Hawaiian Volcano Observatory Record Book 1917

This volume is one of a series of record books compiled by the Hawaiian Volcano Observatory (HVO) from 1912 through early 1966. The pages for this volume were duplicated from an original set housed in the rare book room of the U.S. Geological Survey Library at Reston, Virginia (catalog number 220(950) H3d). Because the record books from the U.S. Geological Survey Library were tightly bound, scanning was not practical. Instead, HVO volunteer Andrew Hara photographed each page, using a tripod-mounted Canon 5D Mark II camera with 16–35 mm lens. The photographs were then delivered to HVO volunteer Ben Gaddis, who processed each of the photographed pages by cropping and by adjusting the exposure and contrast using a photo editing program. The pages for this volume were then combined to form this digital version of the record book. Quality control and posting was done by Tim Orr of the U.S. Geological Survey Alaska Volcano Observatory.

KILAUEA JOURNAL

HAWAIIAN VOLCANO OBSERVATORY

~~1914~~ 1917 -

U.S. GEOLOGICAL SURVEY
94006
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JOURNAL

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Date

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162 MH.

ABBREVIATIONS

A camera ..... Anderson
A ing. or A. ..... ingento A
Al V. or A.V. .... Al Vista
Alex ..... Alex Lancaster
aper. ..... aperture

B. ..... ingento B screen
B & J ..... Burke & James

C.M. ..... crag mass
cam. ..... camera
chan. ..... channel
C. camera ..... Century

D.K. ..... Devil's Kitchen
D.P. ..... double protar
Dall. ..... Dallmeyer
dist. ..... distance

E.S.S. ..... E.S.Shepherd
ex. ..... exposure
elev. ..... elevation

F.B.D. ..... F.B.Dodge
F.P. ..... focal plane
fum. ..... fumarole
F.C. ..... front combination Zeiss Anastigmat lens
ft. ..... fountain
f. or F. ..... F system of stops

Green Hg-CO_2 ..... Green mercurial with compressed CO_2
G. (camera) ..... Graphic
G. (screen) ..... Wratten G
Gl. ..... glycin
grot. ..... grotto

Hale. ..... Halemaumau
h.i. ..... height of instrument (5 feet when not specified)
hor. ..... horizontal angle
H.O.W. ..... H.O.Wood
H.V.O. ..... Hawaiian Volcano Observatory

I.H. ..... Instrument House
ing. ..... ingento
I.P.M. ..... I.P.Maydwell
I.P.J. ..... I.P.Jagger
Iso. or I. ..... isochromatic

Kil. ..... Kilauea
K2 ..... Wratten K2
K2 cel'id ..... Wratten K2 celluloid

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Hawaiian Volcano Observatory
Day Date

loc. ..... location
lev. ..... level reading
M.L. ..... Mauna Loa

N.R.H. ..... New Rest House
N.F. ..... New Faithful
no. ..... number
N & G ..... Newman & Guerdia
N.C. ..... non-curling

O.F. ..... Old Faithful
O.R.H. ..... Old Rest House

penin. or pen. ... peninsula
prob. ..... probably
pt. ..... point photographed or located
pl. ..... plate
pan. ..... panorama
P. (camera) ..... Premo
P. (film) ..... panchromatic
Q.P. ..... quarter plate

R. or rod. ..... rodinal
ramp. ..... rampart

stag. ..... stagnant
stalac. ..... stalactite
sta. ..... station
scr. ..... screen
spat. ..... spatter
S. pan. or S.P. ... Seed panchromatic
s.h. ..... stadia hair

t. ..... time
ther. ..... thermometer
temp. ..... temperature
tele. ..... telephoto
T.A.J. ..... T.A.Jaggar
Tech. Sta. or T.S. Technology Station hut at Halemaumau

U.S. ..... uniform system of stops
vert. or V.A..... vertical angle
vz ..... Zeiss 5x screen
V. ..... 5x screen
V.H. ..... Volcano House

wea. ..... weather
Woll. ..... Wollensak
W.P. ..... Wratten panchromatic
W.M. ..... Wratten M
W.A. ..... wide angle

X. ..... 10x screen
5xz ..... Zeiss 5x screen
3x ..... ingento 3x screen
Z.T. ..... Zeiss Tessar
Z. Ana. ..... Zeiss Anastigmat

JOURNAL

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Hawaiian Volcano Observatory

Day Monday Date January 1, 1917.

3:00 p.m. From NE station.
Lava 5 feet below banks of lake.

3:40 p.m. Overflowing. On the SE the flow ran to the wall and spread in both directions. A considerable flow on the NE.

4:30 p.m. From SE station.
Wide flow from NW arm to wall.

Alex.

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Hawaiian Volcano Observatory

Day Tuesday Date January 2, 1917.

3:10 p.m. From E station.
Lava 10 feet down. Little activity, some fountaining in N part of large pool.

3:35 p.m. Activity began in SE cove and SW arm. Large travelling fountains in latter going toward hole under peninsula down which the lava noisily poured.
The NW pond disappeared, leaving a large hole without visible glow.

Alex.

8 to 11 p.m. This afternoon, from 3 to 5 o'clock, cascade into chasm W end SW arm. This has been going on off and on since Dec. 31, according to Demosthenes.
From S station:-
At 8 p.m. and thereafter lake appeared much as of late. Rather low at arches W of S island and latter appeared very high.
From SW station:-
All was normal W and SW arm, but the arm had extended in a hooked cove into SW peninsula, merging with the enclosed pond at site of former blowing cone. Flames at NW pond and at high hole S side crag-mass.
From E and NE:-
Watched the N driblet cone spouting with "gobbly" noises, large orifice, spasmodic spurts and flings of melt. Occasional enormous fountaining areas develop in middle of lake and migrate SE. Flames from under skins. About ten fountains. N rampart grottoes active. Alex in last two days has taken parties to floor and made specimens NE. One glow spot N side of W wall pond. Not much glow N and SE floors.
At 11 p.m. the cascading into SW cove commenced again. Returned to SW station and saw inrush to SW cove which was a cauldron 30 feet in diameter and 20 feet deep, and whole end of SW arm sucked down into it with a roar and great incandescence and ebullition of gas. Gas bad SW. Same phenomenon as Jan. 1, 1915, but different place. Poured in like a waterfall, churning and boiling below.
Sharp crackling noise SE, and lake generally sinking and showing stalactite border.

T.A.J.

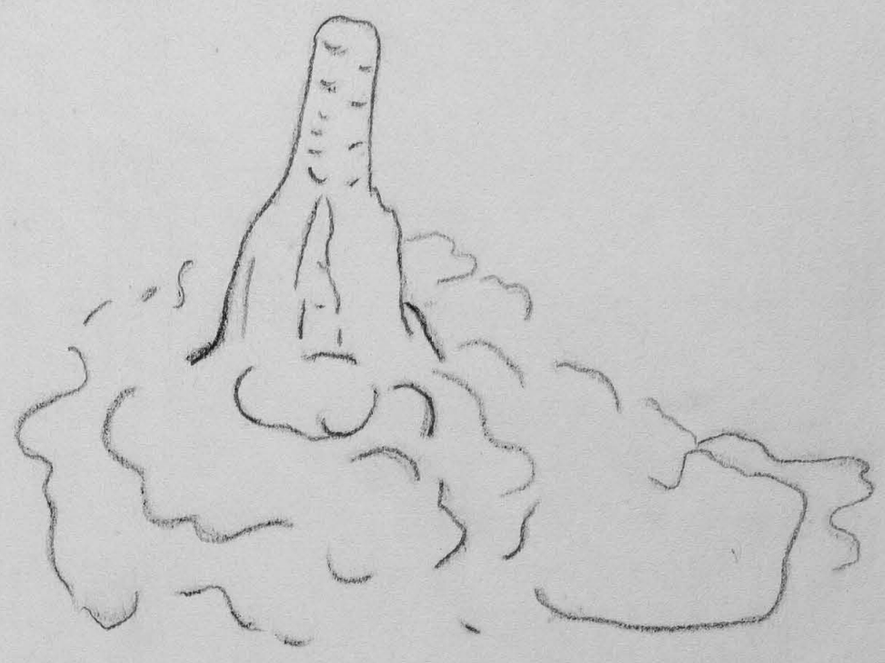
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date January 3, 1917.

11:00 a.m. From E station.
Lake two to three feet down. Eight to ten fountains. Southern region stagnant. Streaming N and out from NW arm. Most striking new feature was the driblet cone, now 20 feet high, with two pedestals side by side below and an arch through seen from N station.

A field of hard lumpy toes of pahoehoe around it.



Descended with Twigg Smith, artist, to floor by E gulch. Rock of E bench rather collapsible brown crusts, that of the fresh NE flow much more solid. Followed edge of this flow to N end E bench escarpment, then across NE flows to driblet cone, found lava toes there pushing out, incandescent, stiff spongy. On pressing a stick into the moving toes, the surface was covered with a glassy net membrane, stiff as leather and flexible. Underneath the orange hot melt was slowly flowable like very stiff porridge and full of vesicles. A fragment of it could be pulled out much like candy and broken away from the rest and handled for a few seconds when it became as hard as glass. Occasionally the piled lava would rend open on a crack and the slow melt within, fed by the crusted cone vent, would well forward sluggishly. No flame vent was visible on the cone. The rampart was smoking strongly with yellowish white fume over a grotto, but this fume was not very oppressive. The lake from 11:30 to 1 p.m. sank to 10 feet below inner rim. Walked out on rampart NE, at N end of E crag, and looked at lake surface 10 feet below. Crusts on lake three inches thick up-ended and foundered. Tearing skins with zigzag pattern along tears appear like a tearing rug several inches thick made of $\frac{1}{4}$ to $\frac{1}{2}$ inch fibre, ropy filaments forming and stretching continuously, part of the surface texture, as the blanket rends and the stiff gas-charged fluid below rises, stiffens and is drawn away so as to pull out the vesicles it contains.
Saw fountains vigorously throwing up umbrellas 50 feet away. The material much stiffer than it appears from above, coagulating and vitreous in the air as it is shredded and changes color to cherry red and purple, and falls as stiff rods only slightly flexible and as droplets wholly hard. What fountain gas eddied near us was not oppressive and not at all like the acrid intolerable blue fume above. Hot air waves were the principal things we noticed. The heat from the lava close to us was quite tolerable, though severe at times when fountains or tearing skins came near. Fume (bluish

white) from a crack back of the rampart was not disagreeable.
The rampart was covered with black, glossy, glistening glass lava, large splashes nearest the lake, openwork splashes and sticks of drawn glass next, say ten feet back from edge, smaller Pele's tears, often perfectly formed, twenty feet back from edge.
The lake surface showed bellying skins with gas beneath, up-folded crusts, and upturned crusts, but as a whole appeared level. The pounding in grottoes made no shake and little noise back of the rampart. There are more noise, heat and fume above.
Walked through the E valley to the SE floor. Found the crusts more treacherous and hot there. Great banks of half decomposed Pele's hair on the wall like rotten hayseed. Walked up on SE rampart. Lake pounding hard beneath and all along rampart farther S. No great inconvenience from fume but worse than NE. High broken face of SE dome on lake side. General smoky condition SE floor region.
Returning above, walked around pit S, SW, W and NW.
Double arch with southward streaming W of S island. Nothing new south. End cove of SW arm stagnant. High driblet cone with radial flows N side of W wall-pond. NW pond small and deep, cannot see bottom; large sulphur-stained flat cone SW of it crackling. Lumpy flows W from it and a long festooned flow S from its E side. No fresh flows from NW arm.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date January 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
		Down on NE floor and rampart, with Z.T. lens.							
11 a.m.	N end E bench	Looking NW	1	W P	8x	f/11.3	1/2	P	
to	NE floor	Driblet cone 100 ft. away	2	"	"	"	"	"	
1 p.m.	"	Same 50 ft. away.	3	"	"	"	"	"	
	N	" " " "	4	"	"	"	"	"	
	E bench	Crag-mass	5	"	"	"	"	"	
	NE rampart	Fountain 50 ft. away	6	"		f/6.3	1/100	"	
								T.A.J.	

7a

1917, Jan. 3



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2

1917, Jan. 3.



5



6

Jap

JOURNAL

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Hawaiian Volcano Observatory

Day Thursday Date January 4, 1917.

8:15 a.m. From E station.
Fresh floods of lava W, SE and N, sinking back from their highest level, crusting, cracking and foundering, three to four inch crusts. W floods back of SW bench nearly meet S flood moving westward from SE cove, meeting place under SW station.
Lake higher than ever around all the crags, which look low. Benches wider than ever. W driblet cone looks lower than yesterday and N driblet cone half submerged. Stalactites hanging in upturned edges of lava flows where crusts have collapsed, great balloon lobes, hollow inside, at end of flows. The NE flow across bench of rampart where we stood yesterday.
Descended to floor and photographed.

Noon. With Alex, Joe Moniz and Mr. Stotts, went out to end of E bench, crossed hard but hot surface of new flow of four hours before, to rampart E side of N cove; thrust a 12-foot long 1-inch galvanized iron pipe into lake at about 45° with an iron solder pot on the end of it attached with heavy wire. Immersed five feet of pipe and pot in glow edge where streaming moved by. Very stiff and resistant in lifting pipe.
First attempt struck pot on carrying the covered mass away and broke off lava shell. Returned and immersed twice more so as to cover pot completely and carried the whole mass back. Pot to be shipped to A. L. Day, Geophysical Laboratory, for gas tests. Noted <u>flame</u> burning around pot on first emersion, yellow flame burning several seconds. Not on second and third emersion.
Sent Alex and Joe back to H.V.O. for box and excelsior so as to box the specimen on the floor before carrying it up the cliff.
Lake falling from 11 a.m. to 12:30 p.m. when the inrush cascade to SW cove began with same violence as two days ago. Cascade stopped at 1:45 p.m., lake rising.

1:45 p.m.

2:15 p.m. Started cascading again. Seven to ten fountains.

2:50 p.m. Cascade stopped again.

8:30 p.m. At this time the cascade was again pouring down.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date January 4, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
8 - 10 a.m.	E	N	0					
	S	SE	0					
	E	Top crag-mass	49 15	2 53	+16	806	35	
	S	" " "	76 57					
	E	Central promontory.	57 18	9 47	+15	611	102	
	S	" "	66 51	9 00	+11	625	96	
	E	Lake under W knob N rampart	28 20	7 56	+18	793	105	
	S	ditto	64 20					
		Height of crag-mass	64 ft.					
		Depth to promontory	101 ft.					

			no	pl	scr	stop	ex	cam
8-10 a.m.		N and S floors covered with fresh lava cracking and foundering to the E gulch talus.						
	E bench	Crag-mass. Same as yesterday. (Cloudy)	1		8x	f/11.3	½	
		Trail down. "	2		"	"	"	
		N rampart. (Sunny)	3		"	"	"	
		S island (overflow) (sunny)	4		"	"	"	
		Cracking & foundering NE flow.	5		"	"	"	
		ditto	6		"	"	"	
		Stotts photographed operation of filling pot with lava.						

T.A.J.



2



3



4



1

Fog

1917, Jan. 4

1917, Jan. 4.





6

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date January 5, 1917.

2:00 p.m. Lake high, up and down -- one to two feet. Fresh flows moving SW from W pond region. Flows SE and NE new but not very hot. SW cove quiet from 2 p.m. to 4 p.m. River streaming in SW arm. Five or six fountains. Blowing at N rampart.

4:20 p.m. Overflows from cone NW adjacent to NW pond, from NW arm, from E side N rampart and from SE cove.
NW cone spouting "artesian" fashion two steady liquid domes side by side 10 feet high, great festooned flows southward, partition between. NW pond a crusted depression. Glowing toes moving along wall crack NW and SW. NW arm broad flow N and E to and around N driblet cone. E flow across space where we had walked just before between N end E bench and NE rampart.

5:30 p.m. Lake sinks three feet; sharp glow outline appears with stalactites. NW "artesian" subsides to an oven. Flows cool. Violent and very large fountains start N, SE and SW. Tremendous emission of gas from under lake skins along N rampart and SE rampart throwing spray high and hissing, with puffs of blue fume. Spatter bench falls SW and others later.
During the overflows the lake was quiet. Query -- Is the gas pressure during overflow expended in the <u>expansion</u> of the flows and during rise in <u>expansion</u> of the column, hence quiet and crusted condition? NW arm, W arm and SW arm evenly covered with skin and no fountains on the ramparts during overflow. Some central fountains. The "artesian" flow also quiet and no sputter; but at end violent spray and spurting and violent continuous fountains in the lake. This may mean loss of heat and tendency to <u>crust deeply</u> during stages of overflowing: when the expansion is relieved and settling back occurs, the gas expended in even vesiculation during overflow, gathers in large blisters under the crust and escapes explosively, causing the prolonged fountaining.
Blue flame still playing S side crag-mass on wall. Flaming pot end SW cove. Drip of glowing lava under overhanging skins from bench into lake at head of W arm, this the back flow from large pool in W pond region. During high stand the W and SW arms were merged and obliterated at their heads.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date January 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
2 p.m.	S	W (windy)	1	W P	8x	f/8	1/5	P
	S	N "	2	"	"	"	"	"
	NE ramp.	Fountain	3	"	"	"	"	"
	"	"	4	"	"	f/6.3	"	"
	"	Crag-mass	5	"	"	f/8	"	"
	"	S	6	"	"	"	"	"
								T.A.J.

1917, Jan. 5.

bot

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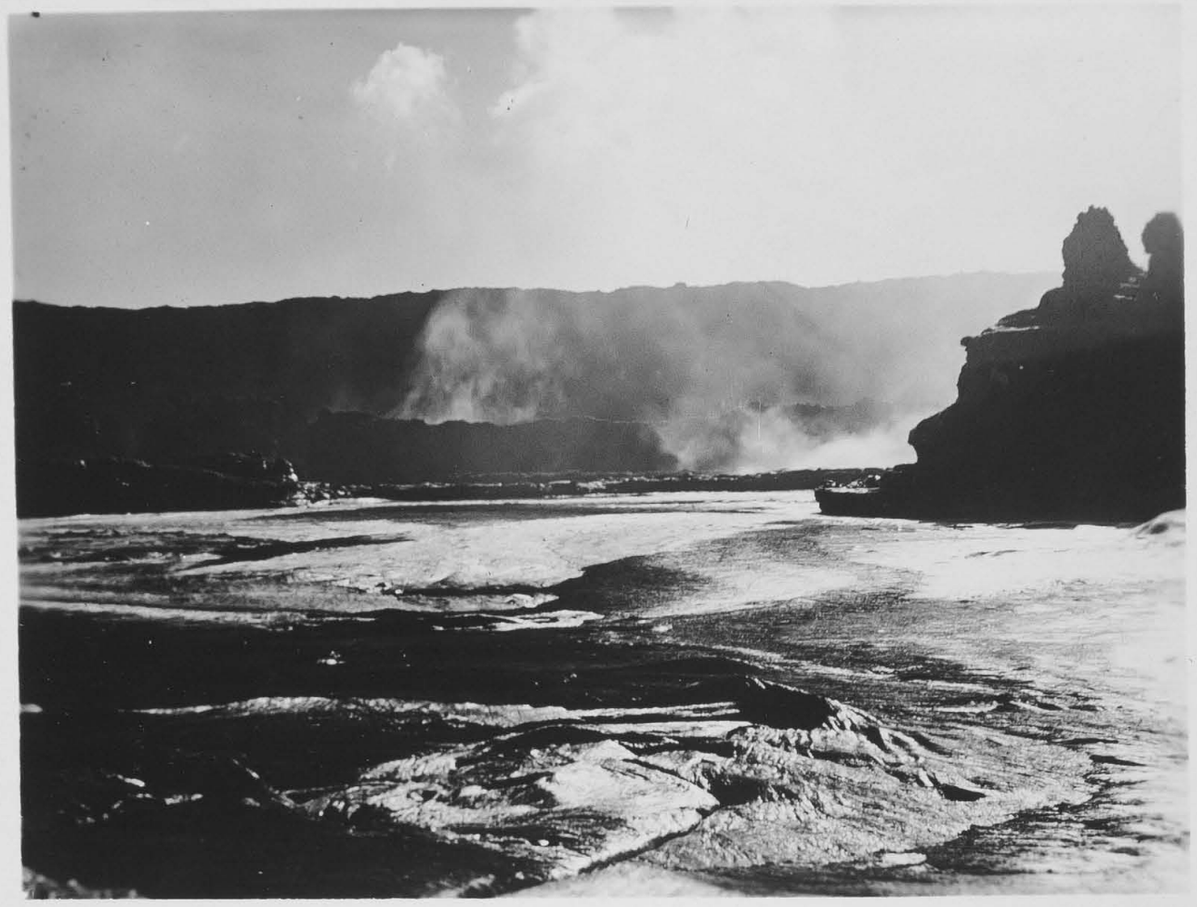
2



1



1917, Jan. 5



5



6

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date January 6, 1917.

From E station.

2:30 p.m. Banks five feet high. Fountains in different parts of the lake. Noisy.

2:40 p.m. A fresh flow from the small E cone could be seen, wide and long.

Alex.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date January 7, 1917.

8:15 a.m. Fresh glowing flows N and SE, toes in motion SW. Lake 5 to 8 feet down. Occasional mild inrush SW described last night.
With Alex, Joe Moniz and Twigg Smith put rope ladders over wall W niche. Wind NE, rather fumy there. Short ladder above attached to piece of piping behind 1894 rampart. 50-foot ladder below attached to rock crags. All descended to NW floor just W of the morning's flow. Two cones W wall small glowing and hissing orifices. Large cone S end NW pond with glowing "doughnut" hole three feet across in summit. NW pond a crusted slight depression. Crossed to crag-mass, 200 feet to S of large cone, climbed crag-mass by gentle tilt-slope northward, then climbed N aspect of summit knob to extreme summit. Made panoramic photographs there. Returned making other photographs. Fumes occasionally bad from N cove fountains but mostly good air on crag. Bad fumes to leeward of NW cone. Flaming gas-cracks in the NW and W cones -- look favorable for gas-collection.
No great changes in lake. Driblet toes building around N cone. Churning lava under NW and W cones.

11:00 a.m. Descended E gulch with large party. Lava hot but traversible, close under E station. Went to NE rampart. No change in aspect of lake. This flow of 7 a.m. this morning. Six to eight fountains.

1:00 p.m. Slight inrush SW

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Sunday Date January 7, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

PHOTOGRAPHS.

(Z. T. lens)

8 a.m.	Sum. of crag	NE	1	W P	8x	f/11.3	½	P	
	"	SE	2	"	"	"	"	"	
	"	SW	3	"	"	"	"	"	
	"	W	4	"	"	"	"	"	
	"	N	5	"	"	"	"	"	
	"	NW	5a	"	"	"	"	"	
	Center of crag	N	6	"	"	"	"	"	
			no	pl	scr	stop	ex	cam	
to		Party on crag-mass S	7	"	"	"	"	"	
		" " " " NW	8	"	"	"	"	"	
		" " NW cone	9	"	"	"	"	"	
		" " lower ladder	10	"	"	"	"	"	
		" " upper "	11	"	"	"	"	"	
		Large party foot E trail	12	"	"	"	"	"	
	E of SW	SW cove	13	"	"	"	"	"	
	"	Crag-mass	14	"	"	"	"	"	
1 p.m.	"	NE	15	"	"	"	"	"	

T.A.J.

1917, Jan. 7



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1917, Jan. 7.

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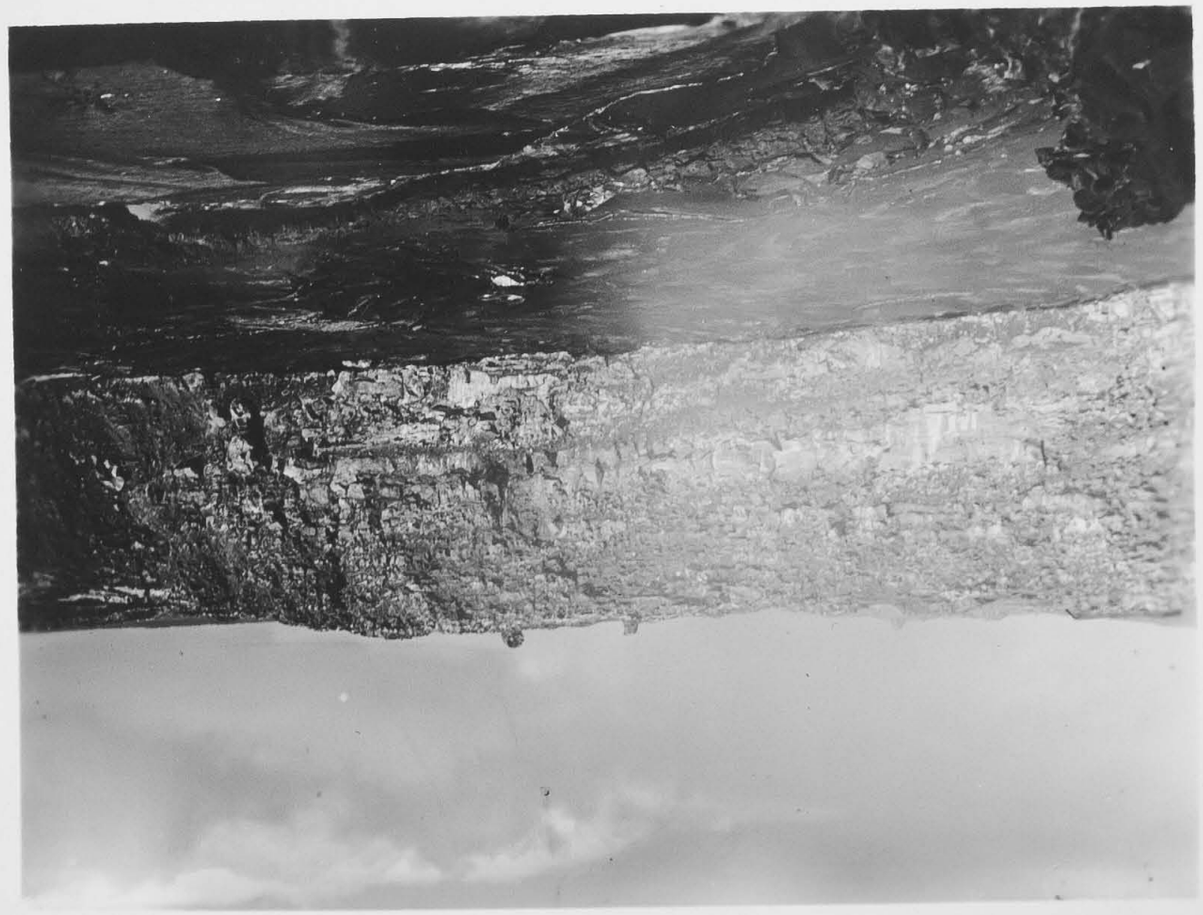

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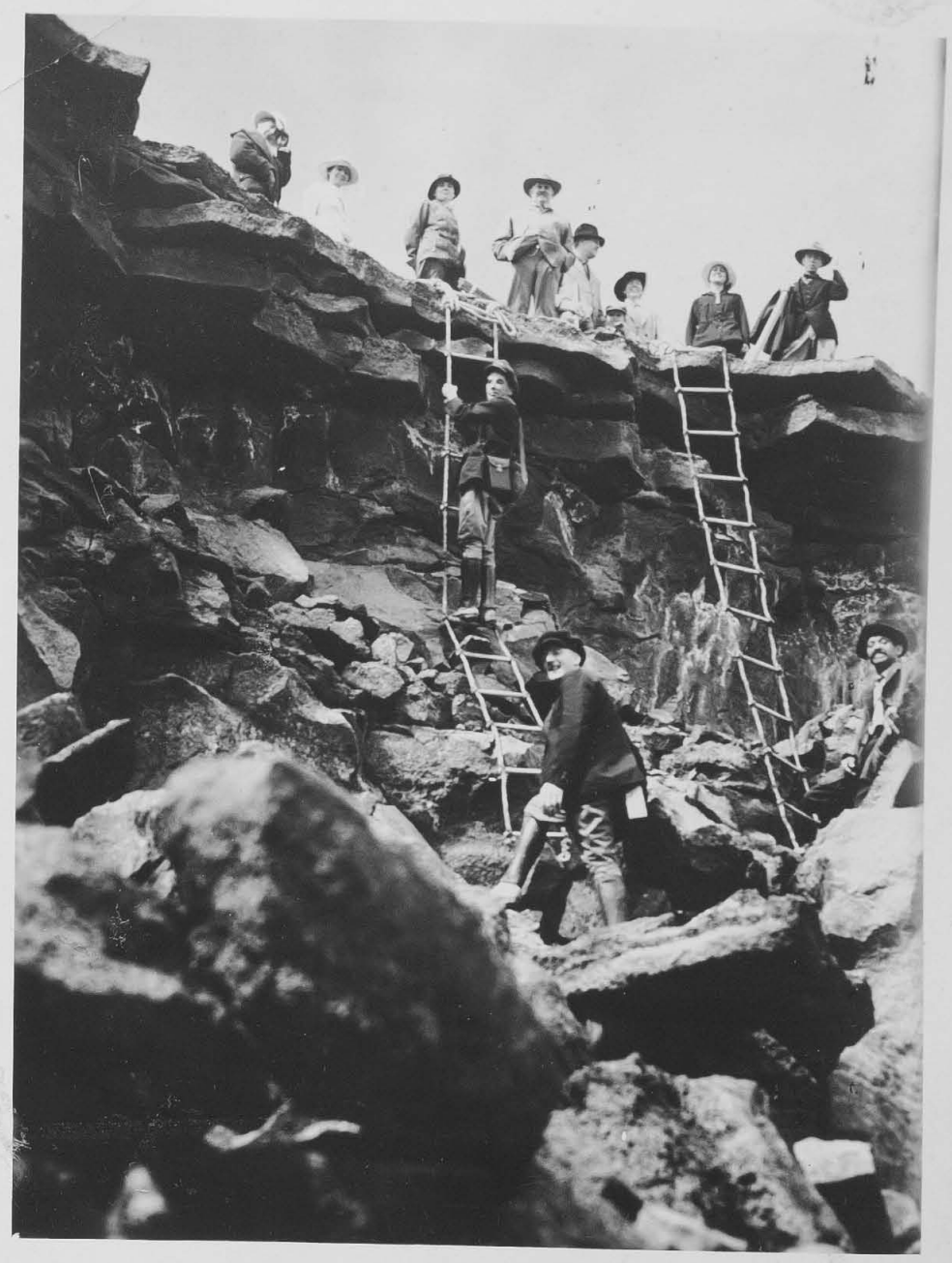
1917,



9



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8



10



12



13



14



15

Jag

1917, Jan.)

23

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date January 8, 1917.
Tuesday " 9, "
Wednesday " 10, "

Jan. 8.

9:00 a.m. H. O. Wood descends ladders W niche to collect gas W cone. With Alex and Joe. Breaks off cone nipple to enlarge orifice and lava spurted out and sealed orifice. NW cone quiet. No gas collected.

10:00 a.m. With Thurston and F.B. Dodge, I descended E gulch and walked around NW floor to opposite NW arm. Met Wood there. At N driblet cone fresh hard lumpy pahoehoe field, occasionally flowing in spots and fed from cone which is low and hissing flaming gas, through a slit (vertical) lined with shell driblets and the orifice yellow with sulphurous sublimate.
Lake this day 2 to 5 feet down. Five to ten fountains, great activity SE rampart. Wind southerly; fume on N bench in consequence.

6:00 p.m. Many flames. Occasional rapid streaming SE, inrush SW. Flow from N driblet cone spreading far to E. Flames and filagree S side crag-mass, NW cone, cone at head NW arm, and S rampart. Small open pool, blistered skins at W wall pond, grotto cavern over its N end which is quiet, but with glow light within. Heavy spraying up 60 feet at times in end of NW arm, at N and S ramparts. Inrush SW mild, not a cascade. Some fall of spatter banks. Lake generally low. Flames over grottoes. A low roar from direction of SW peninsula, apparently gas from under skins.

Jan. 9. Flows seen, lava high.

Jan. 10. Lava retains high levels. Glow NW cone and in flows around N cone.

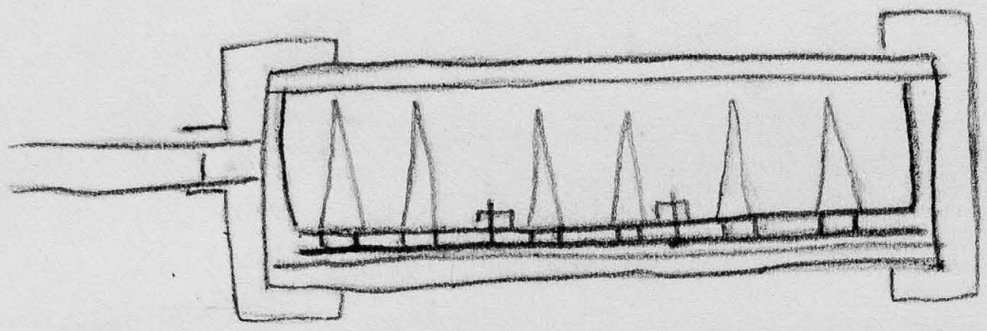
T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date January 11, 1917.

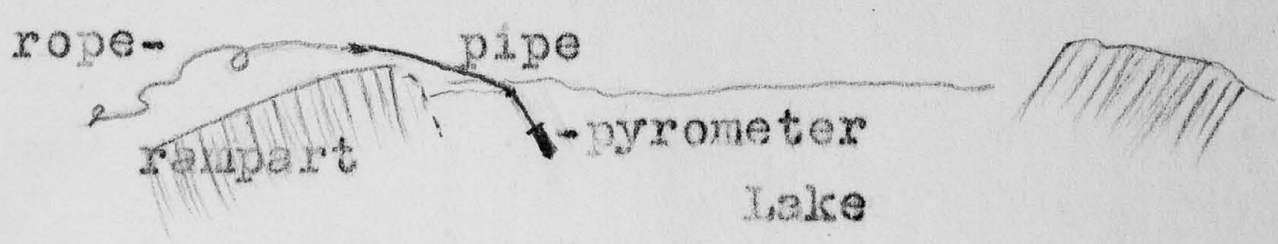
9:00 a.m. E station.
Lake brimming level with ramparts. Four or five fountains. Recent flows small. Considerable recent field around N cone. N cone still about same low cone.
With Thurston, Twigg Smith, Horace Johnson and Joe descended to NE rampart to make temperature test at lake surface with Seger cones.
Set of six cones in iron plate fitted in 4-inch cylinder of iron sealed with screw cap at lower end, bushed to fit 1-inch galvanized iron pipe at upper end.



20-foot length of pipe used with rope to pull it out.
Cones used were

08 (990° C)	06 (1030°)	04 (1070°)
02 (1110°)	01 (1130°)	1 (1150°)

Flows began just as experiment was started NE and SE, three of them E and NE, the one farthest NE flowing for 20 minutes and about 100 feet.
Thrust apparatus for one minute into this flow and for five minutes thereafter into the lake over rampart.
While in lake, by working pipe back and forth, gas escaped from lake past pipe and burned with brilliant zinc flame greenish-yellow depositing zinc oxide, yellow while hot and white when cold.
Pipe inclined only about 20° but a sharp bend formed at point of emersion and of the flames, so that the lower straight three feet of pipe were bent about 50°, and the pyrometer cylinder hung nearly vertical downward from the border crust of the lake. Beyond the pipe the lake was streaming slowly to the NE overflow; between the pipe and bank was a thin flexible crust.



The pyrometer cones were immersed in the lake approximately three feet down.
Apparatus was withdrawn with some difficulty by five men pulling on rope and cylinder emerged encased in a few inches of lava. This was all carried back, cooled and lava broken away. Some hammering on cylinder cap with

cold chisel resulted in breaking three of the cones, but none were even partially fused. The most fusible, #08 (990°C), was quite unsoftened.
The pipe was straight on both sides of the bend and the bend took place just where the gases oxidized. This softening of the iron where the gas flamed, and the temperature below under 990°C, suggests that surface oxidation flames may be much hotter than the lava and that where incessant gas oxidation is promoted in the grottoes and fountains, the lava may be locally hotter and less viscous owing to oxidation heating.
Query:- Is oxidation more complete on Mauna Loa, hence aa? The inside crusts, hence the last crystallized crusts, of the recent pahoehoe flow NE on Halemaumau floor, are true aa surfaces. Can this mean that aeration produces aa? The aa fragments of Kahuku, May, 1916, were intensely oxidized.
The heat waves blown across fresh pahoehoe flows on Kilauea floor have no sulphur smell. The hot fume on the rampart is without much sulphur smell. The white smoke from the NE bench is not disagreeable and has little sulphur; it resembles the Postal Rift.
The blue fume above the pounding grottoes, on the other hand, is full of intolerable SO_2. Does not the S oxidize at the lake surface by flaming and become noxious only then? There are hundreds of bursting bubbles where a flow departs from the lake but these do not generate SO_2, either as visible fume or perceptible odor. Is the same true of CO and H? And is oxidation partial?
Flows stopped at 9;30 a.m., lake sank 6 feet, then recovered 3 feet.
Tried throwing logs of ohia cordwood into the lake. The first was thrown NE rampart while the lake was overflowing and there was little fountaining. Result abundant wood flames puffing through lava and some ballooning of surface, but almost nó fountaining. Flames yellow.
Second time was after subsidence and during temporary rising. The flames again appeared, then one or two puffs of smoke, then a fountain which spattered thick pasty lava over the bank for several minutes. Apparently the wood started gas oxidation and this was continued by release of gas confined under the surface. Apparently gas inflation expended in overflowing oxidizes less than when expended in fountaining. The wood did not float up but burned under the surface.
Saw several flames from under crusts which appeared reddish in daylight. The flames in various places have now been called yellow, green, blue, red and violet. Evidently they are various and worthy of spectroscopic work.
There was no apparent change in general character of lake this day. Very large half-dome grotto SE, with active fountaining. Occasional heavy fountaining N and swift

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date January 11, 1917.

streaming W at bend near S island.
Bonine joined party on floor and took 200 feet moving film.

T.A.J.

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Massachusetts Institute of Technology

Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Thursday Date January 11, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
9 a.m.	E ramp.)	Fountain W	1		scr.	f/8	1/30	Goerz Stereo
	"	" N	2		"	"	"	"
	E pt.	" SE grotto	3		"	"	"	"
		Seger cone cylinder and party	4		"	"	"	"
		ditto with T.A.J. (taken by T.Smith)	5		"	"	"	"
		T.A.J. on rampart	6		"	"	"	"
								T.A.J.



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6

Jag

1917, Jan. 11

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date January 12, 1917.

9:30 a.m. Wind SW. Clear. Bonine photographing.
Lake 6 to 10 feet down and subsiding. Inrush starts to SW cove, churning in grotto. Swift W current SW arm. Three to five fountains, mostly in grottoes. Streaming as usual out from W arm then N and S. Stream S through the two arches W of S island. Sluggish pile pahoehoe making toes over site of W pond. Heavy bombardment occasionally NE grotto and SE grotto in ramparts. No fresh overflows since yesterday. Two heavy falls of spatter bench SW. Cone and crusted pit NW pond. Two stained cones N of W pond pile.
Lava turned and rose up to 1 p.m. Nearly brimming NW arm. Two to four feet down middle to SW.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date January 12, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30 a	S	N	0					
	SW	S	0					
	S	NE grotto	1 42	6 07	+19	878	87	
	SW	" "	69 3					
	S	N summit S island	-10 24	6 14	+17	363	38	
	SW	" " " "	33 52					
	S	SE cove	-38 28					
	SW	" "	23 46					
	S	Summit E crag	-29 00	3 47	+18	588	35	
	SW	" " "	38 20					
	S	Central promontory	18 2	7 56	+14	623	84	
	S	Summit crag-mass	28 58	1 53	+12	807	22	
	SW	" " "	89 2					
	S	SW cove	48 54					
	SW	" "	74 6					
	S	Summit SW crag	61 26	9 8	+11	268	42	
	SW	" " "	12 48					
	S	SW splash	57 58					
	SW	" "	39 32ca					
	S	S tip S island	-25 51					
	SW	" " " "	27 53					
	S	E peninsula	-10 00					
	SW	" "	48 43					
	S	Pt. E side N cove	- 0 32					
	SW	" " " " "	58 58					
	S	Head W arm	46 41					
	SW	" " "	93 6					

Lake depression 87 feet.
Height N summit S island 49 feet.
" summit E crag 52 feet.
" " crag-mass 65 feet.
" " SW crag 45 feet.

T. A. J.

			no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Monday Date January 15, 1917.

Noon to 3 p.m. Lake rising and falling two to six feet. Fresh avalanches NE wall and strong rising of S end of E crag is indicated by crevasses and uplift. Lava piling up W and NW floors. N cone buried under a smoking tumble of crusts.
With Thurston, Palmer, Smith and Alex to NE rampart. Immerse cylinder three feet down in lake with Seger cones 770° to 990° C eleven minutes. None were fused. Possibly the congealed lava on end of pipe acts as a non-conductor to prevent heating in the allotted time. Cooling curves (1st and 2nd tests, see accompanying notes) taken in bucket of lava with Bristol portable pyrometer. First test with terminal of thermo-element encased in iron pipe. Dipped bucket of lava and took temperature every five minutes. The galvanometer did not respond quickly and reached maxima of 335° C and 420° C only, the second with element uncovered (not using pipe). The second cooling curve was taken on the lower of the two scales on the galvanometer. On breaking away the lava around the terminal after this second test, found a large bubble there, the lava in part not touching terminal and probably allowing circulation of air and so vitiating result.
Tried direct temperature of liquid lava at edge of lake with uncovered thermo-element. Took about 1½ minutes for reading to come to stationary position of galvanometer needle. (Notes).
The readings 910° C and 850° C, allowing 100° additional for high temperature of air at cold junction (1010° and 950°) check perfectly with Shepherd's and Daly's results of 1909 and 1911.

Evening. Lake seen overflowing strongly on the south and an avalanche heard at the east.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Monday Date January 15, 1917.

ACTUAL FIELD READINGS COOLING CURVE.

First Test.

Time.		Temperature.
12:08¼ p.m.	72 seconds in lava.	
12:12¼		335°
12:13¼		330
12:18¼	Loss 25	305
12:23¼	20	285
12:28¼	25	260
12:33¼	20	240
12:38¼	45	195
12:43¼	65	130
12:48¼	30	100

Loss 22° each 5 minutes first 20 minutes.
The 22° double and triple loss next 10 minutes.

Second Test.

12:58		
1:03		420
1:08	Loss 70	350
1:13	115	235
1:18	65	170
1:23	45	125
1:28	40	85

Loss 83° each 5 minutes first 15 minutes.
42° " " " next 10 "

(Unreliable because bubble around terminal.)

NOTES TEMPERATURE MEASUREMENT LAKE:- (2 p.m.)

Bristol pyrometer, terminal bare, in edge lake about 6 to 12 inches in glowing lava - molten.
1st test went steadily to 910°, very slow 750° to 910°.
2nd test. After 30 seconds 750°. Slowly to 1 min. 15 sec. total reached 850°. No change after 10 sec.

T.A.J.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Monday Date January 15, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
		Fountain.	1	Seed L Ortho	scr	f/9	1/30	Goerz	
		Men with pyrometer.	2	"	"	"	"	"	
		Fountain, looking along rampart.	3	"	"	"	"	"	
	E pt.	W arm (ballooning skins)	4	"	"	"	"	"	
								T.A.J.	

1917, Jan. 15.



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4

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date January 16, 1917.

Lake rising and falling all day two to three feet. At 4:15 p.m. heavy overflows whole S rampart and N side NW arm, to 4:45 p.m.
Went close to large blowing-cone and blowing grotto in end NW arm. Blowing-cone spurting lava and flame, afterwards flame only from summit orifice eight inches in diameter. During the overflow a filagree glowing heap developed at N cone locality. Heard deep boom occasionally from rising E crag. This crag and the adjacent flows in SE wall valley had been lifted 12 feet within a few days, keeping pace with the upbuilding of the SE rampart. The cascades over the rampart in afternoon filled up the wall valley.
Small avalanches were falling during day from 1894 bench. Eight or nine fountains. Readjustments in base of E gulch, in tumble of bowlders there, have buried a coil of rope left there. Ramparts before the overflow very high and wall valleys NE and SE low. NW and W, however, there were high piles of fresh pahoehoe against the wall.
Saw a balloon of skin 30 feet long blown in middle of N cove. It burst at the end revealing a glowing cavernous space within, then it slumped.

Put a low-fusibility series of six cones in cylinder in lake at E cove (590° to 870° C), N of E point. Left the apparatus in 30 minutes. The skins wrinkled up against the shore and the lava solidified around the pipe, so that it became impossible to withdraw the terminal cylinder containing the Seger cones. The pipe was red hot where it entered the crusts; by twisting pipe above it became broken at glowing part.
Before breaking it one could hear the noise of the bubbling lake distinctly by placing the ear at the upper end of the pipe. There was then no air current in or out of opening.
After partially tearing the pipe at the hot junction with the lava, the air entered the upper end of the pipe and oxidized the zinc of the galvanized lining with strong yellow-green flaming at the break, which played in pulsations for five or six minutes. The pipe was twisted off at this break and preserved. It became softened by bright red heat, but except for the zinc flame there was no great evidence of gas burning or acid corrosion.
This loss taught that it is important to select a streaming glow edge of lava for pipe immersions.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Tuesday Date January 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
	E pt.	Fountain SE cove.	1	W P		f/6.3	1/30	P
		Pipe anchored by ice-axe.	2	"		"	"	"
		Pipe caught in skins.	3	"		"	"	"
		Infolding skins and fountains.	4	"		"	"	"
		Fountain. (blurred)	5	"		"	"	"
		" under E pt.	6	"		"	"	"
		Snap shots.						T.A.J.

1917, Jan. 16

b-24

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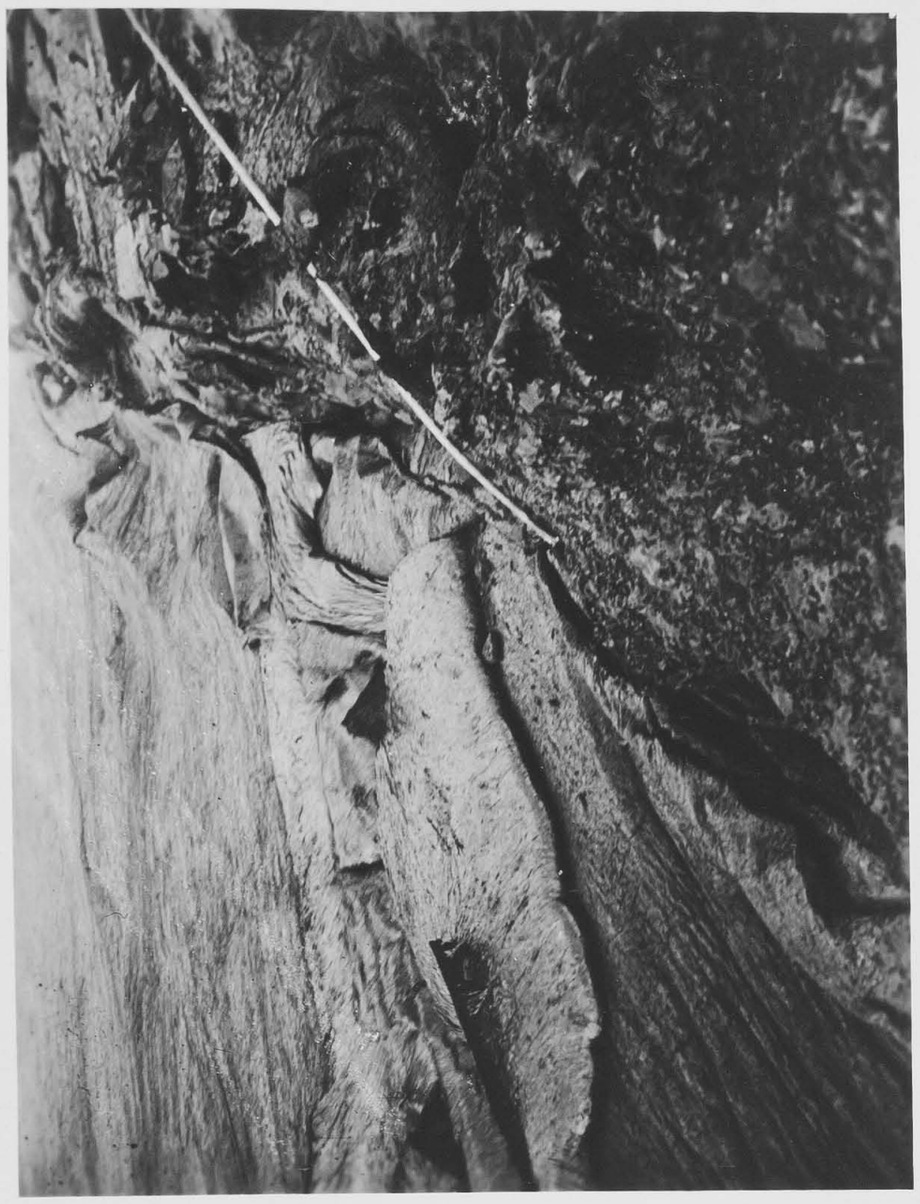
1917, Jan. 16.



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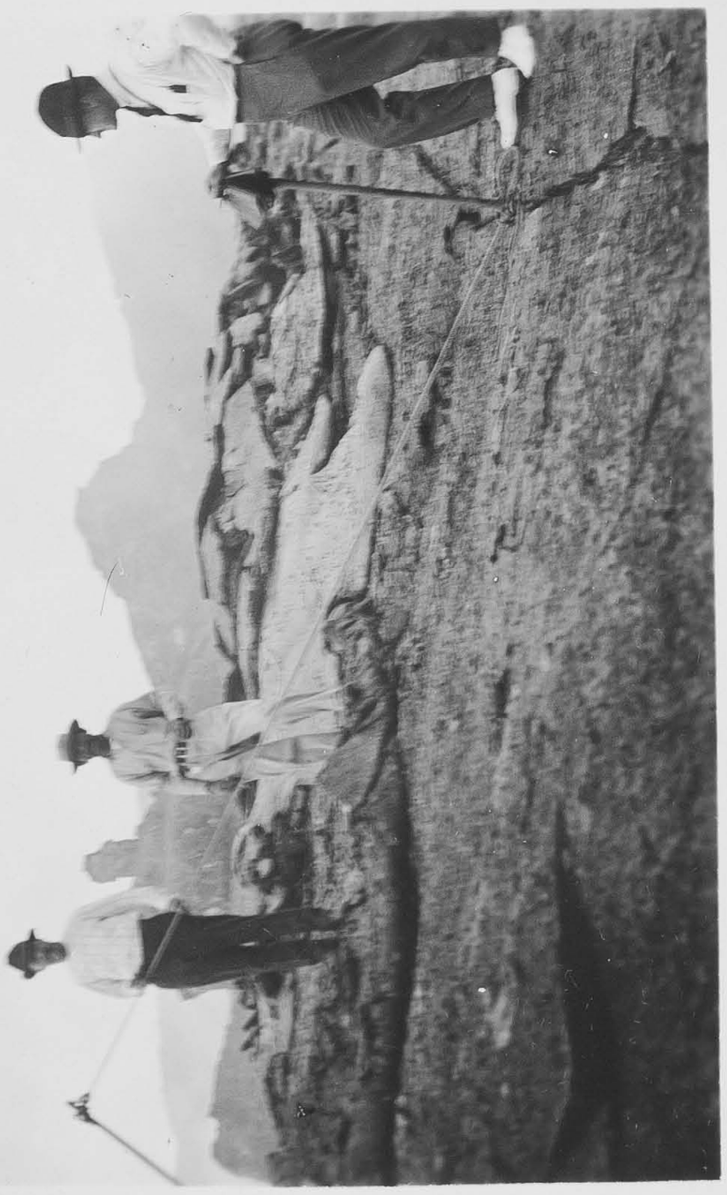

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Wednesday Date January 17, 1917.

11:00 a.m. From E station.
Lake overflowing NE almost reaching wall under NE station.
Many large fountains SW and in N arm.

3:40 p.m. Flow from small N cone in action at this time. Lava in lake about 10 feet down on all sides.

Alex.

Evening. Artesian flowing N and NW.

T.A.J.

JOURNAL

41 Massachusetts Institute of Technology
Hawaiian Volcano Observatory

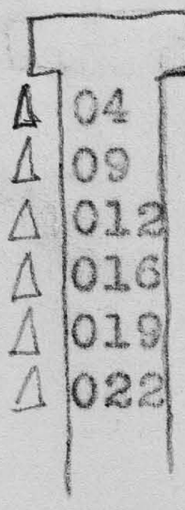
Day Thursday Date January 18, 1917.

10:30 a.m. Seger pyrometer. NE point of rampart. Cones in coil of steel in 1-inch pipe. Cones with tips downward 30°. Forty feet of pipe.

12:02 p.m. Put pipe one foot above lake to heat.

12:32 p.m. Thrust 8 inches of end of pipe into lava. Lava here 10 feet below rampart. The current caught the end and strained the pipe so that it parted at the screw joint. Fortunately it was wired and the whole apparatus was immediately recovered. The end was covered with lava 8 inches down.

The cones were:-



Hence temperature as expected between 870° and 970° C.

Immersed second battery same cones reversed order with single length pipe in valley between two great spatter domes NE (farther N than last).
Annealed in air about twelve inches over lava from 12:53 p.m. to 1:20 p.m.
Then immersed, but current took pipe and crusts clustered on it and pipe was bent strongly. Removed it after three minutes. Results unsatisfactory; cones blackened but not fused and large lump of lava around end of pipe.

Lake low on this day, 9 to 11 feet down. Lava toes moving on N bench. Flow from region of N cone but no cone seen. Fresh flows NE and SE. Large new spatter domes NE, one very high (15 feet). Currents strong. Five or six fountains. E crag still rising and displacing by uplift the bowlder heap at base of E gulch.

T.A.J.

+2

Massachusetts Institute of Technology

KILAUEA DAY SHEET

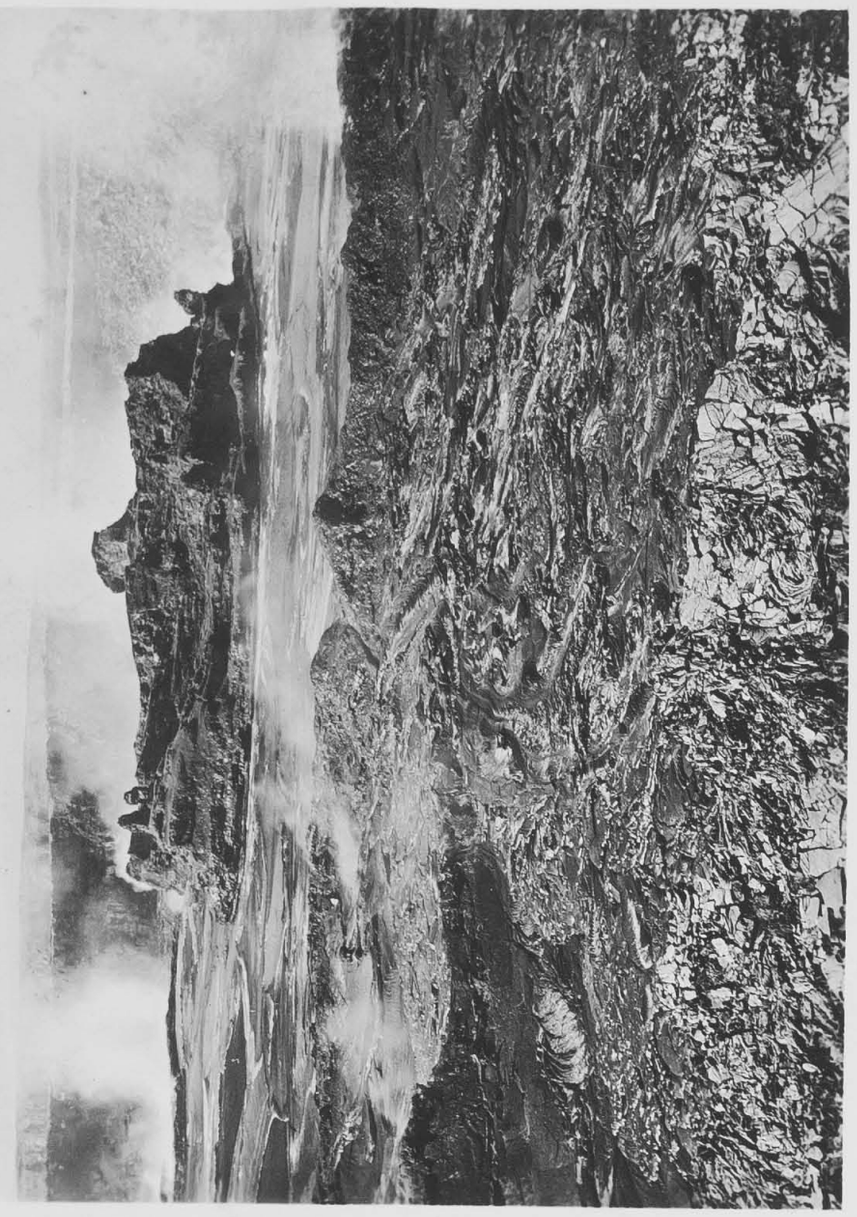
Hawaiian Volcano Observatory

Day Thursday Date January 18, 1917.

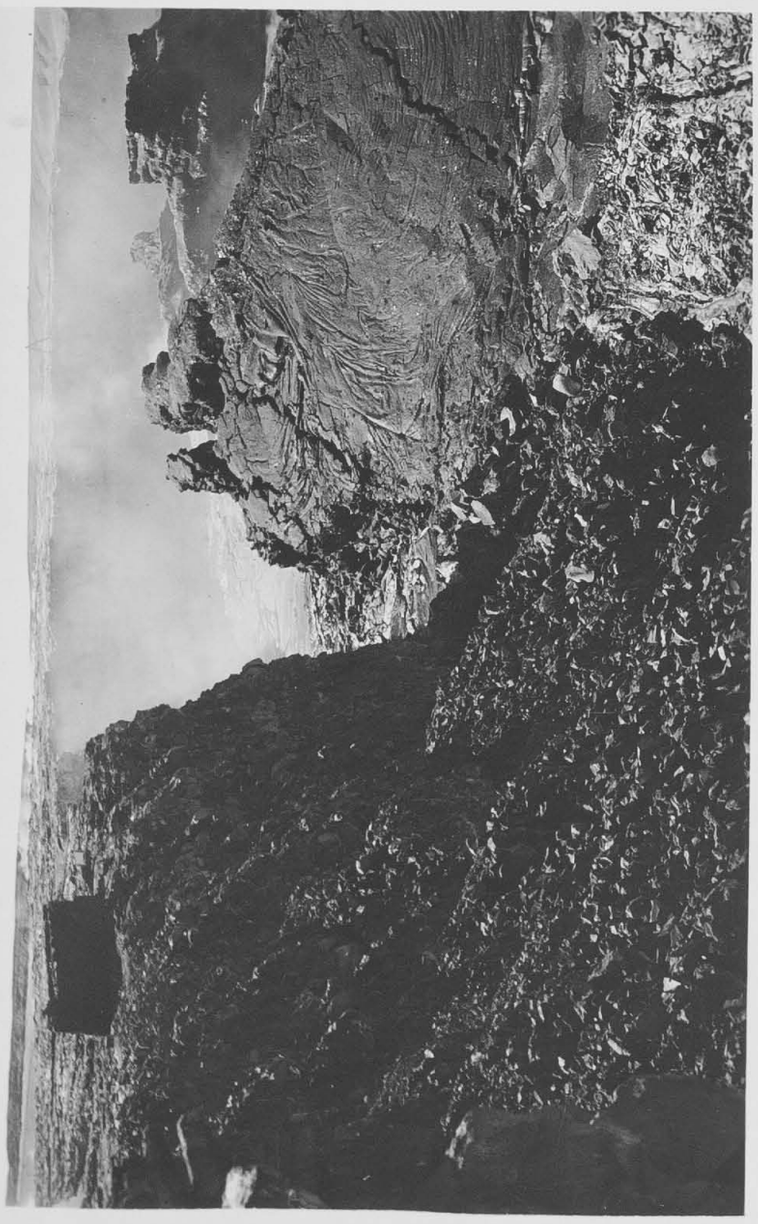
t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10:30a	NE half-dome on rim Hal.	S island.	1	W P	3x	f/16	1/3	P
	"	Crag-mass	2	"	"	"	"	"
		Fountain in NE grotto niche	3		"	f/6.3	1/25	"
		Channel between spatter domes.	4		"	"	"	"
	N ramp.	Fountain, looking S.	5		"	"	"	"
		Alex with Seger spiral coil.	6		"	"	"	"
								T.A.J.

1917, Jan









1917, Jan



5



6

Jag

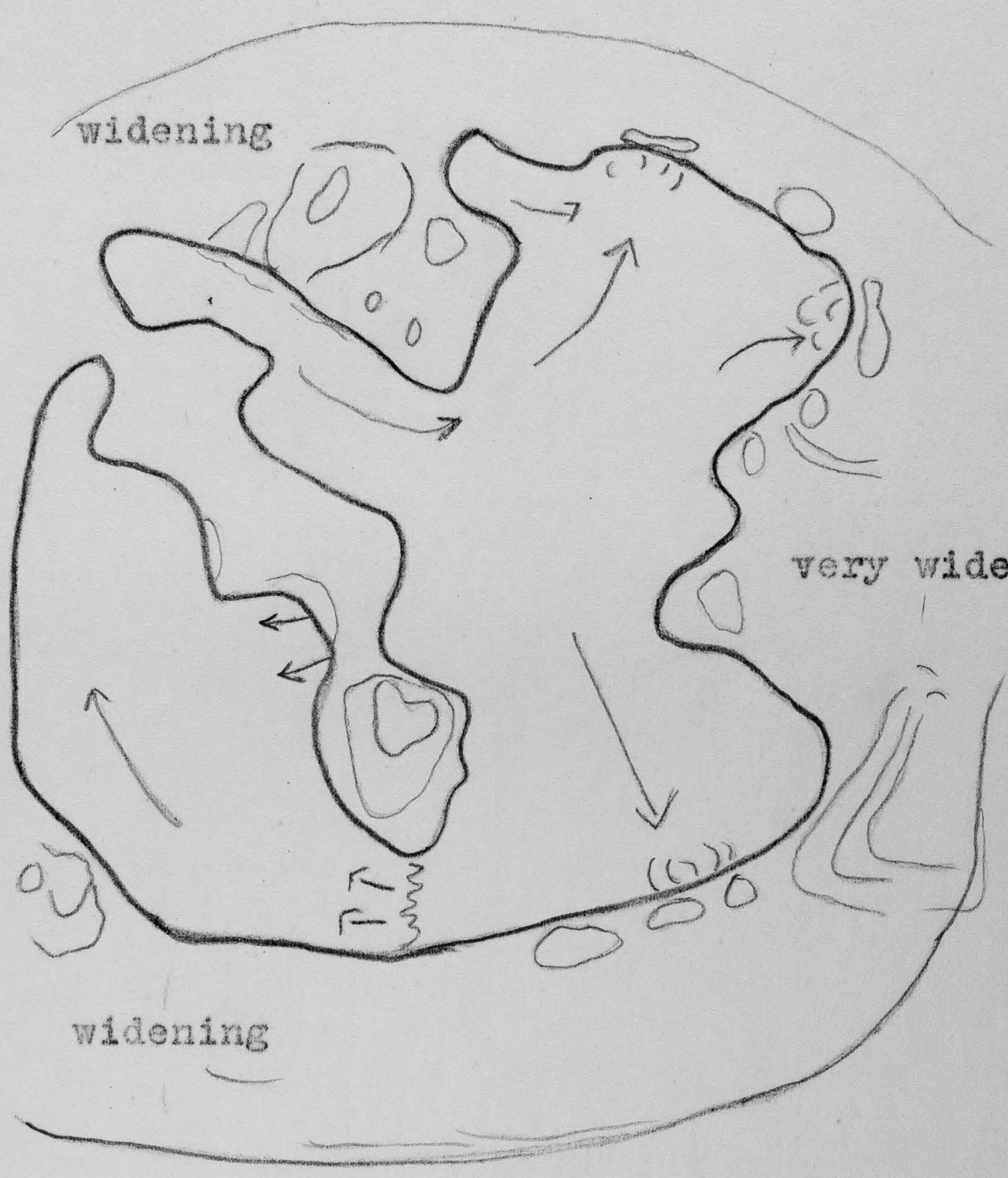
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date January 19, 1917.

10:30 a.m. Five or six fountains. Increased tilt crag-mass to W. Lake rising from 10 feet down to 5 feet down. Wind SW. Streaming as usual. Striated and wrinkled skins. Fresh tumble of very large blocks from wall between S and SW. S pinnacle raised and large crevasses near it. No very fresh overflows. Big pile of fresh pahoehoe in SW wall valley of recent origin.

From SE:-



1:00 p.m± Overflows.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date January 19, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:30a	SE	E	0					
	S	SE	0					
	SE	Summit E crag	28 24	4 14	+24	204	27	
	S	" " "	18 14					
	SE	Tip E pt.(lava level)	57 38	11 00	+19	356	67	
	S	Out of sight.						
	SE	Central promontory.	75 7	6 23	+13	634	68	
	S	" "	67 51	6 12	+4	635	68	
	SE	Summit crag-mass	73 53	50	+12	847	8	
	S	" " "	77 29	17	-2	815		
	SE	" S island	94 40	4 00	+8	293	20	
	S	" " "	38 4					
	SE	" SW crag	119 6	3 4	+8	6300	31	
	S	" " "	111 5					
	SE	S bench pinnacle	132 20	5 21	+6	405	37	
	S	" " "	45 00					

Height summit E crag 41 feet
" " crag-mass 60 "
" " S island 48 "
" " SW crag 37 "
" S bench pinnacle 31 "
Central promontory risen 19 feet in 7 days.

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Saturday Date January 20, 1917.
Sunday " 21, "

Jan. 20.
2:15 p.m. From E station.
Lava five feet down. Very quiet. One fountain in NW arm. Flowing from small cone for quite a distance. Blue fume thick. Wind S.

2:30 p.m. Lava dropped about a foot and a half. Great activity in N arm.

Jan. 21.
1:50 p.m. From E station.
Lava level with bank of lake. Large fountain NE splashing over side, causing a flow that runs to middle of floor and then branches out to the E and N.

Alex.

5:00 p.m. Lake very quiet, few fountains. Large flow N floor from floor vent. Heavy spatter N rampart. Spurting NW cove later in evening.
Flame S wall of crag-mass. Several glow spots S floor.
Lake five or six feet down.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

 Day Monday Date January 22, 1917.

Crag-mass visible from Volcano House now showing two S pinnacles and N escarpment. Also E crag visible from V. H. just to right of E shelter, and part of S island.

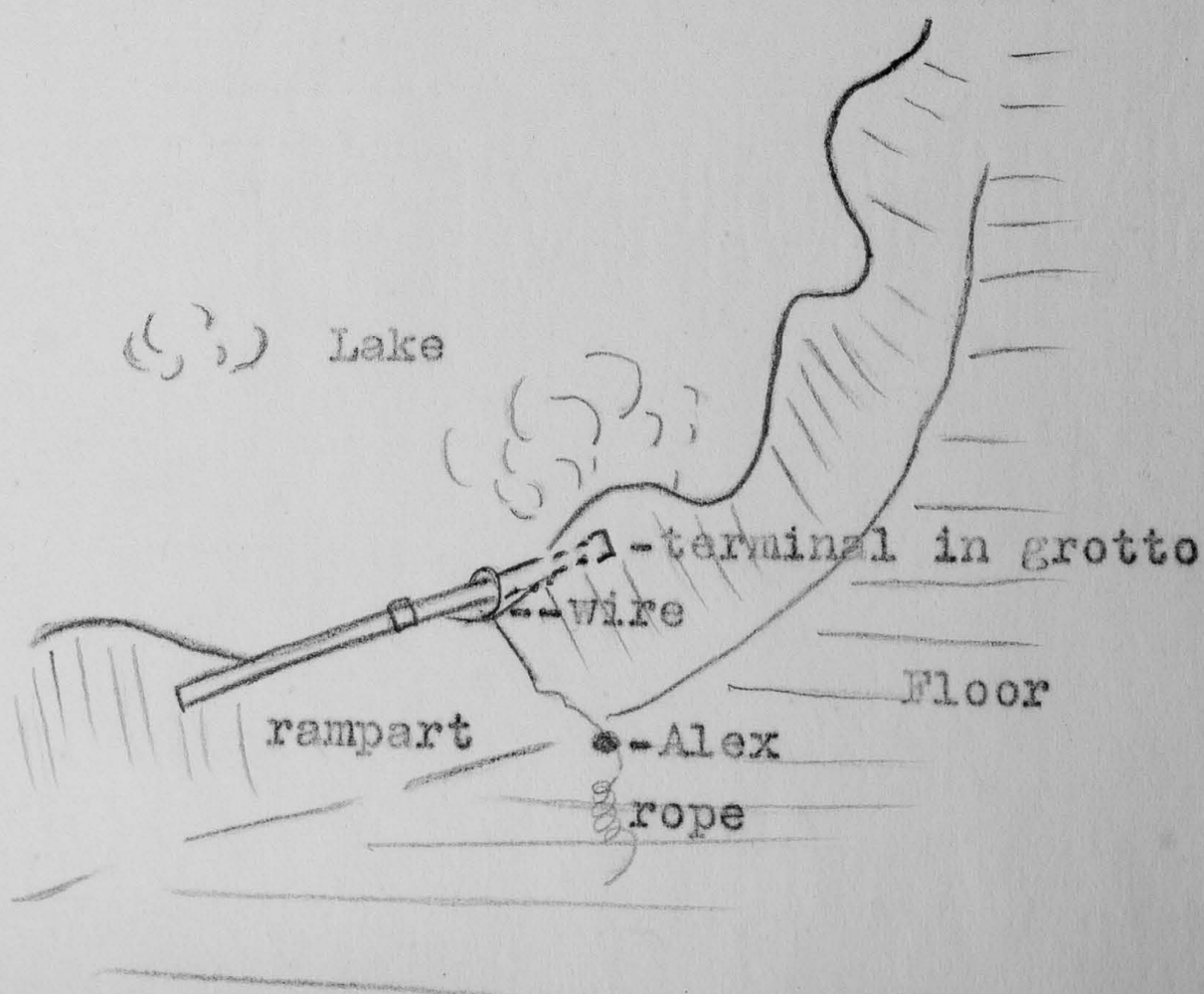
Rising continues. Again crevasses in new flows and fresh uplift at S base of E crag leaving SE wall valley very deep. N ramparts very high. Trickling thick pahoehoe flow from N cone locality over whole NE floor. Avalanches sliding from E cliff and from slope of 1894 bench near E gulch. The large rock tumble below E gulch has lifted and easier way down is now at point of 1894 ledge. The lava pilings on the NW and W are very high and the NW cone a peak high above them.
The lake level varied around three feet down below the lowest rims and ther was much fling of liquid lava over the ramparts. Eight or more fountains. Preparation, apparently, in rampart building and crag uplift for another great overflow which will raise the level of the wall valleys. This sequence of building, lifting and filling appears to be an adjusted mechanism which keeps the lake and crags in constant relations to each other.

Temperature test in NE grotto:-

Screwed two lengths of one inch pipe together so as to get a unit 40 feet long. Assisted by Messrs. Norton, Henry Beckley, Alex Lancaster and another man carried this unit to NE rampart. Put following battery of Seger cones in end of pipe with a cross-wire to prevent sliding up placed under the cap and against end of thread:

590° 680° 770° 870° 970° 1070°

By sliding pipe along the rampart and parallel to it could thrust it into flaming and splashing and insucking grotto. To prevent pipe falling into lake at pyrometer end, attached a wire back from the end and carried that to a rope at right angles to pipe held by Alex. Thus:-



Put end of pipe in flame for 10 minutes (could not see flame) and then thrust it into lava of grotto for 5 minutes. End sucked down violently and pipe hard to recover. Recovered it with difficulty by the united efforts of five men and found the end plastered with lava for five feet.
The cones were all fused except 1070°, which was partially fused. Temperature therefore 1100° plus. The fountain lava gathered on the pipe was denser and more oxidized in appearance than the lava of previous tests, which had been gathered at the glow lines of the lake surface. There was less lava on the terminal, which had been strongly heated in advance, than on the pipe farther up, which gathered a large lump of lava.
This day's work was thoroughly satisfactory and shows, with the previous results, that the lava of the lake surface where liquid, to the lava of the effervescent flaming gases in the fountains and grottoes, varies in temperature from 850° C to 1150°C; that is, through a range of 300° C.

Summit crag-mass now lines up level with SE rim and rim of old rampart over W niche.

T.A.J.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Tuesday Date January 23, 1917.

9:30 a.m. Lake three to four feet down, rising and falling. N rampart growing. Fresh glowing flow on S floor from over S rampart. Crags higher than ever. E wall valley deep and E crag lifting beside it. Descent now over cliff E end 1894 bench. Schollendomes along base NE wall, raised flow crust 12 inches thick, of flow under the fresh trickling pahoehoe. One of these domes, collapsed, reveals cavern three feet high and orange glowing within, marvellous sight. Probably thus stalactites form. The arching of these schollendomes probably occasioned by revival of the hollow lower shell by the penetrating trickle of the lower lava. The lava which has welled up in the cracks of dome is the lava of the pahoehoe trickle which has built a lumpy field over whole N floor.
Query: Is the history of stalactite caverns and domes, first a flow which shrinks away from its crust, then a new flow filling the shell and the pores, then a new shrinkage or outflow and the drip from the pores makes the second type of stalactite?
The intense heat long preserved in this cavern would permit a distinct type of crystallization. The visible stalactites around margins of this glow cavern are merely lava drip.

1:00 p.m. Overflow N margin N rampart pouring toward depression NW. This builds nearly to level of 1912 remnant shelf. Irregular heapings lava NW.

5:00p.m. L.A. Thurston describes heavy overflows S rampart sweeping southwestward, blowing spray vent at SW cove and activity NW cone.
NW and E crags increasingly visible from H.V.O.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date January 23, 1917.

SOUNDING OF LAKE.

Record of sounding depth of Halemaumau lake with a half inch black iron pipe. Assisted by Messrs. Norton, T. Smith, H. F. June and Alex Lancaster; also L.A. Thurston. Operation from rampart directly N of S island. Seven 20-foot lengths screwed together. Seger cones in bottom end of bottom pipe. Pipe first screwed together on black ledge floor of pit and run over rampart from top of a spatter cone, E point, on edge of lake. Spatter cone about 8 feet above average rampart, which is approximately 6 feet above molten surface of lake.

12:17 p.m. Operation begins at 12:17. Heavy crust rolling in to bank threatened to jam.

12:20 p.m. Second attempt. Pipe bent too much, struck crust and was withdrawn.

12:22 p.m Third attempt, from rampart E of cone. Went into lava 6 feet inshore of third joint from end. Struck bottom.

12:24 p.m. Graduallypulled back, got six feet of fourth joint and about 15 feet of third joint out forthwith , then crust jammed up against bank and bent pipe preventing further withdrawal. Six men failed to budge pipe. Tackle then attached to end of pipe -- also failed.
Pipe then carried up over top of cone and like pulls failed. Pipe pushed back in big loop over edge of lake at 12:30-35 and pulled by jerks.
Five lengths of inner end of pipe unscrewed and pipe straightened out to get more direct pull -- which also failed -- leaving six lengths on end next lake.

12:40 p.m. Bank where pipe entered lake fell in, pipe ran back leaving three lengths out of lake; stopped by grabbing it. Again tried to pull -- failed.

12:50 p.m. With three lengths of pipe in lake and three on floor, steam began coming out of pipe.

12:55 p.m. Pipe disconnected at fourth joint from end -- perceptible jet of gas coming from pipe. Applied match and gas failed to light. In a moment more slight steam came from pipe, then water began dripping from end, which was about 18 feet from molten lava.
From noon on pulsations of air in pipe like rapid breathing of a dog with jet perceptible one foot from pipe with odor of molten iron in a foundry. Gas coming from pipe is quite cool. Nine pulsations to the second.

1:30 p.m. Took off one length of pipe; makes eight lengths saved -- three lost in lake.

Place of test E point straight toward center of lake.

1:37 p.m. Second Experiment.
Three joints into lava and pulled out immediately. All that nine men could do to get it out again. Stuck twice. As pipe came out it was coated with lava, which catching against bank, made it difficult to pull. Went in 61 feet. The deeper the pipe went the stiffer the lava appeared to be, making it difficult to push the pipe further down.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

- 2 - Day Tuesday Date January 23, 1917.

Place of test NE rampart N of E cove in glow edge of skins.

Both sounding tests showed stiffer lava effect 60 feet down stopping farther immersion. Pipes went in at 30° but sagged to vertical; 61 feet of second test probably 50 feet vertical.
Second test end of pipe came out clean but there were accumulations of lava two or three places along pipe.
A clot of lava on bank through which pipe scraped with difficulty.

Others who assisted in this test were Panageotes Anastasopulos and George Michopulos. Miss Crawford photographed operation (negatives from three prints in records Observatory.)

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Tuesday Date January 23, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
		Alex near N cavern on floor.	1			f/6.3	1/35	
		Flow pouring over N rampart.	2			"	"	
		ditto	3			"	"	
N	ramp.	Fountain.	4			"	"	
	"	"	5			"	"	
	"	"	6			"	"	
								T.A.J.

1917, Jan. 2

Jag



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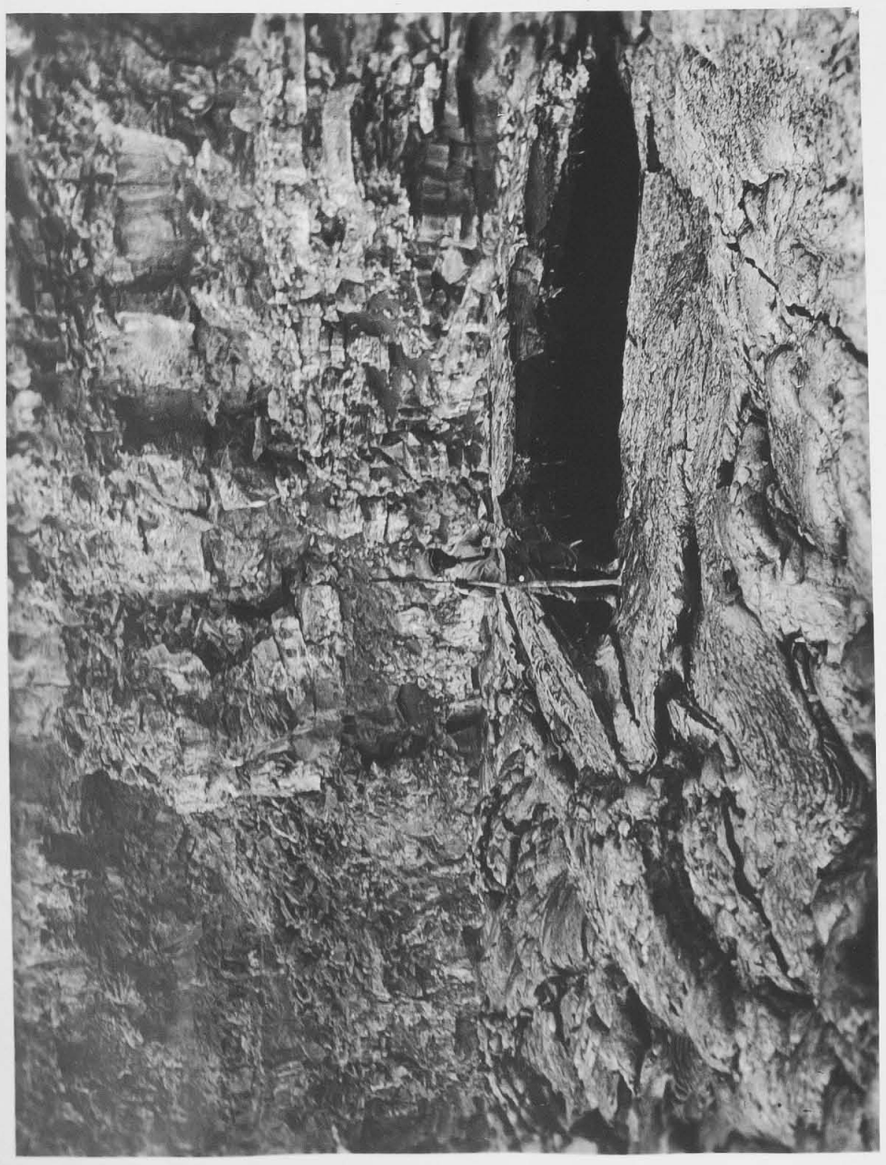

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1917, Jan. 2



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6

Jan 9

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date January 24, 1917.
Thursday " 25, "

Jan. 24.
11:05 a.m. From E station.
Lava about 10 feet down all around lake. A few fountains in N arm. Fresh flow on floor.

2:45 p.m. Overflowing SE.

3:00 p.m. Overflowing on N side and running toward wall.

Jan. 25.
12:20 p.m. From E station.
Lava one foot down on N side and rising fast. The whole floor NE seen to be covered with fresh lava right down to the E side.

2:30 p.m. Overflowing N bank for an hour. Flow wide and spreading in both directions,

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Friday Date January 26, 1917.

2:00 p.m. Rainy at pit. SW wind. Fumes over N bench. As NW floor was built up to within 7 feet of bench of W niche, decided to remove lower rope ladder, which had been left there. Lake down 10 to 12 feet. Huge grottoes in N rampart which is very high, bulgy and overhanging. Back of rampart filagree glow NE which crackles like a fire and fumes and is whitened. Six or seven fountains.
Set up ladder W niche and descend, cross knotty pahoehoe heaps to NW cone, which blows with lava inside 10 feet down, filagree openings W side, large 10-inch orifice E side. See lava splashing down inside, banner of invisible flame, occasional increase of gas pressure with puffing, heavy glowing stalactites inside, even orange color inside. NW pond N of this cone is an arch of schollendome character, with irregular heaped crusts.
With Alex, June, Newton, climb crag-mass and get views into two high curtained grotto domes E side N cove. Climb N and E scarps. Slope of crag-mass steeper and more rifted than on Jan. 7. Yellow alum from crag-mass cracks W side. S island and E crag appear higher than rim of pit.
First time circuit of floor made. Next make circuit of floor of pit going over a high dome of pahoehoe at W wall pond. Fountain near end SW arm and another S side of crag-mass. Trickling flows SW wall valley. Very steep clefts in SW cliff. S wall pond a hard floored depression. Tumble of rock from wall in valley SW. Eddy of disagreeable fume from rampart W side SE cove. SE floor hot. Lake 4 feet below rampart. Immense deep crevasse S of E crag. NE cavern no longer glowing. No stalactites of smooth droplet type. Toes protruding from cracks in pahoehoe vertically. Perret's cavern nearly accessible. 1912 ledge only 6 feet above floor.
Return by W niche and go for pipe and Seger cones to take temperature of NW cone. Insert battery of seven cones

01 (1130°)	03 (1090°)	09 (970°)	012 (870°)
015 (800°)	018 (710°)	021 (620°)	

in end of 1-inch pipe and thrust same in 10-inch blowing and flaming orifice E side NW cone. Blwing hard in pulsations. Push pipe in horizontally 3 feet but it heats to orange and bends down. Leave it nine minutes. First the zinc green-yellow flame appears, then sulphide (?) forms on pipe and drips off it like water in incandescent drops; highest glow plays over pipe just at entrance. Finally this sulphidizes through and on withdrawing pipe find whole end of pipe a mere shell of iron (oxide?) sulphide (?), the cap over end gone entirely. The cones inside all fused, only one retaining its form, presumably 1130° . Hence temperature near 1200° C.
Alex finds young boatswain bird alive on one of the W crags.
Returning above, I descend E trail and take photos at dusk

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date January 26, 1917.

of fountains from E point. Directly leeward of center of lake but heat only, not fumes.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date January 26, 1917.

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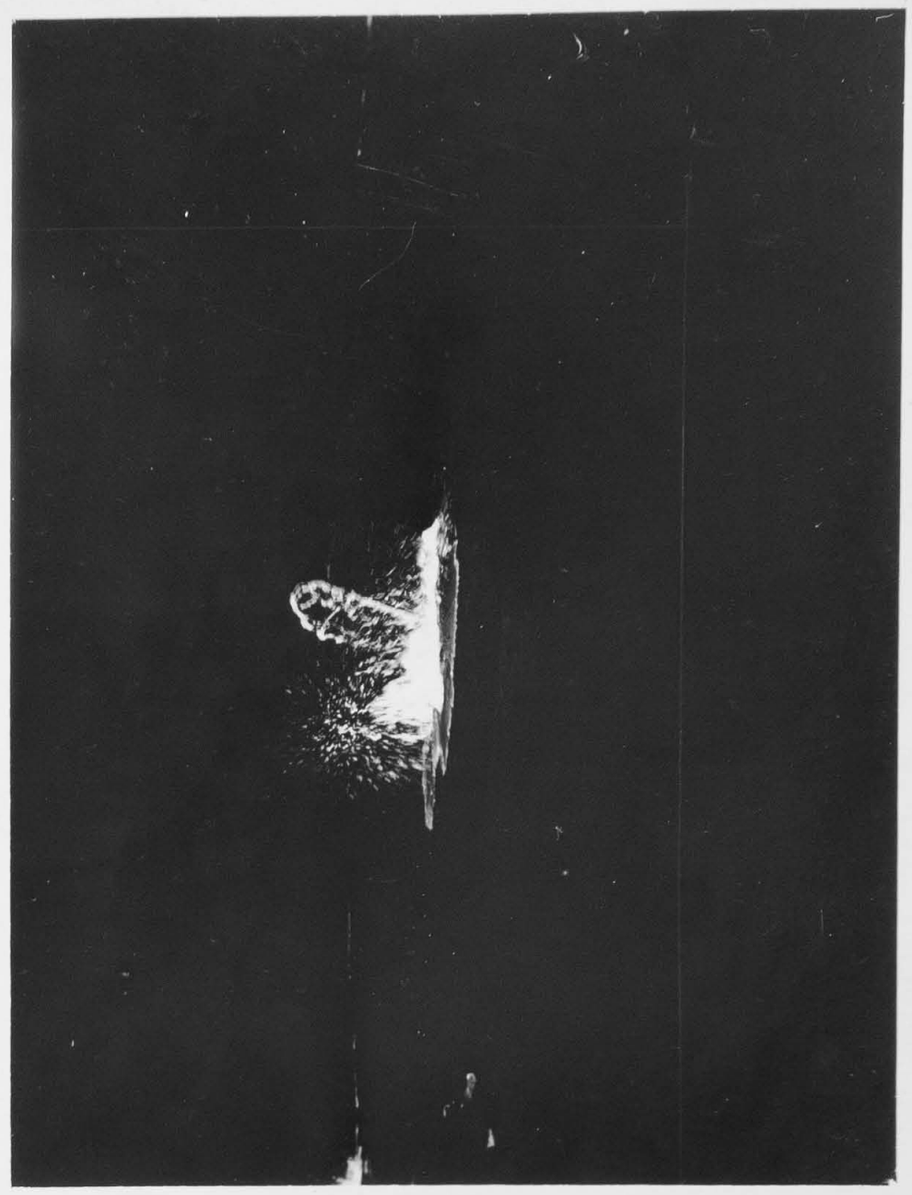
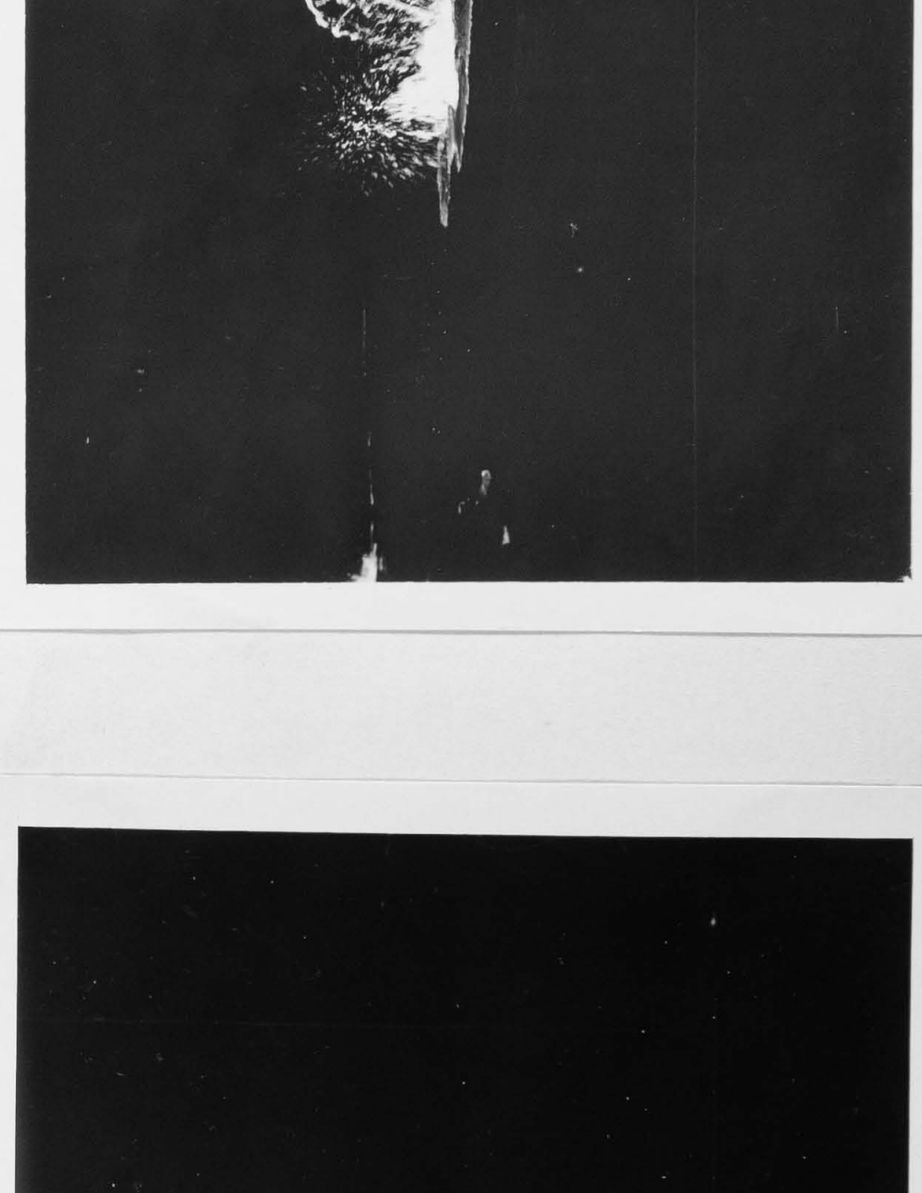
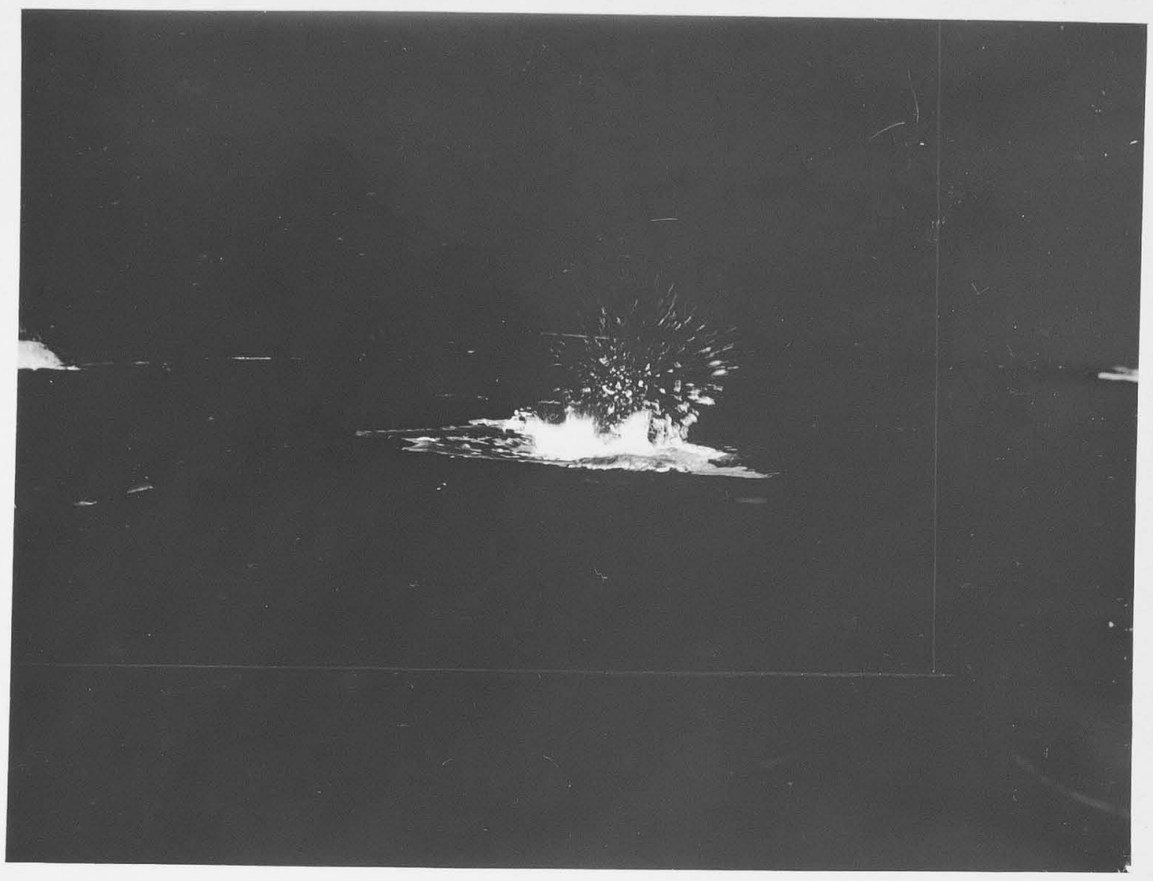
1917, Jan.







1917, Jan. 2



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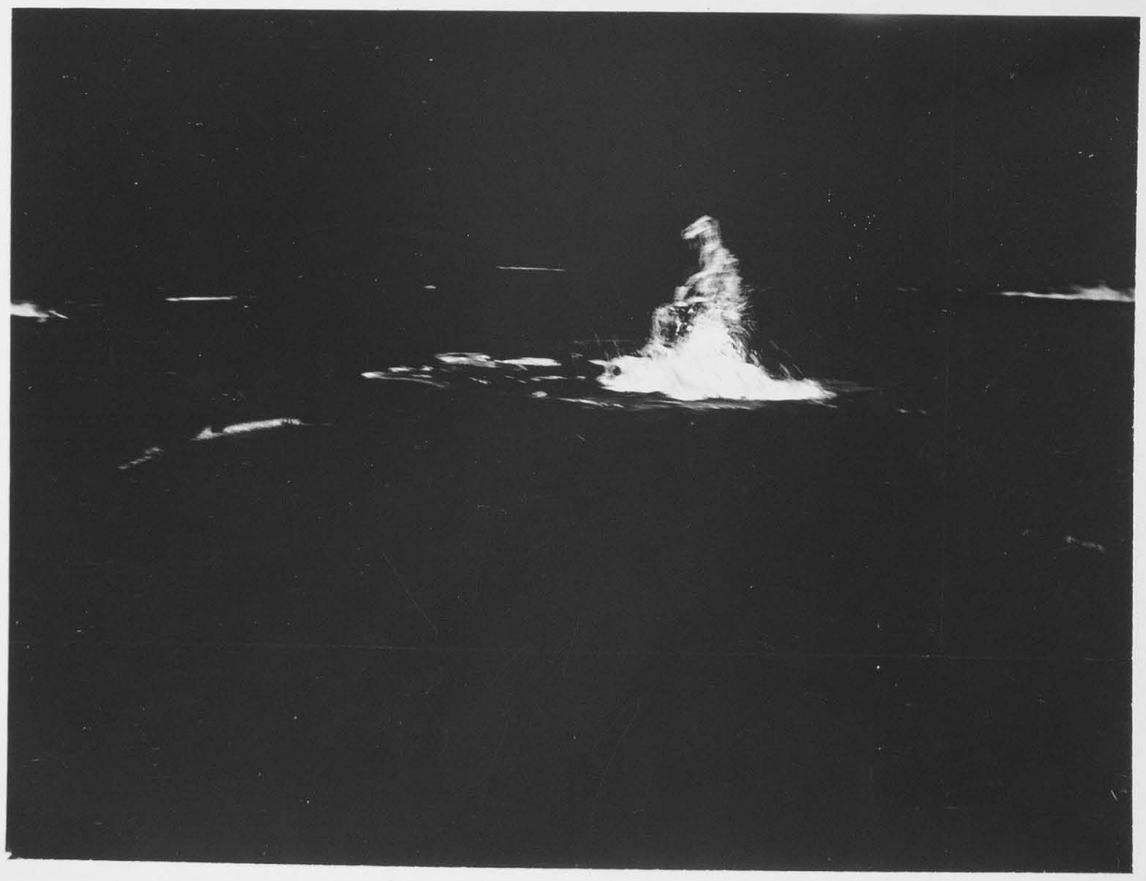

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Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Saturday Date January 27, 1917.

12:35 p.m. Overflow SE began, followed by continuous fountaining against rampart E of it. Flows continued strong from NW pond site in two powerful springs N of NW cone, from N side NW arm in a flood and all over S bench. Lava heap at site of W wall-pond is piled higher than any other floor source and it is noteworthy that this is just under high W cliff, the highest point of Halemaumau construction in 1894. If present floor was raised 60 feet, the W wall-pond heap would be the center of radial flows and would spread W as well as E from that center.
Flows continued four hours. W niche floor overflooded. NW cone sputtering slightly. Small glow cone summit W heap. NW pond flows continued longest. Avalanche material on floor under N station. Some scaling off peninsula W of S island when lava began to subside about 4:30 p.m. The E point appears to be rising along with the E crag, and the S island mass appears rising much more than the isthmus W of it. The crag-mass shows more rising on its E face than SW or N. The SW crags have vertical walls on the wall-valley side as well as on the lake side and a rampart built in front of them on the lake side. The E crag has raised a block of fresh flow material with it around its S base and this material has parted from the SE dome grotto in a deep crevasse, and a glowing aperature in the back of the dome crackles continuously like burning wood: oxidation apparently of the rock.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Saturday Date January 27, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30a	SE	E	0					
	"	Summit E crag	26 15	0 0	0			
	"	Summit crag-mass	73 53	-42	-6			
	"	Lake at tip E point	55 57	8 57	-6			
	"	" " central prom.	75 14	5 8	-10			
	"	Top S island	94 39	-1	-13			
	"	" SW crag	119 32	52	-18			
	"	S pinnacle	133 9	3 5	-16			
	"	N end new break SE bench shore	106 43					
	"	S end ditto	130 59					
	"	Head SW arm	101 51					
	"	" W "	90 52					
	"	S pt. NW arm	63 42					
	"	N " " "	59 59					
	"	Great N dome	47 30					
	"	E cove	37 8					
	"	SE dome	39 24					
	"	E talus foot of trail	5 28					
	"	Summit E pinnacle crag-mass	73 29	0 0	-15			
	"	Summit NE pinnacle crag-mass	66 54	+33	-13			
	"	Summit S pinnacle crag-mass	84 29	1 0	-18			
	"	Summit E point	52 40	5 51	-8			

(No intersections taken because of accident to leg.)

			no	pl	scr	stop	ex	cam
ESE	SE overflow		1		3x	f/6.3	1/30	P
SE	E crag		2		"	f/11.3	1/5	"
SE	SW arm		3		"	f/6.3	1/30	"
SE	SE overflow		5		"	f/11.3	1/5	"
SE	W arm		4		"	"	"	"
SE	E point		6		"	"	"	"
								TAJ

1917, Jan. 2

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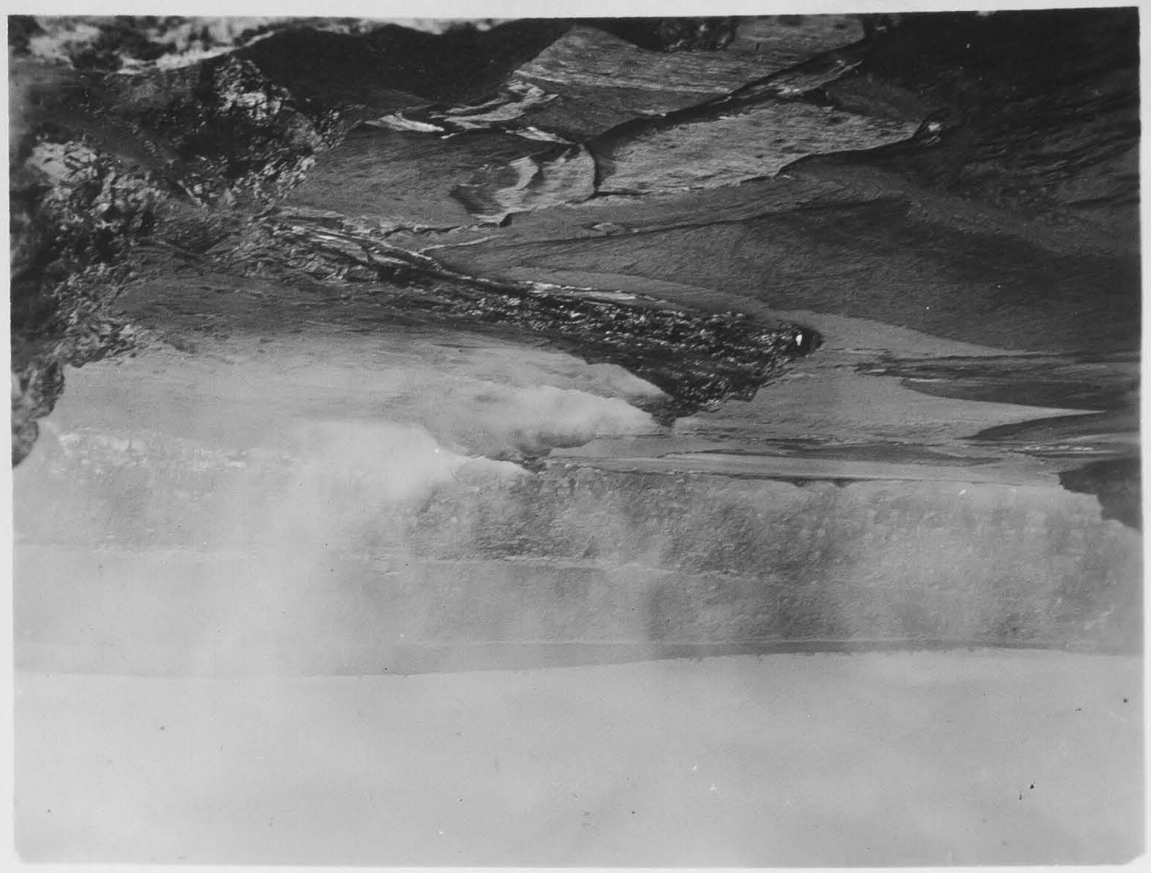

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1917, Jan. 27





5

Jag

JOURNAL

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day	Date
Sunday	January 28, 1917.
Monday	" 29, "
Tuesday	" 30, "
Wednesday	" 31, "

Jan. 28.
12:30 p.m. N station.
Lava level with bank in NW arm.

1:00 p.m. Lava began to sink slowly with great fountain activity and much noise.

2:00 p.m. The whole lake was level again and began to overflow on SE side, running right up to the wall and spreading very wide. Continued about twenty minutes, then stopped, but started to flow over again shortly.
New cone formed W of peninsula; throwing lava spray very high and making a loud noise.

Alex.

This cone seen by H.O.W. in afternoon spraying and making clouds of Pele's hair. Resembled M.L. fountain.
Jets 40 to 50 feet high. Cone 40 feet across.
Evening H.O.W. from V.H. saw fountain spray N cove higher than pinnacles crag-mass.

Jan. 29.
2:09 p.m. N station.
Bank of pool NW three feet high. Quiet except a few fountains in N arm. There has been a large flow from the NW side around to the E.

Alex.

Jan. 30.
1:25 p.m. Lava level NW and likely to overflow at any time. Blowing in NE cove. There has been a new flow on the NE running straight to the wall under the NE station and spreading wide.

1:30 p.m. Overflowing NW, running to wall and spreading wide.

2:30 p.m. Overflowing NE bank, down to middle of floor.

Alex.

Jan. 31. N station.
10:45 a.m. Banks 10 feet high all around. Many big fountains in different parts of pool.

3:12 p.m. No change since 11 a.m. Many fountains, mostly in N arm.

Alex.

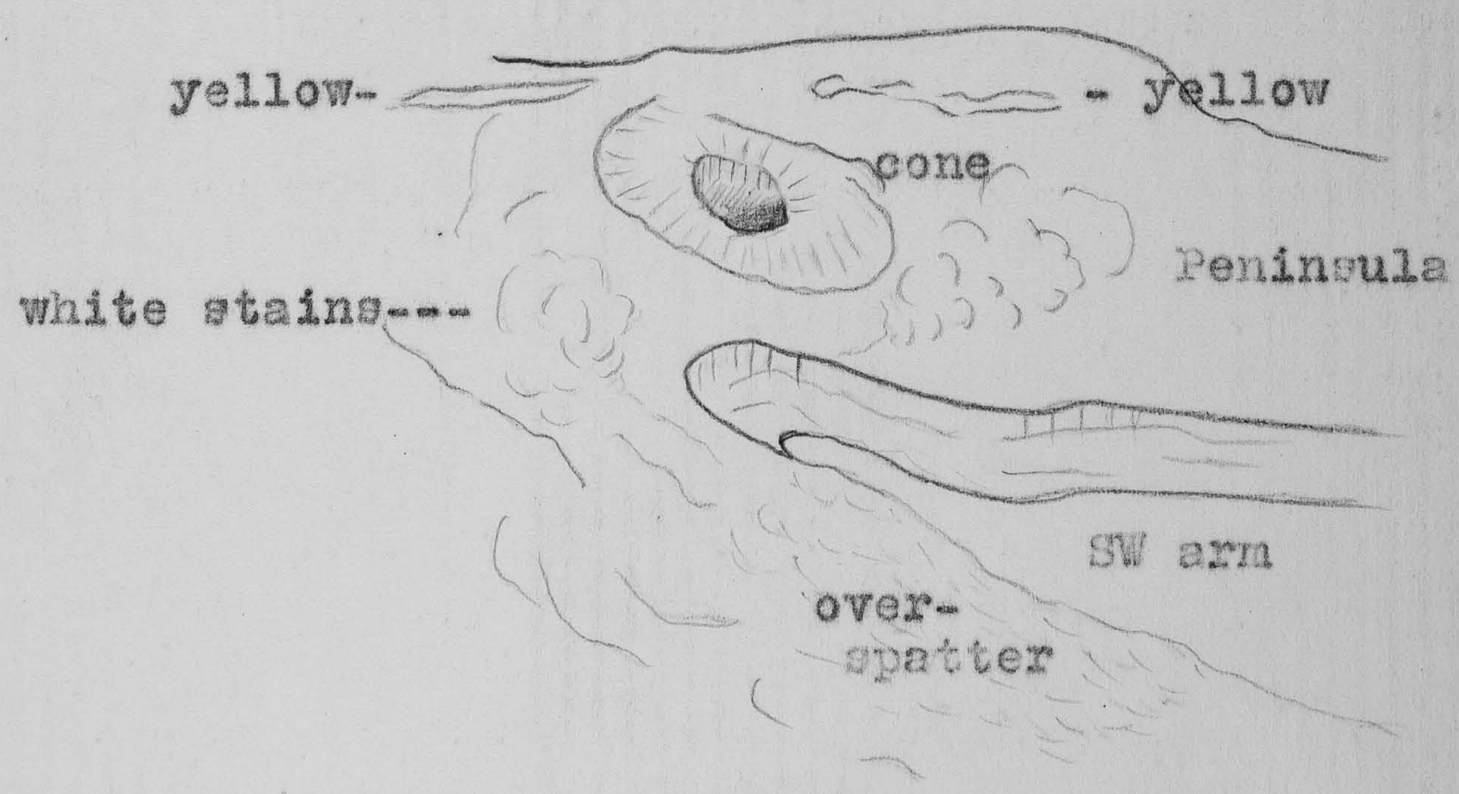
N station.

10:30 a.m. Lava level with bench and in 15 minutes it was overflowing on the NE, running to the middle of the floor and spreading wide -- flowing mostly toward the E.

12:30 p.m. Lake down five feet all around. Many large fountains in different parts of pool. Small cone on W side of crag-mass blowing steadily.
Lava within three feet of floor of W cave; flowing in that direction.
Alex.

2:30 p.m. Wind SW.
All three crags, E crag, S island and crag-mass, protrude above edge of pit in view from motor terminus.
Crag-mass has been tilting westward and the two pinnacles are nearly level with summit. Lake was overflowing this morning (Alex). Is now 6 or 8 feet down. E point appears to have been lifting with E crag. Freah flows ENE, NE and over S rampart opposite S station, W of S pinnacle.
High heap hissing slightly W. NW cone blowing and much same as when temperature was taken.
SW cove locality has changed, the hook in the end of cove where the cascades poured down is now floored over and the cove itself is small;but in the floor is a fuming flat ring-shaped cone and crater, apparently with a pit in middle.

SW cone from SW station:



(This cone was seen with a standing fountain by H.O.W. on afternoon of Jan. 28 spraying and making clouds of Pele's hair. Resembled M.L. fountain. Jets 40 to 50 feet high. Cone 40 feet across. Evening Jan. 28 H.O.W. from V.H. saw fountain spray N cove higher than pinnacles crag-mass.)
Men led by Alex climbed down N slope of W niche and went to Perret's cave. Lava to lower edge of cave.
S pinnacle has been lifting but SW crags appear to have

lifted less than the other crags. S island has lifted much and tipped over southwestward. High rampart with flows from lake into the crevasses of SW crags. N rampart very high, irregular and lumpy. Immense NE glowing grotto, another at W end of SE rampart, and still glow cavern very bright under isthmus.

3:30 p.m. Streaming and travelling fountain out from N cove southward. Seven or eight fountains today, occasional very large ones central, and W arm, and E and W ends of SW arm. Stalactites around lake.
The large fountains spray much, and with the invisible flame is a yellow-brown fume, which changes just above to a blue fume. The gush of yellow flame-fume from the fountains is very marked. Some of these fountains 60 to 100 feet long.
Much smoke from NW cone. Festoons show recent overflows from head of W arm.
Deep grotto with slow inflow SW glowing melt, a few bubble fountains communicates with SW cone.

3:40 p.m. Sudden sinking 3 feet. Can see daylight through arch W of S island. Rushing current around S island. Streaming out from N cove continues. Out from W arm, in at SW arm.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date February 2, 1917.

1:10 p.m. E station.
Lake 10 feet down all around. Many large fountains in N arm. Overflow lava level with floor of Perret's cave.

2:30 p.m. N station.
Flow from small cone going to the hollow between W and NW.

7:30 p.m. Lava level with bank, no overflows. Much activity all over the pool.

Alex.

8 to 10 p.m. From SE, S and SW stations.
Lake 8 to 10 feet down. Fresh trickling flow against NW wall next Perret's cavern. Flaming grottoes NE rampart, SE rampart, SW rampart, SW cove. Flames from SW ring-cone and from NW cone. Immense flames 20 feet high NE dome grotto. Flames blue. Ten fountains, mostly grottoes. Occasional large fountain at glow edge of congested crusts where crust of middle of lake migrates to narrows E of S island, and this fountain migrates to dome grotto W end SE rampart and there expends itself in the grotto flinging solid glowing lava droplets horizontally outward across the lake for 60 to 100 feet; same process at SW grotto. Occasional big central fountains in lines W to E in N cove. No glow W floor but several places at site of NW pond. Filagree over NE dome and glow cracks back of rampart E end SE rampart.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date February 3, 1917.

2 - 4 p.m. Lake chiefly sinking. 20 feet down. Fresh falls on floor S and SW. Five fountains. Two high tunnels under isthmus W of S island, tumble of rocks and shoal under them; no streaming through.
Whole central promontory has fallen in and the two pinnacles gone. Apparently as result of splash from this, the peninsula is broken through just E of SW cove and channel streaming through southward from W arm. SW cove has collapsed carrying SW cone with it and is now a deep cove northward again. W wall pond a collapsed pit 25 feet across with tumbles of roof from time to time and splash within 20 feet down. NW cone open to splashing oven within on side toward crag-mass. Three or more collapsed schollendomes glowing within on NW floor near W niche. NE grottoes not active and largest one collapses. S grotto glowing weakly. Skins heavy, many hard crusts, occasional heavy central fountains, two balloons seen blowing on surface N cove. Spurts of rapid streaming around S island. Streaming out from N cove. Sluggish heavy crusts head of W arm. Mostly quiet, and rather smoky. Stalactites in grotto head of SW arm.
No avalanches heard. But the loose point of rocks just W of S station at top of cliff and the next one west, have both fallen.
Shoal under SW grotto locality.
Avalanche fell under old north rest house. Crevasse wider at base of E crag.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Saturday Date February 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3 p.m.	SW	S	0					
	S	N	0					
	SW	Lake S base S island.	29 26	6 12	-9	588	64	
	S	ditto	-4 37	10 53	-6	295	57	
	SW	Highest spatter.		4 40	-15		50	
	S	ditto		8 34	-6		45	
		Highest spatter line) level of general sur-) face peninsula.)		7 50	-6		41	
	SW	Lake next pt. W on peninsula.	30 39	7 19	-9	475	62	
	S	ditto	17 52	11 00	-11	285	57	
	SW	E side new channel thru peninsula.	49 00					
	S	ditto	34 36					
	SW	W side ditto.	51 45					
	S	ditto	34 36					
	SW	Summit S island.	32 2	-12	-10	667	ca -½(up)	
	S	ditto	-15 00					
	SW	New position central promontory.	73 3					
	S	ditto	18 12					
	SW	Summit crag-mass.	89 48	-1 19	-14	586	11(up)	
	S	ditto	29 45					
	SW	Summit E crag.	38 41	-23	-16	931	ca 1(up)	
	S	ditto	-29 40					
	SW	Summit SW crag.	10 34	3 36	-14	293	20	
	S	ditto	64 54					

Recent minimum depth lake 45 feet
Present depth lake 60
Height S island 60½
" crag-mass 71
" E crag 61
" SW crag 40

			no	pl	scr	stop	ex	cam
				holder				
2 p.m.	W of S	Arches W of S isl.	1	XI	"	f/8	1/30	Goerz
	"	SW cove	2	XII	"	"	"	"
	"	Crag-mass with fallen pinnacles.	3	X	"	"	"	"
	Betw. S & SW	S island	4	IX	"	"	"	"

T.A.J.



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Fog

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Sunday Date February 4, 1917.

4 to 5 p.m. S island has sunk bodily 25 or 30 feet. Last night arch W of it fell in. The next part of former peninsula has sunk and tipped northward. S island also has tipped back northward. The entire W part of peninsula has subsided and is now lake. Lake falling reveals remnant islet of this near former SW cove. Streaming in SW channel reversed and flows eastward meeting other current SE of S island with violent fountaining. Piece of W end middle island fell off leaving red hot scar. Falls have been frequent from SE rampart leaving raw and red hot wall. Dome grotto W end SE rampart has collapsed.
E crag higher, crag-mass lower than yesterday. SW crags appear unchanged except for some falls from rampart. W wall pond an open pit 80 feet long. NW pond open 100 feet long, extended irregukarly on side of crag-mass. Glowing filagree cone under W station.
Streaming out from W arm and from NW arm. Ten or more fountains from time to time. Thick crusts in interim. Falls from N rampart. Deep cavern grottoes SW, SE and NE still.
W wall-pond rises and falls through 15 feet range. Flames from its E wall and the puffing of flames in sympathy with a heaving of the dark flexible crust over it. This crust breaks up with cracking and foundering at the beginning of each subsidence. Subsidence rapid with revelation of a red hot sugary looking lava like glowing coke which is massive and scaly and underlies the definite pahoehoe crust shown in section all around the collapsed pit. This glow is very intense yellow in cavern over liquid extending N. Another higher shallow cavern in flow shell, adjacent edge of pit, which also maintains a high glow. What maintains shimmering heat glow in such caverns with no evidence of lava, or gas burning? What permeates the red hot coke-like underpinning of all the benches to maintain heat? A lava fluid or a gas?
No stalactites drip down in the cavern over W pond lava when lava sinks. Stalactites common only where <u>splash</u> occurs.
Flames SE, NE and N side middle island and numerous around NW and W ponds. Occasional falls spatter borders and one fall from wall of SW crevasse. Liquidity and glow fountains and grottoes high.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Sunday Date February 4, 1917.

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			no	pl	scr	stop	ex	cam
4 p.m.	W of S.	SW crags	1		3x	f/11.3	½	P
	"	Crag-mass	2		"	"	"	"
	"	Channel W of S isl.	3		"	"	"	"
	"	E crag	4		"	"	"	"
		(Double exposure - 5)						
4:45p	Betw. S & SW	SE channel	5		"	f/6.3	"	"
	"	NW corner	6		"	"	"	"
								T.A.J.

1917, Feb. 1

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1917, Feb. 4



5



6

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date February 5, 1917.
Tuesday " 6, "
Wednesday " 7, "
Thursday " 8, "

Feb. 5.
1:30 p.m. From N station.
Lake 20 feet down. Rising slowly. Molten lava even with flat place of island. A few fountains in N arm.

2:10 p.m. Large piece fell from big crag on the NE side.

3:50 p.m. Fall from E side of island, starting many fountains. Two ponds W of crag-mass occasionally overflowing and covering quite a large space. They are very active.

Feb. 6. SE station.
Lake about 30 feet down. Much fountain activity in different parts of lake. No change in W ponds.
Rock fall from crag-mass.

Feb. 7.
2:00 p.m. S station.
Lake about 30 feet down. Very quiet.

4:30 p.m. Lake very active. Rapid streaming from SW to the SE cove.

Feb. 8.
2:10 p.m. S station.
Lava sinking slowly. Banks about 40 feet high. Lake quiet with only one fountain -- south side. SW floor has subsided about 20 feet. Thick blue fumes rising from that locality.
Part of the floor NE has dropped into lake and a new island has formed about 200 feet from the bank.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date February 9, 1917.
Saturday " 10, "
Monday " 12, "

Feb. 9.
1:20 p.m. SE station.
Lake about 50 feet below the lower bench. Very active all over pool. Crag-mass has sunk over 20 feet, mostly on the NW side. The floor W and NW of crag has sunk about 15 or 20 feet. Blue fumes thick.

Feb. 10.
1:30 p.m. SW station.
No change in lake. Few fountains in N arm, rest of pool quiet. Fumes the same. Rock fall into lake NE, starting a few fountains.

Feb. 12.
2:05 p.m. E station.
Lava rising slowly. No fountains. Fumes thick.

2:50 p.m. Activity began in SW cove and later more fountains started in different parts of lake.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date February 13, 1917.

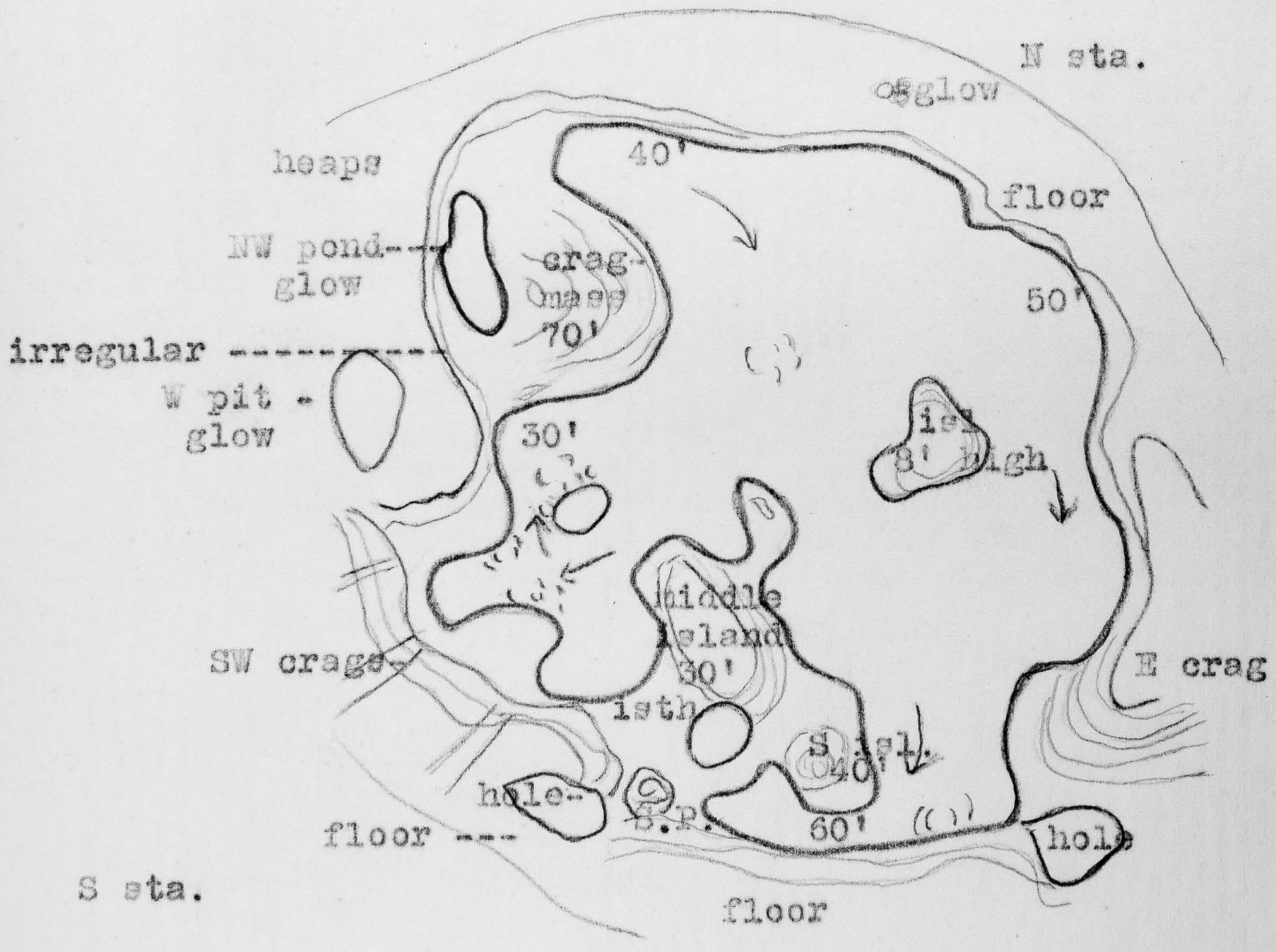
11:30 a.m. SE station.
Lake 50 feet down. Active NE.

11:45 a.m. A large slide from crag on E side of pool started many fountains which lasted only a short time.

NW station.
SW cove very active; sometimes spray thrown high over bank. Streaming toward SW cove.

Alex.

6:00 p.m. SE station.



5 - 6 p.m. Crags have sunk from view H.V.O. last week.

General.
Lake down. S island and middle island a large single mass. SW arm separated in two by an isthmus opposite S station. Crag-mass has sunk and tipped more to W.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date February 13, 1917.

SW crags and E crag have sunk less than crag-mass and S island. E crag still above rim of pit. SE floor still high; NE floor lower. Lake appears about 50 feet below NE floor and has a secondary bench, marking a stand of last week, about a third of the way up. Glow in W pond, NW pond and in tumble on N floor. S pinnacle has lowered and fallen forward to N and has a crevasse system behind it and around it. The new island was formerly the E point which parted from the floor and moved out into the lake. Streaming is sluggish from NW arm and N cove SW to SW cove, and SE and S coves are stagnant. At 6 p.m. saw part of SE bench fall, send up brown avalanche cloud, and break up crusts below so as to make a wave and start general cracking and foundering.
Six to seven fountains.
Lake quiet and rising at 5 p.m.; sinking at 6 p.m.

From E station.
The E crag has a pit under its S end and there is much new tumble under E station. E station block has sagged out so as to widen crevasses greatly. NE floor little changed, but covered with Pele's hair and E point all fallen away. No evident changes in 1894 bench.

From NW station.
About where N driblet cones were there is now a red hot tumble of crusts. The NW arm has widened and fallen in. Needless to say all the ramparts NE and SE have fallen. The crag-mass has tipped westward so much, subsiding about with the lake, that the summit peak protrudes westward at a high angle and is not identifiable from the E. The NW floor is two or three feet below Perret's cave with great festooned flows that were the last to come from high level of NW arm.

From W niche.
Lavas piled high on floor of W niche and over NW region and no subsidence along wall. The NW pond is at base of crag-mass in a valley and is glowing. Alex still goes down to it to make specimens. This valley extends with irregularities to the low cliff over head of former W arm.

From W station.
W arm and SW cove now merged and an islet about where SW pot formerly was, and incandescent fountaining against W side of this island. There is also a large grotto cavern splashing under SW crags. The W wall pond is a pit with a crusted pond showing glow at its margins, deep within it. Much smoke rises N margin lake and several places W, SW and S.

From SW station.
The S island is low and has little of its summit left. The SW arm in all its eastern part has become a series of shoals connecting the former S island peninsula with the S bench, but there is a crusted cove from the east and another from the west and a small pond between them, all sluggish.

From S station.
The SE bench overhangs and has cracked edges and is covered with Pele's hair. The cliff beneath it appears much higher than that under NE bench.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Wednesday Date February 14, 1917.

11:00 a.m. Lake has been up and down again. New island much longer, and low and flat. Almost no fountains and much crusting, but a cascade falling 40 feet into a 60-foot pit S, scene of small pond between two isthmuses of crust in yesterday's map. A river-like channel of rapid-moving lava to it from SW cove. This torrent and cascade was pouring all day from 11 a.m. to 5 p.m. and had been pouring before and appeared from the brightness of Hale-maumau to be going in evening.
11 a.m. to 1:30 p.m. the lake rose slightly but no diminution in cascade. Fumes to lee of it, but pit less fumy than yesterday. Few falls.
Pit 40 feet across where glow heap was on N floor. Occasional trivial fountains. All the activity of oxidation appears concentrated in the cascading pot, where festoons of Pele's hair cling to wall over caldron, and spatter knob forms within, and the fall strikes against wall and is deflected. Like a river vanishing into a limestone sinkhole. No apparent effect on level of lake.
S pinnacle looks poised and ready to fall. SE cove cracking and foundering, separated by narrow partition only from cascade.
Afternoon lake down 10 feet.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Wednesday Date February 14, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11a.m.	SE	N	0					
	N	W	0					
	W	SW	0					
	SE	E crag	-6 11	-50	+5	200	3+	
	N	Ditto	71 5					
	SE	NE point	15 3	9 13	-20	595		
	W	ditto	77 38ca					
	SE	Tip new island (S tip)	36 45	13 51	-21	375		
	N	ditto	51 8ca					
	SE	N tip new island	25 4					
	N	ditto	41 33					
	SE	Central promontory	42 3	7 38	-20	678	94	
	N	ditto	25 39					
	N	2nd knob(?) central promontory	24 42					
	SE	Summit crag-mass	41 33	+1 00	-20	687	20	
	N	ditto	7 32					
	SE	S summit S island	60 44	13 9	-20	210		
	N	ditto	57 36					
	SE	W summit middle isl.	64 8	5 35	-24	550	57½	
	N	ditto	35 41					
	SE	E tip peninsula N from middle island.	45 25					
	N	ditto	46 00					
	N	W tip ditto	38 24					
	W	ditto	56 41	10 1	0	656	116	
	SE	Knob N side cascade	79 3	10 4	-2	428	77	
	W	ditto	36 42					
	SE	S rim cascade pit	88 49	13 24	-14	379	92	
	N	General cascade smoke	46 40					
	W	ditto	35 00					
	SE	Pt. SW, entrance torrent	73 53	8 49	-16	593	95	
	N	ditto	32 11ca					
	W	ditto	32 28					
	SE	S pinnacle	98 20	4 26	-14	394	32	
	N	ditto	48 46					
	SE	SW crag	86 56	1 13	-16	673	17	
	N	ditto	35 49					

			no	pl	scr	stop	ex	cam
	SE	S side W pit	67 32					
	N	ditto	14 26					
	SE	N side W pit	59 14					
	N	ditto	6 11					
	SE	N side NW arm at entrance	27 7					
	W	ditto	99 00ca					
	SE	Point N smoke	14 22					
	N	ditto	31 34ca					
	SE	S end S island, lake level	74 56					
	N	ditto	59 13					
	N	SW islet	25 25					
	W	ditto	47 22					

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Wednesday Date February 14, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	N	N pit in floor	5 54					
	N	Tangent lake SE cove	64 38					
	N	Tangent floor NE	98 39					
	N	Tangent lake NW arm	-5 11					
	N	Tangent floor NW	-38 00					
	N	W side S isl. crag	52 24					
	SE	White streak NE bench (floor level)	2 45	4 51	-17	697	62	
	N	ditto	64 17					
	SE	S knob middle isl.	70 9					
	N	ditto	44 36					
	SE	SSE edge bench	99 26	11 15	-13	185	17½	
	N	ditto	59 10					
	SE	Highest spatter central promontory.	41 26	5 6	-18	712	64	
	N	ditto	22 41					
	SE	Highest spatter N side W arm. (showing tilt of crag-mass W)	54 12	5 20	-19	863	84	
	W	ditto	59 9ca					
	SE	N pt. S island (lake level)	52 26					
	N	ditto	56 23					
	SE	N pt. crag-mass (lake level)	31 40					
	N	ditto	6 9					

Length lake NW-SE 850 feet
Width lake E-W 790 "
Diameter cascade pot 60 "
Length stream leading to cascade 200 "
" southern island mass 450 "
" new island 220 "
Diameter new pits N, E and S 60 to 80 feet.
Length W pond pit 160 feet

			no	pl	scr	stop	ex	cam
11a.m.	SE	SW arm cascade	1	W P	8x	f/16	½	P
	SE	S isl. and crag-mass	2	"	"	"	"	"
	SE	E crag	3	"	"	"	"	"
	Betw. SE & S	Cascade	4	"	"	"	"	"
	NE	Crag-mass	5	"	"	"	"	"
	W	SW region; W pit in foreground	6	"	"	"	"	"

T.A.J.

1917, Feb. 14.













JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date February 15, 1917.

9:00 a.m. Cascade had ceased and lake was down.

11:00 a.m. Lake lower. S island mass lower. Crag-mass lower. S pinnacle has fallen. S cascade-pot crusted and slow outwelling from it westward to meet sluggish inflow at mouth of gorge. SW islet now two islets. New island stands 8 feet high. Fresh heavy falls from high edge Halemaumau between E and SE. E station platform gone. Spatter rim pounding SE, only one or two other fountains. Streaming out from NW arm to SE and SW. Streaming rather more active than yesterday.
At SW lower bench, about where the great dome grotto was, there is a spurting pot four feet across with very hot gas rising. Top of S island has crumbled to a narrow ridge since yesterday. Some spatter building NE. Walls over lake higher NE and SE. Rising 11 a.m. to noon.

Afternoon. Lake still lower and more falls near S pinnacle locality. The recent falls S and E from high rim mean a profound subsidence different from the temporary inflations of January.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date February 15, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		Survey to check depth.						
11a.m.	SE	N	0					
	S	N	0					
	SE	Central promontory	42 14	8 56	+23	685	102	
	S	ditto	22 41					
	SE	Pt. S side crag-mass	52 29	8 0	+22	762	101	
	S	ditto	35 36					
	SE	Summit crag-mass	41 39	1 56	+22	895	23	
	S	ditto	31 21					
	SE	E crag	-6 14	-39	+23	167	3½	
	S	ditto	-29 38					
	SE	NW summit S island	58 0	12 0	+21	264	59½	
	S	ditto	-14 30					
	S	E of two islets	38 10					
	S	W " " "	44 0					
						T.A.J.		

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date February 16, 1917.

Noon. Lake rising and nearly level with the new island and islets. Channel connected through S arm. Violent shore fountain against cliff W and reversed streaming, from NW arm S and then W, other side southeastward flowing through from the ends and meeting sluggishly with cracking and foundering, in S channel. Shifting three or four fountains. NW pond and W pond occasional fountains at S ends. Both are pits. W pit has extended itself northward and beyond goes a crack in a semicircle to NW arm, which is a deep canyon. This crevasse appears to be due to tendency of subsiding crag-mass now to topple forward E toward lake. Is this rising? The slope down to NW pond is a gradual one of collapsed and crevassed pahoehoe. W islets tend to form a crescent.

12:30 p.m. Sinking about 4 feet to 1 p.m. and this crescent of one islet results, making a kind of crater about where the ring crater was. Noises very quiet these days, one or two puffing fountains and clattering shells occasionally.
Other conditions unchanged. Fumes appear thin from H.V.O. Base of cliff under S channel a slab parting from old wall -- may make S station dangerous.
E wall now quite dangerous.
Pit under E crag is a gulch to lava level.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date February 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

1917, Feb. 10



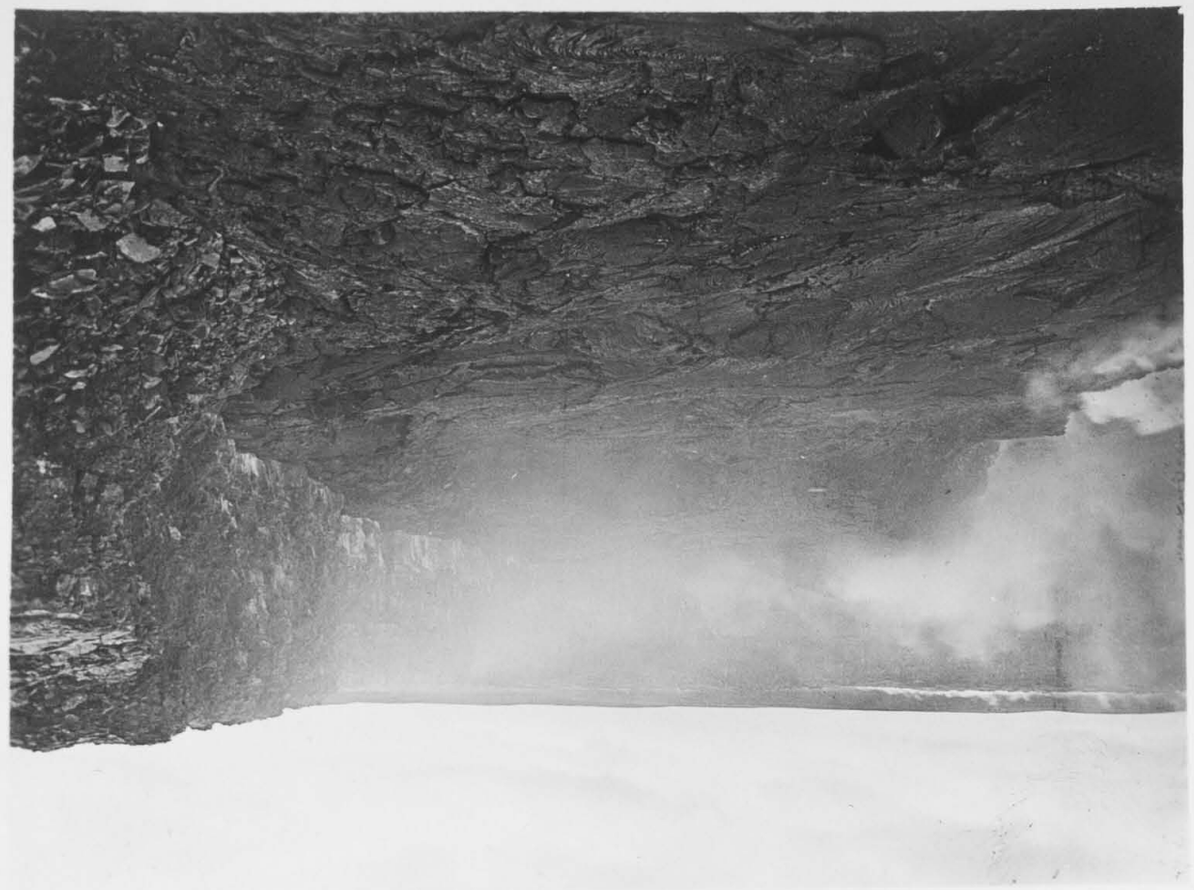
1



2

Tag

1917, Feb. 1









JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date February 17, 1917.
Sunday " 18, "

Feb. 17.
7:00 p.m. Lake higher. Splashing in NW pond and in grotto SW which flares (about where hot pot was). New island flush with lake surface and evidently recently overflowed for it is covered with glow lines. Streaming from NW arm, which is covered with dark skin. N pit glowing. E crag high. Four or five fountains occasionally migrating from W islets to SW grotto, or from N cove to face of crag-mass.

Feb. 18.
11:30 a.m. Extraordinary change since 7 p.m. last night. E crag has subsided 30 feet, and new central island and N peninsula of S island have come up. New island a table top 100 feet long, oval, showing spatter rims of its former level just below summit for about 6 feet, and for 35 feet below a raw wall nearly vertical reddish broken rock. New island a pulpit rock like former S island, and 40 feet high. Its long N tail is now five broken low pinnacle-islets extending to center N cove, the main pulpit being eastward, midway between E crag and N peninsula S island. The latter is 25 feet high, heaved up bodily with tilt of its benches westward. E crag has sunk quietly and preserved its form, the pipes stored on its escarpment are still there. NE bench lower than NW. W end of S island mass rising and cracking as east end(S island crag) sinks. Occasional falls heard there. Many fountains N, SW and W. Lake rising 12 to 12:30, sinking 12:30 to 1 p.m. S cadcade-pit full and overbrimming. Large SW grotto splashing. Crusts between new island and E shore. Fountains in W cove and NW pond. W islets gone.
Probably the recent lengthening of new island northward was due to subsidence of NE bench mass pressing out the underpinning and squeezing it up under the island.
Query: Is not the semi-solid bench and island matter always sinking and so the downward matter of "two-phase convection"?

Lake from S, showing upraised new island and peninsula:-



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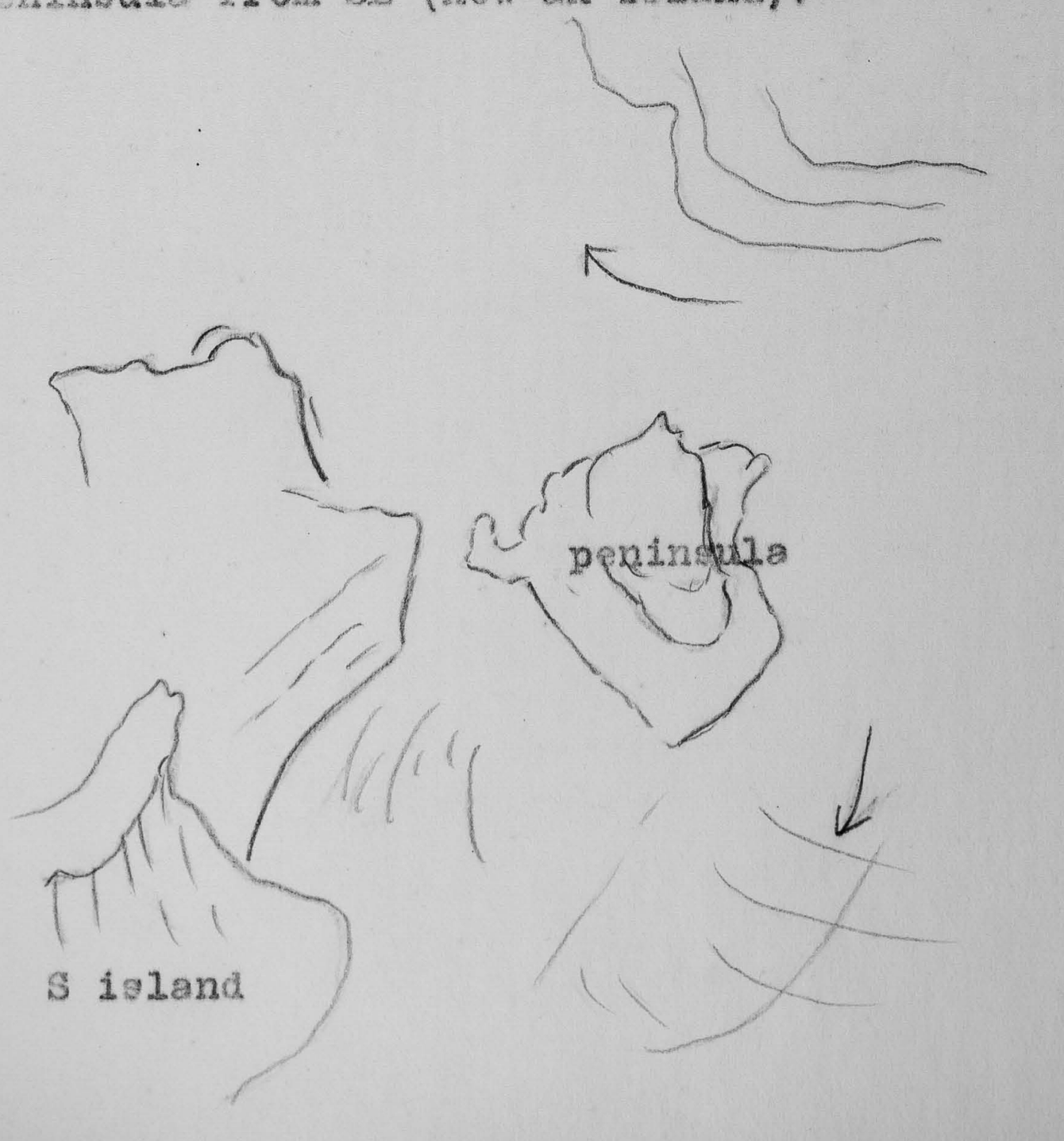
Hawaiian Volcano Observatory

- 2 Day Sunday Date February 18, 1917.

Noon. New island from SE:-



Peninsula from SE (now an island):-

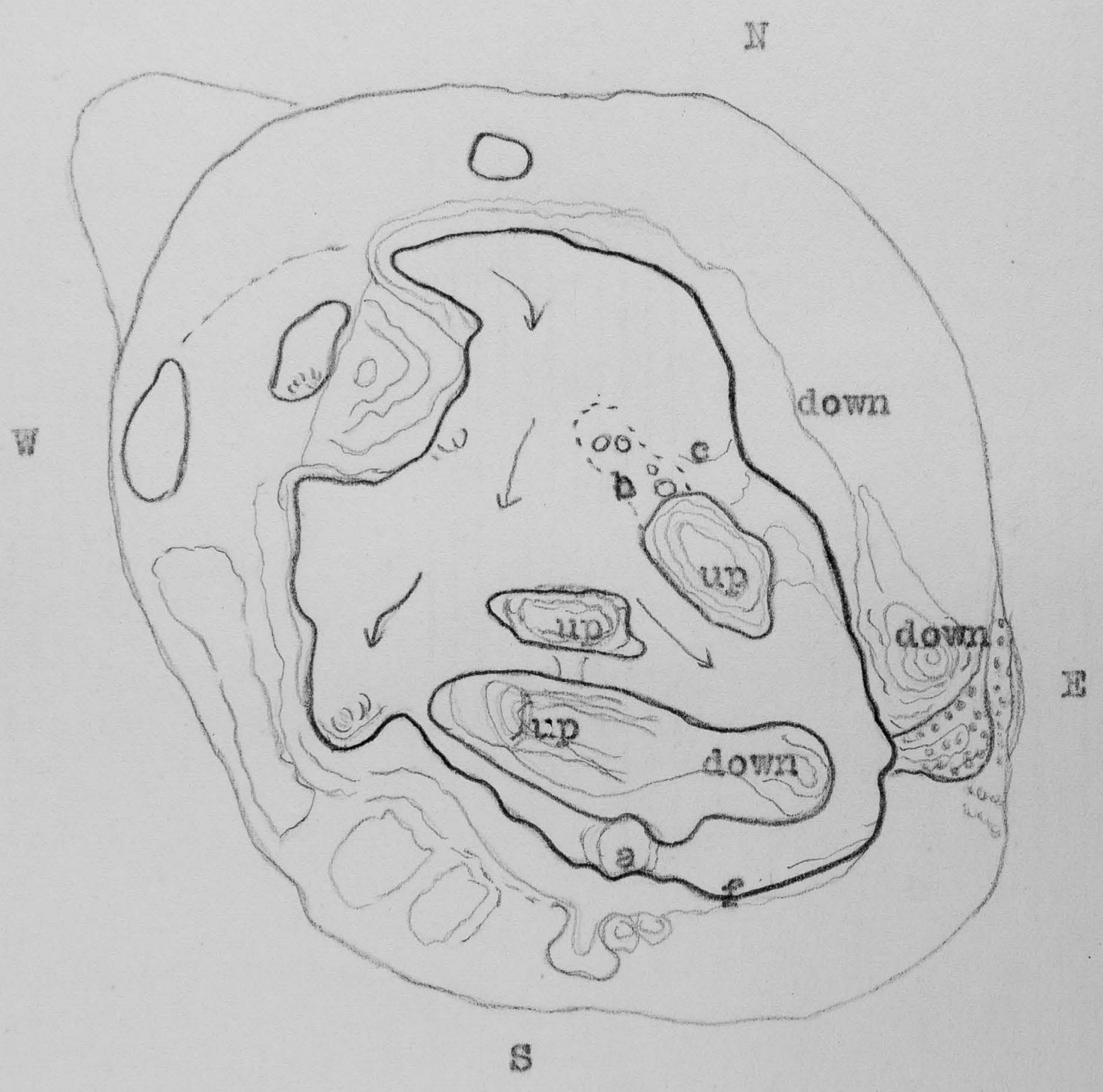


JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Sunday Date February 18, 1917.

Map from S showing transformation of night of Feb. 17-18, 1917:-



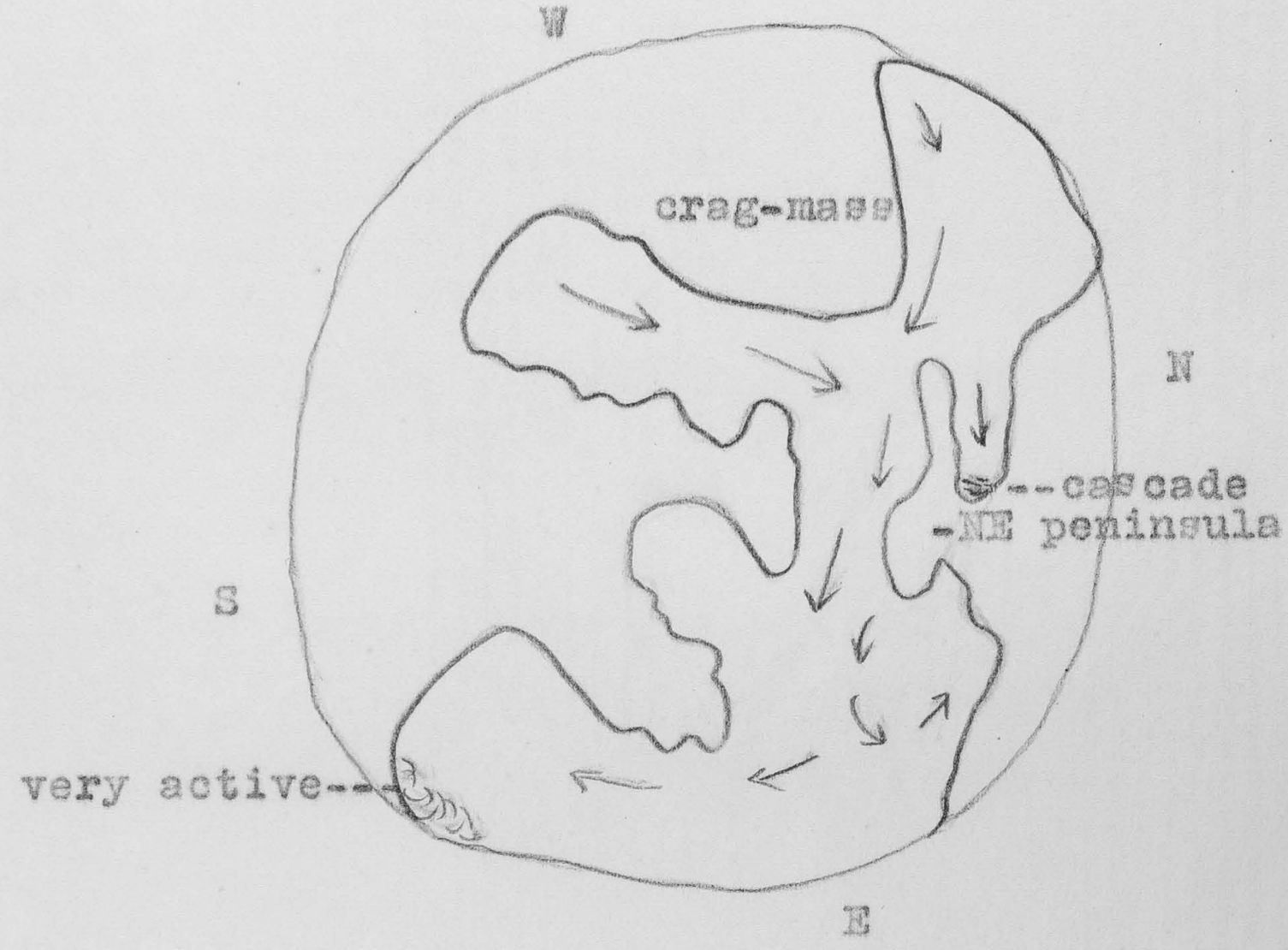
T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date February 21, 1917.

1:40 p.m. From E station.
SE cove very active. Rapid streaming into this cove.
From the wall between the E and SE stations much rock has fallen on the floor below.
From SE station.
Small island joined with NE bank. Thick blue fume rising from top of it.



2:20 p.m. From SE station.
Lava down about 5 feet all around. Commencing to rise slowly.

2:40 p.m. Wall under the old rest house has been dropping rocks.

2:50 p.m. From NW station.
New cascade on NW side of NE peninsula rushing rapidly under bank of peninsula.

Alex.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Thursday Date February 22, 1917.

1:30 p.m. See Map of Feb. 18. Letters indicate changes today.

a - now a cone. b - peninsula 5 feet high.
c - cascade down (O.F.?) f - inrush fountain.

Five-foot spatter bench all around. Whole S channel a 5-foot floor. E crag still above SE bench. Fresh falls E, S and SW. S island (old) now lower than W end same island mass. Fountain in S end W pit which is deeper. More smoke than 18th. Violent fountaining SSE and hot fume column. Only other fountain is against bank SW. Streaming from NW arm, then S, SE and around old S island into S cove, which ends at the inrush locality (where high spatter cavern was at W end SE floor). SW cove mostly crusted over, also E side N cove. The SW fountaining and NE cascade both from under crusts.
N pit sending up hot fume.
New island joined to bank NE.
NW pond quiet. Even slope of subsidence towards NW pond. NW bench now appears about level with NE bench.
E crag not much lower than 18th.
All around pit fresh falls from high walls and fresh opening of crevasses E, S, SW, NW, N and back of high rim Halemaumau.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date February 22, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
1:30p	S	N	0					
	SW	S	0					
	S	Central promontory	20 10	8 21	-8	715	106	
	SW	ditto	75 3ca					
	S	S side central prom.	25 26			691		
	SW	ditto	77 15			548		
	S	Lake level		8 43	-9		107	
	SW	Lower bench this loc.		9 56	-9		97	
	S	Crag-mass summit	31 54	2 7	-10	842	33	
	SW	ditto	93 41					
	S	Top E crag	28 33	2 54	-12	574	30½	
	SW	ditto	38 8					
	S	W top new island	4 51	4 58	-12	600	54	
	SW	ditto	51 52					
	SW	W end new island extension.	67 2					
	S	E summit new peninsula	8 13	7 56	-9	495	71	
	SW	ditto	50 52					
	S	W summit new S island	27 43	8 23	-9	405	61	
	SW	ditto	46 16ca					
	S	Old S island middle summit.	-19 20	11 4	-14	367	73	
	SW	ditto	31 30					
	S	Floor N, edge cliff over lake.	6 37	2 23	-13	973	43	
	SW	ditto	76 33					
	S	SW crag	62 30	5 18	-9	275	27	
	SW	ditto	12 34					

				no	pl	scr	stop	ex	cam	
1:30p	SE	New island	(cloudy)	1	Ortho	8x	f/8	½	P	
	"	E crag	"	2	"	"	"	"	"	
	S	New island	(fumy)	3	"	"	"	"	"	
	"	Crag-mass	"	4	"	"	"	"	"	
2:30p	SW	Islands	"	5	"	"	f/7	"	"	
	"	Crag-mass	"	6	"	"	"			

T.A.J.

1917, Feb. 22.

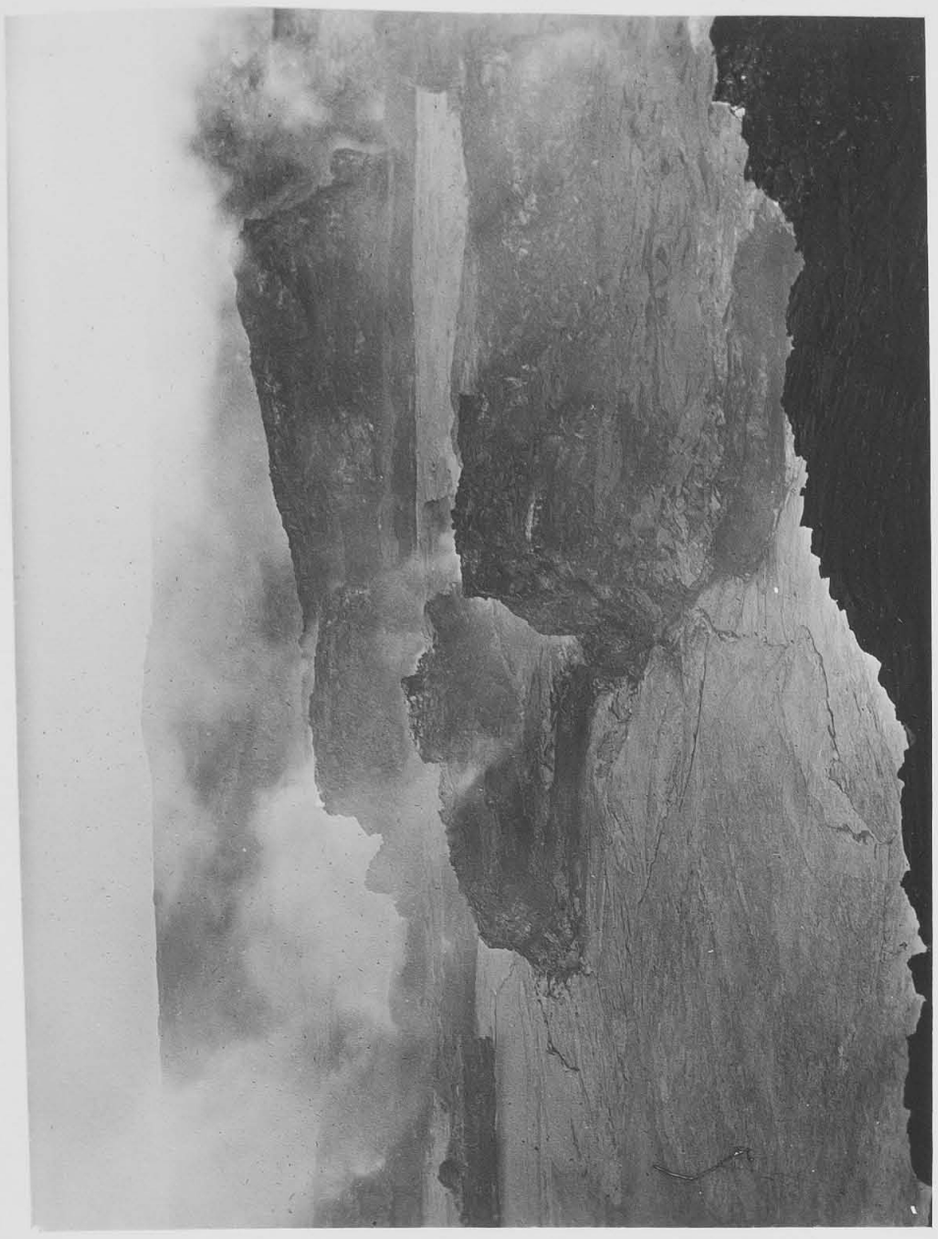


1



2

1917, Feb. 22.



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JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday . Date February 23, 1917.

4 to 5 p.m. Lake about same. Strong current from SW and from NW rushing to SE where is violent boiling and fume under cliff. Strong cascade under bank NE cove: running now three days.
New island and S islands higher, bench SE three feet high, on central peninsula eleven feet high. Fountain in NW arm. SW cove heavily crusted. Heavy falls of talus at base SW crags on lake side.
N pit quiet.
E crag a little lower.
Bubbling at base of crag-mass but no central fountains. The river-like current to SE appears to slope. Smoke heavy, especially NE and SE.

T.A.J.

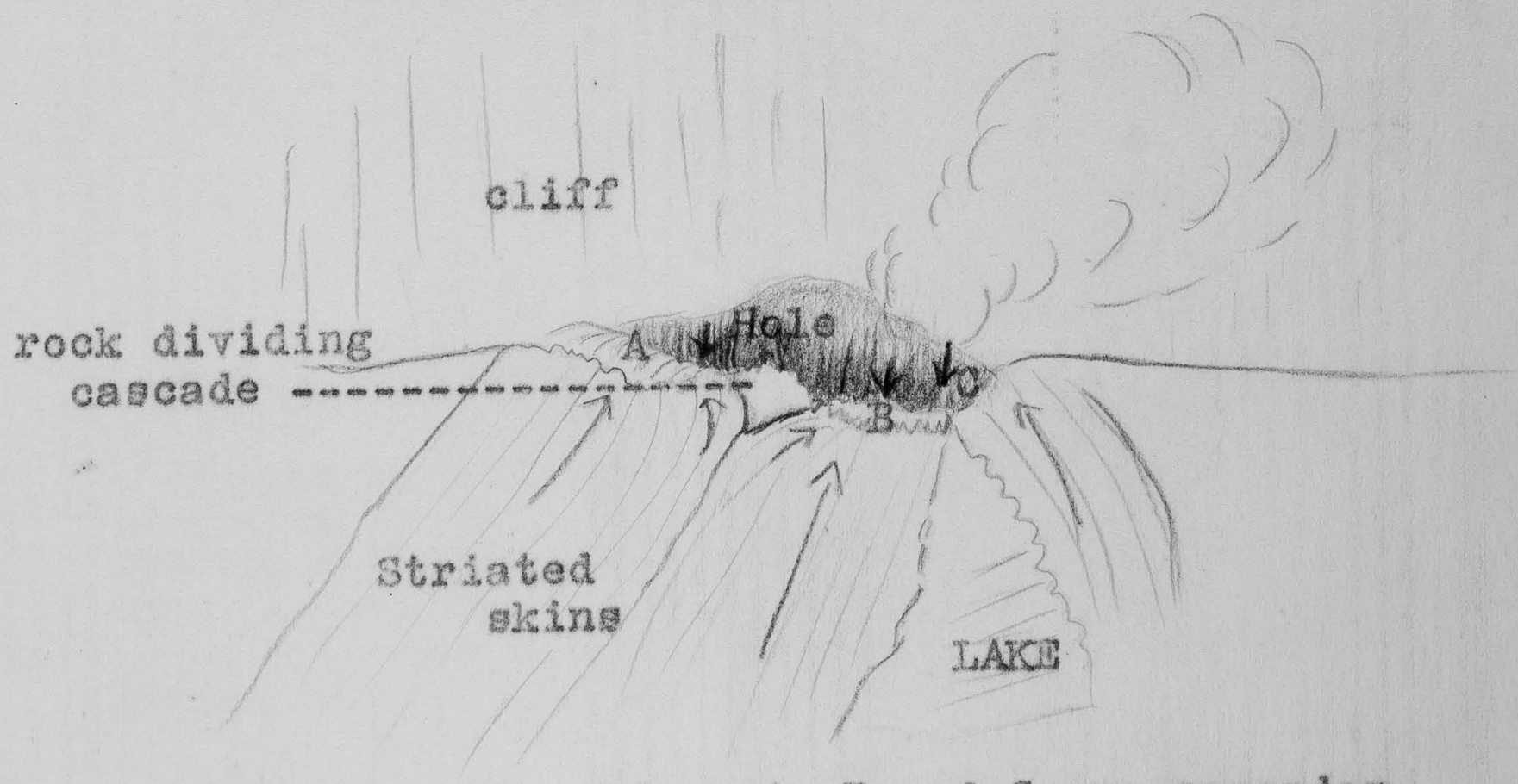
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Saturday Date February 24, 1917.

11:30 a.m. Lake higher, bench 2 to 3 feet all around. Same NE cascade and SE grotto, otherwise little fountaining. SW cove crusted, NW pond crusted, W pond blowing, N pit with glowing bubbling lava slowly streaming N. NW pond has small dark pit (circular).

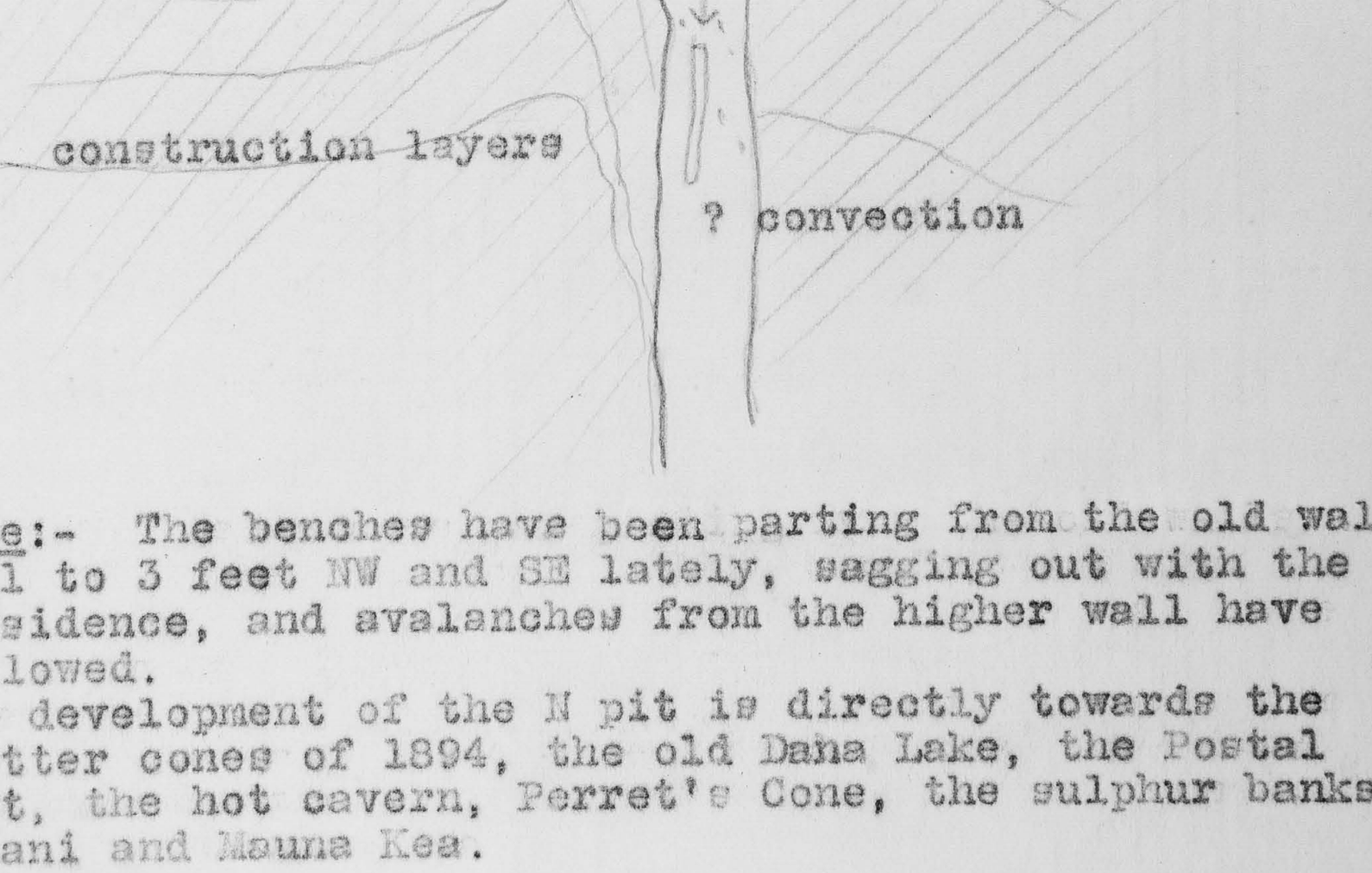
11:45 a.m. The streaming was wholly reversed from SE to N, and from NW arm meeting this current in N cove, and both pouring into N bank, which is notched back, and into NE cascade. The N floor is cracked and heavily smoking with brownish white fumes not at all disagreeable. This smoke would collect in a whirlwind occasionally and shoot up in billows making almost cauliflowers, and the effect was very unusual for Kilauea. There is a wide tunnel under N bench apparently and the N pit is a shaft leading to it. The heavy smoke was during strong flow into this tunnel, but the whole N bench is smoking as though preparing to collapse to a new arm of lake.
The second conspicuous feature was the NE cascade which has now been pouring for four days or more. It is a triangular hole under the bank, perhaps 80 feet long, and a wide cascade shoots from the lake into it. The cascade unquestionably pours over a ledge, for the ledge is V-shaped and the cascade pours over both sides of the V and also one side showed a piece jutting up through the cascade dividing it; thus:-



Sketch from NW. Edges A, B and C are cascades.

It now appears as though the cases in the past of cascades at the lake border pouring from the lake really were pouring over edges of the hardened lake bottom. All the occasions have been after subsidence to reveal the lake bottom, and they are always into places where border grottoes or channels have been

engulfing crusts which probably pile up on the bottom and build ledges athwart the outlet holes. Perhaps the fixture of the border grottoes is determined by melting, through oxidation of gas along the wall and building up a partition under the lake of foundered skins; this would make a furnace stack at the lake basin margin under the grotto thus:- (cross section)



Note:- The benches have been parting from the old walls by 1 to 3 feet NW and SE lately, sagging out with the subsidence, and avalanches from the higher wall have followed.
The development of the N pit is directly towards the spatter cones of 1894, the old Dana Lake, the Postal Rift, the hot cavern, Perret's Cone, the sulphur banks, Kulani and Mauna Kea.

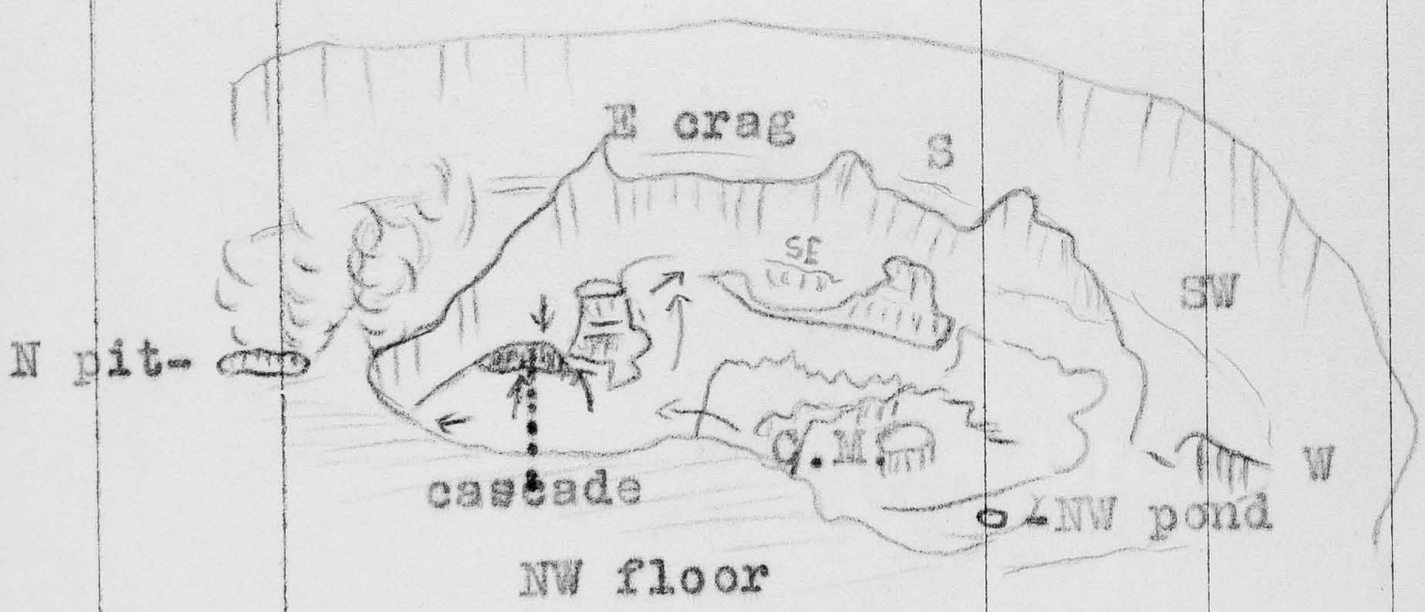
T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date February 24, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

Key to panorama photo, from WNW:-



			no	pl	scr	stop	ex	cam	
11:30a	From NW high rim, point next N of W niche:-								
	To NW cascade	1	Ortho	8x	f/11.3	½		P	
	" N corner inner pit	2	"	"	"	"		"	
	" SW cove	3	"	"	"	"		"	
	" N pit	4	"	"	"	"		"	
	" crag-mass	5	"	"	"	"		"	
	From W of N station:-								
	To N pit	6	"	"	f/6.3	1/5		"	

T.A.J.







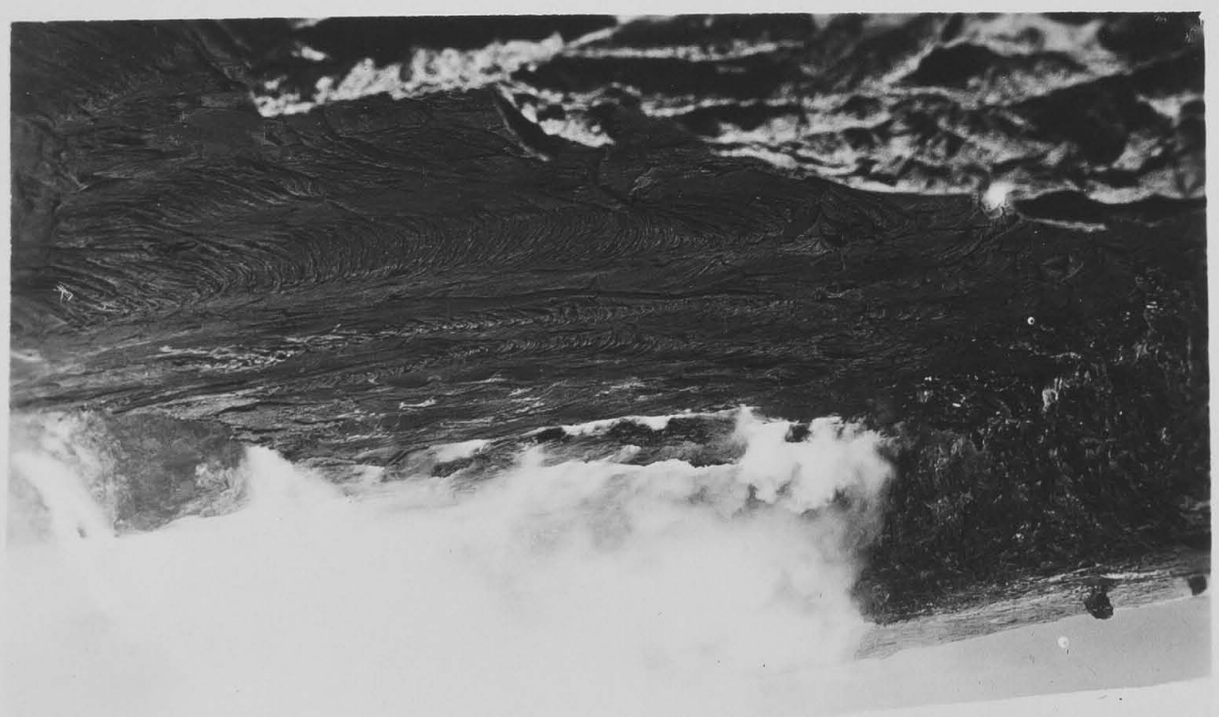
1917, Feb. 24

606

9



4



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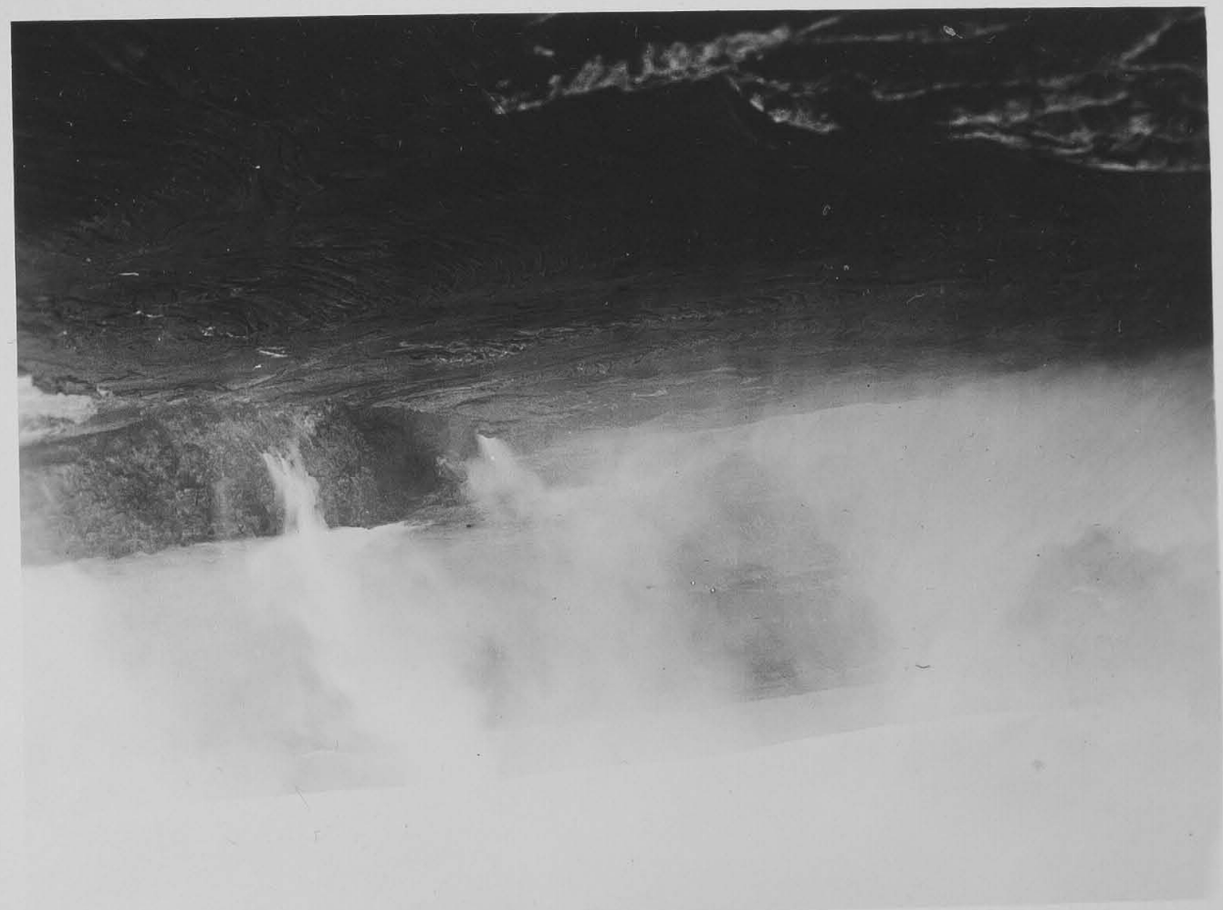


JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date February 25, 1917.
Monday " 26, "

Feb. 25.
2:05 p.m. E station.
Lava down about 5 feet all around lake. No fountains.
Cascade still running very fast N side of NE peninsula,
making much noise.

3:30 p.m. N station.
Lava level with floor of peninsula.

4:00 p.m. Large fall N starting many fountains.

Feb. 26.
2:30 p.m. SE station.
Lava about 10 feet down and cascade still running. SE
cascade has stopped. No fountains. Current in same
direction.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Tuesday Date February 27,1917.

1:45 p.m. E station.
Lava level with floor of peninsula. Streaming still toward the SE cove. No fountains.

2:00 p.m. NW station.
The cascade is still running but the mouth is smaller. W arm crusted over.

3:30 p.m. W station.
Lava down about 3 feet and sinking slowly. Only a few fountains,

Alex.

6:00 p.m. Crags in middle appear higher. Inner bench moderately high. Cascade pouring strongly NE. Two glowing and flaming high pots SW. Active spatter grottoes WSW and SE. Streaming from NW arm to E, to SW and to SE. SW cove active. N pit active. S pot a filagree glowing cone. Some movement in E talus heard. Six fountains, chiefly at border. Noises roar of cataract blowing and fountaining.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date February 28,1917.

10 to 11 a.m. Lake 8 feet below inner bench. Cascade pouring sluggishly; cannot be well seen on account of smoke. No smoke around N pit to speak of but dense white smoke against N wall of inner pit. N pit a cavernous space widening below with bubbling pool of lava streaming N. NW pond same as before and W pit appears unchanged. Active fountaining and fuming SE grotto; SW cove stagnant. Streaming NW to cascade and to SE. Flaming chimneys SW with yellow sublimates.
Making circuit of pit, fumes disagreeable quality directly related to fountaining places making them. At SW station bad fume from a fountain grotto WSW; at point SSW bad fume from the two SW chimneys; SSE bad fume from SE grotto.

9:00 p.m. Brilliancy of glow greatest SE and at cascade pit. SW cove crusted. Two large holes SW chimneys with lazy blue ! flames like burning alcohol; little pressure. Larger hole at least 6 feet across. Another blue flame spurting under pressure on bank SE behind a filagree glowing cone next SE grotto, appears to be a place of high oxidation of gases. Small fountain through crust occasionally NW arm. Glow in bench cracks under S station and at two places in NE floor. N pit glowing. High glow, flame and yellowish fume over cascade pit.

Note:- In the morning watched a spatter border fall into lake in E cove, piece 30 feet long, 5 feet high, 3 feet wide. Lake below for one minute thrown into fountaining, large bubbles, then smaller, then dwindling, insuck from all directions with rending of crusts, then cooled off and crusted. The effect was surely oxidation of gas in lava by contact air in fallen rocks.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date February 28, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10-11 a.m.	SE	E crag	1	Stand. / Ortho.	8x	f/16	½	P
	"	New island	2	"	"	"	"	"
	"	Central peninsula	3	"	"	"	"	"
	ESE	S channel	4	"	"	"	"	"
	"	Old S isl. through gulch beside E crag.	5	"	"	"	"	"
	S	SW cove	6	"	"	"	"	"

Double strength Eastman Pyro-metol developer.

T A.J.

1917, Feb. 28.



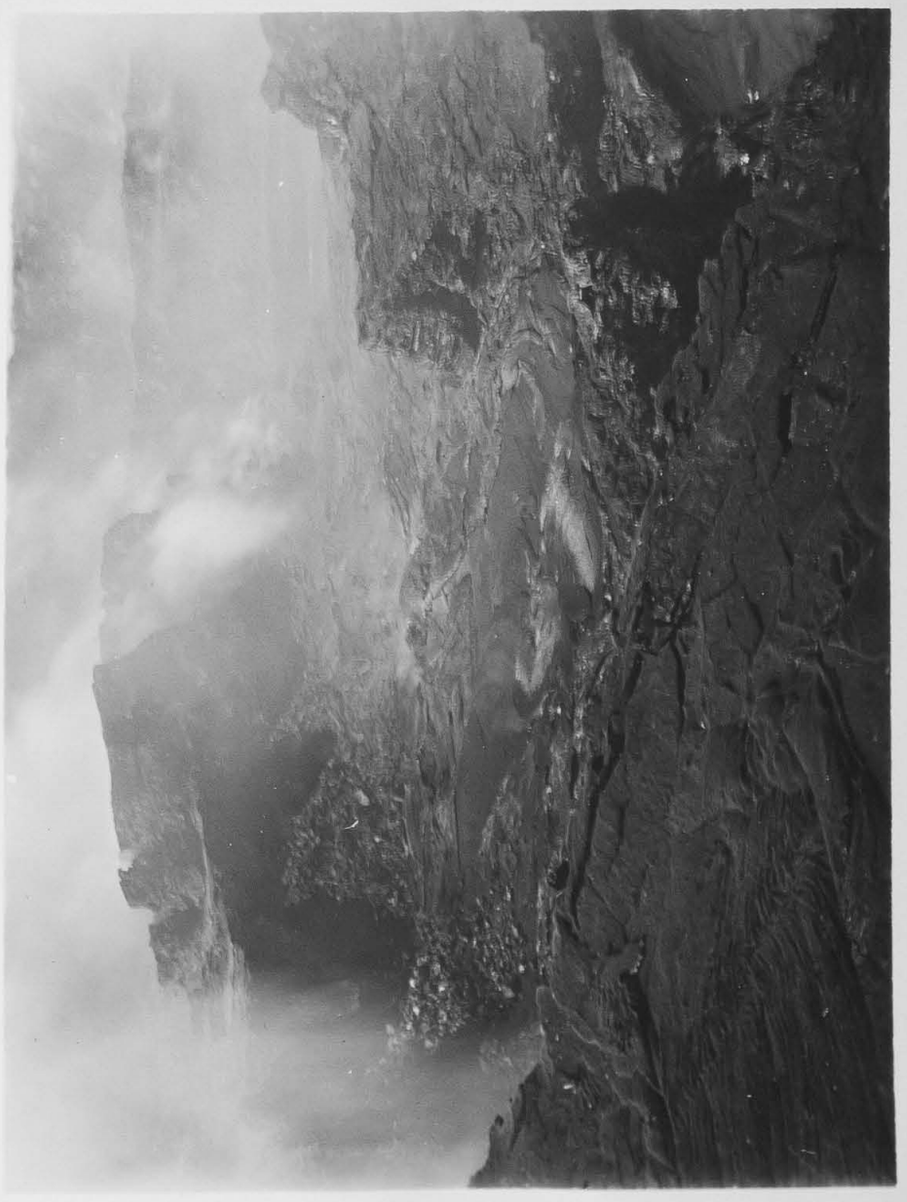
1



3



2



4

1917, Feb. 28.



5



6

Taf

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date March 1, 1917.

Lake low. High bench falling S. Lake falling after 11 a.m.. Collapse at site of S wall pond. Inner bench 15 feet high. Cavern arches of crust between central peninsula and S island mass, under S channel crust at inner end SE cove and under crust between NE bench and new island. Four or five fountains occasionally central. New channel between N cove pinnacle island and new island with streaming through it under arch of crust from center of lake northeastward, perhaps to cascade pit; while N cove crust appears stagnant and not streaming to former cascade locality. Benches uniformly about 15 feet high. Crag-mass has subsided during this week with reference to W niche.
Hissing SE, no roar from cascade heard. Smoke N inner cliff. Streaming from NW to SE and SW, and to NE through new channel. N, NW and W pits appear same. Fumes much thinner from pit as a whole, but very dry day.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Thursday Date March 1, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
		Cold, brilliant, windy.	Wind NE.						
	ENE	Pit	20 in.	1	Film	B & J	f/16	1/4	8 in. Cirkut
	SE	Pit	28 "	2	"	"	"	1/6	"
	ENE	Pit	19 "	3	"	"	"	1/8	"
	NE	Pit	29 "	4	"	"	"	1/2	"
	NW	Pit (underexposed)		5	"	"	"	1/9	"
	SE	Pit		6	"	"	"	1/6	"

1 & 2 fogged in wrongly opening camera. Developed in developing apron-tank 20 minutes.

3 & 4 streaked by insufficient motion in developer. #4 proper exposure.

5 & 6 hand devel. Eastman double strength. Underdeveloped.

T.A.J.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Friday Date March 2,1917.

9:30 a.m. Lake same. Cascade NE more to the N. Cascade also SE into pot undermining the pinnacle locality under S station. Streaming as before. Four or five fountains. Dense smoke N wall and strong fume SE cascade. No apparent change in height lake or crags.
Many recent falls on bench NW, N and NE.
Alex says W pond active and streaming northward.
Development of cascade SE explains the peculiar very hot rushing fume which has been here, though place looked like mere grotto.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Friday Date March 2, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30a	SE	N	0					
	E	N	0					
	SE	E sta., loc. W of sign	-33 14					
	E	SW station	82 28					
	SE	(Lake cove N of old S (isl. top of lower (bench.	58 34	18 36	-4	333	113	
	E	ditto	85 52					
	SE	Lake just below	58 52	20 12	-4	335	124	
	E	ditto	85 52					
	SE	(Lake E end central (peninsula.	46 10	17 5	-4	378	117	
	E	ditto	74 20					
	SE	E crag	0 54	10 50	-4	199	38.5	
	E	ditto	90 10					
	SE	W end new island	26 10	8 25	-5	408	51	
	E	ditto	56 16					
	SE	Cent. penin. summit	47 29	9 0	-6	469	75	
	E	ditto	68 56					
	SE	Summit crag-mass	42 20	2 22	+10	872	31	
	E	ditto	49 6					
	SE	(Summit W end S island (mass.	63 26	7 14	+7	550	69	
	E	ditto	77 39					
	SE	(Central summit old S (island.	60 25	19 1	+7	237	82	
	E	ditto	96 24					
	SE	Sulphur SW chimney	77 39	8 21	+4	665	96	
	E	ditto	85 0					
	SE	SW crag	85 56	3 8	+3	625	33	
	E	ditto	92 13					
	SE	S glow cone	79 48	13 56	+2	424	105	
	E	ditto	94 8					
	SE	Lake W cove	57 49	7 57	+8	846	114	
	E	ditto	64 11					
	SE	(Bench level under (Perret's cave.	34 47	2 16	+14	1249		
	E	ditto	36 0					

			no	pl	scr	stop	ex	eam
	SE	Bench level W niche	45 48	1 57	+10	377	12	
	E	ditto	46 45					
	SE	Bench level W pond	61 38	2 11	+9			
	E	ditto	64 19					
	SE	(Bench level back of E (end SW crags.	98 44	4 54	0	691	59	
	E	ditto	100 32					
	SE	(Point bench opposite (SE sta. (under it).	42 37	24 9	+9	107	71½	
	E	ditto	112 51					
	SE	(Bench level N edge N (pit.	8 0	3 39	+11	954	57	
	E	ditto	10 21					

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Friday Date March 2, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SE	(Bench level base 1894	-15 55	5 50	+9			
		(bench.						
	E	ditto	-10 37					
	SE	(NE point of bench	12 14	7 8	+13			
		(over lake.						
	E	ditto	28 30					
	SE	NE pinnacle crag-mass	24 42					
	E	ditto	42 39					

Average depression of lake 120 feet SE, 114 feet W.
Height shore bench 11 feet
" E crag over lake 81 "
" new island over lake 59 "
" crag-mass " " 83 "
Sinking in 8 days 14 feet.
Lake slopes down 6 feet from W inlet to SE outlet.

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date March 3, 1917.
Sunday " 4, "

Mar. 3.
2:15 p.m. E station.
Lava 2 feet below floor of peninsula. Rising. SE cascade still running but rest of lake very quiet; no fountains. Thick smoke.

3:00 p.m. W station.
Lava down about 5 feet. Lake quiet. Fumes thick all around pool.

5:30 p.m. E station.
Lava level with third floor around peninsula. Very active SE. Streaming to the SE.

6:00 p.m. E station.
Cascade on N side NE peninsula began to flow. Many noisy fountains in N arm and a few in channel running SE.

Mar. 4.
1:20 p.m. E station.
Lava down about 5 feet. Lake very quiet except for the cascade on N side of NE peninsula which is rapidly pouring over the fall.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date March 5, 1917.
Tuesday " 6, "

Mar. 5.
1:30 p.m. E station.
Overflowing third floor on S side of pool; spreading out wide.

2:10 p.m. E station.
Lava down one foot. SE cove very active, throwing lava up very high.

2:50 p.m. W station.
Banks about 5 feet high all around lake. Many fountains in N arm. Cascade still running on N side NE peninsula, about 100 feet wide at mouth, going down very fast.

Mar. 6.
11:00 a.m. E station.
Lava down 5 feet. Many fountains in different parts of lake. SE cascade has stopped as has that one NE. Lava rising slowly.

4:30 p.m. E station.
Lava level with third floor on S side of pool. Many fountains. Activity of yesterday continues.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Wednesday Date March 7, 1917.

1:30 p.m. E station.
Lava level with floor on S side of pool. Very active.

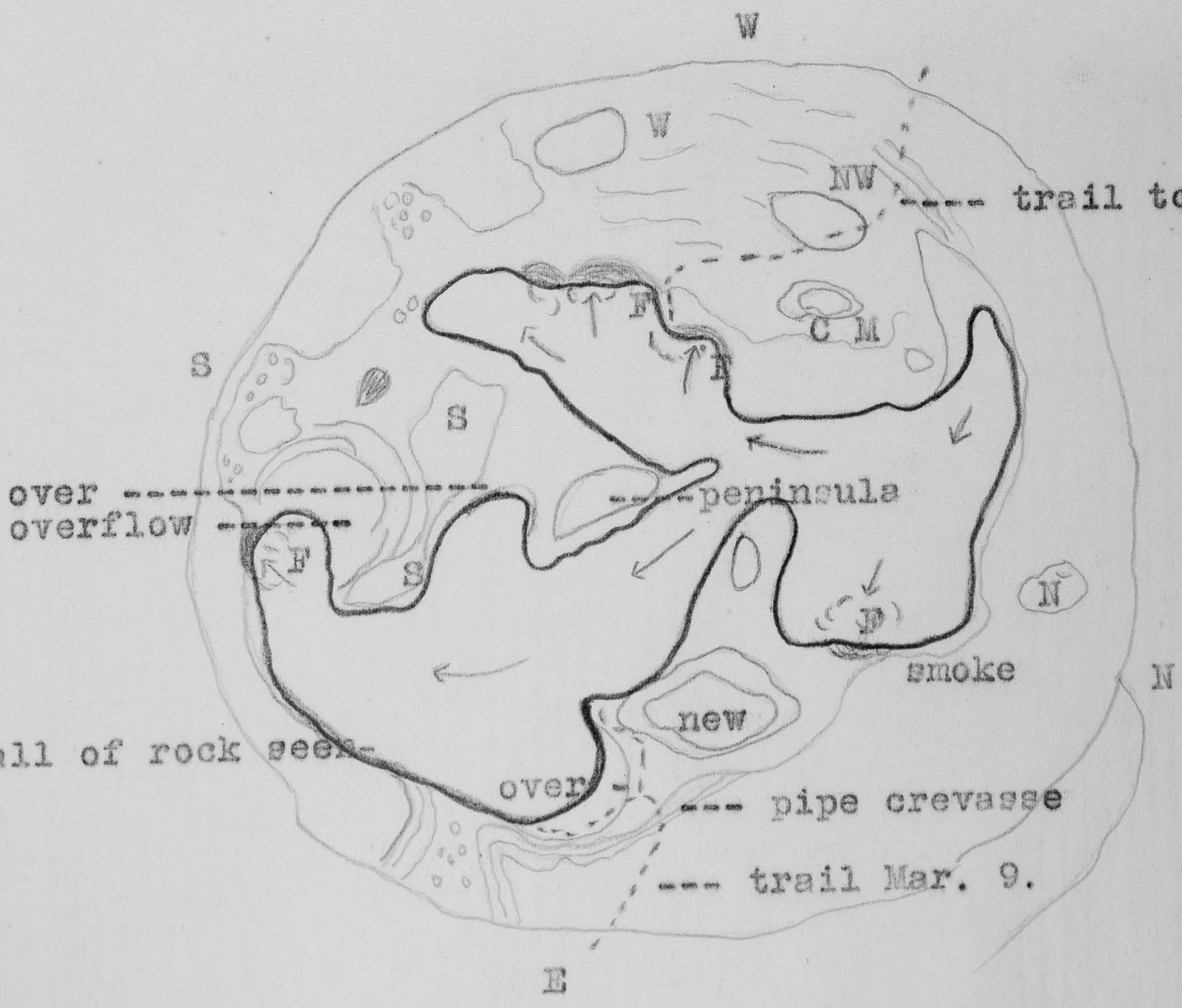
2:05 p.m. E station.
Large active grotto on W side of lake, boiling, rumbling and occasionally throwing up the lava high in the air.

Alex.

5:00 p.m. Lake rising. Overflows glowing S channel, E cove and SE of central peninsula. Recent bench entirely covered and new one forming. Spatter ramparts forming W, NE and SE. Crag-mass appears a little higher. (Not confirmed by survey.) Streaming sluggish. Middle crevasse SW bench appears wider. Slight fall of rock ESE. Otherwise much the same. See map.

Note:- The word "island" does not mean continuously surrounded by liquid. All the "islands" at present are peninsulas, evolved from islets.

Lake from E:-



T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date March 8, 1917.

4:30 p.m. Lake higher, new widening brnch all around, at the moment falling two feet below bench. Six fountains. Much blowing and rumbling.
Fountain grotto SE, very large curtained grotto hung with stalactites NE, continuous fountain at entrance to N tunnel and lava up to top of arch. Slow streaming N inside tunnel revealed through N pit and fountain at N end of tunnel under N station. Recent falls from cliff under old rest house.
NW pond a low smoking cone with stained overflows.
W pit has tumbled in more and has a well 3 feet across of red lava with overflow rim around it; quiet but blows occasionally.
Above W cove is an extensive yellow-stained cone crackling, spurting, and filagree glow, fountain within. Just below it is a spatter rampart with heavy-pounding grotto beneath; greatest crackling and blasts when this is active. Other small fountains at changing locations. Streaming lively, many glow lines, from NW to N, to NE, to SE, to SW, to W. S cone fuming. Greatest noise N and NE. Another fountain SW bank. Flames numerous.

Note:- The tumbled walls around interior W pit are masses of limonite and hemotite, and same is true on breaks in bench matter everywhere. Lava only a few months old has iron oxidized through and through.

T.A.J.

122

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Thursday Date March 8, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
4:30 p	SE	New island	1	Ortho	8x	f/6.3	$\frac{1}{2}$	P	
	"	River	2	"	"	"	"	"	
	"	S island mass	3	"	"	"	"	"	
	ORH	Crag-mass	4	"	"	"	1	"	
								T.A.J.	

1917, Mar. 8.



1



2



3



4

Jag

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

 Day Friday Date March 9, 1917.

10:50 a.m. Big fountain suddenly SE end SE river. After period of quiet and very sluggish streaming with no grotto action SE, begins small, sucks in crust, increases to enormous, streaming started by it southeastward, reduces inflation, stalactites under bank right and left, fountain migrates to SE wall. Streaming accentuated clear to NW arm.

11:03 a.m. This happened again at end of SE cove. Rush and burning of combustible gases. Lake apparently inflates with these gases and expels them with combustion following at intervals.

11:22 a.m. River stagnant completely; fountaining and streaming to SW. Some steady blowing at S cone. A little bubbling at margins of river. Thin cracking zigzags near entrance SE cove. Rising overflows over crusts near E bank.

11:26 a.m. Large fountain middle river migrates SE to old S island. River becomes a torrent, violent bombardment of bank, and SW cove now stagnant.

Note:- Central fountaining starts, not only by conflict of currents, but by inflation reaching limit and finding relief: locus of relief is place of current conflict, however, for border bubblings do not necessarily start fountains at such a time. The fountain reaction is started where sufficient oxygen goes below surface by foundering to make a first explosion. And current conflict starts foundering in a stagnant stream, unless thickness limit and overweighting does it.
The inflation periodicity is very pretty this morning.

Lake at present accessible W cove and E cove. Alex descended by pipe crevasse, to E cove shore this morning.
W cove accessible by way of W niche and NW pond.
On this day lake rising and nearly brimming with fluctuations of about one foot. Spattering over SE cove. Six fountains at 9 a.m., strong blowing and gas pressure, thereafter only two or three fountains much of the time.
Fountains central in N cove and SE river and SW cove occasionally; otherwise SW, W, base of crag-mass, NE, SE.
No action at tunnel to N pit, which seems to be submerged.
Crag-mass seems to be tilting back eastward and summit rising. Lake inflating and discharging through fountains all morning.

Noon. Descended to NE bench. Way down to E cove easy. Close inspection of new island reveals rock below massive and rough without the bedding of the lava flows above; three-fifths rough, two-fifths bedded (photos).
NE floor considerably collapsed and crevassed.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date March 9, 1917.

Visited E side N pit, which 40 feet down has very hot churning lava pool with black skins and walls showing spatter layers and stalactitic drip, heavy fountains N and NE against walls, but not showing deep grottoes. N grotto Alex says was deeper a few days ago when lake was lower. Streaming in pit northward, and later rotary counter-clockwise.

Afternoon. Lake 10 feet down, and recovered to 5 feet down.

Night. Little illumination from pit.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Friday Date March 9, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30 a	SE	N	0					
	E	N	0					
	SE	E crag	1 0	10 57	+4	197	38	
	E	ditto	90 24					
	SE	W summit new island	25 16	8 27	+7	405	59	
	E	ditto	56 0					
	SE	Shore E end peninsula	43 34	15 24	+9	377	103	
	E	ditto	72 31					
	SE	W grotto	58 0	7 10	+5	841	102	
	E	ditto	64 16					
	SE	Summit crag-mass	42 16	2 25	+6	880	34	
	E	ditto	48 49					
	SE	Summit peninsula	47 34	9 1	+1	467	74	
	E	ditto	68 41					
	SE	SW summit S isl. mass	65 36	7 17	+1	523	66	
	E	ditto	79 33					
	SE	Old S island	60 34	18 39	0	234	79	
	E	ditto	96 9					
	SE	S cove overflow	86 45	19 57	0	314	114	
	E	ditto	102 43					
	SE	SW crag	86 8	2 51	+1	614	30	
	E	ditto	91 59					
	SE	E cove	18 3	21 37	0			
	E	ditto	71 26 ca					
	SE	S cone	80 48	13 18	0	422	100	
	E	ditto	94 8					
	E	(N limit new island & (also pinnacles.	42 22					
	E	(NE cliff E side new (island channel	30 24					
	E	Crevasse at pipes	34 17					
	E	N end crag-mass	39 10					
	E	S end " "	61 3					
	E	E end old S island	102 30					
	E	W " " " "	92 43					
	E	S " new island base	64 52					
	E	N " " " "	45 0					
	E	" " " " top	48 14					

(continued)

			no	pl	scr	stop	ex	cam	
		NE Bench.							
E crag scarp		New island	1	Ortho	8x	f/11.3	1/2	P	
"		S end ditto	2	"	"	f/8	"	"	
"		" " " (bright)	3	"	"	f/11.3	"	"	
"		Old S island (double exposure)	4	"	"	"	"	"	
"		ditto	5	"	"	"	"	"	
E margin		Into N pit & fountain	6	"	"	f/6.3	1/30	"	

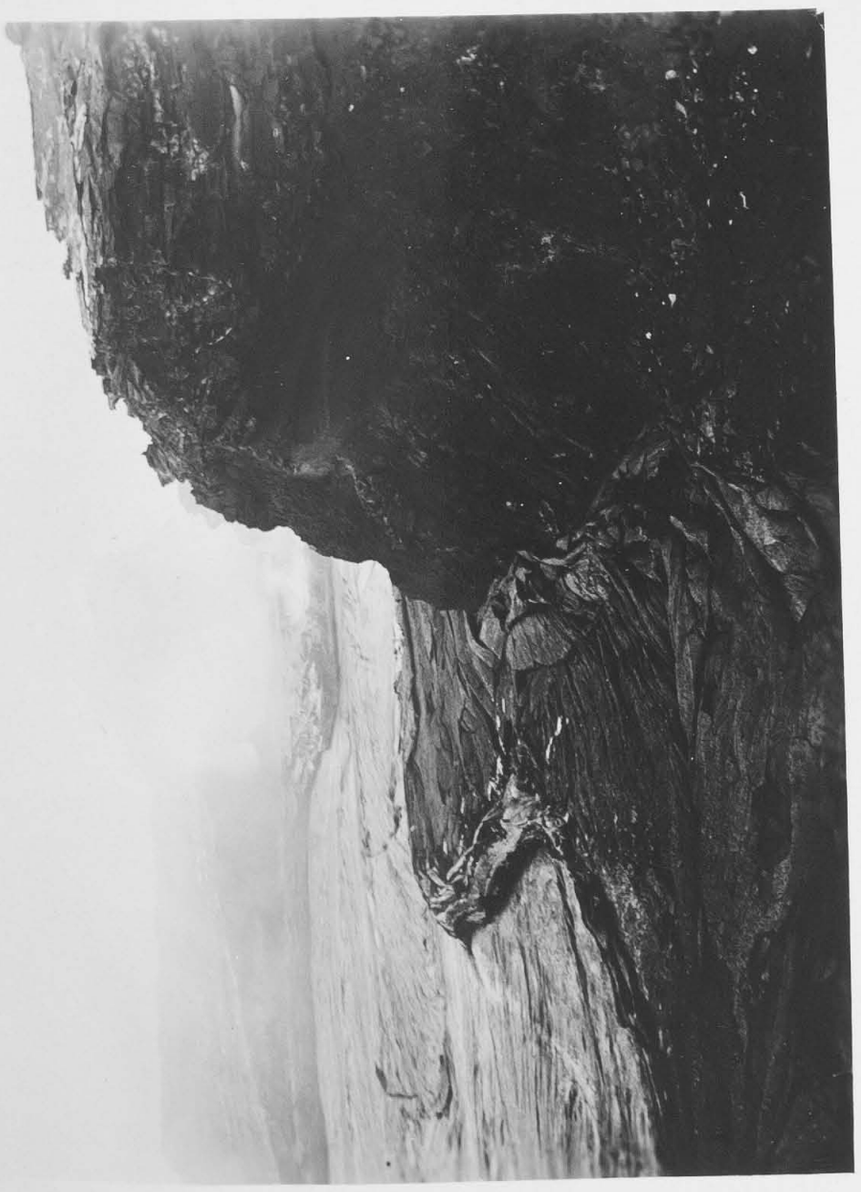
1917, Mar. 9.



1



3



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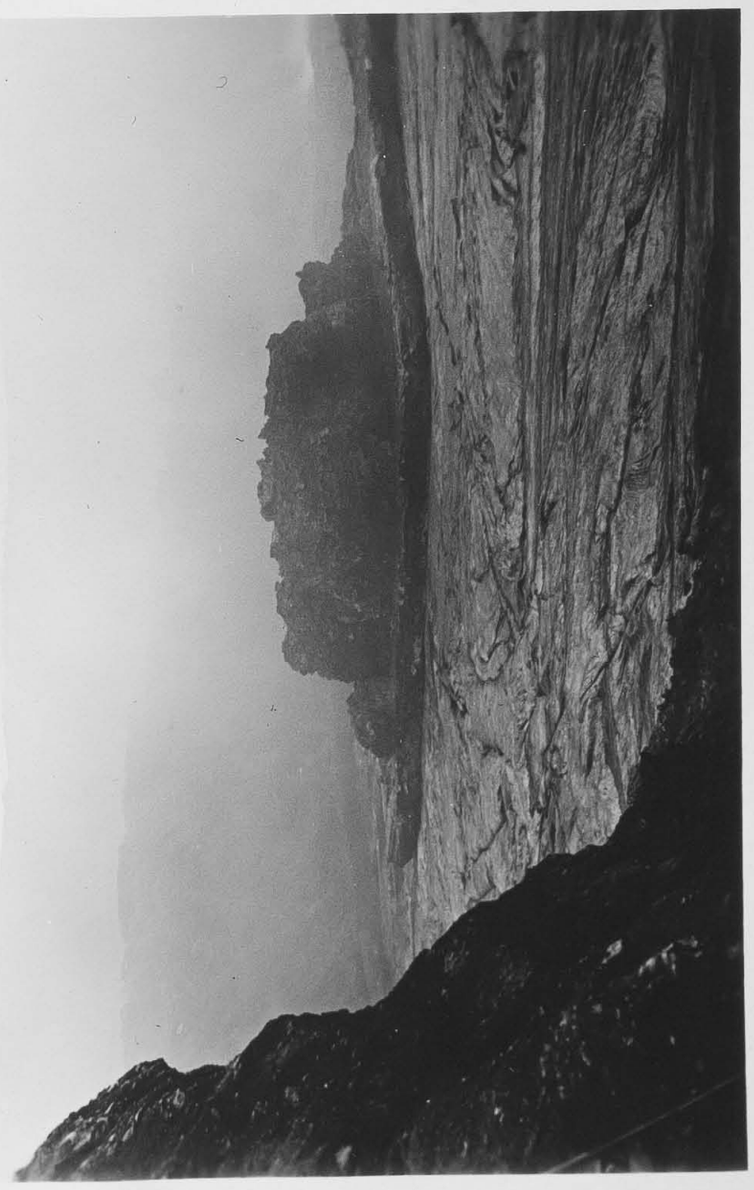

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1917, Mar. 9.



5

6

Jag

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date March 9, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	E	S end new island top	60 15					
	E	SE side E chasm	108 5					
	E	S end SW crags	97 45					
	E	N " " "	72 42					
	E	Tangent floor N	-15 39					
	E	" " S	134 26					
	E	Bend N entrance NW arm	33 25					
	E	N pt. S island mass	78 32					
	E	NE smoke (tangent N corner pit)	20 28					
	E	S pt. S island mass	88 41					
	E	Right tangent SE cove	101 33					
	E	NW arm	40 7					
	E	Pt. bench S isl. bend to SE cove	109 0					
	E	Valley W pond	65 22					
	E	Tip peninsula S entr. river.	59 48					
	E	Point pinnacles N entr	48 6					
	E	S tangent SW cove	82 13					
	E	Tangent SE cove	116 3					
		Lake depression 102 feet.						
		Height E crag		64'	(stationary since Mar. 2)			
		" new island		43	(up 2' " " "			
		" crag-mass		68	(down 3' " " "			
		" peninsula (central)		28				
		" SW summit S island mass		36				
		" old S island		23				
		" SW crag		72				
		" S cone		2	above lake.			

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date March 10, 1917.
Sunday " 11, "

Mar. 10.
2:00 p.m. Rainy.
Lake 5 feet below inner bench. Five fountains - NW, NE, SW, W and SE. Streaming to SE and SW vigorously. Blue fumr from N pit indicates fountain there. Crackling at fountain SE cove. Flame in W cone above bank. Much steam on benches from rain. No other changes. Heavy white smoke NE wall.

T.A.J.

3:55 p.m. E station.
Large piece dropped from crag-mass and started many fountains. Lake sank two feet.

4:15 p.m. Large piece fell from N wall of pool and caused fountaining.

4:25 p.m. Large slide of rock from under the old rest house.

Alex.

Mar. 11.
10:05 a.m. SE station.
The point of NE peninsula fell into lake and started about twenty fountains boiling.

10:40 a.m. Large piece fell from SE side NE peninsula. Fifteen or twenty fountains at one time.

10:45 a.m. Another slide from N side crag-mass.

11:10 a.m. Another large slide from wall on N side of pool.

12:05 p.m. Large slide from NW wall of pool. From E station.

12:20 p.m. E station. Rock fall from N side N lake.

1:10 p.m. Large part of E crag has fallen. Large slide from NW side of pool.

1:15 p.m. Roof over channel leading from main lake to N pit collapsed so as to join the two pools.

1:35 p.m. N station. Whole floor under N station is cracked and is falling into N lake; this is getting larger. Part of the floor between W and NW has sunk.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date March 12, 1917.
Tuesday " 13, "

Mar. 12.
11:40 a.m. E station.
Lava down about 20 feet. Lake very quiet.

11:45 a.m. Large slide from under S station dropping rocks on second floor..

12:30 p.m. Falls from different parts of the Halemaumau walls and from 1894 bench.

2:30 p.m. SE station.
Large fall of bank of pool NE. Started many fountains some of which lasted nearly an hour.

2:50 p.m. N station.
N pit choked by the fall of its walls. No glow to be seen there.

Mar. 13.
2:30 p.m. E station.
Lava down about 25 or 30 feet. Very quiet. No fountains. Many rock falls around pool.

3:00 p.m. Rocks falling from E side crag-mass started a few fountains which did not last long.

7:20 p.m. Large avalanche from second floor dropping into small pool under this floor and making a loud noise.

Alex.

5:00 p.m. Deming reports very swift torrent through SE channel to SE cove and no other fountains.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date March 14, 1917.

12 to 1 p.m. More fume and lake strongly down. Crag-mass has sunk bodily 15 (?) feet. Caverns have appeared under floors beside E island and central peninsula. Streaming to SE, and northward in N cove, out from crust over W cove. SW cove crusted. Inner bench 20 feet high. Eight fountains. Lake rising now. Puffing and plashing.
SE bench of January cracking. S cone smoking heavily. S gulch more tumbled. Heavy falls from high rim S and SW on bench below. SW crags have subsided and crevasses in floor back of them. W pond more broken, still shows crusted pot at bottom. W cone still in place. NW pond a smoky pit.
In lake a promontory with knob on end revealed by subsidence protruding E from crag-mass. Small SW islet also revealed. A niche with occasional inflow at site of recent NE cascade. Heavy stalactites, inflow and interior fountain in cavern under isthmus of peninsula on E side. E crag has sunk below level of SE bench. NE floor has sunk away from 1894 bench. Crevasses larger in slope from W niche to crag-mass. NW arm and N pit are tumbled. Rock tumbles from high walls in many places and widened crevasses.
This appears to be the equinoxial fall after the preliminary rise.

T.A.J.

1:35 p.m. SE station.
Lava down about 30 feet. Very active on SE side of NE peninsula. Streaming from W and running through channel SE and S. The blue fume is very thick all over the pool.

2:45 p.m. SE station.
Very active all over pool. Thirteen fountains in N part.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date March 15, 1917.

4 to 6 p.m. From SE station.
Lake appears low. About eight fountains. Inrush to cavern S of peninsula, explosions within send out waves and flames. Fountain against SW face of new island. Occasional shore fountaining SE cove. Streaming out from cavern leading from SW cove to S cone and SW, W, and NW, to N wall, to NE, to SE, fountain at NE base of crag-mass. NE floor has sunk farther and a crack concentric to the pit extends from base of 1894 bench at E station clear around to W pond, and five to twenty feet from base of high wall, leaving a shelf against wall as in 1912, of such widths. The NE bench has subsided strongly with the lake and the bench magma under the lake.

From N station.
The N pit has collapsed to a smoky chasm open towards the lake, a great crevasse extends W from the N pit and the block of bench has sagged towards the NW arm and downward. At W niche the old cliff crack has opened and there has been more subsiding and cracking between there and NW pond. NW pond an oval longish pond with glowing quiet lava in its bottom, which blows and fountains at SW end. Occasional cracking and foundering.

From NW station.
Red glow spots in N chasm and among cracks W of there, strong smoking. Glow strong at one place in crack opposite W niche.

From W station.
A remarkable fact of this glow in bench magma, which is in a few spots chiefly N, W and NW, is that old <u>surface lumps</u> of pahoehoe just under W station and above NW pond, about where W blow cone was (where Wood tried to collect gases) are glowing cherry red <u>at the surface</u>, and <u>not</u> in cracks. This is old lava without question, it has no appearance of freshness but it is reheated: how? Must be a path of oxidation gases through very small crevices.
W pond has a live rising red pot of lava and a flaming blow hole E side of pot. Blowing increases and small flow emerges from surface of lava in pot. Query: why here and NW pond, steady glow in lava of low red order, and blow hole <u>at side</u>? Compare Pelee spine, was explosion hole at side? Increased flow, increased blow.
S pot appears to be acting as conduit inlet, out flow from SW cove. General appearance of lake rising. No glow can be detected in cracks under S station. Fumes not bad to leeward of pit. Fountaining not very heavy. S cone glowing strongly. Big blankets of flame out from cavern next peninsula and confinement of gas in roof of cavern within, makes waves as the lava is pressed down and out by the escape of the gas in pulsations.
The SE bench appears to be <u>rising</u> if anything. Crack
betw

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 Day Thursday Date March 15, 1917.

between it and wall gaping and ledge rising and lifting the talus E, just as E crag did. The subsidence all agrees with presence of a stiff circular lava column, under lake, and this column sinking takes down lake and all middle islands with it, but border benches cling. Crag-mass, SW benches, SE bench and N benches, and the islands generally approaching a common level.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date March 15, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
6 p.m.	SE	SE channel	1	W P		f/6.3	1	P	
	W of SE	ditto	2	"		"	"	P	
	"	"	3	"		"	40	P	
								T.A.J.	

1917, Mar. 15,



2



3

Fig 1



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Day Friday Date March 16, 1917.
Saturday " 17, "

Mar. 16.
9 to 11 a.m. Lake rising and falling a few feet, four or five fountains, some central fountains; new bench, narrow, around most of the lake especially N and W; new rampart grottos against central promontory of crag-mass and at E cove. New island shows two vertical cracks. Streaming from SW and W and from NW, to NE and to SE, curving into cove SE of peninsula and into cavern there, which is flaming and exploding within. Occasional avalanches and infalling rims: avalanche SW from bench to lake shore. Much bombardment base of N cliff. Lake appears to have risen there and at base of crag-mass. Much smoke, especially S cone and N and NW wall of inner cliff.

Mar. 17.
3:00 p.m. Rainy. Lake much the same, central cavern exploding.
There has been a very heavy fall, probably from high edge SE bench, into SE cove, making a splash wave all over S floor as far as S cove, far up S side old S island, and less on banks of river channel. There was now a row of spatter grottoes and high rampart building along SW edge of SE cove with much fountaining. Three or four other fountains.
The NE bench has subsided much farther, leaving a wall, under wall of 1894 bench.
The E crag has sunk lower, and the E end SE bench shows overhang and loose slab below.
New slab at NE base of crag-mass sticks out like a new pinnacle island
The N chasm has sunk farther.
SW cove crusted and source of streaming. New avalanche from S side new island. Alex saw it last night falling.

T.A.J.

KILAUEA DAY SHEET

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Hawaiian Volcano Observatory

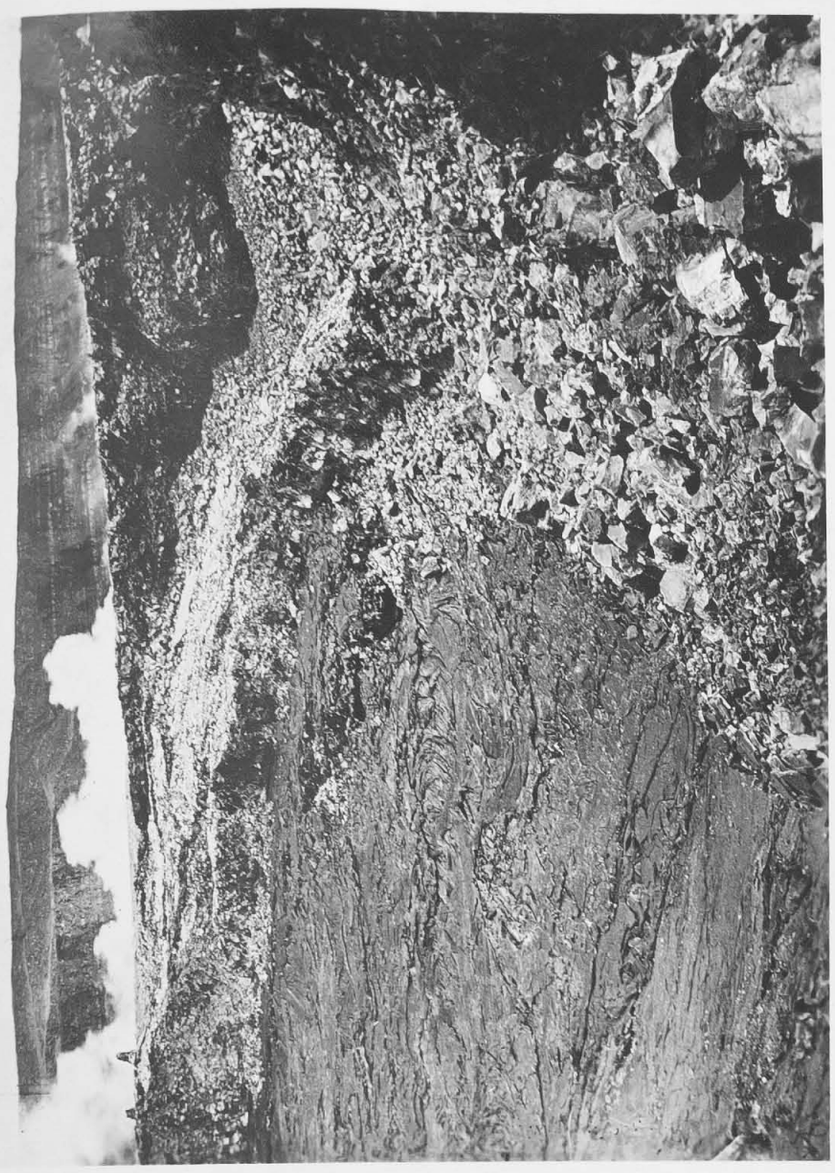
Day Friday Date March 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:15a	SE	N	0					
	E	N	0					
	SE	E crag	3 15	19 44	+5	195	129	
	E	ditto	92 41					
	SE	W summit new island	25 50	11 26	+7	406	81	
	E	ditto	56 42					
	SE	Lake E end peninsula	45 44	20 50	+6	379	143	
	E	ditto	74 15					
	SE	NE point cliff	13 16	8 45	+5	577	87	
	E	ditto	29 14					
	SE	NW pt. cliff (entrance NW arm)	27 48	4 25	+4	961	71	
	E	ditto	32 34					
	SE	Shore N end crag-mass	30 41	10 0	+6	781	79	
	E	ditto	40 0					
	SE	Summit crag-mass	42 42	4 9	+6	884	62	
	E	ditto	49 37					
	SE	Summit old S island	60 34	24 23	+3	238	107½	
	E	ditto	96 26					
	SE	E cor. cliff SE bench (for elevation bench)	11 37	22 57	+8	129	34+	
	E	ditto	110 10					
	SE	W corner ditto	102 19	11 40	+1	258	53	
	E	ditto	114 6					
	SE	Tip new promontory center, lake level.	41 11	12 19	+5	643	129	
	E	ditto	54 52					
	SE	S cone	80 47	16 7	+3	444	128	
	E	ditto	93 52					
	SE	Central peninsula summit	47 34	11 26	+4	474	85	
	E	ditto	68 46					
	SE	SW summit S isl. mass	65 40	9 22	+3	535	81	
	E	ditto	79 38					
	SE	N end W islet	54 34					
	E	ditto	64 48					
	SE	S end W islet	58 48					
	E	ditto	69 0					
	SE	Caverns S of penin.	51 17					
	E	ditto	75 38					

		no	pl	scr	stop	ex	cam
SE	New island	1	W P	8x	f/11.3	½	P
"	E crag	2	"	"	"	"	"
"	1894 bench	3	"	"	"	"	"
"	Crag mass	4	"	"	"	"	"
"	SW islet	5	"	"	"	"	"
	Plate of Seger cones and pipe	6					

T.A.J.

1917, March



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1



2

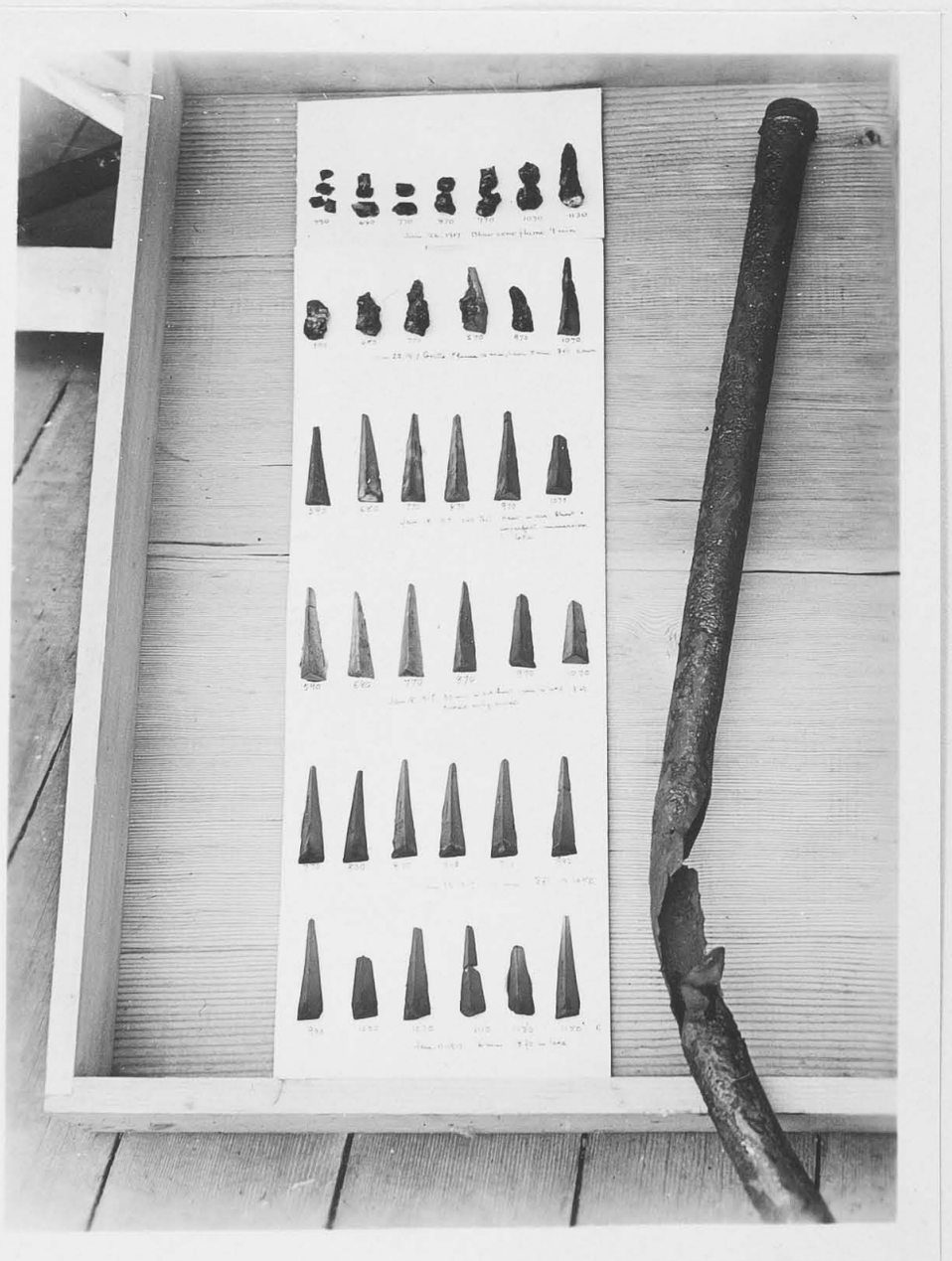


4

1917, Mar. 16



5



6

Fay

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Hawaiian Volcano Observatory
Day Sunday Date March 18, 1917.

5:15 p.m. Pit very smoky. Heavy S wind blowing. Lake from NW and W arms streaming rapidly down to SE island (at end of peninsula) and rushing round to S to plunge in tremendous cascade perpendicularly downwards. Lava surging up in high wave on brink of final plunge and travelling at about 35 miles per hour. Very many bubble fountains on brink of cascade, and heavy roaring noise. Gusts of suffocating blue fume whirling up over SE rim. Five fountains at head of NW arm and furious fountain in grotto under N bench. One small fall of rock from remnant of 1912 bench heard from E rest house. Made circuit of pit but nothing visible except from SSE rim. Fumes almost unbreathable at N station.
(Lake appeared to be rising at SE island as lava was first running well under stalactites, but later swept them all away - with narrowing of glow rim. Color of lava running to cascade vivid orange.)

L.W.N.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date March 19, 1917.
Tuesday " 20, "

Mar. 19. Rainy.

Mar. 20.
2:40 p.m. E station.
Rapid cascading into large hole NW side SE pool.

4:15 p.m. NE station.
Large avalanche into lake from second floor SE. Started many fountains in channel.

4:40 p.m. Another avalanche from second floor S but it did not fall into lake.

5:30 p.m. E station.
Lava beginning to rise.

6:00 p.m. Overflowing NE. Cascade stopped.

Alex.

Note change from sinking to rising about 5 p.m. this being the equinox.

T.A.J.

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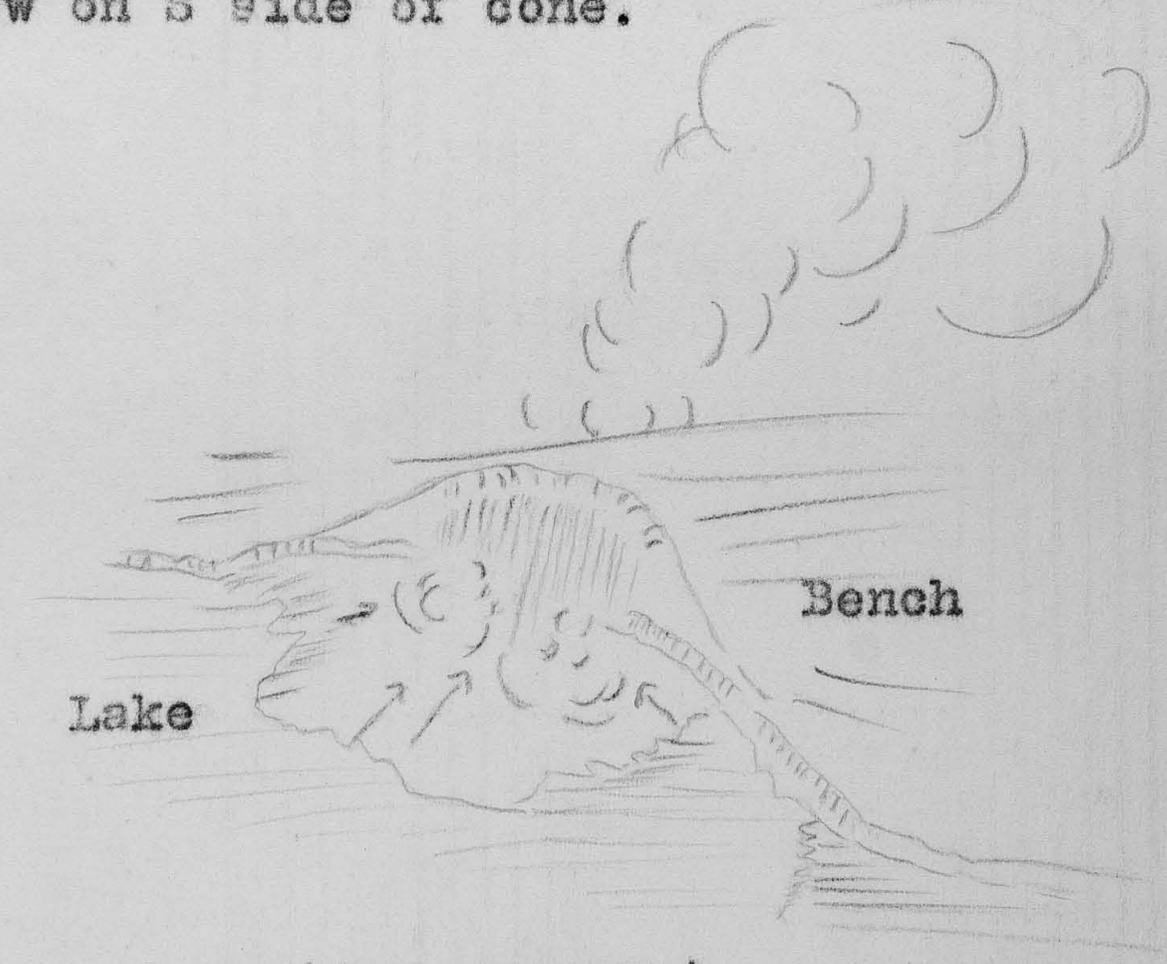
 Day Wednesday Date March 21, 1917.

1:30 p.m. SE station.
Lava level with third floor all around. Very active SE side NE peninsula and many large fountains in N arm. Cascade not running; large grotto formed at place of cascading. Fresh lava on floor S. Rapid rising.

Alex.

11:30 a.m. SE station.
Lake rising vigorously and overflowing S bottom from SE cove, (maximum at noon), E cove and W ccve. Streaming to SE and NE. Niche spatter crescents built E, SE, SW, against central promontory N side NE and NW. S cone still in place.

Noon. Flows from SE cove westward on both sides of spatter crescent there and headed for S cone which was reached by the flow on S side of cone.



A spatter crescent.

Central cavern covered but some fountaining above its entrance. The central peninsula extension northward of S island mass and the W end of S island mass appear rising on their W ends.
There is spatter <u>all over</u> old S island, as well as the wave splash of Saturday on S bottom showing that more falls have been dropping into SE cove from high SE bench.

S station looking down.
Fume from SE, much tumble on bench below and great slabs of old wall rock breaking away along plane parallel to wall just under S channel 30 feet down. Immense new talus fallen away on 1917 floor from just W of S channel and also around to SW station. SW crags settling down so that back slope is becoming horizontal again.

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 Day Wednesday Date March 21, 1917.

From SW station.
The W pond seen in its ragged pit to be a single continuous fountain with concentric festoons of pahoehoe crust around it, filling rather than engulfing. Black crust around its borders. The W cove lava is high and W cone is submerged. The SW islet and another smaller one near SW shore seen. The tunnel from SW cove to S cone shows with crusts at its entrance, just E of SW crescent of spatter, which last becomes active at intervals only. NW pond has built up. Above it W is a bright hot yellow fuming solfataric area and still nearer W wall is the place seen glowing on surface Mar. 15 slightly whitened by solfataric action.
NW arm flooded and some inward streaming to it. Great flows after twelve noon into depression over tumble of N chasm past a spatter crescent at its mouth. Small flows pushing in also at W and NW coves. Lake rising, quiet skins, five or six fountains limited to niches. E island no lower and E crag little lower.

T.A.J.

5:30 p.m. SE station.
Ten fountains active and splashing in five grottoes at one time. Lava rising slowly. Streaming through channel.

5:45 p.m. Very high splashing started in a large grotto E.

Alex.

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Hawaiian Volcano Observatory

Day Wednesday Date March 21, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
11:30a	E of SW.	New talus under S station.	1	W M	8x	f/11.3	½	P	
	"	Crag-mass	2	"	"	f/9	"	"	
	"	N cove	3	"	"	"	"	"	
	SW	W pond	4	"	"	f/8	"	"	
								T.A.J.	

1917, Mar. 21



4



2

3



1

Jag

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Hawaiian Volcano Observatory

Day Thursday Date March 22, 1917.

1:30 p.m. E station.
Lava level with NE floor.

2:30 p.m. Began to sink. About three fountains. Soon began to rise again, with many fountains and splashing in the grottoes. Fume not very thick.

7:00 p.m. SE station.
Lava overflowing S and running into W arm and making the S peninsula look like an island.

Alex.

5 to 6 p.m. Visit of John R. Freeman, Ambrose Swasey, J. A. Brashear, J. R. Freeman, Jr., and Hovey Freeman.

Lake vigorously overflowing; flows while watching join through from SE cove to SW cove over S bottom; then the flows from SW cove direction become dominant as though tilt of S island mass towards the E. Spatter niches blowing and spraying SE, SW, central promontory, N, NE and E. Activity glow in NW pond. Streaming to SE and NE. NE wall splash most continuous. Sinking spells rare. Much Pele's hair. Occasional central fountains N cove migrating eastward.

10 to 11 p.m. Much the same but at 10:45 p.m. fall from SE high bench into lake shows how old S island plastered with splash and break up of all SE region. Fountaining flames.
(Alex on lower bench SE cove this afternoon.)
Exceedingly brilliant fountaining E base old S island after the avalanche. Rising 40 minutes, sinking 20 minutes, rising about 20 minutes; marked sinking 11:30 p.m. about two feet develops form of true lake and shows glow lines of flows S and E, all crusts break up, twelve to fifteen fountains, S cone appears now submerged. A stream pouring from NW pond S making a glowing festoon current around crag-mass end to W cove. Streaming to E through S arm, to SE, to NE. Crusts SW cove and in rising times dark crusts over much of lake. After the SE avalanche the SE spatter crescent became quite quiet.

T.A.J.

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Hawaiian Volcano Observatory

 Day Friday Date March 23, 1917.
Saturday " 24, "

Mar. 23.
2:00 p.m. E station
Lava three feet down. Rising slowly. Three fountains in action.

2:35 p.m. S station.
Lava flows have reached nearly around the crag-mass and have covered the small pool NW of it. A fountain boiling near it.

Alex.

Mar. 24.
3:30 to 6:30 p.m. From SE station.
Tremendous dome grotto head of W cove and the floods connecting NW pond and W cove now raised. Streaming from dark skins N and NW to W, SW and SE. SE spatter cone now arched over and open above, flaring and fuming and spurting. Great falls of bank E cove followed by fountaining: also old S island. Only a little smoke where S cone was. No grotto E.

From W station.
The NW pond crusted flows of great extent with a"doughnut" annular cone at SW corner. The W pond crusted, filagree cone where fountain was, flame hissing E of it. Tremendous splashing and droplets falling over great W dome.

From NW station.
Glow on bench NW and N. NW and N parts of lake crusted. No activity at all NE. The sharp rising has reversed streaming against W bank.

From N station.
The N chasm contains wide area of crusted flows. Glow in NE bench-cracks.

From SE saw a stick of wood thrown into glowing stream leading to SE grotto. The stick plunged below skin and burned in spasms, the little spasmodic lines of flames, moving with each burst down the current, <u>faster than the surface skin</u>, showing that the under-current moved more swiftly than the skins.

With the aid of five enlisted men of Company H, 25th U.S. infantry, (Captain Cecil, comm'g) and with A. Lancaster and others, descended to shore of E cove and examined E surface of massive base of E island of Feb. 18, which proved to be <u>as lava</u>, showing scored grooves vertically where it had pushed up as though it were stiff as hard tar or wax. The debris slopes were typical complete units

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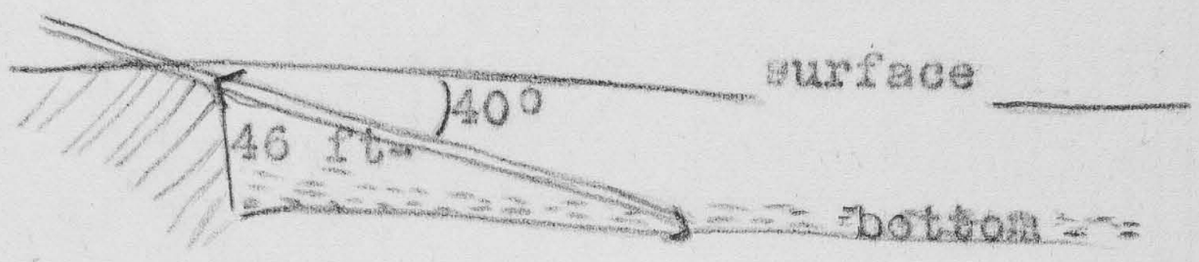
 Day Saturday Date March 24, 1917.

of rather heavy aa; then took the long half-inch pipe and plunged it in channel off S side of E island. It bowed downstream southeastward but went down to the bottom, sticking in stiff material in the lower five or six feet. Forty-six feet only of pipe at angle estimated 40°, making depth of channel 29 feet. This



checks with supposition that subsidence of February has shallowed the lake.

T.A.J.



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 Day Saturday Date March 24, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:30 p	SE	N	0					
	E	N	0					
	SE	E crag	3 25	20 45	+9	95	35¾	
	E	" "	93 19					
	SE	Lake pt. E central peninsula.	46 10	16 18	+6	381	112	
	E	ditto	75 13					
	SE	W summit new island	25 00	9 39	+6	81	13¾	
	E	ditto	56 9					
	SE	Old summit crag-mass	43 2	3 37	+4	900	55	
	E	ditto	49 42					
	SE	NE summit crag-mass	35 59	3 47	+5	844	54	
	E	ditto	43 33					
	SE	Summit central peninsula.	47 49	9 19	-1	472	78	
	E	ditto	69 22					
	SE	Summit old S island	61 32	23 16	+1	242	104	
	E	ditto	97 37					
	SE	SW summit S island mass.	66 46	7 56	-3	540	75	
	E	ditto	80 36					
	SE	SW crag	84 3	4 25	0	686	52½	
	E	ditto	89 46					
	SE	S base great W dome grotto (lake)	60 57	7 17	0	871	111	
	E	ditto	67 0					
	SE	Summit ditto	58 46	5 56	-2	873	90	
	E	ditto	64 57					
	SE	N corner SE bench	12 43	25 11	+4	121	113	
	E	ditto	112 31					
	SE	SE grotto	84 12					
	E	ditto	103 47					
	SE	Pt. W entrance SE cove	79 46					
	E	ditto	110 34					
	SE	Pt. SE entrance SE "	88 48					
	E	ditto	110 41					
	SE	Pt. N old S island	52 36					
	E	ditto	94 0					

			no	pl	scr	stop	ex	cam	

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Hawaiian Volcano Observatory

- 2 - Day Saturday Date March 24, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
	SE	Pt. S of new island	33 0						
	E	ditto	71 37						
	SE	Pt. N of peninsula	40 24						
	E	ditto	59 37						
	SE	Pt. W of new island	35 50						
	E	ditto	61 40						
	SE	St. pt. central prom.	44 16						
	E	ditto	57 36						
	SE	N pt. " "	34 49						
	E	ditto	46 12						
	SE	NE pt. crag-mass shore	30 29						
	E	ditto	39 9t						
	SE	Spatter dome W of central promontory	43 9						
	E	ditto	53 54						
	SE	N end SW island	54 45						
	E	ditto	65 40						
	SE	S end ditto	60 0						
	E	ditto	69 40						
	SE	S end SW cove	74 9						
	E	ditto	82 3						
	SE	Spot cliff head N cove	5 38						
	E	ditto	7 24						
	SE	NE cliff point	12 8						
	E	ditto	27 51						
	SE	Doughnut cone NW pond	51 26						
	E	ditto	56 10						
	SE	Low pass to W pond	61 39						
	E	ditto	66 0						
	SE	Cliff pt.entrance N cove.	8 47						
	E	ditto	14 27						
	SE	S pinnacle smoke	100 9						
	E	ditto	108 0						

T.A.J.

			no	pl	scr	stop	ex	cam	

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Day Monday Date March 26, 1917.
Tuesday " 27, "

Mar. 26.
2:25 p.m. E station.
Lava down about 5 feet all around the pool. Small cone on S side very active, throwing lava very high. Rest of lake quiet.

4:20 p.m. E station.
Large piece dropped from S side of small cone starting a cascade which poured rapidly from the N stream.

Mar. 27.
2:05 p.m. E station.
Lava down about 10 feet all around pool. Very quiet, no fountains anywhere. Blue fume very thin all over lake.

2:30 p.m. E station.
Large piece fell from the middle crag and started a few fountains. A few minutes after another piece fell from the N peninsula on the SE side.

Alex.

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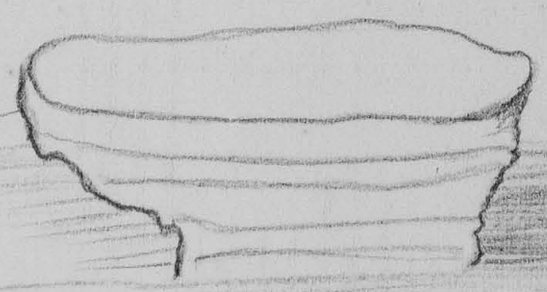
Hawaiian Volcano Observatory

 Day Tuesday Date March 27, 1917.

4 to 7 p.m. Lake down 15 feet so that vertical or overhanging walls appear all around. Yesterday cascading into SE sinkhole, today very quiet.
Strong overhang SE bench, at SE end old S island, caverns S of central peninsula and at E cove; SW islet overhangs like a mushroom all around -- it built bigger in area as the lake rose. General overhang W and SW.
Six or eight fountains. Streaming out of NW arm and thence N, NE, SE and SW. Great W half-dome raised and cold, vertical wall with spatter levels beneath. SW grottoes splashing. SE dome high above lake on margin inner cliff, splash below and flames above. Filagree cone in E cove, glowing and flaming, over arch below. Filagree cone at S end NW pond, and at E margin W pond. N chasm smoky.
Some central fountaining and cracking and foundering. NW and W ponds crusted but not collapsed. The subsidence does not appear deep-seated. No avalanches.
Descend with Alex at N side W niche and find way across the crevasses by zigzagging to the hot pahoehoe seen glowing recently. Stained and very hot cracks of small size, like postal rift.
Cross NW pond by skirting N margin, which is separated from NW arm by quite a ridge of tumbled rocks, and is much higher than NW arm. At the S end NW pond a very bright glowing cone flaming and fuming and sulphur stained. Climb S end of crag-mass and go out on bench over lake N side of W cove. Look into great W half-dome. It is like:-



SW islet was:-



15 feet high.

Great overhang also at central promontory. The lake is like a canyon 15 to 20 feet deep, with quiet swelling blistered crusted surfaces, fountains in curtained grottoes SW, streaming very slow, the islands and recent platform rising above, and the filagree cones indicating good gas pressure and great heat. The heat is strong above also. The overhang and picturesqueness

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 Day Tuesday Date March 27, 1917.

suggest Furneaux's old pictures very strongly.
Climbed back and went into Perret's cave. It is about 60 feet deep and ends in a tumble. Quantities of alum stained yellow, and water drip. Stalactites coated with crystals of gypsum and driblet cones on floor. Mossy with Pele's hair.
Walked around bench N to E station and up that way. Passed several very hot cracks suggesting incandescence and the Postal Rift. N chasm too smoky to see down. Walked out to NE point and looked down at active cracking, foundering and fountaining under NE cliff, the N cove greatly widened since January at the expense of NE floor, one or two lower benches of downsunken NE floor just over lake.
Looking down at floor between E crag and E island notice great brightness to filagree cone there and beyond very bright still incandescence in central cavern. Flames above SE cone.
Fumes greatly increased in three days. A dozen fuming places, mostly white and respirable. Irrespirable fumes from SE, E and NW cones, and SW grottoes. No difficulty with fumes on lower floor.

T.A.J.

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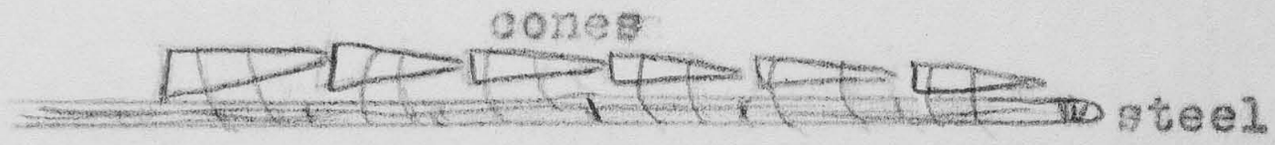
Hawaiian Volcano Observatory

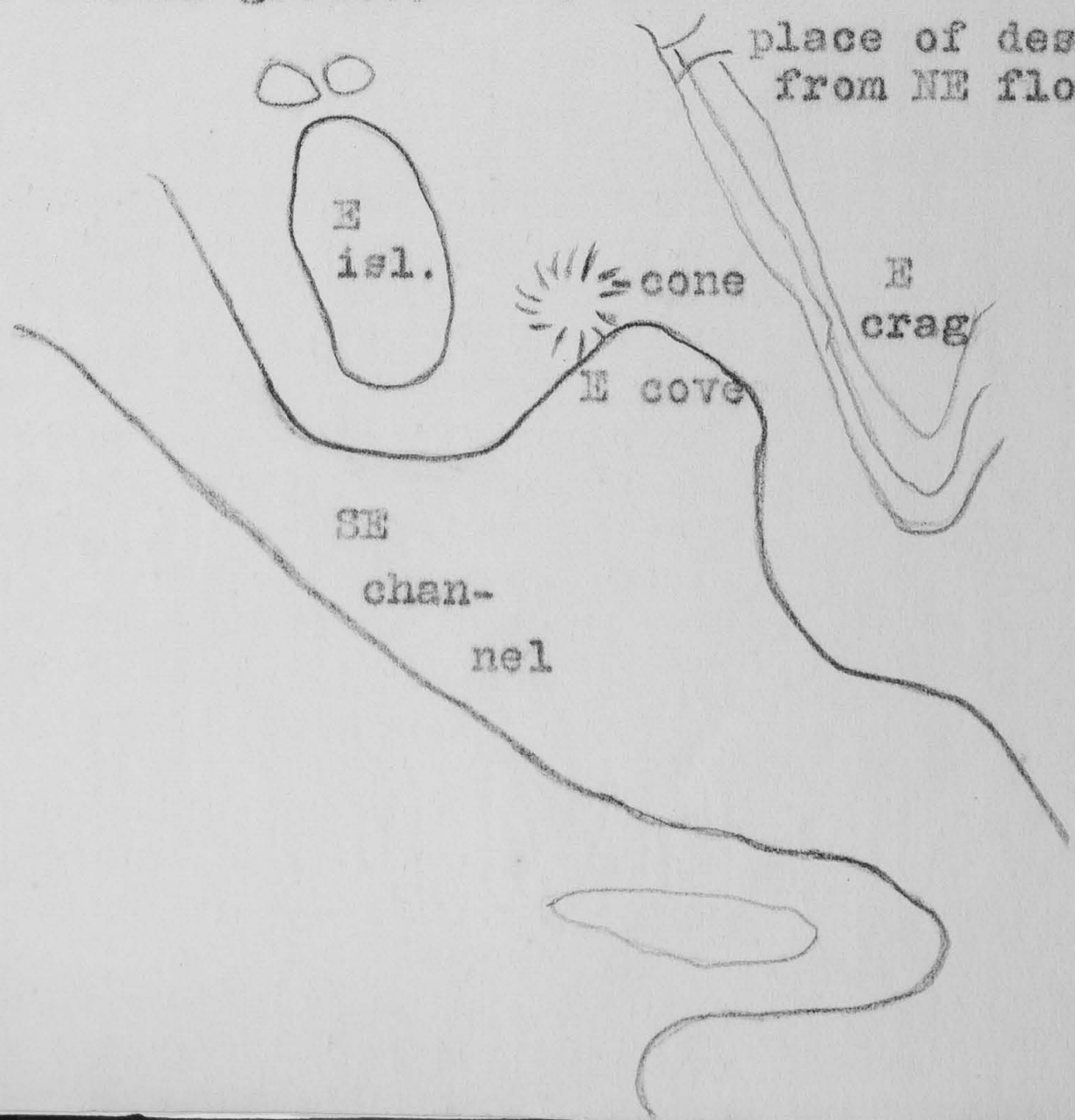
 Day Wednesday Date March 28, 1917.

2 to 6 p.m. Lake down and lower during afternoon. Inner walls more than 20 feet high. Heavy fall from inner bench into SE channel from NE side central peninsula. Central cavern high and deep with inflow. The bench S of crag-mass where Alex and I stood yesterday and part of great western half-dome have fallen into lake and probably the wave from this wrecked the SW island. Five or six fountains, streaming rapid to SE, pit smoky. Cone at E cove and SE cone less hot and active than yesterday.
Descend to NE bench and prepare one-inch pipe for a measurement, when conditions become again favorable, of thermal gradient of lake. Fit three lengths (60 feet) together and straighten it; then straighten a similar length of heavy galvanized steel fence wire, with a view to attaching Seger cones to end of wire after lowering pipe, with lower end sealed, to lake bottom. Made a rehearsal of method by wrapping six cones with light copper wire against end of steel wire, the cones end to end, thus:-



This was thrust through pipe and the steel point caught at the interior of first pipe-joint. Also the Seger cones are very brittle and soft and the copper wire cuts through them.

At 4:30 p.m. tested temperature of E cove filagree cone. This cone was in top of last week's overflow bench, 10 feet from E cove, over a tunnel and strong overhang at E cove; it is between E island and E crag nearer E island and about two feet high and 10 feet across, broken stained crusts over a former grotto-dome, thus:-



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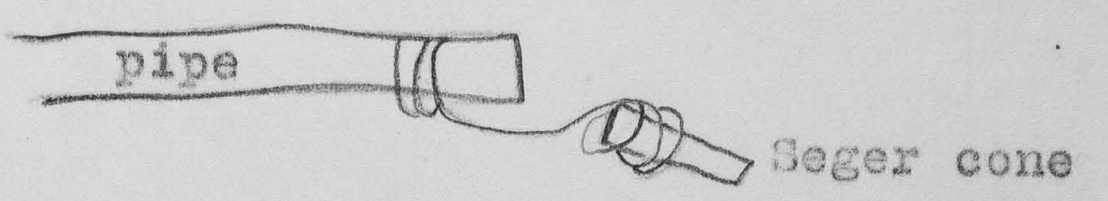
 Day Wednesday Date March 28, 1917.

This cone was today a bright cherry red by daylight at 5 p.m., the inside visible through a few cracks on its E side. The glow inside was less than that of the bright lines of the lake, and about like much of the glow seen in the deep cracks of the bench magma when freshly broken. There was blue flame from the cracks, not visible by daylight, and no puffing.
A half-inch pipe was fitted with a light bale-wire cage on the end to hold a single Seger cone horizontally; this



was thrust into a crack leading to cherry-red chamber in cone so as to be just within entrance three inches; crack two inches across; doubtless in flame. Cone and wire became red hot in less than a minute. The cone in each test was left five minutes. Four cones were tried, as follows:-

Fusing point 1150°C - no effect,
990°C - " "
920°C - slight effect,
890°C - end bent down, cone blistered and fused within first two minutes.

Temperature hence 920°C.

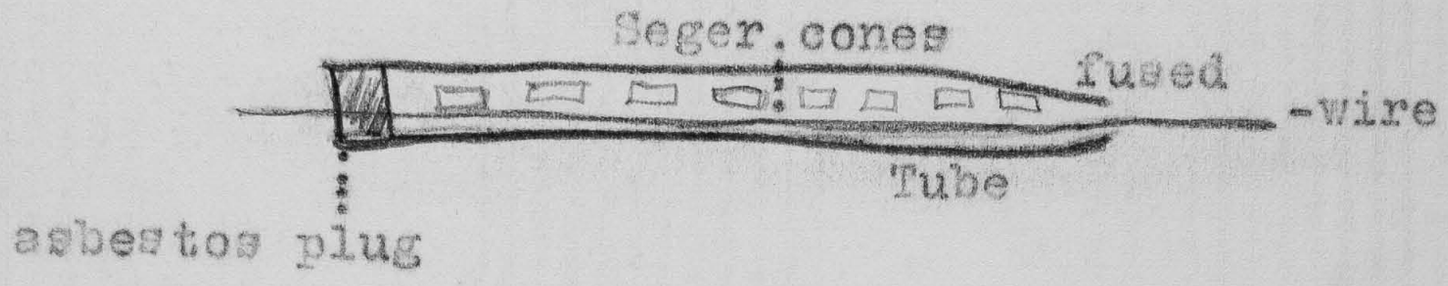
This test was careful and important; if it was flame test, glow perhaps not criterion, but the Seger cone came to almost exactly color of chamber. This color, if 910° C, was distinctly less bright than the glow lines. Query - Are not the glow lines hotter than the lake just below? As former tests showed lake three feet down 700°-800° ±, and Bristol showed higher temperature at surface, the glow lines should be 1000° C±. Are not the glow lines oxidation lines? And may not the local melting of 870° Seger in imperfectly immersed pipe of January be thus explained, namely that that cone in pipe came opposite a glow line at lake surface? In such case, the even dark red of lava of NW conduit pond may be the color of the lake lava below the surface.
This should be tested by submerging the big three-inch pipe, capped below, and looking into it.
The galvanizing was oxidized or melted off the wire and the pipe showed slight black oxide scale after these tests. The day before this cone was brighter and the day after nearly no glow.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date March 29, 1917.

3:00 to
4:30 p.m. Lake 15 feet below bench. Rising. Eight to ten fountains. Central cavern quiet. SW cove crusted. SW islet small and the second islet near shore. W pit shows subsidence of crusted pond and filagree cone on E side. NW cone still glowing. Large cone, broken, in summit, on edge inner cliff SE cove. Much bubble fountaining. Streaming out from SW and NW coves. Fountain at other end from central cavern (W) of isthmus S of central peninsula. Prepared small cut Seger cone pieces 1 cm. long in glass tube, nine to twelve pieces to the tube, and attached copper wire to tube; thus:-



Rehearsed running this on wire through 60-foot one-inch pipe. Prepared end of steel wire thus:-



By this device of bending wire it would go past joints of pipe and protect tube from breakage. Successfully ran tube to extreme end of interior of pipe which was plugged. With chalk marks on exterior of pipe and on wire can tell how far in pipe wire has gone.

Irregular surface of as under E island:-



W side of E island from SW.



E side of E island from E.

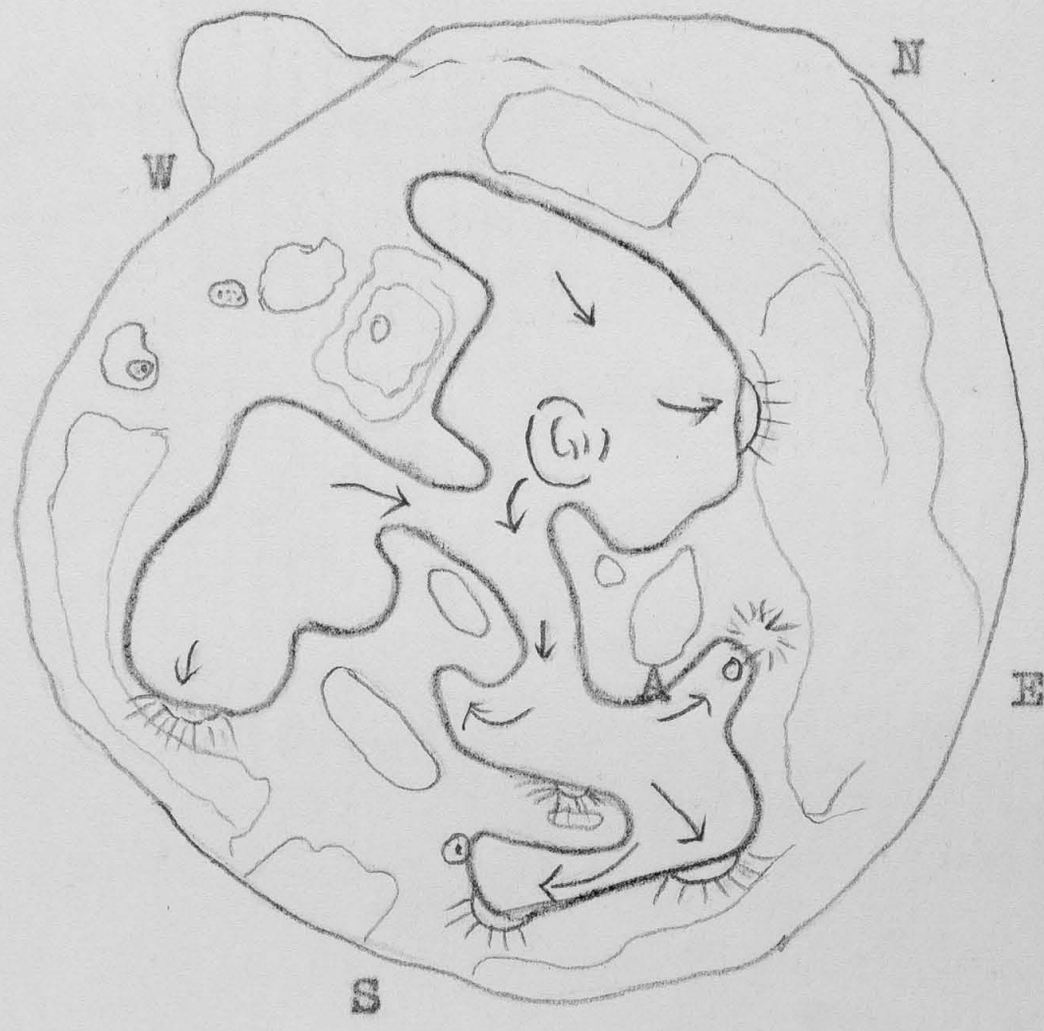
T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date March 30, 1917.

2 p.m. on. Lake 12 feet below inner bench. Rising. Eight fountains. Rapid building of border niches. Quiet crusts; later in afternoon more rapid streaming, flow-like inpouring SE and E coves. Large shore cone built E cove during afternoon. Streaming out from NW and W. SW islet nearly submerged. Tumble of bench on shore S of remains of W half-dome. Very slight red glow left in cone, on bench E cove. Fumes thinner. Central cavern nearly submerged. A fountain in central region N of narrows breaks at intervals, sometimes very large.



At A on sketch the sounding of March 24 and the temperature measurement of March 30 were done.
The preparation for deep temperature measurement continued. Loop of wire attached to one-inch pipe for hauling and block and tackle prepared. Three straight glass tubes prepared filled with Seger cones in miniature.
In view of observation of comparative glow of bright lines, and glow cones of 910°, on Wed., Mar. 28, it became important to test temperature of bright lines. With volunteer assistants, arranged five Seger cones in end of half-inch pipe 60 feet long, of fusibilities 830°C, 860°, 950°, 970°, 1010°. Immersed twelve inches only of pipe in bright line of melt N side of SE channel for five minutes; kept it free and dabbling in bright line most of the time, line maintained by current southeastward. Tip of pipe dragged in the current and on edge of current. No fountains except bubblings of bright line.

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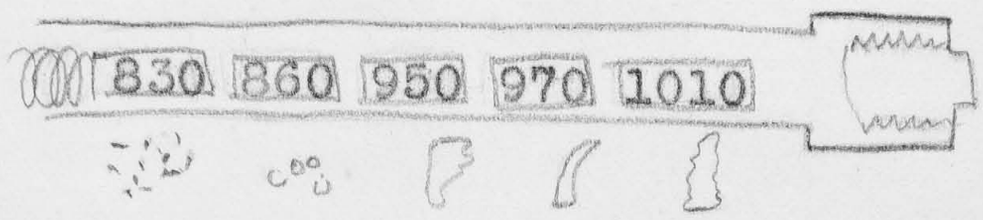
 Day Friday Date March 30, 1917.



830° and 860° powdered.
950° fused
970° bent
1010° blistered

Temperature approximately 1020°C.

Hence the observation of comparative glow is completely verified, and the bright lines are very much hotter than the lake three feet beneath by some 100° to 300° C or more. This explains the discrepancies of January completely. Surface oxidation is heating the lines in a few inches of depth probably with flaming. An overfow, hence, is an oxidation heater at point of overflow and lake must be more viscous just below; the lava clinging to terminal from the bright line was dense and selvaged and very tough and unbreakable while hot, like the grotto lava of January.

The last four photographs made at dusk a few feet from flame over active blowing cone E cove, hole three feet across, flame pale green-violet-yellow shooting up one to two feet above orifice, with occasional jets of lava spatter. Earlier this had been a niche with strong spatter and clouds of Pele's hair.
The effort was to photograph the flame: dark background, subject focussed, 20 and 30 feet away.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date March 30, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
2p.m.	SE	N	0					
	E	N	0					
	SE	Summit new island	24 50	9 1	-6	400	64	
	E	ditto	56 6					
	SE	S crag-mass	43 4	3 15	-9	881	50	
	E	ditto	49 36					
	SE	Lake point E of central peninsula.	47 3	17 22	-11	367	116	
	E	ditto	75 47					
	SE	Summit SW end S island mass.	66 46	7 44	-13	520	72	
	E	ditto	80 41					
	SE	Summit old S island	61 52	22 38	-11	224	94	
	E	ditto	97 51					
	SE	Bench level pt. E of central peninsula.	45 8	14 28	-12	388	101	
	E	ditto	72 40					

Lake depression ..... 116 feet.
New E island above lake 52
Crag-mass " " 66
SW summit S island mass above lake 44
Old S island above lake 22
Depression of bench level SE pool 101

			no	pl	scr	stop	ex	cam	
		Rainy.							
3 p.m.	E	SE cove	1	W P	8x	f/8	1/2	5x7	
	"	SE channel	2	"	"	"	"	"	
	"	E island & crag-mass	3	"	"	"	"	"	
	"	NE floor	4	"	"	"	"	"	
6 p.m.		Border cone E cove flaming, 30' away.	5	"	"	f/6.3	90	"	
		ditto	6	"		"	60	"	
		ditto 20' away (dark)	7	"		"	5	"	
		" " "	8	"	3x	"	30	"	

Tessor lens.

T.A.J.

1917, Mar.3



1917, Mar. 30



3



4



5

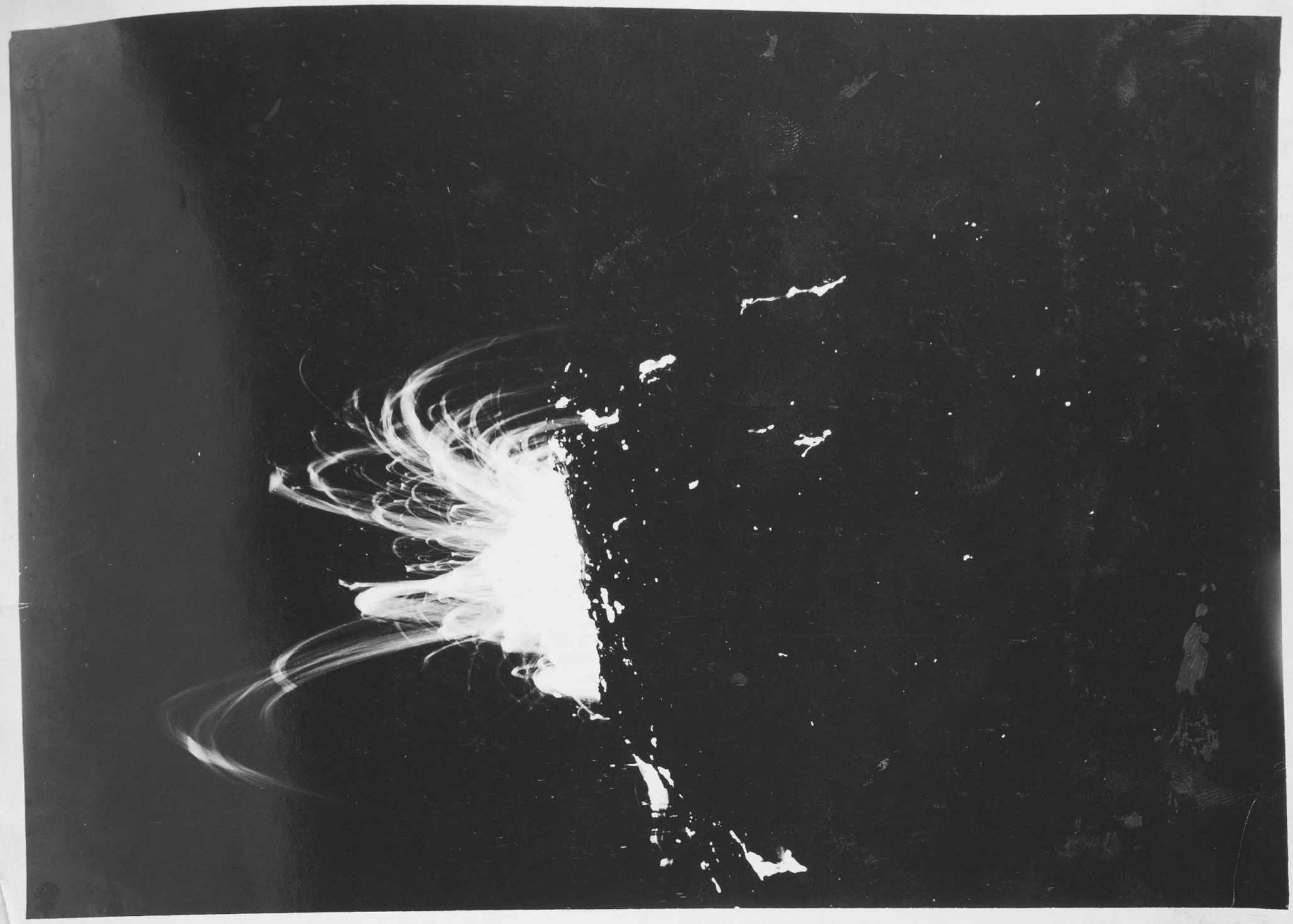


6

Jag

1917, Mar. 3

1917, Mar. 3



8



7

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Saturday Date March 31, 1917.

10 a.m. to 2 p.m. Rainy.

Lake about same, 15 feet below inner bench. Sinking during day. Sluggish and crusted. Eight fountains at times. Large spatter grotto SW, elsewhere a new inner bench three feet high in places. Two islets SW. Cone in E cove destroyed and covered with slabs from rise of last night. Shows how such cones, even eight to ten feet high, are ephemeral and sometimes creations of a few hours. Streaming mostly slow, falls of spatter bench occasionally.

With aid of Co. I, 25th infantry, made some attempts at deep temperature measurement. On arriving at Halemaumau found that a group of four specimen collectors were on the bench with the pipes which Alec and I had spent several days in straightening, jointing and preparing; they had unjointed them, bent up our wire, and dipped one end of the pipe in the lava. They disappeared when they saw us.

We reassembled the apparatus and thrust 60 feet of one-inch pipe into the SE channel at E side of E cove, having first placed in the lower end of the pipe glass tube on wire, with nine Seger cones 590° to 830° fusibility. The wire emerged from upper end of pipe. Block and tackle were prepared for pulling up pipe. Tube was left down for 15 minutes. Forty-five feet of pipe went down at 50°, indicating a depth of 35±feet, and pipe was drawn under the bank southeastward by the current. At end of 15 minutes wire was pulled and was found stuck. Pulled harder and it came up but the end was straightened and the glass tube gone. The copper wire and zinc galvanizing had probably fluxed and so the tube had clung to wall of pipe and then been torn off. Galvanizing melted on wire, apparently most near lake surface: at point opposite lake surface wire showed greatest heating and discoloration.

Put tackle on pipe and pulled. Pipe parted at first joint thread, which was unfortunately just at lake surface zone of greatest heating, and hence expanded the joint sleeve. Twenty feet, five inches of pipe from upper end to bend at entrance lava, 41 inches pipe thence to parted joint.

Experiment a failure except for evidence of depth, increased since last week, and evidence from effect on galvanized iron wire which was recovered, and had been beneath the lake from top to bottom for 15 minutes.

Next screwed together 80 feet of half-inch black steel pipe and placed Seger cones 590°, 620°, 710°, and 800° fusibility in bottom and plunged in channel S of E island. Again got about 35 feet of depth, left for 5 minutes, and pulled up, but unfortunately end cap had not been tightly screwed on and it scraped off in withdrawing

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Saturday Date March 31, 1917.

pipe and the Seger cones were lost.
Both experiments on this day showed strong tendency of pipes in this channel to be swept down the current so as to make it somewhat difficult to find the bottom. It is better to work in quiet glow lines of the central region. Black iron is better than galvanized pipe evidently, on account of fusibility of zinc, and one-inch pipe is too small probably for moving wire up and down.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date April 1, 1917.
Monday " 2, "

Apr. 1.
11:10 a.m. E station.
Lava five feet below third floor; rising slowly. Streaming from NW arm. Not many fountains.

12 noon. S station.
Lava one foot below level of bench S. Quite a few fountains in different parts of pool. Fumes about as usual.

3:45 p.m. NW station.
Fall of rock from N side of E island starting many fountains in N arm.

6:40 p.m. SE station.
Another fall of rock from E island; this time from the SW side. Fell into stream flowing toward the SE and caused many travelling fountains.

Apr. 2.
2:30 p.m. E station.
Lava five feet down and very active in S arm and SW cove. Streaming from NW arm towards the W and SE.

2:40 p.m. E station.
Large fall from NE side of middle island into lake causing many fountains and making a loud noise. About fourteen fountains at once.

4:00 p.m. SE station.
Lava level with floor on the NE side and very active in all the grottoes around the lake but few fountains in center.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date April 3, 1917.

2:30 p.m. E station.
Lava down about five feet. E and S grottoes boiling and rumbling.
At 3:00 p.m. the lava began to rise rapidly and at 3:40 it was level with the bank all around. At 4:20 it was overflowing NE and at 4:40 it was overflowing on all sides. The middle island and the S island were surrounded by the overflow. There were from fifteen to twenty fountains in action at once.

Alex.

Evening. Rainy.
Lake was overflowing this morning and at 4:30 this afternoon. Flows of latter period now visible glowing on S floor amd E floor; on S floor on both sides of SE cone; on E floor from S end E cove some distance northward between E island and E crag on E crag side.
Eight or ten fountains. Swift rush of current from N bay to SW cove, Streaming SE more sluggish. Fountains NE, in central region, on E and W sides of SW cove, and SE. Blue flame NW cone. Spatter grottoes building. Fumes thinner. Afternoon overflow frcm W into NW pond depression.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date April 4, 1917.

Bright morning, rainy evening.
Lke high but not overflowing. Some fresh overspatter E cove. Streaming from NE. Fumes considerable.
Aided by Sergt. James and Private Mackey, 4th Company Coast Artillery U.S.A. of Fort Kamehameha, made a temperature immersion with half-inch pipe using the remaining prepared glass tubes wrapped in copper wire, containing fragments of Seger cones. Put the two tubes in one pipe joined by galvanized bale wire, the lower being Tube 3 of prepared series, fourteen cones from 590° to 970°. This in end pipe 2 m. down. The second tube was only half metre down, Tube 2 of prepared series, sixteen cones from 590° to 1010°. The idea was to determine surface temperature gradient. The pipe was marked on the outside by a wrapping of bale wire just 2 m. from middle of lower tube as it lay in the end of pipe. This marker was kept just at surface of lake; place of immersion E cove E side, where a tearimg crust or glow line had just solidified over, making a skin one inch thick. This skin was punctured by the pipe 10 feet from shore, and pipe lowered through the skin to the marker exactly and kept in motion about once a minute up and down to keep it from freezing in. Inclination 60°. Conditions were perfect, the time given was five minutes, pipe was withdrawn black below the marker, rusty above it.
Test failed because the copper wire weakened and broke from the heating. It fused in places by fluxing with the zinc galvanizing of the bale wire. And the glass tubing, presumably soft glass, melted and fluxed with the Seger cones. To get the tubes out it was necessary to saw up the iron pipe. Tubes were melted and broken and few of the Seger fragments were recognizable.

T.A.J.

3:30 p.m. The W pond was very active and was level with the floor around it. The NW cone was blowing very loudly and occasionally throwing out hot lava.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date April 4, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
		Williams' Cirkut camera.							
SE		Lake	1		scr.	f/16	1/2		
"		"	2		"	"	"		
		Mechanism jumps in places.							
									T.A.J.

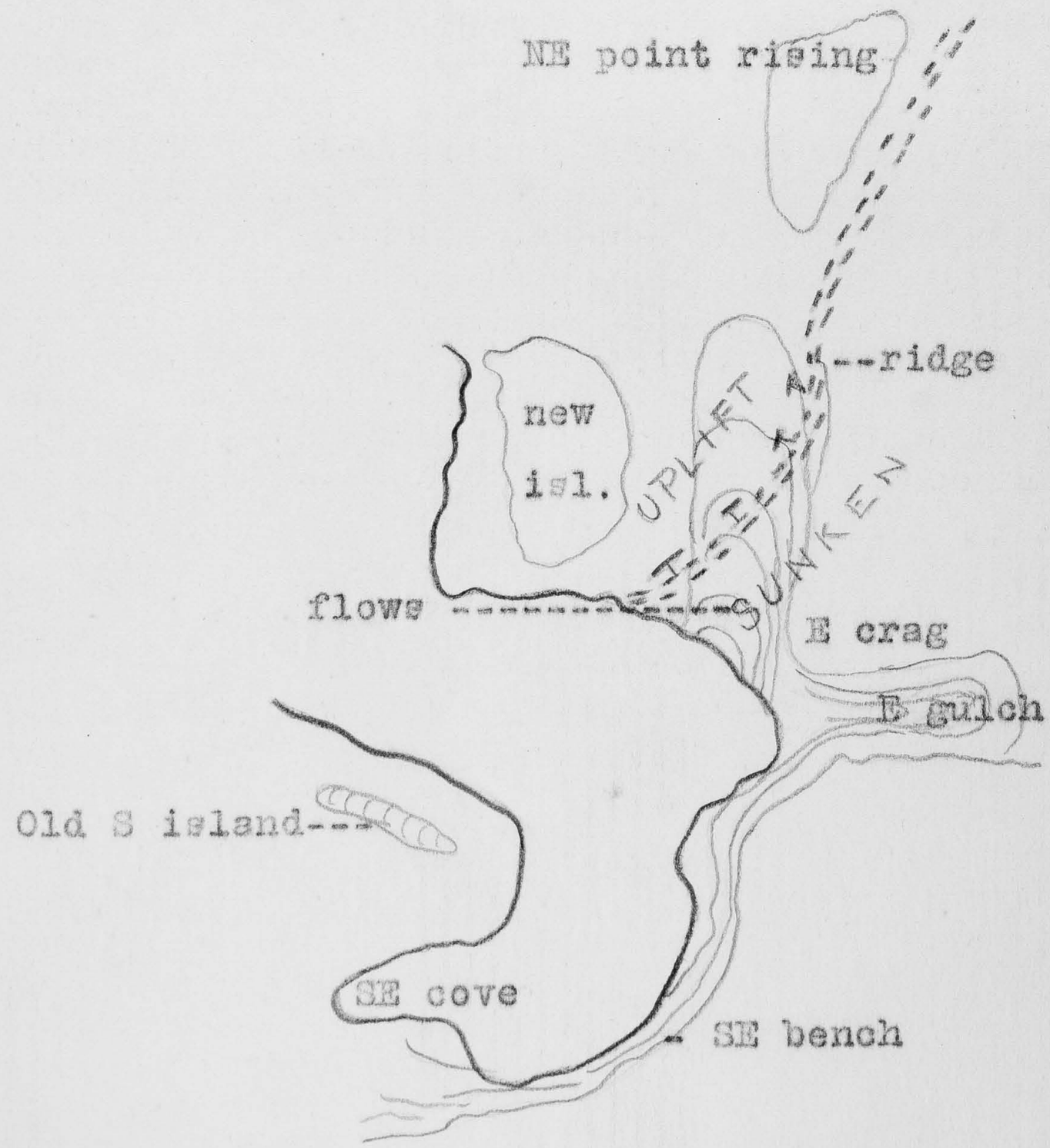
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date April 5, 1917.

10 a.m. to 12 noon.

Conditions of activity much the same. Lake high and streaming from the NW to the SW and SE with five or six fountains and fluctuations of a few feet. At noon and thereafter there was threat of an overflow but only a small trickle overflowed at the foot of the E gulch, at the S base of the old E crag.
This overflow was where depression has been going on with further subsidence of the E crag and NE bench block, accompanied by rising of the new island. In the midst of the new overflow of the E floor between the new island and E bench, there is a curved shoulder with pressure ridges of flow crusts which extends from the smoke holes of the NE to the S side of the new island in a curve bellying southeastward. The high part is on the side of the island and the low part on the side of the E crag with a sharp slope between of perhaps four feet depression, and cracks can be seen beneath; thus:-



Sketch map of E and SE coves.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date April 5, 1917.

Looking from smoky NE bench at the central region, there is a large fountain which bursts there having some resemblance to Old Faithful. Saw immense balloons of leathery crust blown, collapse, and then a great fountain would break. On the rampart strong fountaining was throwing over much spatter which tended to blow large blisters one to three inches across. Fountain farther NE bad fumes.

Made immersions of two half-inch steel pipes containing in the end Seger cones wrapped in black iron netting, the lower end of the pipe being closed with a screw plug. Assisted by members of 4th Co., Coast Artillery.

1st immersion:-

Eighteen Seger cone fragments ranging from fusibility 590° C below to 1050° C above. Fusibility intervals 30° each, 590 to 950, and 20° each, 950 to 1050. Immersion one meter below surface of lake. Temperature 920° C. Time of immersion 5 minutes.

2nd immersion:-

Seven fragments, respectively from below upward 1050°, 1010°, 950°, 860°, 770°, 680°, and 590°. Immersion 6 m. below surface of lake. Temperature 1050°+. Time of immersion 5 minutes. Efflorescence of terminal lava noted.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date April 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10a.m.		Near view aa talus E base E island. (Boy Keanakou.)	1	W P	8x	f/22	1	5x7
		Ditto aa wall rock.	2	"	"	"	"	"
		Looking SE at rampart of E cove where temperature measurements were made.	3	"	"	f/16	½	"
		Tessar lens.						T.A.J.



1



2

Fag

174

1917, Apr.

175

1917, Apr. 5.



3

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date April 6, 1917.

Assisted by Hilo Boarding School boys made two immersions with half-inch steel pipes containing Segar cones wrapped in iron netting.

11:22 a.m. 1st immersion:-
Seger cones as follows: 740°, 770°, 800°, 830°, 860°, 890°, 920°, 950°, 970°, 990°, 1010°, 1030°, 1050°. Immersed tube vertically 2 meters below crust. Time immersion 5 minutes. Temperature 950° C. Lake was 10 ft. below bank, immersion was in quiet soft crust four feet removed from bright line at edge of moving channel lava.

11:45 a.m. 2nd immersion:-
Seger cones as follows: 990°, 1010°, 1030°, 1050°, 1070°, 1090°, 1110°. Attempt to measure temperature adjacent to bright line near E cove. Immersed tube 3 to 5 inches. Pipe swept along bank so that in three minutes it had to be removed with some lava clinging to the end. It was reimmersed several times during 10 minutes. The final immersion lasted two minutes. The tip was in the bright line and in the lava immediately adjacent thereto under the crust. There was no effect on the cone 990° fusibility. As the lava on pipe cooled the vesicles would snap open. Is this due to cooling strain or condensation vaccua?
Reimmersed the same tube in the bright line at edge of channel under point S of E island, immersed 4 inches depth, time 4 minutes. Temperature 1000°. Seger cones 1010° and 990° glazed together. In these tests the glowing part of the bright lines was not so well reached as on March 30 and the temperature measured was rather that of lava adjacent to bright lines just under crusts two to three centimeters thick.

On this day lava has receded 10 to 15 feet leaving walls of that height and <u>higher at the three points</u> in the center (20 feet?). The crag mass summit appears higher measured by its relative height to W niche. Probably there is tilt of S floor lifting S island, of E floor lifting new island, and of NW and W overflow lifting crag mass -- in other words, marginal overflow is again displacing lake bottom and central region of bench magma is rising. Fountains SW, NE, E and SE. Out flow into lake from NW. Streaming SE channel is swift. Occasional falls from raised ramparts. Examined NE shore. Strong fumes and yellow alum at tumbled smoky pit now in bench where former NE cascade was. This has become a very fumy solfatara with ramparts N and W of it. The fume from this solfatara had the sweet sulphur smell, and the heart of it was acrid with SO_2. Otherwise the fume along the old NE bench farther S was very breathable and like steam. This bench in one place is now level with new platform below.

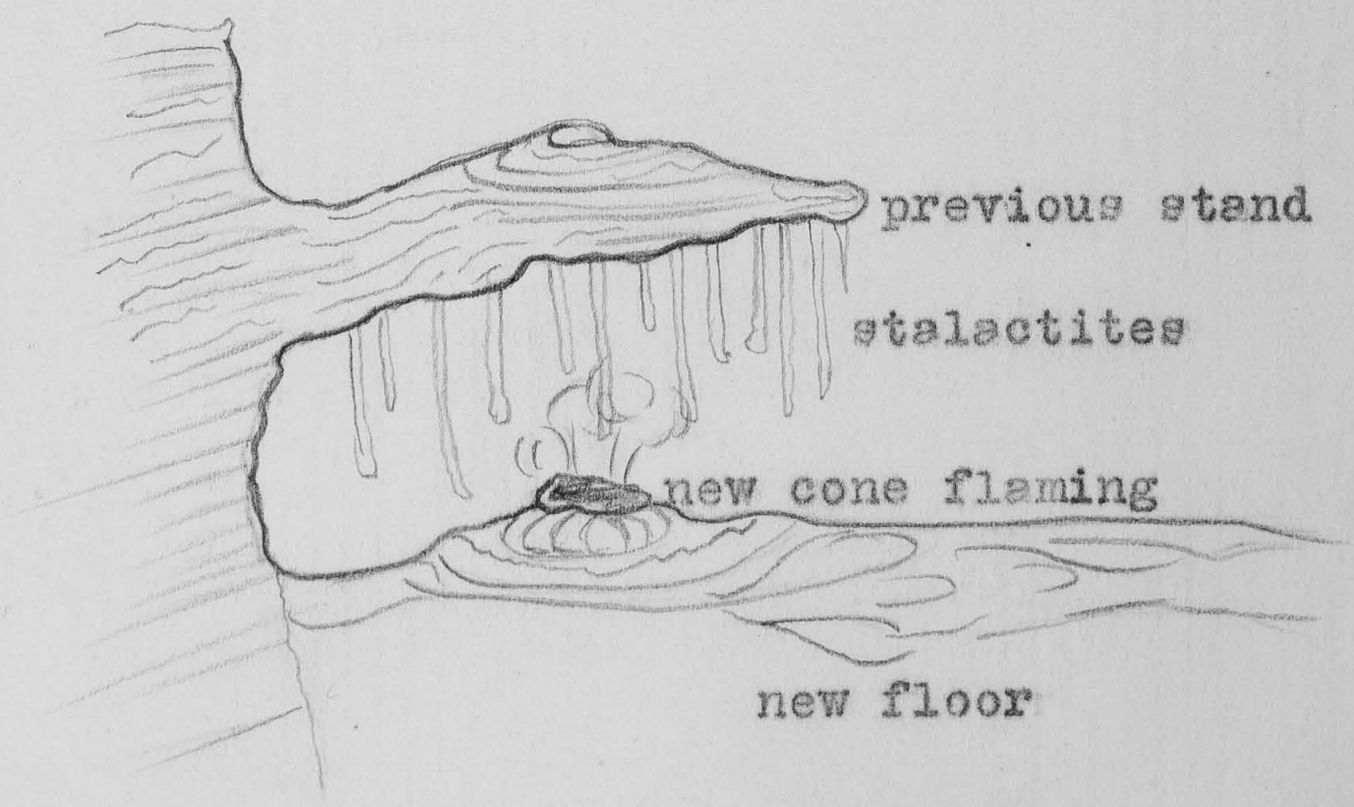
T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Saturday Date April 7, 1917.

Morning. Lake still lower; 20 feet down in SE channel. Central cavern again open with inward streaming, also cavern SE cove. Heavy fresh tumble from S end of SE January bench. It is clear that these tumbles of rock marginally are weighting agents like the overflows, which press down locally the crust blocks of bench magma and force out the subjacent mobile magma towards the center of pit. Made circuit of pit. NE floor subsiding below 1894 bench and latter also appears lower. The NE point is rising with E island and is now a pinnacle bent up and more or less detached from NE floor.
The N bench and chasm appear unchanged but great falls of rock all around rest on bench. NW arm shows platform of recent overflows. NW pond shows recent overflow from W arm. NW glow cone at margin NW pond on SW. Crag-mass increasingly tilted westward so that E crag of it now appears as high as the old summit.
W pond shows a very interesting structure on its NE corner. Three days before the pond had been "very active and level with the floor around it". Now it was four feet, more or less, below the floor around it, this floor of recent overflow extending out towards the lake eastward and southward, with a margin of slumping where the overflow had settled back. The present pool was crusted with a blistered carapace, but maintained a small flaming cone on its NE border. This cone lay under its duplicate of the previous higher stand, and the duplicate was attached to the wall of pit like a bracket, and long slender cavern stalactites hung down from its under side about two feet, directly over the cone below. The flaming of this lower cone may have induced the refusion of the stalactite drip. These stalactites hence less than three days old, and fully formed. They must be product of reheating. There are many of this type, the true



cavern stalactites, less long, in the flat low caverns of the tumbled NW bench matter of January, 1917. These

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Saturday Date April 7, 1917.

stalactites are magmatic accretions formed in a few hours and not formed by water drip. They appear always to be part of a secondary glaze.
SW benches have sunk greatly and crevasses opened here have swallowed the heavy talus slopes at base of SW cliff. SW islet stands 8 feet high; slight overhang. S tumble standing out from wall and crevasse behind it. Bad fume rising SE cone.

T.A.J.

At W lake.
Could hear boiling and rumbling plainly in W lake. Could go no nearer because of strong blue fume from cone.

12:20 p.m. At NW cone.
Was near NW cone and could hear loud blowing and see a few small holes on the side from which lava came out occasionally. Fumes too strong to go very close.

2:20 p.m. From the NE crag.
A large piece fell from the SE island and started many fountains. Lava sank about three feet and then became very quiet.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Sunday Date April 8, 1917.

2:00 p.m. SE station.
Half of the E island has fallen away. Half of the middle island has fallen , also, and built a new floor below; has nearly closed the channel between the two islands, only about 20 feet more of channel left. The floor on the SE side of the large crag has broken off and formed two small islands standing up above the lava about five feet.
Streaming from three directions: from under S cove, from under middle island and from the small channel; all going under NE floor. All but 15 or 20 feet of this floor had fallen.

4:05 p.m. SE station.
Rock fall from SE island starting many fountains.

4:10 p.m. SE station.
The channel between the middle island and the E island nearly closed, only about one or two feet more. Fumes very thick in pit.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date April 9, 1917.

2:10 p.m. E station.
Streaming changed, is now flowing from S cove around the point and toward the cave under the middle island. Much activity at this last point.

2:20 p.m. SE station.
Channel between middle island and E island closed, so there are two lakes of molten lava. Banks about 20 or 25 feet high.

3:00 p.m. SE station.
Small rock fall from under E station.

Alex.

4 to 6 p.m. Lake low. Inner walls 20 feet high more or less. Whole N side of central peninsula has fallen and whole S side of E island. Tumble from central peninsula makes a new low point and the entrance from center of lake to SE channel is partly blocked. Consequently the streaming is now SE or <u>outward</u> from central cavern as though coming through tunnel from SW cove.
A new pit has opened in NE bench, just S of NE point and back of the sulphur pit. This pit, 20 feet across, is flaming and fuming intensely, sending up quick hot billows of dense white fume. There is much smoke from other localities. Looking down into this pit at dusk see about 20 feet down a chute of rapid, silent lava, like a mill-sluice, rushing eastward. Going around to NW station see that the NE cavern is again open in a broad arch and the lake again is cascading into the cavern -- this is the source of the sluice. The sulphur pit is also glowing, next NE of E island.
The lake was very quiet. A rhythmic fountain was playing in N central region opposite the cascade, and there was a fountain against bank SW and also SE. Streaming outward from dark skin NW and N. The central promontory out from crag-mass appears to be an island. Fresh debris in SE cove has made two islets there. The floor over NW pond adjacent to NW cone has collapsed to a small glowing pit.
Fumes from a distance look very dense.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date April 10, 1917.

4:00 p.m. Lake still low but has risen building inner bench two feet high since yesterday. This bench an isthmus across entrance to SE channel. Broad festooned stream eastward from central cavern. Islets in SE cove covered by new bench which blocks entrance to cove. Splashing pool, margined by low rampart, inner end cove and strong fumes from cone above.
Circuit of pit southward. Four islets SW and center in line. Rapid rampart building with continuous fountain between two northern islets, these being remains of central promontory. W pond cone has built up from below so that upper shelf and lower dome have merged and triangular flaming gash faces W revealing clusters of grapevine stalactites inside. Alex, April 7, approached close enough to stalactites to verify observation that they were the true cavern stalactites of grapevine type. NW cone fuming and small glow pit E of it. Crag-mass appears less tilted westward. Bench around NW arm collapsed on N side. High tabular block of January bench NW has split at its W end revealing crosswise gulch crevasse in addition to long E-W crevasse. Violent fountaining at NE cascade locality but no inrush. N part of lake stagnant, cracking and foundering. New NE pit quiet but sulphur hole and N inner wall smoking heavily.

Tests with Bristol pyrometer and Primus stove:-

In flame which melted the tube glass, terminal in iron pipe surrounded by asbestos paper to within one inch of couple, no reddening of pipe. Direct connection cold junction and hot junction.
Temperature 423° C maximum -- 380° C minimum.
Requires 20 minutes first heating.
Air temperature 65° Fahr.

2nd Test. Separated cold junction from hot junction by 120 feet of asbestos insulated No. 12 copper wire.
Temperature 390° C minimum -- 429° C maximum.

Pumped higher pressure on Primus stove:
Temperature 440° C.
Evidently no difference due to wire lengths. Pressure in Primus changes temperature in flame. Both scales of galvanometer work accordantly.

Note:- Allow for changed conductivity due to heat of wires in lake?

Temperature of Primus flame by Seger cones 920° C more or less. Loss due to radiation iron pipe.

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3rd Test.
Put uncovered couple in flame of Primus.
Maximum orange red at contact of small blue flames in stove 757° C.
In midst of upper flame dark red heat (where the glass tube fused) 593° C.
This is where the couple inside iron pipe gave 430° C, more or less.

T.A.J.

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Day Tuesday Date April 10, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
4 p.m.	E	Fallen central penin.	1	W P	8x	f/16	1	5x7	
	E	NE point	2	"	"	"	"	"	
	NE	" " (pan.)	3	"	"	f/8	"	"	
	"	SE cove "	4	"	"	"	"	"	
		Tessar lens.							T.A.J.

1917, Apr. 10



1

Jag

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Day Wednesday Date April 11, 1917.
Thursday " 12, "

Apr. 11.
11:00 a.m. Rainy.
Lake still low. Fresh hardened flow from central region across channel isthmus. High half-dome grotto central island (third from SW). Much smoke, especially NE. Circular pool SE cove looks like sinkhole with slight fountain and heaving soft crust. Streaming eastward from central cavern. Sudden gush of gas with loud hissing noise E cove. Gas breaks from under stiff crust which it demolishes, hissing and spraying continues, violent fountain develops, this migrates to bank, starts a slight crescent rampart and expends itself. The process was equivalent to balloon inflation but with greater confinement due to stiffer crust.
Note deflation sinking in central region not shared by the SE pool separated off by the isthmus. Four or five fountains, conditions as a whole stagnant.
Central cavern dark with hanging black stalactites, crust over outstreaming lava below. Eastern extremity of S island mass (old S island) has collapsed, widening pool E of it. SE cone emitting blue fume. Inner benches mostly 20 feet high or more.

Apr. 12.
2 to 3 p.m. Lake higher and inner floor higher and more substantial. Spatter dome very large on central island. SE pot separated by isthmus two feet high from SE arm and similar isthmus separates latter from main lake. Central cavern fountaining inside but streaming outward to the E and slight streaming outward to the NW from SE cove. The two currents meet in very sluggish foundering crusts opposite old S island. Fountains NE, N center, at the islands and in SW cove. The N central fountain behaves like Old Faithful.
Sulphur hole N end of depression E of S island crackling, fuming, glowing and covered with bright yellow sublimates. NE cascade pit entirely inactive and shows black pahoehoe on its bottom where the sluice-way was. Strong sweet sulphur odor from sulphur hole.
Crossing NE upper floor past several whitened areas very hot but wholly without odor or visible fume showing cherry red glow in cracks one to three feet down.
N chasm T-shaped, stem toward a raised rampart above lake, and bottom a broad festooned flow from lake to head of chasm. No fuming or glowing in chasm. No grapevine stalactites seen in cavernous openings of wall section, such as were abundant near NW pond. Wall section oxidized thin-bedded layers above, massive layers below, no aa seen. Less oxidation than around W pond.
4:00 p.m. Lake marks higher than yesterday and now risen to upper limit and spattering over SE isthmus. Cracking and foundering.

T.A.J.

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 Day Friday Date April 13, 1917.

9 a.m. to 5 p.m.

Lake on this day 9 to 11 a.m. high and rising, reaching during day to within 10 feet of bench at E cove. After 11 a.m. torrent poured across isthmus at entrance to SE channel. Before that time the SE pool was very heavily crusted from shore to shore and near level of roof of central cavern. About 10 a.m. this crust began to break with violent escape of gas along the cracks making hissing and spurting lines with uplift of adjoining crust blocks. Then the broken blocks began to founder, the pool sank about two feet through deflation, fountaining started at several places along shore and finally the whole pool broke up with intense bubble fountaining and tremendous heat. This spell lasted not more than ten minutes and was followed by immediate recrusting. Final restoration of visible flow to the SE did not occur until the torrent from the central region crossed the isthmus and started gradual cracking and foundering by the forward spread of the front of the flow.
Elsewhere the fumes were thinner and large spatter domes were building at the central island and on the E shore of the SW cove. The sulphur hole NE of E island had developed by collapse to a glowing, and probably flaming, pot 4 feet in diameter with brilliant yellow incrustations on the cone slopes surrounding the pot.

Attempt to use Bristol pyrometer by encasing asbestos insulated wires leading to hot junction in 125 feet of half-inch black iron pipe. Connection of wires with enclosed terminal gave trouble owing to lack of heat-proof connector which would go in pipe. First attempts made by leaving hot junction protruding lower end of pipe with asbestos packing around it, and the iron and nickel elements were connected with the leads by copper wires separated by thin asbestos paper and wrapped with electric tape. This joint worked loose with the first shocks given to the junction by contact with the lava and the copper short-circuited against the pipe. After first experiment, 25 cm. immersion, which gave reading 690° C and in another trial a rapid movement of galvanometer to 700° plus immediately jumping back to 0°, it became evident that the current was short-circuiting and erratic. Accordingly in the afternoon the lower pipe was taken apart and a new junction made wrapped only with electric tape. The hot junction was now withdrawn into the pipe and the end of the pipe closed with an iron plug.
The arrangement was
(1) Hot junction enclosed, connected with only tape insulation with 150 feet of asbestos-covered No. 12 copper wire enclosed for 125 feet in pipe.
(2) This wire connected with cold junction in the open

on the bench, the latter at atmospheric temperature.
(3) The cold junction connected with galvanometer levelled on a slab of rock, the connectors used being those for the higher scale reading to 1250°.
No effort was made to keep the twisted terminal of the hot junction from touching the lower end of the pipe.
With this arrangement readings of the first metre of depth by quarters were made through a hole punctured in the crust at the E margin of the lake and the very flat angle of immersion gave an apparent rising temperature from 585° to 870° C during the first four stages of 25 cm. each. In actual depth probably the first two readings represented only about 15 to 30 cm. Thereafter the pipe bent down and became more nearly vertical at the terminal. The low readings of about only 600°, corrected to 700° for pipe contact radiation, etc., for the surface region probably represented the intense radiation cooling effect of thick crusts in contrast to the heating effect of oxidation along the bright lines.
A very interesting evidence of this was shown on withdrawal of the pipe after 50 cm. immersion when the reading below the crust was 599° C, but the clustered lava lumps suddenly exposed to air on the end of the pipe caused the temperature to rise quickly to 650° C and on breaking this lump lava exposing the inner incandescent part to air, the temperature rose 10° more. The temperature record at 1 m. depth of 870° C is fairly accordant with the record of the Seger cones (920° C) allowing for the radiation cooling of a crusted pool as against the oxidation heating of the region immediately below the bright lines.
When 1.25 m. was reached the temperature slowly rose to 890° C and then suddenly the instrument failed and the needle dropped back to 175°. What undoubtedly happened was that the tape insulation burned off inside the pipe now immersed deep enough to affect the upper end of the couple. On withdrawing the pipe the needle again moved up the scale showing that the current was still weakly flowing and the pipe, with a shell of lava about 3 cm. thick encasing it, was thrust back into the hole through the crust of the lake for a length of 1.50 m. After 3 minutes the galvanometer read 350° and showed no disposition to rise and the lump of lava on the end of the pipe had become so unwieldy that the pipe could not be withdrawn through the small hole, about 8 cm. in diameter, in the crust. The pipe could be pushed down but not pulled up, even with block and tackle. Accordingly heavy bowlders were thrown down at the opening so as to break a large hole, through which some fountaining took place, and then the pipe could be withdrawn.
A very instructive demonstration of subsurface solidification in the lava lake was afforded by the 1.50 m. of pipe thus withdrawn. The shell had thickened in 10 min.

to triple its former thickness, being now 9 cm. thick, the whole lump on the end of the pipe being a cylinder about 19 cm. through for the entire length of immersion. The solidification shell of the first withdrawal acted as a nucleus for rapid solidification when thrust again into the lava in contrast to the effect often seen on the smooth iron pipe which may emerge clean. There was evidently no heat sufficient to melt the lava of the first incrustation, and a superfusion quite ready for immediate solidification upon a block of already solidified lava as a nucleus. This showed clearly what would happen to the surface of foundering crusts of lava when they sink into the melt beneath. They would become accumulation centers and tend to have a strong solidifying effect, while the oxygen they carry down with them acts as a combustion agent. This trait of solidified lava to attract or cling to the molten lava, is well known to specimen collectors who draw out on a stick a small wad of the melt wherein to thrust coins to sell to travellers. The expert always inserts the stick first where he may twist or lift away a small lump of the melt which he withdraws long enough for it to cool slightly. Then he makes a second immersion of this small hardened lump and thereby withdraws easily the required larger sample. A tyro who tries with either metal or wood to draw forth a lump of hot lava is apt to be wholly unsuccessful if unacquainted with this trick as either substance slips through the stiff slag but gathers none of it.

The asbestos-covered wire lying across a hot crack on the bench had its insulation eaten off, apparently by burning, so that it seems very improbable that such insulation will be of any value in the pipes beneath the lake exposed to 1000° C. For any electric apparatus a special glass or porcelain insulation would seem to be necessary and neither of the substances lend themselves to the battering and bending which pipes get in this sort of experimentation.

The result of this day's work casts doubt on the value of electrical apparatus for temperature measurement in depth in view of the simpler and more positive results given by the Seger cones.

T.A.J.

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Field Notes

Bristol Pyrometer Measurements.

	Immersion.	Duration.	Reading.	
11:00 a.m.	25 cm.	1 min.	690° C.	
3:30 p.m.	25 cm.	6¾ min.	585°	
	50 "	2½ "	599°	
			650°	(Temperature after withdrawal)
			660°	(Temperature on breaking lava on pipe.)
				(At this time, 3:30 p.m., pipe immersed at 33° angle.)
4:00 p.m.	75 cm.	7 min.	863°	
	1 m.	1 "	870°	
	125 cm.	3 "	175°	
	150 cm.	3 "	350°	(Here terminal stuck in lava and galvanometer went to 0.)

Correction for pipe conduction add 160°; determined on April 10.

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Day Saturday Date April 14, 1917.

2:00 p.m. Lake 5 feet below new inner bench added to by the rising of yesterday. SE cove now a niche with hard floor and no pool at inner end. Isthmus high at entrance to SE channel. Large island of united two islets at entrance to SW cove. Small islet at entrance to N cove. Old SW islet still in place. High spatter domes on central island and E side SW cove. Pinnacle on shore at NE base of crag-mass. Central cavern again open and fountaining inside. Streaming outward from cavern to E cove. Smoke abundant.

The raised isthmus and central islets represent centripetal squeezing of bench magma tending to rise in the central region as elevated lake bottom. The tips of the three sectors of bench are clearly rising and the rising lake bottom is tending to gradually shut off the three inter-sector arms of the lake. If this happens, each arm will have to maintain its own connection with conduit and sinkhole respectively, or else freeze over and cease activity. SE pool is now fed from tunnel leading from SW cove. Latter is till fed from N and W. N cove is fed from NW arm.

E island now overhangs strongly on the S and shows upright laminations in the jointing of its broken southern face, in the part equivalent to the aa of the eastern face. These laminae are curved and platy but strongly suggest a somewhat rectangular columnar structure. They appear to have been formed by upward flow with lateral pressure at the time of the rising of the island and to represent a jointing in the midst of the rock which became aa at the exposed surfaces.

T.A.J.

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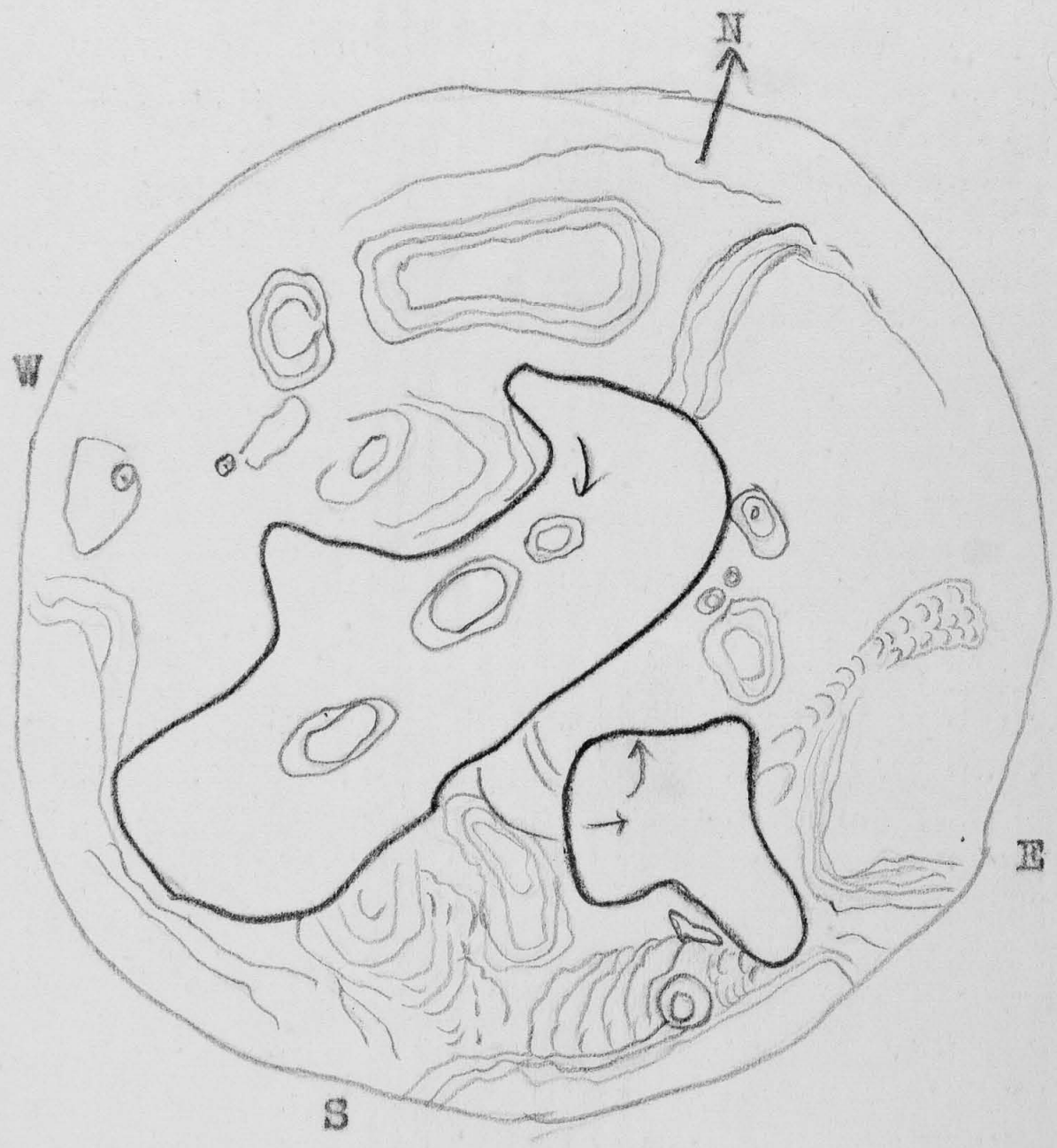
Day Tuesday Date April 17, 1917.

2:30 p.m. Heavy rise reported for Apr. 16. This shown now, SE cove obliterated and S floor flooded from E to W. New overflow E cove and through gap in lower part of E crag making small leaf flow on NE bench. New bench S of E island. Sulphur hole dead. New benches NW and W coves. Three islets now 8 feet high. SE pool banks 8 feet high. Streaming festoon from central cavern to N, fountain grotto under isthmus. Streaming from N and NW. SW appears stagnant. SE cone new shape, round annular ridge, pot in middle crag-mass on SE side much fallen away. Fountaining grotto domes NE, W, SW and E. See piece of bank E cove fall in, breaks up SE pool. Fumes much less. SE high bench gaping out from wall. Estimated depression SE pool 105 feet. Noises grottoes and occasional tinkling falls from banks.

Pit from S:-

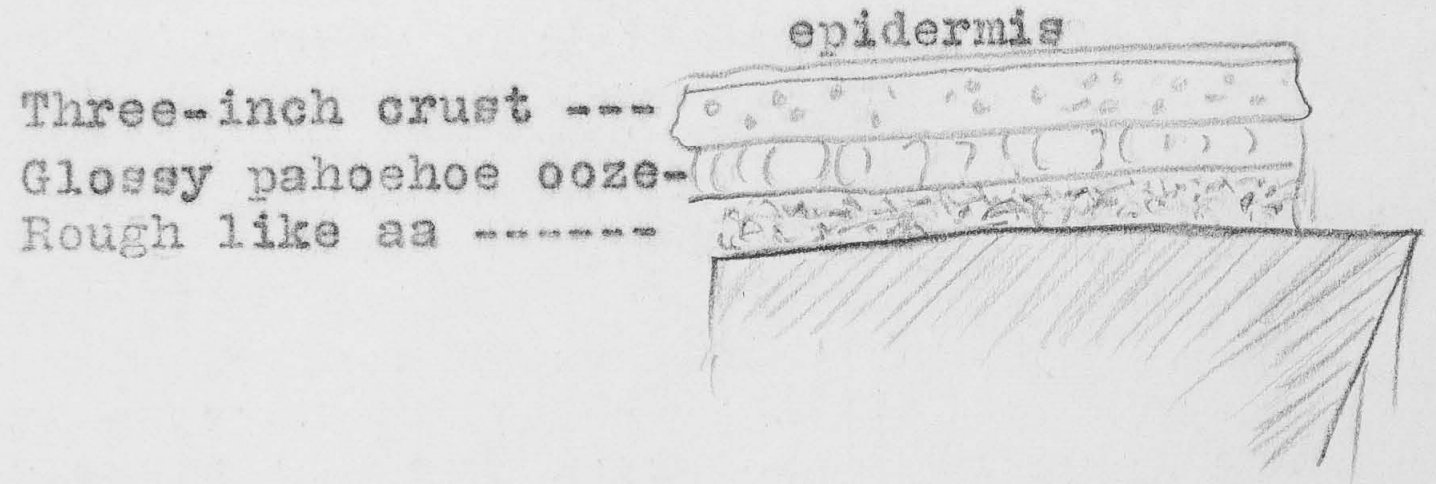


T.A.J.

10 a.m. to 4 p.m.

Lakes 4 feet down at 10 a.m., rise to brimming and slight flows 12 noon, more overflows 1 p.m., subside 8 feet, more or less, 1 to 4 p.m.
Central points continue to rise and periphery of bench magma to sink. Only two islands now in main lake, SW and central, both larger than before, flat topped, the rising may have drowned the third (northern) islet. The isthmus separating SE pool from main lake is pronounced. Inspection of SE pool at 11 a.m. from E cove showed that it was flush with bench and covered with a four-inch crust the surface of which was brown, rough and level. The roughness made up of fibrous filaments and vesicles, and millions of fragments a few mm. in diameter which incessantly jump away from the glass beneath like the sand spurts on a beach made by crabs. Is this cooling strains or bursting vesicles?
This heavy crust was level in the sense of continuous, but it was apparently faintly arched as a convex lens. It extended 150 feet across the pool. All visible streaming, either surface or under the crusts, appears to have ceased in this pool. Its present mechanism is crusting, followed by turbulent cracking and foundering at long intervals. The rising above level of tunnel which connects to SW cove appears to have checked streaming, a fact which suggests that surface streaming is very shallow and instantly interrupted if surface is interrupted. During cracking and foundering spells no current was revealed; a fountain would sometimes play over the central cavern, sometimes elsewhere. No fixed grottoes are established around this pool, and the SE cove is banked over and obliterated.
The currents on this day in the main lake were erratic, sometimes northward, with tumultuous puffing fountains, eight or ten in number, during sinking spells, and these sinkings appeared greater than the simultaneous ones in the SE pool. Is the SE pool viscidifying to bench magma, through loss of connection with sinkholes and with active circulation? Or is it becoming a conduit pool? Standing on its border, a few feet from the heavy crust, it was noticeable that the crust rose with marginal cracking and welling up of lava along the cracks. This upwelling was with hissing gases, the melt rising as a pahoehoe toe, skinning over, and the gas ballooning the skin, every new lava bulb being clearly a foam, instantly covered with membrane, and puffing up sluggishly like the boiling of very stiff pudding. The gas motive power was very striking. When a violent fountain started on the W shore of SE pool, the waves made the stiff crust undulate. General foundering would follow, by lowering of fountain locality, overflow weighting of edge of

crust, down-breaking, upwelling along breaks, over-weighting again, etc. There is gas-foam pressure ready to produce wedging apart and upwelling the instant a crust breaks: to this must be superadded gas oxidation. Immediate bubble fountaining is accounted for by some air carried down; but most of the vesicle air must be imprisoned for some depth. It was observable that after prolonged cracking and foundering, violent large fountains would eventually start at the shores. Is not this the final escape and reaction of oxygen carried down in the crusts, expanding with rise of temperature in depth?
The gas-foam which rises up cracks -- does it come from the cool layer just under crust or the next deeper layer? Does the cool layer split with the crust? In which case it is this layer which drags out to zigzags in the bright lines. In the upturned edge of a cooled crust saw four distinct layers, viz:-



Is the pressure which eventually in such a rise produces overflow, gas pressure at all the overflow lips? It looks like it, the small bubblings at the lips, replacing the balloonings at the sluggish upwellings. In which case, every overflow is an exaggerated toe, and the lake as a whole is an exaggerated overflow, and the whole pit filling is an exaggeration of the lake, aa below, pahoehoe above, but the aa below dominant.
Query -- Is the whole greater crater-filling only an exaggeration of the pit, and the whole mountain only an exaggeration of the cone which fills the greater crater?

The SE cone still fuming. The sulphur hole collapsed, dark, relatively inactive. NE pinnacle tending to slide on side of NE pit. Overflows E cove to E crag wall only. Fill the depression bottom of E gulch. Run out a little way on S floor from both E and W. Cone in W pond high and a small glowing and flaming hole in summit blowing noisily. NW cone also blowing. Lava crusts high both W and NW ponds. More opening of transverse NW crevasse. New floor around NW arm. Fresh glowing, cracking and foundering flow in N chasm. Much fountaining N center,

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 Day Wednesday Date April 18, 1917.

W, SW and SE in main lake.
Fumes abundant, but thinning. Noises strong blowing and fountain plash. Gas pressure marked.

T.A.J.

6:30 p.m. SE station.
Large slide of rock from SE side of crag-mass into lake, starting many fountains.

6:55 p.m. SE station.
Large piece broke off from SW side of E island falling into SE pool; seemed to be about 100 feet by 15 or 20 feet.

Alex.

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Day Wednesday Date April 18, 1917.

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			no	pl	scr	stop	ex	cam	
2:30	E crag.	SE pool	1		scr	f/16	1/2	Cirkut	
to	NE rim.	Pit	2		"	f/11	"	"	
4p.m.	Bet. S & SE.)	Pit	3		"	f/8	"	"	
								T.A.J.	

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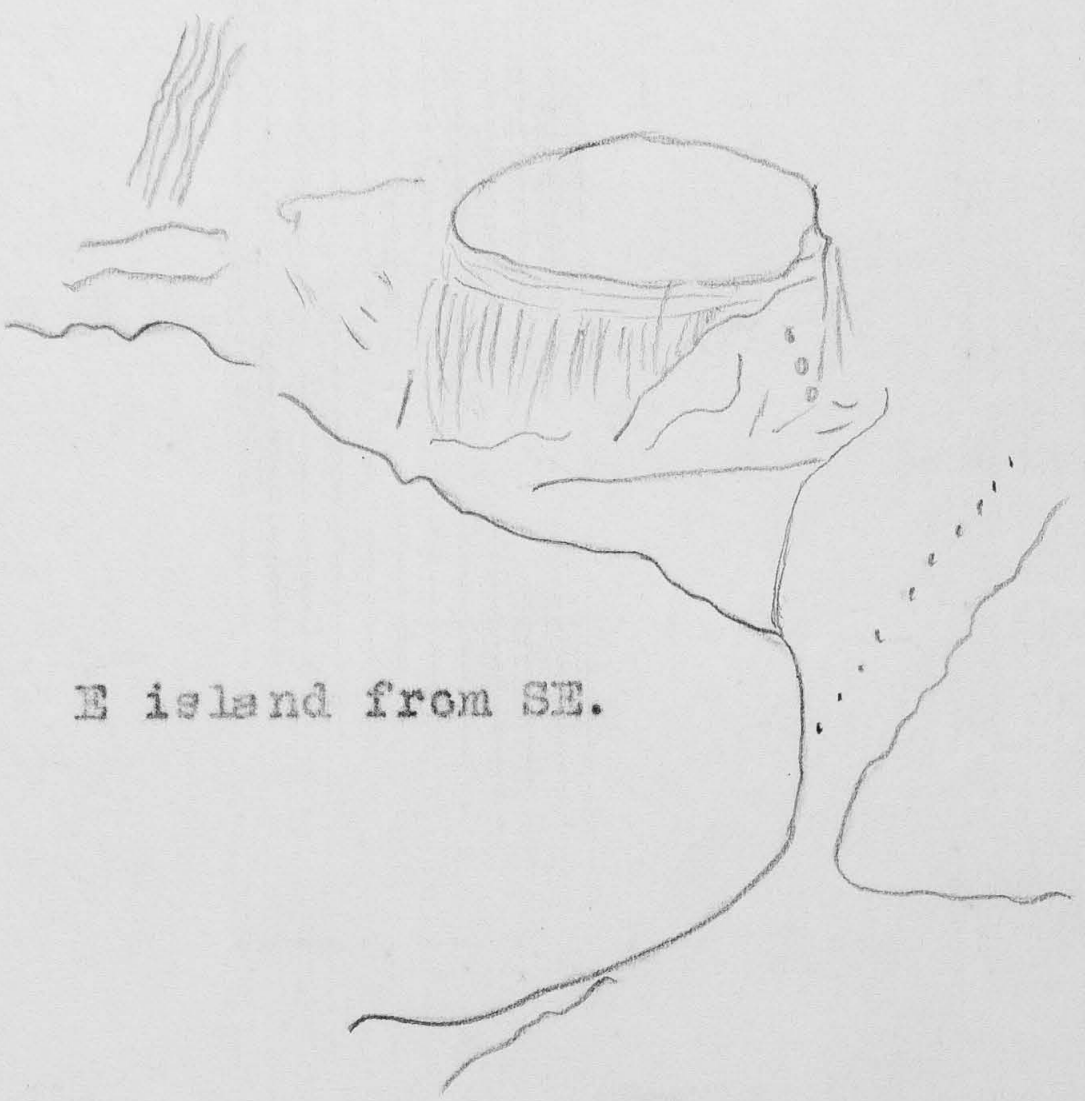
Day Thursday Date April 19, 1917.

2:10 p.m. Query:- Is not the vertical platy parting on W side of E island the foundered crusts of E point of January, plastered against basin side under the lake and uplifted?



E island from SE.

Lake SE quite different. Last evening tunnel opened under isthmus and streaming through from main lake began. Lake now 4 feet down. Five or six fountains. Black satiny skins. Festoons streaming from isthmus to new grot- to SE end. Very hot pool, thin blistered skins. Occas- ional border falls. Rampart around SW cove. Glow in SE cone, flame there last night.
Last evening at 6:30, Alex reports, piece fell from crag- mass SE side, and at 7 p.m. 200 feet of bench S side of E island fell disturbing the isthmus and starting a flow from the lake through a tunnel or crack under the isthmus southeastward. This completely changed the habit of SE pool back to <u>thin skins</u>, <u>streaming</u> and <u>SE grotto</u>.
Streaming now appears southerly and much bubble fountain- ing near central island. Much white smoke from N wall and NE benches. Central peninsula remnant broken across mid- dle and smoking. No fresh ovreflows. Lake now falling.

T.A.J.

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 Day Thursday Date April 19, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
2:10 p	SE	N	0					
	E	N	0					
	SE	E crag	1 41	17 11	0			
	E	ditto	92 10					
	SE	NE point summit	11 44	4 19	0	587	44	
	E	ditto	26 56					
	SE	E margin new flow on NE floor.	-14 8	15 12	0			
	E	ditto	18 22ca					
	SE	Sulphur hole NE	12 34	8 6	0			
	E	ditto	32 44					
	SE	W summit E island	22 16	5 5	-4	403	36	
	E	ditto	53 37					
	SE	Lake at isthmus tunnel	37 40	10 57	-7	446	87	
	E	ditto	62 32					
	SE	Lake at N end central island.	42 31	7 17	-9	700	71	
	E	ditto	53 52ca					
	SE	Summit S " " island.	46 21	6 48	-8	660	79	
	E	ditto	58 40					
	SE	Summit crag-mass	43 10	2 7	-11	880	33	
	E	ditto	49 41					
	SE	N end SW island	57 14					
	E	ditto	66 52					
	SE	S end " "	61 40					
	E	ditto	71 44					
	SE	S end SW cove	73 54					
	E	ditto	82 9ca					
	SE	SW summit S island mass.	67 53	5 48	-12	517	54	
	E	ditto	81 29					
	SE	Summit old S island	62 36	18 18	-12	227	76	
	E	ditto	97 51					
	SE	SE cone	82 29					
	E	ditto	101 59					
	SE	New SE grotto	80 45					
	E	ditto	112 13					
	SE	W pond cone	61 24					
	E	ditto	62 33ca					

			no	pl	scr	stop	ex	cam	

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 Day Thursday Date April 19, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
	SE	Crag NE point crag-mass.	30 12						
	E	ditto	38 43						
	SE	E cove	18 51						
	E	ditto	70 55						
	SE	W point E pool	44 37						
	E	ditto	70 45						
	SE	S point " "	53 26						
	E	ditto	95 47						

Length SE pool ..... 380 ft.
Width " " ..... 220 "
Length Main lake ..... 800 "
Width " " ..... 250 "
Central and SW islands each 60 " long.
Lake depression ..... 87 " (Risen 28' since Mar.31: 14' above inner bench level Mar.30)

NE pinnacle above lake .... 43 "
E island " " .... 51 " (Risen 28' since Mar. 30
Crag-mass " " .... 54 " " 17' " " ")

Inner bench of Mar. 30 was overflowed Mar. 22 and Apr. 2. The marked rise began on Apr. 1 and has been 14 feet since Apr.2 in actual building above inner bench of that date: 14 feet in 17 days, or approximately 1 1/5 ft. per day.

T.A.J.

			no	pl	scr	stop	ex	cam	

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Day	Date
Friday	April 20, 1917.
Sunday	" 22, "
Monday	" 23, "

Apr. 20.
2:00 p.m. Fresh overflows on all S floor and through gap on NE bench. Fresh lava pile around SE cone. Fresh talus to lake edge from SE bench E end. Streaming festoons, wide and straight, from isthmus tunnel toward SE station. Two high rampart grottoes SW. Noise of incessant crust grinding SE pool edge. Only two or three fountains. Much smoke NE, center, WSW and NW.
Streaming in main lake N to S.
Lake now 3 feet down. S floor widening and burying S tumble.

T.A.J.

Apr. 22.
2:30 p.m. E station.
Lava down about 15 feet. Very quiet in small pool and many fountains in main lake. Fumes dense N side pool.

3:30 p.m. SE station.
Floor between middle island and E island has sunk down about 10 feet. Tunnel through which lava flowed from main lake closed. Later streaming from under SE cove, with slowly rising lava until 6 p.m. when it was within 7 feet of the bench. It then became stationary.

Apr. 23.
2:00 p.m. E station.
Lava 10 feet down. Quiet in both pools. No fountains anywhere. Fumes thick all over lake.

2:45 p.m. SW station.
Ten fountains in N part of pool. Occasionally Old Faithful would play. Only two islands in main lake, standing about 10 feet above lava. Small cone in W pond very quiet; could see only one small hole, on its SW side. Fumes in pit so thick it is difficult to see.

Alex.

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 Day Tuesday Date April 24, 1917.

2:00 p.m. SE station.
Streaming from cavern under middle island around point of island to the E island where it was boiling and rumbling loudly. Fumes dense. No fountains in main lake. Small pool is 10 feet down. Slow rise in main lake.

2:30 p.m. Rock fall SE corner which started a large fountain. This lasted but a short time.

Alex.

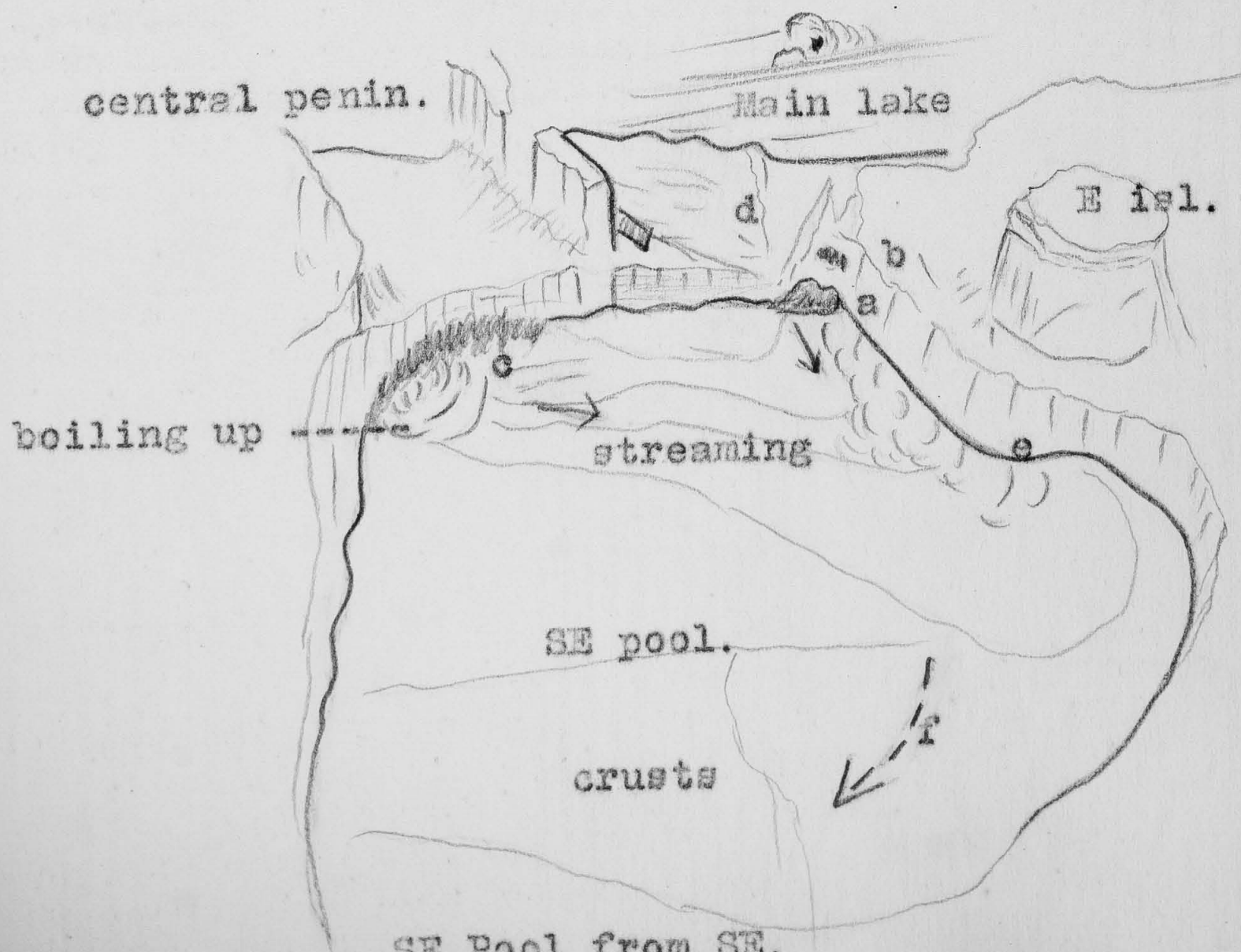
4:30 to 7:30 p.m.

Pit smoky and inner cliffs about 15 feet high.

From NW.
NW cone a tumbled lot of pinnacles, W cone heard puffing; middle and SW islands stand high. NW pond only a flat area of flows. Bench high around NW arm. Recent flows high in N chasm.

From NE.
High annular cone with flame and glow on lake margin NE next adjacent NE pinnacles on N side and under cliff of NE bench.

From SE.
No marked changes E cove. In S pool, outflow from central cavern to N and line of violent bombardment against S side of E island. The arrangement was as follows:-



SE Pool from SE.

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Hawaiian Volcano Observatory

 Day Tuesday Date April 24, 1917.

From central cavern (c) there was boiling up and out. Under the isthmus at"a-b" there were two caverns, the larger below and from the latter there appeared to be a blast or a current upward and outward, forcing the stream from "c" along the wall "a-e" where it surged violently with a roar and much fountaining and downsucking. The interior (a) was a bright orange glow and there appeared to be a chute inside it downward and from the main lake around to the right, which may have rebounded and shot upward at an incline and outward in the direction of the arrow at "a". The upper cavern (b) glowed and occasionally showed lava splash inside. It was evident that the isthmus (d) had broken down away from the central peninsula wall so as to make a low escarpment with backslope to the right.
At 7 p.m. caverns "a" and "c" filled up with rising lake, lava flowed out of "b" into SE pool, and finally it flowed across "d" from main lake, the bombardment "a-e" diminished and a sluggish current (f) started. Both lakes then tended to rise to a common level and the cascade across the isthmus to pour more slowly. Before, the main lake was 8 to 10 feet the higher.
SE cone glowing and flaming. Nothing new S or SW.
Numerous fountains in main lake, against N inner cliff and in N central region especially.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date April 25, 1917.
Thursday " 26, "

Apr. 25.
3:30 p.m. Lake SE five feet down. Isthmus closed, at least on surface. SE grotto active and streaming SE pool steady to SE. Steady hissing W cone loud. Fountain middle island, NE wall and NW curtained grotto (just E of NW cove). NE cone nearly closed above, open cherry red gashes below to large incandescent cupola interior. Crag-mass from NNE bench quite changed profile. Surface in general crusted and rising.
Visited S face of E island. Verified the upright layers as being plastered wavy crusts of pahoehoe two to three inches thick, vesicular and deeply oxidized (spec.). Plastered against aa surface at bottom of section. Nature of layers quite same in appearance as horizontal top layers of the monolith. Only noises the hissing, and puffing and rumbling from the grottoes.

Apr. 26.
6:00 p.m. Fumes thicker. Calm weather and southerly. White fumes SE, WSW and N. Old Faithful in NE central region, period 50 to 60 seconds. Streaming from N to SW. SE pool crusted, occasional fountain SE corner. Benches 10 to 15 feet high. Central peninsula more tumbled at W side and yellow sulphur stain S side of crags. SE pool shut off. No hissing W. Five or six fountains. Central and SW islets more than 10 feet high. Curtained grottoes N. Active bombardment to bank from SW island to bank WSW. Noise plash.

6:30 p.m. The central islet subsided bodily beneath the lake making a short effervescence and wave.
W cone flaming and filagree openings. NW cone smoking.
NE cone flaming and spurting. SE cone flaming.
Cracking and foundering in SE pool and streaming from under isthmus.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date April 27, 1917.

11:30 a.m. S wind. Smoky. Seeing S and SW.
Lake lower. Inner cliffs 12 to 15 feet. Streaming slight. Fountains Old Faithful and grottoes. SE pool mostly quiet, occasionally breaks up. SW islet overhangs S, 15 feet high. Old Faithful quite regular dome fountain and bubble fountains in intervals, tends to migrate E. E island overhangs on E side as seen from S, and upper surface slopes E. Glow in sulphur stained central peninsula area.
Higher bench point W of E island split off as a crag with crevasse separating it from E island mass. E and S of lake two marked bench levels, a newer inner one about 10 feet high, and a higher E sloping one corresponding to S floor and raised isthmus surface between central peninsula and S island mass. The lower one is the level of the newer isthmus between central peninsula and E island. At the NE there are thus three bench levels -- the inner, middle and January levels. The NE cone is on the inner bench and near it or at it there is hissing. Noises otherwise puff and plash.
There are now disjointed small crags S, SE, NW of E island, W, NW and N. No trace of central island.
Heavy smoke SE floor, looks as though a new arm would develop there by collapse.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date April 27, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		Wind S.						
11:30a	S	N	0					
	SW	S	0					
	S	N grotto	6 28	6 4	-7	990	105	
	SW	ditto	76 49					
	S	NW grotto	15 40	5 56	-9	910	96	
	SW	ditto	81 42?					
	S	O.F. locality	9 32					
	SW	ditto	67 34					
	S	Crag-mass grotto	31 6	8 28	-10	836	126	
	SW	ditto	83 21					
	S	SW grotto	45 53	10 21	-9	553	102	
	SW	ditto	73 35					
	S	NW cone	43 15	5 44	-9	833	85	
	SW	ditto	106 39					
	S	SW crag	59 4	9 39	-10	263	73½	
	SW	SW "	14 22					
	S	Summit crag-mass	32 28	2 39	-12	835	41	
	SW	" " "	94 14					
	S	N summit SW island (bench level)	36 51	8 26	-11	545	82	
	SW	ditto	68 21					
	S	SW summit S island-mass	28 0	8 39	-9	364	56	
	SW	ditto	40 40					
	S	Summit E island	-6 44	3 25	-11	626	39	
	SW	ditto	51 46?					
	S	NE pinnacle	-2 12	3 9	-11	627	47	
	SW	ditto	63 54					
	S	E cove S pool level	-14 25	10 7	-10	592	117	
	SW	ditto	45 46?					
	S	Highest point NW bench crag.	20 34	2 4	-12	1145	45	
	SW	ditto	94 53					
	S	W summit central penin	15 9	7 2	-13	480	61	
	SW	ditto	52 4					
								T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date April 28, 1917.
Monday " 30, "

Apr. 28.
2:30 p.m. E station.
Lava down about 20 or 25 feet below the floor and very active in both pools.

2:45 p.m. NE station.
Fifteen or twenty fountains in main lake. NE cone blowing very loudly. Rock falls could be heard occasionally but fumes too thick to see.

Apr. 30.
2:30 p.m. SW station.
Lava in main lake 10 feet down and rising. Only activity in this pool is on the N side.
Many fountains boiling in small pool. Small NE cone blowing loudly. Pit of Halemaumau filled with fumes.

4:15 p.m. SE station.
Lava still rising, is now 6 feet from level of floor.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Tuesday Date May 1, 1917.

2:30 p.m. S wind.
Lakes slowly rising three days past. Both lakes now active and rising. About twelve fountains. Grottoes E and SE. Isthmus two feet high, inner bench mostly five feet high. Streaming out from SW and NW. W side central peninsula and highest NE pinnacle have fallen. Great crevasses base of SW wall gaping. SW island split in two along N-S fissure. NW crag more sagged. Old Faithful and bubble fountains N center. Much smoke. W cone spouting lava from two-foot hole at its W base, lava cascade falls about three feet at first but W pond rapidly filled to level of hole and began to overflow all around, one long flow eastward . At 3 p.m. the artesian effect ceased and backflow from pond into hole set in, with gas explosions at intervals. During the cascade falling the lava of pond crusted, only a pool near the jet remaining liquid on the surface. Small eddies in this pool. Color of jet same appearance as lake fountains, bright red on cloudy afternoon. Gas puffs from jet, bursting bubbles, at orifice. Skins at orifice torn off.
NW cone hissing. Noises puff and plash. Rock fall heard NW crag. NE cone spurting, but top has collapsed. S floor smoky.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Wednesday Date May 2, 1917.

10 a.m. to 4 p.m.

Wind southerly and pit fumy.
Lakes rising. From 10 a.m. to 1 p.m. the lava rose and overflowed N, NW, SW and SE. Point SW opposite SW island is submerged making SW cove larger. Lava up to crevasse which splits SW island. N cone quietly hissing; high, with annular glowing summit orifice. SE flow mostly across site of former SE cove to sinkhole just E of SE cone, pouring down sinkhole with fountaining.
Sinking at 2 p.m. develops SE cove niche and leaves circular sinkhole. Strong gas pressure and border fountaining E end SE pool; W part covered most of time with heavy crust, from which streaming is eastward over eastern third of the pool. At noon the two lakes joined across isthmus by crusted lava without pronounced streaming either way. Once at noon very intense blowing off of gas from under crusts at E cove, followed by break-up and strong fountaining. Fountains at Old Faithful and a few grottoes main lake, streaming mostly southward.

On this day completed successfully immersion of long four-length 1½-inch pipe, 25.20 m. long, with Seger "cocoon" pyrometer inside; pyrometer removed without difficulty after exposure 8 minutes.
Pyrometer consisted of heavy black annealed steel wire with twenty batteries of Seger cones in black iron gauze cocoons, wired on the heavy wire with No. 26 soft iron wire, at intervals from bottom to correspond to different depths in lake. Each battery consisted of 29 Seger cone fragments from fusibility 590° C to fusibility 1290° C, in line in order of fusibilities. By counting number of fused and unfused cones after exposure, temperature is determined within 20° C, for each depth represented by a battery. The duration of immersion and withdrawal only a few seconds, and insufficient to affect the cones appreciably during motion.
The morning given to screwing pipes together, and the pyrometer was placed in the pipe with lowest battery against cap which sealed lower end of pipe. Each cocoon had two thicknesses of wire mesh (iron mosquito netting) over the fragments tapered at ends so as to go by joints of pipe in withdrawing.



The diameter of each cocoon less than one inch.

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 Day Wednesday Date May 2, 1917.

Order of Seger cones in each cocoon.	Spacing of cocoons on wire
(Bottom of cocoon)	(Bottom end of wire)
022 - 590° - 1	1 m.
021 - 620 - 2	2
020 - 650 - 3	4
019 - 680 - 4	6
018 - 710 - 5	8
017 - 740 - 6	8½
016 - 770 - 7	9
014 - 830 - 8	9½
013 - 860 - 9	10
012 - 890 - 10	10½
011 - 920 - 11	11
010 - 950 - 12	11½
09 - 970 - 13	12
08 - 990 - 14	12½
07 -1010 - 15	13
06 -1030 - 16	13½
05 -1050 - 17	14
04 -1070 - 18	14½
03 -1090 - 19	15
02 -1110 - 20	(Top end of wire)
01 -1130 - 21	
1 -1150 - 22	
2 -1170 - 23	
3 -1190 - 24	
4 -1210 - 25	
5 -1230 - 26	
6 -1250 - 27	
7 -1270 - 28	
8 -1290 - 29	
(Top of cocoon)	

At 2 p.m. all was ready and Demosthenes Lycurgus brought three men to help, in addition to Jaggar and Alex Lancaster -- six men in all.
Carried pipe to E cove. Crust heavy, but finally it broke up; lava about 4 feet below rampart. There was no such hot streaming here as during the earlier experiments at this point, and after immersion the heavy crust reformed. The pipe went in at 30° but averaged below lake 35° more or less. Current strong southeastward along shore during break-up at time of immersion, and fountain 15 feet to W of pipe, against bank. Pipe tended to drift to SE as it went down. Encountered stiff bottom lava at 20 m. of immersion, went down to 22.70 m., when there was only 2.50 m. of pipe above lake. Held this with a lashing of bale wire, five men holding the wire.

Massachusetts Institute of Technology
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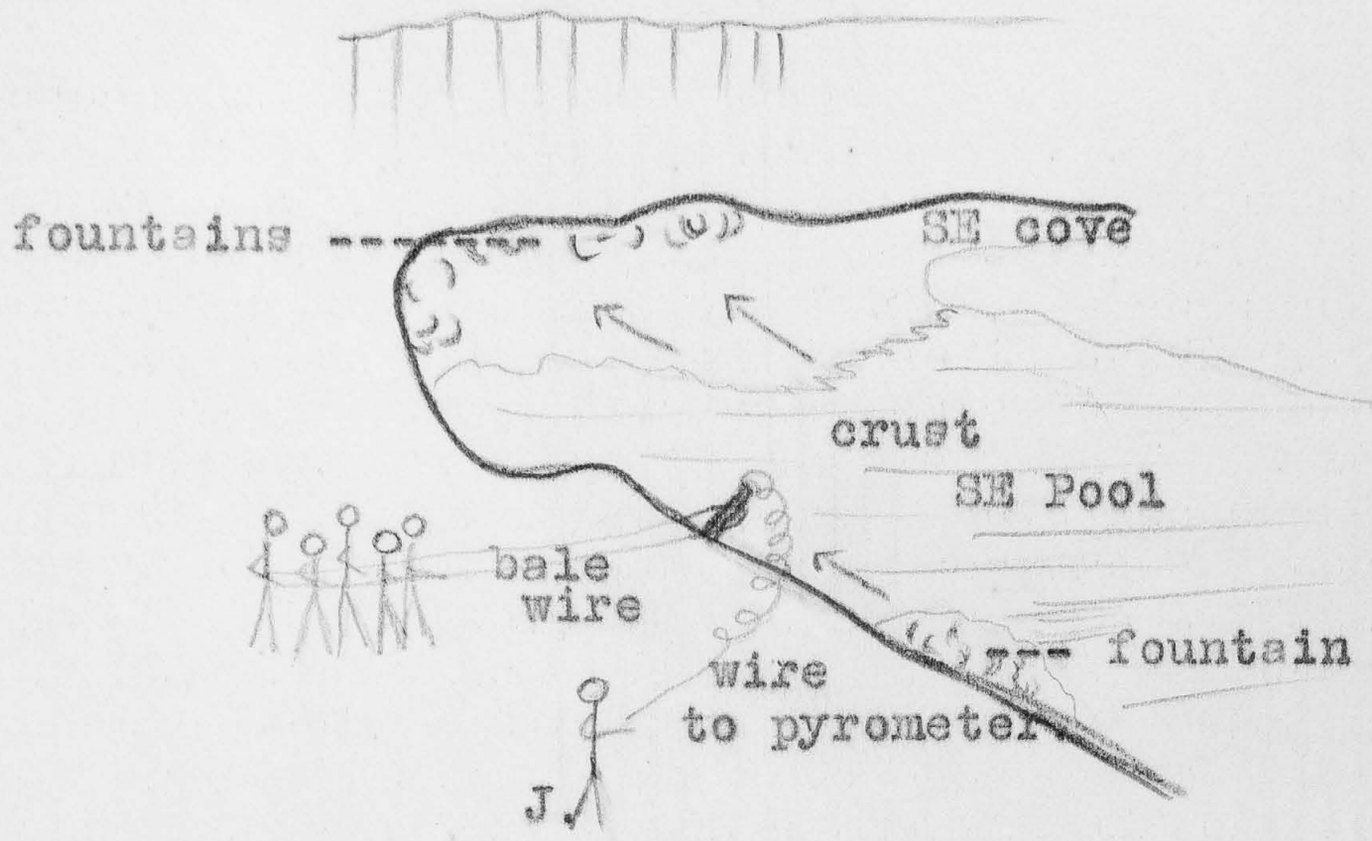
 Day Wednesday Date May 2, 1917.

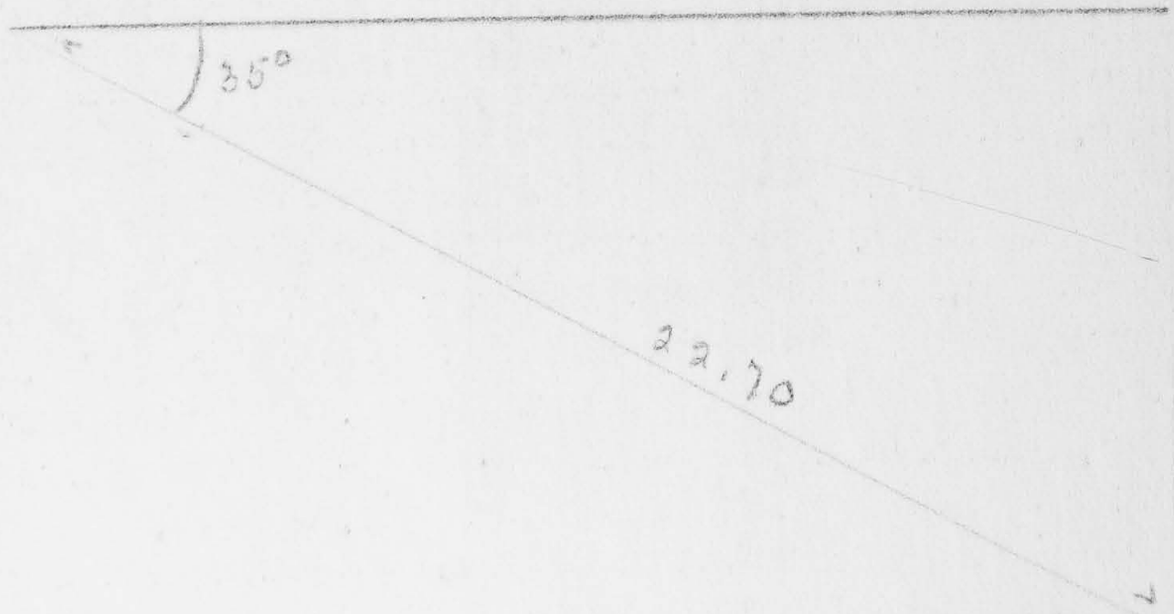


Learned that six lengths of pipe would have been better than four, and that quiet hot "bright lines" condition better than crusted condition.

Left the pyrometer heating 8 minutes, three to heat pipe and five for exposure of Seger cones.
The depth estimated, on basis of 35° angle of immersion, was 42 feet or 12.93 m., and temperatures were taken from depth 4.38 m. to depth 12.93 m., twenty readings as follows:

The wire - 2.50 m. from top of pipe to heated part (whitened).
Pipe - 25.20 m. long, hence
Wire immersed - 22.70 m.

This at 35° -



Nat. sin. - .57

Total depth 12.93 m. or 42±ft.

Depth of each cocoon.
4.38
4.66
4.95
5.23
5.54
5.80
6.09
6.37
6.66
6.94
7.23
7.51
7.80
8.08
8.37
9.51
10.65
11.79
12.36
12.93

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Hawaiian Volcano Observatory

 Day Wednesday Date May 2, 1917.

Depth. (meters)	Number of fragments. Melted.	Unmelted.	Temperature.	Remarks. Average.	Former Experiment.
4.38	6	23	740°		
4.66	5	24	710	725°	
4.95	5	24	710	740°	1040°
5.23	6	23	740		
5.54	6	23	740	740	
5.80	6	23	740		1070
6.09	7	22	770	770	
6.37	9	20	860	830	
6.66	9	20	860	860	
6.94	10	19	890	890	
7.23	11	18	920	920	920
7.51	12	17	950	950	
7.80	12	17	950		
8.08	10	19	890	890	920
8.37	11	18	920	920	
9.51	11	18	920		
10.65	12	17	950	930	
11.79	13	16	970	970	
12.36	12	17	950		
12.93	13	16	970	960	

Comparative Figures Showing Gradient

with 100°, 150° or 200° added as probable error:-

Meters.	Readings.	Added 100°	Added 150°	Added 200°	Former Measure on this basis:
4	700°	800°	850°	900°	1010°
5	720	820	870	920	1040
6	790	890	940	990	1070
7	890	990	1040	1090	1100
8	920	1020	1070	1120	1130
9	920	1020	1070	1120	1130
10	935	1035	1085	1135	1140
11	960	1060	1110	1160	1140 bottom
12	960	1060	1110	1160	
13 bottom	970	1070	1120	1170	

Average increase temperature per meter 31° C, checks with former.

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 Day Wednesday Date May 2, 1917.

The immersion was made at 2:30 p.m. Owing to the large size of pipe and air spaces around cocoons irregular, with circulation of air in pipe, there is irregularity in the result and general too low readings by probably 200°. The increase in temperature in depth is marked.

Next tried two experiments to see effects of oxygen and of air in lava. Took tank of compressed air at 100 lbs. pressure or higher and attached it to 60 feet of half-inch pipe. Turned on air blast and immersed 2 meters of pipe through hole in thick crust. Bubbles and flame emerging around pipe. Frost around pipe near tank from sudden expansion of compressed air.
Tried it again with 4 meters pipe submerged and let tank exhaust itself. After two to three minutes, the entire crust, which was heaving occasionally, rose about eight inches and lava welled out along border. Flames around pipe. Pulled pipe out and a whitish spotting developed on pipe exterior as it cooled. After five or six minutes a great break-up came with a very large central fountain in SE pool, but cannot attribute it to the air without proof by repeating the experiment, although this was an unusual fountain for this pool. There was all the time strong current at E end of pool eastward to fountains at E end. Probably the air bubbles were distributed and expended with others at the fountain grottoes.
Took a liter bottle full of oxygen and wired it to a stone thus:-  Left cork in bottle to burn out by itself. Threw bottle into bright lines between parting crusts.. Bottle sank and probably broke. Immediate puffs of yellow flame and dark brown smoke, up through lava, and this migrated along as in the case of a stick of wood reported before. The flame explosions reappeared after about one minute down the current and were repeated several times. Evidently combustible gas was found by the oxygen. The effect much like wood.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date May 3. 1917.
Friday " 4, "

May 3.
6 to 7 p.m. Lake 3 to 5 feet down. Sluggish fountaining; high curtained grottoes; occasionally very strong gas-pressure fountaining at Old Faithful locality with noise and excessive tumult of spraying, jets flung up 50 feet and out in all directions over an area 80 feet in diameter, slowly migrating to NE bank.
SE pool open and streaming to E and SE. Immense high curtained grotto E and high rampart grotto SE. Flaming cones E and W ends of S floor. Point in SW cove opposite SW island restored. Streaming in main lake southward and northeastward.
W cone bright filagree and flaming and blowing. Blowing glow spots S end NW pond. Fumes abundant, blowing northward. Cracking and foundering in SW cove. Noises puff and plash.

T.A.J

May 4.
3:00 p.m. Lake brimming. Strong pressure fountaining SW and SE sides SE pool and SW cove grottoes. Also probably NE. Blistered skins. Streaming SE. Rise in progress. Streaming S in main lake. Much spatter but no new overflows. SW island low. Big rampart SE and SW.

T.A.J.

5:10 p.m. SE station.
Lava dropped 5 feet in 10 minutes. Remained stationary until 7 p.m. when it began to rise again slowly.

7:30 p.m. Large slide from SE side crag-mass starting many fountains. A little later there was a fall from the SE bank, but the lake is very active.

Alex.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date May 4, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3 p.m.	SE	N	0					
	E	N	0					
	SE	Spatter SW side SE pool	56 0	16 11	-5	282	82	
	E	ditto	89 10	12 3	-5	396	85	

Depression lake 83 feet.

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date May 5, 1917.
Sunday " 6, "
Monday " 7, "

May 5.
2:25 p.m. E station.
Evidence of lake flowing over NE bank and running on old floor below. Lava now 5 feet down. Many fountains in N part of main lake.

2:50 p.m. S station.
Large grotto on SW side of crag-mass continully boiling.

3:05 p.m. SW station.
About fifteen fountains in N arm, some very large. Small W cone blowing very loudly. Pit full of fumes. There has been a flow from the main lake into the W pond, filling up the latter and nearly covering the small cone which has large slabs piled up against it.

May 6.
3:00 p.m. E station.
Lava down 3 feet. Very quiet SE pool. Lava rising.

4:00 p.m. SW station.
Many fountains in different parts of main lake but mostly in N. Old Faithful active. W cone blowing very loudly, as is the small NW cone; both at the same time. Fresh flows on SW floor going to the SE cone.

May 7.
2:55 p.m. SE station.
Lava only 3 feet down, rising slowly. Activity in E cove and SE cove.

4:05 p.m. S station.
Lava splashing over bank in SW cove and many fountains in center of main lake.

4:10 p.m. SW station.
In main lake there is great activity in S cove, in cove under middle island and in N cove, the lava splashing up over sides. W and NW cones quiet.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Tuesday Date May 8, 1917.
Wednesday " 9, 1917.

May 8.
2:10 p.m. E station.
Lava about 5 feet down all around and rising slowly.
Activity in SE cove throws lava over the side.

2:25 p.m. SE station.
E cove boiling and rumbling. There has been a large flow over S side of SE pool spreading out over floor.

3:30 p.m. W station.
W cone blowing loudly and occasionally sending out lava spray. NW cone blowing also.

May 9.
1:50 p.m. E station.
Lava down about 10 feet. Very active in SE pool. Small avalanche from N wall followed by activity in N pool.

2:20 p.m. SE station.
Isthmus between E island and middle island has sunk about 5 feet and closed the tunnel under it. It stood about 5 feet above the lakes.

2:50 p.m. NE station.
Fifteen to twenty fountains in N pool. Fumes not so thick today. W cone blowing loudly.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Thursday Date May 10, 1917.

9:30 a.m. Pouring across isthmus from main lake.

9:45 a.m. Overflowing SE corner. New crags standing out from edge Halemaumau above E gulch; plate or pinnacle.
S floor sinking. S peninsula rising. NE floor sinking. E island rising. N chasm sinking. NW crag now higher than floor of Perret's cave.

10:30 a.m. Overflows strong SE, E gulch, N chasm and NW chasm from NW arm. Spatter niche N side of NW arm. Spatter N rampart entrance to N chasm.
Depression 70 feet.
Old Faithful in action, occasional strong fountaining.
Spatter niches SE.
Alex says recent small overflows from SE pool have been "like aa". They are pahoehoe externally.
Short pooled overflows W side SW cove. SW island 5 feet high. Crescent rampart now S end SW cove and E end of SE pool. Both W and NW cones hissing steadily. NW cone building a spiracle. W and NW ponds crusted, both covered with broad flat flows which have come from overflow of W shore of lake.

11:00 a.m. W overflows of lake in motion. Overflow from NW arm a T, the cross being NW chasm and a chasm toward NW pond.
Rapid pouring now across isthmus.
From 11 to 11:30 a.m. the overflow SE moved rapidly in a broad sheet westward across S floor and at same time the flood from W side SW cove turned southward and swept eastward across S floor, meetimg the other at 11:30 when the two great flows pooled across the S floor. This added an immense weight to the bench magma crust and doubtless heaved up the S island mass. S island mass and E island mass both show strong eastward tilt in their several escarpments.
Strong overflow filling in E gulch. Puffing fountains building ramparts at entrance to the several overflows.
Strong longshore fountaining at W cove. Streaming from N central region to SW, SE, E, NE, N and NW. No overflow at E cove but whole base of SE bench flooded, making that bench much lower. No overflow also from E side SW cove. SE cone surrounded and much flow among rocks in S embayment under S station. Odor of carbon gases. Little disagreeable SO_2, circuit pit to leeward S.
This day one of big overflows, noon rise.

11:45 a.m. Strong fountaining all around SW cove looks like beginning of subsidence. Slight subsidence rims E. N end of lake crusted.

Afternoon. Subsides 5 feet.
The NW tabular block of Jan. bench is becoming a conspicuour rising crag isolated by chasms all around and counterpoised apparently by weight of flows subsiding in N chasm, as well as by subsiding NE bench.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

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 Day Thursday Date May 10, 1917.

3:25 p.m. SE station.
There was a large slide from the NE side of the E island.
Lava down in both pool about 5 feet. Many large fountains
in the N pool.

Alex.

KILAUEA DAY SHEET

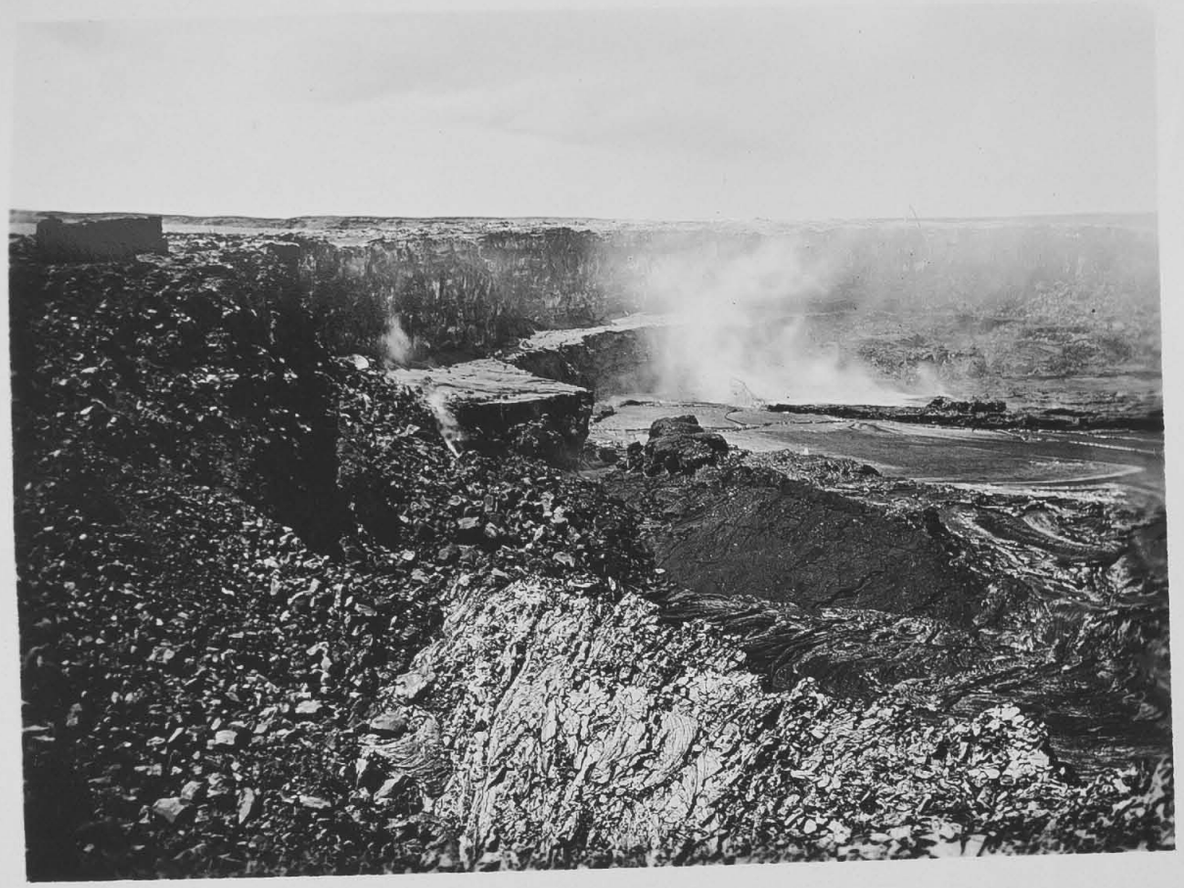
Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date May 10, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
10:30a	NE	E gulch	1	W M	8x	f/11.3	½	P	
	"	E island	2	"	"	"	"	"	
	"	Crag mass	3	"	"	"	"	"	
	"	N chasm	4	"	"	"	"	"	
	W of N	Flow moving in NW chasm (NW crag)	5	"	"	"	"	"	
	NW	NW arm overflowing	6	"	"	"	"	"	

T.A.J.



1



2



3



4

Jag

221

1917, Maj 10

1917, May 10



6



5

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date May 11, 1917.

9:30 to 11 a.m.

Lakes down about 5 feet. Isthmus about 2 feet high. Yesterday's marks higher W end of SE pool than E end, (central crags rising). Large SE half-dome grotto curtained completely and blowing within; with each puff the skin on pool outside curtain is depressed a few inches. Another grotto at extreme SE end SE pool. Bank under E island 7 feet high; at SE 3 feet high. Occasional central fountain SE pool. SW island high.
Middle knob crag-mass appears higher than old summit and N knob of S island mass highest point.
Slides from E side NE peak. Much blowing. Lake rising during morning. Smoke somewhat thinner.
NW arm again outlined. N end main lake crusted. Conspicuous lines of bubble fountaining wherever crust slabs founder in the breaking up of SE pool.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date May 11, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30 to	SE	N	0					
11 a.m.	E	N	0					
	SE	E island	21 3	3 21	+4	407	23	
	E	ditto	52 42					
	SE	Yesterday's level, pt. of central peninsula.	46 0	9 57	+4	384	67	
	E	ditto	74 7	9 9	+3	431	69	
	SE	Today's level ditto	46 12	11 56	+2	381	80	
	E	ditto	74 32	10 40	0	428	81	
	SE	Old summit crag-mass	43 10	1 38	0	893	23	
	E	ditto	49 47					
	SE	Central penin. summit	52 20	4 50	0	496	42	
	E	ditto	71 14					
	SE	SW summit S island mass.	68 34	4 48	0	527	44	
	E	ditto	82 14					
	SE	New summit ditto	63 36	4 38	0	512	41	
	E	ditto	79 6					
	SE	Old E crag	0 39	14 50	+5	197	52	
	E	ditto	92 0					
	SE	Surface SE bench next E gulch.	9 7	28 35	0	102	56	
	E	ditto	116 21					
	SE	Summit SW island	59 27	4 59	-4	700	61	
	E	ditto	69 16					
	SE	Summit old S island	63 55	16 28	-4	239	71	
	E	ditto	97 50ca					
	SE	Summit SW crag	84 36	3 54	-5	671	46	
	E	ditto	90 7					
	SE	White mark E end NW crag.	12 40	3 17	0	936	51	
	E	ditto	16 11					
	SE	Middle summit crag-mass.	40 23	1 24	-4	836	20	
	E	ditto	48 20					
	SE	NE summit crag-mass	35 52	1 43	-4	851	24	
	E	ditto	43 29					

	no	pl	scr	stop	ex	cam
Depression 80 feet -- 10 feet below bench of previous day.						
E island above lake			57 feet.			
New E summit of crag-mass	above	lake	60 "			
Summit S island mass	"	"	39 "			
SE bench	"	"	24 "			
SW island	"	"	19 "			

T.A.J.

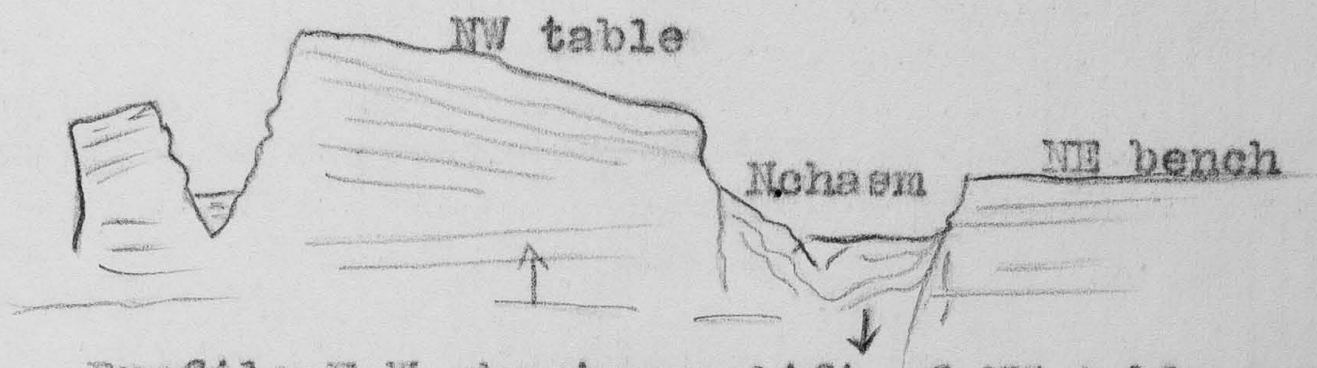
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date May 12, 1917.

10 a.m. to 12:30 p.m.

Great fresh glowing flows at 10 a.m. which had ceased flowing only recently. SE pool now 3 feet down and main lake less. Sinking 10 to 11 a,m., rising thereafter. Flows over whole S floor from E and W and great flow over NE floor nearly to N station. Caught and buried iron pipes there. Great fresh flows over site of NW and W ponds, joining through from NW to W coves. NW cone nearly buried. SE cone buried and old S island entirely buried. Central crags rising and NW table rising strongly, while N chasm sinks. Fresh flow of probably night before in N chasm.



Profile E-W showing uplift of NW table and subsidence of N chasm, latter causing a downcurving ridge or elephant's back in the recent flows on its margin.
At entrance to N chasm on edge lake, and at SE margin SE pool, two spatter cones 12 feet high with narrow openings on lake side, tending to close in and become domes. Much fountaining SW.
11 to 12:30 lake rises, main lake much faster than SE pool, so as to overflow NW cove and SW bank; W pond cone gushing like artesian well and W pond overflowing eastward. Cracking and foundering at 10 a.m. in NE flow, makes bubble fountains and lowers surface.
SE pool crusted W end, streaming eastward E end. Main lake streaming southward amid heavy crusts; Old Faithful in action but small. SW island high.
At noon main lake joined to SE pool across isthmus.
Went down to NE bench by N end of 1894 bench and from there down into N chasm, now easily accessible through flow-fillings and subsidence of NE bench. Walked to edge of lake near high cone at entrance of N chasm. Heavy crusts flush with bank. Crossed fresh flow of N chasm to reach the spatter cone which is on W side of flows that have poured from lake into N chasm.

Note:- N chasm about where similar N smoke-hole was in August 1916.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date May 13, 1917.
Monday " 14, "

May 13.
10:45 a.m. E station.
Lava level with banks all around and very active in E grotto and NE grotto. Fumes thin. There has been a new flow from the main lake on the N side of the E island running around the high crag; fresh lava on most of the floor of Halemaumau. Large dome 15 or 20 feet high on center of bank of N arm.

12:10 p.m. S station.
SW grotto very active boiling and rumbling and throwing up lava high into air. Lava down about 3 feet in both pools.

12:15 p.m. SW station.
Many fountains in main lake; very active in grotto NW side of middle island. The little cone in W pond blowing loudly. The two NW cones are gone, covered over by flows from lake.

5:30 p.m. Overflowing on all sides. Largest flow on NE; goes up to base of 1894 bench. Lasts for two hours then lava sinks about 3 feet.

May 14.
9:35 a.m. SE station.
Lava about 5 feet below banks. Very active in SE cove and E grotto. A few fountains in small pool.

10:00 a.m. From N bank of main lake.
Ten or fifteen fountains in SW grotto and in tunnel under middle island. The large N dome is nearly covered by the flows of last evening, but is active, throwing out lava spray occasionally and making some noise. Fumes thin.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date May 15, 1917.

2:00 p.m. Assisted by Mr. Horace Johnson, chemical engineer.

Lake 15 feet down. Much overhang. Heavy crusts on SE pool which break up every 30 to 40 minutes. Curtain grotto under bank SE with fountaining within and under SE station. Three tunnels at lake level under spatter heaps above, appear to lead to a honeycombing in the direction of SE sinkhole. Dance incessant of cooling strain splinters on crusts. The splinters drift in the wind in ripple pattern on surface lake and sometimes are picked up by overriding melt on crusts foundering so as to give the melt a coating like coal dust.
Main lake fountaining and streaming southward. Immense fresh flows of May 13 everywhere; E gulch connected through to NE floor and by broad shelf around to S floor; and NE floor flush with NE border lake of May 13.

Experiments with air and oxygen:-

Connected 40 feet of half-inch pipe to compressed air tank. Terminal of pipe capped and drilled with one-eighth-inch holes for one foot of langth. Turned on air and immersed during break-up spells. Hard to see place of immersion because of high bank and current under it. On one occasion with shallow immersion saw bubbles. On other occasions no effect seen when thin or thick crust was over lake. On withdrawing pipe in one of the tests where an oxygen bottle was attached, when the lava accumulation was broken away, yellow flames played for several seconds from the holes in the pipe as the wind blew into the other end, forcing a gas which the pipe contained out at the lava end. Later some experiments were tried with this gas. The pipe was immersed, and withdrawn with the upper end closed: the lava was broken off the end: then on blowing through the pipe a gush of yellow flame appeared. Next the pipe was left under 5 minutes; no pressure or odor appeared at the far end; on withdrawing and breaking away the lava and blowing through pipe flames played at the orifice for 30 seconds or more.
Put one-litre bottle of oxygen on end of pipe with cork, string and paper over orifice. On plunging in hole in lava no effect; bottle broken. Threw bottle tied to stone in lava, flame gust appeared. Threw amother bottle free in lava, white flames in groups punctured the skin for many seconds. Threw another in, bottle exploded on surface and cork burned on surface for some minutes. Query -- were the other flames the corks? Threw last bottle in, explosion and slight flame. Threw a box full of straw, about a foot and a half square, in lava; bright flame some minutes, then explosions as box sank (loaded with stones), then violent fountaining with flames at intervals. Does the fountaining depend on puncturing a

surface layer to a certain depth?
Tried air pipe at a blowing flame on NE bench near lake (site of recent NE cone). Crack three inches across, three feet long, bright glow and puffing. To see if combustion was satisfied with air, put pipe end in crack and blew air; no effect whatever seen; combustion appeared complete without additional air. Put terminal in quiet dark cherry-red crack close at hand; air blowing cooled the crack and reduced the incandescence.

Important to collect the gas which burns, and to explore the upper gradient and the fountaining zone. What level does the fountaining gas accumulate at in largest bubbles?

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date May 16, 1917.

11:30 a.m. Lake lower, 20 feet down. SE pool thin crusts. Streaming from central cavern in curve E and SE. Splashing in SE and E grottoes. Overhang all around. Hot.
Main lake several central fountains. Streaming from NW. Overhang grottoes all around. Streaming into two caverns at isthmus eastward. SW island 20 feet high. High rampart heaps N and S.
Collapse in all the extensive recent flows. E island mass rising and NE floor sinking. NW crag rising and N chasm sinking. Crag-mass rising and NW pond region sinking. S island mass rising and S floor sinking.
The SW crags, SE bench, old E crag and NE peak are being encroached upon and buried by the new flows.
NW crag now quite surrounded by new flows. Lakes are constricting and floors all widening. NW and W ponds and NW bench a wide floor. NW and W cones both glowing and flaming; NW 12 feet high open S side and W 20 feet high open orifice one foot across, stalactites within, on summit.
Driblet flows in SW wall valley from E, W, and middle crevasse. SW crags appear low. Cone crater over SE grotto. Fumes thin. SO_2 to leeward very strong.
Crag-mass seen from SE now well above floor of W niche. NW crag above Perret's cave.
Occasional central fountain. SE pool migrates E.

12:30 p.m. Lava had risen 4 feet.

T.A.J.

230

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Wednesday Date May 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10a.m.	SE	E island	1	W P	8x	f/14	1/2	5x7
	"	1894 bench	2	"	"	"	"	"
	NE	SE pool	3	"	"	"	"	"
	"	Crag-mass	4	"	"	"	"	"
	E of N	Main lake	5	"	"	"	"	"
	N	NW crag	6	"	"	"	"	"
	E of NW	NE floor	7	"	"	"	"	"
	W " "	NW crag	8	"	"	"	"	"

Tessar lens.

T.A.J.

1917, May 16



2



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Jag



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Jag

1917, May 16.



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Jag

234



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6

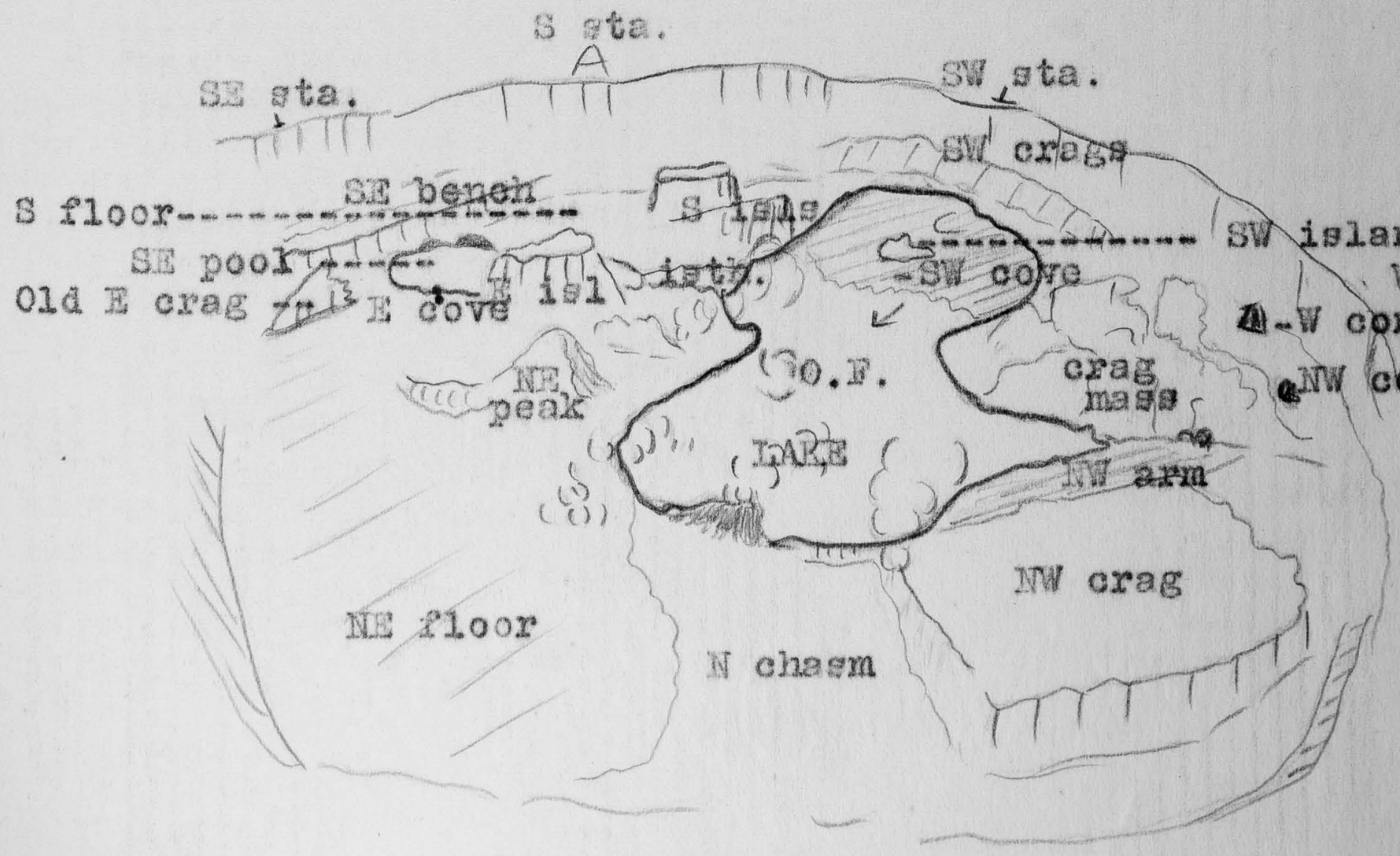
Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date May 17, 1917.

10:00 a.m. Lakes 10 feet down. Rising fast. SE pool mostly thin crusts. Fountaining on three sides. Streaming mostly eastward.
In main lake SW cove crusted. Streaming northward. Bombardment shore NNW and NNE. W cone has a cap N side.

10:30 a.m. Strong rising. SW cove cracking and foundering. The SW point has cracked away and down from the SW bench in a triangular mass 50 feet on a side and is separated from bench by crevasse about 10 feet wide.
Occasional blobs from W cone. Border fountains puffing. Old Faithful the only locality of central fountaining. NW cone hissing continuously. W cone lava pasty and nearly to level of orifice which is smaller than yesterday.

Noon. NW cone puffing with rapid rhythm like a locomotive. High grotto dome SW side NW arm and a depressed area smoking between it and NW pond. Immense grotto dome NE and blue smoke from its summit. Streaming outward from NW arm.
SW point mostly submerged. Much crusting. Bombardment SE. Slight rim of elevation in flows of N chasm on NW crag side. Heavy smoke from NE bench and from SE corner of NW table. Also from lower portions of E island mass. O. F. irregular, 40 to 80 seconds, a bubbling spot in a heavy crust. Occasional strong dome explosions.

Lake from N at noon:-



JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date May 17, 1917.

12:30 p.m. SE corner within one foot of bank.

1:00 p.m. Lake brimming. Little change of level indicated in S island mass, but E island shore higher by two feet than SE end. Fountains dribbling over E cove and SE.

1:15 p.m. SE pool dribbling overflows E and SE, and flow starting across isthmus from main lake.

Query:- Would it not be possible to <u>bore</u> into bench magma?

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date May 17, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
10a.m.	S	SW crags	1	W P	8x	f/14	1/2	5x7	
	SSW	Cracked off pt.SW cove	2	"	"	f/11	"	"	
	WSW	Down to W cone	3	"	"	"	"	"	
	W niche	NW cone	4	"	"	"	"	"	
		E cove fountain 20 ft. away	5	"		f/6.3	1/100	"	
		ditto	6	"		"	"	"	
		Tessar lens.							
									T.A.J.

1917, May



2

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Jaj

1917, May 17



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6

Jag

240

1917, May 17



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Jag

1917 May 17.



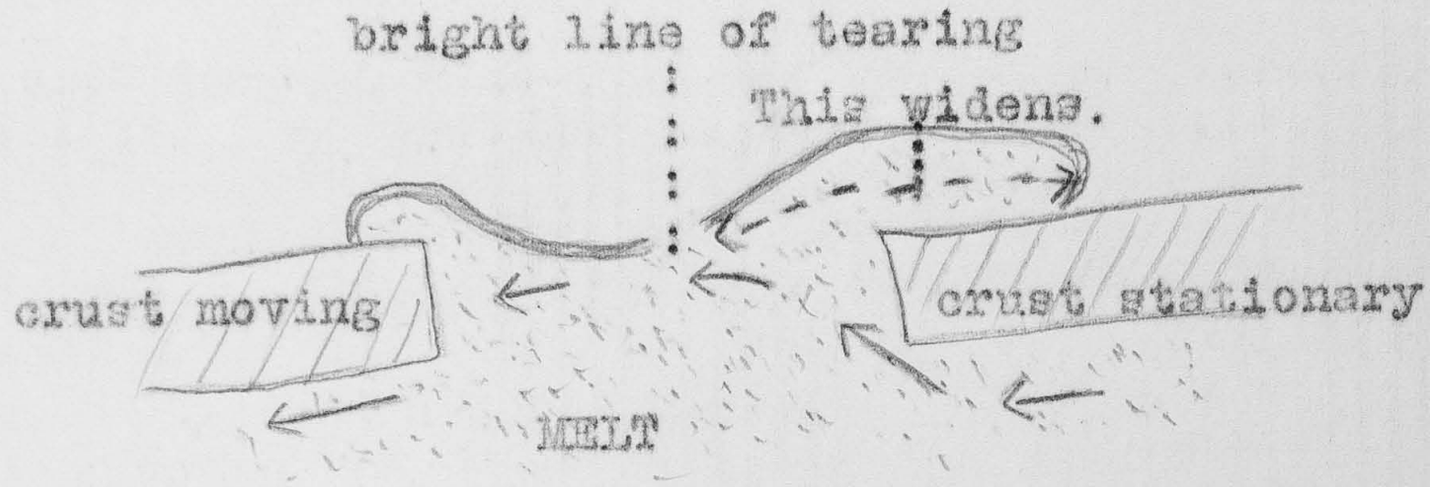
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date May 18, 1917.

9:15 a.m. Lake 15 feet down and rising. Yesterday's highest only driblet flows, mostly E gulch.
Falls of rock inner cliff SE pool. Crusted, crack and founder from rock fall. Streaming to SE. Border fountains irregular SE. SE domes curtained completely. Large dome SW cove. Isthmus high. Puffing grotto N. Fume abundant around main lake. Occasional cracking E and NE floors.

Note:- Bright lines are always between two thin skins. When they form on edge of a heavy crust, the lava first wells over the edge of the crust, and it is the skin of this overwelled ridgelet that tears to make the bright line, thus:-



When thin skins make the bright lines it is always the new skin in the lava which wells up between the pullings apart which forms bright lines. If two skins pull apart, both zones of new skin widen. If one pulls away from the other, the latter remaining attached, the zone of new skin attached to the latter widens, the other zone becomes a broad striated sheet.

Large cracked dome smoking hotly over SE corner SE pool. Blowing and surging incandescent pct 100 feet farther W in S floor (near site former SE cone). Small orifice two feet across in shells of recent flat flow.
SW point restored by subsidence; it was completely submerged yesterday. Bombardment S face SW island.
S island-mass crags are being encroached on rapidly by flows of S floor. S floor as seen from W of S station is very wide. The N-S line across pit now has only the dwindled SE pool E of it, all the rest is floor and there is much floor SW of it. Bench magma growing in area at expense of lake magma.
W cone hole smaller. Puffing NW cone broken and glowing and fresh driblet flows from it over site of NW pond.
Short streaming area from SW island southward, otherwise S half main lake crusted. Travelling fountain violent from O.F. locality to isthmus. Three grotto tunnels on lake side of isthmus. Fresh festooned overflow at NW arm. No blowing heard NW cone.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date May 18, 1917.

Distinct pressure ridge, up-arched, broken along crest, extending straight from NW arm toward W niche. This in flows of May 13. Pressure from crag-mass and from NW old bench meeting. Tunnel below?
Fresh tumble N base of NW crag. The isthmus area now very wide on lake side.
Dome at W chasm increased in size on its W side; fresh driblet flows. Pounding grotto beneath.
N end main lake crusted and streaming confined to a semi-circular patch near O.F. where streaming is from SW and N against E bank of main lake about N limit of isthmus. Distinct travelling fountains. Fresh driblet overflows NE shore.

1:45 p.m. A very unusual wind from the NW out of a thunder squall on Mauna Loa blew the pit fume across the SE part of Kilauea crater and nucleated there great quantities of moist warm air rising from the cracks making the whole SE region look as though new steam cracks had broken out.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date May 18, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:15 a	SE	N	0					
	E	N	0					
	SE	Pt. central peninsula lake level.	47 33	10 51	4	369	70	
	E	ditto	76 32					
	SE	Ditto yesterday's bench level of overflow. (Bench of May 13)	47 33	8 48	4	373	57	
	E	ditto	76 10					
	SE	Middle summit crag-mass	40 30	1 1	2	847	13	
	E	ditto	48 13					
	SE	Summit E island	20 42	2 12	2	405	16	
	E	ditto	52 19					
	SE	Summit old E crag	0 0	12 56	4			
	E	ditto	91 47					

Depression 70 feet.

			no	pl	scr	stop	ex	cam	
		Upright laminae E isl.	1		3x	f/6.3	1/40	5x7	

No tripod.

T.A.J.

1917, May 18.



1

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date May 19, 1917.
Sunday " 20, "
Monday " 21, "

May 19.
1:00 p.m. E station.
Lava level with bank on NE side. At 1:20 p.m. fell two feet. Active SE cove but few fountains outside of it.

1:30 p.m. E station.
Large flow from the SW side still moving. Then lava sank.

3:30 p.m. NE station.
Lava began to flow over NE bank; went 200 feet and stopped. Very wide.

4:30 p.m. Lava began to flow over bank under the E station again, though five minutes before it was two feet down. Streaming from W in main lake. Both pools active. Small island only two feet above the lava.

Alex.

May 20.
11:30 a.m. E station.
NE floor covered with fresh lava. N lake almost overflowing. Both pools brimming with small pool overflowing S bank. S floor half covered with fresh flows from SE pool and the S cone which is throwing out lava very fast. Fumes thin in all parts of pit.

12:20 p.m. S station.
Lava down 5 feet below banks all around. SW cove very active, sometimes throwing lava over banks.

2:25 p.m. Part of bench on N side of E island fell and a few minutes later some of the N dome broke off.

7:35 p.m. Lava level with bench. Ten minutes later it was overflowing NE and running into the N pit.

May 21.
2:05 p.m. E station.
Lava five feet down in both pools. Fountains in N cove and middle of main lake. Fumes not so thick. SE pond quiet, only activity is in SE cove. Lava appears to be rising.

2:25 p.m. SE station.
E and NE coves very active.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Tuesday Date May 22, 1917.

10:20 a.m. SE station.
Lava 10 feet down. Activity in SE and NE grottoes, occasionally throwing lava over banks.

11:30 a.m. NE station.
Two large falls of rock on S side of small pool, starting some fountains and breaking up the crust so that streaming toward E grotto began.

12:10 p.m. From N bank of main lake saw fall of rock from NW bench go into NW arm causing mant fountains. Lava sank 3 feet.

Alex.

2:30 p.m. During afternoon lake stagnant. Lakes 5 to 8 feet down. SE pool crusted; fountaining E bank. Fresh festooned flows NE and E. Floods SE and S nearly level with older SE bench. S driblet cone middle S floor at its E end. Crag-mass now plainly visible from Volcano House. Fountains W shore, N and NW. N dome and NE rampart sulphur stained. E island mass still more upraised on side of main lake. SE rampart cone higher and hissing from glowing cracks on its SW side. S cone glowing at its W base. NW cone a tumble; glowing. W cone low, glowing gash in middle. Double cone, with valley separating the two halves, on NE bank, same size and shape as the double cone here in January. N dome overhangs to W and has continuous flaming fountain inside.
Fresh smooth flows over NW and W ponds, crack-and-founder pattern, the NW one from NW arm. New floods SW wall valley. Much Pele's hair S floor. O.F. active. There is now a cove in main lake at isthmus and another NE. Tendency to building points along E side. Curtains common.

T.A.J.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

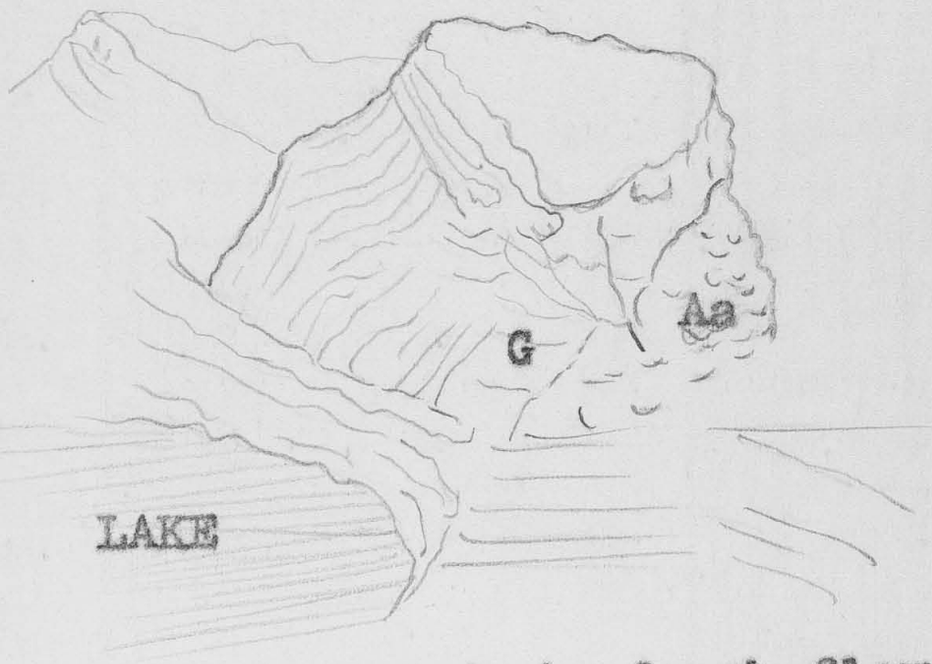
 Day Wednesday Date May 23, 1917.

8:40 a.m. SE station.
Half of the dome grotto SE broke off and fell into lake, starting a large fountain. Crust broke up followed by rapid eastward streaming. SE pool about 10 feet below bench.

Alex.

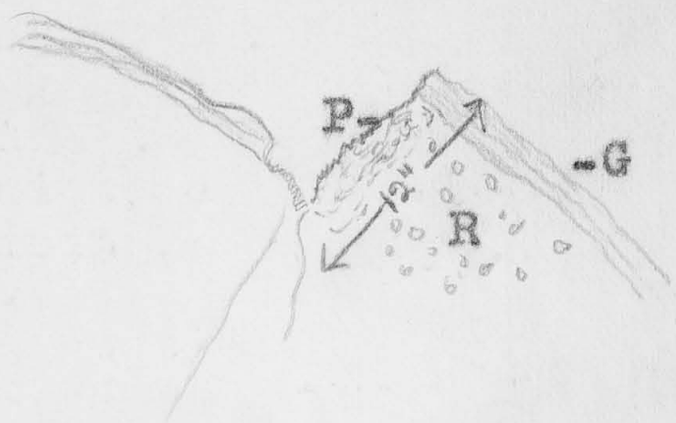
10:30 a.m. to 1 p.m.
During the morning the lake rose from a level 15 feet below the banks to within 2 or 3 feet of top, with SE corner brimming but not overflowing. Fountains in the grottoes and Old Faithful; occasional central fountain in SE pool. Rampart at E cove is highest bank of SE pool.
Streaming from NW, much quiet crust.
N dome curtained across, blowing fountain beside it.
Much breathing of gas from under crusts and some balloons.

E island from SE:-



G -- gradual transition from thin bedded red pahoehoe above to gray thick bedded and structureless aa below.

Note break in fresh flow, 12-inch section, next rampart E cove as follows:-



P -- pearly gray miniature aa. This gray scale goes in about one inch.

G -- glistening glass blebs drawn out -- the blister skin.

R -- red vesicular rock inside.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Wednesday Date May 23, 1917.

Note that festoon flows are brittle and thin crusted. Flows which have cracked and foundered are massive and thick crusted. Query: Is all pahoehoe flow in a sense the collapse and wrinkling of skin over bubble-blowing foam?

T.A.J.

250

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Wednesday Date May 23, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10:30a		Bright lines in day-light, E cove.	1			f/6.3	1/100	5x7
		Downfolding & upwell'g	2			"	"	"
		Nearer bright lines	3			"	"	"
		Crag-mass from E shore main lake.	4			"	"	"
		N grotto from NW table	5			"	"	"
		NE double cone	6			"	"	"
		SE fountains looking S	7			"	"	"
		Hand exposure.						T.A.J.

1917, May 23





2

Jaj

1917, May 23



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Zag

1917, May 23.

253





1917, May 23.



9

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date May 24, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
11:30a	E of SE.	Channel isthmus	1	W P	3x	f/6.3	1/40	5x7	
	NE	N smoke	2	"	"	"	"	"	
		Hand exposure.							T.A.J.

1917, May 24.



1



2

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date May 24, 1917.
Friday " 25, "

May 24.
11:30 a.m. Lake down 20 feet. S side isthmus collapsed -- open channel. Fresh broad festooned overflow SE on S floor. SE, W and NW cones and SW border heap all glowing. W and NW cones puffing slightly. Fresh driblet flow N chasm and dome lower. High bench and overhang main lake and SW island. Main lake crusted, inrush and bombardment NW tunnel, and at SW shore leading to tunnels under S floor; and rapids through narrows to SE pool. More smoke. Apparently begins the June subsidence? Some very small rock falls heard; there has been much caving from inner cliff.

12:15 p.m. Rising strongly -- only 10 feet bank SE.

May 25.
9:00 a.m. Overflowing. To noon subsided 5 feet. Lakes joined at first clear across isthmus. Scone drowned. Floods S floor and E, NW floor and W. After sinking, N side of isthmus revealed as a subsided large flat islet. SW islet still in place. S talus mostly covered. Tremendous bombardment against NW table. NW table lifted fifteen feet since yesterday; breaks in it and at its base W and E; upcurved bench of fresh flow crusts 15 feet high W side of N chasm at base of this colossal table. Floods to January level SE and at Perret's cave. Tilt to inner bench northwestward from central promontory of crag-mass to NW cove, and from isthmus to SE cove. Rumble and roar of NW bombardment. NE floor very low but no overflows NE or N. This edge rising?
Floods E, S and NW first festooned, then pooled, crack and founder, and subside. Floods crescent-shaped NW and SE. NW cone blowing.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date May 25, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30 a	SE	N	0					
	E	N	0					
	SE	E side central peninsula (lake culmination)	47 8	6 38	-14	384	46	
	E	ditto	74 48					
	SE	Overflow channel SE corner.	70 29	15 23	-16	172	104	
	E	ditto	108 0					
	SE	Summit S island	64 10	2 26	-15	527	24	
	E	ditto	79 9					
	SE	Summit SW crag remnant	85 50	3 16	-15	645	40	
	E	ditto	91 46					
	SE	Summit central penin.	52 59	2 9	-16	504	20	
	E	ditto	71 40					
	SE	Summit crag-mass (level exactly)	40 32	-19	-19	858	13	
	E	ditto	48 5					
	SE	Summit E island	19 52	0 8	-19	411	5	
	E	ditto	51 25					
	SE	Summit NE pinnacle	9 25	1 35	-16	587	18	
	E	ditto	24 17					
	SE	Summit old crag E	-1 22	9 41	-16	203	70½	
	E	ditto	91 51					
	E	E end surface NW table	15 34	2 21	-12			
	N	NW	0					
	N	E end " " "	30 26					
	E	W " " " "	28 31	1 42	-12			
	N	ditto	28 34	2 8	-15			

Depression 46 feet.

		no	pl	scr	stop	ex	cam
SE	S floor	1		3x	f/6.3	1/40	5x7
"	E island	2		8x	f/11	1/8	"
ENE	NW table	3		"	"	"	"

T.A.J.

1917, May 20.



1



2

Jag

1917, May 25.

260



JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date May 26, 1917.

9 to 11:30 a.m.

Lake high. One foot down SE corner, 7 feet in inner cliff at E island. Fresh overflows glowing SE and NW. Violent fountaining along SE bank, E side SW cove, E coves of main lake, and at N grotto which is curtained. W cone puffing and NW cone steadily hissing. SW border cone glowing and hissing. S cone rebuilt and glowing. Streaming through broad channel from main lake to SE pool and awat from W and NW coves. Crags continue to rise and floors to sink. Lake appears stationary. Much quiet crust. The fresh flows are festooned with slumped crusts, whereas yesterday's flows show crack-and -founder pattern and large blisters. Smoke thin from a distance but patches densely fuming, especially from the central and northern crags.
NW table dropping rocks on slopes
Bank around base NW table now 20 feet high, and new wall crevasses NW and NE. Collapsing crusts. Much sinking floor at base of E trail. W side of old summit crag of crag-mass has fallen.
Heavy overflows in evening.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date May 26, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	lens	scr	stop	ex	cam
9 to 11:30 a.m.		Fountains & SE grotto dome.	1	single Dagor	Goerz	f/7	1/100	Goerz
		ditto	2	"	"	"	"	"
		ditto	3	"	"	"	"	"
		ditto	4	"	"	"	"	"
		Same and crust balloon	5	"	"	"	"	"
	S	SE pool	6	"	"	"	"	"
	SW	Crag-mass	7	"	"	"	"	"
	W niche	.NW arm	8	"	"	"	"	"

T.A.J.



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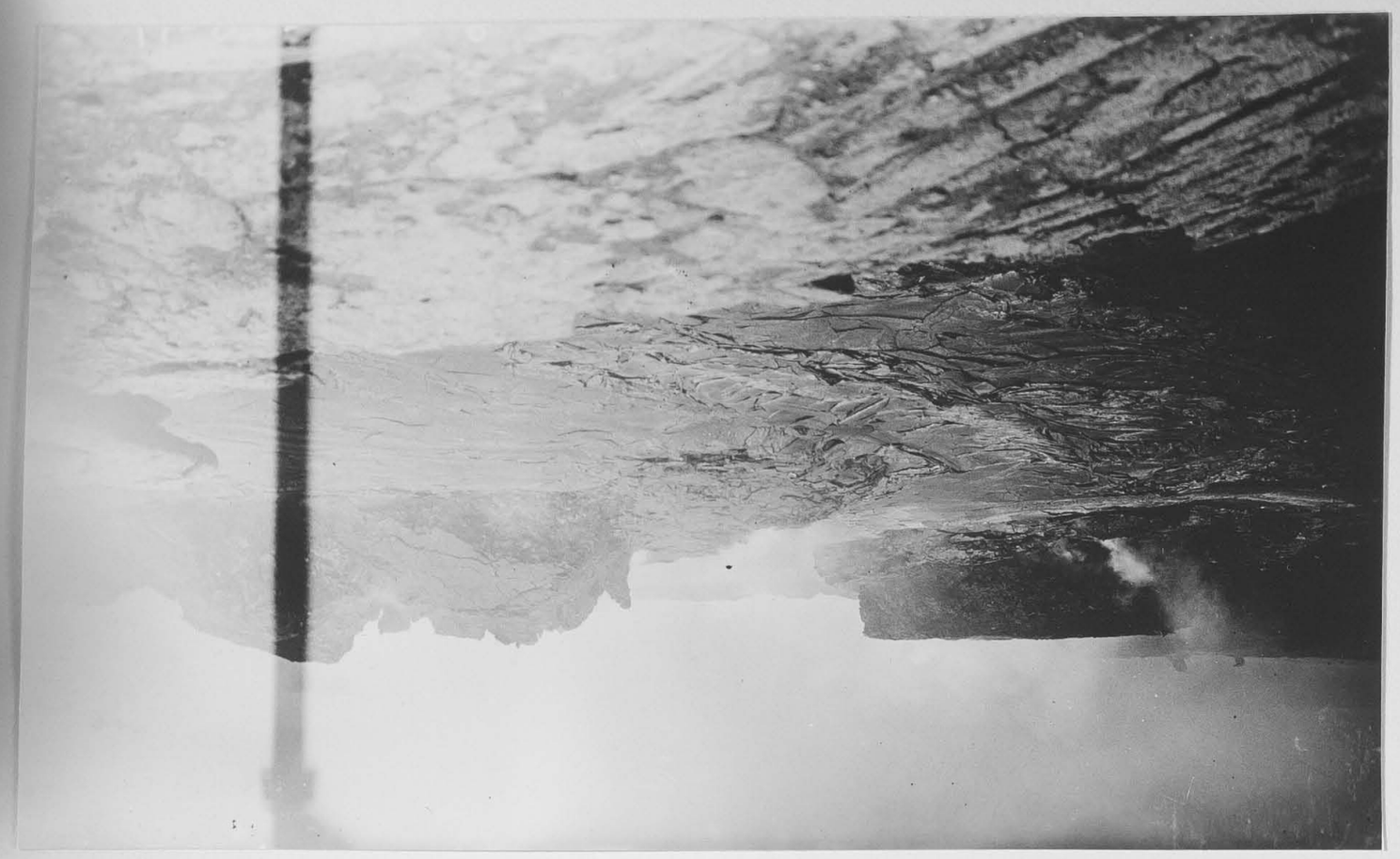
4

Jag

263

1917, May 26

1917, May 26:









JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Sunday Date May 27, 1917.

2 to 5 p.m. Morning and noon overflows from W and NW ponds largely in great horse-shoe following floors to N chasm, and around to E station. NE floor remains low and as yet uncovered, making floor extraordinarily unbalanced. During afternoon lake subsides 10 feet and recovers in evening. During the culmination of morning flows Perret's cavern drowned. NW cone drowned. W cone maintains itself as a dome with upwelling fountain beside it in the midst of a sea od melt. SW crags nearly drowned. High rampart with splashing E side SW cove. S cone drowned. Immense cone 15 feet high with spurting above edge of pit at SE cove.
Violent bombardment N table and central peninsula, much of lake quiet skin. Floor NE sloping northeastward more strongly than ever as though the bench magma pushing beneath in that direction from the overweighted region S and W. When subsidence began, glow lines all around lake and flows, which are against Halemaumau wall all the way from E station to S, to SW, to W, all over floor of W niche, to NW. Then cracking and foundering all over flows. Then NW and S cones reasserted themselves and S cone built three feet high with splashing and some violent spraying. SW crags reappeared as low piles of crust in midst of new flows. Persistent features are SE and SW border cones and a fountain over central cavern. Old Faithful still in action.

8:30 to 11:30 p.m. Lake again high, overflows from W, tremendous spurting SE cone and SW rampart, fountaining over central cavern, and main lake dark crust.
Rising continues; short driblet overflow at E cove but throughout evening NE depression remains unfilled 30 feet below lake level and all the way from E to NW stations. Driblet flows at NW chasm and under E station but no large flows there. Great flow S from SE pool curving around to E and filling E and S floor. Two others from SW cove, and others from W cone region. Overfloods also NW and W niche. Morning performance repeated. Steady wide blue flame S cone; later drowned. Quantities of flames from under crusts around lake margin. Much piling up and scraping of slabs. Short rapid overflows at E cove quickly cooled. SE cone becomes quiet but two fountains build half-ring ramparts over central cavern (W side of SE pool). Leaping fountains SW. Little fountaining NW and W cones. High pressure continuous for three hours; at 11:30 p.m. cracking and foundering all over lakes, thousands of bubble fountains accompanying it, then cravking and foundering in the flows, then glow-rims of subsidence around lake and flows. The cracking and foundering in the flows began in the NW conduit region and spread from there, indicating that the greatest thickness of crusts was first reached in that region.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Monday Date May 28, 1917.

9:00 a.m. Short flows E and W. Lake subsides five feet during morning and recovers. S cone a pile of crusts. Violent bombardment E bank. Streaming as usual. Hot fresh short flow from E to base 1894 ledge. With Burton Holmes moving picture photographers to E cove. Crag mass, E island mass and NW table appear slightly higher.

1:00 p.m. Flow N and S from W cone which was an open oven facing W; and NW cone a high driblet pile. During afternoon, this flooded NW and S as before.

Evening. Great cataclysmal change. After the flows of the early afternoon there was subsidence of 10 or 15 feet which apparently induced a final and sudden readjustment of the under bench magma resulting in upthrust of the central and northern crags.

7:00 p.m. Lake subsiding apparently with violent fountaining and the revelation of the central cavern arch facing eastward between the south island mass and central peninsula.

7:15 p.m. A sudden tumble of benches with great clouds of dust and gas brilliantly illumined by multiple fountaining which made a display conspicuous at the Volcano House. What appears to have happened was a sudden upflow under all the benches and great crags, and opening of crevasses by their rupture, into which the lake flowed so as to lower it temporarily.

7:45 p.m. As result of this there was a profound canyon-like inner pit with a great niched cavern glowing at central cavern locality, high incandescence and rapid flow from NW and SW to E and SE; the SW island toppled over northward. The S island mass and central peninsula rose above rim of pit with a distinct shoulder in the fresh flows; rise 15 to 20 feet. The E island table sank slightly away from the old E scarp and a lava pond 50 feet across opened at the site of the sulphur hole. The outer ledge of E island mass broke away from the rest by a broad crevasse filled with talus and rose, forming a second mushroom table with flattish craggy top between E island and main lake and about same height as E island table. The old E crag and adjacent new rampart rose bodily 10 feet, opening again the E gulch. The NW tabular crag rose bodily above rim of pit. The crag mass rose tilting W so that the middle summit which has been the highest was overtopped by the serrate NE summit and the cliff of the recent inner bench above the lake appeared 40 feet high. The NW cone had become a flaming pile of crusts, and the W cone a glowing hole. Another glowing hole at N margin NW arm. Glowing crusts on floor from NW to W to S to E and some very bright

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Monday Date May 28, 1917.

cavities, light yellow. The inner cliffs around main lake appeared 40 to 90 feet high. The walls on S side SE pool appeared horizontally banded with spatter lines half way down (20 feet) and massive (aa?) below for remaining 20 feet.
Pit picturesque like old Furneaux paintings.
Lake immediately recovered and was rising slowly during evening.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date May 28, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
noon	SE	N	0					
	E	N	0					
	SE	Lower margin NE floor	-14 52	5 55	-9	560	59	
	E	ditto	-9 54					
	SE	Bottom back of 1894 bench	-27 39	6 21	-10	572	65	
	E	ditto	-34 8					
	SE	Old E crag	-2 26	6 52	-13	200	25	
	E	ditto	91 37					
	SE	Lake S pt. E cove	53 4	8 9	-18	235	35	
	E	ditto	93 51					
	SE	Summit crag mass	40 41	-1 13	-17	854	-12	
	E	ditto	48 9					
	SE	Summit E island	19 29	-1 34	-16	405	-10	
	E	ditto	51 21					
	SE	Summit SE cone	81 26	10 3	-15	128	23	
	E	ditto	115 59					
		(Measure SE wall with cord -- 28 feet.)						
9:55 p	SE	Summit central penin.			-22			
	"	Lake E side central peninsula			8 36			
10:15p		Summit central penin.			-22			
10:18p	SE	" E island			-55			
10:27p		" central penin.			-35			
10:57p		" " "			-35			

			no	pl	scr	stop	ex	cam
1p.m.	SE	NE floor	1		8x	f/11.3	½	5x7
	SSE	Lake	2		"	"	"	"
Ev'ng	SE	"	3			f/6.3	4 min	"
	NW height	Lake	4			"	10 "	"

T.A.J.

1917, May 28.



2



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270

1917, May 28



4



3

Jaj

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Tuesday Date May 29, 1917.

11:40 a.m. to 1:30 p.m.

Lake brimming. Deep canyon effect entirely gone. E gulch, E cove and N rim just beginning to overflow. Evident that last night's readjustment has slightly raised NE bench away from lake edge. Pond splashing at site of sulphur hole between E island and NE pinnacle. NW table, crag mass, both E crags and S crags all now visible from Volcano House. Lake streaming from W and NW; and SE cone spurting.
After a short time E and N overflows become subordinate and stop, and the E overflow becomes dominant and pours for two hours in steady torrent 40 feet wide, filling NE depression from E to N stations and penetrating middle crevasse of 1894 ledge. End of pooled flow sends an extension into N chasm. Filled depth 10 to 15 feet for a length more than 800 feet.
Then lake subsided slightly. High driblet cone W.

T.A.J.

1:30 p.m. E station.
Overflowing NE. Flow spreading wide over NE floor down to N wall.
Flow lasted about an hour then the lake subsided about five feet.

4:30 p.m. Lava again level with NE bench.

5:00 p.m. Overflowing.

Alex.

6 to 8 p.m. Strong overflow in afternoon and again now to E, to NE floor from E cove, to NW floor from NW arm.



W cones from WSW.

Two cones W 15 feet high. One spurting high with bell-like ring in gulping noise.
Two cones NW, the lower one building fast.

Note: Two cone 1894 -- two cones Jan. 4, 1917. Why two? Is one an air vent?

Flow from W and SW shore. Strong gas pressure, border fountains SW and NE and SE.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

 Day Tuesday Date May 29, 1917.

6:15 p.m. E flow.

6:30 p.m. NE and W flows.

7:30 p.m. Flows ceased and lake subsided and crust cracked up.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date May 29, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
11:51a	E	NW. Overflow NE bench.	1	W P	8x	f/8	1/5	5x7
12:18p		ditto	2	"	"	"	"	"
12:30p	NE	Overflow NE bench	3	"	"	f/11	1/2	"
	E	S	4	"	"	"	"	"
	E	Center	5	"	"	"	"	"
	NE	Driblet flow through 1894 crags.	6	"	"	"	"	"

Tessar lens.

T.A.J.

1917, May 29.



1

4

1917, May 29.



5



2

Jaf

1917, May 29.



3



6

Jag

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date May 30, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
2:45 p	SSE	E island	1		scr	f/10	1/30	Goerz 3½x5½	
	S	Rock fall SSW.	2		"	"	"	"	
	W of S.	SW cove, showing uplift of May 28.	3		"	"	"	"	
	SW	Boys making specimens.	4		"	f/8	"	"	
	WSW	W cone	5		"	"	"	"	
	NE	E island	6		"	f/7	"	"	
		Cloudy.						T.A.J.	

1917, May 30.









1917, May 30,



6



1

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date May 30, 1917.
Thursday " 31, "

May 30.
2:45 p.m. Lake two feet down, actively streaming to SE. Few fountains and slight gas pressure NW cone. W cone quiet, but driblet flows on W floor moving.
No fresh overflow since yesterday.
NE pond floored over and new cone heap built there.
Streaming from NW. Fumes moderate.

May 31.
9:30 a.m. to 12:30 p.m.

Fresh overflows E, E cove, NE, N, NW and W, but not long ones. SE bench 22 feet down.
NW pond revealed by slight collapse SW of NW cones.
W cone surrounded by domed up flows.
Lake four feet down, falling to 12 feet down during morning. Cavern at central cavern locality. Moderate fountaining. Crags higher. Smoke moderate.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date May 31, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam
9:30	SE	Lake	1		scr	f/11	½	Cirkut
a.m.	NE	" (poor, no prints)	2		"	"	"	"
to	N spatter heap.	NW table (½ roll)	3		"	"	"	"
12:30 p.m.	NW height	Crag mass " "	4		"	"	"	"
	SSE	Lake	5		"	"	"	"
								TAJ

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date June 1, 1917.
Saturday " 2, "

June 1, Crags higher. Smoky. Rain.

June 2.

11:15 a.m. Individual rocks falling 1894 bench and valley.
Lake down 20 to 25 feet SE revealing central cavern; main lake low. Central crags have risen, especially the two E islands and old E crag, a new ridge of elevation showing between E crag and SE station. All the crags appear higher from Volcano House and the crag mass is from there up to far wall of pit. The NE pinnacle shows from Volcano House.
Streaming to SE. Fountaining SE and few other places. Smoky. Streaming into central cavern.
Falls from crag mass summit 12:15 and 12:20 p.m.. SW islet has reappeared. Falls into lake NE.
After 12:15 sinking until 3 p.m., depth inner pit more than 30 feet. Then some rising.
During afternoon and night the benches and crags sank, NE pinnacle disappeared from Volcano House view, then the E island disappeared and next morning, only summit crags of crag mass in view. NW table in smoke.
Glow moderate. Fumes increase.

T.A.J.

3:45 p.m. SE station.
Avalanche from under N station and a few minutes later another from under E station.

5:30 p.m. SE station.
Large piece fell from S side of small pool, causing fountaining for a short time. Lava rising.

6:15 p.m. The whole top of the SE cove fell in, producing great activity there.

6:50 p.m. Another large fall from top of E cove followed by many fountains.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date June 2, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:15a	SE	N	0					
	E	N	0					
	SE	Old E crag	-4 54	2 35	+6	205	9	
	E	ditto	91 57					
	SE	Overflow rim NE floor (gulch to 1894 valley)	-6 40	4 8	+7	288	21	
	E	ditto	-30 50					
	SE	New E crag lake edge	13 7	2 16	+5	193	7½	
	E	ditto	92 8					
	SE	NE pinnacle	8 8	-23	+6	577	4	
	E	ditto	22 49					
	SE	Summit E island	20 11	-2 4	+6	408	14	
	E	ditto	51 48					
	SE	Summit outer E island	27 27	-1 15	+4	616	12	
	SE	NE summit crag mass	34 29	-1 34	+7	809	20	
	E	ditto	43 8					
	SE	Cent. " " "	40 51	-1 12	+6	313	12	
	SE	Lake central penin.	47 36	7 11	+6	323	40	
	SE	Highest spatter level ditto.	48 6	3 0	+6	382	20	
	E	ditto	75 41					
	SE	Summit central penin.	54 19	-1 6	+6	493	11	
	E	ditto	72 47					
	SE	Summit S island mass	65 33	-6	+7	525	2	
	E	ditto	80 4					
	SE	SE inner cliff edge	71 5	14 0	+5	119	29½	
	E	ditto	115 10 ca					
	SE	Floor SE	56 26	50 46	+6	34		
	E	ditto	129 2					
	SE	S margin floor	105 0	3 24	+6	591	33	
	E	ditto	106 41	6 42	+9			
	SE	S end NW table	11 41	+18	+5	910	5	
	E	ditto	15 25	+46	+7			
	SE	High cliff NW table	22 20 ca	-49	+6	926	10	
	E	ditto	27 30	-49	+6			
	E	Lake, tip cent. penin.	64 0	5 21	+9	525	48	

			no	pl	scr	stop	ex	cam
1p.m.	SE	Lake	1	old'13 film	10xz	f/12	¼	Al Vista
"	"	"	2	"	3xa	"		"
"	NE	"	3	"	10x	"		"
	"	"	4	"	3xa	"		"
	"	" Small vane.	5	"	"	"		"

Exposure with clock and no vane.

T.A.J.

1917, June

bof





2

Jag

285

1917, June



3

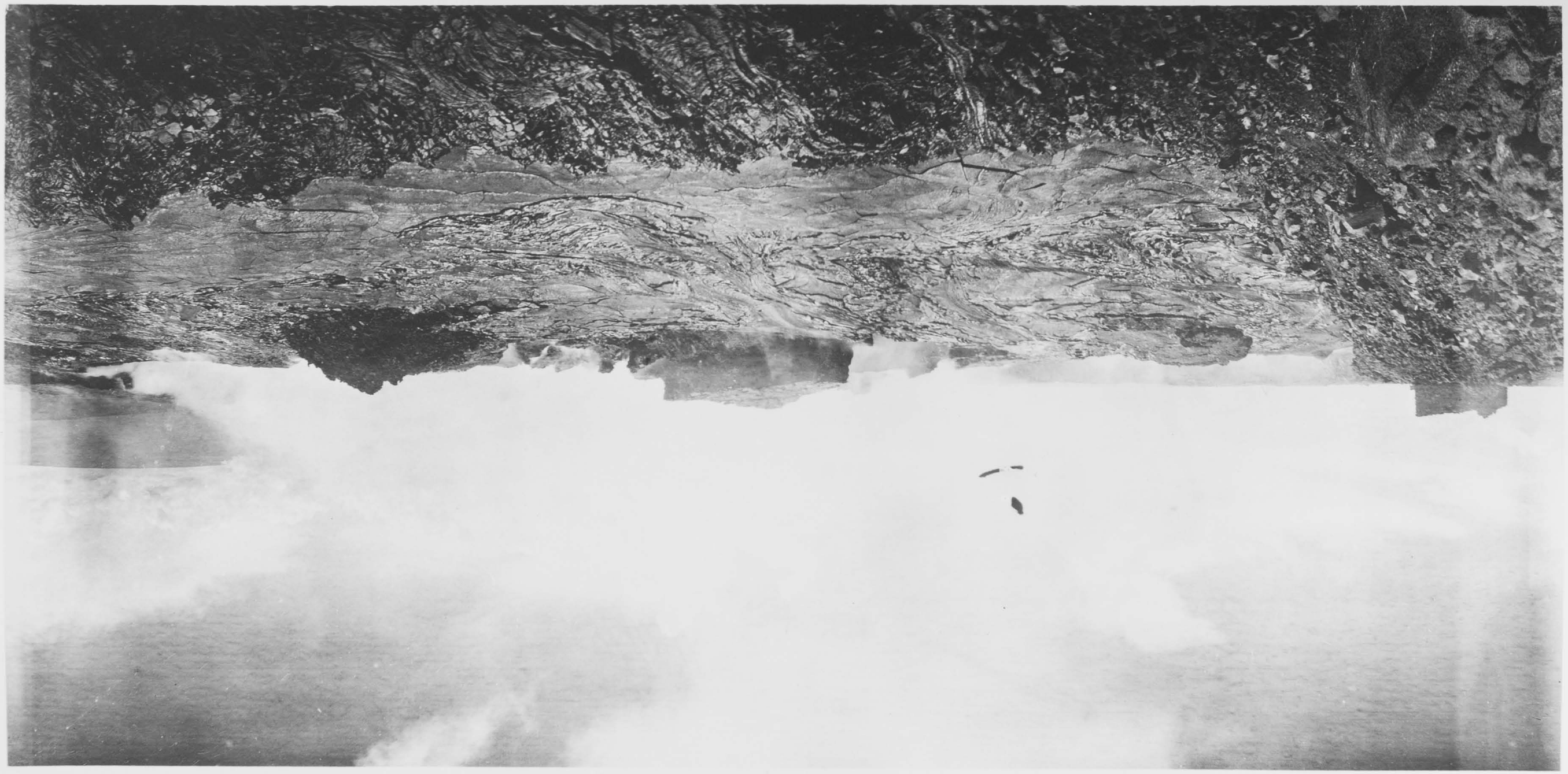
Jag

286

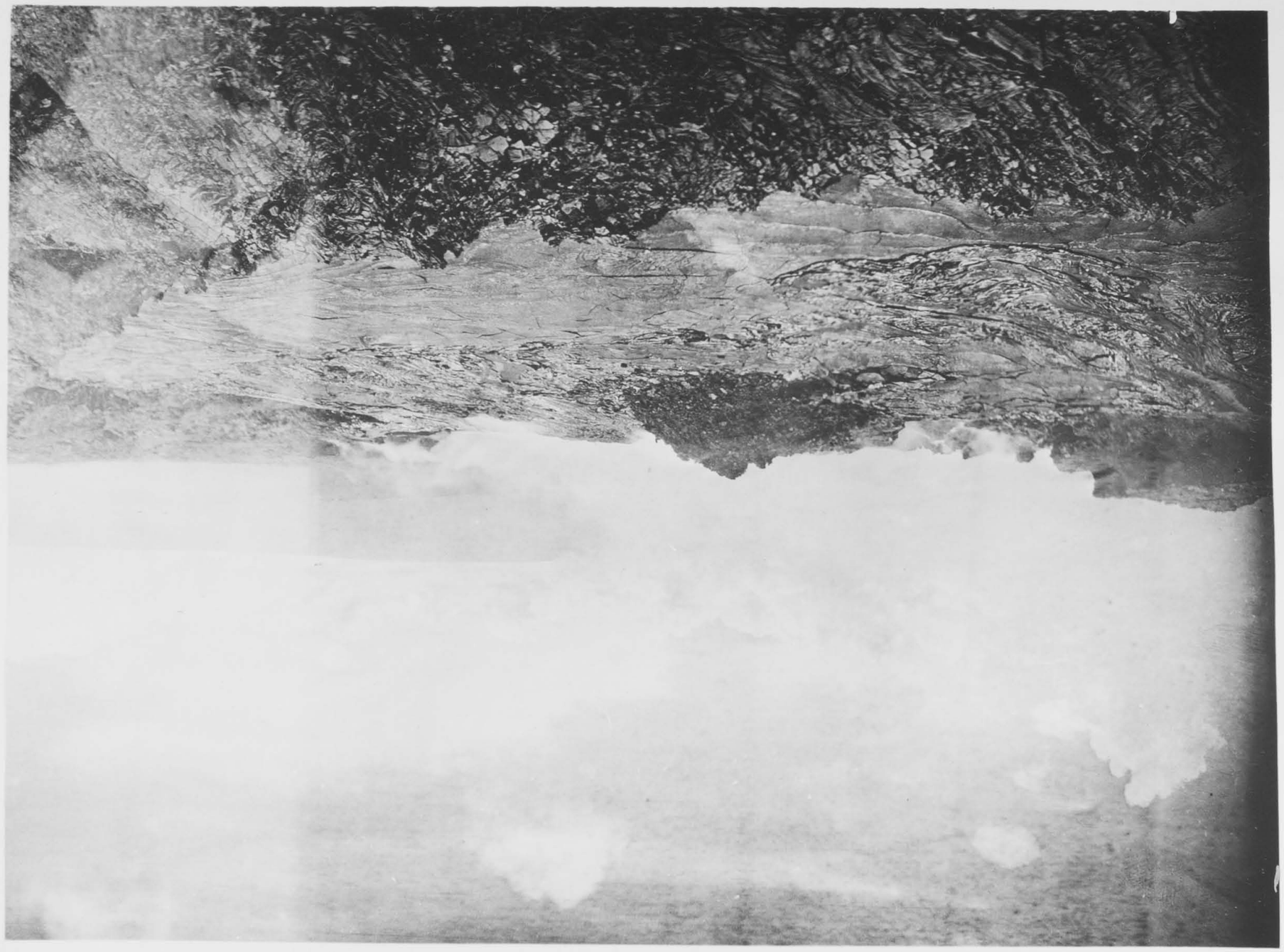
1917, June

1917, June 2

287



1917, June 2.



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2888

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Sunday Date June 3, 1917.

8:30 to 10:30 a.m.

Lake low, about 75 feet below upper rim, 40 to 45 feet down inner pit. SE bench remains high, also S and SW. Whole NE mass has sunk, especially the E islands and NE pinnacle and much of cliff over lake NE has fallen in. Crevasses along NE floor and large gaping crevasse E. Subsidence new floor along 1894 bench carrying much of that bench down in new talus. Rocks falling in valley back of 1894 bench.
NW table has subsided somewhat within the elevation ridge around it; dense smoke from cracks at its base E, S and W. Rocks falling from it.
Crevasse from N base of NW table to W station, but the NW and W floor mostly high, especially around NW arm.
Crag mass has tilted back to NE and broken down along NE face, tumble makes heap in lake there, and three peaks of crag mass appear equally high.
W and NW cones multiple heaps. From W cone to W cove a pressure ridge and crevasses and pits, much broken.
The main lake is very smoky. Fountaining toward the N. No very pronounced rising or falling discernible. From the rock falls occasionally heard about the crags apparently subsidence continues. No puffing heard.

T.A.J.

290

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date June 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
8:30	SE	N	0					
to	E	N	0					
10:30	SE	Summit E island	21 50	2 4	+6	412	14	
a.m.	E	ditto	52 52					
	SE	Lake, central penin.	44 14	8 56	+6	507	78	
	E	ditto	64 19	8 49	+8	520	79	

			no	pl	scr	stop	ex	cam
	ESE	Lake	1		8x	f/11	$\frac{1}{2}$	5x7
	E	SE crevasse	2		"	"	"	"
	NNW	W crevasse	3		"	"	"	"
	ORH	NE crevasse	4		"	"	"	"
	ORH	Uplift ridge E end NW table.	5		"	"	"	"
	NE	Crag mass and NW table	6		"	"	"	"

T.A.J.

1917, June 3.



2



1

Zag

1917, June 3



3



5

Jaj

1917, June 3.



4



6

Taf

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date June 4, 1917.
Tuesday " 5, "

June 4.
10:30 a.m. Lake farther down. Benches much lower, parting from SE bench which remains high. NE floor now horizontal. Lake about 20 feet below inner bench and shows new spatter level five feet above liquid. Fountains SE, Old Faithful and central fountain in narrows migrating E. NW table lower. Crag mass appears high and shaped much as in January. S cone glowing. All crags same and fumes thinner.

T.A.J.

2:30 p.m. E station.
Lava down about 12 feet below bench. Very active in SE cove and E cove. NE floor is subsiding. Falls from 1894 bench and all along from N to NW station.

Alex.

June 5.
2:45 p.m. From N bench.
The bench on the NW side of the E island is completely gone. N arm is wider.

3:25 p.m. SE station.
NE grotto very active, throwing the lava high in the air. Many small fountains just outside of this grotto.

Alex.

Apport. June 5. 1917

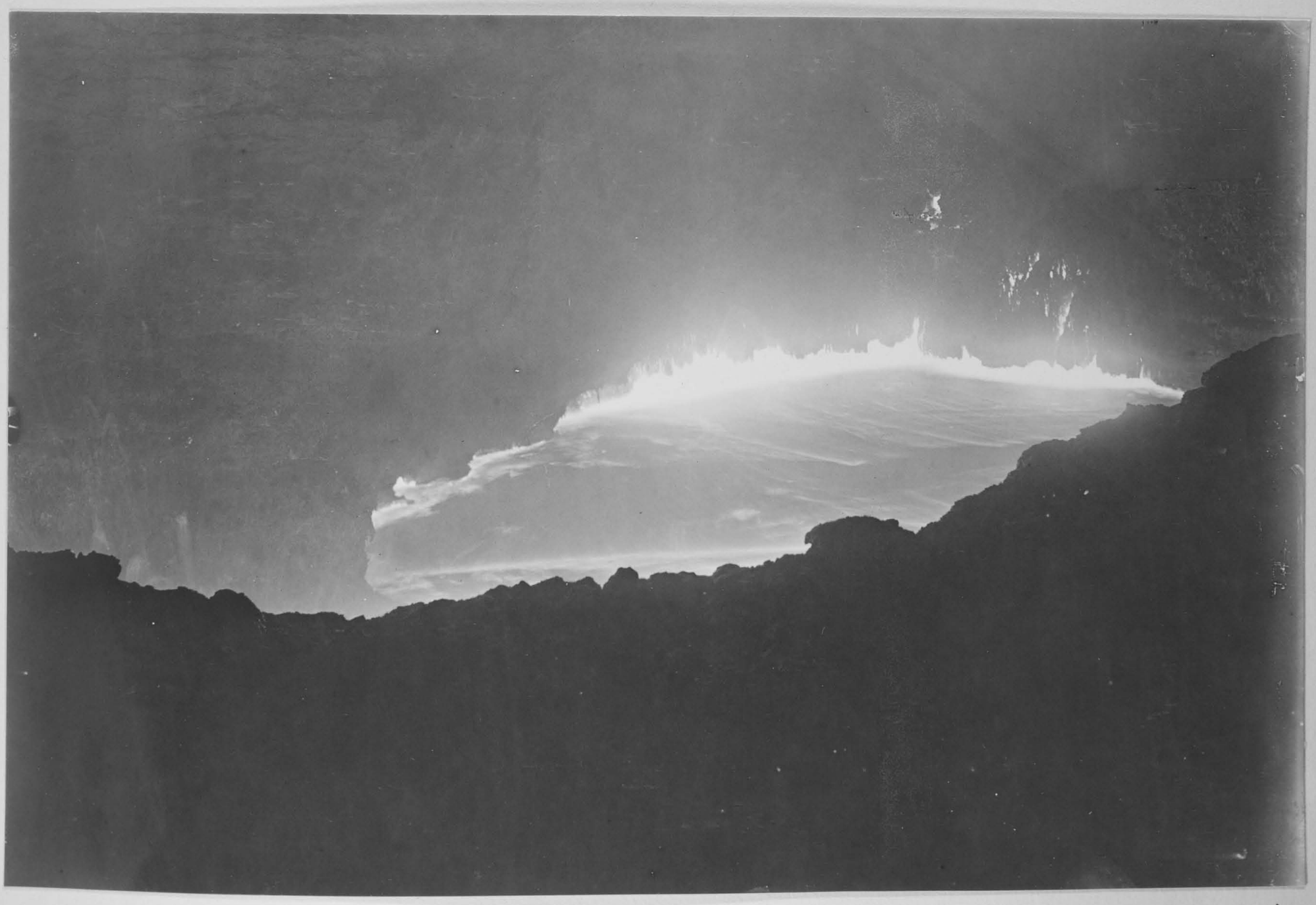




H.O.W.

Appeal. June 5, 1917.





H. O. W.

Appoint. June 5, 1917



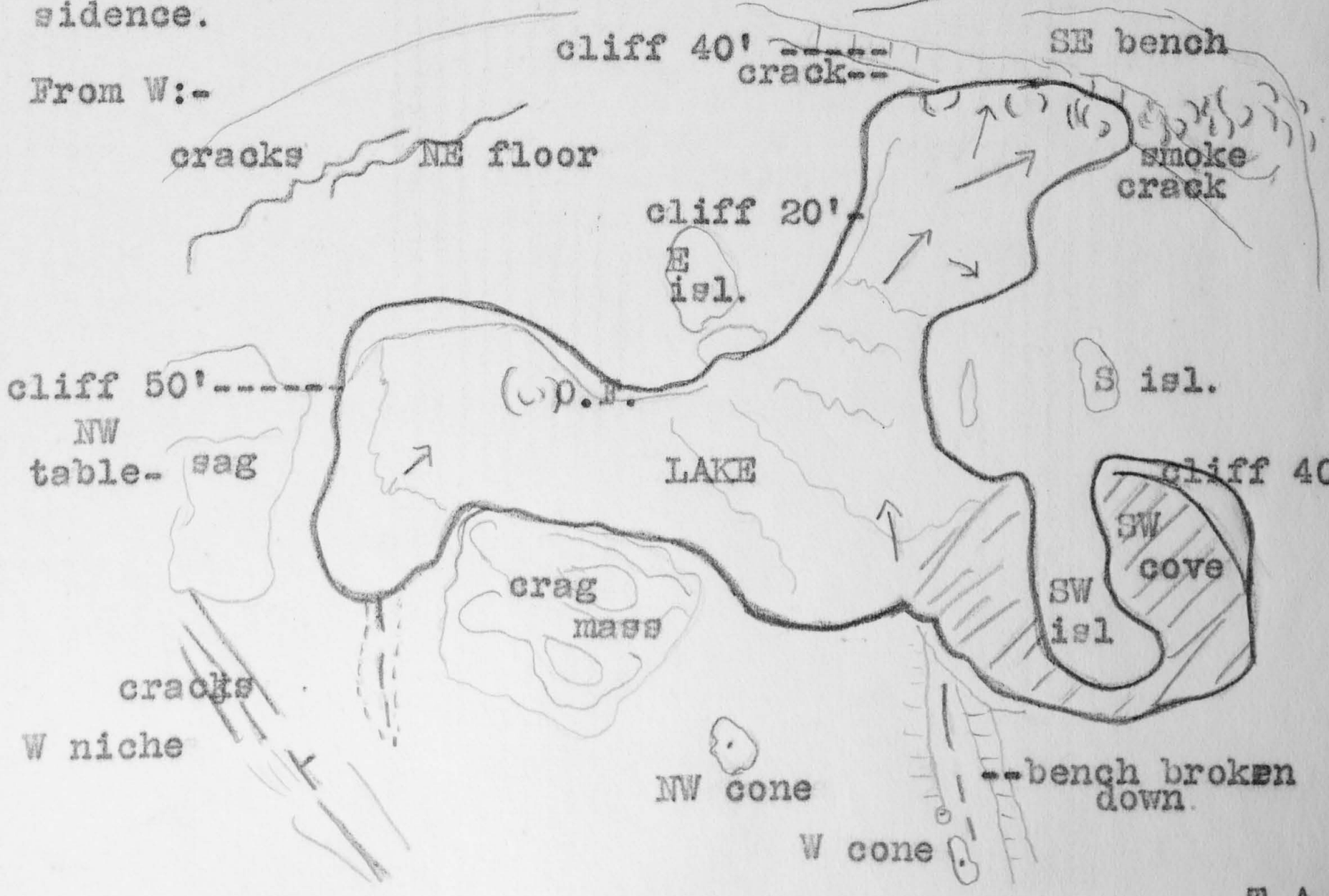
H.O.W.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date June 6, 1917.

4 to 6 p.m. Lake about 60 feet below rim Halemaumau. Benches have settled differentially. S island mass and E island mass have gone lowest making N and S inner walls of SE pool only 20 feet high. SE bench remains high -- 40 feet above lake; there is much bombardment and many stalactites at SE where cracks extend N and S, the S one to the S cone which is a glowing heap. Glow also along crack leading to cone.
Streaming fast from jammed crust in narrows southeastward. SW crusted and SW island is now a peninsula attached to S island mass, narrow channel encircling it on W.
SW floor has sunk differentially to NW floor along a crack from W cove to W cones. Latter fuming and hollow, NW cones the same, no glow seen in daylight.
Crack from N side NW table to W point S of W niche has widened with some sagging and subsidence on lake side.
NW table has sagged down in middle so as to arch downward like a plastic substance, the upper layers showing the arch in the N wall, without conspicuous breaks.
The settling of the NE floor has made it continuous with the N chasm so that the latter is no longer marked.
N end of lake inactive with streaming southward. Heavy smoke from NE shore and ends of NW table. Very heavy hot smoke from SE cracks.
Cracks in NE floor have widened into chasms three to four feet across and hot air rises there. Saw red glow beneath four feet down in one place. No smoke.
At 5:15 p.m. saw fall of face of bench S island mass into SE channel. Not much motion otherwise in evidence and inner bench wide SW, and W of main lake four feet above liquid. Present phase apparently temporary subsidence.

From W:-



T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date June 7, 1917.
Friday " 8, "

June 7.
3 to 4 p.m. Lake much the same, about 10 feet lower (70? feet down). Smoke heavy. Central fountains and rapid eastward streaming. Benches appear unchanged.
From the E the crack from the W cove to the W cone appears like a pressure ridge over a tunnel and a brightly glowing large gash appears at the W end of this ridge which trends <u>up hill</u> from the lake westward.

June 8.
9:45 a.m. Smoke less. Lake higher, very quiet and rising. No spatter level marks that are not submerged.
Occasional blow-off fountaining from under crust at central cavern and S side SE pool. Streaming E and S.
Rapid streaming at noon around W end of SW island peninsula to end of SW cove. Sinks back about one foot at noon. Fountains SW and central.
New falls of rock from high wall E of S station, from W wall, from NW and NE and E. NW table has sunk more, its E end now a pressure ridge, and a valley N of it extending into crevasse W, which shows more subsidence of floor on lake side.
Pressure ridge from NW arm to a smoking heap near W niche.
Pressure ridge from lake to W cone very marked as seen from SW, like a mole hill. Faint blowing NW cones. Crevasse 20 feet out from wall in SW and S floor, and W end of SE bench a tumbled slope. Here is the heavy fall from above. SE corner lake quiet today.

4:30 to 7 p.m.
Lake five feet lower and a little more active. Fountains SW, W, O.F. and SE. Streaming with thin and blistered crusts <u>out</u> from SW and NW to SE: steady streaming to NE pond locality (cascade sinkhole of Feb.). Bright flare of flames at S cone, central cavern and W cone. O.F. small. Small falls of spatter banks.
Glow in NE cracks nearest surface in smaller (4-inch) cracks;not visible in deep crevasses 18 inches in diameter. In former glow only four feet down.

Dr. E. S. Shepherd and Chisholm arrive.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date June 8, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:45 a	SE	N	0					
	E	N	0					
	SE	Lake level central peninsula.	45 22	11 22	+19	376	73	
	E	ditto	74 41					
	SE	Summit S pt. S pool (lower bench level)	54 31	15 9	+16	235	63	
	E	ditto	94 42					
	SE	Summit S island mass	64 4	3 25	+18	523	28	
	E	ditto	79 10					
	SE	Summit central penin.	51 48	3 10	+16	485	24	
	E	ditto	71 41					
	SE	Old summit crag mass (highest now)	43 12	1 41	+19	908	19	
	E	ditto	49 40					
	SE	Summit W knob E isl.	29 14	4 54	+17	509	41	
	E	ditto	50 56					
	SE	Summit E island	22 53	4 36	+19	416	31	
	E	ditto	53 25					
	SE	Summit NE peak	10 9	2 59	+17	585	27	
	E	ditto	25 25					
	SE	Cone remnant edge upper SE bench.	79 54	11 51	+18	130	27	
	E	ditto	115 40					
	SE	New rock fall from high edge S.	117 38	6 10	+19	390	40	
	E	ditto	118 24					
	SE	Middle NE floor	-12 24	8 19	+16	443	62	
	E	ditto	4 18					
	SE	Summit E end NW table	11 0	1 37	+18	994	20	
	E	ditto	13 9					
	SE	Summit W " " "	23 4	1 0	+16	1052	10	
	E	ditto	26 0					
	E	New (?) driblet cone W	63 32	2 27	+ 9	X		

Heights above lake:-

Inner bench SE	10	feet.
Summit S island mass	45	"
Summit central peninsula	49	"

	no	pl	scr	stop	ex	cam
Summit crag mass	64	"				
" W knob E island	32	"				
" E island	42	"				
" NW table	63	"				
" NE peak	46	"				
" SE bench	46	"				
Floor near S station	33	"				
Middle NE floor	11	"				

E island down 17 feet in 5 days.
Lake up 5 " " " "

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date June 9, 1917.
Sunday " 10, "

June 9.
4:00 p.m. Lake lower though level of SE pool appears same. Benches down more than 10 feet. SE smoke area under SE bench collapsed; appears like a growing new arm; now full of stones. New smoke cracks on SE bench. New falls W and S. NW crack shows a marked bench now near Perret's cavern locality, the portion toward lake subsided. NW arm has a narrow W extension. Crag mass appears subsided with slope toward it just as in February, looking from W. NW table lower, only about 20 feet above NW upper bench floor. SW cove wall at SW island peninsula appears 15 feet high and the E walls of main lake appear 60 feet high. Fountaining about the same. Current very slow SE. Glow gash S aspect of W cone. W and NW cones whitened. Smoke increased generally.

June 10.
5:00 p.m. Much the same. SE chasm more collapsed and lava within it as though forming a new arm. NE crevasses wider. Some marginal falls into lake. Level lake on spatter lines the same.
Note that smoke localities each indicate a tunnel or concealed pit below probably -- an open gas condensing chamber -- SE chasm and cone, W pressure ridge, NW pressure ridge, N pit, NE pit, central cavern tunnel. In other cases it is a crack developing below. Note that large open cracks widening above do not smoke.

T.A.J.

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

JOURNAL

Day Monday Date June 11, 1917.
Tuesday " 12, "
Wednesday " 13, "

June 11.
2:20 p.m. E station.
There have been heavy tumbles of shore bench into lake N of E island widening the N arm. NE grotto very active.

June 12.
3:30 p.m. SE station.
NE and S benches have sunk lower. Wall of SE bench scaling off.

June 13.
11:10 a.m. E station.
Rock fall from middle island into lake starting many fountains. A few minutes later another fall from SE bench. Lava down about 20 feet. E grotto very active.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date June 14, 1917.

1:50 p.m. NE station.
Lava about 10 feet down. S cove very active. Rapid streaming from W pool toward S and SE coves with travelling fountains in the current. Lake appeared rising. Fumes dense N.

2:10 p.m. SE station.
Much fountaining in N pool. Islands appear to be about the same.

2:30 p.m. Lava sank four or five feet in a few minutes. Fountaining in central cavern.

Alex.

3:10 p.m. Lake 15 to 20 feet below inner bench SE. Heavy fall from E island bank. Streaming to SE rapid, fountains numerous. Smoke very heavy from N and NE peaks. Crag mass appears much lower as though slowly subsiding bodily. Can see whole lake SW over crag mass from NW. Smoke SE has diminished. NW floor near crag mass lower but elsewhere floors appear unchanged. Glow in SE chasm leading to S cone.
Walked around N end of E island to floor between the two knobs. Fountaining at Old Faithful, crust farther N. Sinking five feet during afternoon.

T.A.J.

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Thursday Date June 14, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
3:10 p	Old E crag	SE cove	1	W P	8x	f/8	½	5x7
	"	Channel	2	"	"	"	"	"
	"	Fountain	3	"	"	f/6.3	1/10	"
	NE peak slope	E island	4	"	"	"	½	"
	Bet. E isl. knobs	East	5	"	"	f/8	"	"
	"	West	6	"	"	"	"	"

T.A.J.

1917, June 4.



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1917, June 14.



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307

1917, June 14



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Jaf

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date June 15, 1917.
Saturday " 16, "

June 15.

10:00 a.m. Lake high and rising. Much higher than spatter level of yesterday. Constructional activity. Very large spatter cone building against crag mass, others NW, W, SW, and SE. SW island and peninsula submerged.
W and NW cones smoking quietly. Smoke still heavy but less than yesterday.
Streaming strong from W to N and E. SE chasm has a fountaining pot between SE pool and S cone.
A piece of bank fell from S side of SE pool.
Bombardment in NW arm. Fountaining in SW pool on shore, pool otherwise crusted to the S of the submerged peninsula. Lake flush with floor between the two knobs of E island.

June 16.

10:00 a.m. Lake down. Streaming swift to large cavern under SE bench where is violent cauldron at lake level. Stalactite grottoes.
Lake rising after 10 a.m. Streaming in main lake from NW and SW.
Half dome of yesterday under crag mass partially collapsed. New inner bench all around about 10 feet above lake. Puffing grotto near Old Faithful.
At N end of crag mass subsidence of latter and of NW pond area behind it has created an escarpment facing S extending W from NW arm where pressure ridge was. A pressure ridge has been formed under S station extending to S cone. (Tunnel from old S pond?) There are other pressure ridges and cracks in S floor.
Smoke very dense and blue white N and NE. Other smoking places NW and W cones, NW scarp, SW floor, central peninsula, and SE.
Fire in W cone -- not there yesterday.
Rocks falling E crevasse and above E end 1894 bench. SW bench has gaped away from wall in four-foot crevasse and rocks in motion there.
SW peninsula in SW cove restored.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date June 15, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10 a.m.	SE	N	0					
	E	N	0					
	SE	Lake central penin.	47 31	10 51	2	369	71	
	E	ditto	75 13	9 21	2	436	71	
	SE	E island summit	22 57	4 54	2	414	35	
	E	ditto	53 29					
	SE	Crag mass summit	43 0	1 48	2	897	25	
	E	ditto	49 36					

Lake 2 feet higher than June 8.
Crag mass down 6 feet since June 8.
E island down 4 feet " " ".

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Saturday Date June 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10a.m.	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	47 23	12 57	0	380	87	
	E	ditto	75 31	11 25	0	432	87	
	SE	Summit crag mass	43 13	1 51	0	900	27	
	E	ditto	49 44					
	SE	Summit E island	23 13	5 0	0	414	36	
	E	ditto	53 45					

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date June 17, 1917.
Monday " 18, "

June 17.

2:05 p.m. SE station.
Lava 20 feet below bank. Lake quiet. Fumes dense.
No rock falls

2:20 p.m. S station.
NE and E grottoes very active. Lava appears to be rising.

2:30 p.m. SW station.
Avalanche from SE bench lasting several minutes and starting fountain activity. Another from same place about five minutes later.

2:40 p.m. W station.
Top of W cone has collapsed leaving a hole about 10 feet across, from which smoke issues.

2:50 p.m. N station.
Much activity W side of main lake. Pounding in W grotto.

2:55 p.m. Another small avalanche from SE bench.

6:20 p.m. E station.
Rock fall from bench on S side small lake causing the lava to spout up. Soon after slides began in different places along the wall of the 1894 bench. Falls E also, making SE bench much narrower. NE floor is subsiding slowly.

June 18.

12:20 p.m. E station.
Lava 8 feet down S side small lake. New small pool under SE bench; latter is subsiding.

12:45 p.m. From NW side main lake the SW grotto was seen to be very active. Streaming from N around the island peninsula to SW grotto. NW cone has collapsed and rumbling could be heard coming from below, with dense fumes rising. There are three cones, two small and one large, but no sound from any but the NW cone.

1:30 p.m. E station.
Large piece of bench on S side of SE pond fell. As the pieces broke off they were seen to be red within.

2:20 p.m. A long piece fell from central peninsula making many fountains in channel..

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date June 19, 1917.

1:15 p.m. N station.
Lava 6 feet below S bench in SE pool. SE cove very active, lava being thrown up very high. There is fountaining in W part of main lake. SW cove active. Lava rising slowly. Fumes thick N. The high mound under N station has fallen leaving a deep hole from which smoke is coming; no fire could be seen there.

2:00 p.m. E station.
Lava to within four feet of top of bench SW of SE pool. Slides E of small pool continue.

3:05 p.m. Sinking begins with much fountain activity SW side of main lake.

Alex.

3:30 p.m. Lake low. Benches have subsided heavily last two days leaving border bench back of border crevasses all around. NW bench high cliff from W station to NW table. NW table down level with bench. NW floor and crag mass much subsided. NW and W cones smoking. NE floor has subsided leaving bench under N station. Lake inner cliff hence only 10 to 15 feet. E and S floors have subsided much and the SE chasm now a cove of lake at site of former S cone. Another smoking cone or pile of slabs farther W connected with SE cove by a pressure ridge. The SE bench near its W end leads to great yawning crevasses with slabs ready to fall and is extended westward to a high bench under S and SW stations, beneath which the floor has subsided much. Tumbled smoky pit in region of N peak. NE peak, E island and S island much the same.
Streaming swift to SW cove and to SE pool from NW. SW islet peninsula flat topped and six feet above lake.
New inner bench two feet above lake, narrow.
Fountaining SW, SE and NE.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Tuesday Date June 19, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
3:30 p	SE	N	0						
	E	N	0						
	SE	Summit E island	24 46						
	E	ditto	54 50	9 49	-9	352	62		
	SE	Lake central peninsula	47 6	16 2	-7	366	101		
	E	ditto	76 21	14 5	-7	418	106		

			no	pl	scr	stop	ex	cam	
2 p.m.	SE	S (clock - no vane)	1	Old film	3x	f/12		Al Vista	
	"	E isl. " " "	2	"	"	"		"	
	NE	S " " "	3	"	"	"		"	
	NE	NW " " "	4	"	"	"		"	

Panorama.

T.A.J.

1917, June 19.



1917, June 19.





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Fog

316

1917, June 19.

1917, June 19.

b2f

4



JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date June 20, 1917.
Thursday " 21, "

June 20.
11:00 a.m. Benches farther down. NE shelf and 1894 bench falling almost continuously. NW table at its W crag now <u>below</u> shelf -- yesterday level with it.
SE cove has a blowing hole in spatter bank on its W shore flaming and hissing strongly: otherwise cove crusted over.
Streaming <u>out</u> from SW cove to the N and E. Violent bubble fountaining and downsucking at O.F. Violent bombardment N bank. N chasm fume much diminished. Yellow sulphur spot growing E of E island. Tumbles heard.
Lake relatively high and appears rising above inner bench of yesterday and some spatter benches building.
Condition apparently a contest between sinking bench magma and rising lake magma at present.

June 21.
9:30 a.m. Lake still low and now falling. Rock fall NE crevasses.
Open pool in crust SE cove.
Streaming E from NW and SW. Six fountains.
Spatter building. Two-foot stalactite rim around lake.

Earthquake felt at 7 a.m.

Great splash mark across point N of SE cove from fall of debris into E end lake from SE bench.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Wednesday Date June 20, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
11 a.m.	E	South	1		scr.	f/8	1/30	Goerz 3¼x5½	
	E	Lake	2		"	"	"	"	
	E	North	3		"	"	"	"	
									T.A.J.

19,17, June 20

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KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date June 21, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30a	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	46 38	17 22	-6			
	E	ditto	75 16					
	SE	Crag mass summit	42 46	4 1	-6			
	E	ditto	49 15					
	SE	E island summit	25 27	10 13	-6			
	E	ditto	55 42					
	SE	Summit NW table	22 0	2 47	-6			
	E	ditto	25 10					
	SE	W summit central peninsula	51 8	7 16	-6			
	E	ditto	67 38					
	SE	Summit S isl. crag	65 56	7 36	-6			
	E	ditto	79 31					

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

JOURNAL

Day Friday Date June 22, 1917.

10:15 a.m. Lake appears near turning point. No rocks falling around margins. Strong rising from five feet down to inner bench level between 10:30 a.m. and noon. Lake now easily accessible at SE cove.
Explored NE floor and found 15-foot cliff along 1894 bench making climb down difficult. The crevasses six feet wide in places and floor now flat. Old E crag partially buried by debris from SE high bench.
The N ridge (formerly E end of NW table) has sunk until there is a depression rather than a ridge, with tumbled slope on NW table side. Latter far below shelf left by May floor. A tumbled pit smoking at site of N chasm. NW cone on a slope beneath a cliff of subsidence made by the shelf which extends from W to NW well outside of former edge of W niche.
Great crevasses at W cone extending all along SW and S, floor below has slumped down.
SE cove open with streaming to its S end. Rapid streaming E in SE pool, large spatter dome building on its S side, another on W shore of lake, others SW and NE.
Heavy smoke from edge lake NE.

Evening. Lake about five feet below bench streaming vigorously. Six or seven fountains. Stalactite margins. Fumes rather thinner. Looks as though crags were rising. Glowing filagree at blowing spatter bank of SE cove and a flame near summit of central peninsula.

Mauna Loa. In the afternoon summit fume heavy and condensing to rain cloud in puffs.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date June 22, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:15a	SE	N	0					
	E	N	0					
	SE	Inner bench central peninsula(lake level)	47 15	16 56	-4	377	115	
	E	ditto	75 40					
	SE	Summit crag mass	42 42	4 1	-3	898	61	
	E	ditto	49 19					
	SE	Summit E island	25 24	10 16	-3	414	76	
	E	ditto	55 46					

Depression lake at noon 115 feet
Height of crag mass above lake 54 "
" " E island " " 39 "

			no	pl	scr	stop	ex	cam	
	E of N	SE	1		scr.	f/8	1/30	Goerz $3\frac{1}{4}x5\frac{1}{2}$	
	NE	Crag mass	2		"	"	"	"	
	N	NE floor	3		"	"	"	"	
								T.A.J.	

1917, June 22.



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Taf

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Saturday Date June 23, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9a.m.	SE	N (cf. June 22)	0					
	"	Highest lake level central peninsula. (Hor. angle same as June 22)	47 15	16 7	-5			
	"	E island summit		10 14				
	"	Summit crag mass		4 0				

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Saturday Date June 23, 1917.
Sunday " 24, "
Monday " 25, "
Tuesday " 26, "

June 23.
9:00 a.m. Lake hot. Fumes thin! Three or four fountains. Streaming from N into SW cove and SE pool. New spatter heap in central cavern and spatter bench generally higher. Floor benches and crags appear unchanged. A pressure ridge smoking through from E cove to sulphur hole, and a sag or valley, partly pressure ridge, from SE cove to SW cove. View clear across pit and fumes from Volcano House much thinner.

T.A.J.

June 24. E station.
At 11 a.m. the lava was rising; at 1 p.m. it was level with the bench SW; and at 1:30 p.m. it was overflowing the bench on the E side.

1:50 p.m. SE station.
Lava sank about four feet all around with much activity in both lakes.

June 25. NE station.
Overflowing on NE side of SE pool. Both pools active. SE grotto very active and undermining wall under SE bench. Lava remained high for about three hours when it sank about five feet with many fountains boiling in different parts of the lakes.

June 26.
2:45 p.m. E station.
Lava down about 10 feet. Lake quiet except in S grotto. Fumes appear a little thicker today. Evidence of fresh overflow on both sides of the SE pool, quite a large space on the NE side being covered.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date June 27, 1917.

Noon. Lake three feet down. New inner floor. Overflows of yesterday SE, E and W. Lake quiet and rising. Some large crusts. Few fountains. Smoke moderate. No great change yet.

T.A.J.

2:05 p.m. N station.
The pit under the N station is very deep and about 100 feet across. Dense fume coming from it.

2:10 p.m. Lava down about five feet. Much activity on SE side of crag mass. O.F. active. Fire could be seen in hole on NE side of E island

2:30 p.m. Lava down about 8 feet in SE pool with many fountains on S side. Many fountains in main lake with great activity in SW grotto.

Alex.

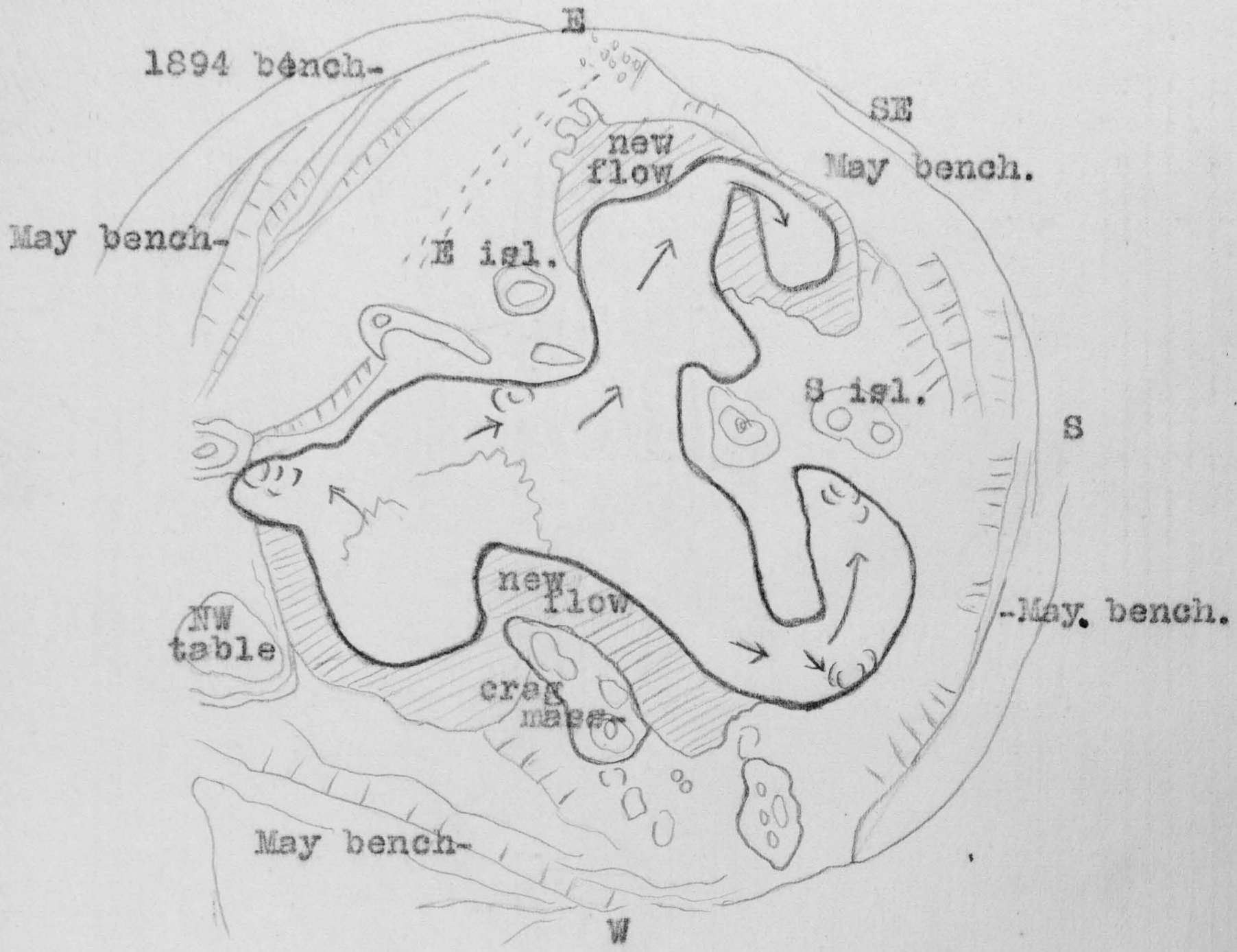
9:00 p.m. Lake eight feet lower than at noon. Strong streaming SW and SE. Fountain S side SE pool, E end SW pool, W side E island point, and new cove N. Blue flames from cracks in two places on S floor W of SE cove.
Some falling of slabs NE.
Smoke developing along crack E of E island and ridge farther E along old NE crag ridge.

T.A.J

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Thursday Date June 28, 1917.

10:15 a.m. Lake from NW height:-



Five or six fountains. Level continues about the same with no special rising. Falling now from 10 a.m. to noon.
Falls from bank SE pool S side and E end SW pool. New floor pronounced all around lake five feet above lava. Strong pits developed N and W. Smoke moderate.
Streaming to SE rapid and to SW pool. Occasional falling slabs. Thin crusts.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Thursday Date June 28, 1917.

t	sta	pt		hor	vert	lev	dist	elev	h. i.	
				no	pl	scr	stop	ex	cam	
11 a.m.	WNW	S	(hand)	1	L ortho	scr.	f/9	1/30	Goerz $3\frac{1}{4}$x$5\frac{1}{2}$	
	"	W	"	2	"	"	"	"	"	
	NNE	SE	"	3	"	"	"	"	"	
	NE	Center	"	4	"	"	"	"	"	
	E	N	"	5	"	"	"	"	"	
	E	Crag mass	"	6	"	"	"	"	"	
									T.A.J.	

1917, June 28.

330

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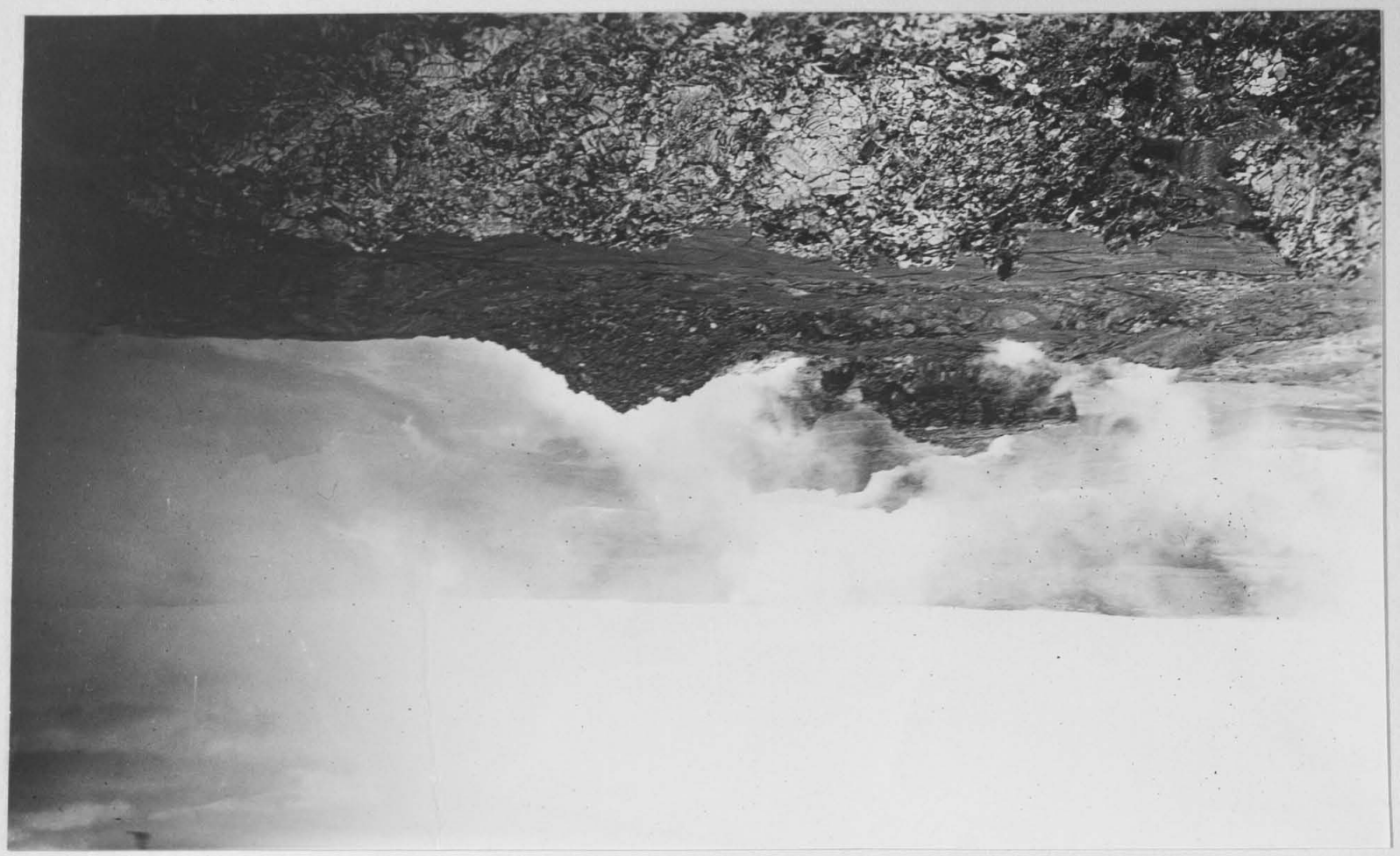
1917, June 2

331



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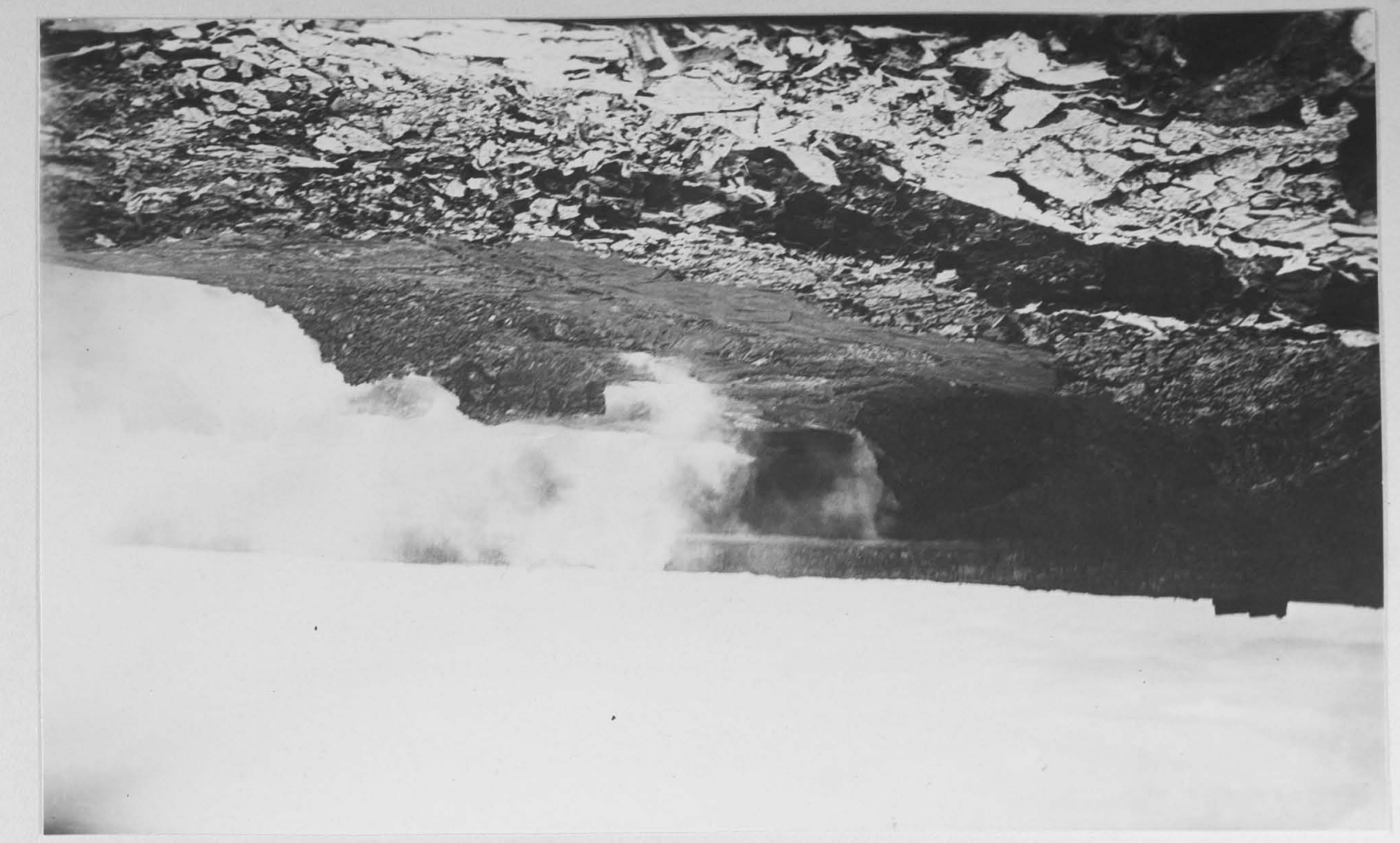

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JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date June 29, 1917.

9:00 a.m. Lake about 15 feet below inner bench.

10:00 a.m. Lake rising and only 10 feet down.
Very marked tilting changes going on in bench magma. N pit has almost entirely ceased to fume. Whole NE floor appears tilting southward, up at N pit, down at old E crag. Latter becoming more buried under talus, now moving, from high SE bench. New smoke hole, similarly, under SE bench near SE cove, with rock falling and apparently new pot developing.
SE cove lava streams swiftly under tunnel toward S floor where pressure ridge and cracks are smoking increasingly through to SW cove. Heavy smoke at SW cove end. Yellow sulphur stain S floor near SE cove. Spatter margins of SE pool show elevation near center of lake, (15-18 feet), depression at SE cove (5 feet). Evidently the S island sector is tilting southeastward. The vertical angles show that E island is up and crag mass slightly down. This all checks with recent weighting by overflow at S and E coves, tilting the NE and S sectors, whereas the weighting at crag mass, as shown by yesterday's map, is all around base of that crag, holding it down without evident differential tilting as yet.
Under SE bench just S of SE station where dense smoke was at 9 a.m. an open splashing pot had developed at 10:30 a.m. 30 feet back from edge of SE cove.
Main lake crusted heavily, streaming slow southward, fountaining against crag mass and against S shore SE pool.

11:00 a.m. Sinks one foot. Before that streaming out from SW cove. Now crusts break up and streaming swift again into SW and SE coves. Big banners of blue and yellow flame from new SE pot and sulphur coatings.
N and NW tumbles plainly visible with little smoke.
The escarpment facing N and NE of NE floor at crevasse now above shelf -- that is lifting.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date June 29, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9 a.m.	SE	N	0					
	E	N	0					
	SE	Highest spatter central penin.(June 6)	46 36	15 22	7	383	105	
	E	ditto	74 45					
	SE	Lake central penin.	46 36	17 50	7	383	123	
	E	ditto	74 45					
	SE	E island summit	25 17	9 57	9	415	74	
	E	ditto	55 30					
	SE	Summit crag mass	42 52	4 12	8	902	67	
	E	ditto	49 18					
	SE	NW cone	51 9	4 8	7	972	71	
	E	ditto	56 7					
	SE	W cone smoke	61 0	3 6	6	1045	57	
	E	ditto	64 9					
	SE	Bowlder floor NE	-14 40	9 55	8	494	88	
	E	Ditto	- 5 26					
	SE	Crack,floor S	74 53	19 43	5	302	109	
	E	ditto	97 56					

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date June 30, 1917.

11:40 a.m. Lake about 10 feet below inner bench. Great activity in grotto on S side of SE pool, and one fountain in middle of pool. Many fountains in main lake. Streaming from the W around the crag mass toward the NW grotto and through the channel toward the SE grotto.

11:55 a.m. SE station.
Boiling in SE pool with rapid streaming toward sinkhole.

1:30 p.m. S station.
Strong bombardment at end of SW cove and a few large fountains in center.

Alex.

JOURNAL

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Sunday Date July 1, 1917.
Monday " 2, "
Tuesday " 3, "
Wednesday " 4, "

July 1.
1:40 p.m. E station.
Surface of lake 4 feet below bank but the SE arm had been overflowing on to the NE bench over which the lava ran for some distance. Rising rapidly at this time.
A few fountains in middle of SE arm.

3:30 p.m. SE station.
Lava in lake within a foot of top.

4:30 p.m. Lava running over the fresh flow on the NE bench. Flow continues for about a half hour and goes about three feet further than the first flow; then subsidence in lake begins, making the level three feet down. Many large fountains in both parts of lake with very active grottoes.

July 2.
11:45 a.m. E station.
Overflowing slightly on NE bench, followed by subsidence which by 1 p.m. made the surface of the lake 10 feet down on the S side of the SE arm.

2:30 p.m. SE station.
Lava rose within 2 feet of top of bank and then started to sink again with activity in both arms of lake.

July 3, 1917.
2:07 p.m. E station.
Lava down about 6 or 7 feet below NE bench. SE grotto active and a few fountains in middle of SE arm. Slowly rising. Surface in NW arm 3 feet below bench.
W lake very quiet.
Fresh flow material on NE bench. Must be quite recent as there is glow still in cracks.

4:35 p.m. E station.
Large block fell from point of middle crag starting many fountains in the channel. Fumes thick in N part of lake.

July 4.
1:15 p.m. NE station.
Lake down about 10 feet all around. Very quiet on W side.
One grotto active on S side SE arm. No fountains.

3:20 p.m. No change to be seen from E station. Streaming from W to the NW and SE. Still about 10 feet down and quiet.

4:25 p.m. From E station saw large block fall from SE side E island starting many fountains.

6:50 p.m. Lava down 15 feet below bench; very active in both lakes.
Large fountains.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date July 5, 1917.
Sunday " 8, "
Monday " 9, "

July 5.
1:55 p.m. E station.
Lava about 15 feet below bank. SE grotto very active and noisy, as was the cove under middle crag.

July 8.
3:30 p.m. E station.
Surface of lava about 5 feet down. About an hour later it began to rise, until at 6 p.m. it was level with the NE bench. At 6:10 there was a small overflow quickly followed by subsidence of the lava in lake with fountain activity.

July 9.
1:15 p.m. NE station.
Banks 8 to 10 feet high. Rising in progress with streaming of rapid current toward SE arm but with no fountains. Thin fume all over pit. SE grotto active.

1:40 p.m. SE station.
Fall of rock from E island causing many fountains. A new blowing cone formed on SE side of SE arm which is blowing loudly and steadily. Place of sinking in SE arm very active and noisy

3:55 p.m. Part of wall of S grotto fell and a little later rocks from middle crag, also; both making commotion in lake.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date July 10, 1917,
Wednesday " 11, "
Thursday " 12, "

July 10.
11:30 a.m. E station.
Fumes rather thick. Lava about 20 feet down. Slow streaming through channel. S grotto active. Boiling and rumbling in the two grottoes on SE side of large crag mass.

11:50 a.m. SE station.
A few fountains playing at entrance to NE grotto. Fresh overflow material on S bench, spreading out quite wide and going for some distance. Middle crag appears to have risen, as floor SE seems depressed.

12:35 p.m. From N bank of main lake.
Old Faithful locality active and many central fountains. Boiling and rumbling in W grotto.

1: 40 p.m. E station.
Rapid rise of lava with quick streaming through channel. Rises within a few feet of top of bench SE.

July 11.
1:55 p.m. SE station.
SE cove nearly all gone. Half of new blowing-cone collapsed. Bench S about 10 feet above lava of lake and 5 feet on NE side. No fountains. Fumes thick but lake appears to be rising slowly. Occasional puffing, like that of an engine, from what remains of blowing-cone.

2:55 p.m. Heavy avalanche from NE side of E island. NE floor being elevated. Thick fumes from cracks N.

July 12.
2:20 p.m. E station.
Half of point of central crag has fallen off. Bank 20 feet high on S side and 10 feet on NE side; appears as if S bench were slowly rising and that NE sinking. Much falling away of sides of E island. Few fountains.

3:05 p.m. From NE.
Rapid streaming through channel toward sinkhole. Great activity in S grotto but no fountains elsewhere. Continuous sliding of rocks from 1894 bench between E and N stations. NE floor beneath slowly sinking. Cracks below 1894 bench widening.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date July 13, 1917.
Saturday " 14, "

July 13.
1:30 p.m. N station.
Fumes rather thick. Surface of lake 10 feet below NW bench.
A few fountains in W arm.

1:40 p.m. NE station.
Banks S 25 feet high. SE arm very quiet -- no fountains.

3:10 p.m. Large fall of rock from NW bench and a little later another from the large crag on N side of lake which started many fountains in NW arm.

July 14.
2:15 p.m. E station.
South grotto very active. Five fountains in SE arm.
Lava 20 feet below S bench and about 10 feet below NE bench.
Lake slowly rising.

3:20 p.m. SE station.
Fall of rock from under SE bench. Slides from wall under 1894 ledge continue.

3:40 p.m. N station.
Great activity in N arm, many fountains there. Grotto NW side of E island throwing lava very high.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Monday Date July 16, 1917.
Tuesday " 17, "

July 16.

1:50 p.m. NE station.
S and SE grottoes very active and noisy. Bank 5 feet high W, while lava is overflowing bench NW.

2:15 p.m. SE station.
Fumes thick all over pit. Sinkhole active with loud puffing. Lava only a few feet below bench NE.

3:00 p.m. S station.
East grotto very active. Lava has dropped to about 5 feet below NE bench. About six fountains in SE arm but main lake is very quiet.

Alex.

5:00 p.m. Lake 10 to 20 feet down in inner pit. S bench block more tilted. Smoking S valley. Flows newish from SE cove and E cove. Old E crag nearly completely buried under talus and flows. Small cone W of SE cove. E island much crumbled especially its S end, NE peak lower and more like a ridge; crag mass and NW crag both look low.
General situation like two weeks ago but with disturbed, tilted and crumbled crags. N pit more pronounced.

T. A. J.

July 17.

10 a.m. to noon. Lake streaming rapidly and showing bubbling activity. Streaming to SE. Crusts thin. Inrush to W side SE cove; other fountains and longshore bombardment W side main lake. Low smoking valley from fresh flow extending westward from SE cove, the flow reaching half way across S floor, from SE cove to SW cove.
W and NW floor has subsided in last two weeks and is backed by high wall of shelf which merges with old wall under W station. S from there shelf renewed and again gives out under SW station. Renewed again E from there and tumble of rocks on it SSW and SSE. Continues into SE shelf which ends abruptly ESE.
Main form of lake and benches has not changed. S bench block has tilted up on main lake side and NE bench block has tilted up on N chasm side.
Smoke thin. New floor has covered lower end of pressure ridge under W cone. Two main inner spatter levels, the floor of June 22-25, uplifted around crag mass and elsewhere, and another bench half as high, perhaps 10 feet above lake, around crag mass, and in SE pool and SE cove. Smoking places uhder W niche, at W cone, at N margin lake and along S valley.

T. A. J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Tuesday Date July 17, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:45 a	SE	N	0					
	E	N	0					
	SE	Summit E island	25 24	7 58	-7	427	61	
	E	" " "	54 7					
	SE	Lake central peninsula	46 32	15 52	-8	374	107	
	E	" " "	75 15	14 18	-7	421	108	
	SE	Summit " "	52 43	6 10	-8	377	42	
	E	" " "	71 33					
	SE	Old summit crag mass	43 00	5 50	-8	910	62	
	E	" " " "	49 14					
	SE	N pinnacle crag mass	33 35	4 00	-8	885	61	
	E	" " " "	40 15					
	SE	Low bench SE side SE cove	84 26	25 10	-8	236		
	E	ditto	107 48					
	SE	Low part S floor, end recent flow	87 22	12 9	-7	452	99	
	E	ditto	98 0					
	SE	Highest spatter level (floor) cent. penin.	47 9	12 24	-8	378	84	
	E	ditto	75 26					
	SE	Highest spatter level (floor) N end crag mass.	30 13	6 11	-8	818	90	
	E	ditto	38 18					
	SE	NE peak	10 29	6 18	-8	552	62	
	E	" "	27 35					
	SE	Bowlder NE floor	-14 53	9 40	-8	501	87	
	E	" " "	- 6 00					
	SE	NW cone	51 18	5 00	-8	974	86	
	E	" "	56 5					
	SE	S crag summit	64 9	6 18	-8	517	59	
	E	" " "	79 22					
	SE	W smoke	61 4	2 58	-8	1,044	55	
	E	" "	64 8					
	SE	Summit NW crag	21 45	2 36	-8	1,018	47	
	E	" " "	24 56					
	SE	W side SE cove	75 10					
	E	" " " "	101 12					

			no	pl	scr	stop	ex	cam	

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date July 17, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SE	N entrance SE cove	70 00					
	E	" " " "	108 53					
	SE	Pt. S side SE pool	53 53					
	E	" " " " "	94 8					
	SE	Central cavern	52 53					
	E	" "	79 17					
	SE	Inner S pt. of channel	44 51					
	E	" " " " "	72 52					
	SE	Outer " " " "	45 36					
	E	" " " " "	62 17					
	SE	N point of channel	38 00					
	E	" " " "	58 22					
	SE	Outer peak E isl. pt.	31 33					
	E	" " " " "	53 29					
	SE	Pt. S entrance NW arm	28 4					
	E	" " " " "	35 45					
	SE	Smoke point N	14 35					
	E	" " "	22 11					
	SE	N pit	8 52					
	E	" "	10 00					
	SE	Craggy mass under ORH	10 16	2 4		-8		
	E	" " " "	11 30					
	SE	Upper shelf limit NE	-4 28	3 22		-8		
	E	" " " "	-3 41					
	SE	End shelf limit under 1894 bench	-16 41	7 24		-8		
	E	ditto	-12 00					
	SE	Shelf level W niche	42 15	1 13		-8		
	E	" " " "	42 28					
	SE	" " under SW station (limit from W)	80 52	2 00		-8		
	E	ditto	83 6					
	SE	Limit S shelf W	91 45	3 00		-8		
	E	" " " "	93 21					
	SE	S tumble on shelf	115 24	6 24		-8		
	E	" " " "	117 44					
	SE	Pt. of overhang SE shelf	17 43	18 43		-8		
	E	ditto	114 32					
		(Limit SE shelf E on	line E-SE)					T.A.J.
			no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date July 18, 1917.
Thursday " 19, "
Friday " 20, "

July 18.
6 to 7:30 p.m. Lake high and slightly overflowing inner bench SE. Streaming from W. Fountaining O.F., NW, SW, E cove and SE at different times. High gas pressure spurting high SE cove and occasionally at narrows S side. Crusts moving along shores crunching noise. Flame glow NW cone. Descend to shore of lake at E cove. Lake brimming and overriding crusts push to SE and steady overflows pile up across stagnant crusts of lake from W to E. Many spurts of blue flame and some white flames through ballooning crusts all over surface and up cracks in crust. Estimated depression 85 feet.
About 6:45 p.m. crusts break up and lake sinks one foot and violent fountains form along shore E cove and migrate E. Increased fountaining elsewhere during subsidence. Then recovery and rising after twenty minutes. Heavy bombardment 60 feet high spurts under SE cliff.

July 19. Lake high.

July 20. Lake about same. S bench block appears still more tilted, down to SE, up to W. The peninsula extending W from central crags of S island block into SW cove is also upraise with its highest point at its W end about 15 feet above lake. The lake still hooks about it making SW cove sickle-shaped and the W bank here is only 5 feet high.
Fumes are moderately thin and the streaming is from the N and NW to a heavy fountain at the W cove and through the narrows to SE bank where there is a wide spatter dome. There is stagnant lava in the SW narrows. The streaming is outward or E from SE cove to the aforementioned SE spatter dome which is under the SE bench. Only five or six fountains and some large stagnant crusts. General condition appears rising. No inner shelf which is not submerged. No marked fresh overflows unless on E bank of SE cove. NW cone hissing strongly and steadily. SW cove appears quiet. Strong fountain building at three points NE shore. Also N shore.
10:30 a.m. Subsidence and marginal fountaining SW and SE. Central fountain S central part main lake. Currents meeting (?) from S and N.

T.A.J.

2:00 p.m. E station. Lava level with NE bench and at 2:30 there was an overflow on the SE side off SE sinkhole, and a wide one on W side main lake. A half hour later lava sank three feet and remained at that level until 5:35, when it began to rise rapidly. At 6:15 it was again level with bench. A little later it overflowed again but not to the extent of the previous flow.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Saturday Date July 21, 1917.
Sunday " 22, "

July 21.
2:05 p.m. SE station.
Fresh overflow lava on the NE bench. Molten lava 4 feet below this bench. Quiet rising, with no fountains at all, though there is rapid streaming through the channel to the SE sinkhole. Fume quite thin.

Alex.

July 22.
11 a.m. to 1 p.m. Lake low (or crags high) in its inner pit at 11 a.m.; rose so as to drown central cavern during the morning. At first during the low stages much more active, with strong rush under arch into tunnel at SE cove toward the smoking place in S floor valley which appears to coincide with the February sinkhole. Continuous fountains from meeting of currents from N and S in center of main lake, fountains SE, NE and N. Fume moderate. Heavy rock falls into lake from under SE bench and from E island mass. The central cavern was open, quiet and glowing within, with blisters forming under the skinover the lake beneath.
At 12:30 p.m., the lake had risen and become coated with quiet crusts, the central cavern was submerged and the SE cavern was fountaining within a little but there was hardly any streaming motion.

9:00 p.m. The lake was again low relative to the crags and the central cavern was open. Streaming was vigorous to the SE, and slow outward from the central cavern; fountains N, NE and in middle of main lake, along E cove and under SE bench. Hanging stalactite curtains abundant. Glow cracks in floor above SE cavern with flames; chimney flaming in crag above central cavern.
In the slow moving skin over quiet lava which slowly moved out from central cavern, blisters one to two or more feet in diameter would swell up suddenly out from the cavern where the skin was thicker, a gas bubble rising from below and inflating them. These rising gas bubbles



were of four distinct types in their surface effects:-
(1) Suddenly formed blanket blisters which remained formed until the skin had migrated out to the bright lines and broken up.
(2) Similar blisters which burst in center and left annular ridges, like a punctured blister. These were nearer the hot glow of the cavern.
(3) Still nearer and within the cavern the blisters were bubble fountains which broke the thin skin at once.
(4) In the intermediate region, and most remarkable of all,

were frequently formed what may be called ambulatory blisters, which appeared to be bubbles that rose either to the under surface of the skin or to a lower zone and then migrated rapidly laterally like localized waves, making a wake exactly like a moving animal just beneath the surface of the liquid; like a school of fish or a tadpole. The motion was frequently from without toward the cavern, or across the cavern's mouth and once at least it was obliquely outward. The movement in each case was like a wave at first, then became a moving point, then the track traced became sinuous and the motion of translation faster and ended suddenly and completely leaving no trace. There was no visible break in the surface at the end and no blister was left. The zigzag rapid motion was almost exactly like that made by a fish just beneath the surface of the water when chasing flies. The surface was distended, the distension moved perhaps 10 to 15 feet wavily and with increasing speed and expended itself with decreasing distension and apparently submergence or diffusion. The area lifted was not more than one foot in diameter usually, and frequently only a few inches, like drawing along a blunt point under a cloth with a rapid zigzag motion and then withdrawing it.

T.A.J.

10:00 a.m. E station.
Slow rising. S grotto very active throwing lava over the bank.

1:00 p.m. SE station.
Lava level with the NE bench. Remained so until 2:05 p.m. when it began to sink, soon being 5 feet down.

6:00 p.m. Lava 10 feet below the bench all around.

Alex.

345

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date July 23, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
2:10 p	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	46 29	15 43	+8	368	103	
	E	ditto	74 52					
	SE	Summit " "	53 00	5 10	+8	490	43	
	E	ditto	71 59					
	SE	New summit E island	22 49	7 7	+8	445	55	
	E	ditto	50 13					
	SE	N summit crag mass	33 8	3 48	+8	893	55	
	E	ditto	39 45					
	SE	Old " " "	42 46	3 51	+8	900	56	
	E	ditto	49 19					
	SE	Summit NW table	21 37	2 46	+8	1025	44	
	E	ditto	24 56					
	SE	Bowlder NE floor	-15 6	9 52	+8	497	85	
	E	ditto	- 6 10					
	SE	Bowlder S "	94 13	12 27	+8	442	96	
	E	ditto	102 42					
	SE	S margin SE cove	86 41	25 19	+8	204	96	
	E	ditto	110 25					
	SE	NW cone	51 6	5 8	+8	963	81	
	E	ditto	56 9					

Lake depression	103	feet	below SE station.
Central peninsula	60	"	above lake
Summit E island	48	"	" "
N summit crag mass	48	"	" "
Old summit crag mass	47	"	" "
NW table	59	"	" "
NE floor	18	"	" "
S floor valley	7	"	" "
Margin SE cove	7	"	" "
NW cone	22	"	" "

T.A.J.

no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date July 23, 1917.

2:10 p.m. Strong motion is in progress in the S mass. Also probably in the E mass. A new pressure ridge forming southward from the NE peak, with apparently raised surface on side of lake and slope on side of NE floor. Very heavy falls from S mass into lake of channel and SE pool, also from point of E island and from E cove. Lake appears 20 feet down at SE pool but the angle seems to indicate no change from last week, hence crags rising rather than lake sinking. Pronounced marginal fall-off of S crag block toward SSW. Old NW crag mass also appears raised on lake side and NW table looks higher. Smoke is denser. Streaming from S and N to SE. Central and SE caverns open. NE pit appears to be reforming.
Note. E, central and S crags and NW crag mass all appear to have tunnels separating them off as real islands, if the surface roofs of the tunnels could be removed.
Hot fume rising from SE and central tunnels. Saw heavy fountain form in SE cove and migrate into tunnel under S floor changing to a swarm of bubble fountains. Shifting bombardments. Spells of rising. A time of intense rising in the bench magma and adjustments in the lake. Inner wall all around fully 15 feet. Much migratory fountaining and thin crusts. Glow orifices fuming above central cavern and SE cavern. The new NE scarp is response to southeastward tilt from flow of July 21.
Peninsula in SW cove much uplifted with southeastward tilt.
NW cone not hissing but large area stained sulphur near it size of old NW pond.
SW pool has 40-foot wall on its E end and 30-foot wall on E side of channel leading to it. Strong bombardment continues at E end SW pool where tunnel leads to S floor.
Summit crag mass overhangs on its N end as seen from W.
Inner crags appear rising as seen from W and S.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date July 24, 1917.

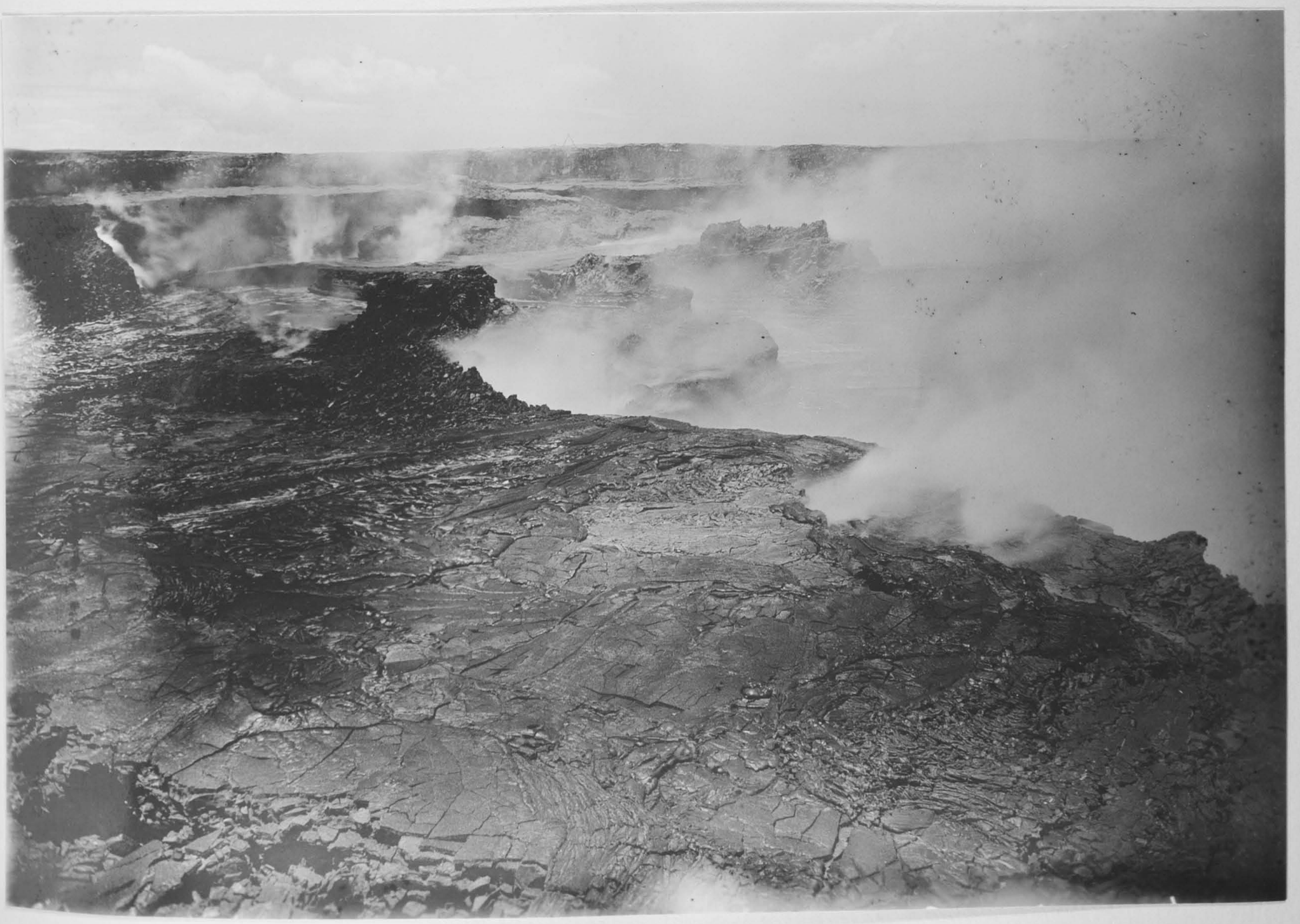
t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
10:30a	NE	Center	1	W P	8x	f/11	½	5x7	
	N	NW crag	2	"	"	"	"	"	
	N	O.F. cove	3	"	"	"	"	"	
									T.A.J.

1917, July 24



2



3

Jag

July, 1917



#1

Jaj

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date July 24, 1917.
Wednesday " 25, "
Thursday " 26, "

July 24.
10:30 a.m. Conditions the same. Lake at first higher than yesterday. Central cavern very small. Streaming swift into SE cavern. Fumes moderate. Fountains few.

11:30 a.m. Swifter flow and fountaining SE cavern. Central cavern higher. Overhang glow rim all around lake. Eight or ten fountains. Streaming out from N and SW to SE; quiet lava flowing out from central cavern, streaming to cove east of O. F. This cove enlarging at expense of NE peak. White stain at glow heap over SE tunnel.

July 25.
6 to 8 p.m. Lake more active. Bench eight feet high in SE cove. Rapid streaming to SE through channel, coming from N and SW. SW cove dark and crusted. Very high incandescence in fountains and in SE tunnel. Many large fountains travelling from channel to E cove. Others under SE shelf. Occasional break-ups in NW arm and fountaining NW bank. Alternations every 20 minutes to 30 minutes of swift current and fountaining with slow current and less fountaining. General effect rising during evening, leading to drowning of central cavern. Streaming from latter at first slow eastward with blisters on thin skin. Later northeastward and more swift. Glow and flame NW cone, over central cavern on floor above and over SE cavern.
Later evening less incandescence and some crusting across channel leading to SE pool. Puffing to the north.

July 26.
2:00 p.m. Lake relatively high. New narrow inner bench. Skins thin and streaming southeastward rather fast; much bubbling but little fountaining. Fumes not thinning at all. Crack developing between central peninsula summit and south crag. Bench at W and E coves 6 to 8 feet high.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date July 27, 1917.
Saturday " 28, "
Sunday " 29, "
Monday " 30, "

July 27.
11:00 a.m. Lake high. Moderate current. SE cove has caved in on its E side and enlarged to double former size. Bombardment on two places of its shore, latter five feet high. Fumes thinner. Streaming from N and SW. Lake crusted until 10 a.m. Fountains few. No other changes. Much sulphur NW cone. More fumes under W niche shelf.

T.A.J.

July 28.
2:20 p.m. SE station.
SE side of SE arm has caved in, widening the cove. Sinkhole locality very active.
3:05 p.m. Looking from N side main lake could see O.F. in action. Banks about 10 feet high in both parts of lake. Fume thick. Only a few fountains. Lava seems stationary. Two grottoes on SE side large crag mass very active.
2:50 p.m. From NE bench.
S and E grottoes boiling and rumbling; throwing lava high.

July 29.
2:45 p.m. E station.
Lava 10 feet down on the NE side and 20 feet below the S bench. SE sinkhole and S grotto very active and noisy.
3:40 p.m. From the north.
Fifteen fountains in N arm. O.F. playing steadily every forty seconds. NW grotto pounding loudly. Thick fumes in pit.

July 30.
2:50 p.m. SE station.
SE grotto and sinkhole very active. Rising in progress. No fountains to be seen anywhere. Fumes dense. S bench appears to be rising; 25 feet from lava to top of this bench. NE bench 10 feet above lava.
3:45 p.m. NE station.
S grotto throwing lava very high.
3:50 p.m. N station.
N arm very quiet except for O.F.

Alex.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date July 27, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11a.m.	SE	N	0					
	E	N	0					
	SE	Lake central penin.	45 28	14 55	-2	384	103	
	E	ditto	73 42	13 22	0			
	SE	Summit central penin.	53 6	5 10	-2	503	46	
	E	ditto	72 2					
	SE	Summit E island	23 3	7 0	-2	445	55	
	E	ditto	50 20					
	SE	Summit crag mass (S)	43 0	3 45	-2			
	E	ditto	49 26?					
	SE	N summit crag mass	33 17	3 42	-4	893	56	
	E	ditto	39 49					

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology.

JOURNAL

Hawaiian Volcano Observatory

Day Tuesday Date July 31, 1917.
Wednesday Aug. 1, "
Thursday " 2, "

July 31.
2:40 p.m. N station.
N arm very quiet except for O.F. Fumes about the same.
2:45 p.m. NE station.
S grotto active and rumbling.
3:00 p.m. SE station.
Streaming rapidly through channel and around S point to sinkhole. Lake rising. Is now 6 feet below the NE bench and 20 feet below the S bench
2:55 p.m. E station.
SE sinkhole boiling and rumbling.

Aug. 1.
2:20 p.m. N station.
Several fountains in N arm. Lava 10 feet below the bank in this arm. Fumes about the same.
2:30 p.m. NE station.
S grotto rather quiet but the grotto between the SE and S stations in the SE arm is very active with streaming toward the SE bench.

Aug. 2.
2:10 p.m. N station.
Lava down 15 feet in N arm where it is very quiet; only one fountain -- on SE side of large crag. Streaming hardly perceptible.
2:15 p.m. NE station.
Lake 25 or 30 feet below the S bench. S grotto quiet. Fumes about the same.
2:45 p.m. East island began to collapse, half of it falling into lake. A few seconds later the roof of the central cavern and part of the S bench fell in. Then half of the bank around the SE cove. The bench of the central crag is 40 feet above the surface of the lake and the S bench 30 feet. East island seems to have subsided almost 10 feet. A heavy block fell from the large crag starting hundreds of fountains. The central peaks rose about 10 feet.

Alex.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Friday Date Aug. 3, 1917.

2:35 p.m. Looking from the N bench it could be seen that the NW side of the E island was all broken up and is 20 feet below the N bench. Much smoke and few fountains in N arm.

2:45 p.m. Looking from the NE bench activity could be seen in the S grotto. SE cave 10 feet high and 20 feet wide, with much activity and noise. Rapid streaming toward the sinkhole.

Alex.

4:45 p.m. Great change in central peninsula, happened yesterday according to Alex.
Peninsula cracked in two, roof of tunnel fell in, leaving a chasm to lake level. Central peninsula summit also cracked in two. Sharp spine or pinnacle on its E side with upright laminations red and white exposed in its upper part.
Great widening of SE cove, large spatter dome on its E side which completely collapsed today about 5 p.m.
E island has crumbled away on its S side and the tunnel E of it has collapsed to a channel full of debris extending from NE pit to E cove.
Old crag mass has collapsed further on its E side and summit is a row of rugged irregular lumps like summit of Tarumai dome.
Bank of E cove stands high and there has been collapse at its E end.
In general, uplift of central crags, parting from S and NE floors.

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date Aug. 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
4:45 p	SE	N	0						
	E	N	0						
	SE	Lake central peninsula	47 30	15 52	-16	378	109		
	E	ditto	75 34						
	SE	Summit " "	54 34	3 50	-17	493	35		
	E	ditto	73 00						
	SE	Summit S grotto dome	103 7	19 26	-16	278	100		
	E	ditto	113 24						
	SE	Summit S crag	64 57	5 16	-16	515	50		
	E	ditto	79 47						
	SE	S summit old crag	42 48	3 50	-16	902	62		
	E	ditto	49 10						
	SE	N " " "	32 13	3 57	-16	907	64		
	E	ditto	38 25						
	SE	Summit E island	22 14	5 58	-16	473	60		
	E	ditto	46 54						
	SE	S floor valley	94 6	12 9	-16	437	97		
	E	ditto	102 38						
	SE	NE floor	-14 56	9 25	-16	502	86		
	E	ditto	- 6 4						

Depression of lake	109 feet.
Central peak	74 " above lake.
S. crag	59 " " "
S. summit NW crag mass	47 " " "
N. " " " "	45 " " "
E. island	49 " " "
S. valley	12 " " "
NE floor	23 " " "

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Saturday Date Aug. 4, 1917.
Sunday " 5, "

Aug. 4.
10:00 a.m. Lake 5 feet lower. Streaming from N to SE. SW pool crusted, tunnel fountain at its inner end. Overflow bench in central chasm. Lines of scraping vertically at base of central pinnacle. Dome at SE cove entirely gone. Cavern SE is slight and gone under central chasm. Walked around lake on upper edge pit. No changes NW or W. Peninsula extension in SW cove higher and an inner bench E end SW cove. Much sulphur stain NW cone.

Afternoon. Bright over Mauna Loa. Whitish fume rising thinly from Mokuaweoweo catching the sunlight. This very conspicuous but due to unusual combination of August sun over mountain and a clear afternoon, very rare on Mauna Loa. Also still air on summit -- N.E. trade down here.

Aug. 5.
6:00 p.m. Dome at E margin SE cove reformed. Strong overflow E cove against remnants E island which appears sinking. Flow to valley NE of E island. Fresh overflow in central chasm.
Change from rising to swift streaming at 6 p.m. Fountaining SE. Streaming out from N and SW.
Fumes less today. Light fume Mokuaweoweo.
Channel to SE cove much wider.

This day Gilmore, of Prizma Company, took colored moving pictures.

T.A.J.

Massachusetts Institute of Technology.

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Saturday Date Aug. 4, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
Survey to check with yesterday:									
10 a.m.	SE	Summit central penin.		3 57	-8	493	35		
	SE	" S crag		5 26	-8	515	50		
	SE	Lake central penin.		16 39	-8	378	114		

			no	pl	scr	stop	ex	cam	
10 a.m.	SE	Narrows	1a		8x	f/11	1/2	5x7	
	E	S (cloudy)	2a		"	f/8	"	"	
	E	NW cove "	3a		"	"	"	"	
	E	Complete panorama	1		B & J ideal	f/10	1/2	Cirkut	
	NE	" "	2		"	"	"	"	

T.A.J.

1917, Aug. 4.



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4 Aug, 1917



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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Sunday Date Aug. 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
6 p.m.	SE	N	0						
	E	N	0						
	SE	SE dome, lake level	97 48	22 54	-10	267	113		
	E	ditto	111 20	12 00	- 9	498	107		

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology.

JOURNAL

Hawaiian Volcano Observatory

Day Monday Date Aug. 6, 1917.
Tuesday " 7, "

Aug. 6.

2:50 p.m. E station.
Recent overflow on NE side but lava is now a foot below the place of overflow. Rising beginning. S grotto very active.

3:00 p.m. SE station.
Boiling and rambling in SE grotto. Rapid streaming into sinkhole.

3:05 p.m. S station.
Lava at E grotto splashing very high. SW grotto quiet.
Fumes about the same.
Could hear NW cone blowing occasionally. N arm quiet.
One fountain in SE arm.

Aug. 7.

11:45 a.m. E station.
Lava rising. Fumes thin. Only activity to be seen in S and SE grottoes. N arm quiet, no fountains. Rocks have been falling off the N side of E island.

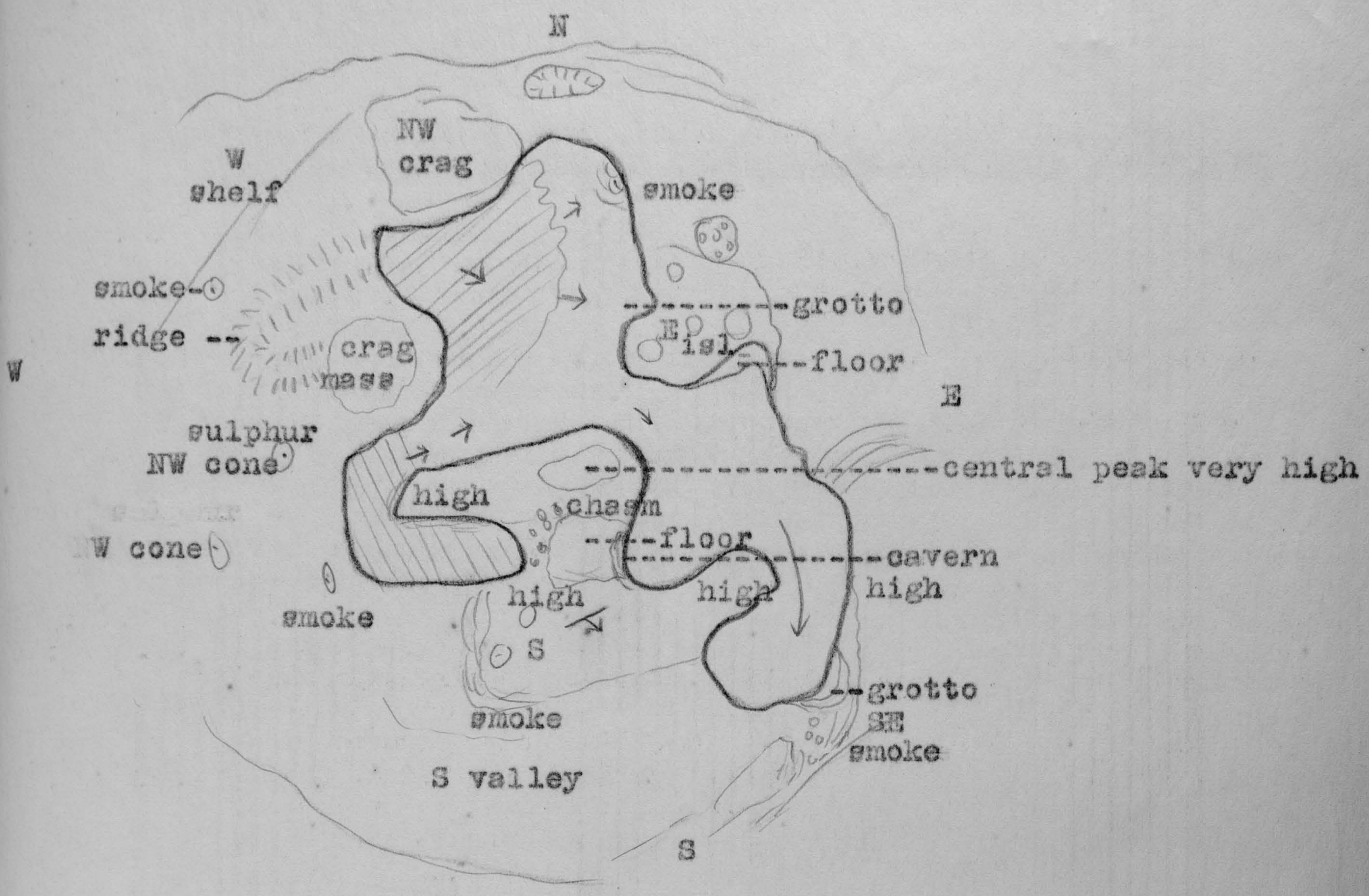
12:05 p.m. SE station.
Lava rushing into sinkhole.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date Aug. 8, 1917.

2:30 p.m.



Inner bench 10 feet high. Central crags still higher. Central chasm wider by collapse of walls. Channel appears narrower. SW and NW coves crusted. Big dome grotto SE with SO_2 smoke puffing up blue and hot. Another large grotto near O.F. Increase yellow sulphur NW cone. Slight puffing N and NW cone. Fume abundant. East island now a tumble of crags. New inner floor at central chasm and E cove.
NW table and crag mass appear stationary.

T.A.J.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Thursday Date Aug. 9, 1917.
Friday " 10, "

Aug. 9.

6:00 p.m. Central crag immense and towering as seen from E cove. Eight-foot inner bench at E island and central channel. Grotto dome SE fifteen feet high. E bench twenty feet high. Streaming to SE, blisters, thin crusts and travelling fountains. Flaming grotto under S bench. Magnificent grotto with steady fountaining in SE dome. Streaming out from SW and N arms.
Flash and rumble noises.
Occasional spatter over E bench.
N arm quietly streaming out from NW; heavy crusts cracking and foundering with bubble fountaining in center; grottoes E and NE. E island and old NW crag mass both tumbled swarms of small crags. NE floor has sag in middle, quite high ridge from NE peak southward. Floor slopes up to E cove and up to north.

Aug. 10.

11:00 a.m. Lake low; inner bench 12 feet high. Streaming rapid. Fumes rather thinner; far side of pit very clear. SE dome moderately active. Bubble fountains E cove.

12:00 m. Lake crusted; quiet and rising. Fountains NE and SE grottoes. A cavern under central chasm floor which was glowing at 11 a.m. at this time was submerged.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Thursday Date Aug. 9, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Friday Date Aug. 10, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11-12	SE	N	0					
a.m.	E	N	0					
	SE	Lake central peninsula	48 23	16 55	-12	379	117	
	E	ditto	76 8					
	SE	Summit central crag	54 39	3 57	-12			
	E	ditto	73 00					
	SE	Summit spine	48 51	6 53	-12			
	E	" "	74 17					
	SE	" E island	22 15	7 9	-12			
	E	ditto	47 00					

			no	pl	scr	stop	ex	cam	
E	cove	Complete circle (Fogged. Two pieces saved)	1		B&J	f/11	½	Cirkut	
	E	SE	2	SeedL Ortho	Goerz	"	1/30	Goerz	
	E	SW	3	"	"	"	"	"	
	E	NW	4	"	"	"	"	"	
	E	N	5	"	"	"	"	"	

T.A.J.

1917, Aug. 10.

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10 Aug., 1917.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Aug. 11, 1917.
Monday " 13, "
Tuesday " 14, "

Aug. 11.
2:15 p.m. From NE side.
NE and S grottoes boiling and rumbling. Travelling fountains following each other going along with the stream.
2:55 p.m. E station.
Lava down about 15 feet all around.. Fall of rock from middle island into channel started many fountains. Many large fountains in N arm. Fumes thin.

Aug. 13.
2:45 p.m. E station.
Lake low. Many fountains in channel. Activity in S and SE grottoes which were noisy.
3:50 p.m. From NE bench.
Block fell from N point of middle crag and started fountains in west arm.
4:30 p.m. NE side.
Avalanche from under E station.

Alex.

Aug. 14.
12:30 p.m. Lake very little changed. Level 5 feet below new bench of E cove. High and appears rising. Fumes rather thin. No fresh overflows. SE dome high and sulphur stained, active grotto within, brown dusty fume rising from crevasse above. Streaming from SW and NW to SE. Peninsula in SW cove unchanged. Seen from NE, the E island mass now appears low relative to central crag mass.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Aug. 15, 1917.
Thursday " 16, "
Friday " 17, "
Saturday " 18, "

Aug. 15.
1:10 p.m. E station.
SE grotto still domed over and active within. Lava rising slowly. S grotto noisy and active.
2:00 p.m. S station.
Many fountains in SE arm with activity in E cove.
2:15 p.m. W station.
N cove very active but cove under E island quiet.
2:30 p.m. SW station.
A cone could be seen on the SW side of the E island close to the NE bench. An active dome on W side of the E island.

Aug. 16.
1:25 p.m. From NE side.
Lake low. SE grotto quiet and no fountains anywhere. Fumes thin.
2:20 p.m. E station.
Lava has risen 3 feet since arrival and is still rising.
S grotto active but lake quiet everywhere else.
2:30 p.m. Rock fall from middle crag which started a few fountains in channel. Soon after there was a fall from point of middle crag into N arm.

Aug. 17.
1:35 p.m. N station.
Lava about 15 feet below the W bench and lake very quiet.
Fumes getting thicker, especially from N smoke hole.
1:45 p.m. NE station.
SE and S grottoes active. Slow streaming through channel.
No central fountains to be seen anywhere.

Alex.

Aug. 18.
10:00 a.m. Lake and crags in general lower, especially E island mass which has subsided and crumbled and the N arm now visible over its top from SE. Innermost spatter 5 feet high. W bench 8 to 10 feet high. SE cove bench 10 to 12 feet high. Heavy curtain across SE dome; SE grotto active; fountaining along W cove shore. Streaming from N swift into SW cove and slow to SE cove. Six or eight fountains. Glowing, fuming sulphur crack top of bench N base of spine. Looks as tho fall would soon occur. N pit bigger and lower, V-shaped in plan. Old crag mass a little lower? Noise plash, crusts medium. Four terraced levels on N side peninsula in SW cove. Strong slope to northward to recent bench levels of old NW crag. Floor from S base old crag mass to SW side SW cove rises from 5 ft. above lake to 15 ft. above lake. Smoke SE cove, central crag, S crag, peninsula in SW cove, W cone, W talus, E base crag mass, N bench, NW table, N talus. General period of stagnation and very slow sinking.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Saturday Date Aug. 18, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10 a.m.	SE	N	0					
	E	N	0					
	SE	Lake central penin.	48 6	17 9	+6			
	E	ditto	76 5					
	SE	Summit E island	22 18	7 53	+6			
	E	ditto	47 10					
	SE	Summit central crag	54 31	4 45	+6			
	E	ditto	72 51					

			no	pl	scr	stop	ex	cam
10 a.m.	SE	Narrows	1		8x	f/11	1/2	5x7
	E of SE.	NW	2		"	"	"	"
	E	S mass	3		"	"	"	"
	E	W cone	4		"	"	"	"
	E	N pit	5		"	"	"	"
	NE	SE dome	6		"	"	"	"

T.A.J.

1917, Aug. 18.



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18 Aug. 1917.



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1917, Aug. 18



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JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date Aug. 19, 1917.
Monday " 20, "
Tuesday " 21, "
Wednesday " 22, "

Aug. 19.
2:30 p.m. From NE side.
Lava 15 feet down on W side, very active in grotto under big crag and many fountains in N arm.
2:45 p.m. E station.
Big block of S bench fell starting many fountains. A little later a fall from SE bench and several small ones from NE bench and from E island.

Aug. 20.
1:55 p.m. From NE side.
Fall from SE side of large crag, causing fountains. A few fountains W part of main lake, in channel and S grotto is active. SE grotto boiling and rumbling. NW cone blowing. Fumes thick.
2:20 p.m. E station.
A long block from NW bench fell; scaling off from flat crag on N side.
2:40 p.m. SE station.
NE grotto throwing lava far out on floor; E grotto noisy. Slow rising in progress.

Aug. 21.
2:00 p.m. From N side.
No fountains to be seen in main lake. Thick fumes NW.
2:10 p.m. Several fountains in SE arm. S and SE grottoes boiling and rumbling very loudly. Blue fumes thick on S bench.
2:45 p.m. SE station.
SE sinkhole very active as was the NE grotto, throwing out lava with much noise.
6:35 p.m. E station.
Fall from N side middle crag into channel causing many fountains.

Aug. 22.
2:00 p.m. E station.
N lake very quiet. In SE arm, S and SE grottoes active but no central fountains.
3:20 p.m. SE grotto collapsed and shortly after there was a large slide from the E bench which stirred things up in E grotto.

Alex.

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Thursday Date Aug. 23, 1917.
Friday " 24, "
Saturday " 25, "
Sunday " 26, "

Aug. 23.
2:05 p.m. NE station.
N lake very quiet. Activity in S and SE grottoes.
2:10 p.m. E station.
Rock slide from E wall of pit carrying down some large bowlders. Lava about 10,feet below the bench of the E island.
Quiet everywhere.

Aug. 24.
2:20 p.m. From NE side.
Lava level with the W bench. Many fountains in N lake. Fresh overflow lava on NW floor. Fumes thick N.
2:35 p.m. From E station.
S, SE and NE grottoes very active and noisy.
3:10 p.m. Subsidence of about 5 feet. Fall from flat crag N side of N arm which started many fountains.

Aug. 25.
2:05 p.m. NE side.
Moderate fumes. Height of lake about the same as yesterday.
Active SE arm and quiet in N arm.
2:20 p.m. E station.
Rapid streaming through channel to SE sinkhole. SE and S grottoes very active. NE grotto quiet. Lava rising slowly.

Aug. 26.
1:15 p.m. NE side.
No change to be noted from here. N lake quiet. Fumes thin N.
1:40 p.m. E station.
Rock falls from E island and middle crag. Lava sank about 10 feet in ten minutes, remained at the same level for half an hour then began to rise until at 4 p.m. it was level with bench of E island. At 4:10 it overflowed a little.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Aug. 27, 1917.

2:10 p.m. NE station.
In N arm lava about 5 feet below bench. Few fountains there. Smoke N thinner. A great deal of the NW side of the E island and of the middle crag have fallen off.

2:20 p.m. E station.
SE and S grottoes very active. Could hear occasional faint blowing from NW cone.

Alex.

From 11:30 p.m. through the night.
Lake shows no great changes. NW cone glowing. Big flaming chimney 25 feet above lake in central spire. This chimney flamed from 11:30 p.m. to 2 a.m. because border fountain below pounded bank N side of spire. When the fountain ceased flame died out and chimney became dull red. When fountain began again flame began and interior chimney gradually acquired yellow glow. The flaming gas pressure in chimney was directly dependent on fountaining at base of the crack which led to chimney; i.e. combustion with a draft as at the base of a furnace stack was set up by the fountain; sulphur vapor was heated to combustion point; and oxygen was supplied by the inrush and the increased convection. The dependence of flame on the local fountain 25 feet below was proved by several distinct occasions.
The changes during night not great. Occasional cracking and foundering general. Mostly crusted and quiet SW; streaming N and SE. Occasional glow seen SW. Fountains E and SE, S grotto with stalactites, fountains NE and E base of old crag mass. Small second chimney 15 feet above lake on E side of central spire. Apparently the fissure feeding the two chimneys with "blow-piping" gases is a crack back of the veneer of spatter on NE aspect of lower part of spire. Occasional bright fountaining N corner of lake.
Fluctuations of height very slight during six hours to 5:30 a.m.
Beautiful coloring of lake, benches and fumes during transitions at dawn.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Aug. 28, 1917.
Wednesday " 29, "

Aug. 28.
4:15 p.m. Lake much the same. Blowing and plashing -- four or five fountains. S and SE grottoes with stalactites. Blue hot fume from central chimneys. Blistered skins. Rather rapid SE streaming out from SW and N. Hot fume rising from E grotto. Crust cracking -- crunching noises. Streaming from NW arm to N bank.

Aug. 29.
11:00 a.m. Lake higher and rising. Level with rampart W cove. Streaming radial from center to SW, to N and to SE. Central fountain, two fountaining grottoes SE, fountain E cove, fountain S grotto, fountain N side of E island mass, fountains SW cove and fountains N bank. New dome building SE. Inner bench at central chasm two feet above lake. Fumes less. Central spire chimney glowing and fuming.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Aug. 28, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
Aug. 28.									
4;15 p	SE	N	0						
	E	N	0						
	SE	Lake central peninsula	45 7	15 51	-3	392	111		
	E	ditto	72 45						
	SE	Summit central crag	54 48	4 18	-3	494	37		
	E	ditto	73 10						

Central crag 74 feet above lake
Depression of lake 111 feet.

			no	pl	scr	stop	ex	cam	
Aug. 29.									
				new 2¼"			no		
11a.m.	E cove. Channel		1	film	3x	f/10	vane	A V	X
	E talus. SE cove		2	"	"	"	"	"	X
	NE high floor to SE		3	"	"	"	"	"	
	Summit NE peak to center lake		4	"	"	"	"	"	X

T.A.J.

1917, Aug 29

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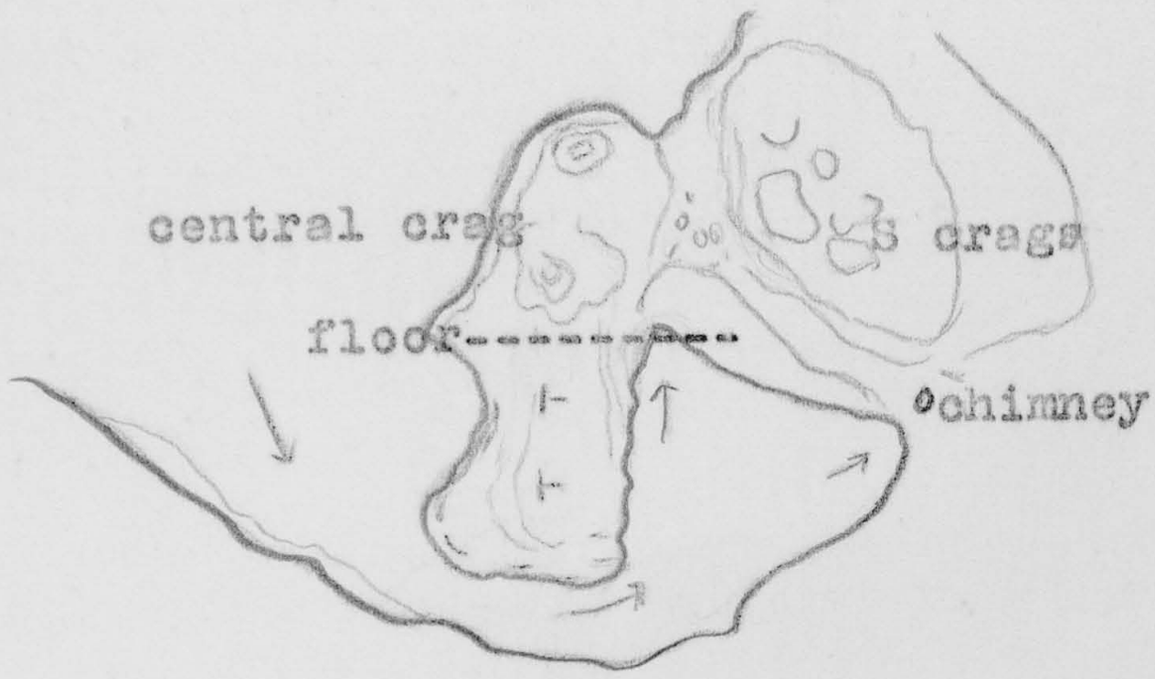
Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Thursday Date Aug. 30, 1917.

5 to 7 p.m. Lake same, high and active. Six to eight fountains. Streaming from N to W bank and to SE. Hissing gas pressure steady at NW cone. New sulphur cone on bank E cove. Hissing and pounding O.F. grotto. Crack and founder episode with bubble fountaining at NW cove. Fountaining at 5:30 p.m. against SW bank seen from NW. Streaming into SW arm. Puff and plash dominant noise. Central crags and SW peninsula very high as seen from NW.
Seen from W niche, the old crag mass summit well below W shelf. Chimney in end SW arm 10 feet above lake. Grotto at SW tunnel.

Shape of SW cove as seen from W:-



Great central crag like early Moses' picture of 1910 island.

Central crag from W:-



Glow in summit sulphurous driblet heap at NW cone.
Much sulphur stain and sulphur odor at great WSW crevasse upper edge Halemaumau. Increased heat and sulphur and alum marked at solfataric patch E of SW station, (at bridge over channel).
Sunken S valley, ridge from it to S crags, very marked as seen from SSW. SW cove has been extending eastward and is wider at its inner end where it merges with central chasm.
Banks of Pele's hair S and SE.
Note all around an annular valley, and central uplift.
Flame crack above S grotto. Flames SE grotto and central chimney. Fountaining N bank.
Streaming very sluggish.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Aug. 31, 1917.

10:00 a.m. Lake high. Spatter grottoes building. Hissing inner end SW cove as well as at NW cone.
Fumes thin.
SW cove stagnant. Streaming to southeast. Usual chimneys and grottoes. Falls of rock from N face central crag mass occasionally.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Friday Date Aug. 31, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
10a.m.	SE	Lake	1	W P	8x	f/11.5	½	5x7	
	WSW	Central crag mass	2	"	"	"	"	"	
	"	Old crag mass	3	"	"	"	"	"	
	W height	SW cove	4	"	"	"	"	"	
	N side)								
	W niche)	Central crags	5	"	"	"	"	"	
	N	Center pit	6	"	"	"	"	"	

T.A.J.

1917. aug. 31



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31 Aug., 1917.

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1917, Aug. 31.



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6

Jag

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Sept. 1, 1917.
Sunday " 2, "
Monday " 3, "

Sept. 1.
1:45 p.m. E station.
Lava rising slowly. Grotto on SE side of central crag and S grotto active and noisy. N side of pit obscured by thick smoke. N lake very quiet.
2:00 p.m. SE station.
SE grotto very active; rumbling loudly.

Sept. 2.
2:15 p.m. NE station.
N arm active with many large fountains. Fumes thick there.
W grotto active.
2:35 p.m. E station.
S and SE grottoes boiling and rumbling. Lava slowly rising.
Streaming rapidly through channel.
3:00 p.m. SE station.
About fifteen fountains in action at once in N arm and SE arm. Dome formed over NE grotto from which sparks occasionally fly.

Alex.

5 to 7 p.m. Lake higher. Puffing glow cone on bank at E cove; inrush under it on lake shore beside it.
Fumes thinner.
Lake quite accessible at E cove, men making specimens.
Dull glow central chimney. Hot chimney over S grotto.

T.A.J.

Sept. 3.
2 to 4 p.m. Descended to E floor.
Cone in E cove dark red glow, no gas pressure, spatter on it and stalactites within it, much like the worm stalactites.
Other features same as usual. Streaming to SE. Lake level 4 feet below bank at E cove. Curtained grottoes.
Fumes moderate.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Sept. 5, 1917.
Thursday " 6, "
Friday " 7, "

Sept. 5.
2:00 p.m. NE station.
Lava low in both lakes. Grotto on SE side of central crag active and many fountains in N arm.

2:10 p.m. E station.
Lava still sinking slowly. S and SE grottoes active.

2:50 p.m. Block from point of S bench fell starting many fountains. Soon after there was a fall from central crag.

Sept. 6.
2:05 p.m. NE station.
W lake very quiet. Lava rising, is nearly level with W bench on the W side and is level with NW bench.

2:30 p.m. SE station.
Fresh thick flow could be seen on E side of E island. NE grotto throwing lava spray quite a distance out on surface of lake. SE grotto boiling and rumbling.

Alex.

3:00 p.m. Lake high. One foot from overflow at NW, W and E. Fresh overflows NW, W and E. Seven to eight fountains. Streaming out from SW and NW to SE and to N. Fumes thin. Highest central crag appears higher, steeple crag lower. Fresh overflow central chasm. Chimney over S grotto bright, chimney central steeple dark. E cove sulphur cone buried under fresh flows. Spatter heaps S, SE and E and under old crag mass.

T.A.J.

Sept. 7.
3:15 p.m. Overflow bench about 3 feet high. Four or five fountains. Streaming N and SE out from NW and SW. Central crag higher. Curtained grottoes S and SE. Half domes of spatter at central chasm and E cove. Fountaining NE, N, S and SE and E side of old crag mass. Chimneys fuming but not glowing by daylight. Crusts hot, blistered and rapid SE channel. Occasional fountain E cove. Lake hot. NW, old crag mass and E island crags appear unchanged. No fresh overflows discernible.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Sept. 7, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:15p	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	45 7	14 48	0	394	104	
	E	ditto	72 38	13 44	+4			
	SE	Central crag	55 7	3 28	0	493	30	
	E	ditto	73 25	3 41	+4			
	SE	Old crag mass	42 43	4 21	0	892	66	
	E	ditto	49 8	4 45	+4	866	72	

Lake depression 104 feet.
Height central crag 74 feet.
" old crag mass 38 "

no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Saturday Date Sept. 8, 1917.
Sunday " 9, "
Monday " 10, "

Sept. 8.
2:20 p.m. E station.
Lava rising fast. Six feet below bench of E island. SE grotto very active, as is also the S grotto. New and active grotto between central crag and S bench; it has a high dome over it. Fumes rather thick.
3:05 p.m. Descended to lower floor. E grotto shooting out lava across the surface of lake.

Sept. 9.
1:00 p.m. NE station.
Lava about 5 feet below bench surrounding both parts of lake and is rising slowly. Fumes rather thin. Many fountains in N arm.

Alex.

5 to 7 p.m. Lake 8 to 10 feet below inner bench. Activity moderate. Occasional breaking up with increased fountaining. Spatter grotto E end SE arm and at E cove. Usual grottoes and occasional central fountains, and fountains along E bank. Glow in S and central chimneys, latter less. Streaming as usual. Smoke moderate.

T.A.J.

Sept. 10.
2:30 p.m. E-W crack across E cove floor.
Lake 8 feet below inner bench. Six or seven fountains. Streaming to N, to SE and to SW. Two active grottoes SE cove, one S bench, one W, one E, one NW; others N and SW. Current to SE moderate. Smoke moderate. Much spatter building. Sulphur at orifice central chimney. Central crag mass appears above May shelf level. E island mass appears to have wall developing facing NE on side of chasm separating it from NE floor.
Wall at W side SE cove has broken in and large yellow sulphur patch on floor above.
Bank SE cove opposite SE valley only 3 feet high. Bank at point of E cove only 3 feet high. E and central blocks rising in center of pit, down away from center.

T.A.J.

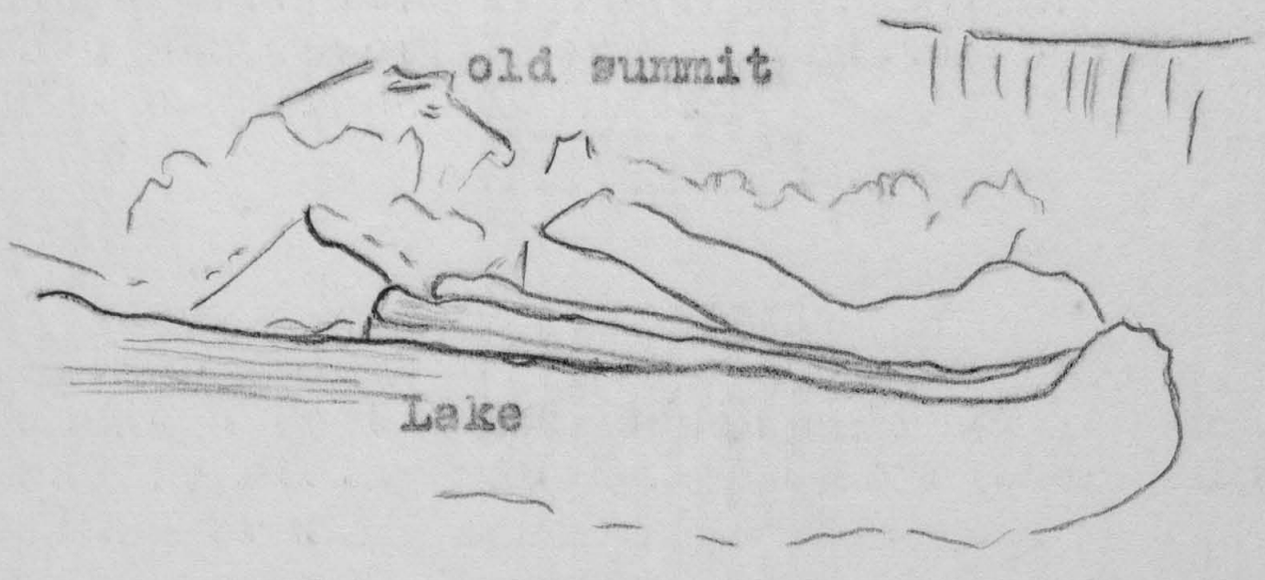
Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Tuesday Date Sept. 11, 1917.
Wednesday " 12, "
Thursday " 13, "

Sept. 11.
3:15 p.m. No change. Central region quiet. Streaming to SE. Four grottoes visible from NE. Fume moderate. Old crag mass has two uplift benches on lake side, both inclined N by 30° with a ten-foot terrace of fresh spatter bench between them which slopes slightly N; thus:-



Old crag mass from NE.

T.A.J.

Sept. 12.
2:50 p.m. E station.
Activity in both arms. Many fountains in NW arm. Lava 8 or 10 feet below banks on all sides. Fumes thick N.
3:05 p.m. SE station.
Great activity in all the grottoes. About ten fountains at one time. Lava beginning to rise slowly.
5:50 p.m. SE station.
Two falls of rock from E island in quick sucession. Many large bowlders roll dwon from top of E island. This was followed at 6 p.m. by a fall from point of S bench into the channel.

Sept. 13.
2:30 p.m. NE station.
Lava 10 feet below bench. A few fountains in N arm and one large fountain in SW arm. Grotto on SE side of central crag very active.
3:10 p.m. SE arm broke up with many large fountains. NE grotto active but S grotto quiet.

Alex.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date Sept. 14, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:30p	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	49 8	14 22	0			
	E	ditto	75 29					
	SE	Central crag summit	55 34	2 55	0			
	E	ditto	73 47					
							T.A.J.	

			no	pl	scr	stop	ex	cam	

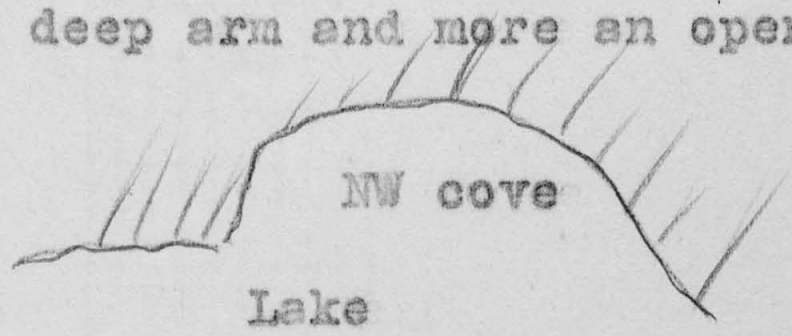
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Sept. 14, 1917.
Saturday " 15, "

Sept. 14.
3:30 p.m. Lake very high. Brimming SE cove. High shore cone with glowing chimney W. Crumbling of NE chasm from E cove to N cove and rise of lake now brings N cove in full view from SE. Wind SE helps this. Old NW crag mass appears more drowned by recent rises.

3:40 p.m. Crust across channel, cracking and foundering center and N. Fresh overflow in E cove. SE grotto quiet and SE cove crusted. Streaming in wide zone SE from channel. S grotto and E grotto, W and NW, splashing. Also NE. Fountaining in SW arm seen from E through central chasm. Fresh tumble makes cape under middle of central crag mass on shore of channel.
NW cove is less a deep arm and more an open bight.



Heavy bombardment E. Hot chimney over S grotto.
Streaming eastward in SW cove and fountain against S bank.

T.A.J.

Sept. 15.
2:30 p.m. NE station.
Lava level with NW bench. Grotto on SE side of central crag very active. No fountains in N arm. Rising in progress.

3:00 p.m. Lava sank about 5 feet all around. This subsidence was accompanied by many large fountains in both sides of lake and active grottoes.

Alex.

8 to 9 p.m. Lake high. Fountains mostly SE, W and N. Occasional outbreaks of grottoes SW and NE. Flaming W and S chimneys, dull glow 20 feet above lake E corner of steeple. N and W crusted. Streaming SE. Vigorous fountaining E and SE. Occasional very high spray from migratory central fountain E end SE arm. Rising and falling slight.
Crack and founder W and NW occasinally.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date Sept. 16, 1917.
Monday " 17, "

Sept. 16.
5 to 7 p.m. Lake unchanged. Five feet down E cove. Three feet overhang rim all around. Stalactites. Streaming N, SW and SE. In SW cove streaming from E and W, to S bank. Flaming filagree cone over E grotto, cone over SE grotto, high spatter overhang and long flaming chimney above, over S grotto, similar over W grotto, horseshoe cone at NE cove. NW cove very shallow in plan, apparently inner part all a solid floor now. Occasional violent longshore bombardment E and SW. Cone at E cove with activity within which produces pulsations and heaving outside. Sliding heavy crusts move over each other in N arm, moving southward. N pit is deep with convergent talus. NW table heavily covered with Pele's hair like SE and S shelf.

T.A.J.

Sept. 17.
2:15 p.m. NE station.
Lava level with NW bench and rising. W grotto active.
Wind from S.
2:30 p.m. E station.
SE grotto very active, the only place in SE arm. Fumes about the same.
3:00 p.m. E station.
Lava overflowing NW bench. It rose a foot above the E bench but was kept from overflowing by its rampart of piled up crusts. It remained in this condition almost an hour when the lake sank 5 feet on all sides, with central and grotto fountains.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Sept. 18, 1917.

3:45 p.m. From NE.
Condition of balance or stagnation which has been in progress with little change for many weeks, continues. There is remarkably little difference in condition. Three or four long spatter domes E. E ones spurting high with puffing noise. Festoon belt streaming from channel to SE. Channel and central region crusted. Smoke N edge lake dense. Cracking and foundering crust in N arm. Fresh overflows apparently, and brimming edge of lake, on NW. Fountains on bank NW, NE and SW. Streaming inward to SW arm. S grotto closed in, heaving inside so as to keep a billows-like wavy motion going in the crust outside; ragged heavily flaming glow crevasses 10 to 15 feet above in S bench. Fumes thin except N, NW and W.
In general the condition is a high lake, with puffing constructional activity on all sides on the margins, stagnant crust on the conduit sides (W and NW), more or less shore bombardment in other directions. No central fountains seen. The eastern and SE domes are shiftingly very noisy with gas pressure.
The E island mass is rising highest again at its SE end. The central crag mass is highest in the middle. The old NW crag mass appears definitely subsiding on its N side, hence the flooding and building out of the NW cove floor. The NW table is tilted strongly east and summit remains slightly below the May bench level. The NE floor and SE shelf have not shifted for a long time. The W and NW cone localities have lately changed very little. No perceptible changes in E cove, bank there only 2 to 3 feet above the lake.
S chimneys occasionally spurt and puff noisily with spraying and high gas pressure.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Sept. 19, 1917.
Friday " 21, "

Sept. 19.
5 to 6 p.m. Lake brimming at SE and NW, 3 to 4 feet below E cove bank. Recent fresh overflow margin SE cove. Spurting crack over SE dome. Heavy fountaining breaks out occasionally center of channel leading from SE arm to SE cove and migrates to W bank of SE cove. Other outbreaks, showing release of gas pressure, E cove and S grotto. Large balloons constantly forming by inflation of surface crust, S of bright line, at S edge of surface flow zone in SE arm, in stagnant crust between the flow zone and the S grotto. Latter closed in by spatter, flaming chimney above. The ballons swelled to heights of 4 or 5 feet and formed in series of five or six large folds or blisters sometimes 10 to 20 feet long. They would swell until they extended themselves lengthwise to the "bright line", where the gas would escape as the crust lifted clear of the incandescent fluid and the bubble would then collapse.
Until 5:30 p.m. action quiet, N arm heavily crusted. Fume N rather dense. Occasional slight activity W grotto. Broad flow zone to SE from bright line at edge of a dark crust across central channel. Central crag mass appears very high. Fountaining E and SE.
At 5:30 p.m. general cracking, foundering and subsidence about two feet. Bubble fountains in abundance, evolution of heat and gas.

Sept. 21.
2:30 p.m. Lake 5 feet below bench SE cove, 8 feet below at E cove. Bombardment S and SE. Streaming rapid SE. Thin crusts blistered. Very hot radiation. Smoke moderate. N and W crusted. Central crag very high. Occasional heavy bombardment under central steeple. Large spatter curtain at S grotto fell in.
General appearance subsidence or central lift of crags. Streaming through channel in blocks, not in festooned flow zone. Central fountains channel and SE arm. Noise rumble. Fountains rather heavy fluid, not much gas spurting. Occasional large central fountain SE cove.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Sept. 21, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
2:30p	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	47 47	14 05	-10	384	97	
	E	ditto	74 24					
	SE	Summit central crag	55 43	2 14	-12	492	21	
	E	ditto	73 56					
	SE	Overflow level SE cove	86 53	18 27	-11	284	96	
	E	ditto	105 00					
	SE	Summit S crag	65 37	4 44	-11	512	44	
	E	ditto	80 37					
	SE	Summit old crag mass	42 34	3 47	-11	893	60	
	E	ditto	49 7					
	SE	W summit E isl. mass	32 54	5 11	-11	535	10	
	E	ditto	52 30					
	SE	E summit " " "	21 29	5 51	-13	462	49	
	E	ditto	47 00					
	SE	Summit NW table	21 33	2 20	-12	1,003	44	
	E	ditto	24 59					
	SE	Bowlder NE floor	-15 7	9 39	-10	492	85	
	E	ditto	- 6 4					
	SE	Bowlder S valley	94 9	12 18	-11	439	97	
	E	ditto	102 40					
	SE	Cliff summit N smoke	12 11	4 0	-12	847	61	
	E	ditto	17 36					

Lake depression..... 97 feet.
SE cove depression..... 94 "
Central crag above lake 76 "

Rise lake since Sept. 7 (14 days) 7 feet -- ½ ft. per day.
" central crag since Sept. 7 -- 2 feet.

			no	pl	scr	stop	ex	cam
	SE	E island mass	1		8x	f/11	½	6x7
E	of SE	Channel	2		"	"	"	"
	E	S mass	3		"	"	"	"
	ENE	NW table	4		"	"	"	"
	"	Central crags	5		"	"	"	"
	NE	SE cove	6		"	"	"	"

Brilliant.

T.A.J.



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2

21 Sept., 1917.



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4

1917, Sept. 2



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6

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Sept. 22, 1917.
Monday " 24, "
Tuesday " 25, "
Wednesday " 26, "
Thursday " 27, "

Sept. 22.
4:30 to 5 p.m. From NE.
Lake high and brimming against definite spatter rampart in SE cove. Noise SE puff and plash. Row of half-dome grottoes along rampart. Occasional spells of rapid streaming into SE cove. Broad festoon flow zone SE from channel. Central crag very high. Blisters on lake. N and W crusted. Strong fountains W bank. Fountaining SW. Fountaining under E cliff. Much Pele's hair. S chimney glowing.
Shore SE one foot high; E cove and central chasm 3 feet high. Little change since yesterday.

Sept. 24.
1:30 p.m. Description of Sept. 22 applies. Domes SE possibly a little higher. Crust folding up and ballooning on E side of S grotto. Dome rampart across central chasm. The present rampart activity around SE arm is like that to the NE in January last. There has been lately much scaling off of the high spatter veneer on the N side of central steeple. Central crag appears no lower, however.

Sept. 25. Evening.
No change. Crater dull and inactive. Fumes denser.

Sept. 26.
2:30 to 3:30 p.m. Only noteworthy change is that lake is down about five feet. Bench over lake at E cove and central chasm about 8 feet high; 5 feet high at SE cove. S, SE and E grottoes open. N and W parts of lake crusted. Fumes not particularly thick and crags as high as ever. No signs of rock falls, but one or two cavings-in of bank of lake reported.

Sept. 27.
9:00 p.m. Overflow SE cove.

T.A.J.

402

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Friday Date Sept. 28, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:50a	SE	N	0					
	E	N	0					
	SE	Lake central peninsula	49 31	13 53	-4	380	102	
	E	ditto	76 52	12 3	-5	492	106	
	SE	W summit central crag	55 9	1 18	-4	550	13	
	E	ditto	70 52					
	SE	S floor bowlder	94 17	12 13	-4	434	93	
	E	ditto	102 53					
	SE	W summit E isl. mass	32 50	4 37	-4	536	44	
	E	ditto	52 34					
	SE	E summit " " "	21 18	5 14	-4	436	43	
	E	ditto	47 00					
	SE	Summit old crag mass	42 47	3 38	-4	894	55	
	E	ditto	49 22					

Depression overflow Sept. 27...95 ft.
" lake Sept. 28.....102 ft. (fall of 5' in 7 days)
Height central crag above lake 89 " (rise of 7' in 7 ")
" E island summit .....59 "
" old NW crag .....47 "

T.A.J.

no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Sept. 28, 1917.
Saturday " 29, "

Sept. 28.
10:50 a.m. Central crags higher. SE floor overflow 100 feet long from SE cove southwestward. Bench 6 feet high center and E, 4 feet high SE, 6 feet high W and NW. Crusted W and NW. Central migratory fountains. Streaming occasionally rapid to SE. Pounding grottoes with stalactites E and W sides of SE cove and at S bench S side SE arm. Streaming out from E cove. E crag of E island appears more broken.
Fumes thinner.

Sept. 29.
5:00 p.m. Bank of lake a little higher but everything much the same. Central crags very high. Fountains against NW crag mass. No more overflows. Large fountains in SE arm occasionally migrating to SE.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

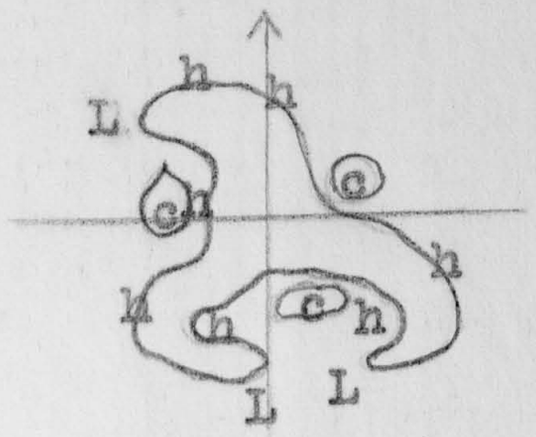
Day Monday Date Oct. 1, 1917.
Wednesday " 3, "

Oct. 1.
Noon.

New inner bench all around lake 2 feet high marking recent lift. This ledge is 5 feet below central chasm and E cove floors and 3 feet below SE rampart; 6 to 10 feet below W floor, which shows distinct upslope from SW to old crag mass; 6 to 7 feet below NW floor.
NE side E island highest block tumbling, talus slope there, rocks in motion.
Whole lake crusted except SE, N and probably SW coves.
SE arm occasionally breaks up and streams to SE. Grotto E, two SE, one S; smoke NE, N, NW, W (three places) and SW. Smoke thin crater S and SE.
Fresh overflows of recent date behind spatter rampart at N cove, where the smoke cliff of the edge of NE floor rises 30 or 40 feet above lake. Seven fountains working in N arm, central ones migrating to NE and N. Curtained grottoes NE, under NE peak and farther south opposite a crack (?) of NE chasm. Bank NW cove 6 feet high. Fresh overflows on NW floor. Pele's hair mat from the N grottoes limited to NW table; none on NW shelf. No notable changes W. Rocks in motion N talueas.

Oct. 3.
11:40 a.m.

From NE.
Fresh sulphur stain on cone E cove floor. Puffing E grotto. Deep rumble S grotto. Streaming to bank W side SE cove. Grottoes active N, NW and W. Streaming through channel SE sluggish. N and W regions crusted.
Cracking and foundering N. New inner spatter rim no longer marked. No change of level observable. NW floor appears to be subsiding under NW shelf, and large talus cone against NNW wall of pit, with its base on lower E end of NW table. Rising of crags appears to continue.



Note benches high (h) on sides of each curve; low (L) at cove ends. (c) -- crags.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory

Day Monday Date Oct. 1, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
Noon	NE	Center (Tessar lens)	1	W P	8x	f/11.3	½	P3¼x4¼	
	"	SE cove " "	2	"	"	"	"	"	
	"	N smoke " " (Bright)	3	"	"	"	"	"	
1p.m.	E of O R H)	N smoke crag(Tes.lens)	4	"	"	"	"	"	
	"	Old crag mass & W floor	5	"	"	"	"	"	
	E	Overflow of Sept.27 SE	6	"	"	"	"	"	

T.A.J.

1917, Oct. 1



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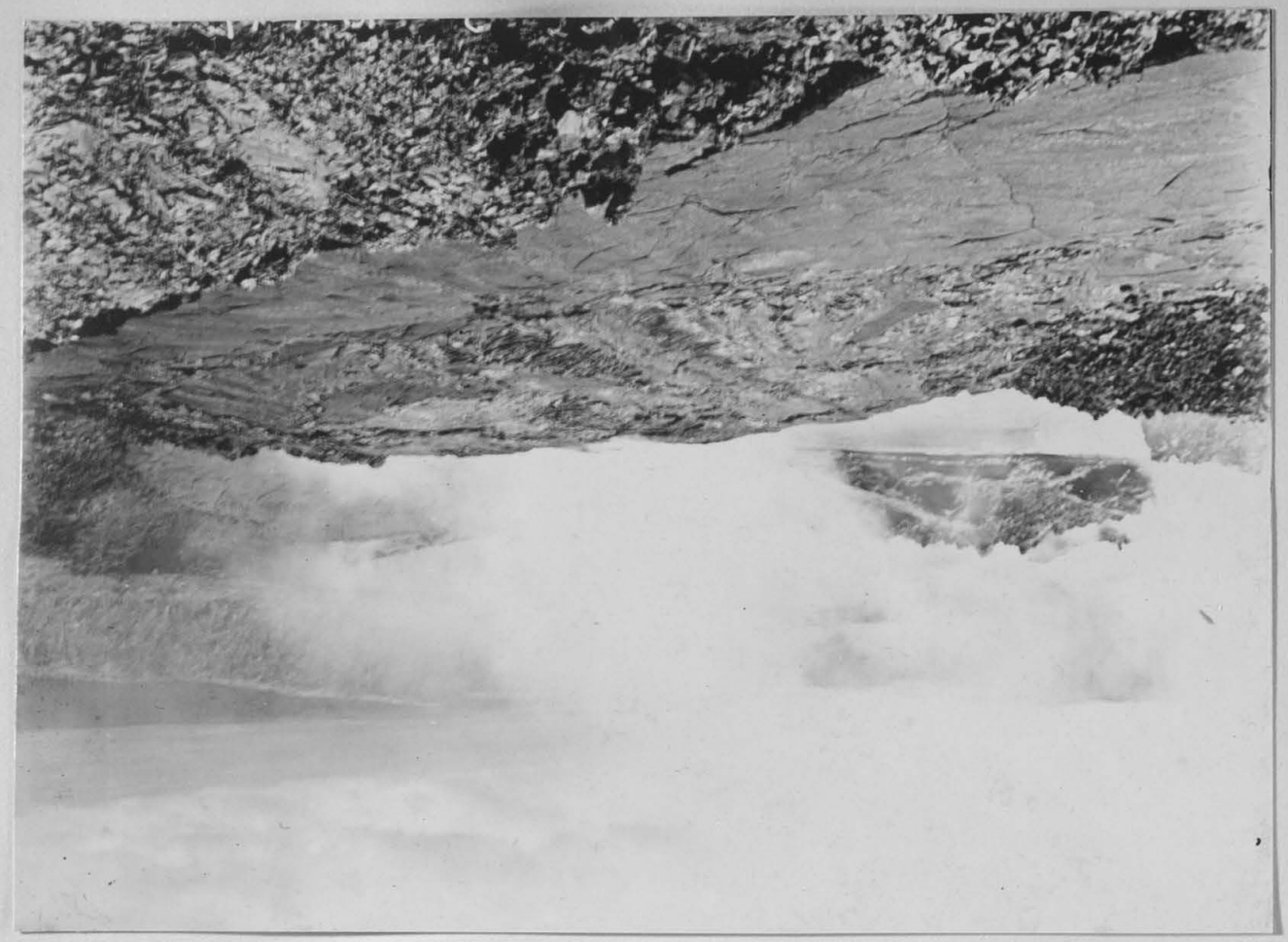

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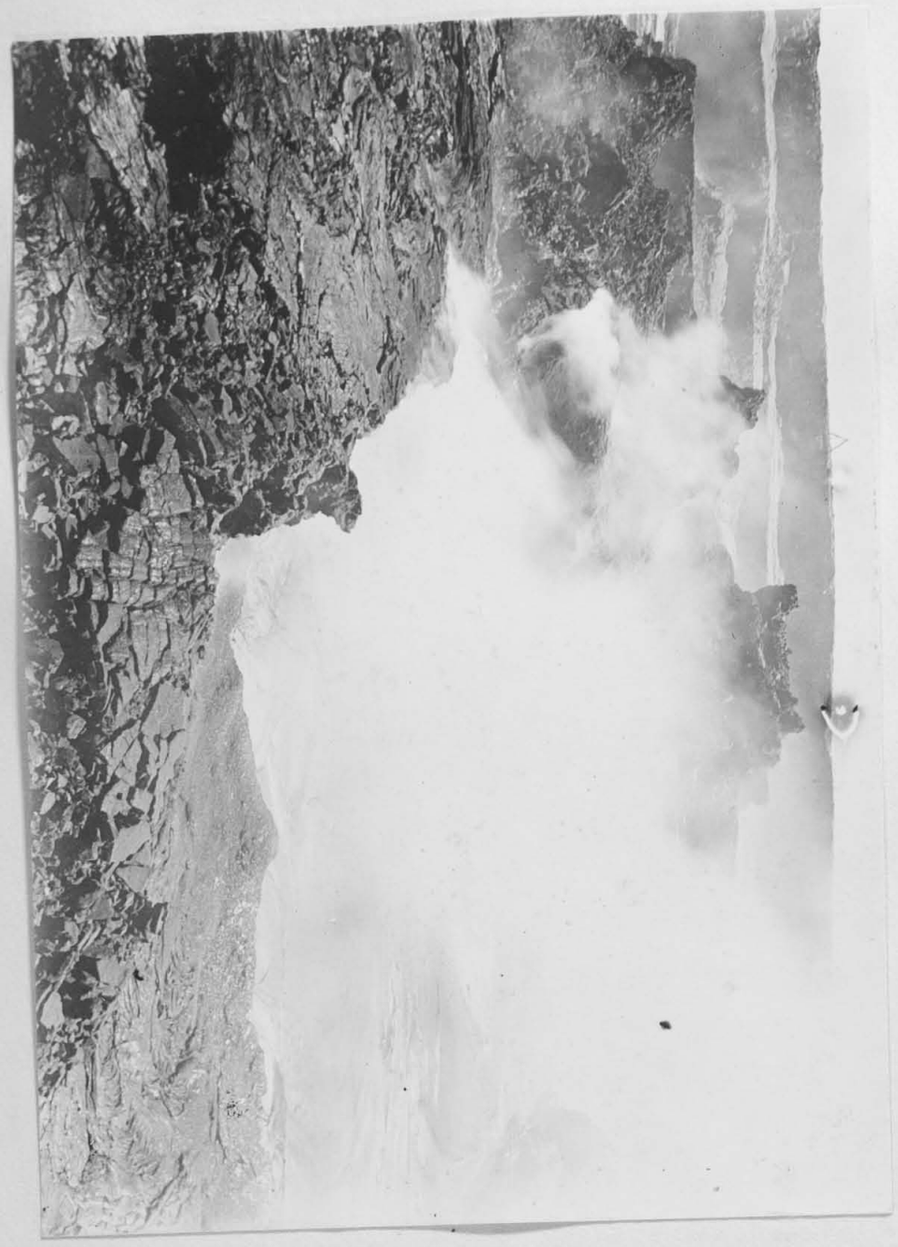
2

10 Oct. 1917.

4



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3



Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

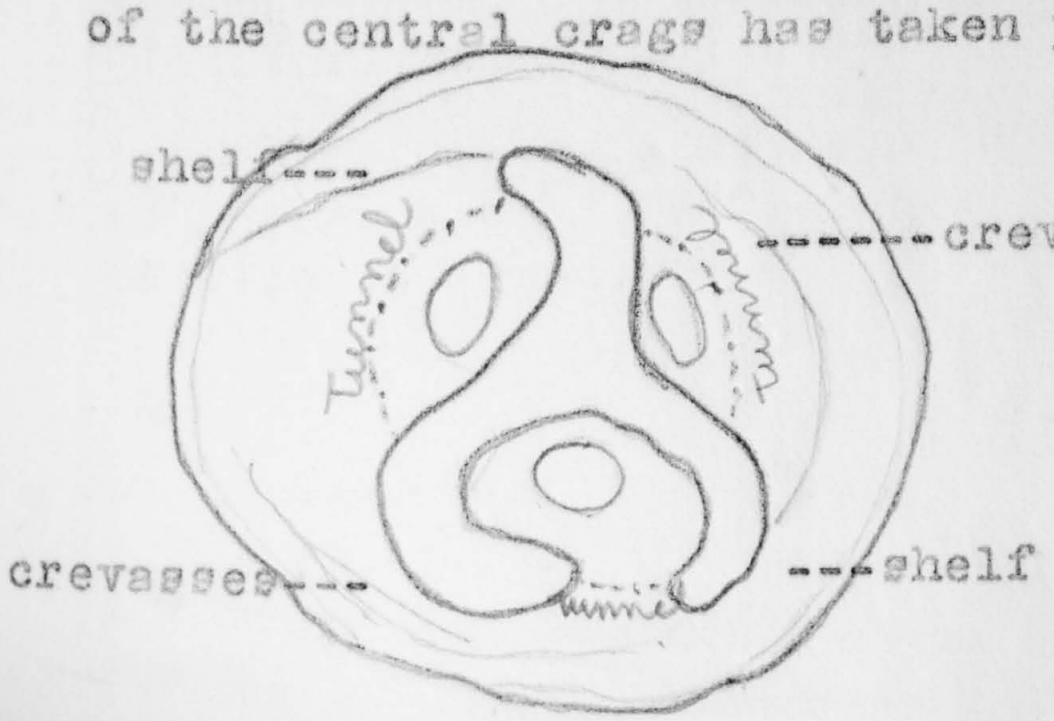
Day Friday Date Oct. 5, 1917.

11:30 a.m. On this day the bank of the lake was 3 to 5 feet high SE and at the central chasm, and about 8 feet high W and NW. About noon sharp subsidence; stalactite rim all around lake; central and migratory fountains and breaking up of crusts. Grotto rumble SE cove in curtained dome. Fierce bombardment S and W sides SE cove. S grotto open and pounding. E cove now a right angle. E cove grotto active, flaming and hung with scalloped stalactites. Descended to E cove and looked into this grotto, which opens to flaming cracks in E cone above. Central steeple chimney smoking unusually much with hot rising billows. Activity in grotto of N rampart.
There has lately been marked rising of bench over lake from E cove to SE shelf, the slope of floor to NE greatly increased and the height of cliff over lake now above the reach of spatter. At S end of this cliff the E dome broken and rifted where the rising floor has parted from the rampart nearer lake level which extends on around to the SE. The lake no longer accessible from E cove which is much shattered. The NE cove shows two active grottoes, one a filagree flaming crack, the other a rampart dome. The N and NE cliff over lake also shattered above and in one of the huge crevasses found a well leading downward which had evidently been melted out by gas heat, irregular smooth lumpy walls in somewhat spiral chimney, now cool -- an interesting evidence of the interior topography of a gas stoped vent. Walls gray and fused.



Sketch of gas well melted out on a crevasse.

Signs of fresh uplift appeared along pressure ridge S side of central crag mass block and along NE side of E island block. It is certain that pronounced movement of the central crags has taken place in last ten days.



Note in this diagram concentric tunnels between the crags in center and outer floors.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Oct. 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30a	SE	N	0					
	E	N	0					
	SE	E summit E island	21 4					
	E	ditto	47 00	6 22	0	372	41	
	SE	W summit " "	32 49					
	E	ditto	52 26	4 32	0	492	39	
	SE	Summit central crag	55 22					
	E	ditto	71 00	1 00	0	611	10	
	SE	Lake central peninsula	51 4	13 26	-5	378	91	
	E	ditto	77 53	11 41	0	448	93	

Lake depression 92' (rise of 10' in 7 days)
W summit E island 53' above lake. (rise 5')
E " " " 51' " " (rise 2')
Central crag 82' " " (rise 3' in 7 days)
(Central crag 10' below rim of pit)

W summit E island crag mass higher than E summit.
Central crag has continued to rise.

T.A.J.

no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date Oct. 7, 1917.

10:30 a.m. to 12;30 p.m. With Professor Gregory of Yale.
E and NE floor continues to rise and in last two days the chasm NE of E island mass has moved so that the floor of E cove has collapsed to a talus continuous from the ruin of E island peak to the lake shore. The sulphur stained cone of E cove has fallen in and the cliff over NE shore of SE arm is higher than ever -- apparently 30 feet high at least. There are two spatter rims at lake shore well marked at E and NW coves marking recent lake levels two and four feet above present lake.
At the NE cove, other end of NE chasm shows a similar collapse and is quite changed since Oct. 5. The fissure grotto is gone and the dome grotto is gone. In place of the former is a solfataric surface and slope of stained debris. In place of the dome is a cove crusted. There is a tumbled gulch extending through to the E cove. The whole E island crag mass is a tumble of most chaotic character, with stained and decomposed fragments, and this gulche or chasm is the fissure which bounds it on the NE; if the E island mass is breaking loose from the NE floor block through these movements of the last two days at this chasm, we may expect to see the E island mass rise and the NE floor sink.
Descended to lake shore at E cove and at SE shelf. Former place too fumy, owing to filagree fissures flaming and grotto pounding at E cove tunnel. At the E end of SE shelf there is a tumble of rocks between the shelf and the newly risen flcor block which can be followed down to the rampart at the lake edge next the E grotto. Here there was a flaming pot, and every ten to twenty minutes there was a break up of crust across SE arm and a rush of streaming SE.
The N and W regions were quiet and crusted. The N rampart grotto was closed in and rumbling. The central chimney on N side of steeple crag appeared inactive but the one on the E side was open and fuming. There appears to be no diminution in the rising of crags; the lake today appears high in the coves, especially NW where the recent overflow rims overlap in flat fashion as though the lake were quite high and the NW pond locality W of NW crag mass appears low compared with the lake level. NW, N, SW and SE the rampart building is lifting the lake, and overflow appears imminent.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Oct. 9, 1917.

Noon. Lake crusted and rising. Crags much higher; summit central crag nearly level with edge of pit.

12:20 p.m. General break up, fountains and rush to SE. Bubble fountains. Thin crusts again. New inner ledge under central crag. NW cove appears to have low shoreline. W rampart, central chasm and E cove each have benches 12 to 15 feet high; NW six to eight feet; SE five feet. S grotto deep. SE dome closed and hissing. Smoke moderate. Central chimney fuming (N side, not E).

T.A.J.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Tuesday Date Oct. 9, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam	
Noon	E	Central crag	1		8x	f/11.3	1/2	P	
	E	E island	2		"	"	"	"	
	E	SE shelf(with color transition to Pele's hair mat)	3		"	"	"	"	
								T.A.J.	

1917, Oct. 9



2



3



1

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

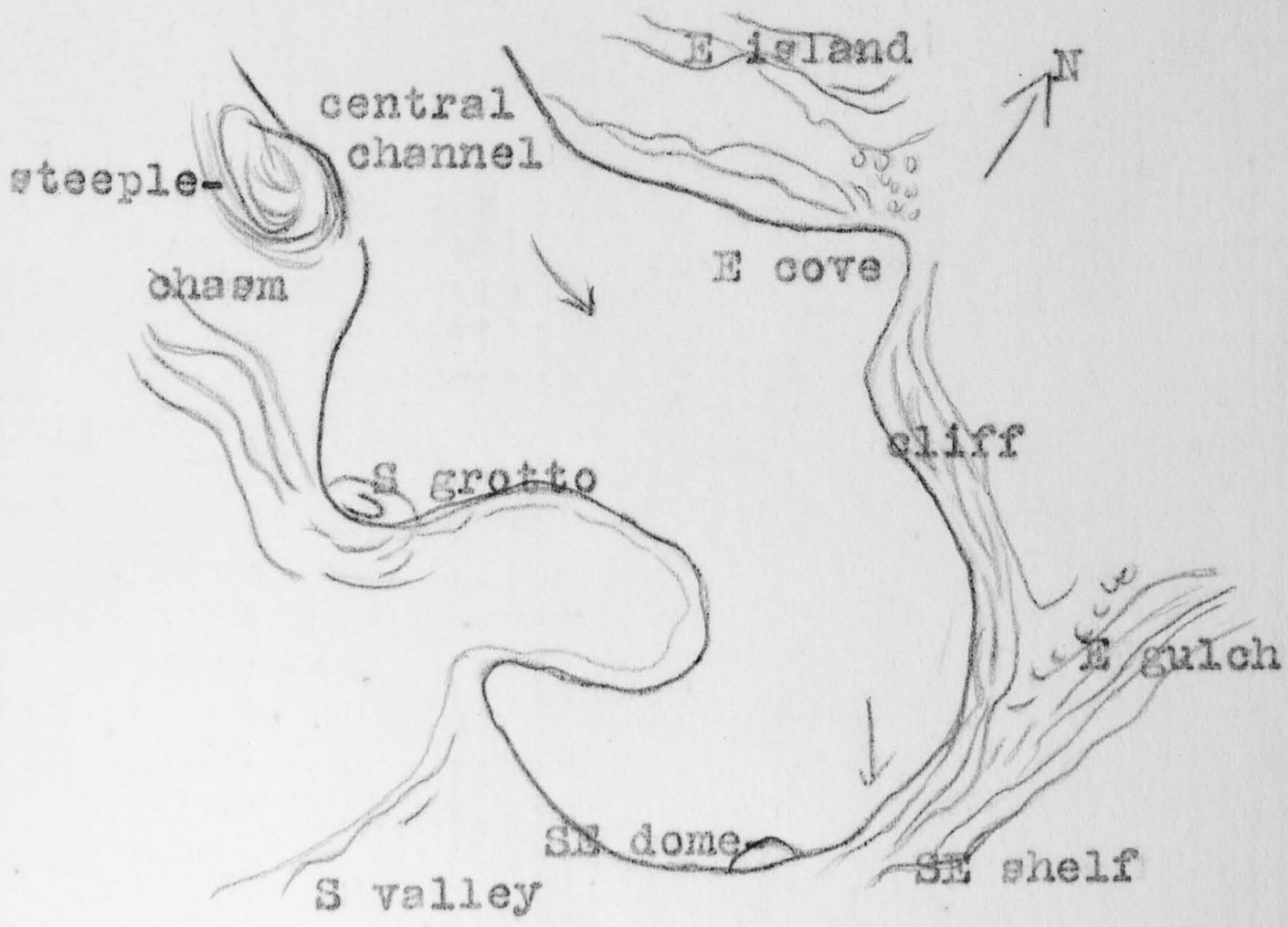
 Day Thursday Date Oct. 11, 1917.

5:00 p.m. SE and E.
Lake high with high gas pressure and much blowing and spraying at SE, S and N grottoes. Noisy puffing. Filagree cone built at SE dome emitting sheaf of reddish flame a foot wide and 8 to 10 inches long with incessant blow-pipe effect. Streaming in wide multiple-festoon zone from center SE. Yellow stain E cove and central chasm. Central steeple and central crag mass beyond both appear higher and leaning southward. Fountain at NE cove. SE rampart only one foot high. Fume thin. W cove lower bank than bank farther S. Heavy fountain spurting SW cove.

5:10 p.m. Subsidence one foot, overhang, increased fountaining. Tumbled valley at lake shore between old summit NW crag mass and N part of same appears very low with smoking rocks at lake shore. Blue fume rising from central chimney. Rampart at E gulch foot of SE shelf widened and built out in front of where grotto splashed on us on Sunday last.

5:15 p.m. Large central fountain develops and migrates slowly S with festoon zone in its wake and quiet crusted area E of it. Migrates to S grotto with high stringy flings and spray fully 50 feet high and flame. Followed by accelerated streaming from center lake curving to S grotto. Thereafter streaming resumed to SE cove. Heat great SE rim. Crusts appear thin, but blisters rare. Crevasses back of edge of E cliff over lake. Filagree chimneys above W side SE cove and above S grotto.

5:30 p.m. S station.
Heavy fall of bench from SE side of E island mass into E cove leaving red hot wall. E cove has eaten back and area of lake under SE shelf has widened so that SE arm appears larger.



Shape of SE arm.

SW arm has low smoking flats on its SW side. Shore there one to two feet high. Slope, however, is toward the lake.

5:40 p.m. SW arm quiet. The slope of uplift on S side of S crag mass has increased in height and steepness toward the west, bending into a cliff over the SW arm.
Central crag from S appears flush with opposite brink of pit.

5:50 p.m. General cracking, foundering and bubble fountaining all over center of lake followed by large fountain. Strong bombardment under SE shelf. E island mass appears to be bodily rising and W end is higher than E end. Seven fountains.

6:00 p.m. Prolonged quiet spell, whole lake heavily crusted except opposite W side SE cove (with strong blowing) and opposite N grotto. This lasted 40 minutes and was followed by release of gas pressure from under crust which broke crust SE arm with burning of long rows of blue flames, and then a great fountain explosion when the whole crust broke up.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Oct. 13, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
5:30 p	SE	N	0					
	E	N	0					
	SE	Central crag summit	55 44	10 3	-2	558	99	
	E	ditto	71 10	0 13	-7	617	3	
	SE	Eisland W summit	32 53	2 37	-3	535	25	
	E	ditto	52 41					
	SE	Lake central peninsula	47 44	12 20	-2	389	85	
	E	ditto	75 00	10 57	-10	442	87	
	SE	Middle SE grotto (level SE overflow rampart)	100 7	18 15	-2	258	85	
	E	ditto	113 4	9 33	-7	492	84	
	SE	Old summit NW crag		3 15				
	SE	" " " table		2 40?				
	SE	Summit steeple		2 1				
		Lake depression	85 feet					
		Height central crag	84 "					
		" E island crag	60 "					

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory

Day Saturday Date Oct. 13, 1917.
Monday " 15, "

Oct. 13.
5:30 p.m. Streaming to E cliff. Lake has recently risen to small overflow at SE cove (SW and NW also). Appears to be temporary subsidence now of about 5 feet making low roofed tunnels E cove, central chasm and W side SE cove. Sharp rise of central crags evident from increase of pressure ridge S valley. Long curtain before SE dome grotto. Stalactites N grotto. Quiet crusts, then cracking and foundering. Spatter margins falling in. Six or seven fountains. Large crevasse edge SE shelf over E gulch.

Oct. 15.
2:00 p.m. Lake noisily puffing and rumbling at the grottoes. Has been overflowing again slightly SE. Now down 6 feet below SE floor. High grotto SE and very large dome built on N rampart. The central steeple has collapsed to two-thirds former height and the debris occupies central chasm. E ledge appears higher and part of the overhang in front of crevasse of SE shelf appears to have fallen. Eight or ten fountains; cracking and foundering; streaming N and SE fairly swift; scattered fountains of heavy viscous fling. Smoke strong blowing from SW.

T.A.J.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Monday Date Oct. 15, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

			no	pl	scr	stop	ex	cam
2p.m.		Experiments. Ordinary film, to compare with panchromatic film.						
	Trail	to Volcano House	2				snap	Brownie
	"	" " "	3		3x(A)		1	"
	"	" " "	4		"		1/5	"
	SE	Channel	5				snap	"
	SE	S crag mass	6		"		"	"
	SE	SE shelf	7		"		1/5	"
	SE	E island mass	8				2	"
		#2 fair, 4 & 7 good, 3,5 & 8 overexposed and 6 underexposed.						
								T.A.J.

1917, Oct. 15















KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Oct. 17, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
		Panchromatic movie film.						
3:50p	Trail	Kualono	1		3x		1	Brownie
"	"	"	2		"		½	"
4:25p	Near	Schollendome with red banding	3		"		2	"
		ditto	4		"		1	"
4:45p		Half western sun and fume	5		"		snap	"
5p.m.	NE	Crags	6		"		4	
"	"	SE	7		"		2	"
"	"	Sunset	8		"		snap	"

T.A.J.

420 a

1917, Oct. 17



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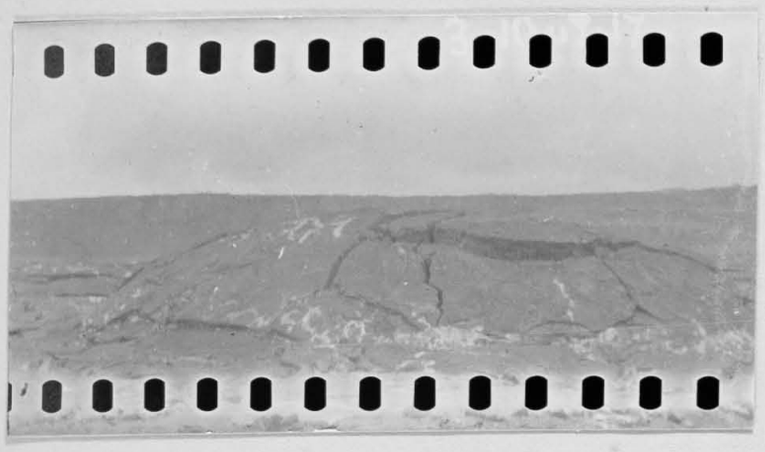
2



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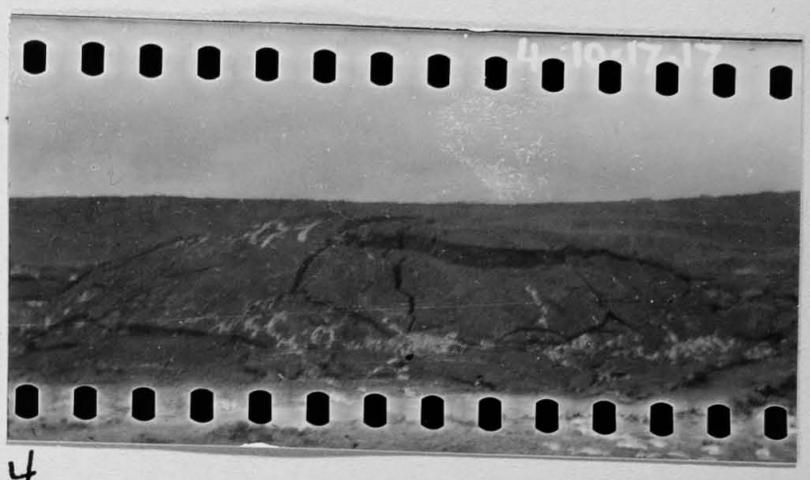

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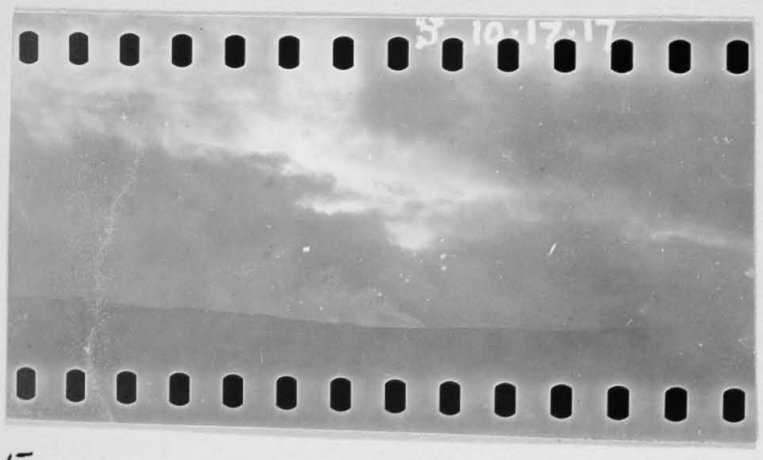

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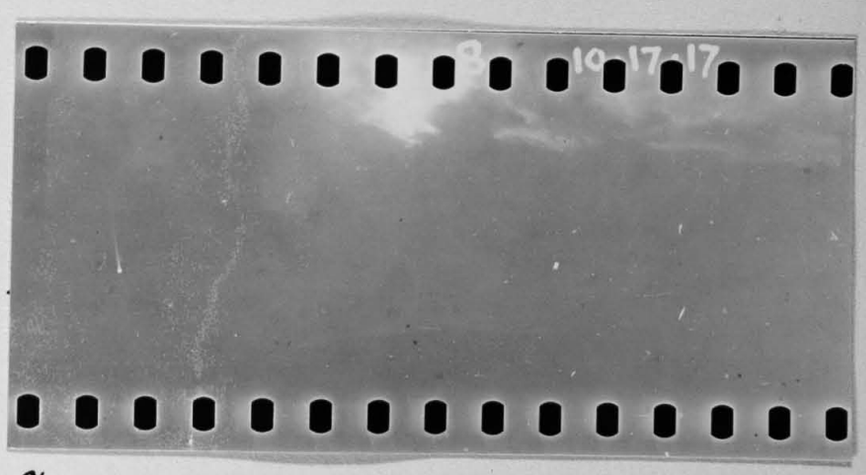

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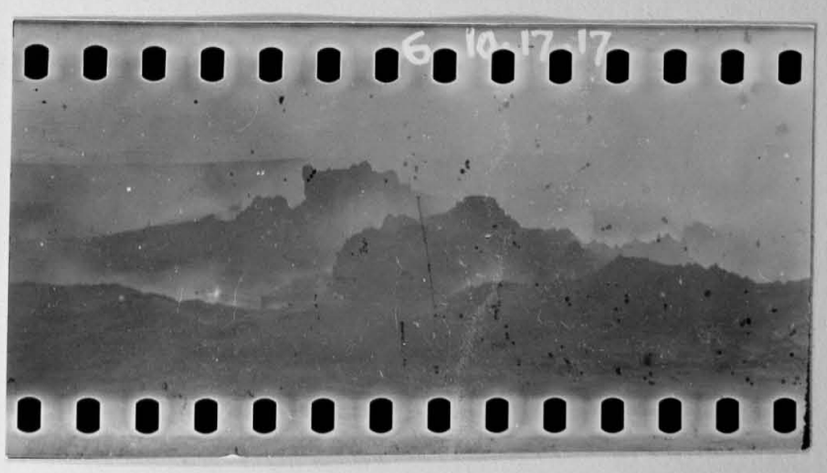

6

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Oct. 17, 1917.
Saturday " 20, "

Oct.17.
4:00 p.m. West end of NW table has collapsed, central steeple has collapsed to rugged lump and lower part of central chimney has caved away. N and S sides central chasm smoking but not the chimneys. Lake 7 feet below central chasm floor; SE rampart, however, only 2 feet high. Much smoke N, W and center. Two grottoes active SE, most of lake crusted. W bank of lake, like the E, appears rising as a crag. Much of edge of E crag (in front of former crevasse) has fallen. Heavy overhang S side central crag. Curtained dome SE. Grotto active in E cove. S crag mass appears lifting. S end of E crag crevassing at right angles to shore.

Oct. 20.
9:30 a.m. During the two days, Thursday and Friday, Oct. 18 and 19, an inportant change which has taken place as a very significant part of the general rising since the equinox is the bursting out of a vent at the W pond site and the building up of a 15-foot blowing cone there. From this cone, which occupies the same position as the W cone of Jan. 1917, there has poured out an extensive flood of piled up pahoehoe in the shape of a fan cone extending to and around the NW cone. Tongues from this flood extend all over the NW pond site and in the direction of the W cove the new lava covers an oval area extending two-thirds of the distance from the W cone to the shore.
The lake has overflowed extensively at the NW cove and the SW cove but not at the W. A pressure ridge and crevasses at right angles to shore line extend from the W cone to the shore. The SW cove has built out its shore on the S crag side so as to widen the platform and apparently narrow the pool. The NW cone is sulphur stained and decomposed, emits blue fumes but does not appear to have partaken with the W cone in the ejection of lava. There is no fresh overflow at the N cove. The central crag has continued to rise and its summit overhang on the S must soon collapse into the chasm beneath. The central steeple has continued to scale off on the S side and has resumed a lower peaked form with bright red plane walls on the S. New spatter margins of the lake stand 10 or 15 ft. above the lake in the central region, whereas at the SE cove the rampart is only 5 ft. high. At 9:30 a.m. the lake was crusted over and mostly quiet. There were occasional central fountains and activity in the curtained SE grottoes. About 10 a.m. and therefater there was cracking with foundering and multiple fountaining and subsidence. Spatter margins fell into the lake at the W side of the SE cove and at the E gulch. Rocks were heard falling at the E gulch and at the central chasm. The W cone was continuously hissing in spasms. It would appear that the region of overflow is shifting to the S and W and the region of uplift to the N and E. Quick fuming from the central chimney

T.A.J.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Saturday Date Oct. 20, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30a	SE	N	0					
	E	N	0					
	SE	Summit central crag	55 54	0 24	0	553		
	E	ditto	71 20					
	SE	Lake central peninsula	51 51	11 55	0	374	79	
	E	ditto	78 55					
	SE	W summit E isl. mass	32 51	1 57	-2	530	18	
	E	ditto	52 45					
	SE	New sum. edge NW table	19 10	1 56	-1	990	31	
	E	ditto	22 37					
	SE	Sum. remnant central steeple	50 35	2 54	0			
	E	ditto	74 43					
	SE	Sum. N peak E isl. mass	18 53	3 22	0			
	E	ditto	34 5					
	SE	Sum. E " " " "	18 43	3 36	0			
	E	ditto	44 36					
	SE	Summit NE peak	9 10	3 50	0			
	E	ditto	26 1					
	SE	Bowlder NE floor	-15 37	9 23	0			
	E	ditto	- 6 59					
	SE	Bowlder S floor	94 34	11 28	-3	4451	91	
	E	ditto	102 51					
	SE	Summit S crag	66 35	2 53	-2	579	27	
	E	ditto	81 8					
	SE	Sum. E crag bench	19 57	13 43	0	205	50	
	E	ditto	89 11					

Depression lake 79 feet
E island above lake 61 "
NW table " " 48 "
E crag bench above lake 29 "
Central crag above ground level on edge pit 9 feet.

			no	pl	scr	stop	ex	cam
		P. film on plate with emulsions.	plaster.	To compare film and plate				
9:30a	ESE	S mass	1	W P	8x	f/11	½	P
	"	" "	2	(P film (strip	"	"	"	"
	"	E "	3	W P	"	"	"	"
	"	" "	4	(P.film (strip	"	"	"	"

T.A.J.

1917, Oct. 20



3



4



1



2

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

Day Monday Date Oct. 22, 1917.

2:30 p.m. Lake low, caverns revealed W side SE cove and under central chasm and at E cove tunnel. Deep well grotto S bench and deep rampart grottoes SE and N. Grotto with stalactites N base of central crag appears to communicate with central chimney which is smoking vigorously. Streaming from crust center of lake to SE, sometimes continuous to SE tunnel, at other times curving in a circle into central tunnel. Streaming from edge of crust into E tunnel. Rocks falling E gulch. Central tunnel a pit within with a fence 2 feet high separating it from the crusted lake. Fountain down in pit throwing up spray from 5 to 6 feet below lake level. At 2:50 p.m. lake rose and overflowed the fence and cascaded continuously into the sinkhole under an overhanging dark edge hung with black stalactites.
West cone continues incessant hissing. A long block of bench SE side of E island has fallen into lake and been replaced by a new 3-foot bench of fresh lava. (Where soldiers stood in photo of Oct. 20 W of talus.)

3:10 p.m. Lake crusted after a violent bombardment at SE cove. The SE tunnel stopped action and there was rapid streaming from a bright line edge 50 feet out in SE arm, straight to the cascade sinkhole central cvaern.

3:15 p.m. Break-up begins and streaming to E. Fountaining E wall under SE shelf.
N and W appears quiet. SE rampart 6 to 8 feet high, central chasm floor 13 to 15 feet.
Smoke heavy today center, W and N. Deep rumble from cascade sinkhole. Fountains rare at present. Blue flame-fume from cascade tunnel.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Oct. 22, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		(Use Oct. 20 positions)						
2:45p	SE	Lake central peninsula		13 43	+ 9		90	
	"	Summit central crag		-0 9	+ 8		2	above h.i.
	"	Summit E island W		2 8	+ 9		18	
	"	Bowlder NE floor		9 35	+ 9			
	"	" S "		11 40	+ 7			
	"	Lake SE grotto dome		19 17	+ 7			
		Lake depression 90 feet.						
		Central crag above ground level edge of pit 7 feet						
		E island above lake 72 feet.						
		Positions of caverns revealed:-						
	SE	N	0					
	"	Central cavern cascade	55 20					
	"	Cavern W side SE cove	77 29					
	"	E cove cavern	14 29					

T.A.J.

			no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Oct. 23, 1917.

2 to 2:30 p.m. From SE the lake appears higher than yesterday measured by newer spatter line base of E island mass; withih one foot of this line. Central cavern, however, shows higher exposed arch than at time of leaving yesterday and a rampart across cascade. Glowing pit within but no spray seen. Streaming toward the rampart but no visible cascading. Appears as though central crag mass had risen bodily carrying cavern up with it. S crag mass appears to have risen especially at the E point where at entrance to SE cove large blocks of the cliff have fallen away and entire cliff from point to SE tunnel shows raw broken rock surface. SE rampart about 5 feet above lake which sank about 2 feet in the hour. Lake crust thinner and more rapidly moving and blistered. Streaming out from W and N to E and SE. Occasional central fountains in SE arm of very large size. Fountaining at dome gortto SE at 2 p.m., later during subsidence fountains at S grotto, SE tunnel and S side of channel. Very rapid hot fume rising from central chimney and dense fumes from S face of steeple. Fumes as a whole heavy. Gas pressure increased.
Inspection of W and NW floors showed great increase of piled pahoehoe covering site of NW cone and extending from near N end old NW crag mass to a point opposite W end of central crag mass. This lava piled in glistening black hummocks with short stretches of festooned flow. The latter indicate flow to the northward and westward in the northern part of the area and more southward and eastward in the southern part. The W cone not hissing, and becoming stained and dull. Later flows may be from NW cone fissures.
Fountaining seen at entrance to SW cove on E side of channel. The NW table appears to have fallen away considerably on its W side as the floor of new lava W and SW of it (opposite NW cove) appears greatly increased in area at its expense.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Wednesday Date Oct. 24, 1917.

4:15 to 5 p.m. Conspicuous change at S point bench separating SE cove from SE arm. Bench has tilted up to form a crag at least 40 feet above lake, the break parting it from S crag mass extending in a N-S line from middle of central chasm southward. Apparently the block slid on a plane inclined eastward along this break so that the old bench surface now slopes down 45° westward and the S point has gone up to form a peak. The old bedded flow lines are shown in the sections exposed down to the former lake level; below that the surface is rough and lumpy without bedding and more or less coated with a skin of fresh lava. This surface is greenish gray and appears the same as the aa underpining of E island when it first rose in February. In lifting and tilting back to the W the new crag scaled off on its N side so as to make a tumble of red talus there. The S grotto was destroyed, the W side of the SE cove was extended into a deep cove and chasm, the chasm going through to join the central chasm and the central cascade pot has disappeared. Fresh lava extends through as a narrow floor for the new chasm.
Compensating the uplift of the new crag, the central crag mass subsided somewhat so that only a small tip of it is now visible from Volcano House. The excessive smoking of the central chimney and chasm has ceased. There is increase of smoke from the high W peak of the E island mass. This mass appears to be crumbling on its N side so as to increase the NE cove. A curtained tunnel, active within, was visible at the E cove. The bench and rampart extending southward from the E gulch had fallen away and the remnant appeared fully 15 feet high above the lake. The SE rampart had similar height and considerable overhang. There was fountaining at the SE tunnel which appeared to follow the S pressure ridge. The level of the lake showed no marked difference from yesterday to judge by the E island spatter banch. That bench stood about 5 feet above the lake level. At 4:45 p.m. there was subsidence accompanied by the usual break-up and heavy falls of spatter margin were seen from the N side of the central crag mass and at the rampart of the N cove. The rampart fell in at the N dome with a heavy crash starting violent fountaining. The SE dome was smoking more than usual as though a collapse were imminent. The lake as a whole was rather stagnant and the streaming during the break-up was as usual to the SE. All trace of the central cavern, cascade pot, and S grotto had disappeared.
In general the readjustment which gave birth to the S ppint crag cannot yet be characterized as either a rising or a sinking. The most striking feature of the new crag is the revelation of the structurless gray upright wall, probably aa, which represented the sub-liquid cliff of recent weeks, suddenly revealed above the liquid by being lifted. The surface is irregular and wavy and in strong contrast to the red oxidized, bedded layers above.
This sudden change in the bench magma surface, the recent driblet overflows at the W and the excessive tilt to the N and E shown by the seismigraphs, all appear to indicate marked disturbance of the lava column.

T.A.J.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Oct. 24, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
4:15 to 5p.m.	E of S.	S point crag (exposure correct)	2	fresh film	xz	f/11 (full opening)	clock	A V
	E	S point crag	3	"	"	"	"	"
	NE	" " "	4	"	"	"	clock and vane 5.	"

(Pictures spoiled by experimental developer frame.)

T.A.J.

1917, Oct



2

24 Oct. 1917.





JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date Oct. 25, 1917.
Friday " 26, "

Oct. 25. The central crag disappeared from view H.V.O.

Oct. 26.
12:15 p.m. Lake appears to continue to subside. No change in SE new crag. Falls from summit E crag, from S side of new crag and from lake shore under new crag. Small avalanche N high wall to crevasses near N pit. Activity moderate. Grotto under remains of central chasm and under end of S pressure ridge at SE cove. Old NW crag mass has been breaking and tumbling through the middle. Glow in bench high above E tunnel at E cove. Lake first sinking and then rising. Great upright crack in lower wall of S side new crag. Wind E, hence pit smoky. Much smoke W, no hissing heard there. Lake crusted; streaming and fountaining ordinary. The channel to SW cove appears narrower and that cove quiet and crusted. Inner spatter bench 10 feet, more or less, high.

Summary lava movement.

	--Depressions.--			
	Oct.13.	Oct. 20.	Oct.22.	Oct.26.
Lake	85'	79'	90'	98'
	(1 ft. per day)		(Down 3'+per day)	
Central crag	-1'	+4	+2	13
			(Down 3' per day)	
East island	15'	18'	18'	31'
	(2 ft. per day)		(Down 2' per day)	

Main turning point for bench magma was Oct. 22-23.
Lake oscillated in advance.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Oct. 26, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
12:15p	SE	N	0					
	E	N	0					
	SE	Old NW crag mass sum.	42 48					
	E	ditto	49 27	3 27	-12	873	55	
	SE	E island	33 16					
	E	ditto	52 50	3 27	-12	493	31	
	SE	Central crag	56 24					
	E	ditto	71 17	1 5	-12	626	13	
	SE	SE new crag	61 52					
	E	ditto	94 32	3 52	-13	399	28	
	SE	Lake at grotto central chasm	54 5	13 51	-15	393	99	
	E	ditto	79 2	11 36	-12	468	97	

Lake depression below SE rim .....98 feet
Elevation above lake of new crag ... 70 "
" " " " central crag 85 "
" " " " E island ... 67 "

			no	pl	scr	stop	ex	cam	
	SE	Center	1		8x	f/11	1/2	P	
	"	New crag	2		"	"	"	"	
	S	" "	3		"	"	"	"	
	"	Center	4		"	"	"	"	
	"	SE cove	5		"	"	"	"	
	"	SW "	6		"	"	"	"	

T.A.J.

1917, Oct. 26



3



4



1



2

26 Oct. 1917

6



5



JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Oct. 27, 1917.
Sunday " 28, "

Oct. 27.

1:45 p.m. From NE.
Lava in lake slowly rising. Strong current running S through tunnel on the N face of central crag. Fumes thin.

2:10 p.m. From E.
Lava within one foot of level of new floor between the S bench and S point.

2:20 p.m. Three fountains boiling in S pool.

2:25 p.m. SE station.
Large rock slide from side of central crag to floor between the central crag and the S bench. Made considerable noise.

3:10 p.m. SE station.
Fall of rock from SE side of the S point into the lake starting many fountains.

3:40 p.m. From N side of E bench could see E grotto throwing lava very high.

3:50 p.m. Lava level with the new floor under the central chasm.

Oct. 28.

12:45 p.m. NE station.
N pool very quiet. Blue fume about the same.

1:10 p.m. E station.
Lava 2 feet below the S bench and rising fast.

1:30 p.m. E station.
Fountaining started by fall of rock from S bench.

Alex.

4:00 p.m. Half cone built under 10-foot bank at site of SE dome. Bank high around SE cove E and S, rampart fallen in. New inner bench formed around lake, 5 feet high at base E island mass. Portion of this bench subsided into the lake during a sinking spell. Lake rather sluggish. Streaming SE as usual. Glow at E tunnel. Other features unchanged. Lake crusts thin and blistered, lake hot.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Oct. 29, 1917.
Tuesday " 30, "
Wednesday " 31, "

Oct. 29.
1:30 p.m. E station.
Inner bench on SE side of E island has disappeared. There have been falls of rock from side of this crag into lake.
2:40 p.m. SE station.
I could see that the whole top of the E tunnel has collapsed. E cove throwing lava high up in the air. All the grottoes in the SE arm very active.
3:30 p.m. From E bench.
Large piece of the point of the E island fell into the lake causing fountains to boil for some time.

Alex.

Oct. 30.
3:30 p.m. SE valley bench at SE cove and W bench at W cove 10 to 15 feet high. New inner bench flush with lake (6 inches high). Outer W crag of E island high and appears rising separate from E crag mass most of which is low and tumbled. SE half cone puffing continually. No bench whatever on S side of E island, just crags and slide rocks down to lake level.
4:15 p.m. Rising and flooding floor central cove. New rocks in chasm beyond.

T.A.J.

Oct. 31.
2:15 p.m. NE station.
Lava level with the new floor at central cove and very active in SE arm with many fountains boiling at one time. N arm very quiet.
2:25 p.m. E station.
Whole pit very quiet, no fountains to be seen for nearly an hour, then a few fountains broke out in N arm.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Oct. 30, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

1917, Oct. 30



2





3

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Thursday Date Nov. 1, 1917.

11:30 a.m. Lake low. 5 feet from SE floor to new bench, lake 5 feet below new bench. Caverns W side SE cove and under new floor central cove.

Test plummet pendulum (Japanese) on bench magma NE floor 40 feet from edge NE cliff. Set on floor adjusted to center. Affected by wind pressure and vibrates to strong fountains. Point remains within circle of 2.5 mm diameter most of time; however, fairly stationary. Would remain wholly so in a tent. Fall SE, plummet towards it.

12:01 p.m. centered. Steady fountain at SE dome grotto locality.
12:06 p.m. Point 0.25 mm W.
12.11 p.m. " 0.50 mm WNW. Fountaining SE continues. Vibration 3-4 mm.
12:16 p.m. WNW 0.62 mm. Lake fallen 1' more (or benches rising?)
12:21 W 0.40 mm. Lake quiet -- rising?
12:26 NNW 0.40 mm. NE breeze.
12:31 NNW 0.40 mm. " "
12:36 NNW 0.50 mm. Fountain NE cove. Lake quiet, level apparently unchanged. Crusts overriding E. Hiss?
12:41 NW 0.25 mm. Lake slightly higher.
12:46 NW 0.30 mm. Lake rising.
12:51 NNW 0.25 mm. Fountain migrates E from W peak E island along shore. Hissing SE grotto.
12:56 W 0.40 mm. Fountain continues along shore to E cove.
1:01 N 0.62 mm. Lake discharging gas, central fountains and streaming SE arm, sinks several inches. Vibration.
1:06 N 0.75 mm. Lake has sunk 9" more or less. Hissing SE continues. Successive travelling fountains from center. Plummet swings toward SE cove.
1:11 NNW 0.62 mm. Lake 12"+down. Central fountains, rapid streaming.
Wind varied much during test and did not affect tilt.

Cavern in former S grotto locality. New bench overhangs greatly; 20 feet wide under E island. Rampart cone central chasm. Hot blue fume far to N at N cove locality.
The lake is evidently pulsating strongly through a 5-foot range and the crags have been crumbling and probably rising. Gas pressure puffing SE today suggests rising conditions, though the high inner bench does not look like rising. The western lava field could be seen plainly and showed no change. The SE tunnel goes under the new chasm by the new SE crag and not under the S pressure ridge, though there is fountaining at the end of the pressure ridge. Occasional fountains at NE cove. The E island mass has been crumbling most, the western high block rising and the rest becoming a serrate tumble subsiding relative to the NE floor block.

There is under the E gulch a new E grotto half-dome but only a narrow ledge from there to the SE dome. The latter today fell in with a crash and left an open wall grotto, not appearing deep.

T.A.J.

4:00 p.m. SE station.
Lava about 10 feet below the new floor. All grottoes active and fountains in SE arm and main lake.

Alex.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Nov. 2, 1917.
Saturday " 3, "
Sunday " 4, "

Nov. 2.
2:40 p.m. E station.
Lava within one foot of inner bench on SE side of E island, and rising. Quiet everywhere except in SE grotto.
3:40 p.m. SE station.
Main lake broke up and began rapid streaming through channel into SE arm.

Alex.

Nov. 3.
9:45 a.m. Lake about 5 feet below inner bench. NW cove has been shallowing eastward, i.e. less indented. NW table crevassed on lake side. N cove has been increasing northward. No change observed W floor or W cones. Old crag mass has a number of peaks but still preserves the old islet of Aug. 1916 as its westernmost outpost. NE cove valley extended and widened. View of SE arm getting cut off by E ledge as seen from NE. Grotto E side of old W crag mass active. NW quiet, center quiet, N active, SE active, occasional central fountains. New grotto formed under N side steeple.

T.A.J.

2:20 p.m. E station.
SE cove very active. SE grotto throwing lava over the bench. Central cove active also. Lava rising.
3:45 p.m. SE station.
Four fountains in SE arm. Lava sank 5 feet all around. All grottoes quiet.
5:35 p.m. Much activity on all sides with all grottoes in action at same time. Lake 10 feet below inner bench.

Alex.

Nov. 4.
2:30 p.m. From SE side of E crag. Lava 2 feet below inner bench. SE grotto and E cove the only places active.
2:45 p.m. From E bench.
Fifteen fountains going at one time and lake sank 3 feet in a few seconds.
2:55 p.m. The whole new floor under SE bench fell in starting many fountains. SE arm very active.

Alex.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

 Day Saturday Date Nov. 3, 1917

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:45a	N	NW	0					
	NW	W	0					
	N	Tangent upper bench W	1 0					
	N	Pt. N side W niche at upper bench level	19 50					
	NW	ditto	-19 00	5 23	-7	405	39	
	N	Summit NW table	25 29	7 46	-9	332	45	
	NW	ditto (smoky NW)	76 00ca					
	N	Smoke edge NE cliff	71 42	11 46	-10	292	62	
	NW	ditto (smoky NW)	81 00					
10a.m.	N	NW cove (lake)	40 36	13 20	-10	423	101	
	NW	ditto (smoky NW)	52 28ca					
	N	W side N cove	39 40					
	NW	ditto (smoky NW)	72 22ca					
	N	E side N cove, ca	55 00					
	NW	ditto (smoky NW)	88 06ca					
	N	Pt. S of NW cove	51 58					
Noon	NW	ditto	56 41	15 17	-10	380	105	
	N	Grotto next S	53 28					
	NW	ditto	50 48					
	N	Summit old crag mass	46 51	5 3	-10	684	67	
	NW	ditto	26 14					
	N	NE peak " " "	51 9					
	NW	ditto	39 6					
	N	SE peak " " "	56 28					
	NW	ditto	42 40					
	N	Scentral peak ditto	50 34					
	NW	ditto	31 18					
	N	Central " "	48 19					
	NW	ditto	35 26					
	N	N peak ditto	41 6					
	NW	ditto	27 00ca					
	N	W come summit	48 11	3 33	-10	1,003	64	
	NW	ditto	12 47					
	N	W pinnacle NW table	23 58	7 47	-10	398	52	
	NW	ditto	54 2					
	N	W pinnacle NE floor block (over N cove now)	54 51					
	NW	ditto	91 17ca					

			no	pl	scr	stop	ex	cam

Massachusetts Institute of Technology

KILAUEA DAY SHEET — Hawaiian Volcano Observatory

- 2 - Day Saturday Date Nov. 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	N	E point lake	72 17					
	NW	ditto	61 6 ca					
	N	N peak E isl. (NE cove)	81 7	6 53	-10	442	55	
	NW	ditto	70 6 ca					
	N	Summit E island	79 6	3 18	-10	606	46	
	NW	ditto	58 18 ca					
	N	E peak E island	92 5	5 18	-10	561	51	
	NW	ditto	69 10					
	N	NE peak	95 16	6 48	-10	438	53	
	NW	ditto	77 48 ca					
	N	E ledge edge	103 29	4 43	-10	534	69	
	NW	ditto (smoky NW)	67 54 ca					
	N	E gulch	106 42					
	NW	ditto " "	69 10 ca					
	N	Bench heap E gulch	110 20	3 42	-10	818	54	
	NW	ditto (smoky NW)	73 00 ca					
	N	E limit SE shelf	113 54	2 3	-10	847	34	
	NW	ditto (smoky NW)	74 58 ca					
	N	Summit SE crag (also E end SSE crevasse)	93 37	1 59	-10	883	33	
	NW	ditto	59 3					
	N	S point (lake)	98 9	6 19	-10	912	102	
	NW	ditto (smoky NW)	61 54 ca					
	N	Central cove (W base SW crag slope)	86 52					
	NW	ditto (smoky NW)	55 18? ca					
	N	Summit remnant steeple	83 24	2 39	-10	781	38	
	NW	ditto	53 48					
	N	Summit E central crag	77 54	1 13	-10	820	29	
	NW	ditto	48 11					
	N	Summit W " "	73 22	1 8	-10	815	17	
	NW	ditto	44 28					
	N	S crag W summit (also angle between deck & summit central crag)	71 21	2 30	-10	838	38	
	NW	ditto (smoky NW)	41 56 ca					
	N	W end central deck	60 40	4 31	-10	901	73	
	NW	ditto (smoky NW)	29 40 ca					
	N	Pt. E side SW channel	58 24					
	NW	ditto (smoky NW)	27 51					

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

- 3 - Day Saturday Date Nov. 3, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
	N	W point lake , ca	60 00						
	NW	ditto (smoky NW)	42 40ca						
	N	W side SW channel, ca	56 6						
	NW	ditto	26 14						
	N	SW smoke floor, ca	59 00						
	NW	ditto	25 24						
	N	W smoke " "	34 54						
	NW	ditto	1 32						
	N	NW cone smoke floor, ca	44 22						
	NW	ditto	15 54						
	N	W limit SE shelf, ca	78 8						
	NW	ditto	38 25						
	N	W limit S crevasses, ca	85 40						
	NW	ditto	46 20?						
	N	N pit ca	39 30						
	NW	ditto	107 8						
	N	Tangent NE floor	134 10						
	N	E limit NE pressure ridge	107 25						
		Lake depression below N rim		103 feet					
		Central crag above lake		86 "					

T.A.J.

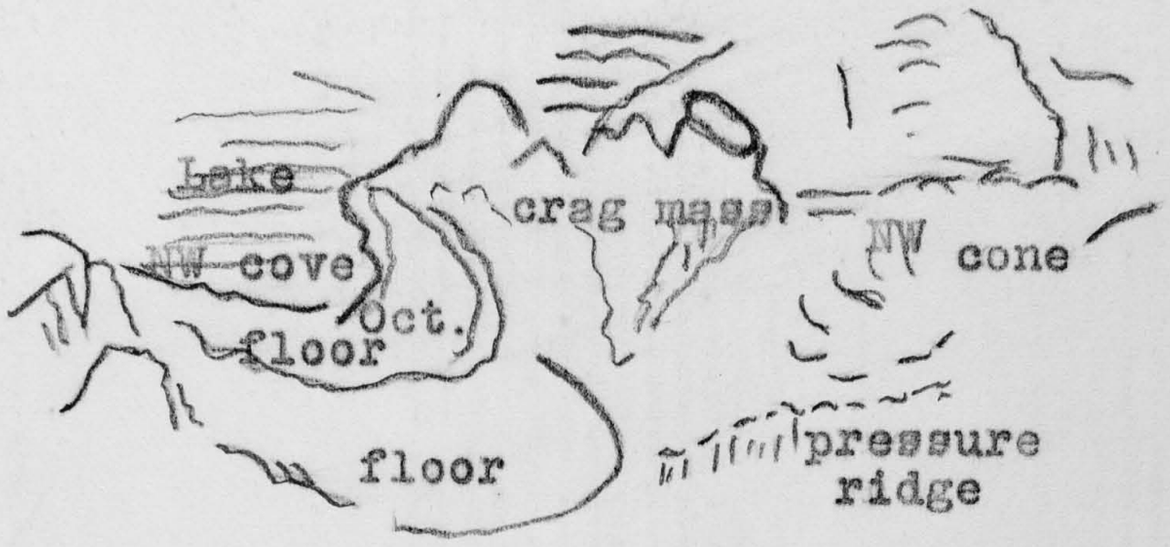
t	sta	pt	no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Nov. 5, 1917.
Tuesday " 6, "

Nov. 5,
11:30 a.m. Lake one foot below bench central and NW coves. Spatter NE 8 feet above lake. Fountaining N, W, E and SE. Streaming into SW arm. Center and NW stagnant. SE dome enlarged and glowing. Inner floor NW cove 50 feet wide and forms outline of the October cove.



NW cove from NW.

Present cove built in towards lake. October overflows make a still higher and wider circle (see sketch).
Rock fall heard at N cove. As seen from NW, SE crag is well above SE shelf level. Central fountains occasionally in SE arm. Smoking W, N and SW. Puffing accompanies the fountaining splash noise of the N grotto.
There is now a wide rock-filled gulch between NW shelf and NW table. Latter cracking away on lake side. NE gulch widening also, (between NE and E coves).

T.A.J.

Nov. 6.
2:15 p.m. E station.
Lava about 3 feet below bench all around. Quiet everywhere even in the grottoes. Fumes thick in N arm.
4:15 p.m. From E bench.
Lava level with new floor of central cove. It remained at this level for over an hour when subsidence set in and the lake sank 5 feet, a few fountains accompanying the subsidence.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Nov. 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

1917, Mad 5



2



3



1

444

JOURNAL

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory

Day Wednesday Date Nov. 7, 1917.
Thursday " 8, "

Nov. 7.

10:15 a.m. Lake has built inner bench to within 3 feet of floor level at SE cove. Fresh overflows central cove widening floor of gulch between SE new crag and S crag. Lake now 5 feet below inner bench with glow rim and overhang. Streaming to SE, fountaining in usual fashion, fume moderate, little noise. Heavy folded festooned crusts over stream through central channel.

10:50 a.m. Strong fall of spatter bank N side central steeple. SE crag from NE appears only slightly above W end of S shelf. Wide inner bench SE side E island. SE grotto dome built over by new bench. Much smoke from W lava fields, from N cliff, and some blue fume from Svalley pressure ridge.

11:00 a.m. Lake rising. W high summit central crag appears to have changed shape. (cf. photos)
From SE the overflow fresh from central cove seen to reach far S in gulch but does not join through to inner bench of SE cove. Latter shows flaming holes at SE dome locality.

11:15 a.m. The whole wall of SE cove on S side fell, leaving a raw glowing wall 8 feet high and made great commotion and heat in the cove. Carried away 50 to 75 feet (long) of both upper and inner benches.
Central chasm now a widened valley, the S crag crumbling in a tumbled flowing fashion, making extensive talus. Jutting rock in middle. Fall of turret central crag on S side seems more imminent than ever. Spatter bench wider E gulch. Fume from E tunnel.
Lake not rising strongly.

T.A.J.

Nov. 8.

3:15 p.m. E station.
Lava 5 feet below bench. No activity except in SE sinkhole and E grotto.

4:15 p.m. Lava sank 2 feet farther. Several fountains in SE arm travelling with the stream but all the grottoes are quiet.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory
Day Wednesday Date Nov. 7, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

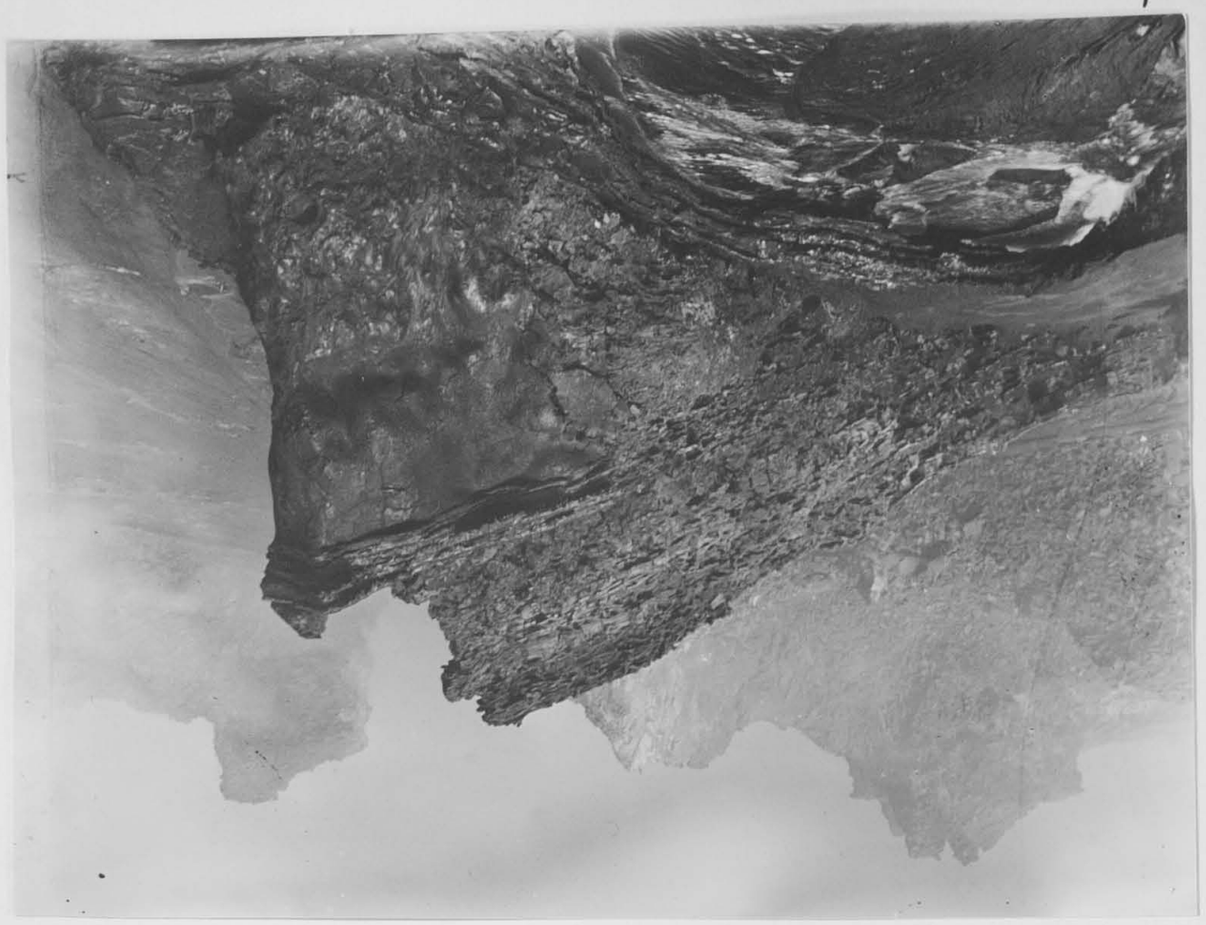
			no	pl	scr	stop	ex	cam
10:15a	NE	Central steeple	1		8x	f/11	½	P
	ESE	" cove	2		"	"	"	"
11:15a	SE by S	SE cove just after collapse S wall	3		"	"	"	"
	SSE	SE crag	4		"	"	"	"

T.A.J.

1917, March



3



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2

Massachusetts Institute of Technology

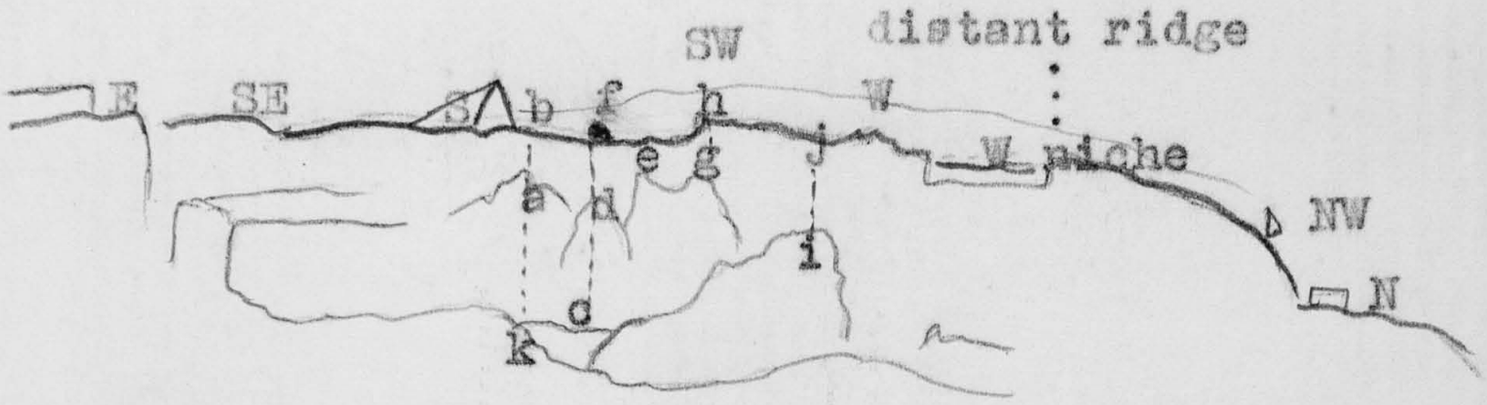
JOURNAL

Hawaiian Volcano Observatory

Day Friday Date Nov. 9, 1917.

10:00 a.m. Increasing smoke NW gulch (N of table). Lakw quiet. Streaming to SE and SW. Fountaining NE, SW and SE grottoes. Inner bench about 5 feet above lake. Fume dense N, WNW, W and SW, elsewhere thin. Flaming pot SE grotto. General conditions stationary as compared with last few days; bench under E island narrower. SE grotto puffing at 4 p.m.

Set up new station in NE niche of high rim next W of NE half-dome. Here with shelter from NE wind fixed transit in view of all stations. Propose from this station to make quarter-hourly readings of changes in height of crags and lake.



a - SE crag vertically under distant ridge.
d - steeple " " black stone on edge Halemaumau and distant ridge beyond; lake below.
g - central crag under SW station.
i - W knob E island under SW rim Halemaumau.
k - East ledge.
c - lake edge.

Level carefully and read azimuth angles from N station as mark beginning and end of each day. Thereafter read vertical angle only of points a, c, d, g, h, i and k. Read b, e, f and j at beginning (v.a.).

Vertical Angle.

Time	a	b	c	d	e	f	g	h	i	j	k	lev. bub.
a.m.												
11.34-11.54	1 48	0 9	7 36	2 11	0 0	-0 9	0 40	-0 6	2 19	-0 6	7 0	-0 6
p.m.												
12.09-12.19	1 50		7 49	2 10			0 39	-0 6	2 15			-0 6
12.24-12.30	1 52		7 48	2 10			0 33	-0 6	2 15		6 57	-0 6
12.39-12.46	1 46		7 44	2 5			0 32	-0 9	2 15		6 57	
12.54- 1.00	1 48		7 47	2 6			0 28	-0 9	2 11		6 58	
1.09- 1.18	1 48		7 45	2 5			0 28	-0 10	2 10		6 57	-0 10
1.24- 1.30	1 49		7 44	2 3			0 26	-0 12	2 11		6 58	-0 12#
1.39- 1.45	1 48		7 45	2 5			0 26	-0 13	2 9		6 58	-0 14#
1.54- 2.02	1 44		7 50	2 4			0 25	-0 11	2 9		6 54	-0 11#
2.09- 2.17	1 47		7 50	2 4			0 26	-0 14	2 12		6 55	-0 15#
2.24- 2.33	1 43		7 47	2 2			0 26	-0 14	2 5		6 53	-0 15#
2.39- 2.48	1 44		7 39	2 2			0 24	-0 12	2 8		6 55	-0 16
2.54- 2.04	1 44		7 52	2 1			0 24	-0 12	2 8		6 52	-0 12
3.09- 3.18	1 45		7 42	2 3			0 26	-0 15	2 8		6 58	-0 15

Afternoon fume and refraction strong.

Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day Friday Date Nov. 9, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10 a.m.+	NE	N	0					
	"	N (concrete platform)		-0 12#	0			
	"	U.S.B.M.(Tech.Sta.)	1 00	-0 5	0			
	NE	NW sta.	13 26	-0 12	0			
	"	W sta.	47 0	-0 51	-9			
	"	SW sta.	67 4	-0 5	-5			
	"	S sta. (ground level)	91 37	+0 4	-8			
	"	SE sta. " "	107 25	0 16	-6			
	"	E sta. " "	109 41	0 15	-6			
	"	U.S.B.M.(E shelter)	116 33	0 10	-10			
		(This preliminary survey ended at 11:30 a.m.)						
		# Minus angles -- angles of elevation.						
		Plus " " " depression.						
	"	E isl. summit (i)	60 26					
	"	Central crag (g)	67 02	0 42		864	7	
	"	" steeple (d)	73 54	7 53		715	98	
	"	Lake (c)	" "	" "				
	"	Black stone (f)	" "	" "				
	"	SE crag (a)	87 00					
	"	E ledge (k)	" "					
2.09p	"	Summit steeple	73 44					
2.06p	"	Grotto central cove	76 46	7 8	-10	764	97	
		Location of NE station:-						
3.40p	N	S	0					
	N	NE	63 47					
	N	SE crag summit (a)	6 4					
	"	k	15 55					
	"	i	- 7 56					
	"	d	- 3 48					
	"	g	-13 48					
	"	c ca	- 0 50					
	NW	S	0					
	"	NE	57 18					
	SE	N	0					
	"	NE	-30 00					
	"	Central cove grotto	54 39					
	"	c, approx	46 18					

			no	pl	scr	stop	ex	cam
	"	a	62 11					
	"	d	51 28					
	"	g	56 33					
	"	i	33 5					

Depression of lake below NE station 98 feet
" central crag below NE sta. 7 "
Hence " " above lake 91 "

T.A.J.

Massachusetts Institute of Technology.

JOURNAL

Hawaiian Volcano Observatory

Day Saturday Date Nov. 10, 1917.
Sunday " 11, "
Monday " 12, "

Nov. 10.
2:15 p.m. E station.
Lava about 4 feet below central new floor. E grotto active.
A few fountains in SE arm. Fume thick N.

2:50 p.m. From lower NE bench.
W cove under W crag very active; NE grotto also. Latter boiling and rumbling and throwing lava spray over side.

2:55 p.m. N bench.
Activity in N grotto. Block of new N floor fell into lake causing fountaining which lasted for some time.

4:00 p.m. E bench.
Lava beginning to sink.

4:30 p.m. Lava 7 feet below new floor of E crag. Very active in SE channel.

Nov. 11.
2:10 p.m. E station.
Lava about 5 feet down and quiet. No changes.

2:20 p.m. E station.
A large block of new floor around SE crag (a piece about 50 feet long and 10 wide) fell into the channel. Part of S bench gone; some scaling off there has been going on in the last few minutes.

Alex.

Nov. 12.
4 to 7 p.m. With Congressional party.
Lake sluggish with rising spells; very much crusted and breakings up of crust at intervals. Streaming to SW and SE. Fountaining grottoes SE, W side SE cove, SW, E, N and E side W crag mass. E cove tunnel has high flaming chimney occasionally spurting. Gas breathing from under crusts, ballooning up of skin SE. Fumes thin, W cone visible from S station.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Tuesday Date Nov. 13, 1917.
Wednesday " 14, "
Thursday " 15, "

Nov. 13.
2:10 p.m. E station.
Both parts of lake quiet. Lava rising slowly. E grotto blowing. Fumes thick N.
2:35 p.m. SE station.
Lava about 3 feet below bench and still rising.
6:30 p.m. SE station.
Lava level with new floor of E crag.

Alex.

Nov. 14.
6:00 p.m. Yesterday and today fume very thin. Today central crag reappeared seen from H.V.O. SE station shows crags very high. Inner bench 3 feet high E, 8 feet high under SE crag. Lake streaming into SE cove from dark crust over SE arm. Central fountains SE cove and N arm. Active fountains E end SW cove and in SW channel. Grotto N active. No glow at E chimney. Glow in W cone district. Smoking crack across channel at S. station close to rim of pit and great crevasse in bench below, which look new as though the sharp rise of central crags were dragging down S valley and S wall of pit. Crags, seen from S, very impressive. The E island mass increasing in height and smoking from summit. The NE cove and valley extending from it appears larger. There appears to have been a relatively sudden rise of central group of crags (S, center, SE and E) within twenty-four hours, a caving of SE bank, a new bench built there 3 to 4 feet high. As Alex reported slow rising of lake yesterday afternoon, this movement may have taken place last night or this a.m. (cf. tilt E and N on seismograms)

T.A.J.

Nov. 15.
2:10 p.m. SE station. Lava about 8 or 10 feet down. Fifteen fountains in both arms. Grottoes quiet.
3:20 p.m. SW station. Rocks have been falling from central crag. On N side of summit there is a long crack. SW arm quiet but in center of lake there are several fountains.
4:10 p.m. SE station. Most of E grotto fell making a tunnel under E cove.
5:15 p.m. More than half of new floor of E island crag fell into SE arm and some of SE shelf has fallen between SE and S stations.
6:30 p.m. SE station. Lava down about 12 feet all around. Large slide from E island crag.

Alex.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

JOURNAL

. Day Friday Date Nov. 16, 1917.
Saturday " 17, "

Nov. 16.
10:45 a.m. Wind SW. Views from S and SW. Fume SE and E.
Lake high and active. Row of building spatter grottoes E; large domes of spatter with curtains of stalactites E gulch and SE. At first heavy crust SE arm and from SW arm the streaming was northward into N arm. Later the streaming to SE appeared in SE arm, but outward streaming from SW arm continued. NE cove now a large feature. Rocks falling from S side of central crags. Inner bench 3 to 5 feet high. Festooned flow in gulch W of SE crag. Puffing at W cone. Sulphur patch on site of NW pond. Smoke moderate. Crusts rather thin and festooning in late afternoon and much streaming, breaking up, and central fountaining.
Lake rising until about 11:30, sinking after that.

T.A.J.

Nov. 17.
2:20 p.m. SE station.
Lake about 15 feet below the new floor of the E island crag and very active.
2:25 p.m. About 50 feet of the inner bench S, which was 4 or 5 feet wide, fell into the lake.
4:35 p.m. Lava sinking. All of the inner bench on E island crag fell even up to the E cove, leaving a straight wall on side of E island mass.
5:40 p.m. All of the inner bench under the 1917 shelf fell into the lake starting many fountains.
6:50 p.m. SW station.
The inner bench at the SW arm has fallen. SW arm active.
7:00 p.m. SE station.
Lava 25 feet below S bench.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

 Day Friday Date Nov. 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:45a	SW	S	0					
	S	SE	0					
	SW	N side SE cove (lake)	26 15	6 56	-8	716	87	
	S	ditto	19 29					
	SW	Summit SE crag	32 21	1 17	-9	672	16	
	S	ditto	32 54					
	SW	E summit central crag	48 32	0 22	-9	687	05	
	S	ditto	67 9					
	SW	W summit " "	54 29	0 15	-9	457	3	
	S	ditto	72 23					
	SW	Summit E island	61 3	1 21	-12	680	18	
	S	ditto	55 23					
	SW	Inner end SW cove	43 55					
	SW	N side inner end SW channel (ground tipped)	74 37	17 51	-30	785	95	
	S	ditto	94 47					
	SW	E point lake	70 4	4 47	-5	311	30½	
	SW	Line bounding W flows E side	95 16					
	"	W cone (bounding W flows W side)	119 4					
	S	ditto	102 16	3 58	-6	575'	37	
	SW	Tangent SW channel W side	89 37					
	"	Tangent SW channel E side	82 41					
	"	Tangent overflow floor E end SW cove	41 18					
	"	Summit S pressure ridge	35 23	9 8	-6	337	55'	
	S	ditto	89 43					
	SW	Tangent S side S pressure ridge	20 25					
	SW	Tangent W limit base old crag mass	96 12					
	"	Tangent E ditto	79 23					
	"	E gulch	33 55					
	S	ditto (lake level)	16 59	9 58	-10	498	89	

			no	pl	scr	stop	ex	cam	
	SSE	Pit	1	½ film	yellow	f/11	½	Cirkut	X
	S	"	2	"	"	"	"	"	
	SSW	"	3	"	"	"	"	"	
	SW	"	4	"	"	"	"	"	
	SE	"	5	long film	"	"	"	"	

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Friday Date Nov. 16, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SW	Sulphur patch NW cone site	108 41					
	S	ditto	92 47					
	SW	Central steeple	45 45	2 13	-6	582	23	
	S	ditto	54 26					

Depression of lake below S rim 88 feet
(10 feet in seven days)
Depression W summit central crag 3 feet
(risen 4 feet in seven days)
Height above lake central crag 85 feet
(Central crag may have lost height by falls from summit)

T.A.J.

t	sta	pt	no	pl	scr	stop	ex	cam	

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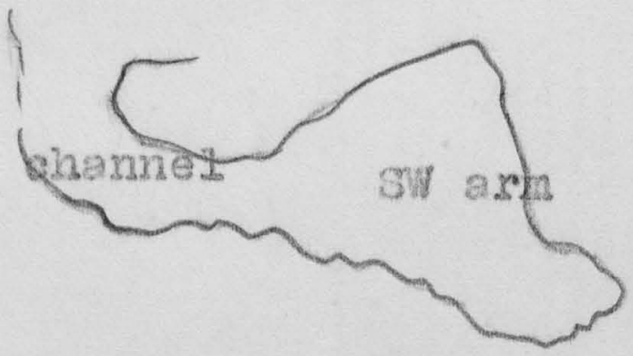
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date Nov. 18, 1917.
Monday " 19, "
Tuesday " 20, "

Nov. 18.
3:10 p.m. SE station.
Lava down about 25 or 30 feet below the E bench. Active in SE arm.
3:20 p.m. SW station.
SW arm very wide. Quiet.



Grottoes quiet all around. Two fountains in N arm.

Alex.

Nov. 19.
11:30 a.m. By some general readjustment Saturday, probably subsidence of lake magma, the inner bench has disappeared in many places. It still clings, about 8 feet high, to central cove, point of SE crag and inner end of SW cove. It is gone under SE shelf, under E island and under E ledge. E ledge appears to have risen. Big N-S crack in E knob of old W crag mass. Avalanches in E gulch. Rocks sliding S side central crag. Tunnels E cove, W side SE cove, and central cove. W side SE cove active and streaming in. SW cove crusted. Puffing SE and SW (fountain inner end tunnel of SW cove). Streaming SW cove appears to be outward. Central group of crags appears lower as a whole, especially E island. E island appears to have sunk and E ledge risen.
Benches central, SE and SW coves 8 to 10 feet high. N grotto pounding.
Lake appears strongly rising now. No sign of fresh spatter rims E. Lava laps the talus.

T.A.J.

Nov. 20.
2:45 p.m. E station.
Lava 10 feet below bench at central cove. Very quiet in SE channel and N arm.
3:10 p.m. SE station.
Rocks from the sides of the central crag constantly falling.
3:25 p.m. Large fall of rock from SE side of SE crag.
5:40 p.m. Streaming toward N and NW grottoes begins, with swift current.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory
Day Monday Date Nov. 19, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
11:30a	S of SE	E island	1		8x	f/11	½	P
	SSW	SW cove and W floor	2		"	"	"	"
								T.A.J.

1917, Nov. 19



1



2

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Nov. 21, 1917.
Thursday " 22, "
Friday " 23, "

Nov. 21.
10:45 to 11:30 a.m. Crags have settled somewhat. NW table split through the middle by wide E-W crevasse. Lake evidently recovering, new 2 to 3-foot inner bench at E cove, under central crag and at point of SE crag. E side old W crag mass looks terraced as though blocks subsiding parallel to lake shore. Floor central cove 7 feet high, new bench below 2 feet high.
Lake crusted and rising at 10:30 a.m.
Lake sinking and streaming at 11 a.m.
Lake crusted and rising at 11:30 a.m.
Streaming outward from SW cove. NE side E island mass lower and more tumbled but the high W end very high. Puffing small fountaining area W side SE cove and much noise NE. Fountaining occasionally E gulch. No slides seen in motion.

T.A.J.

Nov. 22.
2:30 p.m. E station.
Lava rising fast. Active in central cove and on N side central crag.
Inner bench overflowing in the evening.

Alex.

Nov. 23.
9:15 a.m. New inner bench 2 to 3 feet high all around, overflowing last night. This bench also SW arm as seen from S. Spatter domes W end SE cove and at E gulch. Fume thin. Streaming to SE. SW arm crusted. Occasional heavy central fountains SE arm. Blowing noises. Point built out southeastward from SE crag point.
No special activity at E tunnel locality. Crunching crust overriding in SE arm. Double spatter rim E ledge 3 to 5 feet high. Puffing and spraying in fountains. Fountains in SE arm grow in size, followed by bubble fountaining and migrating eastward. Falls of inner bench into lake E, SE and W during sinking spells, which alternate with rising at half hour intervals. Spatter grottoes NW and N. NW cove floor built eastward and recently much overflowed.

T.A.J.

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Friday Date Nov. 23, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:15 a	SE	N	0					
	NE	N	0					
	SE	Lake central penin.pt.	45 4	13 3	4	393	91	
	NE	ditto	74 47					
	SE	W summit central crag	57 4	0 47	+4	564	8	
	NE	ditto (10:35 a.m.)	67 4	0 43	0	870	8	
		(11:00 a.m.)		0 40	0			
	NE	SW station	67 4	0 +1	0			
	SE	Summit SE crag	61 53	4 16	+4	261	19	
	NE	ditto	87 0					
	SE	Summit E island crag	32 52	2 0	+4	542	18	
	NE	ditto	60 13	1 46	0			
	SE	Bowlder NE floor	-15 25	9 41	+4			
	SE	" S "	94 29	11 54	0			

Depression lake 91 ft.
" central crag 8 "; height 83 ft.
" SE crag 19 "; " 72 "
" E island " 18 "; " 73 "

Lake ..... 3' lower than on Nov. 16; 7' higher than on Oct. 26.
Central crag 5' " " " " "; 5' " " " " "
SE crag ..... 9' " " " " "
E island crag .....13' " " " " "

From NE station set summit central crag W on cross hair 11:00 a.m.
At 11:30 it had moved E, (67° 3.5' from 67° 4.3') upward very slightly.
Lake had been rising. Try precision transit and gradienter.

T.A.J.

no	pl	scr	stop	ex	cam

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Nov. 24, 1917.
Sunday " 25, "
Monday " 26, "
Tuesday " 27, "

Nov. 24.
2:55 p.m. SE station.
Lake level 5 feet below new floor of E island mass. Active E gulch and SE sinkhole. Streaming rapidly from N arm thru SE arm to SE sinkhole.
4:55 p.m. E station.
Lava within one foot of top of new bench of E island crag and 10 feet below S bench.

Nov. 25.
3:30.p.m. SE station.
Lava about 5 feet below S bench. Active in SE grotto and SE arm. Central cove spraying vigorously.
3:50 p.m. From inner bench N.
N grotto very active. Large portion of grotto fell into lake. Fall of rock from N side of E island crag causing many fountains.
4:10 p.m. Rocks from the central crag fell to the S bench.

Alex.

Nov. 26.
3:45 p.m. Lake high; covered with hard crust. Blowing and spraying border grotto SE; occasional heavy bursts of fountaining through crust SE arm and NE cove and elsewhere. New inner bench 2 to 3 feet high. Fresh overflows S rampart and central cove. New smooth overflow surface in gulch W of SE crag. Lake rising and nearly brimming over inner bench. Rocks heard sliding in central valley. SW cove seen breaking up with swift eastward (inward) streaming and much violent fountaining; inrush to the cove from lake and the SE arm very sluggish while this was going on.

T.A.J.

Nov. 27.
2:10 p.m. E station. Fresh lava on S bench, bench of central cove, and around SE crah nearly to edge of SE sinkhole. Few fountains.
2:45 p.m. SE station. E island floor covered with fresh lava. Surface of lake 15 feet below E bench above E island grotto.
3:35 p.m. SE station. Lake sank 4 feet with many border fountains. Fumes thin.

Alex.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Nov. 26, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	

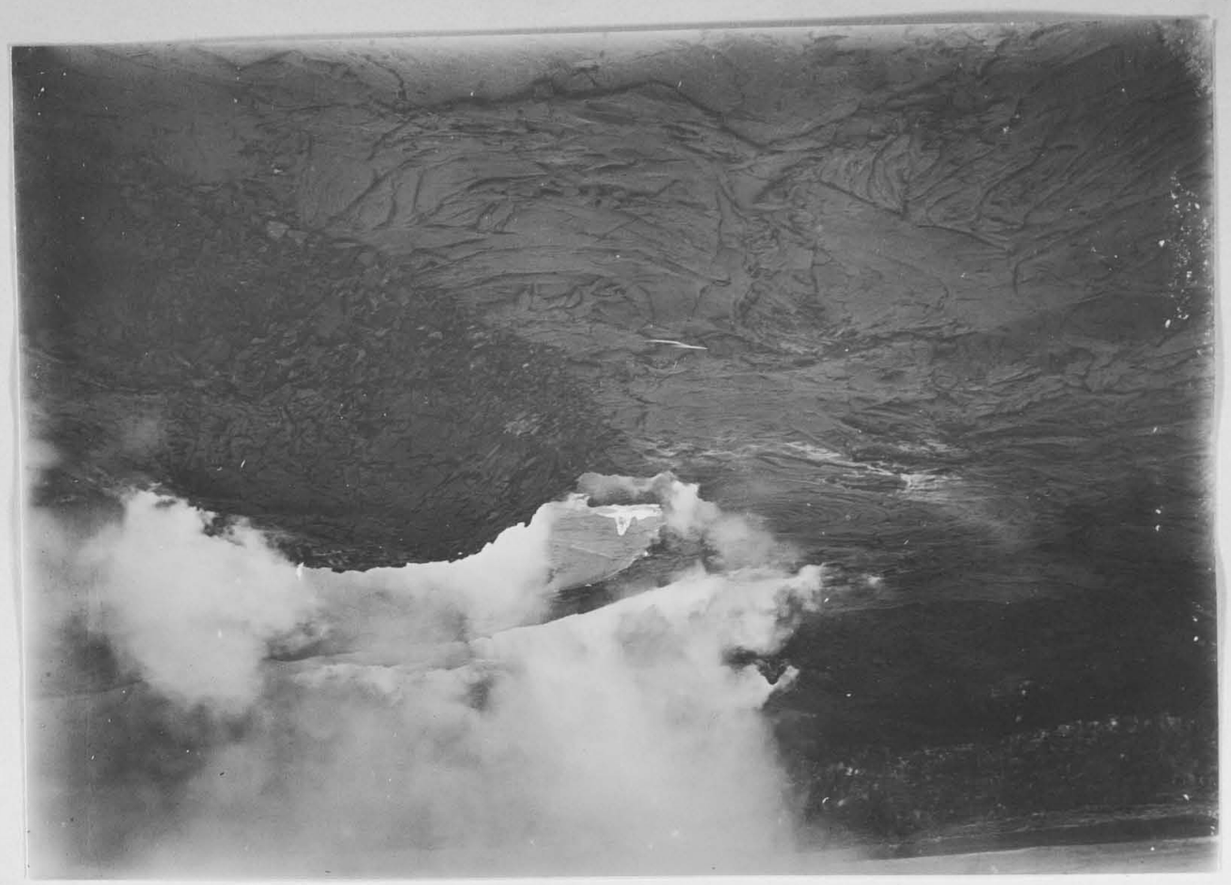
			no	pl	scr	stop	ex	cam
3:45p	NE	Center (cloudy)	1		8x	f/8	½	P
	ESE	SE crag "	2		"	f/7	"	"
	S	New S flows "	3		"	"	"	"
	S	SW cove active "	4		"	"	"	"

T.A.J.

1917, Nov. 26



1



4



2



3

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Wednesday Date Nov. 28, 1917.
Thursday " 29, "
Friday " 30, "

Nov. 28.
10:45 a.m. Central crag showed both horns from Volcano House. Lake high. Two-foot inner bench all around. Spatter domes N, SW and SE and smaller one E cove and at base old crag mass. New festooned overflow from central cove through gulch W of SE crag. Crags higher. SW cove now shut off by new floor across SW channel as though W extension of central crag mass under the channel had risen. SW pond so formed crusted over. Fresh overflows on NW floor from NW cove. No hissing at W cone. Fume moderate. SE grotto puffing. Streaming to SE, central fountains rare. Blistered skins. Streaming out from SW arm. Very large central fountain at entrance to N arm at noon. Lake appears to have been rising and to be at a high limit. Inner bench wide opposite E gulch. At E cove and S side SE crag wide inner bench. Occasional longshore migratory fountain from center to E cove.

T.A.J

Nov. 29.
2:30 p.m. SE station.
Lava down 10 feet all around. Quiet except for fountain in SE grotto. Fume rather dense.

Alex.

Nov. 30. Rainy. Crag visible from Volcano House. Fume moderate but not thin. Lake stationary and relatively low.

T.A.J.

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Massachusetts Institute of Technology

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

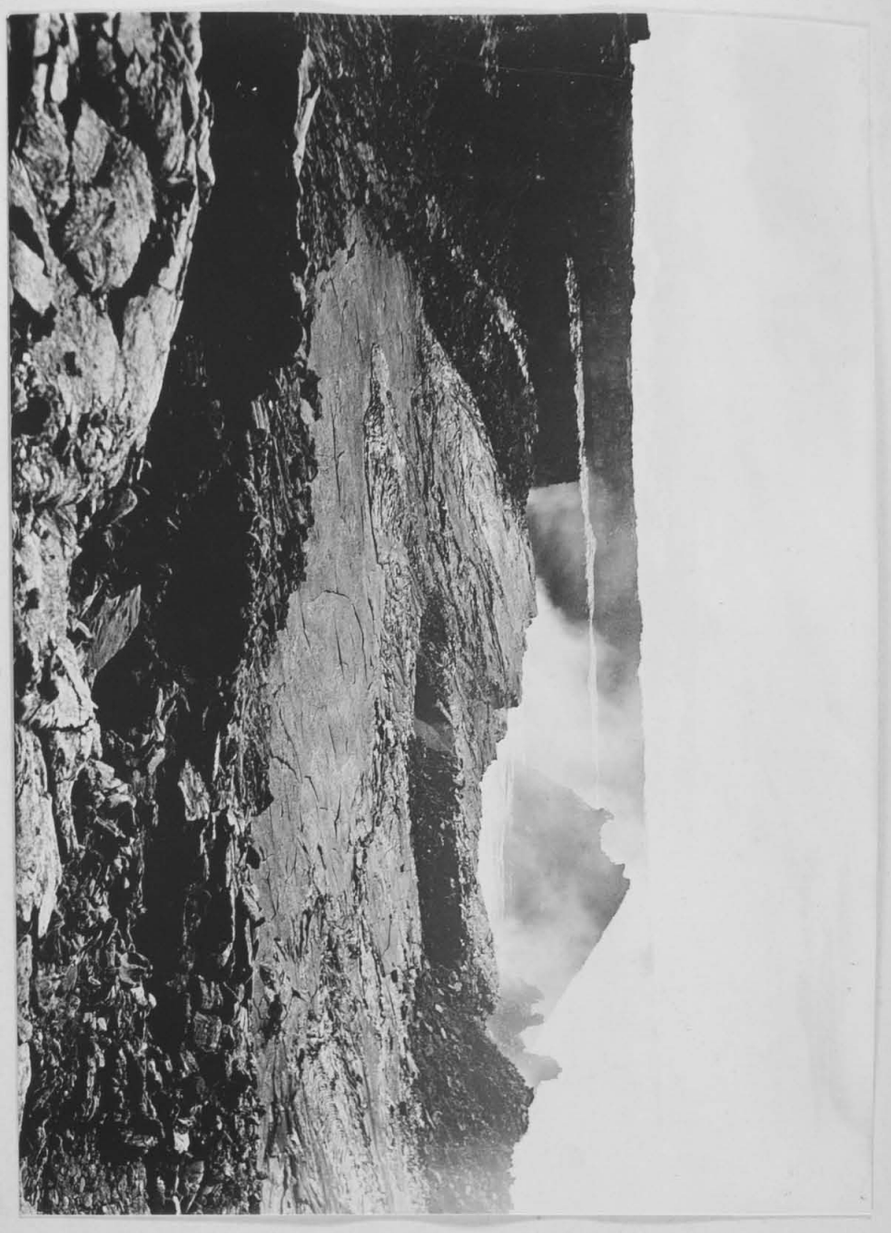
Day Wednesday Date Nov. 28, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
10:45a	E of N.	SE	1		8x	f/11	½	P
	"	Center	2		"	"	"	"
	NW	NW cove	3		"	"	"	"
	NW summit	Old crag mass	4		"	"	"	"
	SSE	Crags	5		"	"	"	"
	SE	SE spatter dome	6		"	"	"	"

T.A.J.









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JOURNAL

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory

Day Saturday Date Dec. 1, 1917.
Sunday " 2, "
Monday " 3, "

Dec. 1.
10:30 a.m. Inner bench 10 feet high, fallen away partly at E cove. Lake rising until 11:30 a.m., then a break-up. Occasional noisy fountain bursts NE. Cavern tunnels W side SE cove, at central cove and at E cove. Built up rampart SE and center. Much fume from SE rampart. Glowing wall over lake at SE grotto. Fresh fallen rocks from whitened S face of steeple on central cove floor. Much crunching and clinking of crusts. Fume moderate. Streaming southeastward and into the tunnels.

T.A.J.

2:20 p.m. E station.
Lava about 20 feet below bench. No fountains in either SE or N arm.
4:30 p.m. SE grotto very active. A few central fountains in SE arm.
5:30 p.m. N arm begins to break up, with streaming through SE arm; though height of lake remained about the same. No avalanches.

Alex.

Dec. 2.
2:15 p.m. E station.
Surface of lake about 25 feet below new inner bench of central cove. Much of this bench has broken off. SE arm very quiet. Fume thick. No fountains to be seen anywhere.
2:40 p.m. From lower N bench. N arm active. NE grotto spraying vigorously.
2:50 p.m. From NE bench.
About six fountains in SW arm.

Alex.

Dec. 3.
3:30 p.m. Rainy. Lake low. Inner bench 10 to 12 feet high. Tunnels W side SE cove, at central and E coves, and curtained grotto with deep recess inside evidently at SE dome. Much smoke rising from floors at all these places above the void within, and also smoke from E gulch. The sudden appearance of dense smoke when these places are not filled with lava, condensation of unburned sulphur vapor accumulated in the chamber opened by subsidence, is very striking. Caving of shores has been taking place somewhat at SE, central and E coves; the crags are lower but the centrak crag still visible from Volcano House.
Reported falls of inner benches by visitors and jarrings indicated by seismographs.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Dec. 1, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:30a	NE	N	0					
	SE	N	0					
	NE	Lake central peninsula	74 26	7 19	0			
	SE	ditto	45 50					
	NE	Summit central crag	67 9	0 11	0			
	SE	ditto	57 21					
	NE	SW station	67 00	0 00	0			
	SE	ditto	80 17					
	NE	E horn central crag	70 39	0 14	0			
	SE	ditto	58 32					
	NE	New horn steeple	73 44	1 27	0			
	SE	ditto	52 28					
	NE	Summit E isl. crag	60 11	1 12	0			
	SE	Ditto	32 49					
	NE	Summit NW table	19 40	2 40	+5	737		32½
	SE	ditto	18 8					
	NE	Summit SE crag	86 57	1 10	-2	749		15
	SE	ditto	62 18					
	NE	Edge floor cent. cove	78 38	5 42	-4	742		74
	SE	ditto	55 0					
	NE	Summit SE dome	94 49	4 46	-2	858		71
	SE	ditto	98 43					
	NE	Highest edge E ledge	91 56	5 16	-2	577		55
	SE	ditto	18 0					
	NE	Summit NE peak	52 35	5 1	0			
	SE	ditto	9 19					
	NE	Pinnacle 1894 ledge (protruding - new?)	33 36	13 34	-2	170	87	
	SE	ditto	-14 54?					
	NE	New Sum. W crag mass	47 6	3 22	0			
	SE	ditto	37 20?					

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology.

JOURNAL

Hawaiian Volcano Observatory

Day Tuesday Date Dec. 4, 1917.
Wednesday " 5, "

Dec. 4.

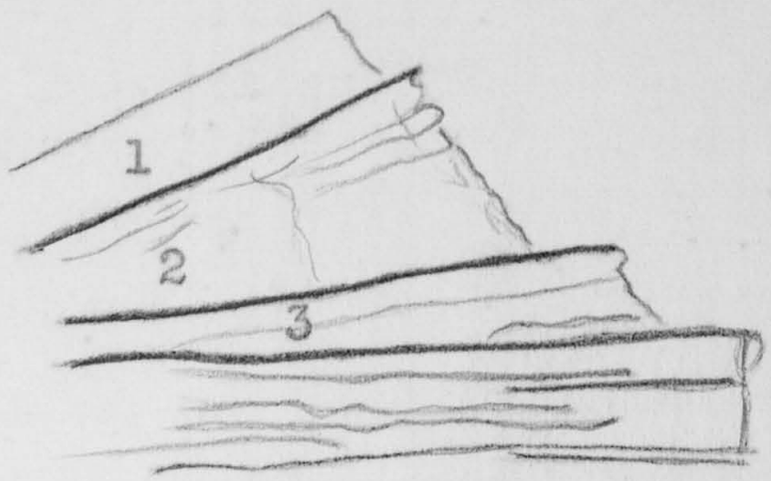
2:10 p.m. SE station.
Bench of central cove has sunk and is covered with fresh lava from the lake. SE crag has tipped in that direction--that is, to the W. SE channel crusted. Lake quiet, only activity at SE sinkhole. Surface of lake 10 feet below floor of E island crag.

3:30 p.m. SW station.
N arm active and SW arm quiet. Rocks still falling from sides of central crag into the gulch between it and S floor.

Alex.

Dec. 5.

11:20 a.m. Lake still low but rising with crusted spells and occasional break-ups. The SW channel open and streaming outward through it and in main lake streaming northward in broad zone from SW, while SE arm is crusted over. Marked tunnels central and E coves. Inward streaming at their mouths. During break-up the visible streaming SE resumed. Feeble puffing and fountaining SE. High spatter central cove and E gulch. Glow at latter above lake level and a whitish fuming chimney still higher probably glowing at night. Nothing at SE grotto (E side SE cove). Noise of fountaining at SW tunnel (E end SW cove). Much central fountaining of a viscous order and bombardment along N cove rampart. NW table looks more broken as seen from W. E island crag more in relief and cracked through. SE crag more tipped to WNW and the SE bench of it shows a new lower level and the recent level upraised.



Three bench levels of SE crag.

It has sunk probably at central cove end and lifted at SE cove end. The E ledge also looks higher and the inner bench under it seems higher than the newest bench level elsewhere, which is 10 to 12 feet above lake level. The strong smoking of the coves has been relieved apparently by collapse and readjustment for the dense smoke has stopped at central, E and SE coves.
Large sulphurous smoking patch SW of SW cove.

T.A.J.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Wednesday Date Dec. 5, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.

			no	pl	scr	stop	ex	cam
11:20a	SSE	Center	1		8x	f/11	$\frac{1}{2}$	
	S	SE cove	2		"	"	"	
	S	SW cove	3		"	"	"	
	SSW	Central cove	4		"	"	"	
	SW	SE crag	5		"	"	"	
	HighNW point	Broken up NW table	6		"	"	"	

T.A.J.

1917, Dec. 5



5



3



2



4

H73

5 Dec. 1917

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1



6

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date Dec. 6, 1917.
Friday " 7, "

Dec. 6.
2:35 p.m. From upper NE bench.
Lava in SE arm 10 feet below floor at central cove. Very active in central cove and on N side central crag. N arm quiet.

3:10 p.m. SE station.
Lava rising. No indication of recent rock falls. SE arm active.

3:20 p.m. Eight grottoes in SE arm active and nine central fountains in same arm.

4:00 p.m. Whole of inner bench E fell into lake starting many fountains. Soon after new bench of SE crag fell.

Alex.

In afternoon from H.V.O. the central crag much higher, both horns and W shoulder showing, seen through glass, above profile half-dome on NE rim of pit over 1894 ledge.

11:30 a.m. Lake higher. New spatter margins hanging with stalactites E gulch and W side SE cove and elsewhere. Inner bench 8 feet high. Comparatively rapid streaming to SE. Smoke less. Crags high. Lake evidently recovering from recent subsidence.

T.A.J.

Dec. 7.
11:20 a.m. General break up. Lake higher. Three feet below inner bench. During break up streaming to SE and SW. E high knob of old W crag mass split in four great crevasses and rocks sliding there. Rock slide at SW crevasse high margin Halemaumau. E island, central and SE crags all higher? Heavy smoke SE domes, S pressure ridge, SW white patch, SW tunnel, W floor, old W crag mass and N cliff. Rocks falling central crag. The rising involves a central cylinder and the sinking a peripheral valley. E crag in view H.V.O.

8 to 9 p.m. High gas pressure. Fountains pounding on bank E cove, E gulch, E bench, SE cove. Heavy fountains base of W crag and N rampart. Occasional heavy bursts center, middle SE arm and at SW tunnel. Blue flames central cove, E gulch and back from edge SW tunnel. No glow W or NW cones. Glowing and flickering vent on central cove floor back from edge. Lake at inner bench level, higher than a.m. SW cove occasional break up. Streaming to SE, and from SW to N.

T.A.J.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

KILAUEA DAY SHEET

Day Friday Date Dec. 7, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:20 a	S	SE	0					
	SW	S	0					
	S	SE dome(5' above lake)	7 7	15 51	-1	262	75	
	SW	ditto	18 54					
	S	W summit SE crag	35 11	2 53	-1	358	19	
	SW	ditto	33 00					
	S	W summit central crag	73 19	-0 18	-1	471	- 3(up)	
	SW	ditto	54 19					
	S	Summit E island crag	55 43	0 26	-1	643	5	
	SW	ditto	61 20					
	S	Old sum. W crag mass	80 22	3 8	-1	833	46	
	SW	ditto	94 21					
	S	Lake point SW cove	95 40	8 19	0	553	80	
11:50a	SW	ditto	74 37	17 22	0	274	86	

Lake 9 ' higher than on Nov. 23 (two weeks)
Cent. crag 11 ' " " " " "
East crag 13 ' " " " " "

Lake depression .....82! .
Central crag above lake 85'; above rim 3'.
E island crag " " 77'; below " 5'.

T.A.J.

			no	pl	scr	stop	ex	cam	

Massachusetts Institute of Technology

JOURNAL

Hawaiian Volcano Observatory

Day Saturday Date Dec. 8, 1917.
Sunday " 9, "
Monday " 10, "
Tuesday " 11, "

Dec. 8. From H.V.O. E crag and whole summit body of central crag more plainly in view, even without glass. Afternoon lake reported very quiet.

Dec. 9.
6:00 p.m. Much movement in crags, falls of rock, lake appeared low, crags high. Great activity.

Dec. 10.
Morning. Crags higher than ever as seen from H.V.O.

T.A.J.

Dec. 11.
8 to 9:30 p.m. From SE and SSE. Wind N.
Fume dense. Fuming place N seemed to be sending out increased amount. Difficult to see details of crags. Thin skins over lake. Much blue flame, especially at SE grotto. Lake low, banks 12 or 15 feet high. The spatter grottoes on SE side and W side of SE cove gone. Banks appeared to have scaled off a great deal all around SE cove, central cove and base E island crag. A very wide third bench at base of SE crag extending in point toward the E and making a narrow channel between that crag and SE bank of lake. Streaming from center to N in main lake. Streaming around SE crag from under skin to the two grottoes in SE cove. Sometimes streaming could be seen toward central cove. Very frequent bombardment N arm of lake. Most continuous activity that could be seen was there, at the two grottoes in SE cove, at base SE crag, with occasional breaking up of E cove. Fall from bank under SE station making wave over to point SE crag. Hot lake.

I.P.J.

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Hawaiian Volcano Observatory

Day Wednesday Date Dec. 12, 1917.
Thursday " 13, "

Dec. 12.
11 a.m. to 12 m. Heavy crusts. Most activity in grotto on W side SE cove. Lake lower than last night - banks almost 20 feet high. Rapid streaming without bombardment into cave of central cove. Much material has fallen from top of SE crag and from central steeple. Central cove seemed deeper. Most of bench at base E island crag gone and new bench 6 or 8 feet lower down forming. Several small central fountains at breaking-up time.

Dec. 13.
10:30 to 11:30 a.m. Fume less. Crusts thick. Banks of SE cove higher. Horseshoe spatter dome began on S bank. Grotto SE curtained with wide long stalactites. Grotto on W side curtained with slender stalactites. Streaming toward these grottoes around long point of SE crag. A large brown horseshoe cone central cove, quiet at this time. Raw red side of SE crag just above. There has evidently been much scaling off here since Friday, Dec. 7.
From NE could see a large tunnel under central crag. It looked about 15 feet wide and 10 or 12 feet high. Lava crusted inside at this time, but while at SE during a slight sinking spell there was some activity in this region. Even during breaking up spells most of the activity visible was confined to SE cove. Central crag appears to be crumbling. Little noise.
Overflow material in valley between SE crag and central crag seems to indicate further rising of central crag as large slabs of it lean against the walls of the crag.

I.P.J.

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Day Friday Date Dec. 14, 1917.
Sunday " 16, "

Dec. 14.
4 to 6:15 p.m. From E, SE and SSE.
Heavy crusts in channel, SE arm and SE cove. Latter nearly always tightly crusted over. Occasionally would break up at SE and W grottoes of SE cove but with no high fountaining. Bank a few feet lower than on Dec. 12 and 13. A piece had fallen out of bank W side of this cove. The point of third and lower ledge of SE crag breaking up into slabs. Another ledge forming lower down as could be seen when a break up of crusts came and a pouring of lava from under these crusts splashed against base at same place where crusts kept breaking and activity set in the day before -- N side of SE crag. The same action just inside channel at base E island crag. E cove and E gulch cove occasionally broke up but channel between the central and E crags was crusted over during the two hours of observation.
In main lake bright lines of northward streaming were almost constant as was the bombardment of bank at end of N arm.
There were times of fountaining in this same region when several central fountains would go with stream.
SE cove and narrow channel leading into it broke up completely with crack and founder action at 6 p.m., leaving a thin brilliant skin.
Blue flames in cracks in thick crust, especially at the usual places of activity and one almost steady one from hole a few feet above lake level at SE grotto.
Tunnel under N side of central crag open but dark.
Fall of rock heard -- seemed to be on NW side E island crag.
S pressure ridge seems higher. Bank at central cove W of horseshoe dome about 3 or 4 feet high only.

IPJ.

(Central cove sinking and SE rising? -- TAJ)

Dec. 16.
2:40 p.m. E station.
The high knob on the central crag is about two feet higher than the SW wall and the SE crag is much lower. Benches rising. The bench between the SE crag and the central crag is only about two feet above the lake level. SE arm very quiet and so is the N arm. Dense fume N arm locality.

Alex.

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Day Monday Date Dec. 17, 1917.
Tuesday " 18, "
Wednesday " 19, "

Dec. 17.
4:00 p.m. Lake high and rising. Twelve red concentric border domes forming. Two-foot inner bench SE. Glow both NW and W cones. Overflows E cove, central cove, NW cove. Latter big. O.F. locality central fountains. High gas pressure. Puffs from W cone, hiss from NW cone. NW table more broken down. E ledge higher. Streaming to SE, and from SW to N. Stalactites hanging at central grotto.

T.A.J.

Dec. 18.
2:10 p.m. E station.
Lake quiet everywhere, even SE arm very quiet. Fume thick.
2:15 p.m. SE station.
There were three border fountains E and SE but everything else was quiet. The SE dome grotto was curtained and smoke was coming from its top.

Alex.

8:30 to 10:30 p.m. Open grottoes S side SE cove, central crag, W side main lake. Glowing stalctite margins around base SE, central and E crags. Long stalactites bending with the flow of the current, which was streaming toward SE base E island, E gulch central cove, under edge SE crag, and both ends SE cove. Many fountains in main lake and SE arm. As many as fourteen could be seen at one time. During these two hours there was activity in the grottoes all the time with occasional border and central fountains.
Wall between E cove and E gulch seemed higher. Channel into SE cove wider.

I.P.J.

Dec. 19.
4 to 6 p.m. Lake relatively low and rather smoky. NW cone glows, no glow seen at W cone; latter caving into chasms; no hissing W. SE bench 9 feet high, central cove 6 feet high, lowest bench of point of SE crag 3 feet high. Lake crusted mostly, occasional fountains NE and in middle region; grotto activity E and SE and against S side E island crag. Streaming to SE and to N. Fountaining N rampart. Dense smoke S edge SW cove. NW cove narrow and 6-foot bench. All around the spatter crescents of Dec. 17 high and deserted by the live lava, now lower. Some hissing at SE grotto, which is curtained.

T.A.J.

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KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Monday Date Dec. 17, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
			no	pl	scr	stop	ex	cam	
4 p.m.	W	NW cove overflow	1		8x	f/8	1	P	
	NE	SE crag	2		"	f/6.3	1	"	

T.A.J.

1917, Dec. 17



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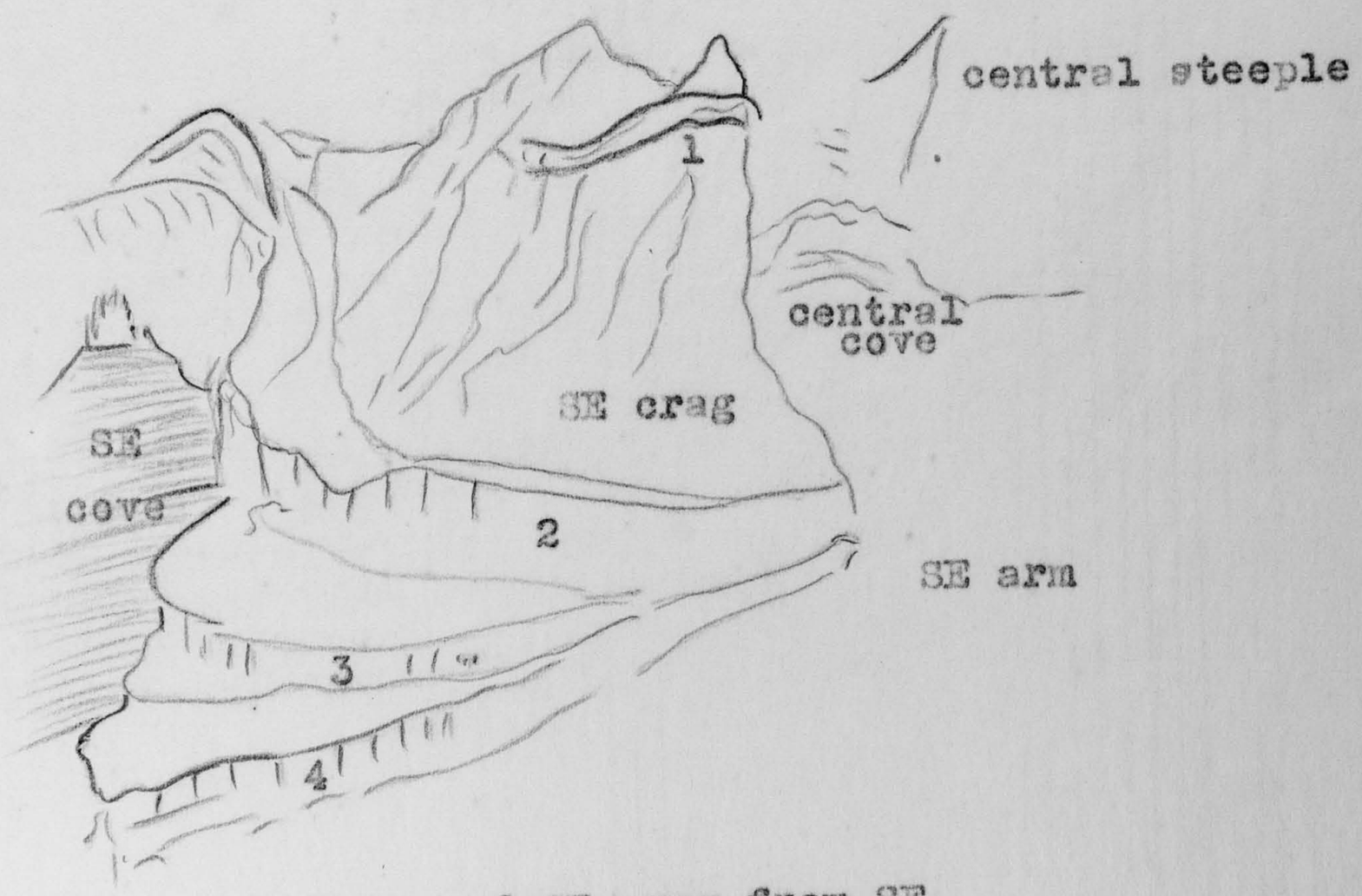
JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Thursday Date Dec. 20, 1917.
Friday " 21, "

Dec.20. Falls reported from SE crag and E island crag.

Dec. 21.
4:20 p.m. Lake low but high gas pressure occasionally breaking through cruat with a rush. Hard thick crust general. Caverns W side SE cove and central cove. Heaving and gas rush SE grotto. Fountain against N base SE crag and S base E island.
S crag and pressure ridge, E ledge, N smoke cliff and NW table remnant uplifted. Inner bench fallen from E cove.
Blocks falling from N side SE crag and at E gulch and at E end 1894 ledge.
SE crag now shows four benches, lowest one 4 feet over lake.
N side of crag all fallen away.
E ledge nearly as high as SE shelf.
Streaming N in N arm. Crust clanking as it cracks. E gulch indented as a considerable cove.



The four benches of SE crag from SE.

5:22 p.m. Only five fountains, three SE, one N and one SW.

10:00 p.m. Heavy fall of whole S margin SE cove seen and some other falls of rock heard. Lake sinking.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology.
Hawaiian Volcano Observatory
Day Friday Date Dec. 21, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
4:20 p	SE	N	0					
	E	N	0					
	SE	Central cavern (lake)	54 41	13 0	-5	396	92	
	E	ditto	79 14					
	SE	E summit central crag	59 19	-0 50	-5	525	-7 (up)	
	E	ditto	75 24					
	SE	E summit SE crag	58 37	6 15	-5	242	27	
	E	ditto	95 30					
	SE	Summit E island	32 36	-5	-3	545	-0.5	
	E	ditto	51 45					
	SE	Summit E ledge	16 50	10 35	-3	206	38	
	E	ditto	88 51					
	SE	Summit spatter cone central cove (recent overlow level)	55 18	11 21	-5	372	75	
	E	ditto	81 33					
	E	Tip point SE crag	112 53					
	"	Summit remnant NW table (tilted up higher?)	21 7	1 6	-5			
	"	Summit S crag	81 23	2 39	-5			
	"	W summit S pressure ridge	84 9	3 27	-5			
	"	E " old crag mass	47 27	2 56	-5			
	"	Cliff edge N smoke	21 36	3 13	-5			

Depression lake 92'.
Central crag 7' above edge (8' lower than day before)
SE crag 27' below "
E ledge 38' " "
E island level with "
Central cove dome 75' below edge.
Floor central cove 15' above lake.
Level of overflow Mon. the 17th about 75' down.

T.A.J.

			no	pl	scr	stop	ex	cam	

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JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Dec. 22, 1917.
Sunday " 23, "

Dec. 22.
Morning. Lake lower. Rocks falling from N side SE crag and cavernous openings W side SE cove and at central cove. New inner bench 2 to 3 feet above lake. Increase of smoke and cracking on W side SE cove.
Crags much lower as seen from H.V.O.
Cloudburst at noon over Uwekahuna makes double waterfall down cliff there drainig the wash valley of southern Uwekahuna bench. Waterfall lasts about 30 minutes.

Dec. 23. Crags stationary and fume somewhat thinner as though lake rising or at least the falling arrested.

Measures of crag movement from H.V.O.

Using Zeiss telemeter, frontal measurements.

Dec.	19.	12:30 p.m.	24.22 feet of crag showing (central crag)
		1:50 p.m.	No change.
"	20.	9:00 a.m.	No change, but a little more shows above rim on left side E island mass.
		4:30	23 feet only of crag shows.
"	21.	8:45 a.m.	18 feet only of crag shows; right shoulder of central crag gone down.
"	22.	9:15 a.m.	14.5 feet of crag shows; greatly down.
"	23.	9:30 a.m.	12 feet of crag shows.

T.A.J.

JOURNAL

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Day Monday Date Dec. 24, 1917.

5:00 p.m. Crags much lower. W summit of central crag gone and E summit now the higher. More overhanging on SE.
From SE. Lake tumultuous, 20 feet below SE cove floor. General cracking and foundering and streaming to E and SE. Twenty fountains more or less, tunnels, stalactitic border.
From SW. Quiet glowing cavern NE corner of SW cove leading under central valley. Part of roof seen to fall into lava below. Several small falls from S face central crag mass. Streaming northward out of SW cove and southward from N arm. Nine fountains N, W and in center. Continuous fountains in groups W and SW of E island mass in the general Old Faithful region. An occasional hiss from SW cove cavern. SW cove crusted and quiet. The abundant central bubble fountaining unusual for this recent time, and suggests a definite subsiding lake. The noise is a continuous plashing. The fountains do much spraying and high flinging. N arm region crusted except during a break-up. No glow seen W or NW cones. SW channel very narrow and 25 feet deep and an active grotto in the outer bend. Dense smoking SW floor and S pressure ridge. Hissing heard. Benches around middle region irregular and 15, 20 and 30 feet high.
The E end of S pressure ridge shows a very hot stained blue fume area which looks as though a tunnel or sinkhole were below. (One-third of distance from SE cove to SW cove.) Tunnels at E cove (quiet), at W side SE cove (rumbling), and at E gulch (quiet). Five benches on SE crag now, lowest 5 feet over lake.

5:30 p.m. From SE.
Four fountains in center, one S of E island, one in SE grotto and one in grotto W side SE cove, and continuous one in central cavern with high incandescence and much bubble fountaining and inward streaming. From under high E island crag and along shore to E cove tunnel there is outward streaming. Continuous hiss heard SE from under crust edge. SE arm crusting over.
N rampart active. Lake noisy -- puff, plash, cracking crusts, hiss, rumble. NW table summit appears higher still.
From E.
No activity seen in cavern N side central crag. Puffing fountains central cavern and NE heard.
Several rock falls from face of E ledge and from N face of SE crag.

T.A.J.

JOURNAL

Massachusetts Institute of Technology
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Day Tuesday Date Dec. 25, 1917.
Thursday " 27, "
Friday " 28, "

Dec. 25.
11:30 a.m. Crags higher. Fume thinner. SE arm crusted. New inner bench covering the lower one of last night at point of SE crag. Inner bench now three feet high. Caverns submerged. Active grotto with short stalactites W side SE cove. Grottoes, not tunnels, E gulch, central cavern, E cove, and NE side and W side SW cove. SW cove crusted. SE cove crusted. Four or five continuous central fountains at O.F. locality and in N arm. Puffing from grottoes. From the west the W and NW cone localities were seen to be smoking and hot, but no glow to be seen nor hiss heard.
There has been much falling from the high edge of Halemaumau along the outcrop, on the wall, of the summit crevasses SW. Fresh scar from second bench S side of SE crag, rock fall since last night.

Dec. 27.
3:00 p.m. Rainy and foggy. Higher lake and higher crags. Lake heavily crusted. Streaming over a small area W side SE cove to SE tunnel. Cracking and foundering at margin E cove and some activity E gulch. New inner bench one foot high, wide at E cove and SE crag point. Only three benches now in SE crag which is being gained on by the lake. NW table crag looks very high.

Dec. 28. Crags still higher.

T.A.J.

2:25 p.m. From SE.
Lava about 2 feet below new floor of E island crag. Lake slowly rising. Central cove very active, throwing lava out on floor.
2:45 p.m. From SE station.
Occasional glimpses of N arm through the fume showed that there was activity there.
3:00 p.m. From S station.
A few fountains in SW arm.

Alex.

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Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Dec. 29, 1917.

This morning lake reported up to inner bench.

4:10 p.m. Now 5 feet below. Streaming to SE and N. Cracking and foundering, splashing and rumbling (especially W side SE cove) in the grottoes. Grotto domes W side SE cove, SE, E gulch, E cove and central cove. Now much overhang. Inner bench 5 to 6 feet below rampart edge of S valley at SE cove. Occasional migrating central fountains. Bright lines and medium crust. Glow at E gulch cone and at cone W side SE cove. Fumes in general rather dense.

5:00 p.m. Line of travelling fountains from center SE arm to SE crag, migrating eastward. This followed by a surface stream accelerated from channel eastward. Much gas pressure and spraying from central fountain. Group of central fountains in middle region. Widest inner benches at point of SE crag and against E island at SE cove. (20 feet wide). Ordinarily 5 to 10 feet wide.

5:16 p.m. Rising resumed and hiss from under border crusts. Two inner benches at E gulch, 6 and 15 feet respectively above lake; upper one sulphur stained and fuming.

T.A.J.

2:10 p.m. From SE station.
Lava down about 5 feet below new floor of S bench and very active in SE cove.

2:53 p.m. From S station.
SW cove very active. Many fountains in SW arm. There have been rock falls from side of central crag.

3:40 p.m. From SW station.
A bridge of crust formed from SW bench to central crag; there are two, one on S side and one on W side.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Saturday Date Dec. 29, 1917.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
4:10 p	SE	S	0					
	S	SE	0					
	SE	SE cove tunnel grotto	-34 27	14 28	-3	298	77	
	S	ditto	36 24	ca				
	SE	Summit central crag	-51 34	-0 53	-4	507	-7 (up)	
	S	ditto	68 3					
	SE	Summit SE crag	-51 54	5 45	-4			
	S	ditto	29 42					
	SE	Bench cone W side SE cove.(bench level) (5 ft. above lake)	-40 36	13 52	-4			
	S	ditto	37 38					
	SE	E island crag	-78 4	-0 21	-4	539	-2	
	S	ditto	55 22					
	SE	Lake level cavern under E island crag	-79 50	10 15	-4	428		
	S	ditto	46 25	7 39	-3			

Depression lake 78 feet
Elevation summit central crag (E summit) 7 feet
" E island crag 2 feet

T.A.J.

no	pl	scr	stop	ex	cam	

JOURNAL

Massachusetts Institute of Technology
Hawaiian Volcano Observatory

Day Sunday Date Dec. 30, 1917.
Monday " 31, "

Dec. 30.
5 to 7 p.m. Crags higher. Lake 10 feet down SE point. Quiet spells and occasional breakings up. At first 2 to 3-foot glowing overhang, afterwards filled by rising. Glowing and flaming crack E gulch. Central fountains in central region and in SE arm. Glowing cavern SW cove leading to central valley. Fountains break a way slowly E with cracking and foundering. Inner bench SE breaking down occasionally. Three benches only in SE crag. Glow N rampart. Fume rather heavy.

Dec. 31.
4:30 p.m. Lake rising. Larger opening glowing at E gulch. Spatter building and much Pele's hair floating up. Crust thinner. Slow southeastward streaming. Five or six border grottoes. Large dome built at E cove. Central fountains. SW pond shut off by bridge across channel. Pond crusted. Blowing and spurting cone building 20 feet SE from edge SW pond over S tunnel and building rapidly. Saw break-up of pond -- violent escape of gas and border fountains; this relieved pressure and cone ceased blowing. Rapid streaming inward to pond both sides of bridge during break-up. As soon as crust formed the cone began again.
W cone looks hot but no glow seen or hiss heard.
The sulphur patch recently fresh, on high edge Halemaumau SSW, is now dead and white again.
Spatter dome W side SE cove. E gulch dome spurting.
5:30 p.m. SE arm and center crusted. Streaming from opposite E gulch to W side SE cove and to E bench. Streaming also into center cove.
Inner bench only 2 feet high.

T.A.J.