

Notes

Yellowstone  
Nat. Park

Aug 1897.

W. B. W.



A. L. Love

L. W. G. Stan.

Frank

Ag. - P. H. Jones

Capt. Frank M. Catledge  
Home Dept. Y. N. P.



Y.N.P.

Aug. 28/97

Road Canyon to Yanceys,

Examined line of road.

Distance 20 - 22 miles  
beyond pantheon built  
to Inspiration point.  
Greatest difficulty at  
spur projecting east  
to canyon from Mt  
Washington. It is possible  
however to build a road  
with a grade not to  
exceed  $7\frac{1}{2}\%$  at the steepest  
points & not over  $5\frac{1}{2}\%$   
 $9\frac{1}{10}\%$  of the distance.  $1\frac{1}{2}\%$   
while long stretches would  
not be over 1 to  $2\frac{1}{2}\%$ .

The scenery is very  
fine along the canyon  
& the mountain & valley  
view along altitude



2

Creek is ~~very~~ superior  
to any creek along the  
Lake -



Capt. Horain M.  
Chittenden

Formerly asst to  
Sup. Yellowstone  
Nat. Park.

---

Very highly spoken  
of by all I met  
in the Park -  
who new him,  
Aug 28/92



Aug. - 1897.  
Yellowstone Nat. Park.

About Mammoth Hot  
Springs - all fallen trees,  
dead trees & brush except  
on the slopes of the spring  
deposits, should be removed  
& the ~~concrete~~ ground  
cleared up. Men  
& strong ladders placed  
in dirt kitchen -  
& wherever needed.

Good horse trail  
should be built to  
mountain peaks  
& points of interest

Dead trees piled  
along the road side  
should be removed.  
& burned in damp  
weather.



Y. N. P. (2)

Hotel at Upper Geyser Basin  
A hotel should be  
erected at the Upper  
Geyser Basin. It  
is an imposition on  
all tourists to oblige  
them to return to the  
Fountain Hotel & go  
back over the same  
dusty road the next  
day. This causes 18  
miles extra ride over  
very dusty roads - obliges  
the tourist to cut  
short his stay at  
the great geyser  
basin & to ride 50  
miles the next day -  
of which one  
unnecessary.

The hotel company  
have a large hotel  
at the Fountain Geysers



Y. N. P.

3

but for the convenience  
& comfort of the  
thousands of people  
who pass thro' the  
Park, a hotel should  
be erected at the  
Upper Basin, & not  
compell all tourists  
to return nine miles  
for a place to sleep  
& get two meals. If  
the present hotel com-  
pany cannot see their  
way clear to replace  
the hotel destroyed  
by fire at the Upper  
Basin then a permit  
should be granted  
to the same other  
party or parties to  
erect one.



4

The road from Fortan  
to the Summit is well  
graded but dusty.  
Much of the road  
needs surfacing with  
clay or gravel. This  
is true of most  
of the roads in the  
Park.



Y. N. P. Aug 28/97

all persons entering  
Park to be given a  
permit wh - they  
must have to  
present on demand.

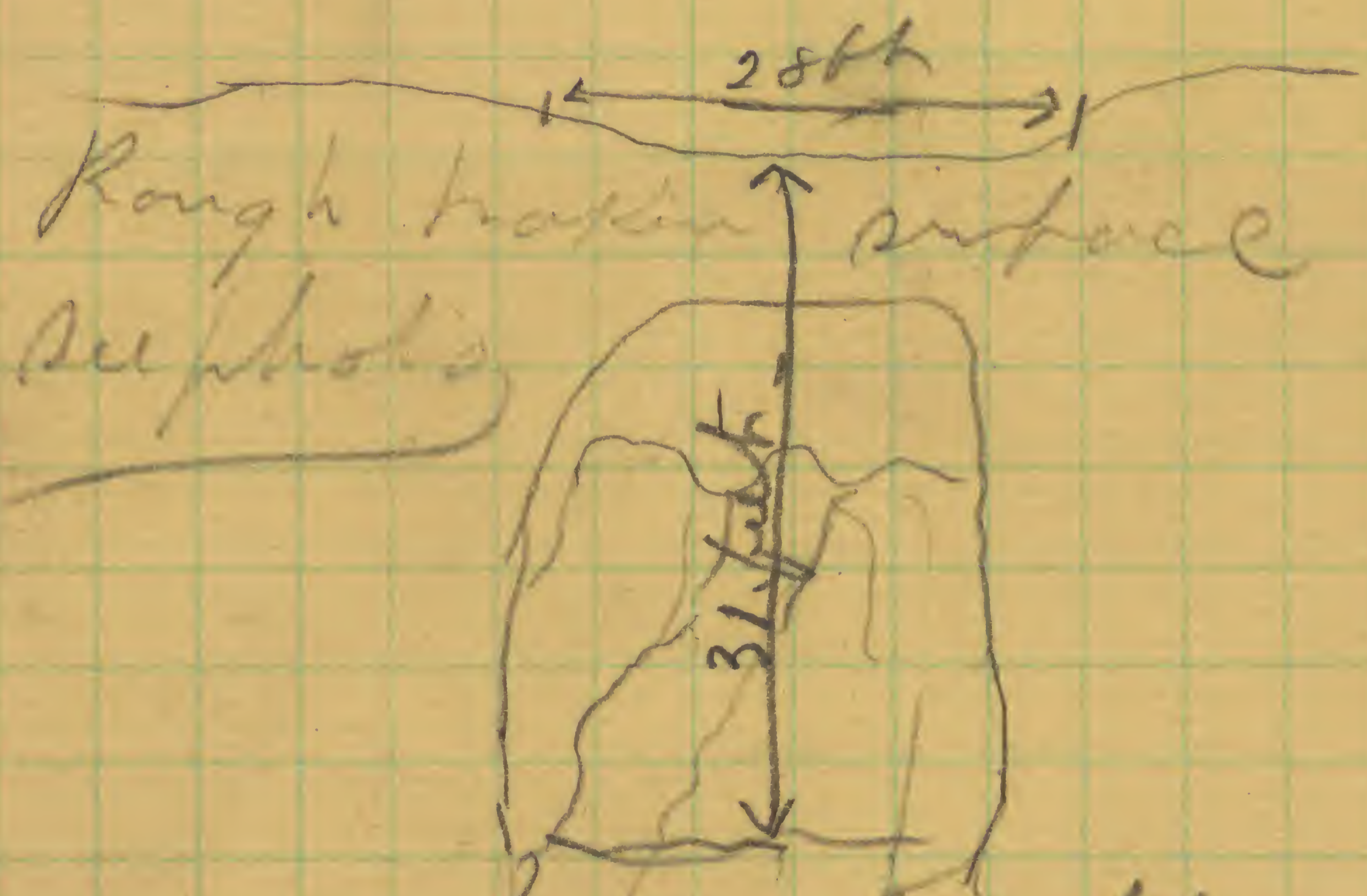
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Aug 27/97

Natural Bridge -  
Yellowstone Lake -  
Y. N. P.  
Wyo

Rock Abrasion amygdaloid.



Width	}	whole	12ft.
Solid part			7ft.

7.  
shape  
edge 50ft



G. W. Gilham -  
Lansensh -  
Mat

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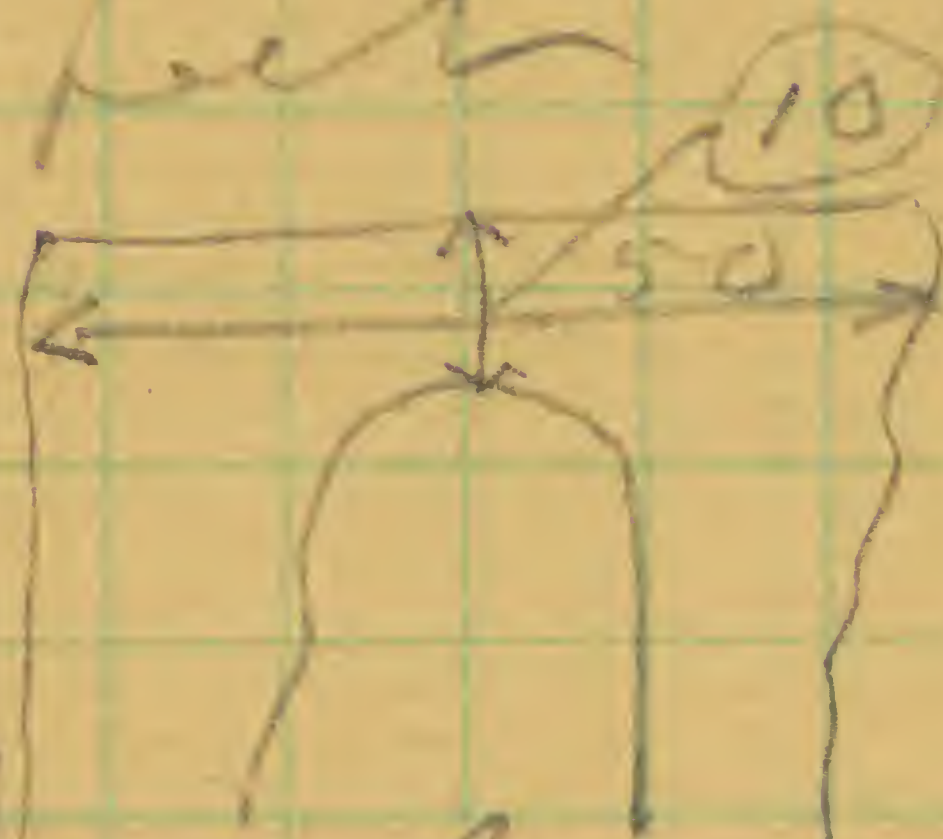
Photos - of Notit Bdg

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Nat. Bridge <sup>2</sup> (2)

On the upper side  
the width of arch  
from buttress to buttress  
is 28ft. On the  
lower side the  
arch is about the same  
but the walls of the  
canyon are further  
apart & the face  
of the arch & buttress  
is 50 feet



Depth of arch 10ft



E. C. Waters

Mammath Hobbs

Forch du Lac  
Wis



L.R.

Aug. 8/97.

Homestake Mines

Visited the mine with  
Mr. Ches. J. Grier. The  
mines under the control  
of this company have  
a plant that costs  
~~in~~ about \$1,000,000 -  
a large town has  
been built at Lead.  
The Homestake mine  
is a great mine  
& there appears to be  
every reason to believe  
that the mines of the  
Company will produce  
large amounts of ore  
for many years to  
come.

The consumption of  
timber by the mines  
& mills will be  
great for as long  
as a large output



F.R. cata <sup>2</sup>

continues. The  
natural supply is  
from the Region south  
S.W. & S.E. of the  
mines & back into the  
limits of the proposed  
forest reserve.

The interests of  
the mining companies  
should be with the  
'Forest Reserves', provided  
that the reserves are  
administered honestly  
& efficiently. All  
depends upon the hard-  
ness & effectiveness of  
the care & protection  
of the forest, & the  
provisions made for  
the sale of timber.



L.R.

2

About 12 mi' E. of Creston

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Timber disappears except  
on the spurs & ridges.  
Reserve line should  
be carried a little  
west of Rocky Mt  
pine with scattered  
yellow pine occurs  
but most of north  
all of the young  
growth is the Rocky  
Mt pine.



L. R. 3 Aug 10/97  
Custer City, S.D.

Situated in a park &  
surrounded by wooded  
hills & Mts. (For size  
see map).

Principal business -  
supplying mining & lumbering  
camps. Harney's Peak  
to the south is covered  
with forest except on the  
cliffs. From Custer Rock  
& part of the town the  
forest extends in an  
unbroken line all around  
the horizon. (See Kodak  
photos.) Except on granite  
cliffs just west of the  
town.



At the time of the  
B & M. R.R. the reserve  
should come down to  
the right of way of  
the R.R. in order to  
protect the forest back  
from the road from  
fires started along  
the road. These  
forest reserve patrol  
should have the  
care of all forests  
& woodlands with  
public lands ad-  
joining the reserves,



F.R.

4

Aug 11/97

West of Custer S.D.

Out with Henry Gammett

Numerous ranches occur east of the limestone cliff 8 to 9 mi west of Custer all in the narrow valley - a few stock ranches occur in the prairie on the high limestone ridges & the broader valleys - not much value but for grazing lands. Most of the land is covered with pine & the prairie have scatter clumps of yellow & Rocky Mt pine (Bull). Drove out about 16 miles to here we could overlook all



the country to the west  
 out to the plains -

a large amount  
 of land in scattered  
 areas will have  
 to be taken out of the  
 reserves - but for  
 the future of the  
 mining & timber in-  
 dustry all the forest  
 & wooded land should  
 be included within  
 a forest reserve -



S. R.

6

Private Ownership.

Timber lands owned  
by private parties  
will sooner or  
later be stripped  
of its timber & then  
obliged to go back  
to the local govern-  
ment on account of non-  
payment of taxes.  
The land will  
be worth nothing  
except for future  
growth of timber &  
that will be destroyed  
by forest fires before  
maturing. The  
policy of forest  
reservations under  
chrg of the National  
Govt. is the only  
business-like, sensible  
course to pursue.  
(Admiralty & New England)



4

Big Horn Forest Reserve.

Aug. 17/97

Began examination of reserve in the vicinity of the canyon of Little Goose Creek. The woods are scattered on the slopes from a short distance above the foot slopes to the base of Cloud Peak. Large park-like openings occur in all directions. As far as seen to day the timber is small & second growth yellow & white pine.



17

25-



L. R. Aug 17/97

Secure data from  
Horn Indians of  
burning forests on  
Big Horn Mts for  
the purpose of driving  
out the game.

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The pastorage of  
sheep & cattle on  
the Big Horn Mts  
parks will prevent  
the spread of  
fire - The great  
distribution of fire  
in the past has been  
the burning grass -  
many patches of  
timber for fire and  
large body have  
been burned over  
repeated & I think



J.R.

2

as the result of  
burning the grass.

Forest fires have  
occurred again &  
again over nearly  
the entire area of  
the Big Horn Mts. &  
a few patches  
areas have escaped  
for the past 15 or  
years & there large  
pines 10" - 18" in  
diameter occur.

Other small areas  
have not been burned  
in 40 - 50 years  
& pines 8" - 10" occur.

Other areas 20 - 40  
& pines 6" - 8" occur.

& other 5 - 10 yrs

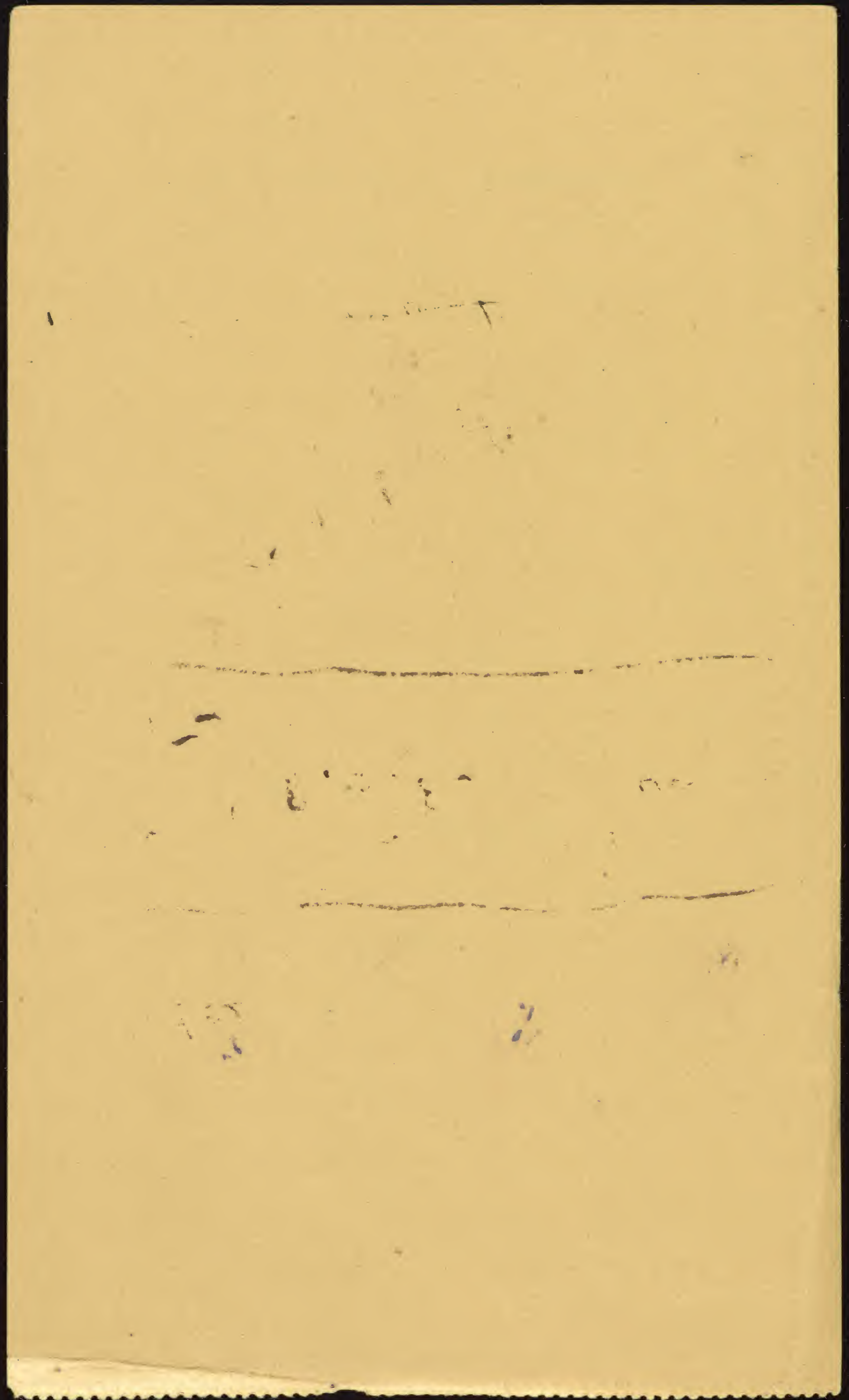
& young pines 2 -  
4" - occur. Also



the park-like areas  
the repeated burning  
has killed out all  
the trees & seed, but  
if the fire is kept  
out it will be  
only a question of  
time to reforest  
the entire area  
of the mountains.

ATW,  
Aug 17/97







1

Hot Spring deposits &  
algal growth.

A typical "boiling" spring  
was selected for study  
that occurs about  $1\frac{1}{4}$  mi  
S.E. of Big Fountain <sup>Geyser</sup> and  
about 100 feet N.E. of  
"The Diamond" pool. The  
water rises to the edge  
of the pool which is  
fringed with overhang-  
ing cornice-like fluted  
scalloped & often fluted,  
siliceous deposits. The  
steam bubbles up on the  
N.W. side of the pool &  
the temperature of the water  
is  $93^{\circ}$  to  $94^{\circ}$  C. (199.2. 201.2<sup>o</sup>-F  
Elevation 7300 ft  
~~causing~~ the variation is  
owing to the amount of steam  
rising. The surplus  
water spreads over  
the flat surface of the



78  
1.8  

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624  
78

86  
1.8  

---

688  
86  

---

154.8

~~140.4~~  
32

90.5  
1.8

57  
1.8  

---

45.6  
27  
32  

---

134.6

67  
1.8  

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536  
67  
32  

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152.6

7240  
905  

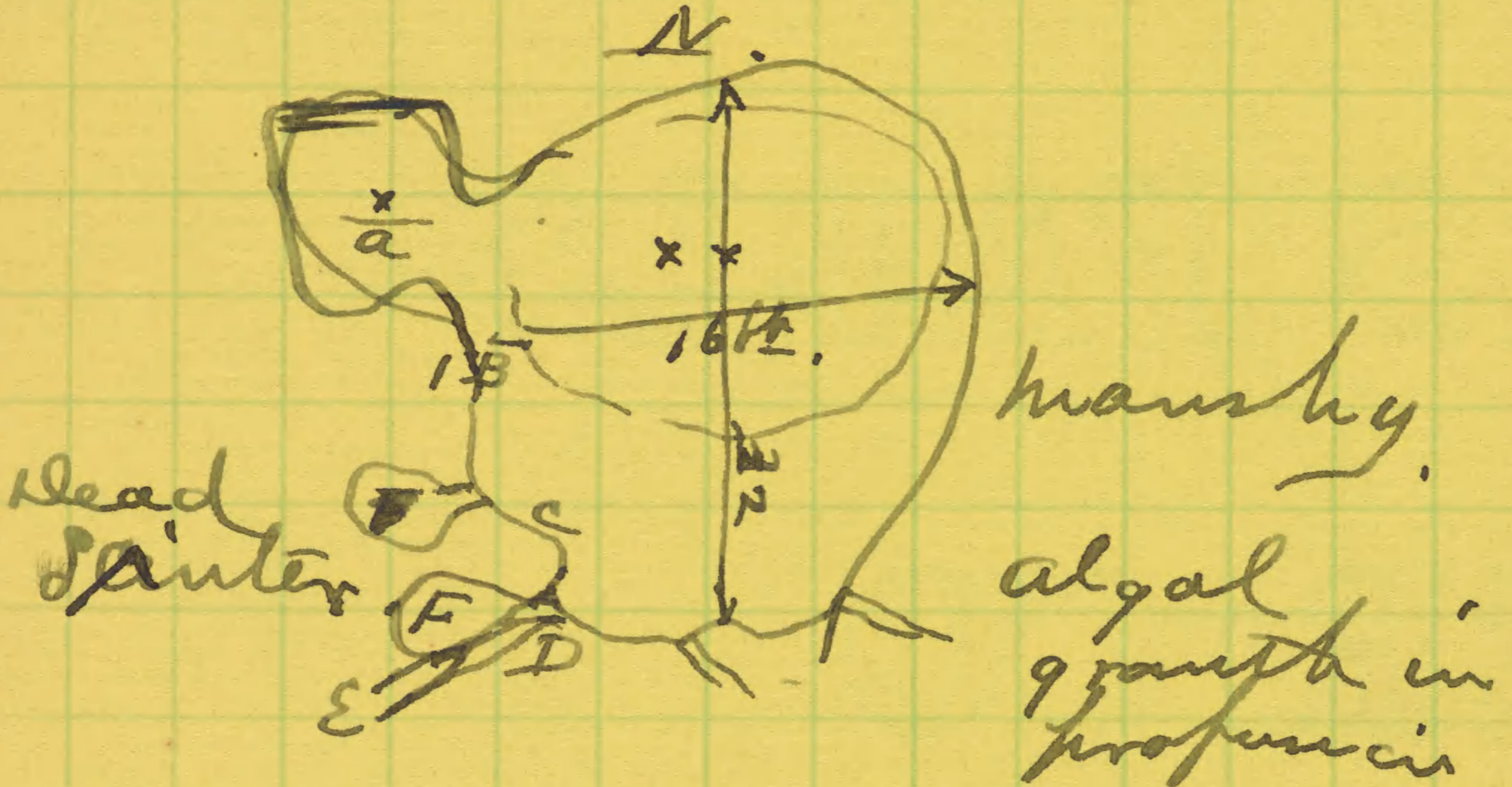
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1629  
32

A



"reinter" designated  
 and also runs  
 out in narrow shallow  
 channels.



x. Bailing spring.

xx. Deep reversed conical  
 pool.

(a) Bailing Spring.

93 to 94°C

201.2°F

B. Edge of pool 6 feet  
 from a.

90.5°C

194.9°F

C. Edge of pool 18 ft  
 from a.

86°C

186.8°F

D. Edge of pool 32 ft  
 from a

78°C

172-419.4°F



E. about <sup>3</sup> 6 feet from  
D in run off narrow  
outlet

57°  
134.6 F

F. Shallow pool - 3 feet  
and connected by narrow inlet  
from main pool & full  
of algal growth

67°  
152.6 F

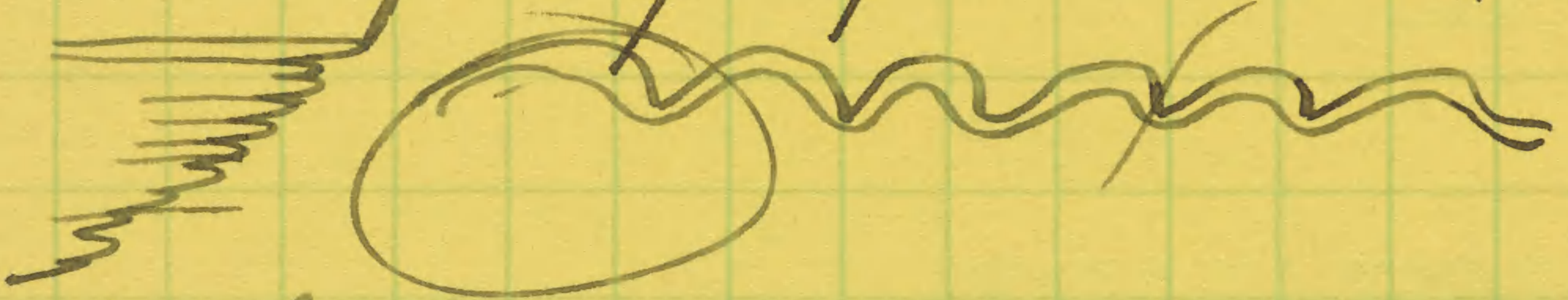
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At E. the water spreads  
out & a dense growth  
of gelatinous algal growth  
occurs. This growth is  
in all stages of mineraliza-  
tion - from a leathery tender  
condition to traces of  
silicious & ~~deposits~~  
to where further from  
the <sup>running</sup> water algal growth  
has disappeared and  
a white semi-columnar  
silicious deposit remains.  
All the forms of silicious  
deposit fringing the

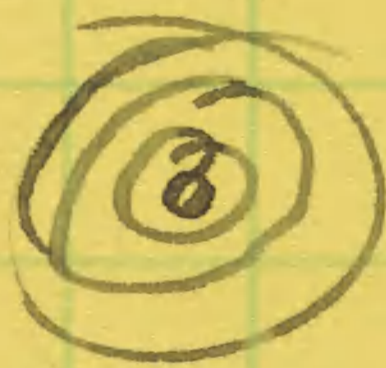
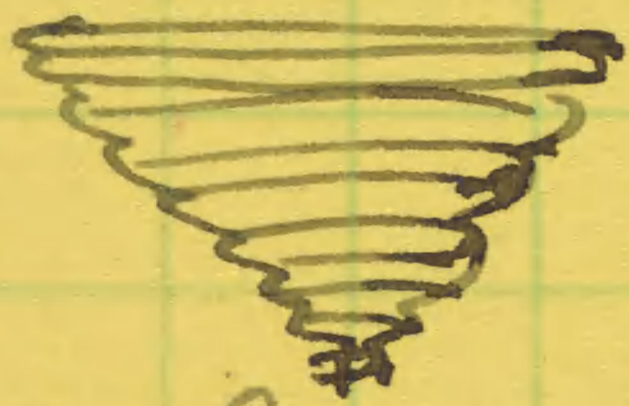


pool & outlets & filling  
up shallow pools may  
be duplicated in the  
gelatinous, lathery algal  
deposits (growth) in the  
immediate vicinity of the  
pool.

These growths include  
the fringing cornice

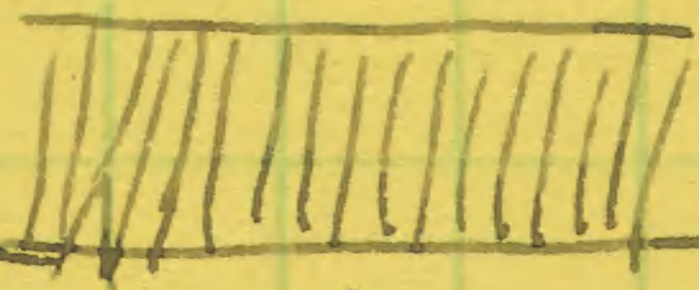


isolated reversed cones



and more

solid masses made  
up of an almost  
viscicular vertical  
growth



This  
latter type is the  
principal form of  
growth of the great  
resinter deposits



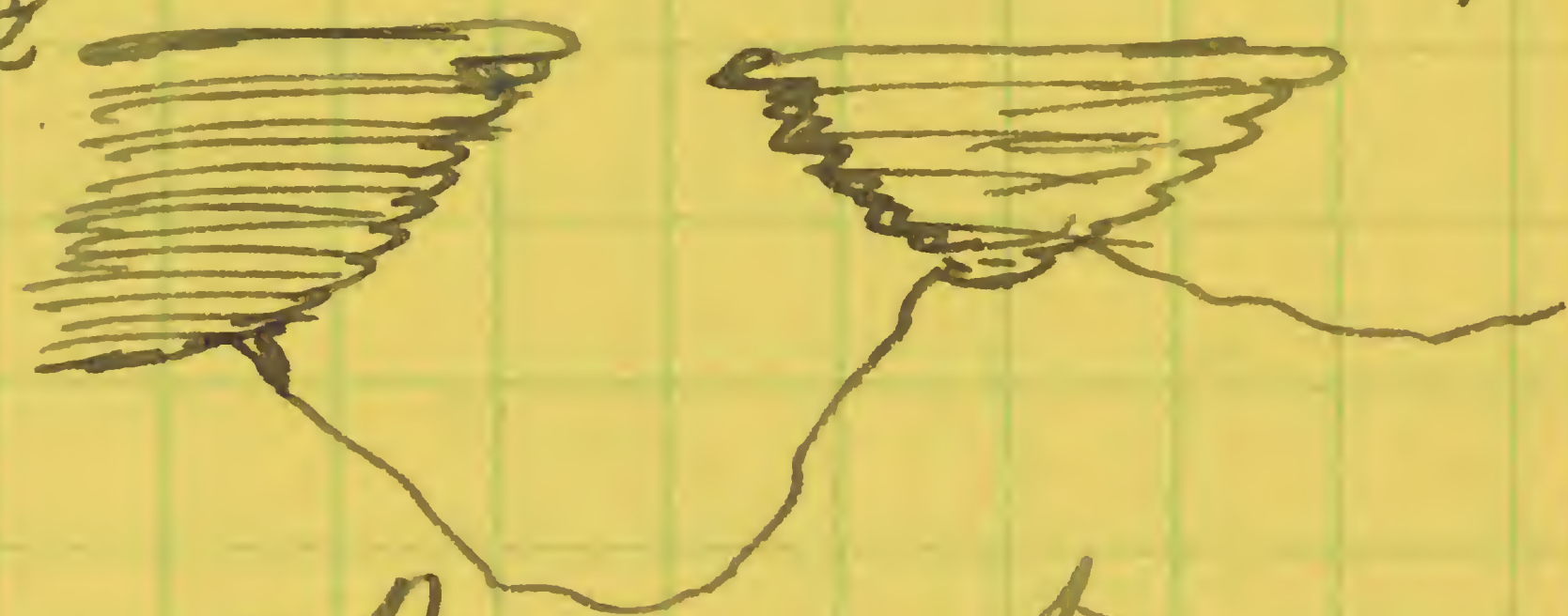
$$\begin{array}{r} 35.5 \\ 18 \\ \hline 2840 \\ 355 \\ 32 \\ \hline 95.9 \end{array}$$



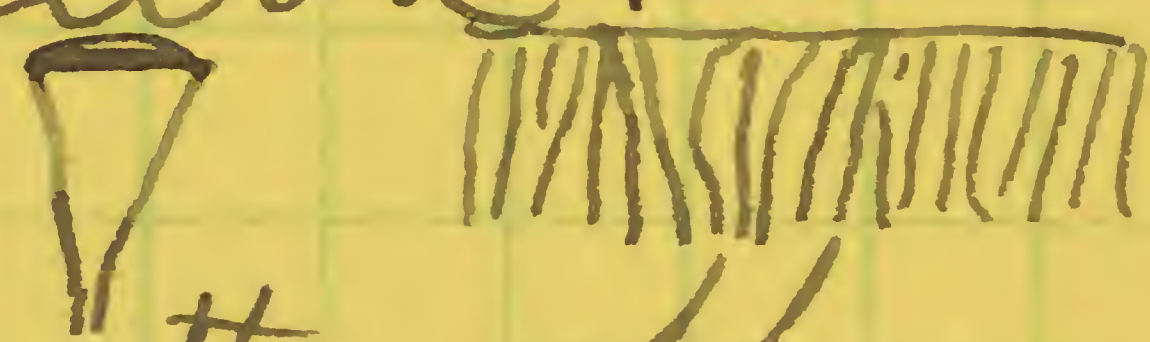
a

Fluting & scalloping of  
hot spring deposits.

The same type or essentially  
the same type of deposit  
occurs in all springs  
where the algae grow  
or where the mineral  
(silicious) forms overhanging  
cornices



Back from the outer  
surface the structure  
is irregularly laminated  
or it may be irregular  
ventral tubes that  
formed about the tubes  
of algal growth.



The mineral matter appears  
to be deposited on or  
in the outer walls of



5  
surrounding many of  
the hot springs &  
geysers in the J.N.P.

Celestine near  
930 — 940 Big Paint Pole

70 feet in ~~run~~ <sup>run</sup>

off — 35.5 c = 95.9 F.

Algal green thinning run

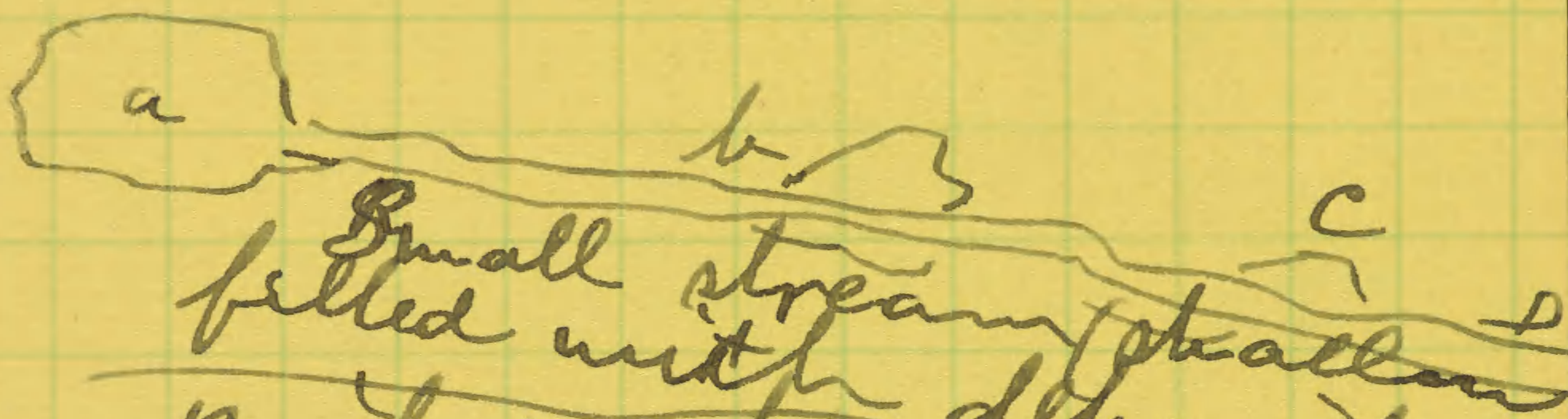
off photographs.

Specimens of cornice  
green etc taken from  
pool —



Temperature.

Spring. N. E. of Black  
Warrior from which  
we took many  
specimens.



a. Boiling spg. dolomite.

b. 25 feet below <sup>93°</sup> 86.5°

c. 50 " " 74°

d. 75 " " 66°  
with much  
gelatinous algal  
material.

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Sinter gathers below  
on flat space.

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the algal growth  
when in vertical columns  
& over the partitions  
of various form - convex,  
flat - & inclining at  
various angles, when  
at the base of the  
columnar structure  
or when forming  
the mass top of the  
layer.



See collections.

Thin algal growth in thin



sheets on the  
surface of nearly  
all deposits where  
the falling waters  
from geysers does not  
strike.



mode of algal growth  
in very hot pools  
93° 94°.

The waters of all the  
hot pools, geysers or  
springs fluctuate in  
height at longer or  
shorter intervals. The  
overhanging edges of  
the deposit that  
come directly in  
contact with the  
hot water are washed  
clean but from  $\frac{1}{4}$  in to  
 $\frac{1}{2}$  inches back of the  
edge the soft algal  
growth is alive, &  
secreting mineral matter  
& depositing it as a  
thin layer  $\frac{1}{16}$  to  $\frac{1}{2}$  in thick.  
When the very hot water  
is lowered along the  
edges mineral matter



is deposited either  
by evaporation of the  
water containing it which  
is splashed up on the  
rim ~~or~~ or by the  
action of algae which  
has a longer or  
shorter interval in  
which to work. Probably  
by both agencies -  
contribute to the  
building up of the  
cornices -

On the margins of  
the cooler waters  
50° to 70° the living  
algal cornices grow  
& mineral matter is  
deposited or not as  
may be influenced by  
~~the~~ its presence in  
the water & the action  
of the algae in precipitation  
Dr.  
The important thing



to be noted is that the scalloped cornices are of the same form in ~~the~~ where they are formed of soft algal jelly-like matter - semi-mineralized or compact hard silicious sinter-like material.

It now seems that the algal growth controls the form taken by the sinter deposits whenever as laminated projecting cornices and as broad, laminated deposits.

The throat & aperture of active geysers that erupt frequently or in great force is formed of irregular bosses of compact silicious deposit with a <sup>thin layer of</sup> hardy silicious mud



coating the surface where the eruptions are not frequent. The deposition of silicious matter is mechanical in such geysers as "Old Faithful" The Grotto, Lone Star, Giant of the Upper Geyser Basin, and by aid of organic action about boiling springs, weak geysers, quiet pools & in run off channels where the current is water too swift (rapid.)

Deposition by evaporation occurs about all active geysers within reach of splashing or drifting mist from eruptions.



$$\begin{array}{r} 25 \\ 18 \\ \hline 240 \\ 25 \\ 32 \\ \hline 77 \end{array}$$

(187)



7-11-15

Photographed algal  
deposits in pool  
2 mi S. of Lantana  
hotel at angle  
in road where side  
road from Big Lantana  
geyser comes in

(77F)

Temperature 25°, Polywogs  
& water heaters in  
water. Profuse algal  
growth in various  
forms. At center  
where water appears  
to come up as a  
spring the algal growth  
is much like that  
on the flat slope  
of the Celestine and  
other of geysers & springs  
~~at~~ No mineral matter  
appears to be forming in  
this pond.



7-13-15

Lone Star Geyser

Cone built up by  
deposition resulting from  
evaporation after each  
eruption.