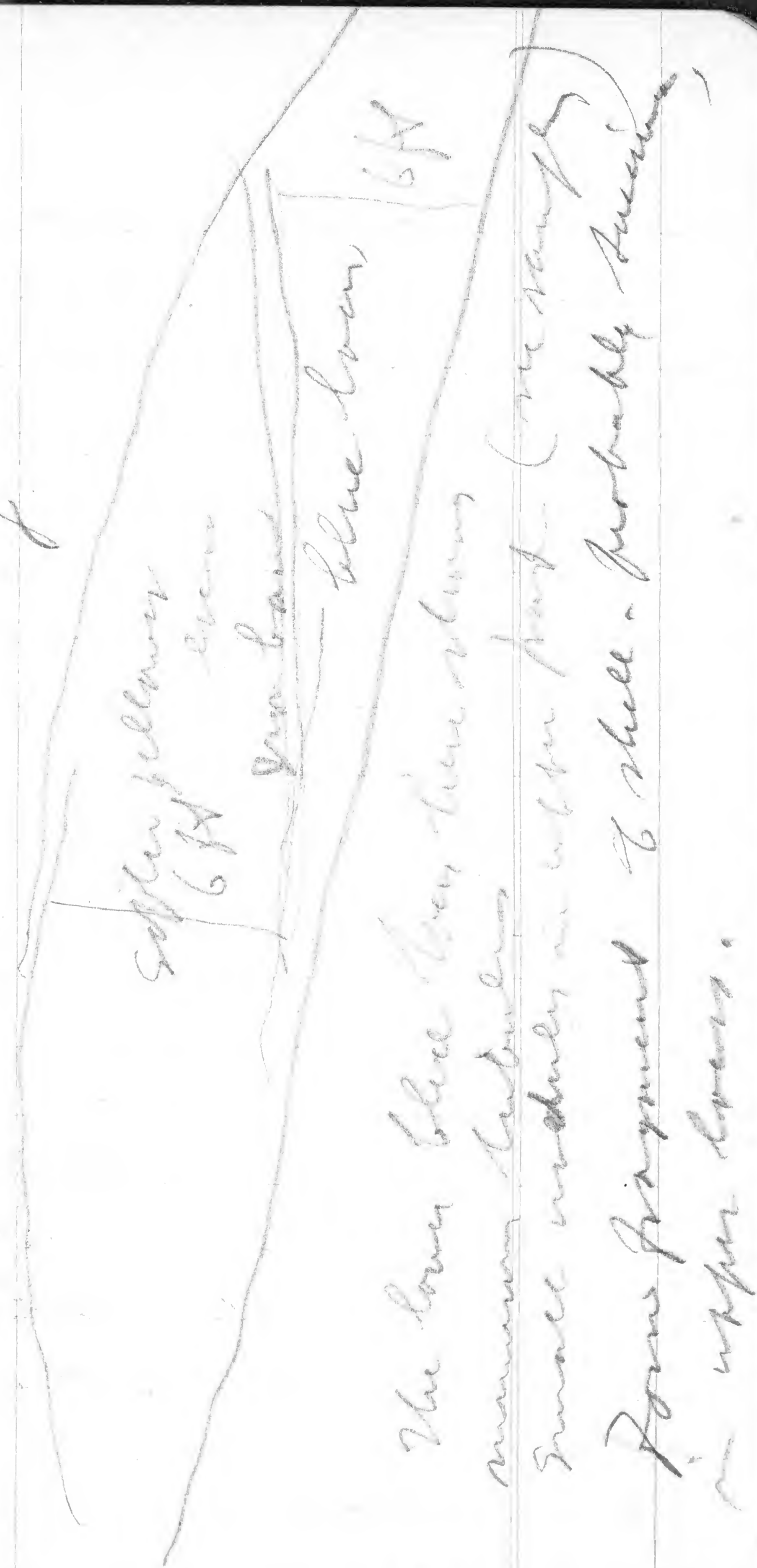


This is clear <sup>part</sup> Kama <sup>has</sup>  
 small irregular calcareous  
 nodules, or abundant  
 in upper part.  
 cut i. the next cut on E side  
 of same ravine shows  
 superficially the same thing

cut j: just over the ridge E -  
 only a few eggs, and the  
 ravine cuts in.

cut j. is the cut on west  
 slope, about 8 ft deep.  
 The upper level is much  
 softer, shows laminations  
 & is mottled with blue.  
 The lower is separated  
 by a distinct ferruginous  
 layer, has numerous  
 iron tubules, & is by far  
 part-Kama.

North cut j.



6 ft

softer yellow  
6 ft even

iron band

blue loam

6 ft

The lower blue loam, thin, shows numerous tubules

Small nodules in upper part. (see sample)

From fragment of shell - probably Acanthis

in upper loam.

Cut k is on E. side of  
same ravine.

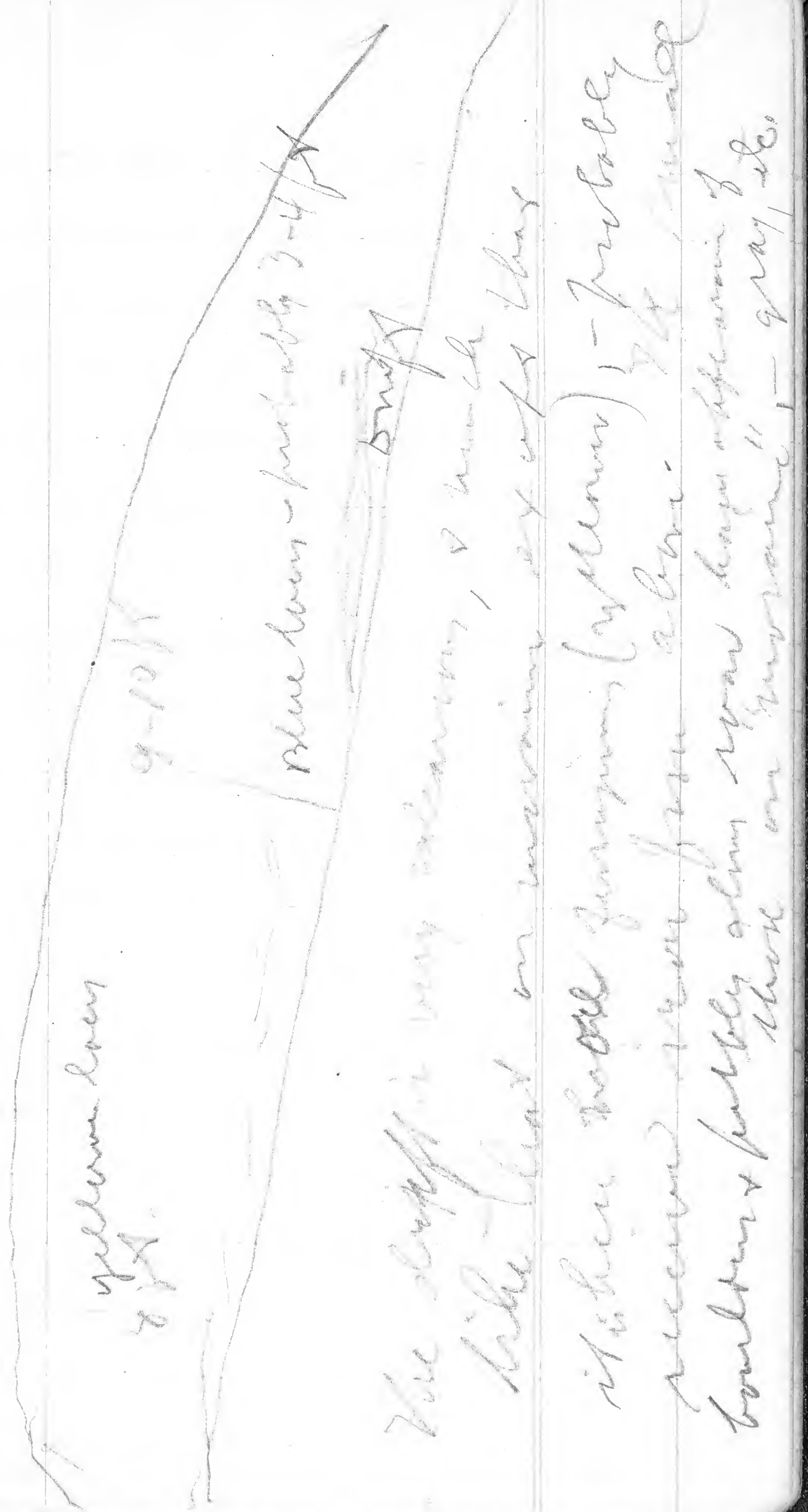
Dip appears in road  
in lower part.

at top about 7 ft deep -  
all the yellow <sup>softer</sup> ~~softer~~  
loam, here with few <sup>small</sup> ~~small~~  
round nodules. Better  
exposed on E. side & side  
only 5 ft.

(at the house, where road  
turned around ravine,  
a lot of *St. O.* boulders  
were piled up.

Just a little below top  
the real blue loam, with  
gypsum bar above,  
appears - more exposed  
lower down - slumped  
badly.

cut k - E. side.



One good sized Gov Q.  
boulder appears in  
lower part near foot  
of slope, but Gov Q.  
is not much in evidence,  
Lovers caps hills eastward  
everywhere, but it  
cannot be thick, as  
boulders (Kansan?) are  
sparsely scattered over  
all the slope up to  
within a few feet  
of the top,

High point across a  
20 a. road of Schoolhouse  
= 1460, this is  
about general level  
E + S.E.

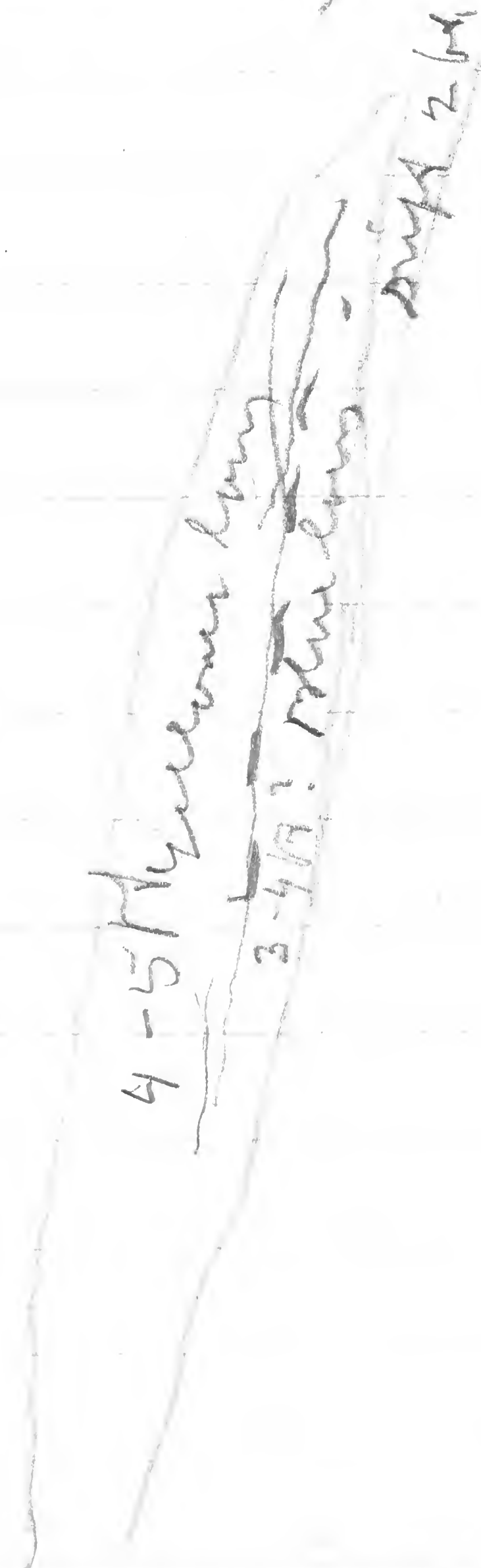
North of turn at School-house  
~~at~~ on N. side of ridge which  
begins to rise at corner, &  
less than 1/2 mi. north, is a  
cut along road which is  
cut E. - at base this  
shows (i.e. on lower slope)  
a drift, yellow again,  
but where weathering  
looking just like drift  
(weathered on "moraine"  
boulders <sup>(small)</sup> pebbles, many  
gray, are frequent, but  
Gov Q. is absent.

The drift is not only  
in upper part. Below  
is in the yellowish, but  
nearly same as drift  
on "moraine".

The boulders are badly  
chumpier, but they are

clearly above drift  
 first a blue <sup>with tubules</sup> ~~one~~ ✓  
 then the yellow, with  
 nodules.

The oxidized band of present  
 shows in places.



Cut on (S. of Kennedy <sup>camp</sup>)  
 A little cut just N,  
 across creeklet (or ravine)  
 shows drift (it is low)  
 & this drift is clearly  
 the yellow, blue-streaked  
 calcareous drift of  
 the N & S road across  
 "moraine". (Took sample)

The pebbles scattered on  
 surface are "gray, etc."  
 just like "moraine"  
 stuff.

Loess appears in several  
 places northwards to turn  
 in road.

In going down the big  
 hill I saw first the  
 yellow loam, then blue  
 loam with large iron tubes  
 & finally at 1440 drift

appeared. This is  
again the same muddy  
yellowish, calcareous  
till with some blue  
streaks, pebbles,  
again same on  
weathered surface.  
It is gray where weathered,  
has iron streaks, & in  
every way is identical  
with that on W. side of  
main river.

Could see this drift  
down to level of 1345 feet  
then the road runs on a  
~~lower slope~~, level almost  
to cattle way & then drops.  
The drift above the  
wild bed in the  
cattle way cut is  
the same yellowish

till, in all particulars.  
The base of the drift  
read 1330.

At saw pit in point  
of bluff the  
drift runs down  
to 1350, - top of sand.

Drift also extends  
hereabouts to lower  
slopes, blackberry hill  
evidently.

Above the saw the  
drift is rather soft  
(from surface) bluish  
(more so than in East)  
calcareous, in every  
way typical weathered  
gray Kansan. The

pebbles on their exposed  
surfaces from the  
same gray affluence  
& here look much like  
those in hills N.W.  
of Fox Falls.

The loess here &  
northward is scant  
or wanting, which  
suggests that it  
came largely from  
the Missouri.

For. O. is rare, or at  
least not common.

The bottom of the tributary  
valley on which road runs  
is 1270

This drops then to river  
bottom, at little bridge,  
which reads 1225

The best level on  
bottom read 1215.

The long Kansan cut  
in bend of road, ascending  
to Kansan bench, rises  
to 1330 ft. - exp. 10-15 ft deep

Parts are yellow & like  
the yellowed till on  
W. side of mountain.

Parts have more blue.  
The pebbles on surface  
& the weathered parts  
look exactly as  
on W. part of mountain.

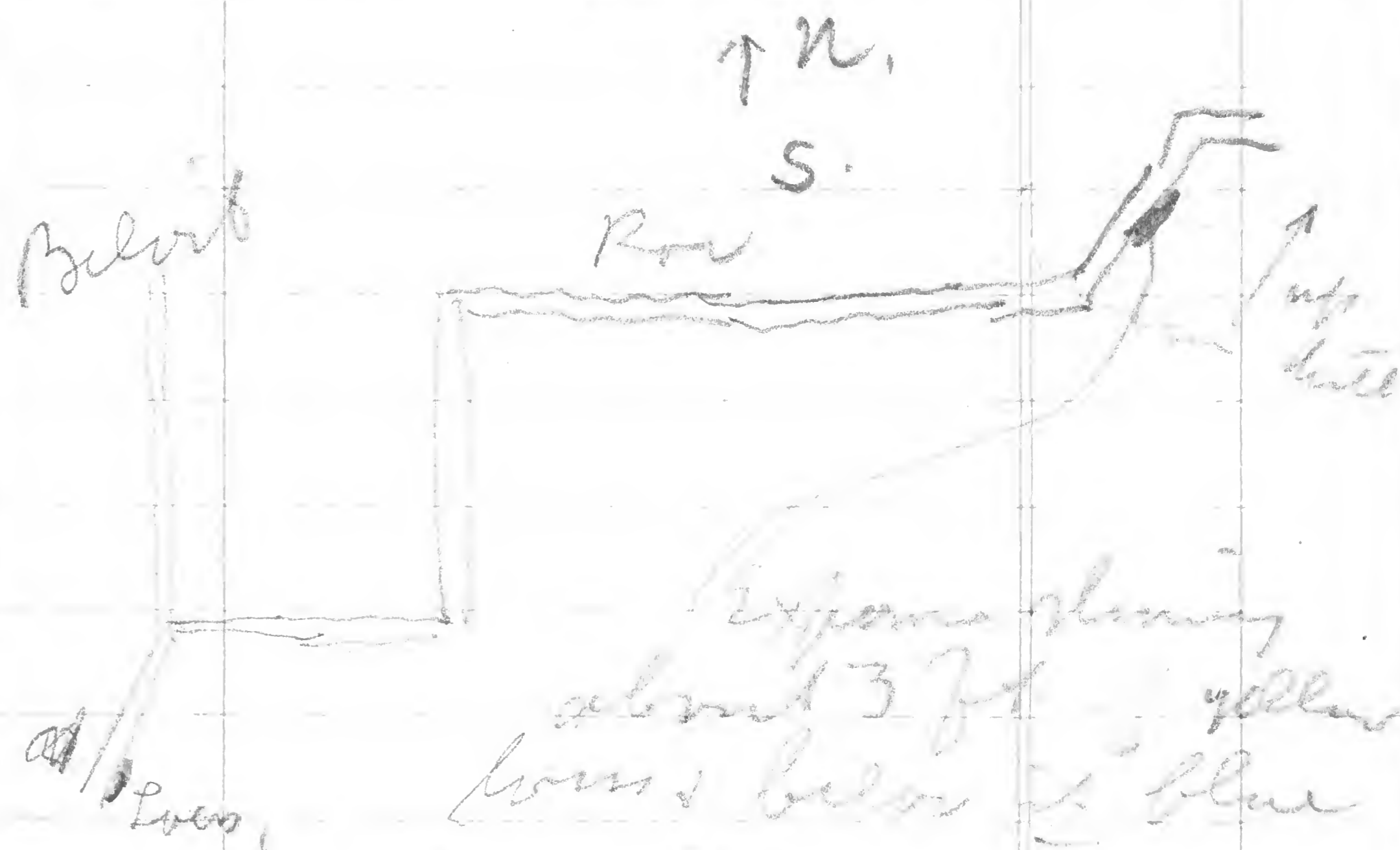
A few boulders  
appear here & on  
the nearby benches,  
& they are same  
as ever.  
all Kansan!

The 1330 level is that of Kansan bench, dark boulders pebbles on this bench.

The general level of this bench runs at 1290 to school-house, beyond which it drops to 1260.

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

Drove E. of Melrot to hills with M.A.



Exposure showing about 3 ft. yellow loam below it blue loam with inclusions  
Upper loam with inclusions  
A strongly ferruginous band separated from the two above by parallel to contours

gathered Anemone  
palea, Ranunculus,  
great number of  
millium wood,  
Salix discolor, Ulex  
fulva,

There is a good sized  
slide below (to right)  
of creek up the creek  
which was going E.  
crosses. There is  
some below, Ranunculus  
drugs above, &  
probably A. fulva  
can be seen.

In row E. of Indian Asylum  
(on row N. of Asylum)  
there is a little cut  
showing calcareous  
deposits, with gray  
pebbles, etc.

This is on plain

along the row  
east of Canton town  
asylum (N. row)  
there are several  
little exposures of  
branny drift, etc.  
like weathered limestone

Top of knob with  
stair pipe in  
Canton = 1395  
plain east = 1350  
Level of RR = 1305



N. B. Inwood  
Jura, Iowa.  
Owner of site.

(Mr. Heckert has  
not received  
the 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 abuts  
& this upper drift  
rests on Nebraskan, which  
is common to somewhere  
in N.E. Cherokee co.

There are sandbars  
between the two drifts,  
or the newer rests on  
Nebraskan.

New drifts difficult  
to describe - from Kansan  
It is slightly different  
in color, but both show  
great range; somewhat  
different still.

breaking; a more  
sandy clay; and  
frequently mixed with  
many masses and  
veins of sand.

He walked from Buck  
Grove to Arion,  
about  $1\frac{1}{2}$  mi. W. of  
Buck Grove in creek  
just S. of RR. bridge  
is black clay - Nebraska?  
It is overlain by a  
boulder bed & then by  
silt, some fossiliferous -  
and then sand to  
bench 10-50 ft. above  
black clay.

Farther down the  
valley (S.W. 6 - Washington  
Twp. ?) is a

30 foot exposure of  
sand and gravel containing  
snail shells and overlain  
by fossiliferous loess.  
As I understood Shreck  
he called the sand just  
S. E. of Arion Aftonian  
because it contains  
shells.

N. of Boyer village  
I found fossiliferous  
silt & sands and there  
rested on what I  
called Kansan drift.  
He says I (B.S.) ~~thought~~  
called Aftonian  
Prebendine bench  
Aftonian & says  
he cannot conceive  
of Aftonian with silt.

Kaman ice.

He says he is skeptical  
about my aptitude  
along Myrton.  
That gravel rest on  
subsoil doesn't  
prove it, if nothing  
above.

Des Moines, Ia.

May 13, 1911

Went to C. H. Rawson's  
tile factory.

The section here  
shows upper reddish  
jointed clay with few  
small boulders &  
some pebbles. Wisconsin.

There are about 4-6 ft  
of this.

Below this is a  
gray, vertically  
jointed layer, quite  
hard, with some  
quartz in it. 5-12 ft

The lower part shows  
laminated streaks  
or bands, - water.

Below this is a rusty  
hard pebbly drift.

5-7 ft.  
(see samples.)

5-17<sup>th</sup> Red drift.

Gray drifty (empty?) fossils,  
5-12<sup>th</sup> 1/2

Red drift - 5-7<sup>th</sup>.

Shale

The gray part where I found fossils seems  
to be a Gyrinus bed. The laminated layer  
probably formed bottom.

Visited excavation  
for steam plant  
E. of High School.  
In block in center  
of area

Reddish drift (?)  
with few pebbles  
sand point

gray, with shells & iron tubes

also pebbles &  
shells scattered  
through it

Looking - S -

looks  
like piece  
of upper  
drift.

On west side of  
same block of  
earth.

4 1/2 ft. yellow till,  
not like that  
on bluff (see  
sample)

4 1/4 ft. gray, with  
few iron streaks  
& some pebbles

The upper till here is  
in its lower part, and  
less mixed with gray, in  
occurrence, and it is here  
This is, evidently, a car  
by Wisconsin ice, and  
broken, carries some of the

oxidized base 4-6 in -

5 1/2 ft.

everywhere in the excavation,  
for several feet, more or  
less scattered pebbles  
that shells are found  
where the loess was plowed  
being at least in part  
shells entire

On W. side of  
excavation this  
shows about so:

yellow till  
10-12 ft.

iron

gray water line

5 ft

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

gray loamy

gray loamy

1

3 ft

4 ft

pebbles

gray

this  
gray part  
undoubtedly  
shows  
over yellow

Wet  
yellow  
(shells)

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

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

The upper redish  
drift has few  
pebbles (see sampled  
but is not same  
in texture as at  
tile works. It is  
more when mixed  
with streaks, spots  
& masses of gray,  
especially on the  
side where shells  
are most abundant  
in red till.  
The west side shows  
a mixing of the  
gray & red till  
& streaks & masses  
of former because  
in latter.  
It may be one  
deposit, or the

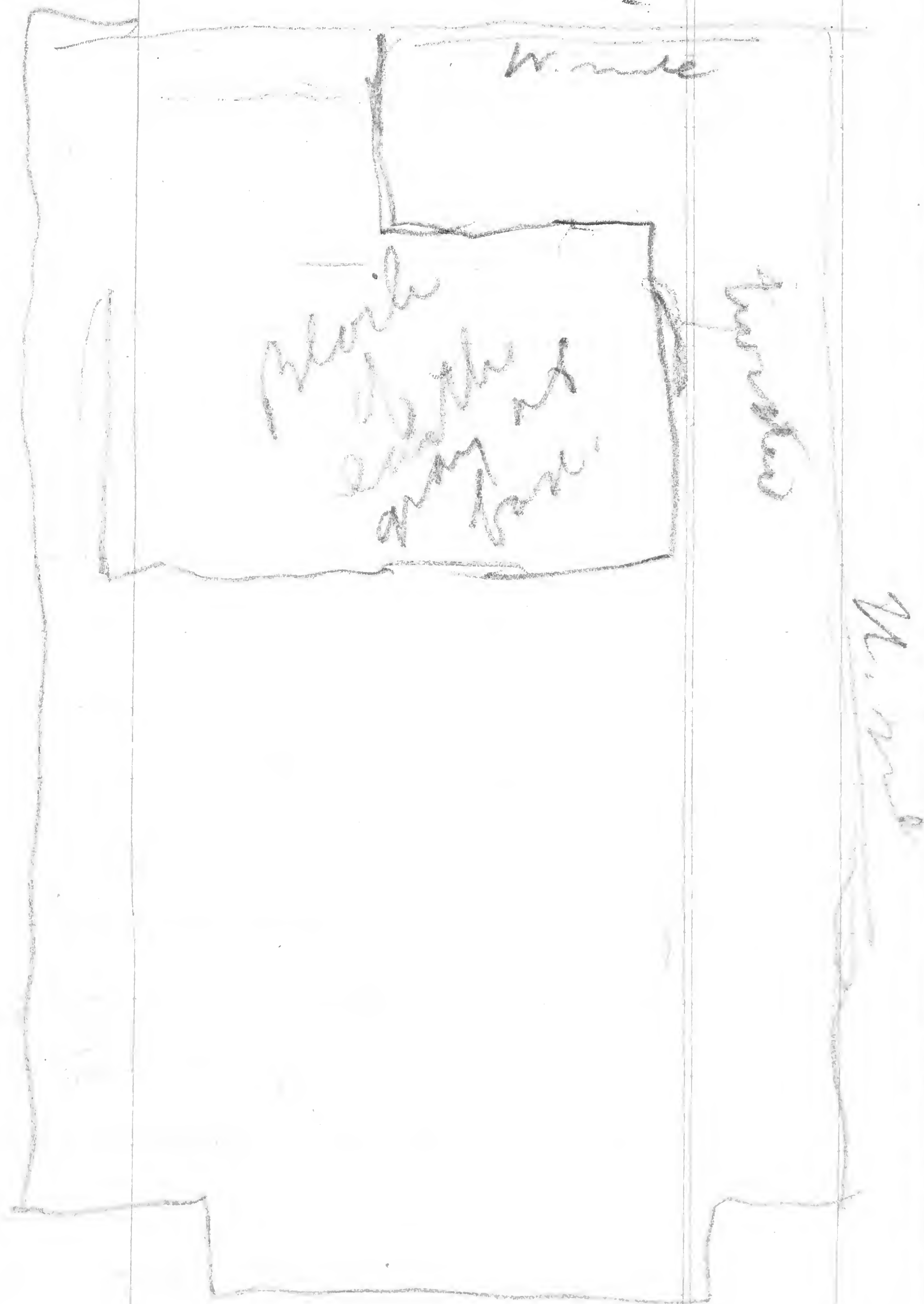
gray has been  
blown by the wind.

On N. side (opp. front  
in block) there  
is also folding.



In fact there seems  
to be much of  
this folding, especially  
in W. half of N. side.  
In the yellow, even on  
W. side I found a  
short steel bar.  
(see specimen)

W. side





Along the N. side  
the cut looks as

yellow till

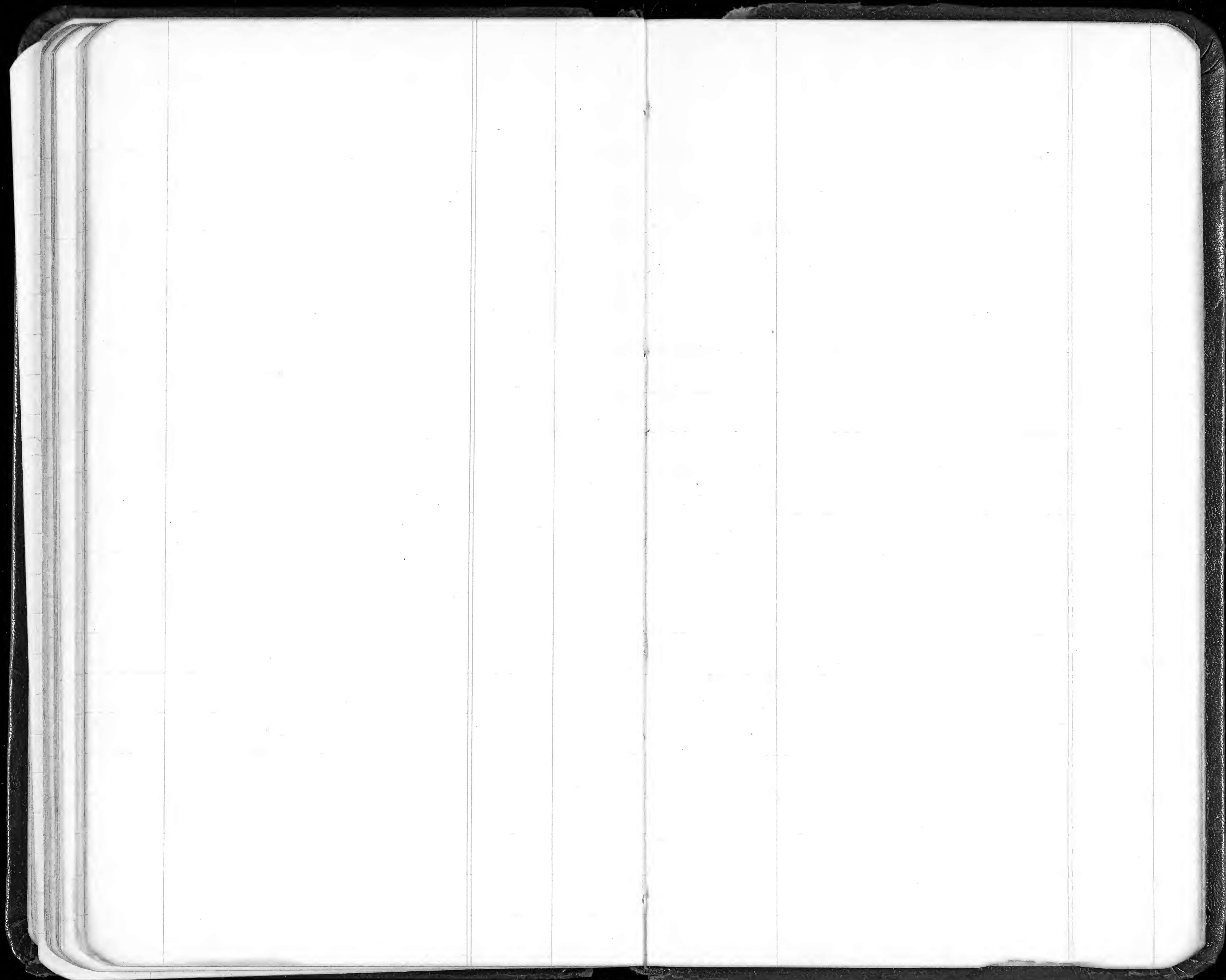


Along W. part the loess & till blow  
& white in part, but east of middle  
the till is above & gray loess (see  
samples) below. The same  
fossils are present & fossils occur.  
Lime nodules are few.  
In the gray loess in E. half I could find no  
sign of pebbles or coarse sand grains.  
It is fine loess (post-Kansas).

The shells in  
bed tell on the  
side are practically  
wholly (wholly as  
far as I can see)  
in lower 4-6 ft.  
of the till.

The gray loess is  
separated from  
till above by  
an oxidized layer,  
distinct on each  
half.

At center &  
westward they  
blue loess dips  
down (after greater  
elevation - 3 ft.)  
& in mixed shuff  
to west.



Apr 13 1911

Fare to Cedar R. \$ .50

" " Commetsing 3.69.

Supper C. Rapids .30

Apr. 14 Waverly Hotel Evening breakfast 1.50

Brushes 10

Fare to Spencer 48.

RR to Keosauqua 26

City Rest. " Dinner 25

Livery R. C. McCutcheon 1.50

RR to Spirit Lake 14

RR to Gilley .68

Windsor Hotel, Gilley, <sup>supper</sup> .50

Apr. 15 RR to New Ulm 2.87

Breakfast Waukegan 25

Dinner - Grand Hotel <sup>New Ulm</sup> 50

RR to Mt. Vernon .53

RR to Sioux Falls 2.59

Apr. 16 Hotel (single room) 1.00

Fortune, livery 2.00

supper Poston Lake .35

	Prins Rupert. Mtn Cafe	25
	Hotel Dacota	
	dinner room	1.00
	RR. to Canby	.62
Apr 17	RR to Howland	.67
	Livery	2.00
	Hotel - Rudolph <sup>m</sup> breakfast	.50
Apr 18	RR. fare to Fern	1.76
	Breakfast & dinner <sup>Park</sup>	
	Hour, Orma	1.00
	RR. to Malheur	16 + 76.
	<del>Fern</del>	
	Subur Miller Hotel	.50
	RR. to Cedon Park	4.96

RR to Jewell - .50

Des Moines, May 13, 1911

	RR. to Des Moines	2.41
	Elliott hotel - breakfast	.30
	dinner <sup>45</sup> , supper <sup>45</sup>	.90
May 14	Room 1.00 - breakfast	1.
	RR to Iowa City	2.41.

2176

25  
10

