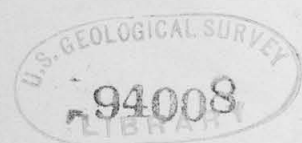


# Hawaiian Volcano Observatory Record Book 1918

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.

Hawaiian volcanic observatory.  
Daily journal  
Jan. - May, 1918



52336  
16277ABBREVIATIONS

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 <sub>2</sub>	.....	Green mercurial with compressed CO <sub>2</sub>
G. (camera)	.....	Graphic
G. (screen)	.....	Wratten G
Gl.	.....	glycin
grot.	.....	grotto
Hale.	.....	Helenaumeu
h.i.	.....	height 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
K11.	.....	Kilsues
K2	.....	Wratten K2
K2 cel'id	.....	Wratten K2 celluloid

loc. ....	location
lev. ....	level reading
M.L. ....	Mauna Loa
N.R.H. ....	New Rest House
N.F. ....	New Faithful
no. ....	number
N & G ....	Newman & Guardia
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 Halemau
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

Day Tuesday Date January 1, 1918.  
Thursday " 3, "

- 1 -

Jan. 1.  
7:30 p.m.

SE station.

Lake about 10 feet below inner bench. Very active SE. Fountains in E gulch. Rest of lake crusted over with a few fountains in N arm. No avalanches.

Jan. 3.  
10:30 a.m.

Went down on NE floor; fummy with S wind. Walked around pit S. The pronounced rise of the last week has pushed up the middle portion of the bench magma and pushed back to the NE the NE floor and NW table and N cove as a single unit, while the central and E island crag masses have risen over the central column. The E ledge now higher than SE shelf. The NE crevasses have greatly closed and new pressure ridges have risen, extending along the base of the floor slope from the E gulch tumble northward. The N cove floor has risen and been crushed between the rising NW table and the NE smoke cliff. This tumble forms a talus leading to the N pit. The surface of the NW table, now a peak, slopes eastward, while the NE floor slopes northeastward. Two outlying crags lie at the W base of the NW table.

The inner bench is 4 feet high at E cove and SE point, 2 feet high at SW pond and NW cove, 1 foot high at E and NE sides of N arm.

The NE cove is floored with fresh lava like the central cove. The NW cove is a narrow river-like short indentation but the floor area is wide and flat. The overflows, however, are nowhere fresh in the pit.

The SW pond is crusted, heaves slightly and the SE corner shows the blowing filagree area with many glowing cracks and sulphur stain, flaming and hissing continuously and harshly. That the crags are in motion is shown by tumbling rocks from time to time, especially NE side of NE peak, the NE crevasses, the NE taluses, the crevasse of E gulch. The central crag has lost its high E peak and has now a jagged straight top or ridge.

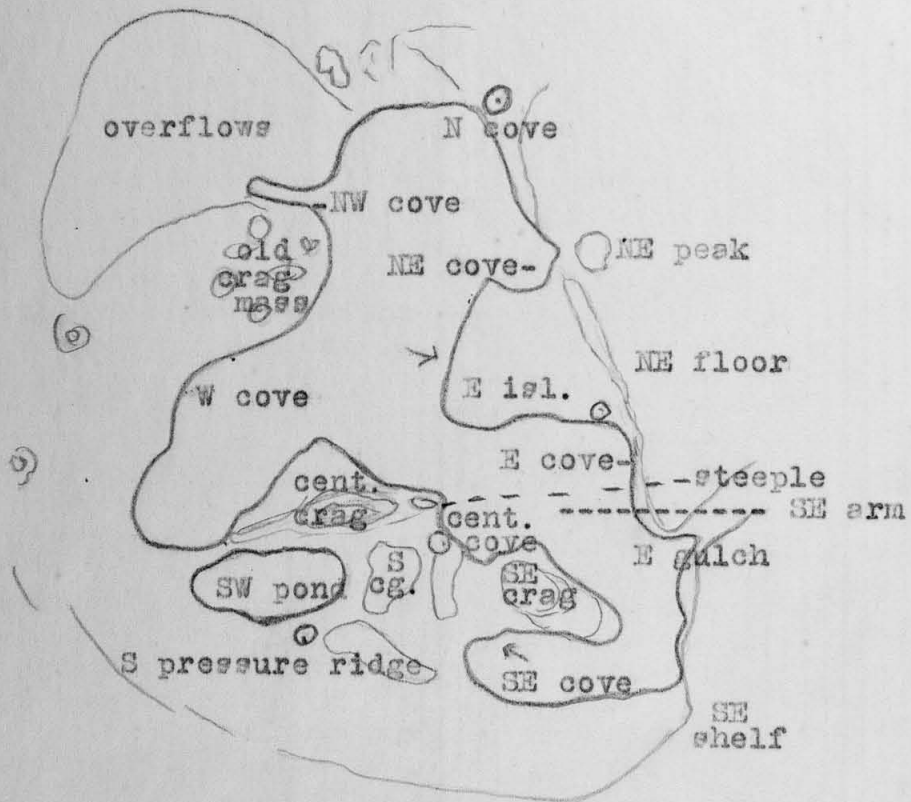
No hissing from NW or W cones but fresh tumbles seen at latter. The lake is rising; crusted; occasional break-ups with central fountains in central region; blowing grotto fountains W side SE cove and occasionally E cove and E gulch. Domes at E cove, NW cove and N cove. Fountains NE. Streaming probably outward from NW and SW coves.

The blowing area by SW cove and the ponding of that cove all suggest that the S well is acting as a conduit, like the NW pond of 1916; the shutting off of channel SW, however, due partly to uplift of central crag.

Much noise from central fountains especially against W base of E island crag mass. Occasional heavy bombardments at the coves, especially N cove. Old W crag mass shows seven peaks. Seen from the N edge of pit the E island and central crags rise very high above the far edge and the edge of the E ledge

seen to be higher than SE shelf. The SE crag is in height about midway between height of SE shelf and rim of pit. The whole NE floor bench is now a replica of the 1894 bench, wider and farther in toward the center of pit. The accordance of slope and form and ragged edges is striking as seen from NNE.  
 The density of the white billows today at Postal Rift is very striking.

Lake from South:-



T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

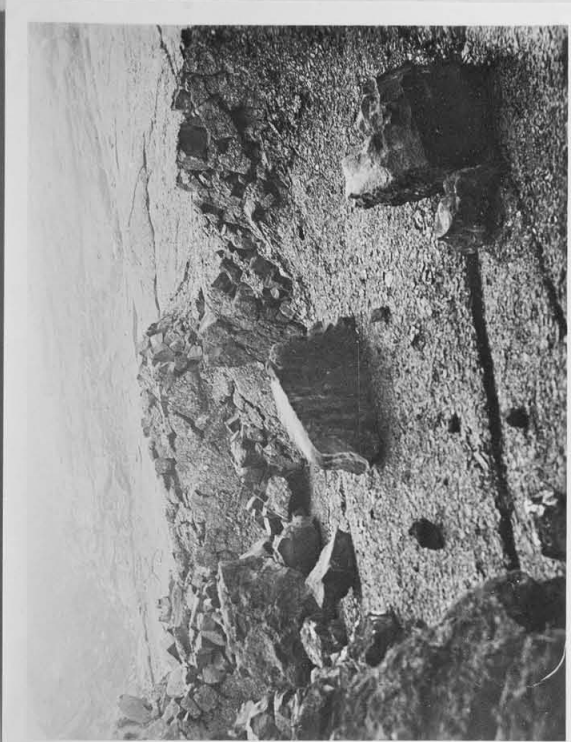
Day ~~Thursday~~ Date January 3, 1918.

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

			no	pl	scr	stop	ex	cam
10:30a	E end	) N smoke. Shows '94 ledge, slope NE floor. Base ) E gulch, new pres- ditto) sure ridges. " N sta. Closed cracks NE floor. SSE SE crag Top'94 } Crag ledge } SSW SW pond, blowing fila- gree patch in foreground.	1		8x	f/11	$\frac{1}{2}$	P
			2		"	"	"	"
			3		"	"	"	"
			4		"	"	"	"
			5		"	"	"	"
			6		"	"	"	"

Cloudy and calm.

T.A.J.



2

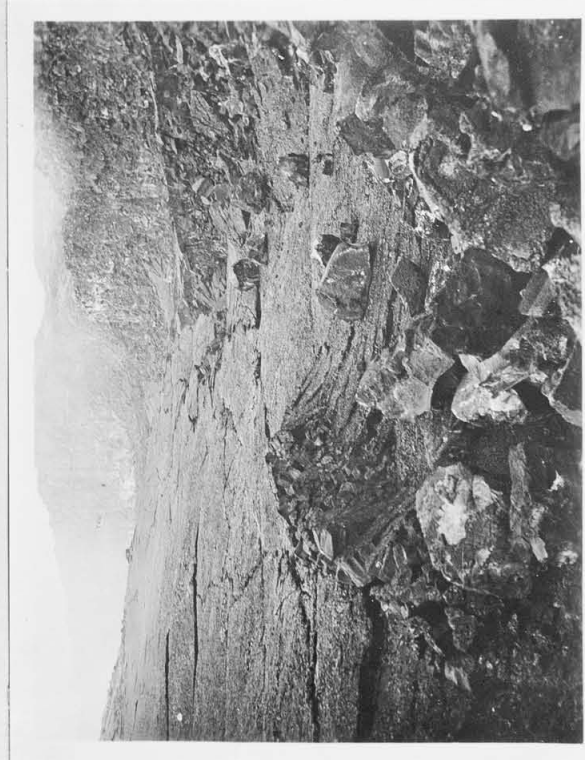


bar

5



1



3



4



6

Jag

- 11:15 a.m. Fume very thin. E summit of central crag fell. Strong rising and overflow of SE inner bench under SE shelf from 11 to 12:30.
- 12:30 p.m. A break-up. Very hot. Strong gas-pressure and blowing at spatter domes E and W sides SE cove. High drip cone with stalactites at E-gulch. Fresh flow whole S valley to SE rampart from SW cove. Inner bench SE point, E cove, central cove. SE cove 2 to 3 feet high. Streaming to SE, rapid in SE cove. Streaming northward from SW arm. Rocks falling back of E gulch, from pressure ridge under E station, NE side of NE peak, S face of E island crag, S face of central crag, N side NW crag and in N pit. Crag evidently in process of slow warping, but rising not shown in measured angles on E and central summits in course of an hour and a half. Hot blistered thin crusts SE cove, heavier polygons separated by bright lines over central region and SE arm. Occasional big central fountains migratory with swarms of bubblings. The S valley floods covered with crack and founder pattern. What festoon convexities remain show flow southward and eastward from general overflow of SW pond. Strong streaming W to E across SW pond, hissing vent in floor SE of it and smoke patch SW of it -- both maintained through the new floods. There is a distinct ridge from W cone to old W crag and the smoking NW cone region is a depression NW of this ridge. The NW crag seen from SW is a steep hog-back like the SE cone.
- 1:30 p.m. Lake generally crusted and high, fountaining at SE margin of SW pond made a small overflow. Crackling at hissing patch over SW tunnel. Tremendous fountaining W side SE cove and rapid streaming to that corner -- the E end SW tunnel? Shores of SW pond only 1 to 2 feet high. The weight of the great S fill accounts for the uplift of central crag and the falling off of its summit material, for it overhangs on the S strongly as usual. The W bank of the SW arm of main lake is warped up 20 feet high, while at either end, namely S of W crag and at SW isthmus, the bank is only 3 to 4 feet high. The 1917 January rise is repeating itself.
- 1:45 p.m. There was general break-up and temporary subsidence in SW pond. Strong streaming from W. The E cove has new floor and spatter dome. This contrasts with the SE cove, which has not overflowed S or W but probably its shore has risen with the crags except on the E.
- 2:00 p.m. The N arm was quiet and heavily crusted. NW cove brimming. The wide area of flat lava between the W shelf, NW crag and W crag may be fresh: it shows subsidence of 4 feet from its maximum level around the lower outliers of NW crag which it attained prior to loss of gas through cracking and foundering.
- 2:15 p.m. General cracking and foundering, violent fountaining, temporary subsidence, much noise, all over lake. Bright rim with overhang. Began with violent fountaining somewhere SW. Lines of

- 2 - Day Saturday Date January 5, 1918.

bubbling between large foundering crust areas. Subsidence 2 feet, immediate crusting again.

From NW edge the E ledge is well above SE shelf, the SE crag only a little below edge of pit, the E island crag highest of all, and the E island crag, central steeple and central crag all three higher than the A-frame at S station. The central steeple is wide from this point of view.

T.A.J.

3:20 p.m. SW station.

Large rock slide from central crag followed a few seconds later by one from S bench. Sliding continues for some time.

3:50 p.m. SE station.

SE arm overflowing its SE bank, the lava extending up to the SE wall of pit and around to the E gulch. About 10 feet back of SE grotto there is a round hole 8 or 10 feet across that at times threw lava up nearly as high as the upper bench.

4:30 p.m.

Fall from NE bench into N arm starting fountain activity which lasted some time.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day Saturday Date January 5, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:15a	SE	N	0					
	E	N	0					
	SE	NW crag	17 47					
	E	ditto	20 56	0 19	-3			
	SE	Summit E island	32 28					
	E	ditto	52 3	-2 6	-3			
12noon	E	ditto		-2 7	-2	490	up 17	
11:15+a	SE	Bench level cent. cove	52 4					
	E	ditto	79 23	7 9	-1	579	72	
	SE	SE point (lake)	82 34					
	E	ditto	113 3	9 10	-3	378	61	
	SE	SE blowing cone (lake)	100 0					
	E	ditto	115 0	7 42	-3	459	62	
	SE	Surface bench SE pt.	81 51					
	E	ditto	111 49	8 9	-3	371	54	
	SE	Surface 2nd bench " "	71 49					
	E	ditto	105 29	6 36	-3	361	45	
	SE	Summit SE crag	59 4					
	E	ditto	95 19	1 4	-3	383	8	
	SE	Summit E ledge	14 37					
	E	ditto	89 11	5 38	-3	206	20	
	SE	Summit steeple	53 46					
	E	ditto	76 8	-0 58	-4	501	8	
	SE	E summit cent. crag (fell)	58 45					
	E	ditto	75 46	-1 28	-4	579	14	
	SE	W summit ditto (higher)	58 45					
	E	ditto	73 12	-1 39	-4	638	17	
12 noon	E	ditto		-1 40	-2	637	up 17	
11:15+a	SE	Summit S crag	68 34					
	E	ditto	81 51	1 21	-3	167	4+	
	SE	E sum. old W crag mass	37 42?					
	E	ditto	47 36	1 41	-2	711	21	
	SE	NE peak	8 27					
	E	ditto	24 40	2 8	-2	374	15	
	SE	N smoke cliff	12 34					
	E	ditto	21 4	1 45	0	585	18	
	SE	Boulder NE floor	-15 8					
	E	ditto	-7 14	18 13	0			
	SE	Pt. SE shelf (summit level)	9 30					
			no	pl	scr	stop	ex	cam
	E	ditto	115 0	8 48	-5			
	SE	Old summit W crag	42 39	1 28	-4			
		Depression lake 61 feet						
		Elevation E island crag 17 feet						
		" central " 17 " (W summit)						
		Lake risen 17 feet in 7 days						
		E isl. " 15 " " " "						
		Cent. crag risen 15 feet in 7 days. (ca)						

KILAUEA DAY SHEET

Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day Saturday Date January 5, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
11:55a	SE	E gulch	1		8x	f/11	1/8+	P
	"	E island	2		"	"	"	"
	"	SE crag	3		"	"	"	"
	"	SE cove	4		"	"	"	"
	E of SW	SW pond	5		"	"	"	"
	SW	W cone ridge	6		"	"	"	"

T.A.J.

608



3



2



4



5

709

Day	Sunday	Date	January 6, 1918.
	Monday		" 7, "
	Tuesday		" 8, "

Jan. 6.  
2:15 p.m. SE station.  
Level of lake about 8 feet below S bench. Very active in the central cove. Se arm crusted over.

3:30 p.m. About half of the new bench SE fell into the SE arm causing many fountains. A few seconds later there was a fall from the point of the SE crag and still later another from the SE grotto dome where there was much boiling of lava.

4:30 p.m. Rocks rolling down sides of E island crag.

6:00 p.m. Lake 10 feet below banks all around. N and SE arms very active, with lava streaming rapidly toward SE grotto.

Alex.

Jan. 7.  
11:15 a.m. Lake high and crusted. Bombardment and inrush W side SE cove, pounding grotto and pot SE dome, E cove dome gone and bench collapsed. E gulch deep like a crack at lake level extending toward E station. Rapid streaming, great heat, from SE point to SE tunnel grotto -- estimated 2 feet per second. (Use telemeter for such measures). SE point bench 6 feet high, cove bench E across stream 2 feet high -- means SE crag still rising and tilting W? New spatter grotto forming at extreme end E cove (E tunnel). SW pond crusted, bubble fountaining at W tunnel, fountain noise S tunnel side, no hissing at blow hole. Large dome on bank SW pond E end, border of pond 6 to 8 feet high, flow at 11:30 a.m. overriding crust over pond from W to E. W bench of SW arm appears rising and ridge rising from W cone to old W crag. NW cone area greatly whitened, smoking and hot. Central area has fountains. Fountains N and E sides of SW pond. Only sluggish inflow to tunnel SE corner SW pond. NW crag level with far edge pit as seen SW. Cavern grotto where W tunnel (W pressure ridge) emerges on lake E from W cone.

T.A.J.

Jan. 8.  
2:20 p.m. SE station.  
Lava 10 feet below new bench S. About twelve fountains in SE arm but north arm crusted over. Fume thick N and NW.

3:10 p.m. SW station.  
There have been falls of rock from the SE side of the central crag. SW pond 10 feet down and very active with large fountains playing there.

6:15 p.m. Lava 5 feet below new bench S. SE grotto and SE sinkhole very active. Rapid streaming through channel and around point of SE crag into sinkhole.

Alex.

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day Monday Date January 7, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
11:15a	S chan.	SE point. (Shows E ledge higher than SE shelf and latter same height as cliff above)	1	W M	8x	f/8	1/2+	P
	SSW	S pressure ridge	2	"	"	"	"	"
	SW	SW pond	3	"	"	"	"	"

T.A.J.



1



2



3

309

Day Wednesday Date January 9, 1918.  
Thursday " 10, "

Jan. 9.

4:30 p.m.

Lake high; one foot down SE inner bench, five feet down SE point. Thin crusts; swift streaming to SE tunnel. (In morning SE tunnel had been quiet.) E ledge higher than ever and much higher than SE shelf. This lift extends clear around to NW crag. Large fountain breaks out under SE station. Fume rather dense. Rapid rising crags of this week accompanied by E tilt of seismographs.

T.A.J.

Jan. 10.

2:30 p.m.

E station.

Lava has been overflowing into E gulch extending for about 100 feet toward the E station. SE inner bench shows fresh overflow, also. Rapid streaming around SE point to SE tunnel.

2:40 p.m.

E station.

Fall from bank S started many fountains and shortly after the lava in SE arm sank three feet.

2:50 p.m.

SE station.

Rumbling and boiling at SE tunnel where the lava was thrown quite a distance on the ledge above. Northern part of pit quiet and crusted over.

Alex.

KILAUEA DAY SHEET

17

Massachusetts Institute of Technology  
 Hawaiian Volcano Observatory

Day **Wednesday** Date **January 9, 1918.**

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

no	pl	scr	stop	ex	cam
----	----	-----	------	----	-----

4:30p	NE "	NW crag E ledge	1 2	W M "	8x "	f/11 "	$\frac{1}{8}$ "	P "
-------	---------	--------------------	--------	----------	---------	-----------	--------------------	--------

T.A.J.



1



2

Jog

Noon.

Lake inner bench much higher. New 12-foot driblet cone sharp pointed at NW cone locality; puffs occasionally; glow and puff at driblet heap W cone. New overflows from NW cove, which is now a very slight embayment. New long driblet flow from NW cone to base NW shelf, then northward along it for 300 feet. Fresh overflows from SW pond to S valley, different pattern surface from first, and SW pond smaller. Glow cracks, hissing and sulphur stain at SE corner of SW pond, tunnel locality. W cone ridge and SW ledge over lake higher. New crevasses from W cone to NW cone and great crevasse from NW cone along W side old crag mass.

Inner bench in general about 4 feet high; 6 feet around SW pond including a considerable rampart. Cracking and foundering N cove; polygonal skins and rapid current SE arm; rush to tunnel SE cove; dome grottoes at the coves. Individual rocks falling S side S pressure ridge, high cliff under W station, NE cove, E gulch and NW crag. Crag in motion. Steady light hiss near W cones. Noise of central fountains continuous. Solfataric smoking areas SW of SW pond and S of NW cone. Also smoke from floor opposite NW cove (the NW tunnel) and from steeple and N smoke crag. E island crag looks higher than central crag. Great oxidation to red hematite at W base of upraised NW crag. Great crevasses at base of outer Halemaumau cliff NE show lift on NE floor side by four feet. N pit deep tumble. New rampart and dome N cove. Entire N pit and NE floor area free from fume back from edge of inner cliff. Angle of slope NE  $35^{\circ}$ . New lava flow far into E gulch. E ledge appears level with E station. Large dome grotto SE tunnel with fiery interior and stalactites. Occasional fountains in SE arm which migrate around SE point and against S side of SE crag with swirling and very swift currents. Current out of N arm to SE. The whole habit of pit has changed since the solstice with great increase of swift streaming to the SE tunnel, thinner crusts, more central fountains, rapid tilt to the crags and consequent tumbling of blocks, but compensated perhaps by subsidence at NE valley, N pit, S valley and under NW shelf. The lake foams up to higher level, and the crags tilt their summits up to higher level, but is the lake deepening and the bench magma really beginning to sink? Is it possible that all volcanic eruption is the beginning of sinking of a lava column? A release of compressive stress on walls of conduit might mean release of gas from solution, heating effects and inflation, hence rising and overflow of lake magma or dermolith, but actual subsidence almost immediately of aphyrolith. The swift rush of the SE cove into a sinkhole tunnel and similar rush eastward at SW cove recently, suggests subsidence. The solstice change would thus stand for sudden inflation, where explosion or release by rupture and overflow is wanting.

T.A.J.

Day Friday Date January 11, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
12:40p	SE	N	0					
	E	N	0					
	SE	Boulder NE floor	-15 26	9 12	+9			
	E	ditto	- 7 44					
	SE	Summit E ledge	12 48	2 9	+8	202	down 7	
	E	ditto	89 32					
	SE	N smoke ledge	12 00	0 19	+8			
	E	ditto	20 40					
	SE	Summit E island crag	32 35	-3 8	+8	536	up 30	
	E	ditto	52 15					
	SE	Central steeple	54 00	-2 39	+8			
	E	ditto	76 11					
	SE	Central crag	58 44	-2 50	+8	562	up 28	
	E	ditto	73 18					
	SE	SE crag	58 22	-0 24	+6	243	up 2	
	E	ditto	95 11					
	SE	Lake SE grotto	98 14	12 37	+6	260	57	
	E	ditto	112 6					
	SE	Bench level SE grotto	100 32	12 46	+6	244	55	
	E	ditto	113 55					
SE	Lake SE point	81 23	19 44	+6	163	58		
E	ditto	112 30						
SE	Summit NW crag	17 40	-0 6	+7				
E	(Cut off by smoke)							
	Depression lake 57 feet (max. 55 ft.)							
	E	island crag above edge Halemaunau			30	feet.		
		Central crag " "			28	"		
		SE crag " "			2	"		
	E	ledge below " "			7	"		
	In six days lake rose 6 feet.							
	"	" " E isl. crag rose 13 "						
	"	" " central crag " 11 "						
	Since Dec. 21 (3 weeks) SE crag has risen 25 feet.							
	"	" " " " E ledge " " 31 "						

no	pl	scr	stop	ex	cam
----	----	-----	------	----	-----

Noon	SE	Channel & new NW cone NW cone	1	W M	8x	f/11	1/2+	P
	NW height)		2	W P	"	"	"	"

T.A.J.



1



2

509

Day **Saturday** Date **January 12, 1918.**  
Sunday " 13, "

Jan. 12.

- 12:15 p.m. E station.  
Lava about 3 feet below inner bench. Rapid streaming around SE point toward the sinkhole, but no fountains.
- 12:20 p.m. SE station.  
Eight fountains travelling with the stream to the SE tunnel where there is great activity.
- 4:15 p.m. Large block fell from SE crag into SE arm causing great fountain activity.
- 6:30 p.m. Lava level with new bench at E gulch. Active in SE cove and SE sinkhole.

Jan. 13.

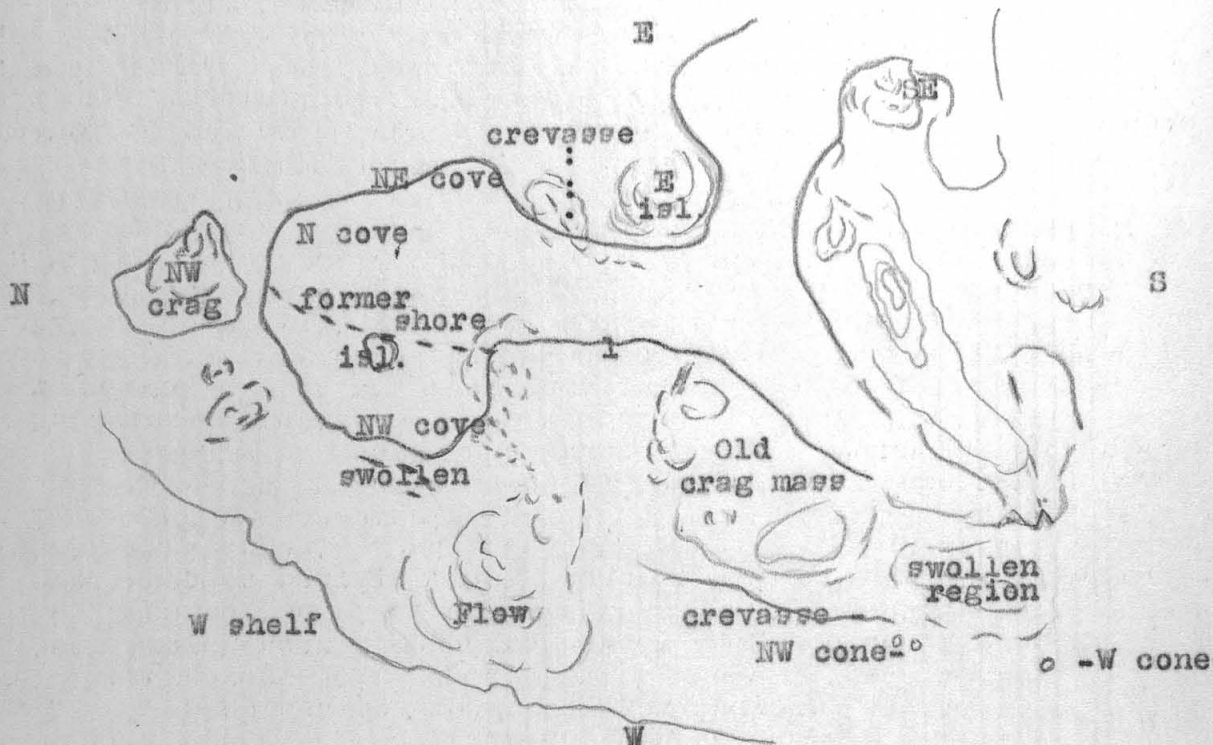
- 1:50 p.m. NW station.  
Lava 10 feet below NW bench. Whole N arm very quiet and crusted over. Much fume in this locality.
- 2:25 p.m. N station.  
Summit of E crag appears to be 30 feet above the NE bench and the NNW crag which is straight is a little higher than the NE bench.
- 2:35 p.m. E station.  
Border activity in SE cove with rapid streaming to the SE tunnel.
- 3:00 p.m. Noisy rock tumble from SE side of the central crag.
- 3:10 p.m. SW station.  
SW pond crusted over and very quiet.

Alex.

Day Monday Date January 14, 1918.

12:20 p.m. Lake 8 to 12 feet below inner bench. Spatter lines below, elevated lumpy rampart above at E island shore. Large dome left side of center cove. Strong rush to SE tunnel, elsewhere rather quiet and crusted.

Shape of N arm, from NW summit:-



1 - At 2 p.m. shore 6 feet high.

Crag immense and NE floor becoming a table crag all the way from E ledge to N smoke crag, both of which are level with edge of pit. SW pond small; tunnel SE of it now has an open ragged pot glowing with half-dome over it where the hissing holes were before. The W-cone ridge has risen so much, by intumescence apparently, that the W cone is now level with W niche floor and there is hardly any descent from that floor to the area surrounding W cone. This area is whitened. W cone glowing and hissing. NW cone also hissing and two smaller cones next it S along a line. The NW cove has collapsed open again to a wide and deep cove greatly widening the N arm of lake. (See sketch map). A pile of crusts in the middle makes an island in the cove. The N cove dome has an open glowing gash on top. The W bench of E island mass, over the middle of lake at O.F. locality, is crevassed straight through. The high E island crag is slab shaped, wide NNW-SSE, thin through from ENE to WSW. It is wide as seen from the SW and narrow as seen from the NW. There are no fresh overflows anywhere, the crags rising much more than the lake apparently. At the W margin of the new NW cove there is another swollen up place, with gaping crevasses.

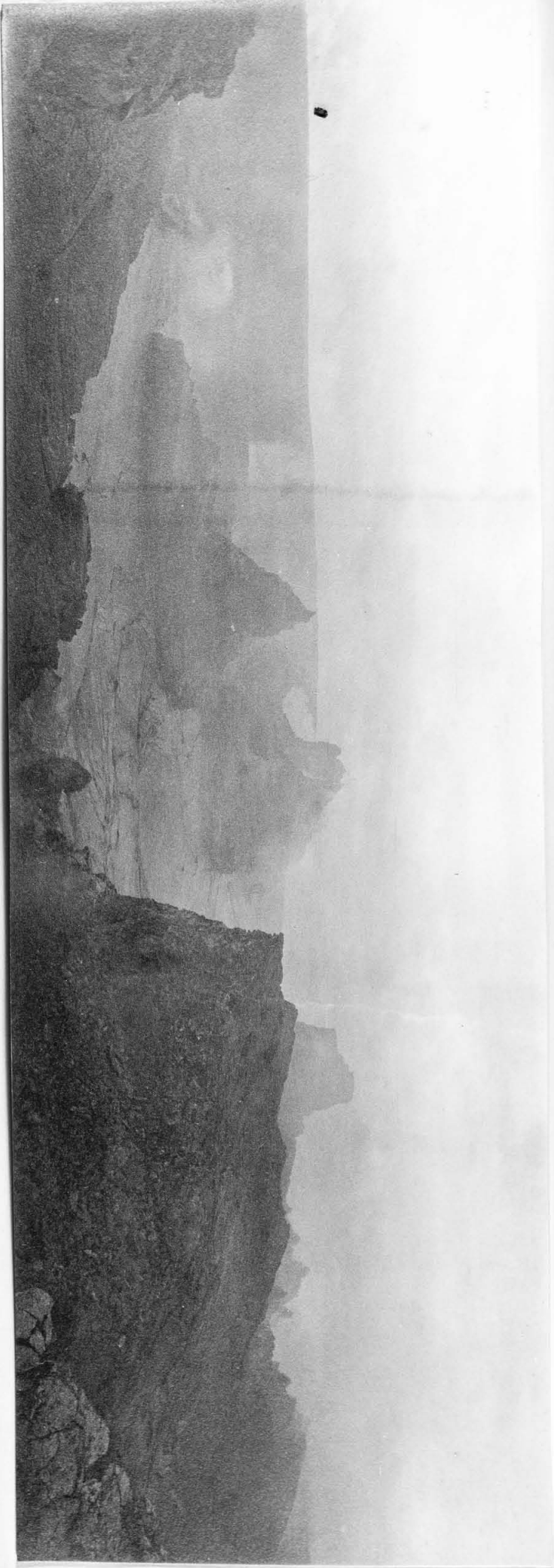




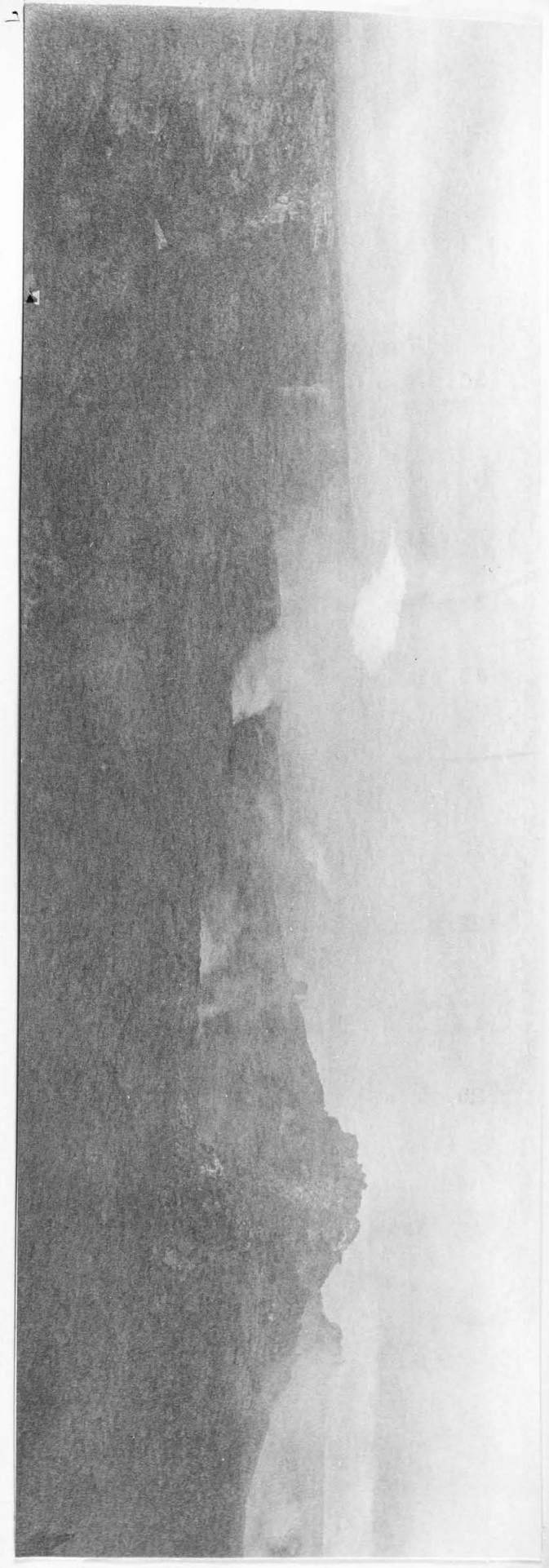
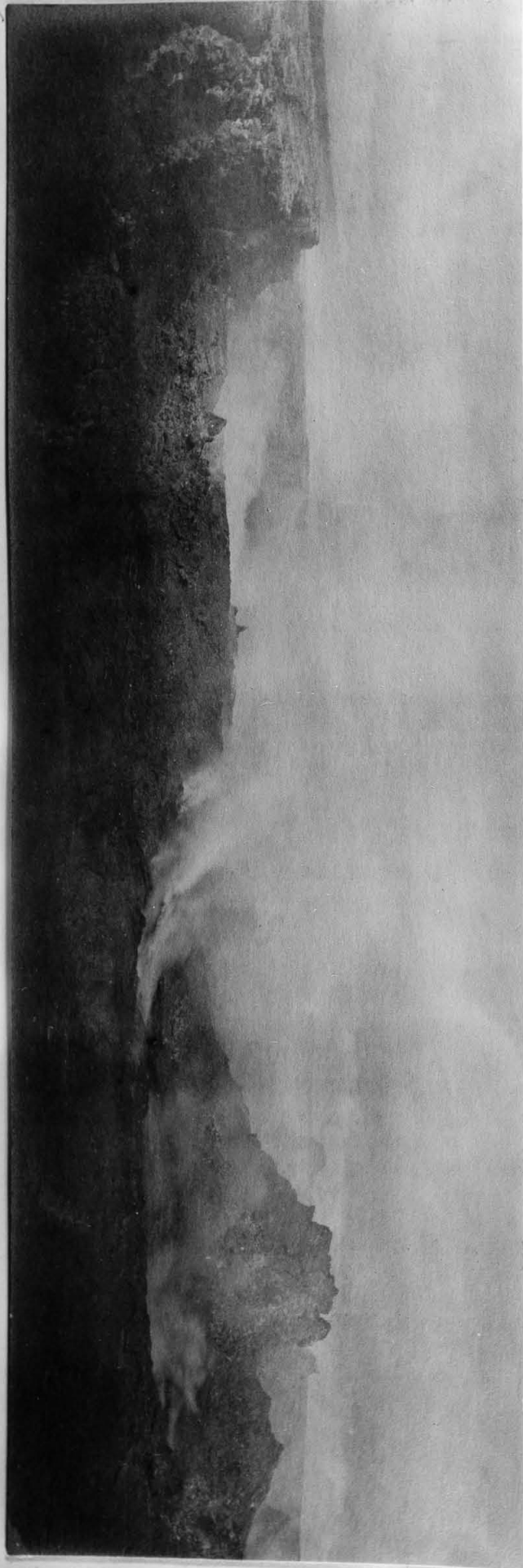
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3







Day Tuesday Date January 15, 1918.  
Wednesday " 16, "  
Thursday " 17, "

Jan. 15. Crags so high that all of them practically are visible from H.V.O., including long stretches of E ledge, N smoke cliff and pinnacle of NE peak. The fume in morning very thin.

T.A.J.

2:30 p.m. E station.  
Lava one foot below inner bench SE. Very quiet. SE cove bench smoking densely.

3:45 p.m. SE station.  
Lava level with SE bench. Fountaining along border of SE crag, with a few fountains in center of SE arm.

Jan. 16.  
2:35 p.m. E station.  
Lava 3 feet below inner bench SE and rising. Active in SE arm and SE cove.

2:45 p.m. SE station.  
New shore bench at E cove and spatter dome at E tunnel fell in leaving a straight wall. Some of the bench at SE sink-hole has fallen also.

3:20 p.m. S station.  
Top of SW grotto has collapsed leaving a glowing cavity about 8 or 10 feet across. No liquid lava to be seen in it.

5:10 p.m. SE station.  
Lava level with bench SE but no overflowing. Block from bank of SE cove fell in.

5:22 p.m. Lake overflowing SE.

Jan. 17,  
2:15 p.m. E station.  
Lava level with SE inner bench and rising. SE cove rather quiet.

2:25 p.m. SE station.  
Much activity in central cove and in new grotto on NW side of central cove. Rocks falling from central crag from time to time, some of them large boulders. Grotto under SE crag boiling and spurting.

2:40 p.m. SW station.  
SW pond crusted and SW grotto blowing loudly. Thick smoke coming from SW bench. N arm quiet and crusted except in N cove grotto.

2:50 p.m. SW pond subsided 3 feet and a few fountains began playing.

Alex.

Day Friday Date January 18, 1918.

10:30 a.m. Lake high. Crags very high. W cone ridge level with floor of W niche and both W and NW cones above that level. Pressure ridge line eastward from W cone. SW pond crusted, break-up and subsidence a few feet at noon. Break-up also in lake. Tunnel heap SE of SW pond quiet, some hissing. S area lifted bodily, new S valley flows tilted southward, great N-S crevasses gaping open from under S station to summit S crag and central crag, showing S valley is swollen up along N-S axis. Shores of SW pond and SE cove both uplifted. SE cove rather quiet. SE dome high; glowing and hissing. Streaming and fountaining vigorous in SE arm. Bench at SE point upraised; three benches in profile SE crag above present lake rim bench which is 2 feet high. Fresh flows E gulch bench. E ledge like the E crag of January 1917, well above edge of pit and cuts off view of NE floor from SE station. E island mass appears to be swollen along a SE-NW axis, broken bench on E cove side upraised in middle and tilted NE and SW. Central region is now a mass of benches lifted differentially as shown in photo #4. Two new dribblet peaks N of NW cone. Slides from summit central crag and at E gulch. Active grotto at end of W arm, which heads toward W cone. Streaming northeastward from W arm and northward in N arm. The lifting of SW pond in its relation to central crag is what NW pond was to W crag mass of November 1916-January 1917. The tendency to scale off and topple over of E summit of central crag -- which is going on today and has happened repeatedly lately -- suggests that that place is the peak of a moving upright pencil of bench magma like the Pelée spine, rising differentially to the rest of the mass and near the center of motion of the rising magma. We can conceive of the bench magma rising in concentric shells more viscous outward. This is the innermost one.

T.A.J.

Day **Friday** Date **January 18, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:30a	SE	N						
	E	N	0					
	SE	NE floor valley	0					
	E	ditto	-17	54	8 51	-2		
	SE	E ledge	-11	31				
	E	ditto	10	28	-2 18	-2	201	up 8
	SE	E island summit	90	0				
	E	ditto	32	40	-4 37	-2	539	up 43
	SE	Summit steeple	52	9				
	E	ditto	53	51	-4 21	-2		
	SE	Central crag	76	2				
	E	ditto	58	38	-4 7	-2	567	40
	SE	SE crag	73	5				
	E	ditto	56	51	-2 35	-2		
	SE	Lake SE point	94	23				
	E	ditto	81	38	15 47	-2	166	47
			112	15	7 0	0	380	47
Depression of lake 47 feet.								
E ledge above edge of Halemaumau							8 feet.	
E island " " "							43 "	
Central crag above edge of "							40 "	
In seven days lake rose							10 feet	
" " " E ledge rose							15 "	
" " " E island "							13 "	
" " " Central crag rose							12 "	

			no	<del>no</del>	scr	stop	ex	cam
10:30a	Gravel flat	Halemaumau look'g NW Center " (overexposed) " " cloudy.	1	no vane	old light f/12 yellow.		1/4	A V
	SE		2	"	3x	"	"	"
	E		3	vane	5 10x	"	"	"
	SW		4	"	3 3x	"	"	"

T.A.J.



1



2

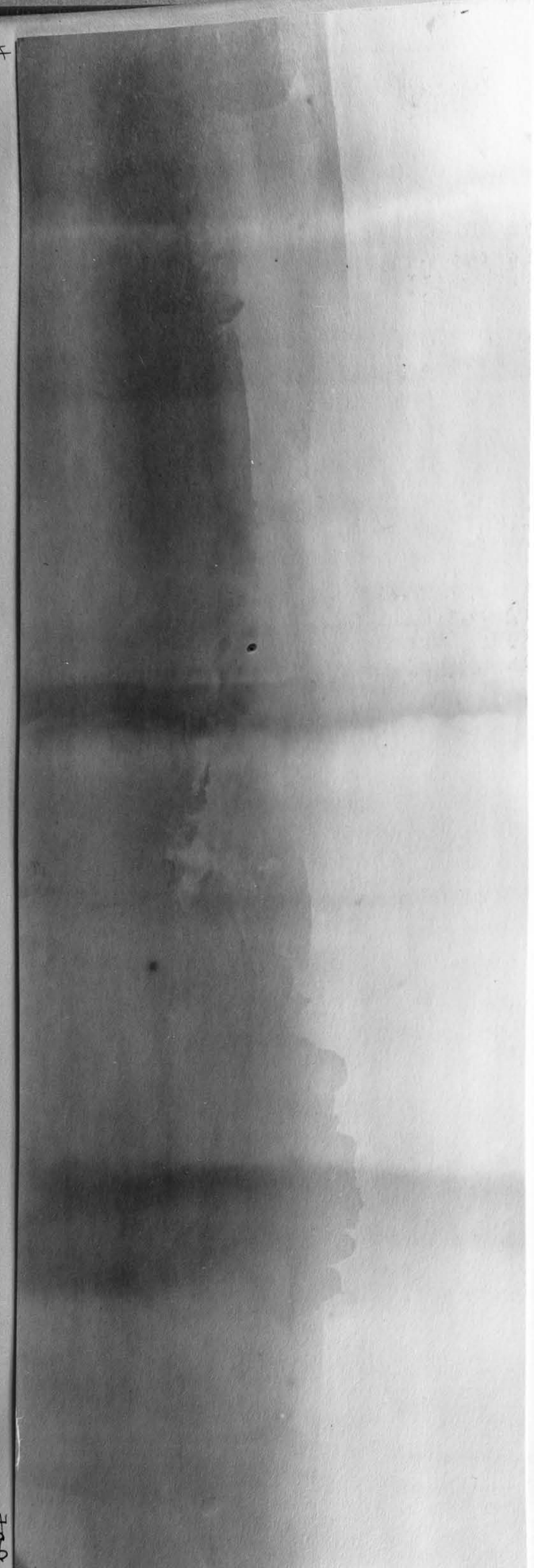
1918, Jan. 18.

24-25

3

+

60-E



Day Saturday Date January 19, 1918.  
Sunday " 20, "

Jan. 19.

2:55 p.m.

SE station.

Banks of lake about 10 feet high. SE cove active. The streaming is slow. Spatter rampart at SE sinkhole has collapsed leaving a straight wall.

3:25 p.m.

SW station.

SW pond crusted and quiet. Bridge is gone. SW cove enlarged by collapse. N arm quiet.

Jan. 20.

1:05 p.m.

E station.

Lava 10 feet below bank of lake. SE cove quiet and SE arm crusted. S bench smoking.

1:30 p.m.

SE station.

Fall of portion of bank SE cove showed a new grotto. Grotto on side of SE crag rumbling and boiling. Lake quiet.

A large piece of the summit of the E crag has fallen.

6:30 p.m.

Lava in lake level with its banks.

7:00 p.m.

Overflowing E gulch floor.

Alex.

Day Monday

Date January 21, 1916.

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

From 9:30 a.m. on the crater had been overflowing strongly; fresh flows from SW pond southward and isthmus at entrance to SW pond flooded so as to make channel all liquid from lake to SW pond. Fresh flows from NW cove probably last night, making a new area of pooled, cracked and foundered lava from NW crag to W shelf back of NW cone. Since that overflow, the whole floor NW including the new flow, uplifted and tilted westward so as to make a new cliff over the lake. The W floor thus from NW crag to W cone ridge another unit of uplift like the NE floor. W shelf now appears low. W cone hissing. The great crevasse on the E side of NW driblet cones has collapsed to an elongate pond of active lava with a grotto splashing on its E side, the elongation headed toward NW cove. Fountain here 5 to 6 feet below base of NW cone. Latter stands on the extreme lip of the chasm, two cones side by side. This open pond is a new demonstration of the persistence of the NW pond conduit.

The great flow of this day was through the E gulch to fill the bottom of NE valley. Flowing 9:30 to 1:30 continuously. The flood moved as a rapid rill the whole length of E gulch 300 ft. and then pooled for 600 feet or more under the whole length of 1894 bench. The rill was 5 to 10 feet wide, bounded by a spatter margin. Estimated speed 10 miles per hour. Erosion in the boulder bed seemed to be undermining the slope of rocks on the E ledge side for they continually slid down, on one occasion falling into the stream and damming it and making a cascade. Speed estimated by watching a 30-foot stretch of bank and timing progress of crusts floating down on the current. The under-rush of the melt appeared to be faster. Carbon odor noticeable. There were six or more great fountaining areas in the lake, otherwise crusted rather thinly, namely N, W, NE, SW pond, NW pond, SE. The SE shelf was now only about 4 feet high with the great SE fountain continuously splashing over it just as on May 31st last. The May culmination was quite like this one, flow filling NE valley, great lift of E ledge, splashing at SE shelf, revival of western cones, etc.

During this morning there was overflowing abundantly on the inner bench of the E cove, undoubtedly also at the NE cove, into the depression back of the central cove, flowing past the great dome there and flooding for toward the S pressure ridge all the depression W of SE crag. The floods have also overflowed the margins of SE cove into the SE crevasses and into new crevasses in the direction of the S tunnel. The SE crag has been tilting more to the N, showing a fresh broken wall and talus on that side. The central pencil of the central crag stands out again as a turret ready to fall southward. The steeple is again very sharp needle-pointed with a smooth and perhaps striated red wall on its S side. Tumbling was heard into the N pit from the lake side, and other falls showed instability and tilting of the crags. All this tilting appears to be away from the center.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:40a	E	N	0					
	SE	N	0					
	E	SE point (lake)	112 0	6 0	-6	376	40	
	SE	ditto	79 40	13 44	-13	163	40	
	E	Entrance flow E	115 30					
	SE	ditto	13 14					
	E	Entrance flow W	114 0					
	SE	ditto	13 14					
	E	Summit E ledge	90 43	-2 21	-6	188	up 8	
	SE	ditto	9 26					
	E	Central steeple	76 15	-3 49	-6	499	33	
	SE	ditto	53 51					
	E	Central crag	73 17	-3 38	-6	632	up 38	
	SE	ditto	58 35					
	E	E island crag	52 27	-4 51	-6	490	up 40	
	SE	ditto	32 40					
	12:20p	E	N smoke cliff	20 0	-1 18	-6	560	up 11
SE		ditto	11 14					
E		N limit new flow	-4 40	8 25	-6	460	69	
SE		ditto	-7 49ca					
E		Boulder level NE (top new flow)	-13 38	22 5	-6	170	69	
SE		ditto	-21 21					
E		N		-0 13	-6			51"
SE		N		-0 14	-4			
E		S		+0 6	-6			
SE		S		+0 0	-11			
E	SE		+1 3	-6				
		Depression of lake 40 feet.						
		E island crag above edge of Halemsunau 40 feet.						
		Central crag	" "	" "	38	"		
		N smoke cliff	" "	" "	11	"		
		E ledge	" "	" "	8	"		
		In three days the lake had risen		7	"			
		" " " " E island had lost		3	"			
			no	pl	scr	stop	ex	cam
		" " " "	central crag had lost 2		"			
		" " " "	E ledge was unchanged.					

T.A.J.

Day Tuesday Date January 22, 1918.  
Wednesday " 23, "

Jan. 22.  
2:45 p.m. SE station.  
Lava level with new SE bench.  
3:45 p.m. Slow overflow beginning.  
4:05 p.m. Overflowing through E gulch.  
4:35 p.m. Lava has been rising so fast that it is now level with the 1917 bench and is flowing over in places.

Alex.

Jan. 23. Last night there were overflows at 11 p.m.  
11 a.m. to 2 p.m. Lake 2 feet below new rim SE. SE shelf overflowed and new bench from lake to cliff was twice as wide as SE shelf had been. Fresh flow along wall to S station and glow at end of flow in NE valley, which is not, however, a deep pooled filling but festooned and has been subsiding and breaking under sinking of valley below it which appears as deep as ever. SE cove wider and deeper. Great uplifted tumble between S pressure ridge and SSE wall of Halemaumau, confining the flow between it and wall and preventing escape of this flow into S valley.  
Flow depression 22 feet at SE station -- measured with cord -- (level of lake).  
Strong overflows began at 1:30 p.m. -- E gulch, SE ledge, NW, probably SW also. Again the progress through the E gulch into NE valley was not very strong but the floods over SE shelf as along it southward were considerable. There was a depression much below lake back of rampart at central cove.  
The channel to SW pond was open. Islet in NW cove. Fresh flows from SW pond southward. Crags higher than day before. All crags far above edge of pit except old west crag mass. The W cone had given vent to a considerable flow southward. No activity could be seen in NW cone chasm. The lake was of rising type with high gas pressure, balloons and flames, occasional great central fountains and five or six grottoes. A great knob or turret hung out ready to fall from S side summit central crag. The N smoke crag and NW crag both much alike and both far above N edge of pit.  
9:00 p.m. Sudden subsidence SE cove, a standing rapid at the channel (now narrowing) between SE crag and SE shelf or inner bench, and a whirlpool for 10 minutes between SE crag and E ledge.  
Seen from Uwekahuna at 8 p.m., remarkable view, streaming from SW arm to SE arm, fountain against W base of E island crag. Glow at W cones.

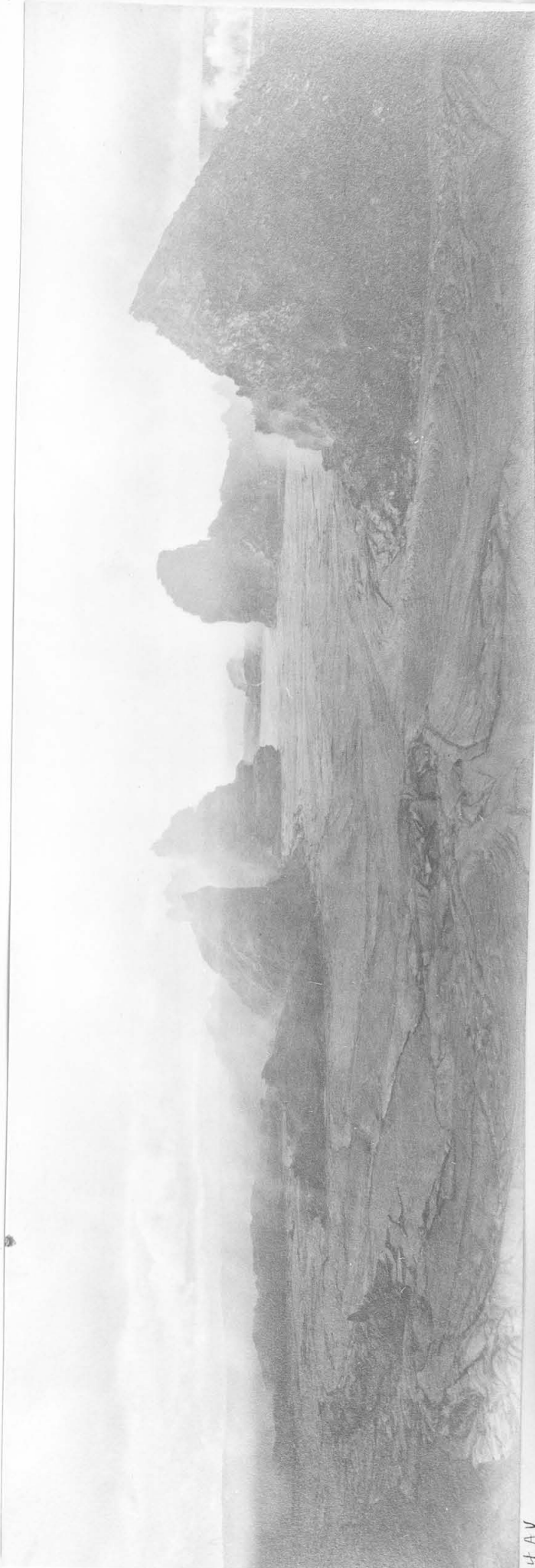


T.A.J.

Day Wednesday Date January 23, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Photographs.</u>								
11 a.m. to 2 p.m.								
	Road N of Keanakakoi to	crater. (infinity focus)	1		8x	f/16	1/8	5x7
	ESE	NE valley	2		"	f/11	"	"
	"	Channel	3		"	"	"	"
	"	SE crag	4		"	"	"	"
	"	SE shelf overflowed	5		"	"	"	"
	Soft SE.	E cove	6		"	"	"	"
		(#5 & 6 double exposure)						
		Spoiled	7					
	S chan.	New flow SW and W cone	8		"	"	"	"
			no	pl	scr	stop	ex	cam
	SW	Lake showing NW & N crags						
	"	above far edge of pit	9		"	"	"	"
	"	S pressure ridge	10		"	"	"	"
	"	Fresh flow from W cone	11		"	"	"	"
	WSW	Cent. crag showing						
		overhanging knob	12		"	"	"	"
	W of NW.	NW pond crevasse						
		(smoky)	13		"	"	"	"
	E of NW.	NW crag mass	14		"	"	"	"
	Tech Sta porch to N cove notch		15		"	"	"	"
	N cone (elephant) to N cove notch		1v		3x	f/12	no vane	A V
	N N crag		2v		"	"	"	"
		Spoiled	3v					
	E of SE.	Lake	4v		"	"	"	"

T.A.J.





4



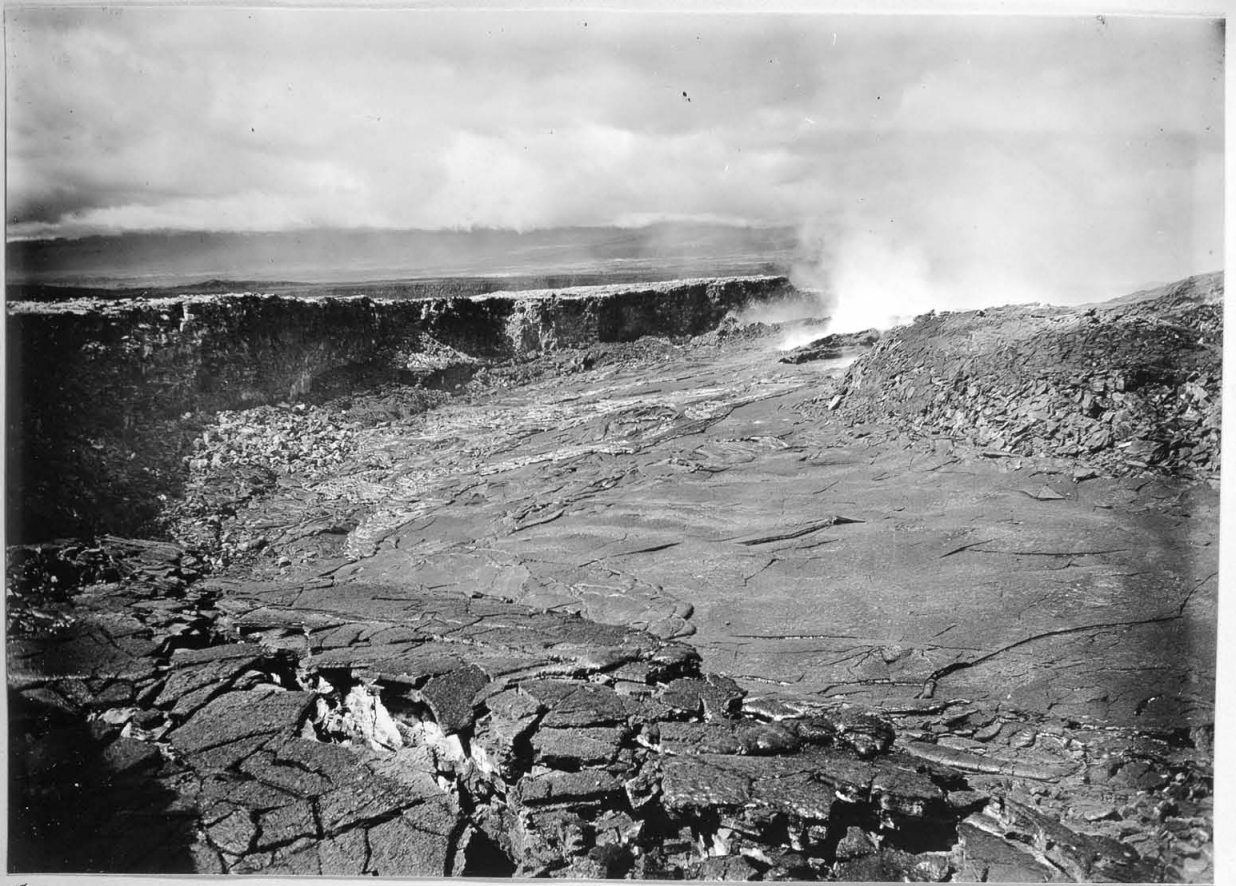
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2



5+6



6



10



9



12



11



12



14



15

2 AV



1 AV



Day Thursday Date January 24, 1918.  
Friday " 25, "

- Jan. 24.  
2:40 p.m. N station.  
Many fountains in N arm.  
2:45 p.m. NW station.  
Lava 5 feet below new floor on NW side of E crag. Fumes rather thin on this side of pit.  
3:00 p.m. W station.  
N cove very active. Everything quiet W with little fume.  
3:10 p.m. SW station.  
SW pond active. S cove of this pond boiling and rumbling loudly; also W cove.  
3:25 p.m. SE station.  
SE arm crusted and rising slowly. The only activity in grotto under SE crag. Large hole in summit of SE grotto.

Alex.

- 4-5 p.m. Lake about 5 feet below inner bench and in places lower. Craggs have lifted strongly especially N smoke crag and NW crag. Filling NE valley a little thicker but still far below edge 1894 bench. Fresh flow from SE along wall to point under S station, then across the crevasses extending S from S crag and the length of S valley to join other festoon flows fresh from SW pond. These flows like those photographed in 1916 from NW pond. Intumescence increased and lifting everywhere. Tremendous change in SE crag which is tilting over towards middle of SE arm, tip has fallen off, SE point uplifting, new break through to depression between S crag and SE crag. This depression now a pond. This new break is part of a rapid break-away of SE crag mass northward, perhaps induced by under flow northwestward from new SE flows. Central crag enormously high. New series of fresh flows from SW pond. The W cone ridge has lifted still higher. N arm and NW cove appear 8 feet below bench. Islet in NW cove stands up as a mushroom.  
Streaming to SE tunnel; flaming pot SE grotto.  
Descended to SE bench. Lake blowing balloons. Many flames. Occasional central fountain migrating E along S base of E island mass, or southeastward through channel, or along bank E side of SE crag. W cone broken open showing hollow inside. Streaming in main lake from S to N, meeting at fountain lines W of E island mass. Streaming SE in SE arm occasionally stops and crusts over. Red glow in cracks of SE floor. Stalactite overhangs 2 to 3 feet during temporary subsidence. Rocks rolling E gulch and NW side NW crag. Craggs much higher, N smoke ledge more than E ledge.  
The pond back of central cove breaks up occasionally. Smell free sulphur cracks SW. Enormous lift of N cove bank, making steep high back slope into N pit.

- Jan. 25. Heavy rain all day. Lake reported low in the evening.

T.A.J.

Day Thursday Date January 24, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
Phot. 5 - Fresh flows in foreground; W cone ridge background. " 7 - Intumescence cracks in foreground.								
			no	pl	scr	stop	ex	cam
4-5 p.m.	SE	Break SE cove	1		8x	f/11	$\frac{1}{8}$	5x7
	SE	Channel (leveled)	2		"	f/8	"	"
	SSE	SE crag uptilted and broken	3		"	"	"	"
	W of S	SE crag, crevasses and fresh flow from SE in foreground	4		"	"	"	"
	" " "	SW pond	5		"	"	"	"
	E of SW	S floor & new SE flow	6		"	"	"	"
	S of W	NW cone	7		"	"	1	"
5 p.m.	N of W	Old W crag mass and whole lake	8		"	f/6.3	1	"

T.A.J.



1



2

309



3



4



5



6



7



8

Day Saturday Date January 26, 1918.

3 to 6 p.m. Heavy rains for three days; still continuing. The culminating change whereby both lake and crags began to subside together came during the storm of January 25 but the lake had started subsidence in spasms with the whirlpools such as were seen at the SE on the night of January 23 and the rupture and overturning of the SE crag Jan. 24 was characteristic of a culmination. Today the lake is down 30 feet below the SE bench and the spatter limit elsewhere. The E island summit crag has collapsed leaving one small horn in its place and much lower. The crags in general are lower. Streaming to SE is vigorous, border fountains all around SE cove, cavern grotto under new gateway leading to central pond. The latter crusted at a level 15 feet above cove. SE crag has subsided bodily, lost most of its summit and shows an inner bench below parallel to lake surface and 5 feet above it. A similar lower platform borders E cove and occurs elsewhere, especially in N arm. One heavy fall into lake from NE corner SE crag but avalanches otherwise absent. Tendency so far to slow central subsidence. Hanging turret of central crag still in place. SW pond 30 feet down, tunnel grotto NE corner of it, hot blue fumes SE corner. W cone ridge lower. Glowing heap S of NW cone. Most striking changes in N arm, now the largest part of lake. (See map). NW cove extended toward NW cone, high cliff W of it, new cove in midst of W crag mass, two peninsulas making out W from E island mass, three islands in N arm. Narrows W of E island crag down which torrent pours when SE arm sinks faster than N arm. At 3:20 p.m. general break-up in N arm, violent recession of lava across shoals NE cove, intense fountaining. Probably occasioned by sudden subsidence. High glowing margins revealed. Rising and heavy crusting ensues. At 4:30 p.m. climbed to summit N smoke crag to make sketch map. Streaming out from NW to N grotto, which is active, and through narrows to SE arm. Streaming out from SW arm. New E island peninsulas probably from fall of crag. Cracking and foundering N arm accompanies subsidence to the SE and rapids through narrows. NE escarpment still very high and at high angle. Looks as though rising islands N were lifting shoals due to reaction from settling back of crags after recent enormous elevation. Glow still in SE flows. Great volumes of rain steam.

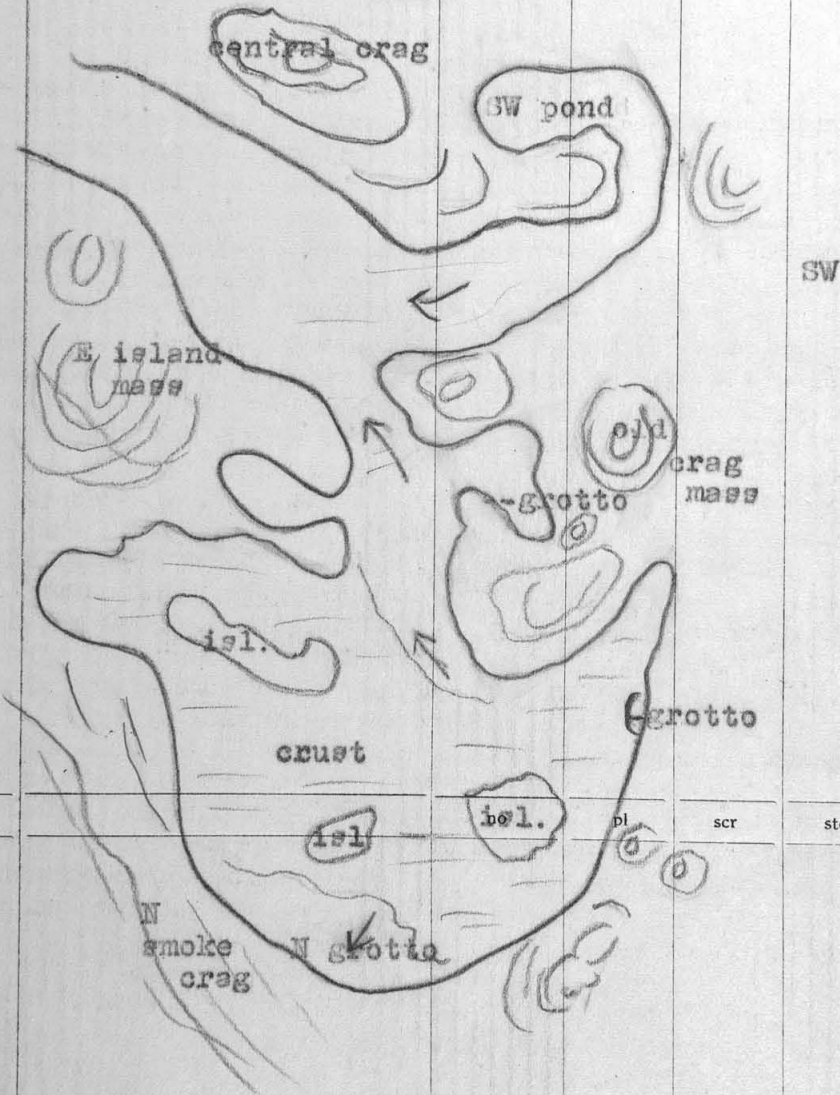
T.A.J.

Day Saturday Date January 26, 1918.

t	sta	pt	hor	vert	lev	dist	xxx	elev.
5:30 p	SE	E	0					
		E ledge	40 39	-5 56	-6			
		SE tunnel	111 22	8 45	-6	300±(Dec. 29.)		47
		Lake SE crag	85 24	18 7	-6	150±(Jan. 21)		49
		Central steeple	87 15	-14 9	-6			
		" crag	91 51	-14 56	-6			
		E island crag (remnant)	68 00	- 1 32	-6			

Lake depression 48 feet.

Lake from N crag:-



NE

T.A.J.

Day	Sunday	Date	January 27, 1918.
	Monday		" 28, "
	Tuesday		" 29, "

Jan. 27.

2:30 p.m.

SE station.

Level of lava about the same. SE arm crusted. Two fountains in SE cove. Half of the new bench on SE side of E island crag has fallen leaving a straight wall.

2:45 p.m.

S station.

SW pond very quiet.

3:00 p.m.

Inspection of the central pond showed there were two small cones, one of which was puffing steadily. Lava in this pond was 3 feet below the bench around it.

6:30 p.m.

Two fountains playing in central pond.

Alex.

Jan. 28.

Lake quiet and low. Some rock falls. Little activity. In evening abundant flames.

Jan. 29.

SE station. Lava 20 or 25 feet below 1917 bench SE. Many fountains in SE arm but only a few in the N.

2:55 p.m.

Central pond crusted, but hissing could be heard from there.

3:00 p.m.

Fountaining in SW pond especially at grotto on its S side. A dome had formed over this grotto in which glow could be seen and from which came a puff occasionally.

6:10 p.m.

Lava within 1 foot of top of SE sinkhole.

Alex.

3:30 to 4:30 p.m. Rainy. Lake 15 feet below SE bench and below S margin at SW pond. Activity SE usual; streaming slow; occasional central fountains; border fountains SE grotto and SE tunnel. Middle of lake quiet, streaming N from SW arm. SW channel open. Descended to SE bench and went around to examine pond W of SE crag. This proved to be a crusted circular pit 20 feet deep with lava at lake level; glow through cracks of crust; diameter 20 feet. Went to margin SW pond which was crusted, sluggishly cracking and foundering; fountain against E bank; glowing filagree heap flaming and puffing at S tunnel corner. Skin heaving outside grotto. Both SW and SE coves showed a new spatter margin building 3 feet above lake. Measurement from Observatory today show crags higher. Lake has been rising. Pulsating strongly. At 4:30 sudden subsidence; 3-foot glow rim; violent fountains, one of these migrating from SE cove northward, reversing the streaming in cove for a few minutes. Then recovery. Strong turbulence and cracking up during the subsidence. Strong vaporizing of recent flow surfaces and of crust over SW pond during the very heavy rainfall.

T.A.J.

Day Wednesday Date January 30, 1918.  
Thursday " 31, "

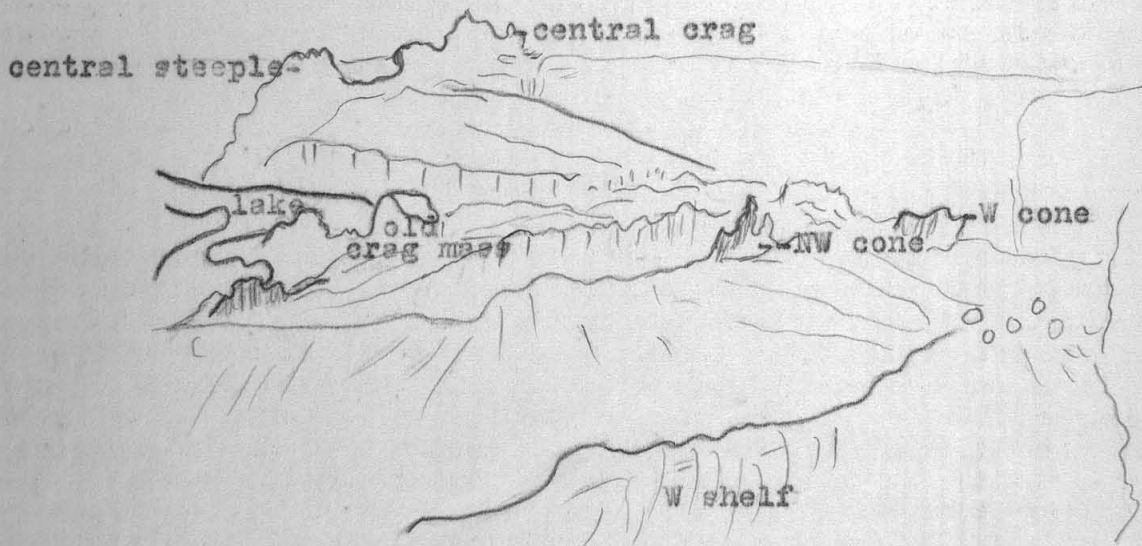
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Jan. 30. Lake very quiet and apparently sinking.

Jan. 31.  
Noon.

Lake about 20 feet below SE bench but rising and with new construction rim about it. New floor E cove and new spatter dome there. New floors over wide areas around N arm and overflow surfaces on the islands and peninsulas there. The SE chasm leading from SE cove to central pond is wider. Streaming vigorous to SE, central fountains, occasional subsidence of few feet with accelerated streaming and border fountains SE cove. Fumes rather thin at noon. Balloon crusts. Remarkable "U" gap between central steeple and central crag as seen from SSE and flaring upward of laminae W of the U. The steeple face E of it appears striated or slickensided as tho' scraped by pushing up against a fault surface. SW pond low surrounded by cliffs. SE crag shows fresh fall from tip of upraised SE escarpment. SE crag shows remarkably the W tilt of its upper part, and separate N tilt of its lower part, two distinct crags as seen from S, and the whole mass has changed position recently northwestward by these rotations, the crag now quite cutting off the view of central cove from SE station.

From NW height to great W chasm and swollen W ridge:-



The tumescence of W ridge has increased to such extent that a wide chasm has now been formed out of the NW pond crevasse closely comparable in form with the 1868 flow rift of Kapapala. This chasm is probably partly from collapse with the recent subsidence of the NW pond lava. There now appears to be a revival of upswelling. Seen from the NW height this W ridge is a swollen dome with the old W crag mass on its E flank. The great chasm extends from the NW cove to the W cone. Occasional hiss NW cone.

The channel from N arm (streaming S), now a large roundish lake of islands and flats, to the S is now a narrow curved stream greatly constricted and nearly separating off the N lake. The E island turret is a narrow upright tower of great

- 2 - Day Thursday Date January 31, 1918.

slenderness like the Florence campanile. The central crags tower greatly, but the N and NE crag ridge appears lower, and the lake appears encroaching on the E island and old W crags. There is a tumbled chasm or cove opening at the lake end of the W tunnel and the W cone appears more broken. The NW cone is very complete and unbroken as a sharp group of dribblet spiracles. The NW cone is farther S than the NW cone of 1916.

T.A.J.

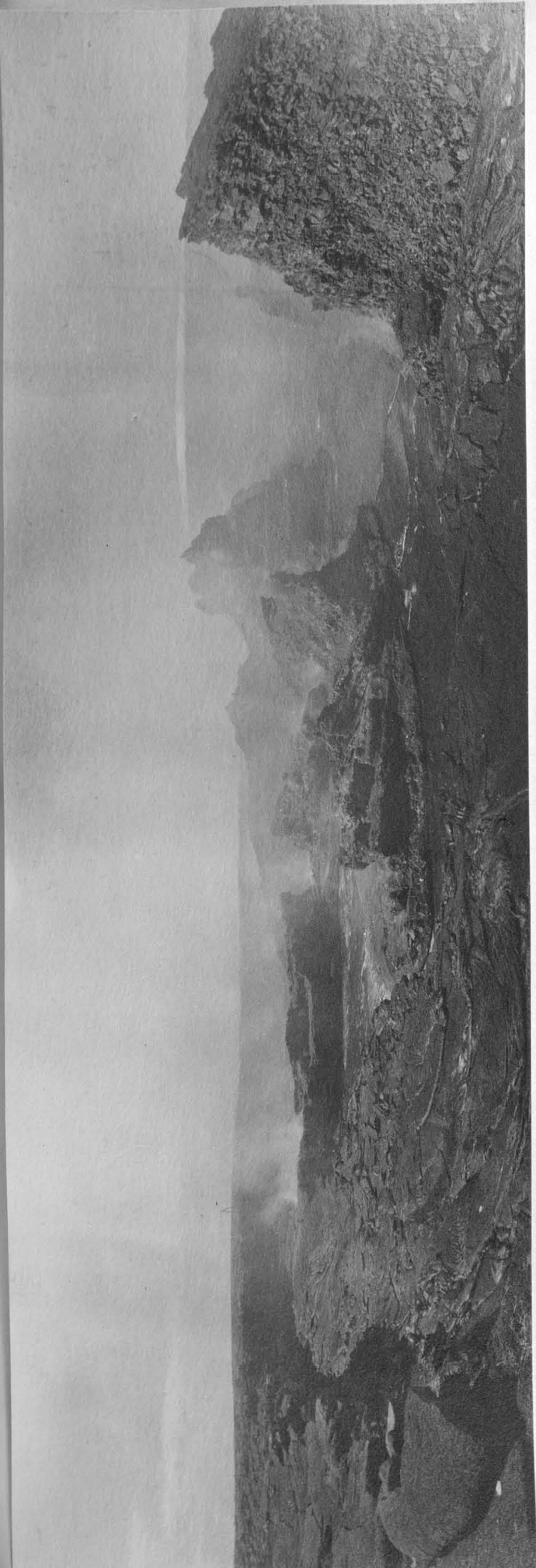
- 2:10 p.m. N station.  
Lava 5 feet below top of new island in N arm. A few fountains in this arm, where the fumes were at times thick.
- 2:30 p.m. SE station.  
Lava 3 feet below new floor of E island crag and rising. SE cove very active; a few fountains in SE arm.
- 2:40 p.m. Went to small pond SW of SE crag (central pond) and found two fountains in action there.
- 3:10 p.m. Went to SW pond. It was very active. S grotto boiling and rumbling.
- 5:05 p.m. Lava level with new bench of E island crag.

Alex.



69 a

1918 Jan. 31.



1



2



Day Friday Date February 1, 1918.  
Saturday " 2, "  
Sunday " 3, "

Feb. 1.

- 4:30 p.m. A heavy fall from N side of SE crag into lake, with whirlwinds carrying up flakes of lava above the convection draft started by the intense fountaining in the SE arm where the avalanche material fell in.
- 5:30 p.m. Lake markedly high and rising. Brimming against its new inner bench at the E cove, center cove and around SE point. Blowing cone grottoes. High gas pressures, balloons and flames. Travelling fountains. Depression of lake not more than 30 feet apparently -- 10 feet below the floor of gap to central pond. Fume very thin. Crag in general stationary. The central crag mass appears to be spreading E and W, widening the "U" gap in its summit ridge. Light of pit bright at night; fountains N, center and SE.

T.A.J.

Feb. 2.

- 2:30 p.m. SE station. Lava nearly level with new inner bench of E island crag. SE cove grottoes all active but no fountains in SE arm, though streaming there to the SE is rapid.
- 2:50 p.m. Quiet in the small pond in the center of the crags, only a glowing streak to be seen.
- 3:20 p.m. From SW bench. Lava level with surrounding bench in SW pond. S cove very active with the cone there blowing loudly and occasionally spraying. There have been falls of rock from the SW side of the central crag.
- 6:30 p.m. SE station. Rocks from the central crag could be heard falling. A little later some fell from the N side of the SE crag into the lake.

Feb. 3.

- 1:50 p.m. SE station. Lava about 2 feet below new inner bench of E island crag and rising. Border fountaining on E side of SE crag.
- 2:15 p.m. From SW bench of SE cove could see that the small central pond was black and crusted with no evidence of molten lava in it.
- 2:20 p.m. SW bench. Lava in SW pond very high; S grotto closed and cone there blowing loudly.

Alex.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
4:30 p	S	SE	0						
	SE	NE	0						
	S	SE point	12 44	6 26	-8	375	43		
	SE	ditto	103 24	ca					
	S	E ledge	20 8	-1 56	-8	553	up 17		
	SE	ditto	37 32						
	S	SE crag	33 31	+0 36	-8	421	4		
	SE	ditto	79 0						
	S	Rock on bench SSE	-14 54	6 58	-8	263	66		
	SE	ditto	157 5	ca					
	S	Loc central pond	60 0						
	SE	ditto	107 46						
	S	Loc middle new flow at gap S	47 24						
	SE	ditto	139 46	ca					
	S	Loc S side central pond gap	46 16						
	SE	ditto	110 15						
	S	Summit N side central pond gap	45 36	3 12	-8	367	23		
	SE	ditto	104 43						
	S	W end ridge SE crag	41 17						
	SE	ditto	86 44						
	S	E end " " "	31 25						
	SE	ditto	75 30						
	S	3rd scarp SE crag	22 55						
	SE	ditto	83 6						
	S	2nd " " "	17 16						
	SE	ditto	92 32						
	S	1st " " "	14 20						
			(tumble) 6 ft above lake.						
	SE	ditto	95 48	15 8	-13	137	38		
	S	E end E island ridge	40 53						
	SE	ditto	same as E ledge						
	S	E cove sag in E ledge	35 5						
SE	ditto	same as E ledge							
S	Height next NW	39 52							
SE	ditto	same as E ledge							
S	NE peak serrate	42 45							
SE	ditto	same as E ledge							

no pl scr stop ex cam

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	S	N smoke crag	50 20	-1 40	-8			
	SE	ditto	40 50					
	S	Summit steeple	56 36	-5 27	-8			
	SE	ditto	83 26					
	S	Summit central crag	73 16	-5 50	-8	463	up 46	
	SE	ditto	88 11					
	S	Summit S crag	76 42	-2 13	-8			
	SE	ditto	98 13					
	S	S pressure ridge	89 26	1 10	-8			
	SE	ditto	108 0					
	SE	Tangent SW pond S	102 2					
	"	W tunnel break	93 12					
	"	Talus end raised rem- nant bench from S sta. southward	124 50					
	"	SW smoke bank	100 0					
	"	Left base S ridge	100 45					
	"	" side central pond	63 44					
	"	Right " " "	55 50					
<p>Lake depression below S station 44 feet.                      Central crag above edge Halemaumau 46 feet.                      East ledge " " " 17 "</p>								
<p>Since Jan. 23 (9 days) the lake has subsided 22 feet</p>								
"	"	26 (6 " )	"	"	"	risen	4 "	
"	"	21 (11 " )	cent. crag	"	"	"	8 "	
"	"	" " "	E ledge	"	"	"	9 "	
<p>Lake from Jan. 23 to Jan. 26 subsided 26 feet.</p>								
<p>T.A.J.</p>								
			no	pl	scr	stop	ex	cam

Day	Date	February 4, 1918
Monday		
Tuesday	"	5, "
Wednesday	"	6, "
Thursday	"	7, "

- Feb. 4.  
2:20 p.m. SE station.  
Banks of lake about 4 feet high all around. SE cove very active. SE arm crusted. No rock fall heard.
- 2:30 p.m. Small central pond again active. One large fountain there.
- 2:50 p.m. Both border and central fountain in SW pond, with lava about 4 feet below banks. Its S grotto very active, the cone blowing loudly.
- Feb. 5.  
2:25 p.m. SE station.  
Lava 6 feet below inner bench of E island crag and rising slowly. SE cove active. Surface of molten lava 20 feet below the May 1917 bench.
- 2:50 p.m. From the SW bench it could be seen that the SW pond was very quiet and 8 or 10 feet down in its banks, with only two active spots. Fume thick down in that locality.
- 5:05 p.m. SE station.  
Lava in SE cove 10 feet below floor; many fountains and rapid streaming to the SE grotto.
- Feb. 6.  
1:55 p.m. E station.  
Surface of lake 25 or 30 feet below 1917 bench SE. Very active in the SE grotto. Rapid streaming to the SE.
- 2:55 p.m. SE station.  
Lava rose 4 feet in the hour. Then subsidence with fountaining began and the lake fell back 2 feet in the SE pond.
- 3:45 p.m. On N bench of N pond -- many fountains; could see two islands in the N pond only; third may be joined to the E island crag though thick smoke interferes with seeing. The islands are 3 feet above the surface of the lake.
- 4:10 p.m. From the NE bench could see that the third island is joined to the E island crag making a wide floor there. The channel between the E island crag and the NW crag is 50 or 75 feet wide.
- Feb. 7.  
1:40 p.m. SE station.  
Lava 6 feet below bench of SE cove. Quiet and crusted everywhere.
- 2:00 p.m. SW bench.  
Only active place in SW pond is the S cove which is rumbling loudly. Half of W cone collapsed; smoking strongly.

Alex.

Day	Friday	Date	February 8, 1918.
	Saturday		" 9, "
	Sunday		" 10, "

- Feb. 8.  
2:25 p.m. SE station.  
Lava in SE arm about 10 feet below bench all around. Fountaining in SE cove, SE channel and N arm.
- 2:50 p.m. Lava beginning to rise rapidly until at 3:30 it was 6 feet below bench at SE cove.
- 4:45 p.m. Rising continues; lava has reached the level of the new inner bench of the E island crag.
- 5:10 p.m. Overflowing a little at E grotto.
- 
- Feb. 9.  
1:55 p.m. SE station.  
Lava 6 feet down in SE cove. Swift streaming from N arm thru channel towards the SE. Grotto under SE crag very active.
- 2:30 p.m. Lava rising slowly until at 4:50 it reached a level near the top of the bench SE. Portions of the E bench have fallen.
- 
- Feb. 10.  
1:45 p.m. E station.  
Rapid streaming from the N arm through channel towards SE. Lake active and 10 feet inside banks.
- 3:45 p.m. SE station.  
Lava has overflowed the bench at SE cove going a little way inward. Border activity at SE crag.
- 5:30 p.m. SE station.  
Large part of inner bench on SE side of SE crag and a block of the SE point fell in during a subsidence spell.

Alex.

Day **Tuesday** Date **February 12, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:45a	NE	N	0					
	E	N	0					
	SE	NE	0					
	NE	NW crag	17 8	-2 17	-9			
	E	Lake SE point	107 25	5 48	-7	326	34	
	SE	ditto	89 45	11 36	-9	152.5	32	
	NE	N smoke	33 6	-2 58	-9			
	E	ditto	19 12					
	E	Lake SE tunnel left side	104 39	3 51	-7			
	SE	ditto	118 5	6 10	-9			
	NE	NE peak (pile stones)	47 37	-2 12	-9	427	16	
	E	ditto	21 0					
	SE	Stump E isl. crag	63 44	-1 52	-9			
	NE	Central crag	67 36	-3 16	-9	869	45 up	
	E	ditto	72 29					
	SE	SE crag	76 28	-0 5	-12			
	NE	Central steeple	73 35	-3 16	-9	774	4	
	E	ditto	75 32					
	SE	Old W crag	72 10	-0 38	-12			
	NE	E ledge	94 54	-1 53	-9	547	up 16	
	E	ditto	91 3					
	NE	Himnook E end SE shelf	106 57	2 39	-11	534	26	
	E	ditto	129 51					
Depression lake 33 feet								
Central crag above edge Halemaumau			45 feet					
East ledge " " "			16 "					
Lake in 11 days up 11 feet.								
Cent crag in 11 days down 1 foot.								
E ledge " " " " 1 "								
			no	pl	scr	stop	ex	cam

T.A.J.

Day Tuesday Date February 12, 1918.

10:45 a.m.

Lake very high and rising; about 1 foot below SE shelf. Rising by advancing waves or overriding layers from the W, coming through the SE arm. Central and northern region crusted, SE arm mostly crusted, bombardment at E cove, occasionally at E gulch and continually at SE tunnel where high spatter rampart is built. High dome grotto under N smoke cliff, scattered fountains NW and W. Continuous bombardment along a straight shoreline trending N-S at E end of SW pond and streaming eastward to rampart there. This rampart at edge of a floor greatly extended westward so as to shorten the SW pond. The noon rise reached a point where there was some overflow SE into the crevasses in the direction of the S station and overflow through the gateway leading to central pond. The latter at much lower level than SE cove. At the central cove and E cove there had been strong overflowing and the N lake had flooded the two eastern pinnacles of the old W crag mass so as to leave them standing as islands. Of the other islands only one was in evidence, that to the NW, all the others being drowned including the floor at the W base of the E island mass. The NW pond filled the great NW chasm for at least 150 feet of length and there were fresh outflows from it the whole length of the chasm to the NW cove and over the lip of the chasm northwestward. A broad flow from the NW pond began to pour westward at 12:15 p.m. and was still flooding the western valley at the base of the W shelf at 1 p.m. The filling of this hollow was enough to satisfy the requirements of the rise. The crags showed no especial change in height and the lake now appeared to be rising faster than the crags, especially the SE, E island and old W crag masses. The only rocks heard in motion about the crags were at the E gulch. Seen from the W the loose block hanging southward from the summit mass of the central crag was seen to represent the summit portion of a body separated from the central crag mass along an inclined plane or fracture trending E-W and dipping about  $80^{\circ}$  to the N. This showed as a crack that extended the chasm of the southward hanging block down nearly to the SW pond shore. There were fresh falls of rock from the high walls of Halemaumau under the W station. Fumes were not especially thin.

T.A.J.

Day Thursday Date February 14, 1918.

- 2:10 p.m. SE station.  
Lava level with 1917 bench. A fresh flow to be seen on bench, still glowing in places.
- 3:40 p.m. W station.  
W pond has been overflowing but the smoke here was so dense it was difficult to see. Flow still moving at its end.
- 3:50 p.m. Margin of SW pond.  
This pond crusted and rising. Level with bank and almost overflowing on S side. There is a new cone beside the W cone.
- 3:30 p.m. Lake brimming with SE shelf and fresh broad overflow from it on part of that shelf. High gas pressure, border fountains, rapid streaming through SE arm, new ramparts SE, E and central cove. Overflow lava of rough aspect. SE and E island crags look higher as though rising again. Other crags same. Lake only about 20 feet down below SE station at time of overflow.
- 4:00 p.m. One foot below shelf.

Alex.

T.A.J.

12 noon.

to

8 p.m.

Lake 5 feet below new bench. Crags higher. Great pond in depression NE of 1894 bench with cascade of lava from it down 20 feet to NE valley below, the cascade at E end of 1894 bench. Five cones in a line over the fissure up which this new lake arose; this line of cones directly under the NE station following the 1894 depression. The westernmost of these vents was a steadily upwelling fountain; the others were beginning to form low dribble cones in the crust over the pond. This crust was smooth from cracking and foundering, except around the margin where it showed festoon pattern, and new trickle flows were continually pushing out among the rocks. The cascade 10 feet wide and poured as a glowing torrent from under the ragged edge of the crust of the upper pond into an aperture in the crust of the lower pond where a continuous small whirlpool was maintained. The lower pond showed festooned surface at this time and it was rapidly extending itself on all sides with glowing toes pushing out among the boulders. The entire upwelling was very quiet and closely analogous to what must have happened in 1877 in Keanakakoi; even crackling was not audible. The odor from the cones and the cascade was sharp with sulphur but there was no great amount of visible blue fume and the foundry smell was dominant.

From NW station observed effects of recent filling of NW depression in the greater uplift of the NW inner cliff over the lake and of the small pinnacles at the SW base of the NW crag. These were now much larger and separated from the NW crag by a deep smoking chasm where the rumbling of a fountaining grotto of the lake was heard. From this point of view the interior of the pit appeared a chaotic tumble of crags in all directions.

From the SE the recent highest level of the lake was seen to have again overflowed the SE shelf in extensive heavy festooned flows and this flooding had gone through the SE gateway to the central pond.

At 1 p.m. the NE cascade was still in full flow and no appreciable draining down of the level of the lake was in evidence. At 5:30 p.m. the rising and flooding of the two NE depressions was still proceeding vigorously. The NE valley filling had now risen nearly to the level of the 1894 depression, the cascade being reduced to a torrent of slight fall. The NE-valley pond had a pasty blowing cone at its margin near the E end and at the other end it had penetrated and filled the N pit and was still pushing vigorously northwestward. The surface of this pond was now smooth as result of cracking and foundering of its crust. The upper pond had also increased in height and size and two puffing and flaming cones were all that remained of the vents, these two being toward the western end and corresponding to the open pot of the morning. Sudden cracking and foundering of this upper pond took place about 7 p.m. with very bright incandescence and violent bubble fountaining and rapid spread of the action over the whole surface engulfing huge slabs of crust, demolishing the cones, giving off intense heat and sulphur fumes and leaving a cherry red lake which immediately crusted again with sluggish fountains where the cones had

- 2 - Day Friday Date February 15, 1918.

been. There was left a very smooth surface. The lower pond also showed cracking and foundering of a more sluggish character.

The main lake in the evening was slightly higher than at noon, depressed 3 to 4 feet below the new bench, streaming as usual and fountaining violently with high spurts from a grotto on the S side of the SE crag. There was a very hot tunnel grotto at the gateway leading to the central pond and that pond was also fountaining. There was a glowing cone over the tunnel grotto. The N lake and SW pond also showed vigorous border fountains. During a temporary subsidence about 7:15 p.m. a red hot margin about 3 feet deep was revealed all around the lake with stringy and shredded drip curtains and huge central fountains migrated southeastward with very high fling of spray.

From the S station a small circular glowing pudding of lava was seen to have emerged on the S floor from a crevasse leading to the central pond. From the SW a fresh active flow from a new high W cone was seen filling the W pit. The top of this cone was 20 feet above its base and recurved like a bent pipe with stalactites hanging from the end. There was a glowing fissure at the base of the NW cone.

At 7:30 the filling of the NE valleys was still in progress. There was no sign that any draining down of the level of the main lake had taken place through the welling up of this great bulk of northeastern lava. Everything indicated that the northeastern upwelling marked a tremendous access of fresh lava from below and this was evidenced by the other outwellings S and W and the recent floods from the NW chasm. At 7:30 p.m. the level of the northeastern filling was still some 40 feet below the level of the lake.

T.A.J.

Day **Saturday** Date **February 16, 1918.**  
**Sunday** " **17, "**

Feb. 16.

11:15 a.m.

Lake 4 feet below bench, streaming steadily, usual border fountains, considerable overhang and stalactites. NE valleys show red hot cracks but in general cooling off with surface like Keanakakoi - smooth, cracked and level. The level about 30 feet below the lake and flush with eastern and middle parts of 1894 ledge which is submerged at those two places. No difference of level in the two valleys. The five vents of yesterday marked by stained and smoking spots in this smooth floor, an eastern one hissing and the larger western one a very small low cone. The margins show trickle flows and festoons. The N pit is entirely filled and the surface there lumpy pahoehoe. The great NE crag ledge higher and at a higher angle, tilted by this huge filling. The E island mass has also risen and the inner bench under it is 10 feet high sloping down towards the E cove. The east ledge is scaling off with many rock falls on its E gulch side as though tipping southeastward from a swelling up in the middle of the great NE ledge.

1:00 p.m.

The SW pond was broken up, showed border fountains, overhang and perhaps temporary sinking. Fumes thin but denser than yesterday. W cone not flowing. Five benches now in SE crag profile, three lower ones tilted N, two upper ones tilted W. Marked swollen bench of uplift with cracks at E base of E ledge, formed by the rise since yesterday.

Feb. 17.

Excessive storm.

T.A.J.

KILAUEA DAY SHEET

73 Massachusetts Institute of Technology  
 Hawaiian Volcano Observatory

Day **Saturday** Date **February 16, 1918.**

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

			no	pl	scr	stop	ex	cam
11:15a	S of Keena-kakoi	Crag	1		8x	f/16	1/2	5x7
	E of SE. NE valley		2		"	"	"	"
	ESE Cent. & SE crag profiles		3		"	"	"	"
	E 1894 valley		4		"	f/11	"	"
	ENE N pit		5		"	"	"	"
	NE E gulch		6		"	"	"	"
	MNE Feeding cone 1894 fill		7		"	f/16	"	"
	W of SW. New W cone		8		"	"	"	"

T.A.J.





4



2

308



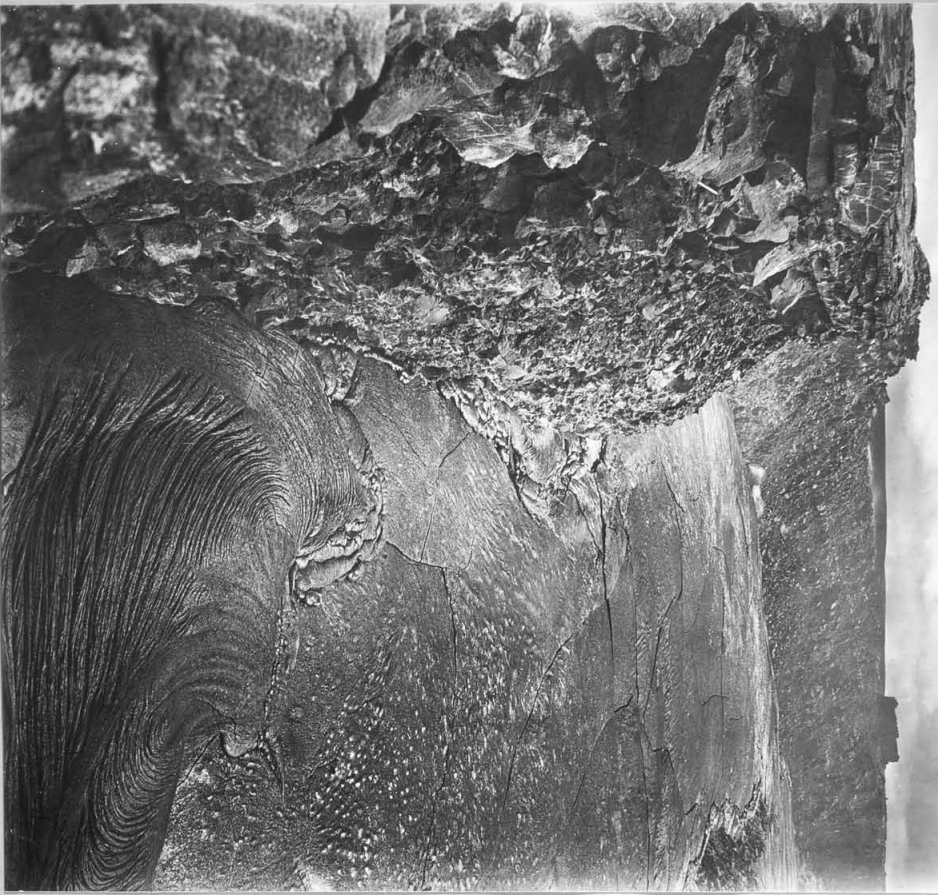
5



6

Jag

7



8



805

Day Monday Date February 18, 1918.  
 Tuesday " 19, "

Feb. 18.  
 3 to 6 p.m.

Lake rising, from 4 feet below bench to 1 foot below bench between 3 and 5:30 p.m. All crags much higher, lowest bench of SE crag and the rampart of gateway to central pond 10 feet above lake by uplift. Intumescence everywhere in evidence; edge of SW pond, W cone ridge, NW inner cliff, all lifted and near level of edge of pit. NE filling swollen up and also higher around 1894 ledge remnants, fresh sulphur fume smell, the conelet hissing in pulsations and also at times in prolonged continuous spells. Went down to conelet, now a dribblet heap over a crack in swollen up slabs; glow seen down cracks between slabs; small dribblet blowing pipes 6 inches to 3 feet long formed within and along main fissure line by gas escaping and bringing up heavy gas-free pahoehoe with it which forms a tube around each gas vent. The main cone the same thing 3 feet high with a filagree glow mesh on its summit and one or two dribblet flows on its flanks.

The floor of both the 1894 valley area and the NE valley area strongly arched, and still like Keanakakoi, but whether the same floor as that of Feb. 16 cannot tell; probably not, as the areas connecting the two valleys are wider, and the peaks of the 1894 ledge distinctly more engulfed. Believe the rise of the filling has proceeded by repeated sudden crackings and founderingings like that witnessed Feb. 15 at 5 p.m., the melt continuing to pour in through the vents below and occasionally engulfing the crust. There are areas marginal (and also interior) of lumpy pahoehoe more recent and hotter than the main flooring of the fill, which is now only about 20 feet below the lake level. One such area is at the W end of the 1894 valley. The N pit shows a slumped ellipse in the new floor.

The uplift NW has now raised an outer block of the NW shelf and the uplift under the S station has lifted bodily the remnant there of the W end of the SE shelf.

The central pond has increased in diameter at the expense of the S pressure ridge.

The lava of the SW pond mostly 8 to 10 feet below the marginal rampart.

The central steeple and central crag have both slumped off their summits and changed profile. The NE crag mass from E ledge to N smoke ledge all higher and more steeply tilted. The NW cone has fallen and is gone.

Activity moderate, fairly rapid streaming, glow lines, occasional high spraying central fountains. Large SE spatter dome. Large dome at N end NW chasm at lake edge. New point of shore from under E island tower.

Looks as though lake basin and bed must be uplifted bodily. The lake however still 25 to 30 feet down.

Feb. 19.

Heavy storm. 14 inches rain.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3 to 6 p.m.	SE	E	0					
		E ledge	37 22	-10 51	-13			
		E island tower	65 48	- 4 4	-13			
		SE crag (W peak)	84 3	- 4 0	-13			
		Central steeple	85 58	- 7 45	-13			
		Cent. crag (new profile)	91 43	- 7 1	-13			
		W crag mass	75 49	- 2 2	-13			
		N smoke crag	43 29	- 3 9	-13			
Intersect with previous readings.								
T.A.J.								
			no	pl	scr	stop	ex	cam

Day Wednesday Date February 20, 1918.  
Thursday " 21, "

- 1 -

Feb. 20.

11:00 a.m.

Heavy steaming fog all over Halemaumau. Encircled pit in rain by the S side from SE. Lake high, 1 foot below bench, 25± feet down. Active fountains migrating southeastward. Crusts rather heavy. Craggs all higher and steeper. E ledge fallen away at SE end and becoming pinnacled. SE cove appears larger, no inner bench around S side SE crag. SE crag seems rising en masse. Fresh overflow of rough pahoehoe from E end lake through E gulch to join with upper surface of NE valley filling. The two are merged; neither overlaps the other. Must have been a rise of the fill and overflow from lake at same time. Under S station fresh lava next wall appears as though it had well-ed up as in old "S pond". Ledge under S station very much lifted. Fresh falls and inner shelf under region W of SW station. New W cone still in place. W and NW floors appear unchanged.

Descended to NE fill. Blowing vent transferred a few feet farther W, along crack in swollen up ridge 3 to 4 feet high. Other dribble pipes glowing, larger cone as before but not hissing so loudly as the smaller one. Strong smell of pure sulphur vapor as well as SO<sub>2</sub>. These spiracles identical with those in lava caverns but with different glaze. Blue fume along this ridge of intumescence farther E, corresponding to line of vents of Friday last. Floor humpy, swollen, but smooth, higher around remnant peaks of 1894 bench and merged under E station with a festooned flow from the E gulch. NE ledge very much steepened.

Afternoon.

Slight flows. No marked change of level, lake 20 feet down.

T.A.J.

Feb. 21.

2:30 p.m.

SE station.

It could be seen that much overflowing had been going on from the SE arm as the SE bench had been covered until it was only a few feet below the rim.

2:55 p.m.

NW station.

Two streams of overflow from the NW pond covering the floor W. This lasted for two hours then the lake sank about 7 feet and was quiet.

Alex.

- 2 - Day Thursday Date February 21, 1918.

5 p.m. to midnight.

Remarkable rise. Alex to midnight on 20th reported no marked change, dribble overflows, SE bench 20 feet down. Now SE bench only 4 feet down, covered with new flows -- some had poured W, others through E gulch. NE fill higher, blowing and flaming cone N part of it. Fresh fill in NW depression, fountain at W niche, W shelf nearly covered, cracking and foundering in progress; flows from NW pond. Occasional bright flaring center and SW.

Lake quiet, high, brimming with SE rampart; carrying along upended crusts, blisters and balloons of skin; noiseless fountains; rampart heaped with crusts. Voluminous overflows at 8 and 11 p.m., pouring W beyond S station and N beyond E station from opposite SE station. Surface of flows reached a level only 15 inches below rim of pit near SE station. General level of lake slightly above SE rim level. Golden floods down E gulch. Hot foundry smell. Bright curtained grotto S side SE crag. Large block of SE crag fell into lake E side.

Lake continuously high until 11:45 p.m., then subsidence of about 1 foot. High gas pressure, big flames; green flame from large cone central cove, many flames through crusts and balloons. Filagree cone E cove. Domes N, NW and NE and in NW pond chasm. W cone still high. Crag tower enormously. Smoke not dense. Rocks falling E ledge. Lava 10 to 15 feet below S station in S pond or wall crack. Central pond fountaining.

NE fill glowing and fresh flow from it in afternoon met an E flowing one W of N station in gulch between wall and NW crag. N arm crusted mostly.

T.A.J.





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- 1 - Day Friday Date February 22, 1918.

Noon  
to  
6 p.m.

General conditions same with noon overflows on bench SE, driblet flowing up wall-crack S, spreading westward, and flows from NW fill spreading eastward to N pit. Lake approximately level with SE rim of pit fluctuating between short overflows and subsidences of from one to two feet. Fresh lava on SE bench in general lower by sagging and perhaps some subsidence of the bench.

From SE station.

Lake margined by rampart of piled crusts, streaming to large double spatter cone S corner SE cove. Central pond appears crusted. New spatter margin 1 foot above lake around lower bench SE crag and general around SE arm. Big fall of rampart of SE bench makes wave. Lake surface full of tipped and broken crusts SE arm, streaming from bright edge SE narrows. Balloons and blisters incessantly blown in surface skin SE cove. Fountaining quiet most of the time, noisy splashing and spraying during sinkings. At 1 p.m. strong overflow spreading both E and W on bench but not lasting long. At 3 p.m. another short flow spreading E.

From S station.

The pond beneath S channel rising along wall crack seemed to have swelled up to completely fill gulch between wall and the up-lifted bench remnant and this fill made of stiff pudding of lava. This pudding had met and blocked the southeastern overflows and extending to the W was now spreading rapidly by driblet flows down a rather steep slope to the depression of the SW valley fully 30 feet below. This lava was driblet lava in short festooned toes, ropy, black, glistening and humpy. At the S channel where the rim cracks emitted hot mist from the recent rains, the new fill stood 4 feet above the channel floor as a ridge of swelling, made of slabs 14 inches thick with a lengthwise crack on top of the ridge extending E-W. This crack and other cracks showed the incandescent lava beneath, and the summit crack extending 100 feet to the W contained blowing and hissing spiracles. In places the gas charged pudding beneath lifted the heavy slabs like lids and the gas escaped with a rush. This heaving motion was rather general and showed plainly how a "schollendome" is formed. This was in fact a typical elongate schollendome with the pahoehoe melt welling up the cracks and spreading from the end in extensive driblet flows. Its character, as distinct from the overflow lava, appeared to be dependent on the narrowness of the cracks beneath and the relatively small supply of lava, bringing about a condition where the gas escape was local and the lava, relieved of gas, denser, more viscous and slower moving.

From the SW.

The slope up to the SW pond from the base of the cliff, here 30 to 40 feet high, started from a pronounced tumbled crevasse, following the base of the wall of the pit and produced apparently by a drawing away from the wall of the central bench magma with the intumescence of the central crags. The floor crust, heaved up in the central crags excessively, was pulled away from the wall and subsided somewhat. It was up the extension of this crevasse that the S lava was welling and probably a similar process had occasioned the upwelling W, NW and NE.

The SW pond well was so uplifted with the crags that the pond could not overflow but a high fountain flung its spray up at the S tunnel.

From the NW a new dome of spatter was seen on the N side of the W niche floor. This floor was continuous over the whole wide area extending from the former W pond to the gulch N of the NW crag and the surface everywhere was smooth. The NW pond was splashing in the great chasm building an inner spatter cone 10 or 12 feet below the rim of the chasm.

During a rise on previous day this had overflowed the chasm westward and the subsidence of the lava following the rise had left a natural arch of crust across the chasm. The view from the NW height showed strikingly the arch of intumescence produced by the swelling up of the W crag mass and the dip of the lifted surface away from it, and away from the lake, all the way from the NW inner cliff to the S end of the W cone ridge. The old W crag mass summit was again a dominant tower but the remainder was a few tumbled spurs to the eastward wholly different from a year ago.

The N arm of the lake contained three or more large spatter domes, one W, one N, and one NE, and the outlines of this lake could no longer be seen, so little was it depressed below the observer. There was apparently a wider portion NW, a hooked cove N with a fountain spattering on the N side of the cone there, and something similar NE with the fountain playing on the E side of its cone. There appeared to be a large uplifted cavernous depression in the N face of the central crag mass. The high pinnacle of the E island mass was an isolated tower rising from its W side. The NW crag pinnacles appeared more broken.

In the morning there had been a flow from the NW fill into the N pit. Seen from the N station this N pit surface was still cracking and foundering and smoothing its surface. There was a cascade of the previous day frozen to the slope leading from the N cove and this had been glowing the night before. At that time the view through this N gap from E of the N station had revealed a very large dome on the SW edge of the NW cove, that is under the raised NW inner cliff, having crescent form with opening towards the lake and a large blue flame steadily rising from the opening. Another blue flame played at the lake margin under the NW pinnacles.

From the NE the new fill was now a flat floor not more than 15 feet down to its highest marginal scar of uplift, but it had subsided 10 feet below this margin and was in general 30 feet below the NE cliff and perhaps 15 feet below the lake. This subsidence may have been due to general sinking of the bench magma below compensating the new weight of the fill. There was only one marked cone, a dome of spatter hissing, perhaps 10 feet in diameter and quite like the one in the W niche.

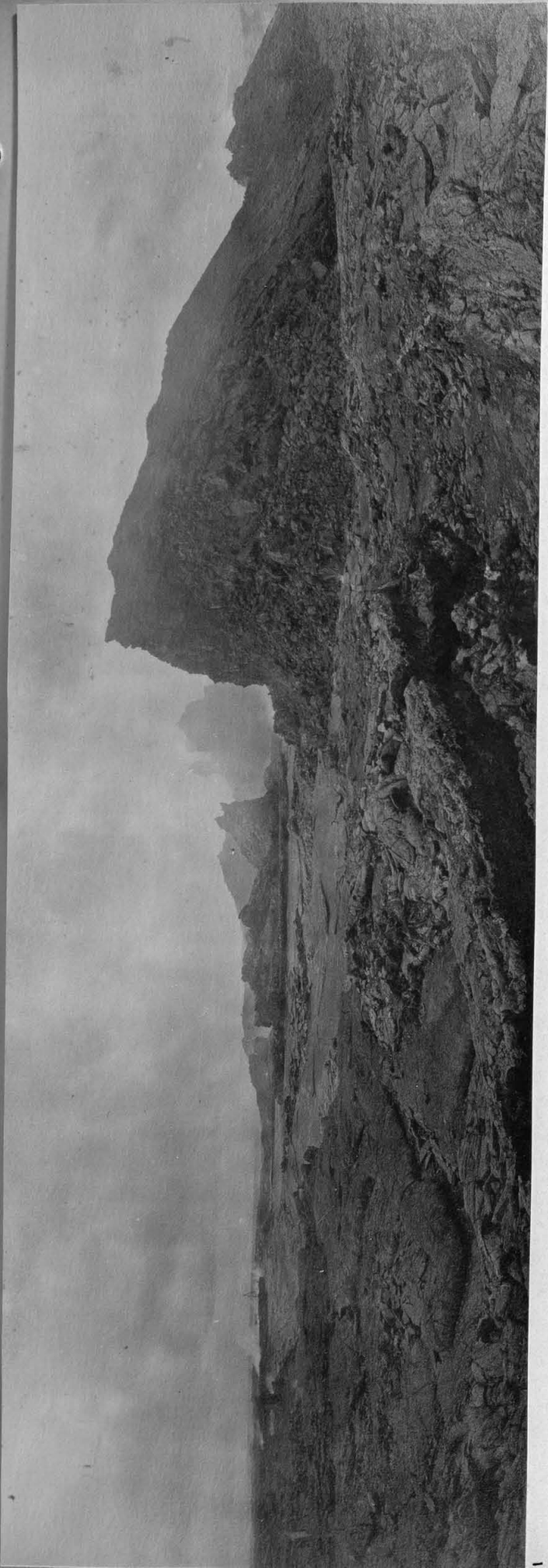
There were no marked changes E. Rocks were falling under the N station, also from the E ledge and NW crag, showing that the crags were in motion.

Occasional heavy fountains in SE arm. Large dome curtained in E cove.

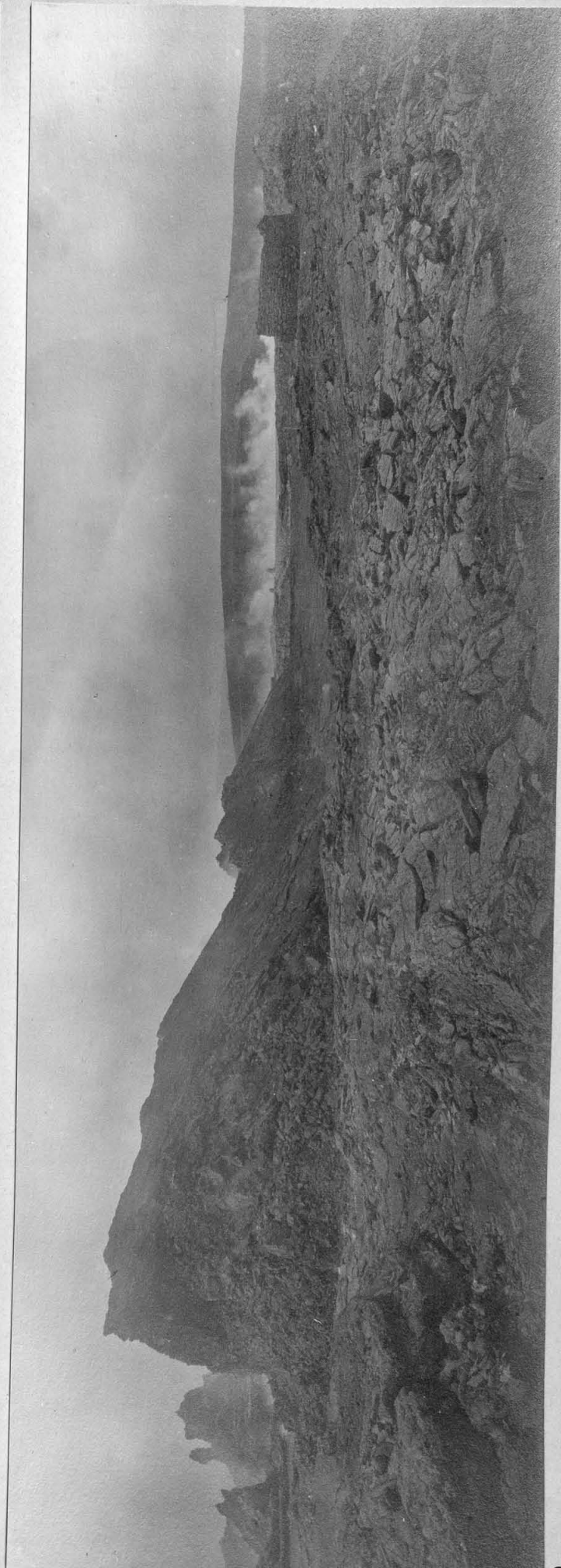
Day **Friday** Date **February 22, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	lens	scr	stop	ex	cam
Noon	Trail	South	1		old	f/16	no vane.	A V
	"	NE	2		"	"	"	"
	NW	Center	3		"	"	"	"
	height							
3:20p	S of SE	Central pond	4		"	"	"	"
		(fresh overflow)						
	N	Lake	1	Tessar	8x	f/11	1/8	5x7
	Tech Sta.	West	2	"	"	"	"	"
	W of NW	NW pond	3	"	"	"	"	"
	"	N gulch	4	"	"	"	"	"
1:45p	ESE	Overflow	5	"	"	"	"	"
	E of S	SE bench & rim with people	6	"	"	"	"	"

T.A.J.



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1918, Feb. 22

3 A.V.



Tag



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4 Av.



Taj

- 1 - Day Saturday Date February 23, 1918

Examination of pit with telescope in morning revealed long overflow from SE cove eastward across automobile terminus. Arriving pit at noon learned that this flow started at 5:10 a.m. and flowed for some hours. It was now possible to cross the flow but at 1 p.m. strong overflowing was resumed from the lake SE and also through the E gulch to the NE valley pool which cracked and fountained.

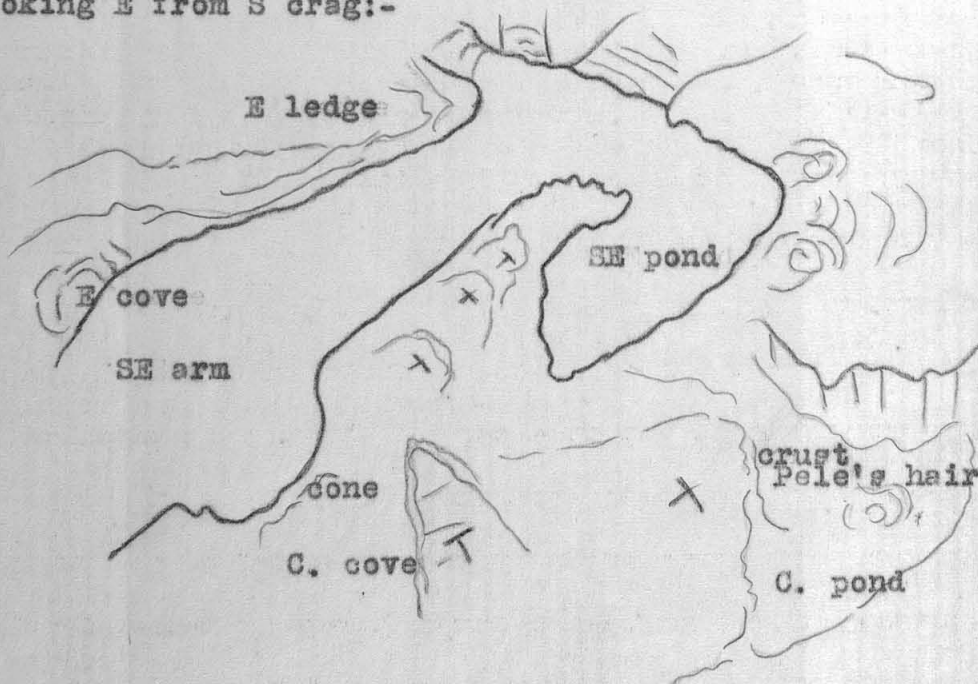
Data furnished by O. E. Long who with Mrs. Long saw first overflow:-

4:55 a.m. - overflow inner rim.  
 5:09 " - " Halemaumau rim.  
 5:12 " - path covered.  
 5:35 " - moved S of path and reached corral.  
 5:41 " - corral covered.  
 5:47 " - corral walls buried.  
 5:55 " - 400 yards.  
 8:30 " - slowing down.

Noon.

The lake showed high activity with high spatter domes and strong streaming eastward in both the SE arm and the SW pond. Lake about 5 feet above rim of pit and spatter ramparts 5 or 6 feet higher. Climbed to summit S crag and made accompanying sketch maps.

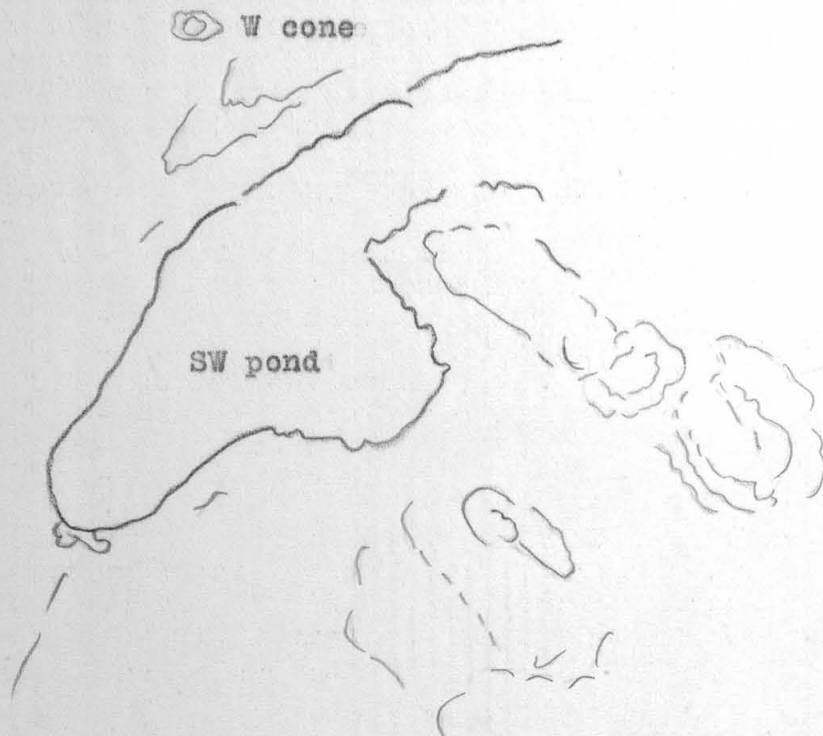
Looking E from S crag:-



In afternoon during overflow, about 2 p.m., S channel filled with lava welling up under S station. This lava had greatly extended the flows westward which were heaped and irregular with snaky cascades. At noon a fountaining and spurting pot a few feet from S station. At 3:30 p.m. this had built a driblet cone 5 feet high and 3 feet across, filagree summit, gas flames emerging from many small orifices in rhythmical flares.

- 2 - Day Saturday Date February 23, 1918.

Looking W from S crag:-



Strong overflowing 1 to 4 p.m. from the SE and again after 5:45 p.m. The overflowing is nearly continuous but appears to have made fresh starts about 6 a.m., 12 noon and 6 p.m. The great rise of the morning was general. West fill higher, driblet fountain in W niche, fountains splashing in NW chasm and W fill very flat floored. Two remnants NW shelf still protrude through it. New overflows through N gap and NE fill still higher. (NE and NW fills about 10 feet below lake level). Large E driblet dome in NE fill. Craggs do not appear much higher. Lakes gaining on them.

Remarkable uplift of SW station on edge of pit raised into a half-dome, artificial platform of rock at station tilted southwestward, on a hummock lifted at least 6 feet. There appears to be similar intumescence of the whole area S of Halemaumau, for the A-frame was nowhere visible from auto road.

The area of overflow crosses the lip of pit from crevasses S of E station to S station. The main overflowing being about where SE station had been or directly opposite SE cove. The flood extended half a mile eastward generally covering the area just to the N of auto road and reaching nearly to the gravel flats. The flow was from 50 to 300 yards wide. It was pahoehoe of the glistening variety with aa fragments developed in the under layers and seen when the under layers were revealed by cracking open of the glistening upper slabs. The continuity and voluminousness of the flooding since Feb. 15 has not been equaled probably since the rise of December 1911.

Very large spatter domes almost continuously active all day E cove, central cove, E end SW cove, SE corner SE cove, S tunnel entrance SE cove, and in N, NE and NW. Small driblet overflows had poured between the NW crag and the pinnacles under it from the lake. No

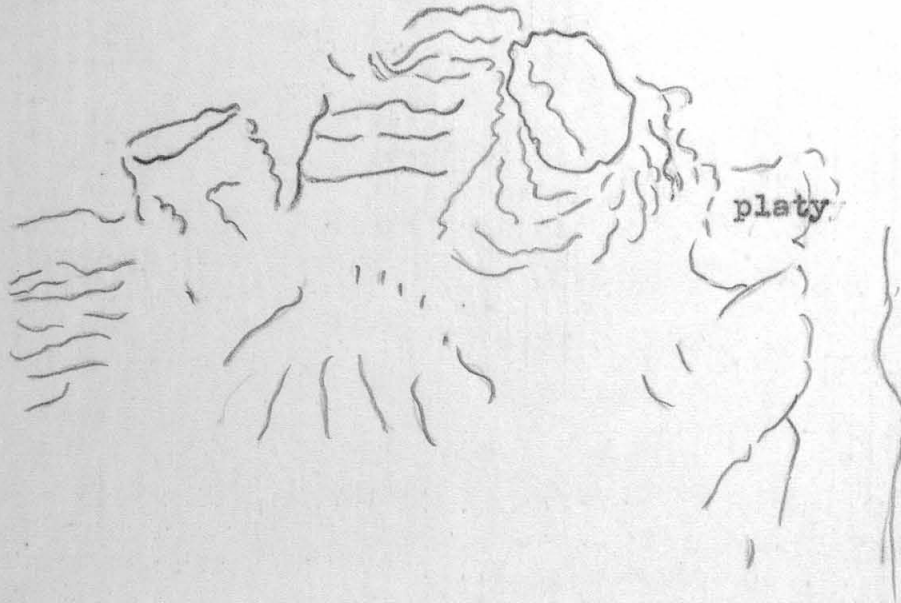
- 3 - Day **Saturday** Date **February 23, 1918.**

changes observed at Pele's kitchen or Postal Rift or anywhere away from the pit.

Sharp earthquake felt in Hilo about 1 p.m.

At 11:30 p.m. there were further general overflows, cascades through N gap and from NW pond.

Looking N from S crag. Imbrication of plates central crag:-



T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
5:15 p	S	Left cor, front roof	0					
	S	E wooden tool house.						
	S	SW sta. (swollen up)	131 10	- 0 36	-6			
		Summit S crag	84 11	- 7 41	-6			
		Summit central crag	80 39	-10 6	-6			
		" " steeple	63 35	- 9 33	-6			
		" SE crag	40 38	- 4 32	-6			
		" E ledge	25 47	- 5 7	-6			
		" E lump SE dome (3 ft. over lake)	17 48	- 1 8	-6			
		Lake oversplash (W of three SE domes)	28 6	- 0 24	-6			
		Summit S tunnel dome SE cove	40 00	- 1 12	-6			
		Lake overflowing SE margin SE cove E of SE dome.	11 49	- 6	-6			50 in.
		(Flow 50 in. above rim)						
		Crag summit N side central pond gate.	52 13	- 4 3	-6			
		Crag S side central pond gate.	58 39	- 3 42	-6			
		Central pond floor (through gap)	65 24	+ 0 12	-6			
		Sag SE cor. SW pond (pond level) spatter glow.	108 26	- 0 27	-6			
		Summit S pressure ridge	95 42	- 5 06	-6			

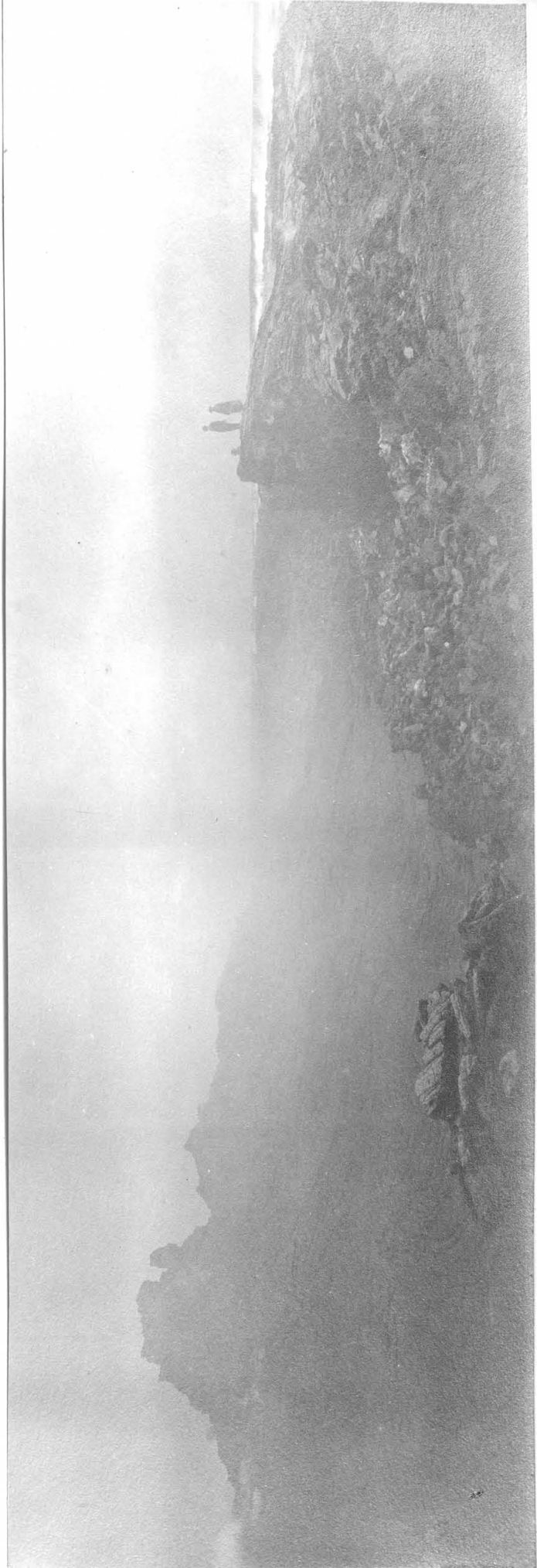
			no	pl	scr	stop	ex	cam
		Cloudy.						
Noon	W of S	SE dome	1		old	f/16	no vane.	A V
12:20p	W " SW	SE	2		"	"	"	"
12:45p	W	NW pond	3		"	"	"	"
	niche							
1:30p	ESE	SE rampart overflowing	4		"	"	"	"
2:15p	N of E	(NE pond, crack & foun- shelter. der edge & flow from (lake going into it)	1	Tessar	8x	f/22.6	1	5x7
	NE half)	E gulch flowing	2	"	"	f/16	1/2	"
	dome.							
3 p.m.	Back	Lake	3	"	"	"	"	"
	ESE.							
3:30p		S chan. full of lava	4	"	"	f/22.6	1	"
4 p.m.		Spnt. grot. 25' away.	6	"	"	f/6.3	1/20	"
		S tunnel end SW pond.						

T.A.J.



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30-g

1918, Feb. 23.



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3a g



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307



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709



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50g

Day Sunday Date February 24, 1918.

During night glow less bright.

6 to 8 a.m. Flows had ceased. Lake 4 feet down streaming with a rush SE channel. Grotto rampart high all around lake with overhang and glowing caverns, some rumbling. Went out to edge SE. Some incaving.

Same all around. NE floor had subsided and about 15 feet below lake. Fresh flows of last night N gap and NW pond. Hissing cones NE and W niche. W floor filling less slumped than NE fill. Flows nearly cold (of previous day).

3:30 p.m. Lake seen through telescope ready to overflow. Autos parked along lava road. Not now overflowing. Splash N cove dome. Fume rather dense. A-frame gone (burned from flow spreading out in tongues from S station cone). Later in day sunk again. In evening two fountains SE visible.

T.A.J.

9:00 a.m. From SE side of SE arm could see that the lava was down about 7 or 8 feet below rampart. Many fountains playing.

9:30 a.m. Fresh flow from the S station cone over old lava continuing for some time.

10:10 a.m. S flow continues.

12 noon. A broad flow from the S ran 300 or 400 feet.

2:40 p.m. No new flows to be seen NW. Lava down 6 or 7 feet down in N arm but there are several fountains in action there.

3:30 p.m. E station.  
Cone on floor of NE fill NE sending out lava spray occasionally.

5:30 p.m. SE station.  
Lava about 3 feet below rampart, sinking again at 6:30 p.m. Many fountains playing.

Alex.

- 1 - Day Monday Date February 25, 1918.

- 7:00 a.m. New flow began at 12 p.m. last night, overrode old flows south-eastward; branches renewed this morning 6 o'clock now pushing SE, E and through E gulch. Road overridden more than halfway to gravel flats. Cone S station closed and hissing. S station buried. SW valley half filled for its whole length. Rim of pit buried from E station to W of S station. NE fill arched, new heavy flows to it, two feet above E station ground in E gulch.
- 8:00 a.m. Flow pushing slowly through E gulch into arched tube of next former flow. Sulphur-alum stains on back of E ledge.
- 9:00 a.m. SE cove crusted, only one fountain SE. Walk up to western domes and look in. Climbed gate to central pond. Latter all crusted, one place hissing and stained. Rocks falling E ledge, SE end. Central crags not visible from E station. Flowing vigorously.
- 11:00 a.m. Both W and NE valleys filling by same mechanism. Lava welling up from below, presumably through wall crack, makes a pond which crusts over heavily and periodically cracks and founders suddenly. Margins of such pond make driblet flows. Into pond in each case pour flows from lake at intervals which tend to pile up on the pond crust but merge with the pond when the latter cracks up. Thus the NE valley fill is receiving flows from the N gap and E gulch while the W valley receives flows from the NW pond chasm. The SW valley is different as yet in that it is being filled wholly with lumpy sluggish flows from the S driblet cone. This phase of activity, namely intumescence followed by upwelling through wall cracks, is new.
- 12:30 p.m. Streaming reversed in SW channel and poured southward while strong streaming southward from N arm bent off to the SE.
- 11:25 a.m. Descended W floor and climbed old crag mass. Flow from filled and crusted NW pond. Round Pool N with 2-foot crusts around it (NW cove). Other isolated pools N and NE. Pahoehoe platform with three pinnacles E part old crag mass. Large platform N of old summit crag. Streaming out and around central crag from SW fairly swift. Grotto W side E island tower. N arm narrow and short. Spatter heaps in chasm W side SW channel.
- The NW chasm was overflowing down steep slope westward 11 to 12 a.m. and this was brought to a close by fountaining through an oval pit 30 feet long wherein the lava subsided about 2 feet. There was a large horseshoe dome adjacent to this pit on the W and a gas spiracle on the bench adjacent E. During the sinking spell the crusts elsewhere along the chasm collapsed and showed glowing tubes or caverns. The chasm extends from a cove at the SW bend through to the NW cove pond following a slight curve past the W side of the old crag mass. The fall from the NW pond level to W valley was about 30 feet and the level of NW pond was about 18 feet above the lake.
- SW station raised still higher, probably 10 feet above its original level. S cone surmounted by small hissing gas vents and driblet flows continue to push out from it as a center.
- 1:00 p.m. Very sudden break-up of W niche cone welling up of lava through it like artesian well, then sudden tumultuous breaking up of the high swollen surface of the whole western ponded area with violent bubble fountaining, great liquidity of flow and readjustment of large oval area. This was followed by quick cooling

- 2 - Day Monday Date February 25, 1918.

of the whole surface through shades of orange to cherry red and purple, and there was left a more extensive smoothed area, somewhat less high than the smaller arched-up area which had been there before. I walked over this arched-up area to the W niche cone a half hour before and the cracked slabs composing it were fully two feet thick, cemented tightly, but quaked sharply occasionally. The W niche cone was 4 feet high and 10 feet across with a hissing gas tube of smooth lava on top.

6:00 p.m.

Cascade of lava from overflow platform SE pouring E about half-way from SE cove to front of new flows.

11:30 p.m.

Overflow SE and S broad and short and slow.

During night fountains seen to be high, lake brimming SE and N.

Note. Aa under slabs and forms interior linings in this flow.



Hollow under festoons lined with aa.

Query. Outer skin subaerial cooled; interior internally cooled by gas expansion released when toe flowed out. Sudden release makes aa? Of lava already viscous and surcharged with gas? Or with gases still in solution?

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9 a.m.	E	NE (rock peak in hollow)	0	-7	-7			51"
		N	39 22	- 0 15	-5			
		N cor. N corral	44 26	- 23	-7			
		Summit "elephant"	40 21	- 0 39	-7			
		W driblet cone	37 00	- 34	-6			
		E " "	35 25	- 0 50	-6			
		Low sag N end 1894 valley	27 55	+ 0 39	-4			
		Slab projecting E of NE sta. (high rim)	- 3 0	- 1 13	-6			
		Summit NE half dome	- 7 54	- 2 25	-6			
		N cor. E shelter	-36 9	- 4 27	-5			
		Left front cor. E tool house	-90 18	+ 0 33				
		Ground ditto	-90 18	+ 1 54	-6			
		Lake edge E gulch (E gulch grotto)	151 12	- 1 22	-4			
		3rd scallop E ledge	101 0	-15 28	-4			
		Low sag NE ledge	74 51	- 6 7	-3			
		NE peak	60 9	- 6 53	-3			
		N smoke	58 4	- 5 55	-2			
		New lava level, stain crack under E ledge (E sta. tilting under pressure)	104 32	+ 0 99	0			
		New lava level stain crack under N smoke	46 37	+ 0 47	-4			
		New lava level boulder under N station	40 14	- 0 43	-4			
9:25a		Lava outbursts destroys E station -- I move.						
	NW cor. ) E tool house )	N	0					51" on ground
		NE stone heap	-32 2	- 3 18	-5			
		Summit SE crag	53 14	- 4 0	-5			
		" E "	54 10	- 3 50	-5			
		" N gate crag	60 0	- 2 33	-5			
		central pond						
			no	pl	scr	stop	ex	cam
11 a.m.	N	Lake	2		old	f/16	no vane.	A V
	N	E	3		"	"	"	"
	E side)							
	W cone)	N arm	4a		"	"	"	"
	ridge )							

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	E tool house	E summit S pressure ridge	63 14	- 2 18	-5			
		Summit S gate crag central pond	63 50	- 2 0	-5			
		Summit NE half-dome	-11 35	- 3 4	-5			
		W dome SE pond	67 42	- 1 49	-5			
		E dome SE pond	70 0	- 1 46	-5			
		SE sharp new dribblet cone	84 9	- 1 9	-5			
		Lake edge E gulch (E gulch grotto)	55 46	- 1 51	-8			
		SE summit E ledge	47 24	- 7 21	-7			
		N smoke	14 32					
<p>Lava in E gulch 10 feet west, 2 feet higher than ground E station.</p> <p><u>Note.</u> U.S.G.S. bench mark E (3697 feet) is 8 feet below and 8 feet from pile of stones N corner E shelter line of direction = SE station approx.</p>								
			no	pl	scr	stop	ex	cam

T.A.J.

1918, Feb. 25

62



108

4a



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109

109

- 9:00 a.m. H. V. O.  
Sharp earthquake felt which shook off rocks from the wall of Kilauea.
- 9:30 a.m. Lava high SE cove and splashing. No marked changes detectable from distance. Height crags about same.
- 11:00 a.m. No activity visible and no glow.
- 12:30 p.m. Lava up again SE.
- 1:00 p.m. Lava down again. The filling N and W appears greatly rising.

Afternoon.

At crater.  
NE fill ridged along NE side and arched elsewhere and somewhat lower to the N. Driblet flows and central puddle which had welled up cracks. N gap about the same. W valley filling much higher, about 10 feet below rim at W niche where the spurting cone was now beside a small open pot. The cone had broken away on the W side and the remaining half was acting as a grotto throwing jets westward to build a rampart on the W side of the pot. The pond filling of the W valley had a sluggish border flow in motion. The W pond was open with glowing lava inside at a lower level than the heap that filled that depression the day before. The W cone had a lower horn in addition to the higher curved one. The filling of the SW valley was now only a few feet below the SW rim of the pit and in its middle region was arched up, showing a tendency to definition as an oval pond, a new feature for this area. The lift of the SW station was now fully 12 feet, the mass standing as a half-dome with the station platform and an unstable pile of rocks on top of it, lifted bodily in three days without upsetting the rocks. The nature of this uplifting was explained by the pressing up of other places to less degree (3 to 5 feet) all along the rim S and SW and the impression was gained that this was occasioned by the rising of the central crag mass imprisoning the new fill against the outer wall and so forcing that wall up.

The S cone was hissing through a large filagree of apertures in its summit and new toes of elephantine character were spreading like the tentacles of an octopus over the country to the S and W. Fresh shells of overflow lava from the SE cove overlay the driblet accumulations from the S cone about as far as the former S station.

Cross to these flows to see the SE rampart which was found uniformly built up and without active fountains at the moment (3:15 p.m.). The lake was crusted with brown skin across the SE arm, streaming from the narrows as usual to the SE cove and a very bright curtained grotto was the most conspicuous feature, on the W side of the cove. There was no notable change at the E station.

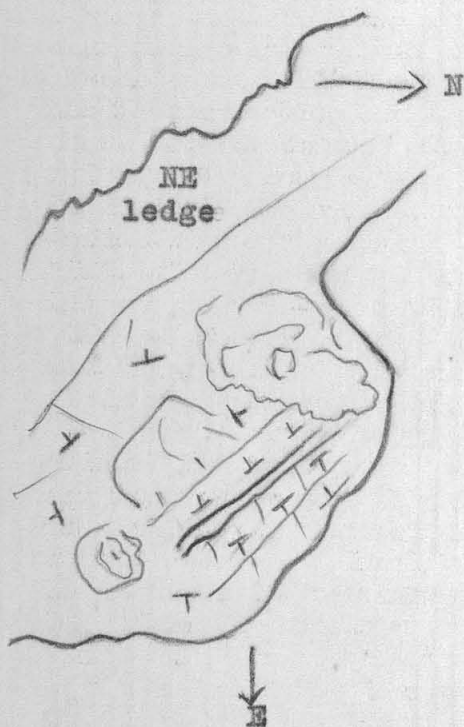
- 7:00 p.m. H. V. O.  
Fountains SE and N arm again.
- 8:45 p.m. Extreme brightness in general at pit.
- Midnight. The flow E of Halemaumau was glowing farther E than early in the evening.

Day **Wednesday** Date **February 27, 1918.**

9:30 a.m. H.V.O.  
 Lava splashing in SE grotto. No activity seen W. W fill and E gulch appear same.

At crater.  
 Rather an inactive day. Trickle flows continue S. Fills NE and W continue to swell up and well out margins. Great lift of crags and fill of SW valley from S cone vent continue; lake up and down.

6 to 7 p.m. In evening visit stations E, NE and N.  
 E gulch slumped down where flows had poured out to NE fill but piled up arch of new flows high above E station level, between E station and E ledge.  
 Delta-like platform E of SE cove. Lake now high above rim level.  
 Map of NE valley showing swelling over vent line and quaquaversal:-



Long arched swelling NE side NE fill, with flaming cone E end and puddle of driblet flows in motion W end (N station end of 1894 valley). Fill about 55 feet below ENE rim of pit.  
 Fountain fling in N cove pond.  
 Glowing toes in NW wall valley flowing from under high flat-topped "slag-heap pond" of W niche. This pond has been rising by cracking, foundering and crusting again. W-niche cone hissing but otherwise quiet. W-niche pond 5 feet below W-niche shelf.  
 SW rim of pit pushed up higher. S cone like a lighthouse. S flows glowing.

9:00 p.m. Lava splashing SE, N and glow W.

T.A.J.

- 1 - Day Thursday Date February 28, 1918.

8:00 a.m. H.V.O. Lava splashing SE.

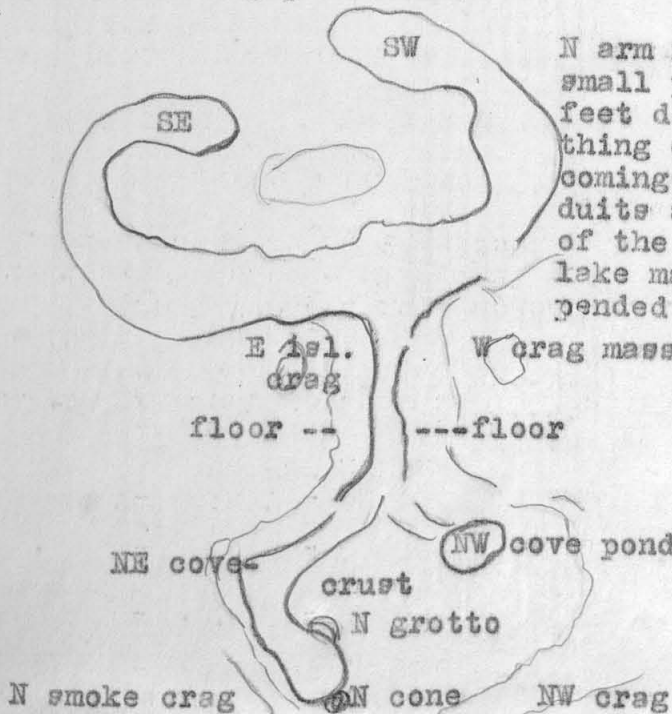
10:30 a.m. Walked around pit from SE to S. S cone itself no higher, but lifted on upswollen flows. SSW rim up-pushed 9 feet. This up-push precisely like the NE half-dome. Toes active SE near road and S near S cone. The SW station upthrust fully 12 feet high. The SW valley filling 10 or 12 feet above old rim some way W of S station and slopes westward. W cone ridge a towering crag comparable in height to NW crag. Only remnant of old wall crack is a confused uplifted tumble opposite the W cone; W cone base now high above rim of pit. W pond an arch of crust and slumped fresh lava N of it.

W-niche fill now arched over great pressure, and trickle flows from it on S side of W niche marginal bench. The surface of fill above level of margin (edge of pit). W niche cones now five in number, one or two hissing. Sulphur crystals around a small blowing orifice on one of them. Trickle flows moving E and N from the W-niche pool sloping down to NW crag gulch. Near Old Rest House N, lava about 5 feet below rim of pit. No activity seen in NW pond chasm and no recent overflows from it. Dome on its W lip. Great upheaval of crags everywhere and from W this shows as an intumescent dome filling whole interior of pit, with the lake becoming a tortuous channel in the midst of this craggy dome. Lake now not visible from any part of the rim of pit, as lake is everywhere above level of rim. Fountains on SE margin of lake and at N cove pond, occasionally showing their fling above the ramparts.

NE fill overflowing slightly the rim of pit ENE and NNE. Flat crust over whole fill and the crust of a few days before so up-lifted on NE crag-mass side as to be a beach against which the new shore laps. The crust heavy, no cones, flows of the trickle and toe order.

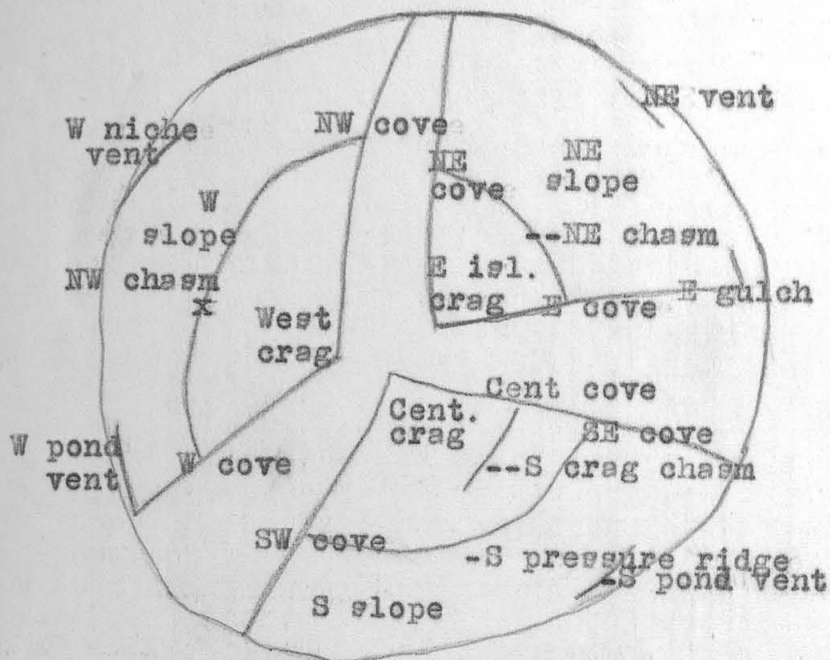
Lake at 10:30 a.m. 3 feet down, sluggish, heavy crusts, fountains SE cove, curtain grotto S side of a pond at N cove locality.

Lake from N gap at noon:-



N arm now tortuous channels and small ponds NE, N and NW, 3 to 4 feet down, heavy crust over everything else. Is not the bottom lava coming up, leaving only the conduits and sinkholes open? The rise of the bench magma gaining on the lake magma? The latter being expended in flows and fillings? If so the holes are W pond, W niche, NW chasm, NW cove, N cove (N pit?), NE cove, SW cove to SE cove (S sinkhole?), E cove (united with NE = NE sinkhole?), center?, NE valley, central cove? (united with SW cove?) S pond cone.

Note the symmetry as shown in diagram.  
Radial-concentric arrangement of vents, treating the crags as sections:-



This illustrates something of the mechanism of the fracturing which gives rise to the lake magma honeycomb in the upper part of the lava column.

Lake in afternoon (1 to 4 p.m.) brimming SE, very quiet, occasional subsidences of a few feet. In evening as much as 7 feet down, with increased activity. The W fill rose during afternoon, new cone on top and flows to N in wall valley. NE fill domed up. Falls of rock from crags continue, marked at E end NE ledge. Trickle flowing always from S cone to S.

T.A.J.

- 5:30 p.m. SE side of SE arm.  
Lava 7 feet down and streaming rapidly through channel to the SE sinkhole. SE cove active.
- 5:50 p.m. S cone blowing loudly and occasionally sending out lava.
- 6:10 p.m. Ends of S flows moving in many places.
- 8:00 p.m. These flows have joined with those from the SE arm and continue moving on.

Alex.

Day **Thursday** Date **February 28, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		High wind.						
	W	Central crag		- 8 9	-34			
		W cone		- 4 34	- 8			
		SW		+ 0 38	- 8			
		W crag		- 6 56	-40			
		N smoke crag		- 4 30	-40			
		(Use intersections of previous positions)						
		<b>PHOTOGRAPHS:</b>						
		Snap Shots Brownie Camera.						
10:30	No.1.	Channel SE of Halemaumau.						
to	2.	Lava toes in motion, S cone flows, 1st stage.						
11:30	3.	" " " " " " " " 2nd " " 1 min. later.						
a.m.	4.	" " " " " " " " 3rd " " " "						
	5.	" " " " " " " " 4th " " " "						
	6.	" " " " " " " " 5th " " " "						
	7.	" " " " " " " " 6th " " " "						
	8.	" " " " " " " " 7th " " " "						
	9.	Panorama of pit from near S cone, 1.						
	10.	" " " " " " " " 2.						
	11.	" " " " " " " " 3.						
	12.	S cone looking N.						
	13.	SW edge of pit.						
	14.	E edge SW pond.						
	15.	S valley flow filling.						
			no	pl	scr	stop	ex	cam
	16.	Spurt of driblet flow festooning (in motion).						
	17.	Toes inflating and advancing, S cone vicinity, 1.						
	18.	" " " " " " " " 2. (3 min. later)						
	19.	" " " " " " " " 3. " " "						
	20.	Pushed up SW station.						
	21.	Lifted W cone -- distant.						
	22.	W cone -- near.						
	23.	W niche, filled.						
		These exposures experimental.						
		Film jams in camera.						
		Strong developer, pyro, best results, 17 to 23.						

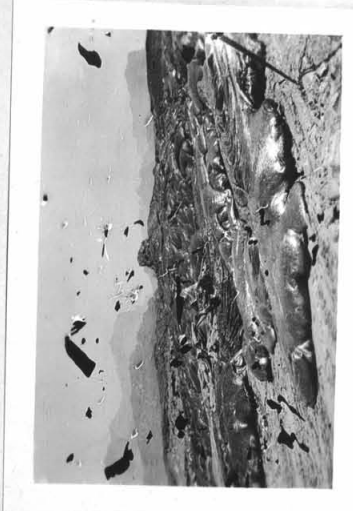
T.A.J.



3



6



12



2



5



8



10



1



4



7



9



13



16



17



14



20



18



15



23



19



21



22

11 a.m. to 1 p.m.

Lava in lake high and overflowing SE at noon. Lava in NE fill high and overflowing around edges. Flowing over old rim ENE in dribble toes, and fill NE much above rim by piling. Fountain in E part. Dribble flows continue S and have nearly reached the remainder of road on lava SE.

Started work with vacuum tubes to collect gas. Object, to collect gas at live toes of ENE flow. Used 25 feet 1-inch black steel pipe perforated all around end and end cap with  $\frac{1}{4}$ -inch holes for one foot of length. Holes two inches apart. Thrust pipe in flow to cover perforations, worked it there for five minutes, pulled it out with clot of lava over end; thrust vacuum tube (100 cc) to end of pipe on wire. First tube broke, second one collapsed by fusion.

Finally adopted method of measuring wire and tube exactly and thrusting only to point where terminal bulb of vacuum tube would enter incandescent part of pipe filled with gas. This gave satisfactory result, bulb only collapsed, tube filled, sealed end with rubber tube and finally sealed off with gasoline torch.

7:00 p.m. Made second collection with large (500 cc) tubes. Studied toes with some attention; glow very high when toes are stirred. Breaking off a knob and small festooned flow comes forth. Toes swell up when crisp skin forms over them. Broken off toe, crust 4 inches thick, middle full of glowing paste. Toe lava when red hot cannot break even with crowbar; extraordinarily tough; becomes brittle when cold. Flow of the morning, outer shell black, inner part cherry red, like red hot coke. Impossible to get out of it a pipe caught in it in the morning.

Tried thrusting tip of large vacuum tube directly in swelling and bubbling toe lava. Little spurts of bluish flame come from the bubblings. The tip fused with the lava but refused to break the vacuum. The aperture became clogged with lava glass. Two tubes lost in this way; tried to break tip inside toe bubble by thrusting an iron in against it; same effect.

Finally made collection at edge of lake thrusting tip against crust slab at a blue flare orifice, and breaking tip and sealing with rubber.

Surface of NE valley pond cracking, foundering, fountaining in pools, and flame through crust orifice in E part. Level of surface of this pond 6 feet above ground of E station. Edge in terraces of overlapping slag, with toes and flows pushing out beneath over the edge of pit near East Bench Mark.

Lake brimming and even above its rampart, hemmed in merely by its marginal piled slabs and crust folds; heaving crust over most of it. Occasional fountain in SE arm migrates to E gulch rampart. Fountain at SE cove grottoes. Slight dribbling overflow.

7:30 p.m. Lake brimming. NE overflows.

9:00 p.m. Activity SE, N and W. Glow from S flows.

11:00 p.m. Unusual rumble heard at Kualone.

11:30 p.m. Great activity. Bright flow S. Three glowing areas. Wide flow E gulch from lake. Glow N. Bright activity N arm. Fountain West.

12:00 p.m. Activity dwindled.

Day Saturday Date March 2, 1918.

11:25 a.m. to 1.15 p.m.

At noon the pressure was high, lake 3 feet down, moderate marginal activity. Crags very high. Slides observed tumbling down backslope of NE escarpment. New point projects into lake at E cove. NE fill domed up, a collapsed pool near its middle, hissing and flaming through small cracks in the domed slabs. No marked changes N. At the W niche pond, the cone locality an open pool of very sluggish fountaining lava, and fresh marginal flows had pushed out on the W niche shelf.

Gas collection.

12:30 to 1:15 p.m. At NE fill, from NE station, collected two gas samples from flaming cracks hissing strongly; large tubes; excellent collection.

No. 1. Crack near margin pool in 2-foot crusts 20 feet from cliff NE station.

No. 2. Ditto 50 feet from cliff NE station. Walked

Walked out on crust of pool to make collections, tube in hand; cracks one to two inches wide.

In the early morning and in the evening lake observed from H.V.O. very high and active SE, N and W fill. Fountains seen at all three places. Crags high above far wall of Kilauea. Glowing flows in action S.

During following night sharp subsidence set in which showed in lake March 3 and in crags March 4.

T.A.J.

4:45 p.m. Lava down about 3 feet in SE arm.

5:15 p.m. Lake brimming. Overflowing in narrow stream at E gulch running toward E station.

5:50 p.m. Long, spreading flow from S cone source.

Alex.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
11:25a	Auto	Looking NW at Halemau-	1	W P	8x	f/11	$\frac{1}{8}$	5x7. Tes-
	term. mau							ear.
	SE lake	Panoram. to SE dome(a)	2	"	"	f/16	"	"
	margin.							
	"	" " crag(b)	3	"	"	"	"	"
	"	to E gulch dome (c)	4	"	"	"	"	"
1:30p	NW	W niche	5	"	"	f/11	"	"
	height							
	NE	N station. (T.A.J. on	6	"	"	"	"	"
		pool collecting gas;						
		showing crack where second						
		tube was collected.)						

T.A.J.



1



5

Jaag





4



6

Fog

9:00 a.m. From H.V.O. no activity visible at crater. Crags same. No changes.

4:00 p.m. At crater. Everything was down and crowds of visitors were swarming over the SE rim, the NE fill and the N arm crust near the N gap. The change to dead crusts was remarkable, though the S cone continued to puff. The lake was about 12 feet down below the SE rim and a sluggish fountain played in a cavern lined with stalactites at the cone locality of the W fill. The N cove pond was down 15 feet and the spatter cone had broken and fallen southward. Driblet flows continued to move at two localities S near the road and the remarkable feature of the lava in motion was its lack of inflation bubbles. It was orange and remained very incandescent, putting out flat lobes of pasty appearance easily gathered on a stick; this material stayed soft for specimen-making longer than the "bubbly" lava which emerged from the NE fill edge two nights before. That tended to swell the toes; this tends to spread like paste, and shows no such pattern of drawn filaments over vesicles as the other. The cooling surface of the gas-charged type is a glistening black or silvery net; the cooling surface of this pasty type is rough, dull and lumpy.

The driblet lava near the S cone was humping up into large schollendomes. The SW edge was higher than ever. There was an indentation of SE cove leading to central pond. The streaming SE was largely reversed, pouring into E and central coves, N from SE channel, stagnant in SE cove, travelling fountains across SE arm where currents from E and W met. Activity during sinkings, more quiet during usual risings.

Slumping and broken tumoles in new lava fills SW, W and NE. A sub-circular area slumped 10 feet near NE wall, in NE fill. The SE rim and SE crag both appeared as though lifted and tilted freshly, the rim eastward and SE crag westward making the height above lake greater than elsewhere. The inner spatter bench of the lake, anyway, was only 3 feet high around SE arm and at point projecting from E island into central region.

Note. First flows heavy pahoehoe with aa in places.  
Second flows shell-like and cave in.  
S cone flows driblet first swelling and gas-charged. Some with driblet from marginal ponds.  
Last driblet flows pasty and rough simultaneous with schollendomes S.

T.A.J.

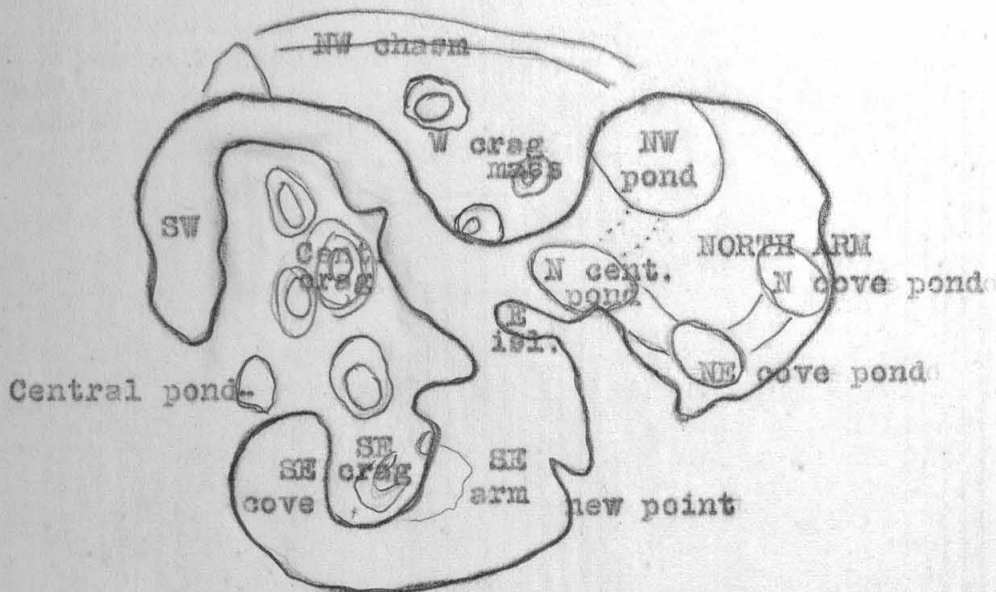
4:30 p.m. From SE side SE arm it could be seen that the lava was down 10 or 12 feet below the bench. Very active in SE pond and SE arm.

5:10 p.m. N arm filled with dead crusts. A small stream from under E island and crag, NW side, running into a tunnel.

5:50 p.m. From NW height could see no activity nor flows anywhere.

Alex.

- 1 - Day Monday Date March 4, 1918.



Top E bench SE crag level with SE rim. Upper limit NE fill level with NE station; (crust subsided below this 5 feet). Beach lift along NE crag mass level with E station ground. NE pond rim same; pond crust collapsed 5 feet below.

N cove pond 15 feet down, streaming in from S to grotto W side. Dark thin festooned skin, comes from glow tunnel 2 feet high crusted channel to NE cove and beyond. Another bridge between NE channel and N central channel, another between latter and central region. Fountain grotto W side central region.

NW pond 100 feet across. 10-foot wall arch under 10-foot wall to N central pool.

From NW height the W niche pool about same, grotto in it still shows active pasty lava, a little lower than yesterday, puffing holes through it spitting gas.

The W crag mass has sagged inward opening wider the NW chasm. The E island crag has sagged inward, tilting its higher spatter rim plane toward center of pit. The E ledge crag has sagged inward, making a tumble of rocks in a ridge along E gulch. The SE shelf has sagged inward, opening cracks, glowing, along line of old wall. The SE crag and S floor have subsided bodily.

The S cone flaming and lava pounding inside. S flows hot but still; long flows in two or three lobes to the SSW have recently developed. SW margin much the same, but rocks falling into a kind of pit of collapse, E of the W pond site. The base of W cone slightly below rim of pit now.

Lake 18 feet down at 3 p.m., 25 feet down at 5 p.m. SE rim. Streaming various, often westward through SE arm from SE channel, many fountains, stalactite rims. The general level of the top SE crag and top SE rim same. E island tower gone.

Gas Collection. Collected one large tube gas SE wall crack (over old wall) gaping open, red hot, under subsidence. Hot gas rising, smells hardly at all. Moisture and haze in tube. Three inch ori-

- 2 - Day **Monday** Date **March 4, 1918.**

fice; one foot down; cherry red heat. Suspect slow insuck and some air from withdrawing tube too soon for fear of melting.

Note. The driblet lava which last pushed out pastily, as mentioned before, cooled gray and very heavy like cast iron, with fine-textured ropy festoons and rough surface like pig-iron. The festoons broke into ragged aa lava cracks and shells in places. This was the last material to emerge at the extreme tip of the S driblet flows near the road, coming out from a schollendome, seemingly very free from gas. How accomodate freedom from gas and dense solidification with aa character?

During night a steady beacon light from S cone. Pit very bright all night. No glow from flows. Crags continue subsidence.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:30p	E	N Monument SE rim oppo- site SE crag (Lake 15 feet below) E ledge N smoke crag	0	-0 17	0			56"
			114 37	-2 45	-2			
			94 10	-16 39	-2			
			18 0	- 6 17	-2			
								T.A.J.
			no	pl	scr	stop	ex	cam

Day Tuesday Date March 5, 1918.

Noon on.

SE rim.

Lake 35 feet down, streaming to SE, large grotto tunnel with continuous fountain and rapid inrush SE corner SE cove, another tunnel to central pond. SE cove crusted. Streaming (occasionally reversed to central and E coves) and bright lines in SE arm. Spatter heaps SE rim gone. Central point and E cove show 3-foot inner bench. No sign of special subsidence at present. The SE grotto tunnel appears to lead to S cone vent.

SE crag 10 feet lower than SE rim. Central crag summit changed but the free pinnacle still persists. Central steeple a castle with small turret on top. Much has fallen from middle of NE escarpment. Settlement of E ledge has made a ridge of blocks along lake end of E gulch, one large boulder found 40 feet from base of cliff on the new SE flow, showing that it must have fallen from top and rolled.

NE fill pond has fume in E crusts and glowing cavern at its N margin in overhang of high part, the elliptical crust of pond having settled. The maximum was exactly level with shelf of NE station depression.

Nothing new seen from N or NW stations. Pounding heard in N cove pond (or NW). The W niche crust remains high. The SE rim keeps its height but the S side of SE cove has subsided, parting from SE shelf along course of SE tunnel apparently (tunnel from SE grotto to S cone vent).

In late afternoon, crags retain their height, and in evening glow less strong as though a rising and crusted lake. S cone flare continues.

Note. All during overflow days, there were visible fountains W, N and SE as seen from H.V.O. at night.

Gas Collection. Collected another tube SE glowing wall crack at place where slight SO<sub>2</sub> odor and slight deposit sulphur at orifice and slight blue fume. Elsewhere same crack brighter glow within and no odor or fume (March 4 locality). Crackle noise in cracks.

Left tube after breaking tip to be sure it filled. Yellow sublimate at entrance of tube, white when cold. Preserved entrance tube and sealed it.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11a.m.		Simplex transit stadia intercept = 124 ft. to 1 ft. on rod.						
		Test:- 1 ft. intercept = 124 ft.						
		2 " " = 252 "						
		3 " " = 372 "						
		∴ 124 2/3 = 1 ft. intercept.						
		<u>Survey for location SE rim (check with yesterday)</u>						
		NW corner E tool house -- 10 ft. high.						
		Height of instrument -- 4 "						
		Ground station NW corner of E tool house called "Sta.X".						
X	E		0	-1	2		+2	
	SE rim		28 44	-2	18		+2	
	E ledge		14 24	-6	5		+2	
	S crag		20 28	-2	49		+2	
	Low NE saddle		- 4 50	-3	0		+2	
	N smoke crag		- 8 19	-4	13		+2	
	N side fresh overflow							
	from NE fill (ENE) at		-38 31	-1	11		+2	
	edge of pit							
	S side ditto		-21 12	-1	10		+2	
	Fork of E gulch flow							
	and SE flow.		21 40	-1	23		+2	
	Channel lobe SE flow		90 45	+1	8		0	
N	NW		+ 2 24	+0	48		0	
	E house ground		139 6	+0	47		-8	
	" " roof			+0	8		-8	
			no	pl	scr	stop	ex	cam

T.A.J.

Day Wednesday Date March 6, 1918.

11:00 a.m.

Craggs lower.

12:30 p.m.

Made circuit of pit in rain.

Lake SE 35 feet down. New spatter margin and numerous spatter domes and crescent domes SE, E, central cove, W side of central region, N arm, and SW arm. Streaming from SE narrows to S, crust SE arm. Spraying in grotto SE cove, four grottoes there.

New gulch developing E gulch -- E ledge on N side, pile of rocks on S side. SE rim stays high, S floor and E ledge going down.

High pressure ridge follows line from E gulch just inside former pit edge to NE pool. NE pool as yesterday, but in center, at site of former eastern cone, a new cone developing, a small moving lava flow from it over the collapsed blocks, and block heaving on top with occasional puff.

Crossed NE fill. Slight ridge along line of 1894 bench. Very hot large crevasses glowing.

Climber N gap flow. Active fountains at tunnels, including tunnel leading from NW pool to NW chasm. Crust or floor of N arm lower, pools slightly higher. Five or six fountains.

Climbed to NW chasm. Lava pool there active, 12 feet down, fully 20 feet above lake level.

Climbed to summit W niche fill. Grotto nearly dead, some glow, no hissing.

No activity W cone or W pond.

Crossed from S rim over flows to SW pond. Streaming eastward. Fountain at S tunnel and SW side. Floor at E end has subsided 15 feet below S margin. Lava 20 feet down below S margin.

No activity at S cone.

In evening glow moderate to dull. No light at S cone.

Same all night. Some bright fountaining SE. Marked gradation in brightness from W to E.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Survey lava flow.</u>								
<u>Note</u> -- SE cliff monument is Birdseye's mark, SE rim Kilauea S of Keana-kakoi. Outside road bend (called Sta. R) is first bend E of lava flow.								
Mar. 6.	R	SE cliff monument	0					54"
11a.m.		Summit E ledge	138 20					
		Bay S (1)	162 00	-2 26				
		Lobe (2)	165 24	-2 9				
		Bay (3)	160 16	-1 54				
		Lobe (open lobe) (4)	148 34	-1 6				
		Bay (5)	143 37	-1 4				TAJ detail
		Lobe (road S) narrow lobe (6)	145 13	+0 18				
		Bay (road end) (7)	138 16	-0 14				
		Lobe narrow (road N) (8)	131 21	+43				
		Bay (9)	120 22	+0 49				
		Lobe open (10)	90 21	+1 4				TAJ
		Bay (11)	82 56	+1 5				
		Lobe (12)	74 0	+1 50				
		Bay (13)	76 49	+1 7				
		Lobe (14)	39 23	+1 24				
		Bay (15)	43 30	+1 9				
		Lobe (16)	40 50	+1 15				
		Bay (17)	45 33	+1 22				
		Lobe (18)	49 31	+1 19				
		Bay (19)	52 21	+1 7				
		Lobe (20)	61 29	+1 4				
		Bay (21)	64 34	+0 58				
		Lobe (22)	73 49	+0 51				
		Bay (23)	80 0	+0 47				
		Lobe (24)	85 47	+0 27				
		Bay (25)	90 5	+0 9				
		Lobe (26)	94 14	+0 7				
		Bay (27)	105 46	-0 34				
Mar. 27.								
<u>Note</u> -- Upper road bend on gravel called "Sta. U".								
	U	SE cliff	0					
	U	Bay S (1)	165 5	-1 23	-10			
			167 2	-1 13	-10			
		Bay (3)	165 42	-1 2	-10			
		Lobe (road S) narrow lobe (6)	165 0	-0 23	-12			
		Bay (road end) (7)	163 5	0 22	-12			
		Lobe narrow (road N) (8)	165 6	-0 15	-10			
		Bay (11)	155 16	-0 10	-10			
		Lobe (12)	154 26	-0 2	-10			
		Bay (13)	150 12	-0 2	-10			
		Lobe (14)	147 9	+0 24	-10			
		Bay (15)	137 10	+0 22	-10			
		Lobe (16)	127 40	+0 48	-10			
		Bay (17)	124 32	+0 46	-10			
		Lobe (18)	120 55	+0 50	-10			
		Bay (19)	131 44	+0 26	-10			

t	sta	pt	hor	vert	lev	dist	elev	h. i.
Mar. 27.	U	Lobe	(20) 133 36	+0 18	-10			
		Bay	(21) 140 38	+0 9	-10			
		Lobe	(22) 140 0	+0 7	-10			
		Bay	(23) 143 10	-0 5	-10			
		Lobe	(24) 141 24	-0 7	-10			
		Bay	(25) 140 40	-0 14	-10			
		Lobe	(26) 140 17	-0 14	-10			
		Bay	(27) 145 40	-0 33	-10			
								T.A.J.
			no	pl	scr	stop	ex	cam

Day Thursday Date March 7, 1918.

Morning. Crags same. Fume a little denser. NE fill out of sight from H.V.O. Edge of crater defined again except at W niche.  
5:30 p.m. No change in crags. Fume rather dense.  
Night. Some bright spells, mostly moderate glow. Lake reported higher.

T.A.J.

10:30 a.m. Lava about 30 feet down in SE arm. Only a few fountains playing there.  
11:00 a.m. From NE side. Inspected the cone in the NE fill and found it quiet with a few glowing spots. Much heat to be felt all around there.  
11:15 a.m. Looking from the N side of the N arm found all three ponds crusted over and quiet.  
11:30 a.m. Smoke very thick in vicinity of NW chasm. Saw one fountain there, the lava appearing to be rising. Much of the top of the W-niche cone has fallen in, there is no glow but much heat.  
11:50 a.m. A few fountains in SW pond and S grotto very active.  
4:20 p.m. Small cone under NE wall now puffing quite loudly and occasionally sending out lava spray.  
4:50 p.m. From SE bench. Surface of lake about 23 to 25 feet below this bench.  
5:50 p.m. Lava only 3 or 4 feet below gate floor to central cove and still rising. Little fountain activity.

Alex.

Day **Friday** Date **March 8, 1918.**

11 a.m. to 1 p.m.

General appearance same, crags stationary, lake rising.

Made circuit of pit E to N.

Lake 22 feet below SE rim, level with entrance to central pond, building new spatter margins actively everywhere. SE tunnels submerged. Overflows central and E cove and on sunken floors of N arm. Many border grottoes. Strong hissing cone middle N arm. Gas pressure renewed. SE crag and E island crag being submerged by lake.

No hissing in border cones NE, W or S. (Also no renewal of rising of crags.) Large cone built on slabs of sunken area of NE fill.

From N gap the N pool seen to be overflowing adjacent floor actively, and the other pools all active. NW pool distinctly higher than W, and N higher than central region. Fume thinner, but abundant from N smoke crag. NW chasm probably active (blue fume). No activity in W niche or W cone region. Strong fume from fountains of SW arm and cove.

The dribble flows around S cone glossy black, the fresh flows from lake of Feb. 23 were silvery, and the last pasty dribble flows are iron gray with a whitish stain.

It is worthy of note that the whole N region from Tech Station to the N spiracles and thence to the Postal Rift is whitened as though new fume were rising through the rocks.

No rocks falling or sign of motion in the crags. Back slope of E ledge near  $40^{\circ}$ , very steep climbing.

T.A.J.

KILAUEA DAY SHEET

134

Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day **Friday**

Date **March 8, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
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			no	lens	scr	stop	ex	cam
11 a.m.	SE rim	Lake (40")	1	Pro-tar	Yellow	f/11	$\frac{1}{8}$	Cirkut
1 p.m.	Sum. E ledge 360° from N NW crag NW height	NE fill, flows, lake and E island (48")	2	"	"	"	"	"
			3	"	"	"	"	"
			4	"	"	"	"	"

(No. 4 probably fogged)

T.A.J.

JOURNAL

Day Saturday Date March 9, 1918.  
Sunday " 10, "  
Monday " 11, "

Mar. 9.  
10:00 a.m. Crags same. Glow during previous night dim.  
1:00 p.m. N cove pond up and fountain high above N gap. Crags up.  
E gulch deep notch.  
T.A.J.  
9:45 a.m. From SE side.  
Strong rising so that bench W of SE cove was flooded, the overflow lasting for two hours, when the lake sank two feet with some fountain activity. It soon started to rise again, reaching to the level of the surrounding floor.  
10:30 a.m. Lava flowing from cone in NE fill.  
11:45 a.m. N cove pond quiet. NW cove pond level with bank and has a large fountain in middle with high flings. Fume here dense.  
2:50 p.m. There had been overflowing again on W shore of SE cove. Many border fountains.

Alex.

Mar. 10.  
1:00 p.m. Rainy. Crags higher. Fountains cannot be detected through mist.  
6:00 p.m. At crater. Lake 20 feet down SE, flush with floor of gate leading to central pond. Streaming to SE. Occasional break-ups. Wind changed from NE to SW and fume bad. Curtained grotto under SE crag west side SE cove, line of fountaining grottoes SE side.

T.A.J.

2:30 p.m. SE bench was 20 feet above the SE cove surface while the bench on the S side was only 4 feet. At the gate leading to the central pond the lava was nearly level with the floor. Streaming quite rapidly.  
3:30 p.m. NW cove pond brimming and active but the N cove pond was quiet.  
3:55 p.m. Lava high in NW chasm. A fountain which lasted for some time boiling there.

Alex.

Mar. 11.  
7:15 p.m. All the grottoes of SE arm active. Streaming rapidly to SE grotto. Few fountains boiling in N part.  
7:50 p.m. NW cove pond very active and 3 feet below its rim. Cone in middle of N arm puffing loudly and sometimes ejecting lava.

Alex.

10:00 p.m. From H.V.O. Glow far west and bright SE.

T.A.J.

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

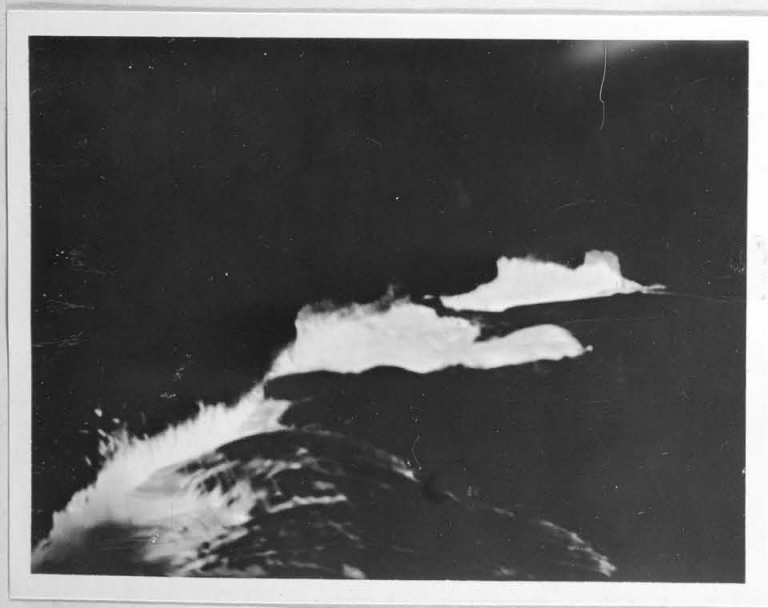
no	pl	scr	stop	ex	cam
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6 p.m. From middle projection of SE bench:-

To grottoes	1	W M	A	f/3.8	$\frac{1}{4}$	3 $\frac{1}{2}$ x4 $\frac{1}{2}$
" "	2	"	"	"	1/45	"
" bright lines (almost no image on plate)	3	"	"	"	1/75	"

Wollensak 16" lens.  
"A" screen makes skins look green.

T.A.J.



2

zag

Day Tuesday Date March 12, 1918.  
Thursday " 14, "

Mar. 12.

4:30 to 5:30 p.m. In rain. Clouds of steam from fresh flows make travel difficult.

SE bench. Lake 18 feet down, fresh overflows to hollow central pond; latter appears lower than lake. Active rising lake. Fountaining grottoes SE. Filagree curtain and hissing SE crag. Lake gaining on crags. Baker reports a hissing cone in central pond. E ledge looks low relative to SE bench; is bench rising?  
NE fill slumped and low, heavily steaming, no glow or hiss.

Mar. 14.

10 a.m. to 12 m. Driving SW rain. Dense clouds of steam from new lava and crater. Follow fresh flows windward margin to point near S cone. Latter quiet. No noise from pit. SW margin high, inner filling higher near SW station, base W cone above level of rim of pit and W cone ridge very high. Glimpse W crag and central crag standing high. No activity W pond. Surface W niche filling is high, no hissing heard.  
At NW station fill only a few feet down. At N station hear thudding rumble from direction of N gap. Fume and steam too dense to pass along NE rim of pit. Turn and visit Postal Rift and Pele's Kitchen. No changes observed at either place. Steam very dense. Make wide detour and reach E station. Great difficulty to advance through vapor. Climb to near edge pit at E gulch. No seeing and no noise heard. Return to E station in drenching rain. Strong rumbling starts in NE valley near base of back slope of NE crag mass and blue fume seen rising there and smelled, as wind was SW. Apparently NE pond was cracking and foundering, or else exploding under action of rain water. Could not see which as fume was too bad. Made long detour and crossed new flows lower down. Returned to road terminus and attempted to reach SE cove following monuments on the new trail across lava flows. Rain vapor too dense, impossible to find monuments. The evidence from the high position of the W cone ridge and the quietness of the lake appears to indicate continued rising.  
Demosthenes reports lava 20 feet down yesterday.  
At night crater bright, some flaring, much steam.

T.A.J.

3:50 p.m.

SE bench 30 feet above level of lake; S bench 12 feet. SE arm active with many fountains following the rapidly moving south-eastward current.

Alex.

Day **Friday** Date **March 15, 1918.**  
**Saturday** " **16, "**

Mar. 15. The low level continues. The crags, however, rising.

Mar. 16.

11:30 a.m. to 1 p.m. Lake crusted and rising. SE cove 18 feet below SE bench, 6 feet below S bench. Abundant stalactites on spatter margins above lake. Occasional cracking and foundering. High gas pressure. Crusts ballooning. Dribblet escaping along shores. Crags slowly rising.

At noon central pond cone poured out dribblet flows which filled whole pond area in an hour. Pot at source ballooning sluggishly, puffing and emitting flame through skin.

At 1 p.m. a spurting fountain developed in pot, then lava sank in it about 3 feet leaving an oval annular ridge around margin. Photo No. 2 shows first stage, No. 6 the second.

S cone fuming and appears as though recently added to. Pure sulphur fumes.

NE fill shows marked change at western cone locality, probably happened morning of Mar. 14 when noisy rumble heard there. The cone was now perforated by a fuming pot 5 feet in diameter and all around was a veneer of thinly festooned and blistered glassy fresh lava radiating in flows from the pot with glistening gray surface in marked contrast to the earlier lava and brittle smooth crust. This covered an area 100 feet across and there were many splashes, Pele's tears and elongate dribblets which had been thrown out explosively. The surface of the flow lava was pitted with the tear dribblets. This lava was in such marked contrast to all other types and had evidently been of such low viscosity and so forcibly ejected, that it may well be inquired whether it was not the product of an explosion produced by torrents of percolating water in some way reaching the highly liquid lava imprisoned beneath the heavy crusts of the NE fill. There are great crevasses at the base of the back slope of the NE crag mass and these must have received torrents of water at the time when I heard the explosive rumbling Thursday, March 14.

Nothing new visible from the N. SE wind and fumes make N gap inaccessible. Fountaining heard in N arm.

No sign of former E cone of NE fill.

W cone ridge seen through SE arm appeared higher. Central pinnacle still hanging. SE crag now low and without peaks.

Note. Apropos of the whitish yellow of lava of toes, can the oxidation in flows, when lava is stored, increase heat and so account for schollendomes by expansion? Query -- Are the last outflows of 1918 more oxidized than the first?

Glow bright at times last night, especially center and SE.

T.A.J.

KILAUEA DAY SHEET

140  
 Massachusetts Institute of Technology  
 Hawaiian Volcano Observatory

Day Saturday Date March 16, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
11:30a	SSE	in front of old rim		Seed L				
to		To SE crag . . . . .	1	Ortho	8x	f/11	1/2	5x7
1p.m.	(E rim	looking down to cone,						
	C. pond	flows & blow'g'pudding . . . . .	2	"	"	f/16	1	"
	S	Crack'g & founder'g						
	bench	crust SE cove . . . . .	3	"		f/6.3	1/50	"
	"	SE grotto	4	"		"	"	"
	From )	" " (20' away)	5	"		"	1/100	"
	above)	Looking down at ring						
		pot blowing Cent. Cove,	6	"	8x	f/32	4	"
		20 feet away.						
		No. 3 double exposure.						

T.A.J.



509



6



2+3

JGA



4



5

Tag

Day Sunday Date March 17, 1918.  
 Tuesday " 19, "

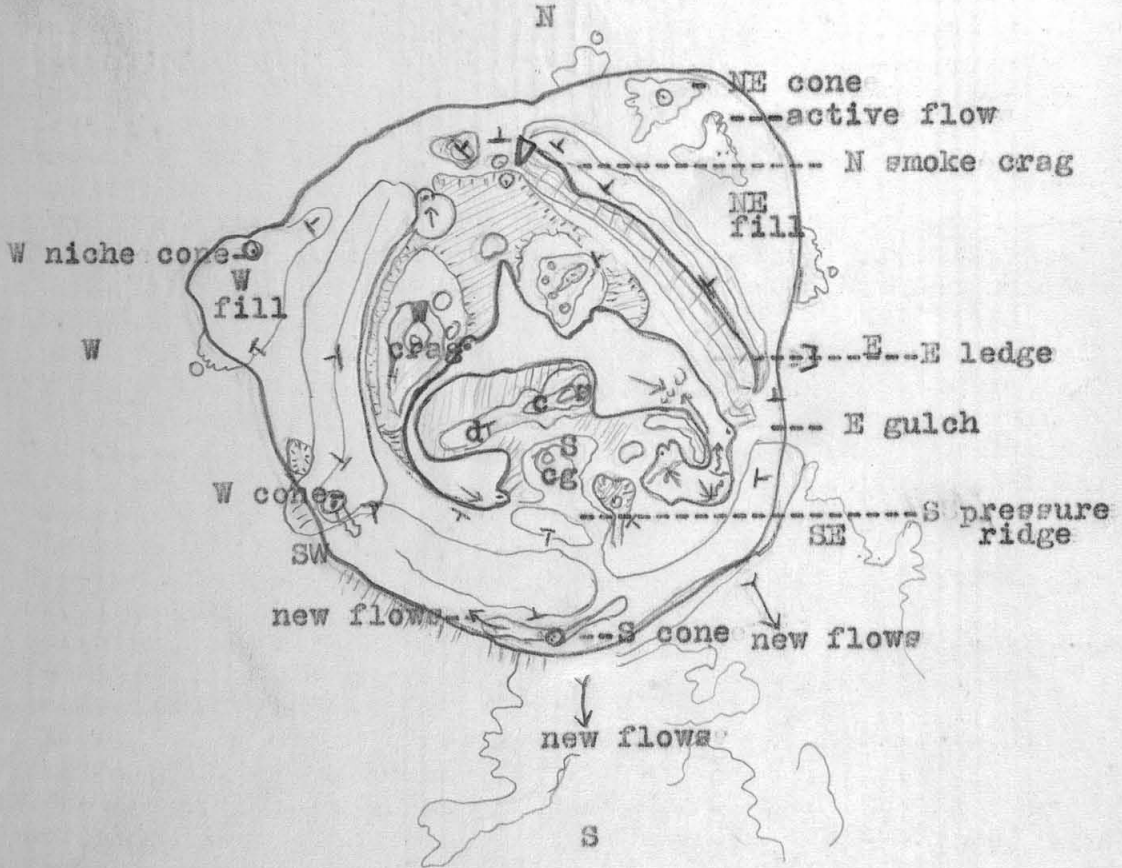
- 1 -

- Mar. 17.  
 3:30 p.m. SE station.  
 Lava 18 feet below rim of pit and 4 feet below S bench. Streaming SE.
- 4:10 p.m. New cone on N side of N arm, stands about 3 feet above floor. Glowing crack on top of cone; loud rumbling inside. NW pond brimming; a few fountains in it. W pond also brimming but crusted.
- 8:30 p.m. SE bench,  
 Lava has dropped a few feet. SE cove active but SE arm quiet.

Alex.

- Mar. 19.  
 9:15 a.m. New rampart 2 feet above level S floor. Lake 3 feet below rampart. SE cove crusted. Streaming outward strongly to N through SE channel meeting current from opposite direction in line of foundering and fountains between SE crag and E cove. New floor E cove. New crescent dome with inward streaming E gulch. The only dome grotto in SE cove is on its NW side. General 3-foot rampart all around lake. SE crag summit fully 15 feet above SE bench and latter 12 feet above lake. Small blowing cone on bank with sulphur stain over SE grotto. Central pond crusted, hissing, unchanged, not fiery.
- 9:30 a.m. Temporary crusting SE channel. Streaming to SE crag grotto. Stagnation in SE arm.
- 9:45 a.m. Northward streaming SE resumed and SE cove stagnant. S cone 8 feet high, great crevasses on both sides. Secondary cone 15 feet NE of it. Both on crest of cracked upswollen ridge extending for 200 feet from SSW to SSE.
- 9:50 a.m. Found SW pond 20 feet below its SW wall with 3-foot inner rim around it. Active grotto at S tunnel. Back slope of the raised SW cliff much steeper. White smoke from its upper rim. This escarpment is becoming a crag continuous with S pressure ridge. Broad new platform built on NW side of western deck extension of central crag mass and SW channel long and narrow between this floor and W cone ridge.
- 10:00 a.m. Two-foot subsidence SE cove. Streaming again vigorous to the SE, incaving margins and many fountains.
- 12:30 p.m. Streaming northward was resumed and heavy fountaining at meeting point of the two currents. Lake a little higher. Active dribble flows in motion NE depression of NE fill E of the glassy lava area. Heavy fresh accumulations here which have welled up through cracks.
- N cove pond built over by floor and spurting pot and 3-foot spatter cone. Farther N on old rim a glowing pot two feet across lined with spatter stalactites and next it a cavity and crack, glowing, flaming and puffing with deep rumble and groups of stalactites crowded at orifice of glow chamber which strongly suggest the grapevine type. Collected these hot. They are mostly more stocky than the cavern stalactites and are bearded with delicate fibrous needles. Inside the glow space wavy fibres incandescent and soft could be seen hanging. These stalactites totally different from spatter type and unquestionably formed by refusion

along flaming orifice. The rock above is porous, corroded and stained with zones of oxidation. The southern N-cove pot burst into violent spurting and fountaining for a few minutes. The NE cove area appeared to have broken back farther and the northwestern part of the E island mass was a row of four or five conspicuous tooth-like peaks. The NW cove pond had an active grotto hung with an arch of stalactites at its N end and streaming was into it. The only other pond visible was a small N central circular one. These N arm ponds are 4 or 5 feet below the floor. Very heavy white smoke rose from cracks in the older rim of the N arm at the southern base of the NW crag. From a distance no special changes were observed toward the W. The crags have risen very slowly but the movement appears general and with maximum in the center as usual. The most marked movements evident at the pit were the lift of the SW floor and of the SE crag.

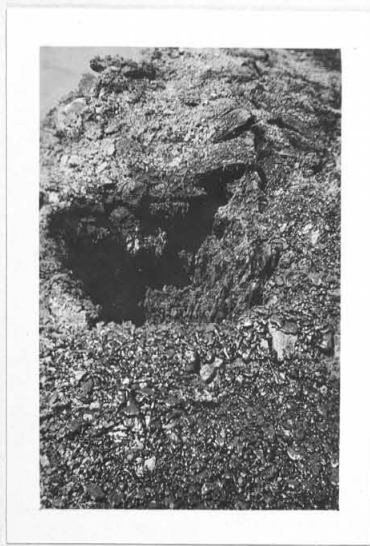


T.A.J.





1



2



3



6



5



4

500

Day Wednesday Date March 20, 1918.

4:30 p.m.

Crag higher. The central masses conspicuously rising above the far edge of Kilauea as seen from the Keanakakoi flats. The lift of the last twenty-four hours is specially conspicuous in the S pressure ridge and the extension W from it making a lifted crag all along the S margin of SW cove and extending thence into the W cone ridge. This W cone ridge formerly continuous from the W cone to the W crag mass is now broken through by the NW chasm which hooks eastward at its southern end to emerge at the cove in the bend of the SW channel. The W cone mass proper is now a high crag on the SW side of this bend a conspicuous feature much higher than the summit of the W cone. And the base of the W cone is now high above the old SW rim of Halemaumau, the cone itself being some 15 feet high. A conspicuous new jutting peak of rock protrudes from the summit of the S pressure ridge.

The entire group of tumuli around the S cone is high and much stained with gypsum and there is similar staining in the new flows along the zone of the old solfataric aureole and over the broken wall crack marking the 1918 edge of Halemaumau. The swelling of the S cone hillocks and the pile of lavas therefrom westward filling the S valley must have gone on for some time after the flows ceased. A very conspicuous up-swollen ridge, cracked open on top, marks apparently the main tunnel for several hundred feet S from the S cone. This ridge is the summit of the heaping.

The lake was still high and had built a very large spatter half-dome in the middle of the shore stretch on the S side of the SE cove. The lake was crusted, rising and under high gas pressure, with spraying outbreaks at the margin at the E gulch and the S grotto. The SE crag grotto was quiet but with a high arch lined with stalactites built above it. Everything indicated strong rising and high gas pressure, the construction of the great half-dome recalling the conditions at times of maximum rise. It is noteworthy that this now occurs just at the equinox.

The glow from the pit at night and for the last several nights has been moderate with visible fountaining seen from the Observatory occasionally showing itself in the N arm. On this night fountaining also could be seen at the SE cove. The main bright glows are at the NW cove, in the central region and in the SE cove.

Note. The new crag rising SW of the SW cove has a conspicuous group of smoking cracks giving off white sulphur smoke at the edge of its escarpment. It will be remembered that this has happened repeatedly as at the E crag of Dec. 1916, the NW crag of 1917 and the present N smoke crag. When an area begins to crack up and smoke excessively it is apt afterwards to show tumescence and rise into a crag mass.

T.A.J.

Day Thursday      Date March 21, 1918.  
Friday                      "    22, "

Mar. 21.  
 11 a.m. to 1 p.m.

At the SE cove lake very high, very large half-domes S and W sides; occasional big central fountains, hissing and flaming SE glow cracks, high gas pressure, ballooning of skins, southeastward streaming. Lake margin easily accessible at E gulch, no activity there. Crags remain high, upward movement slight except at new SW crag.

No flows in motion at NE fill. At N gap high fountains seen in NW cove pond, strong hissing at cone N cove pond and moderate flaming at the pot farther N. Cone in middle region of N arm. Smoke very dense S base of NW crag. Query -- will this become a crag?

No changes at W niche which appears dead. NW chasm shows no activity as seen from NW rim of pit. From W no changes near W cove seen, but the SW crag very high. No changes observed S.

In evening lake overflowed bank at E gulch and activity of fountains plainly visible and photographed from H.V.O. at the SE and in the N and NW cove ponds. Late in evening spatter bank under SE crag fell in, making strong wave and accompanying subsidence spell.

Note. Hills in Mohokea Sink probably crags of bench magma.

T.A.J.

3:45 p.m.      Lake crusted. Lava 10 feet below SE bench and level with S bench. Twenty minutes later break-up of crust with rapid streaming to the SE, lake sinking about three feet. Subsidence lasted but a short time.

4:50 p.m.      From the N arm could see that the NW pond was level with its margin; one fountain active in this pond. Two blowing cones on the NW side of the N cove pond.

Alex.

Mar. 22.      In the morning lake at SE cove reported 4 feet lower. Fountains not visible from Observatory. Fume thin in morning, very dense in afternoon. Crags remain high.

T.A.J.

Day Saturday Date March 23, 1918.

10:00 a.m.

No marked changes SE cove. Lake a little higher -- about 5 feet down at E gulch. Spatter margins built up. Large dome SE corner with very long stalactites between which glowing interior could be seen. Lake at first cracking and foundering. Afterwards crusted over. Rose about three feet at noon. SE crag grotto has collapsed. Line of sulfataric fume and stain extending down E gulch. Heavy fountaining noises SW cove. Very bright fountains SE and N at night.

Phot. No. 4. -- (1 ft. scale in foreground) In this crack the brown zone 8 inches down on wall of crack consists of delicate red-brown banded shells, like barnacles in form, sticking to the rock and protruding from it in ragged edged wavy septae like a very rough broken honeycomb standing out 2 to 5 mm. from the rock. These are the bandings which make bright color bands on old schollendome cracks, the delicate detail being lost.

The lava in crack with the small gas cones on top is excessively hot still.

This shell of "lava barnacles" is the refusion coating of the crack over the tunnel, equivalent to the cavern stalactites; this portion was over the tunnel before the arching split the upper smooth zone of break. Small group of grape stalactites seen in one place.

Phot. No. 5. -- N wall of S cone tunnel crack, lava filling below. (Small group of grape stalactites, 4 cm. diameter, just to right of picture.) The "barnacles" are partly or wholly the stumps of grape forms, some seen with small grapes, size of peas, whole or partially broken. Small shock felt on this ridge -- still tumescent apparently. Is this oxidation heat?

T.A.J.

2:20 p.m.

NW pond crusted, only one place where glow could be seen. Lava 2 feet down in this pond. Two small cones on N side of N cove pond still blowing loudly.

2:45 p.m.

From SE side.

Lava 8 or 9 feet below SE bench and rising slowly. No fountains.

4:05 p.m.

Lava 4 or 5 feet below SE bench and almost level with S bench. Activity in SE grotto and in grotto on SE side of SE crag.

Alex.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10a.m.	Lifted SW sta	Birdseye SE sta.	0	-0 11	-0 20			
		SW cor. notch old rim	4 2	4 27	-20			
		Summit S cone	24 3	-0 37	-20			
		" " pressure)						
		ridge pinnacle )	44 16	-2 16	-18			
		Hump SE cove	34 33	+0 8	-20			
		Sum. cent. pond ridge	47 44	-2 34	-18			
		" S pres. ridge (W)	53 35	-3 24	-12			
		" S crag	66 19	-4 55	-12			
		" steeple	71 47	-6 9	- 5			
		Fume S tunnel SW cove	65 39					
		Sum. cliff S side SW cove	74 39	-1 22	- 5			

	no	pl	scr	stop	ex	cam
From prisoners' camp flats to crater.	1	Seed L Ortho	8x	f/11	$\frac{1}{2}$	5x7
From stones of E gulch to SE crag.	2	"	"	"	"	"
From tumuli near S cone to upwashed SW rim Hale.	3	"	"	"	"	"
From tunnel ridge S of S cone to cent. steeple show- ing gas cones along crack on top.	4	"	"	f/22	2	"
Lava barnacles, cm scale, 46 inches from camera.	5	"	"	f/11	$\frac{1}{2}$	"
Nov. 4 & 5 see notes.						



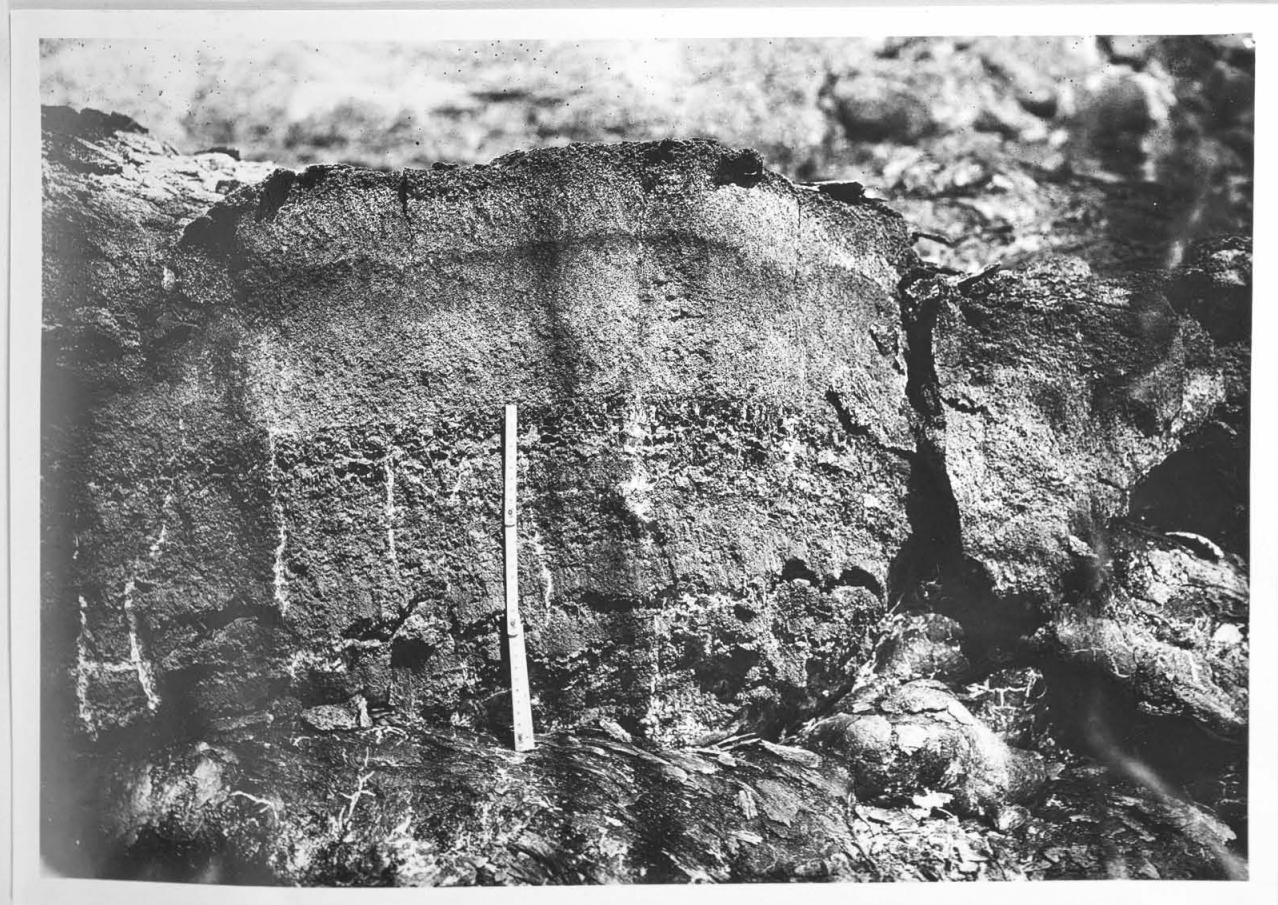


3

Fog



4



5

Jag

Mar. 24.  
3:45 p.m.

From SE.  
Lava 8 feet down below SE bench. Much marginal activity.  
Rising slowly.

4:30 p.m.

The two small cones at N arm blowing loudly. NW pond 3 feet down and rising slowly. Fumes dense in that locality.

5:50 p.m.

From SE.  
Lava about 6 feet below SE bench and rising slowly. One active grotto in SE cove. SE arm quiet.

Alex.

4:30 p.m.

Telescope H.V.O. shows fountains splashing SE.  
At night bright fountains two places SE and one place in N arm seen.  
Later, very bright center and SW cove. Less at the SE and N fountains.

Mar. 25.  
4 to 5:30 p.m.

Lake SE high and quiet. Two feet below latest spatter margin. Large domes built along SE and S rampart. SE shelf about 6 feet above lake. Streaming from SE cove channel across the cove. Central pond depression smoky. No marked changes in crags. One conspicuous spire has developed on E island crag mass. New flows heaped up in NE depression and dribble flows moving there to the east of the blister lava. A cone with numerous bearded spiracles in midst of active area and glowing and hissing gas crack in it.

At N gap the marginal pot nearly dead, with one cherry red crack hissing and depositing yellow sublimate. The N cove cone hissing strongly from orifice half inch in diameter and other similar orifices on summit with small spiracle heaps built around them. Also yellow stained.

NW cove pond crusted heavily; lava high; balloon of crust belching a sluggish fountain at N corner of pond. Two cones at site of N central pond.

Visited W niche and NW chasm. W niche dead. NW chasm pond a crust 12 feet down and on upper rim a bright yellow solfataric area. Hollow blowing sound heard somewhere below. No glow seen. Fall of rocks seen from W end of N smoke crag on N station side and the E ledge is sinking compared to this crag, so that the profile of NE crag mass slopes downward to the E increasingly.

At 5:30 p.m. subsidence of about one foot in SE arm, general break up, very rapid streaming, enormous fountains migrating across SE cove. Many bubble fountains. Large open cupola seen inside SE dome. Long stalactites at entrance.

Gas Collections. Large tubes.

First tube from flaming, hissing crack in cone at source of active flows in motion by pushing toes and small festooned streams NE fill. Orange glow. Bulb tip used. Tip fused readily. Sealed by melting glass in glowing cavity. Tube filled liberally, no haste. Cloudy with fume inside at first. Fume opalescent whitish.

Second tube, N cove pond cone, collected at bearded spiracle hissing strongly, very small orifice glowing inside but not

- 2 - Day Monday Date March 25, 1918.

very hot. Broke bulb by jamming tip inside about one inch. Fused tip imperfectly; afterwards fused it better in another flaming crack. Gave insuck plenty of time and tube filled as before -- opalescent white fume.

Third tube collected in glowing crack on top of SE dome grotto SE corner SE cove over tunnel line leading toward S cone. Brilliant glowing cupola beneath, stalactites on lake side. Very active. Cracks flaming. Used taper tipped tube. Broke tip in crack. Depth about two inches. Gave plenty of time. Tube filled with opalescent gray fume.

Evening. Rainy. Glow dim.

T.A.J.

Day Tuesday Date March 26, 1918.  
 Wednesday " 27, "

Mar. 26.  
 10:00 a.m.

Telescope shows crags slightly higher. No visible fountains. Fume rather dense.

4-5 p.m.

Lake high and much the same. Heavily crusted all over center and SE arm. Fountains playing SW arm, W side central region, NW cove pond and SE cove. Streaming SE from SE cove channel. Steady inward pouring into grotto hung with stalactite curtain SE corner SE cove, grotto under cove.

No flows seen in motion in NE depression. Yesterday's flows very hot.

At N gap the N cove pond cone still hissing, the pot on N rim nearly dead, much free sulphur smell, hissing and glowing small marginal crack, large areas yellow with sulphur. Other cones near N central pond. W end N smoke crag greatly crevasse-d and fallen away and there has been much falling from E ledge at the other end of the long NE crag mass also, filling up the E gulch notch.

The crust of the N arm area appears humpy as though arching and the larger areas of the NE fill appear to be swelling also, especially W of the active part. The active part is an oval area under the NE wall. (This probably is the beginning of differential subsidence which followed.)

The W niche is dead and the grotto at cone locality fallen in. Made circuit of pit. No changes observed SW and W. The W crag mass continues to rise and the wall of NW chasm on its E side, under the old W crag summit, appears to be rising also, the upper surface tilting toward the central region. (Note - W side of NW chasm was beginning to sink?)

5:30 p.m.  
 Evening.

Fountains of SE cove spraying high.

Moderate fountain action visible from H.V.O.

Note. - Can it be that the gray steely end flow of dribblet series 1918 near road (as in cracks), was also, like the splash-blister area of NE fill, started by rain action? If water accumulated in the lava tunnels it would produce a rending gas pressure.

Mar. 27.  
 10+ a.m.

No marked changes in lake. Lava lower: Twelve feet below SE shelf. No activity NE fill. Crags lower but SE crag well above SE shelf (see survey).

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
Continuation survey from gravel road bend after last former station sighted.								
10 a.m.		Lobe (next beyond last going toward crater on N side of flows) (43)	147 35	- 0 39	-10			
		Bay (42)	146 28	- 0 53	-10			
		Point (41)	145 21	- 1 3	-10	} two pts. together		
		" (40)	145 28	- 1 14	-10			
		Bay (39)	144 2	- 1 14	+10	} two bays together		
		" (38)	143 0	- 1 15	-10			
		Point (37)	142 47	- 1 16	-10			
		Bay (36)	142 0	- 1 15	-10			
		Point (35)	143 4	- 1 15	-10			
		Bay (34)	143 6	- 1 14	-10			
	?	Point (33)	143 4	- 1 15	-10			
		Bay (32)	144 21	- 1 18	-10			
		Point (31)	145 50	- 1 26	-10			
		Bay (30)	144 43	- 1 21	-10			
		Point (29)	(missed -- no seeing)					
		Monument back corner E shelter	144 22	- 1 25	-10			
		Profile base of E ledge E	147 29	- 1 27	-10			
		Summit E ledge	148 49	- 2 26	-10			
		Bay (edge crater E gulch) (28)	149 20	- 1 39	-10			
		Highest pt. SE shelf	151 2	- 1 47	-10			
		N edge SE crag	151 29	- 1 51	-10			
		S edge ditto	152 2	- 1 54	-10			
		Summit E isl. peak	152 53	- 2 5	-10			
		" W end SE peak	153 36	- 1 53	-10			
		SE trail monument	153 0	- 1 46	-10			
		Middle hump SE crag ?	152 47	- 1 51	-10			
		Central steeple	155 22	- 2 53	-10			
		Crag N of Central pond	155 34	- 2 0	-10			
		" E " " "	157 13	- 1 53	-10			
		Summit central crag	157 39	- 2 52	-10			
		" S crag	158 29	- 2 16	-10			

no pl scr stop ex cam

- 2 - Day Wednesday Date March 27, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		Summit W pinnacle cent- ral crag	158 13	- 2 34			-10	
		E summit S pres. ridge	158 32	- 2 8			-10	
		New middle peak ditto	160 0	- 2 2			-10	
		E peak S cone	160 0	- 1 52			-10	
		Summit S cone	160 21	- 1 56			-10	
		" pressure ridge	161 47	- 1 52			-10	
		S of S cone						
		Summit next dome S (scarp facing N)	163 2	- 1 50			-10	
		Bay lave flow next S (white)	164 40	- 1 22			-10	
		Limit pt. new flow to W beyond (profile)	167 36	- 1 25			-10	
		W crag (?) (W end S pressure ridge?)	160 50	- 2 4			-10	
		Next crag W (old W?)	162 10	- 1 56			-10	
		Great S schollendome	202 34	- 0 16			-11	
		Top large boulder on gravel SW	213 47	- 0 38			-11	4 ft.
		Large schollendome foot of new flow Feb. 23, 1918.	112 37	+ 1 0				
		Check on Birdseye mon- ument SE	0	- 1 19	0			
		Birdseye station S gap W side	267 20	- 0 13	-8			
								T.A.J.
			no	pl	scr	stop	ex	cam

Day Thursday Date March 28, 1918.  
Friday " 29, "

- 1 -

Mar. 28.  
9:00 a.m. Crags lower. SE cove and N arm both smoky. Falls reported last night and bright glows in sudden flares seen. Otherwise dull.  
11:00 p.m. Crater very bright especially N. Flaring changes during night. Crags lowering, central crag well below far rim Kilauea.

T.A.J.

4:20 p.m. From SE bench.  
SE pond active. Lava 15 feet below SE bench and 11 feet below E gulch. Rapid streaming to SE with many travelling fountains.  
4:50 p.m. Part of N arm floor has collapsed and formed a large pond on NW side of E crag. NW pond about 8 feet down.

Alex.

Mar. 29.  
8:00 a.m. Crags lower. Fumes thin. (Small earthquake 5 a.m.).  
3:30 to 5:30 p.m. Lake much lower, sinking of crags of central region, SE bench 40 to 50 feet above lake. Lake fully 25 feet lower than yesterday. Small shifts of rock on crags and in crevasses showing motion. SE crag 10 feet below SE shelf. Crack opening along line from SE grotto to S cone. S cone tumbled in, much broken up area all around it. Glow seen 10 feet down in cracks S floor. Puffing sulphur fume from open crack W of S cone. Streaming to S in SE cove. SE arm and middle crusted. Large fountain W side central region.  
Central pond has glowing and flaming heap on E side. Bombardment SE and S in SE cove. Some overhang SE shelf. E gulch deep and choked a short distance from lake, E ledge has subsided and flattened its slope. Depression behind it NE lower. Not much change NE fill, but caved places and open crevasses. Lower spatter margin E island inclined toward center lake.  
Cavern at E cove.  
N arm down 30 feet and new lake in it from central part to N cove. Other activity NW. Fumy, no great activity. No cones left. W ridge slope from NW chasm westward is more flat. No activity W niche. SW crag still high.  
Back slope SW floor from SW pond more flat, pond 30 feet down. SW channel wider. Active fountain S tunnel. Inner bench on E and N sides 10 feet above lake, much higher S side (20 feet above lake). Pond crusted. Big crevasses S. Everywhere the open cracks in floors and benches show that internal incandescence is about 12 to 15 feet down.  
Evening. H.V.O. Occasional flaring. Other dark spells. Fountains have not been visible for two nights past.

Note. Much thinner fumes with this sharp depression means more activity and lake heat, complete combustion. The rising of crags faster than liquid made open tunnels and fume chambers,

- 2 - Day Friday Date March 29, 1918.

hence no diminution in fumes in February. Now probably the crags sinking faster than lake and so keeping the tunnels closed. Ratio lake to crag movement measure of real movement of lava column and lag of one or the other means a different pressure-heat equation in depth. This accounts probably for the failure at equinox of a perfect time correspondence between equinox and evident movement. We are now getting the post-equinox subsidence strongly.

Note that the tilt and local earthquakes have followed recent movements strikingly. N and E tilt during rises, S and W tilt during sinkings, but again the turning times not exactly with the apparent movement of the lava. Now many earthquakes with the sinking.

Query. Is there not a correspondence in seismogram characters for Halemaumau earthquakes? For Mauna Loa earthquakes?

T.A.J.

Day Saturday Date March 30, 1918.

Crags going down generally and very rapidly all day, measured with telemeter, slower towards evening (?), no avalanche clouds. Visitors report small rock falls but not great ones. No effect shown by measurement on old walls measured against far wall of Kilauea.

Cluster of earthquakes in morning 7 a.m.±, largest amplitude yet for this series.

Fume very thin; thicker p.m.

5:00 p.m.

Visited pit. Lake over 100 feet down. Great change since yesterday. A new Halemaumau pit defined. Crags in general have subsided in nearly same relation to lake as when high. Lake enlarged by marginal collapse. Central pond active. SE shelf remains, immense cliff beneath.

The new cliff rim is SE shelf, new cliff extending SE shelf to follow approximately line of 1894 bench NE but at higher level: N station to NW height old cliff; new cliff across W niche; old cliff from there around to SW station; new cliff includes S cone and extends thence to SE cove. Wherever there is a veneer of overflow there is a new cliff.

Inside of this the E ledge has subsided bodily for whole length of NE crag mass to N smoke cliff. The NE valley has subsided. The new fill over old 1894 wall valley has been drained of lava still liquid and near E cone site a ragged hole 50 feet across revealing roof of a glowing large cavern below 40 feet high, orange incandescence, no fume or flame; when piece of this roof shell 10 feet thick fell in, shell yellow incandescent inside. This and the glowing cavity appear to mean oxidation heat in the rock, else why remain so hot?

A similar tunnel-shaped deep cavern revealed under the W cone-locality of this NE fill, but less incandescent. Great crevasse at base of new wall 30 to 50 feet in front of E shelter. Glowing crevasses occasionally dropping rocks along NE valley and in depression under N station.

View from N station to N arm shows latter 75 or 90 feet below N gap. NW pond appears to be at much higher level. Occasional break up in large N pond of N arm and cascade flow northward from N middle pond area to center of N pond where there was much high-flinging fountaining. Fountains in NW pond. Appears to be a partition between N central lake and central region. N lake much larger and lower than yesterday.

6:30 p.m.

Lake appears as though rising. But cliffs appear higher. E gulch a crack all the way to bottom of cliff where E ledge now moves down. Latter level with SE shelf. Only central crags appear still a little above level of SE shelf. SW pond a deep active pit. SE cove extended in embayment towards S cone. S floor quite inaccessible and subsided, cliff and crevasses between it and SE shelf. SE arm very wide, deep cove in N face of central crag mass. SW arm wider. N region wider. N arm visible from SE shelf. Central cove has a glowing pit and a floor cone on NW side of it. Fountaining mild in SE cove. Broad streaming zone southward from NW of SE narrows.

11:00 p.m.

Brilliant flaring.  
Crag disappeared from view H.V.O. in night.

Day Sunday Date March 31, 1918.

10 a.m.+

Lake very deep down. Activity about same. Cliff SE shelf direct to live pool. Fountaining pot in central cove. Crags keep same relations but the inner circle down more than outer circle: inner -- central and S crags, W crag mass, E island crag; outer -- NE crag mass, SE crag, S pressure ridge, SW crag, NW ridge (W side NW chasm). The ring between these two circles is SW pond, central pond, E cove, NE cove, NW cove, NW chasm. The outer ring depression is NE valley, N pit, W valley, W pond, S valley, SE cove, E gulch. Inner lava column therefore went down fastest, outer ring tended to be retarded by walls, and was by conduction to walls probably cooler.

Depression going on all day, opening crevasses, falling and clattering rocks; rock slides all small, especially notable near W pond, N gap, and E gulch -- junctions of the three sector blocks. Some red dust. Fuse thin.

S crag lower than S pressure ridge. W cone and central crag pinnacle uninjured. Clinging high benches N, W and S, and SE shelf entire. NE valley sinks along old 1894 bench line. W valley sinks along W niche inner line. S cone persists and the pit diminished in size therefore S, SE, NE and W. Fillings of W niche and 1894 valley persist, latter with collapsed pits where lava has drained from under shells. No great amount of incandescence seen in cracks.

NW pond still separate with 15-foot walls. NW chasm has a live lava pond with 15-foot walls. N and NE coves appear joined. Partition apparently separates them from central region. E island keeps its spire. SE arm and cove and SW arm and cove appear unchanged. Inner wall about 10 feet high to 15 or 20 in some places. Cavern arch N side central crag mass. Floor flat S side SW cove, W side NW chasm. NE crag mass keeps its steep back slope, subsiding bodily.

Smoke from numerous crags and cracks same as before. Lake has somewhat increased in size and has cracking and foundering spells; ten or twelve border fountains. Streaming mostly to SE. Saw cracking and foundering NW chasm and occasional rock falls into lake started action.

T.A.J.

4:30 p.m. From SE bench it could be seen that the liquid lava was low. SE cove and SE arm very active. Avalanches from all sides of the pit.

5:10 p.m. From N side.  
Rock sliding continues. Fountaining in NW pond.

Alex.

- 1 - Day Sunday Date March 31, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11a.m.	NW	W	0					
	W	N	0					
	NW	W crag summit	31 48	4 13	+3			
	W	ditto	-21 17					
12noon	NW	ditto (2nd reading)	31 51	4 27	+3			
11a.m.	NW	NW crag	64 0	7 42	+3			
	W	ditto	3 52					
	NW	Central crag	43 52	0 26	+3			
	W	ditto	-52 18					
	NW	Central steeple	53 0	1 1	+3			
	W	ditto	-48 26					
11:15a	NW	Lake E island point	53 41	7 25	+3			
	W	ditto	-39 35					
	NW	N smoke crag	81 04	3 5	+3			
	W	ditto	-11 31					
	NW	E island peak ca.	59 42	4 39	+3			
	W	ditto	-34 38					
	NW	N cove ca.	84 30					
	W	ditto	- 6 4					
	NW	N central cove ca.	69 3					
	W	ditto	-14 46					
	NW	NW cove pond ca.	53 20					
	W	ditto	- 1 40					
	NW	Central region ca.	50 10					
	W	ditto	-36 20					
	NW	SE cove ca	60 0					
	W	ditto	-54 22					
	NW	E end SE arm ca	66 20					
	W	ditto	-47 56					
	NW	SW cove ca	36 40					
	W	ditto	-64 30					
	NW	Summit SW crag	20 3	3 38	3			
	W	ditto	-57 18					
	NW	Summit SE crag	63 41	3 18	3			
	NW	NW chasm (W) ca (floor W of it flat)	21 20					
	W	NW chasm (lava pond)	-23 44	19 47	5			
	NW	W valley ca	11 18					
	W	ditto	3 49					

			no	pl	scr	stop	ex	cam
10a.m.	Gravel flats	} Pit	1	W P	8x	f/22	1/2	5x7
	NE		2	"	"	f/16	1/2	"
	"		3	"	"	"	1/2	"
	N		4	"	"	"	1/2	"
	NW		5	"	"	"	1/2	"
	W		6	"	"	f/10	1/2	"
1:30p	S cone.	SE cove						
		(Great sinking)						

KILAUEA DAY SHEET

165 Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

- 2 - Day Sunday Date March 31, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	NW	S valley ca (between S and SW)	35 30					
	W	ditto	-82 37					
	NW	NE valley ca	90 40					
	W	ditto	-23 51					
11:45a	W	Lake edge NE cove	-13 50ca					
	NW	" " SE channel	67 11	4 50	+3	1039	76	
	W	ditto	-48 21ca					
	NW	NW escarpment over NW cove pond	40 6	11 45	+3	78	16	
	W	ditto	+1 30					
	W	E gulch rocks (edge pit)	-45 43					
	W	SE monument	-65 28	+0 47	+5			
	W	S cone	-77 0	+0 24	+5			
	W	E ledge	-45 20	2 51	+8			
			no	pl	scr	stop	ex	cam

T.A.J.



Jag



2



3

Jag



6

Jag



4



5

5af

Day Monday Date April 1, 1918.

11:45 a.m.

Lake and crags much lower. Same general relations. Avalanches stronger than yesterday especially S, W, and E gulch. Top of crags far below SE shelf. Latter has fallen away, overhangs and is much narrower. In some of the falls great splashes in SE cove have plastered SE crag with sheet of lava over top. Lake usual activity but smaller. N arm again subdivided into N, central and NW ponds, in pits with 15-foot margins. Fresh spatter rim 5 feet high around center and SE arm. Streaming W in NW pond, S in N pond, E in central region. Active grotto in NW chasm pond. Pinnacle on central crag persists. W cone probably broken - cannot see plainly.

The SW, NE and W floor slopes now reversed and sloping inward, the margin slopes of NW chasm and SW pond keeping fairly horizontal. Very great crevasses and outward leaning benches between them all around at the contacts between the inner column and the outer clinging portions. These places have incessant rock falls both into the crevasses and forming talus below. The remnant floors or shelves above begin to cut off the view of pit NW and NE, as it is not safe to go out to their crevassed edges. The SE shelf, undermined from both the E gulch and S cone cracks, is very precarious, a sheer wall to the liquid pool and overhanging. Many rock falls into the lava of SE cove. Summit E ledge a long way down. SE shelf more than twice as high above lake. Spire of E island still shows.

In evening avalanches continued and SE shelf more fallen away.

T.A.J.



- 1 - Day Tuesday Date April 2, 1918.

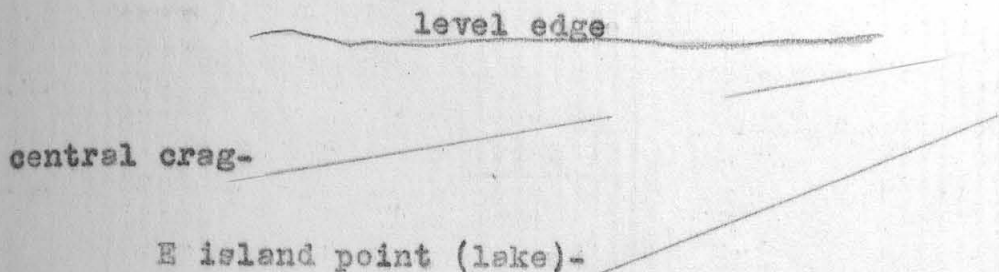
- 12:50 p.m. From Old Rest House.  
There has been much falling of rocks from under the W station. Ponds in N arm active.
- 1:10 p.m. A great fall of rocks carrying large boulders from under O.R.H. lasting about 10 minutes.
- 1:25 p.m. From W station.  
Avalanches have been taking place under the SE bench and still continue.
- 1:40 p.m. From SW.  
Great fall of boulders NE, many of them red hot. Avalanching continued for about 10 minutes.
- 1:50 p.m. From S.  
Great heap of rocks from SE wall has cut off the SE cove from the SE arm.
- 2:15 p.m. From SE.  
Bench of overflow material NW has collapsed, as has nearly all of that NE. Slides of rock still going on.
- 3:50 p.m. An earthquake shock started avalanching on all sides of pit.
- 4:55 p.m. Another shock accompanied by the falling of great rocks took place.

Alex.

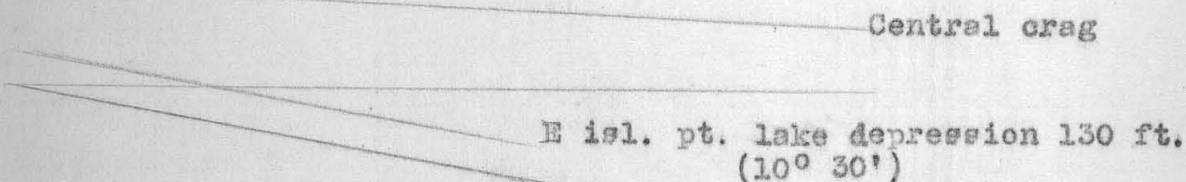
- 4 to 6 p.m. Avalanching and subsidence continues. SE bench broken away back to old wall crack. Large block of bench next in front of that crack E of S cone seen to fall bodily after slides working in gulches on each side of it had undermined it. Another remnant left -- likely to go soon. (Fell before next day). SE channel now filled with fallen debris and SE cove shut off as a pond. Enormous blocks of rock in the slope. General situation indicated in accompanying map and jottings. Lake and crags lower, but general relationships preserved except for encroachments by talus which has destroyed NW crag and W cone. The outer floors of the wall valleys turned up at a high angle and becoming indistinguishable from talus. Subsidence appears to have carried E and SE somewhat lower than W and NW for surfaces are inclined in that direction. At first the streaming was eastward from the central region but later it became reversed to a torrent pouring apparently into a sinkhole at the cove on the W side of the SW bend. Here there was turbulent bubble fountaining at the place of inrush and this condition persisted for more than half an hour. Streaming was outward from the NW chasm tunnel to the NW cove pond. Against the lower part of cliff over lake N side of central crag mass there was a dark arch apparently a flat cavern. Many unstable outward-hanging fragments of the recent fill still clung to the upper margin of the pit and these gave assurance that tumbling would go on for some time. Much of the fallen material was red hot especially under the W niche and NE fill. The cross section of the NE valley revealed by subsidence showed dyke-like moulds of fresh lava which were undoubtedly the fillings of the crevasses in the bottom of the valley made when the lava poured into it. The cross section of the new flows SE shown in the

wall appeared about 15 feet deep. The S cone was still preserved as part of the new edge of the pit.  
At night the glow was dim.

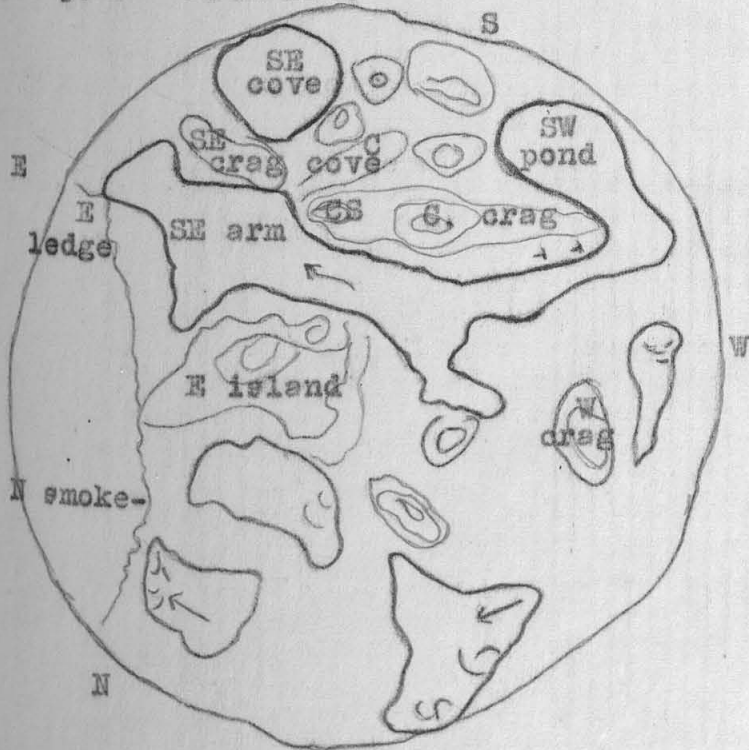
3:15 p.m. From E station:-



3:30 p.m. From NW:-



4:00 p.m. From NNW:-

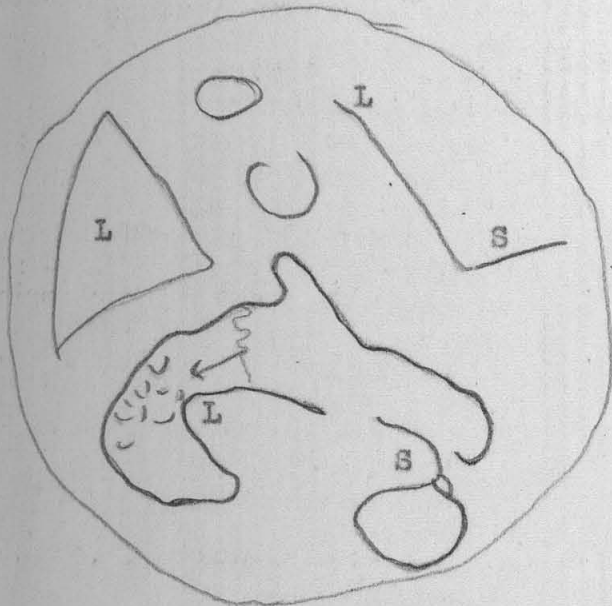


Floor E of NW chasm slopes E.  
Floor under deck W side of central crag slopes E from SW channel.  
Central steeple much lower than central crag as though E tilt.  
N smoke much higher than E ledge.  
NW crag buried under talus.  
SE channel buried under talus.

3:30 p.m. Small quake felt.  
Loosened avalanches all around.  
4:15 p.m. Large bench block fell under and just E of S cone. Brown cloud.  
4:17 p.m. Block of SW crag fell into SW channel. Violent fountaining for 5 minutes.  
Streaming W to it from central region.

- 4:20 p.m. Aa flow trickling out from 15 feet under NE fill just W of E station draining 1894 valley fill. Typical aa. Lake sinking fast. Six-foot inner overhang and bright rim. Violent boiling SW bend continues, rush to it must be sink-hole. SE cove crust holds up. Streaming now out (W) from SE arm.
- 4:40 p.m. Rush to SW corner continues. Same at 4:45 p.m.

Avalanches quieter while lake subsiding. Does this mean crag rising?



Query -- Lift of L - L - L, sink of S - S, lake magma rises S - S in honeycomb, sinks L - L - L, hence reversed streaming.

- 4:57 p.m. Another shock and more slides. Fragments red hot inside.
- 5:00 p.m. Reversed westward streaming continues. Boiling SW still.

Lake margin progressively higher from SE cove, through SE arm to SW arm.

T.A.J.

Day Wednesday Date April 3, 1918.  
Thursday " 4, "Apr. 3.  
6 to 7 p.m.

Lake appeared no lower and eighteen fountains were in action at fixed places where they were building spatter cones and everything indicated gas pressure, overflowing margins, and a lake rising relative to the crags. Mostly the crusts were stagnant except for cracking and foundering spells but the streaming showed no fixed courses. The rush and bubble fountaining to the SW had entirely ceased. The pool of the central region was greatly widened northwestward into the flats of the W crag mass. There was live lava in the central pond, SW pond, SW arm, NW chasm, NW cove pond, N cove pond (extending to the NE cove), central region, SE arm (greatly widened to the base of the NE crag mass), and the SE pond. The principal avalanching was confined to the walls of the NE fill and W niche. Falls were heard elsewhere especially to the N and at the E gulch. The peculiar character of the first two places was the breaking away of the aa lava, incandescent and swelling outward, from under the subsiding crusts and this would break off at the face of the wall, undermine everything above and tremendous glowing tumbles ensued. The talus would slide like a fluid all red hot and there was much of the cheesy flow which has been observed before. Very large red hot blocks frequently fell, looking like chunks of glowing bituminous coal. The entire talus for the length of the former 1894 bench and the cliff above glowed red, and the same appearance marked the fresh face of the W niche where the cross-section of the new filling was revealed.

A great weight of talus material was now piled on the back slope of the NE crag mass and elsewhere all around the pit on bench magma below and it may well be inquired whether the compression of this weight does not cause a deep-seated flow toward the center and perhaps account for the rising lake. It remains to be seen whether this rise affects the central crags.

The large clinging block E of the S station had fallen. There were glow spots in high upper walls near the E gulch and bright red glow was seen only a foot down in a crack 30 feet back from the SE rim in the material of the recent overflows. This, and an apparent rise of temperature in the ground here for the last two days, suggests that new oxidation heat had been induced in these flows by exposure of the fresh cross-section of the broken pit wall to air.

T.A.J.

Apr. 4.  
4:30 p.m.

The floor between the SE crag and central crag and on the N side of the E crag covered with fresh lava. All the small ponds fountaining. Few rock slides and only small ones.

Alex.

Day Friday Date April 5, 1918.

9 to 11 a.m.

Made circuit of pit by e and N. Angle indicates both crags and lake rising. A few dust slides but no avalanches. Tumble from E island mass and from S pressure ridge indicate crags in motion. About eighteen fountains in action mostly building crescent cones. New overflow benches around lake. Lake flush with these and dribble flows pushing across them in central region. All ponds and arms of lake increased by marginal building. Strong blowing noises from center and NW chasm. Latter greatly widened westward and two fountains in action. Everywhere the activity of blowing cone type. Small open pots with streaming to the cones from ragged edges of crust. New connection through from SE arm to SE cove by overflow across west end of SE crag. The old channel farther E covered with talus which filled the lake to its shallow bottom and the rising lake has built a shore platform against this filling so as to move the edge of SE arm some distance west where rampart is building. Central cove depression flooded with elongate oval of fresh flows. Central pond has large dome with hole apparently dead in summit and yellow sublimates. Large cone at almost exact center of pit in midst of crusted lava field apparently W shore of lake. On W end of central crag mass at lake shore SW bend inflow under bank and spatter cone and enormous periodic fountain breaking once in 45 seconds like former Old Faithful. Quiet inflow under bank during intervals, apparently sinkhole. This flow is eastward against E bank of bend and away from the chasm cove of W side. NW cove pond enlarged and extended, especially westward, and whole lake higher relative to crags. On central crag lake appears 15 feet higher than two days ago, the former inner cliff of SW channel submerged.

It is striking how this blowing-cone activity of recovery from a short subsidence recalls large scale blowing-cone recovery of being of 19th century as described by Ellis.

NE fill section still glows in cracks. Talus all around pit has settled, leaving smooth walls above it. The outer floors of S and W valleys in sinking turned up by becoming inclined inward so that they now lie as gigantic slabs nearly vertical against the outer wall of the pit. Backslope NE crag mass flatter. Central pinnacle still stands. SE crag small and partially buried under talus. NW crag and ridges are gone. Old W crag still in place but its eastern horns being obliterated by rising lake. E island mass being indented by deep extensions NE and E coves. Smoke increased and this increase comes with strong rising owing apparently to the building of new floors and the forming of new gas vents by percolation of the lava among the crags and talus.

The smooth scoured faces of central steeple persist, and a similar wall has formed above the talus under W station, as though the lava column scoured the pit wall in sinking. Shows vertical scoring. Bench remnants of 1918 lava still clinging under old N Rest House, under W station and along edge near S cone. The new edge SW shows little remaining of the uplifted pressure edge. A new large crevasse parallel

to edge of pit has formed S of E station in same place as former crack which was there before the overflow. General streaming appears to be eastward in NW cove, central region and SW cove, but there are no large open areas of lake, everything being crusted except for the blowing cones. A very high cone built up the cliff edge at SE corner of SW cove.

T.A.J.

Day

Date April 3, 5 & 8, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Apr. 3.</u>								
7 p.m.	SE	Central crag		13 10		600	140	
	SE	E island point		24 10		555	248	
(Calling SE sts. 10 ft. higher than E sts.)								
Lake 238 feet below E station.								
Central crag 130 " " " "								
<u>Apr. 5.</u>								
9:15a	E	Central crag		11 28		640	129	
	E	E island point		23 8		555	237	
<u>Apr. 8.</u>								
11:45a	E	Central crag		9 10		640	103	
	"	E island point		19 37		555	198	
	"	Summit W crag		10 0				
	"	" central steeple		13 13				
	"	" E island		18 20				
	"	W " S pressure ridge		10 10				
	"	E ledge		35 5				
	"	N smoke crag		12 50				
			no	pl	scr	stop	ex	cam

<u>Apr. 5.</u>								
9:15a	NE	half-dome (W side) to E station		1	3 x	f/16	vane 3	A.V.
	N	E		2	"	"	"	"
	NW	W		3	"	"	"	"
	SW	Center and down		4	"	"	"	"
								T.A.J.

Page 292



2



bag

log



7



bag

Day Saturday Date April 6, 1918.

10:30 a.m.

to noon. Lake rising strongly and faster than the crags. New outlines determined of lakes surrounded by cones and crescent spatter heaps and new overflows make new floors in all directions.

Five pond areas now: (1) main lake from SW arm to SE arm; (2) SW pond; (3) SE pond; (4) N lake; (5) NW -- really W -- chasm pond, hereafter called W pond. Besides there is the central pond, a mass of bronzy lava with a large whitish sulfataric cone in the center which is hissing.

Streaming N in N lake, E in main lake, E in SW pond. Row of cones along NW side SE pond and large cone SE side. Occasional O.F. fountain in W end main lake. This channel cut off by debris fill from SW pond. W deck of central crag mass only a few feet above lake levels. SE crag remnant almost entirely submerged. Central cove, SE pond and SE arm floors are fast merging. E island has its N extension entirely isolated by new floors and floors of NE and E coves have joined through NE of E island remnant. In some way the isolated eastern crags of W crag mass are nearly drowned, and N lake shows signs of joining through to W pond, the new floors lapping the talus W, NW, N, SE and SW. About eighteen cones and occasional central fountains. At noon the lakes and SW pond showed a glow edge of subsidence one foot deep but the SE pond rose and overflowed all around. Then it too cracked, foundered and subsided. Two large cones at sites corresponding to E cove tunnel and E gulch tunnel.

Smoke less than yesterday. Occasional small adjustments of the high talus. Noises of fountaining and puffing.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
Experiments Wollensak camera. Focus with A screen 17 twists left from focus no screen. f/11 with screen 1/15 sec. = f/22 no screen 1/15 sec.								
10:30a	SSE	Camera 30° to white, blue & bronzy cone in cent. pond. Red rocks; black old surfaces. Looking down & NW. Bright cloudy. Holder 5. Plate Wynne f/128, 3 sec. light	1	ortho 4x5	L A	f/11	1/15	
+	"	Ditto (Holder 6)	2			f/22	1/15	
+	"	" (Holder 10)	3	WM	"	f/11	"	
+	"	Camera 40° turned down to SE cove pond crackling & fountaining. Rain darker.	4	ortho	"	f/8	"	

T.A.J.



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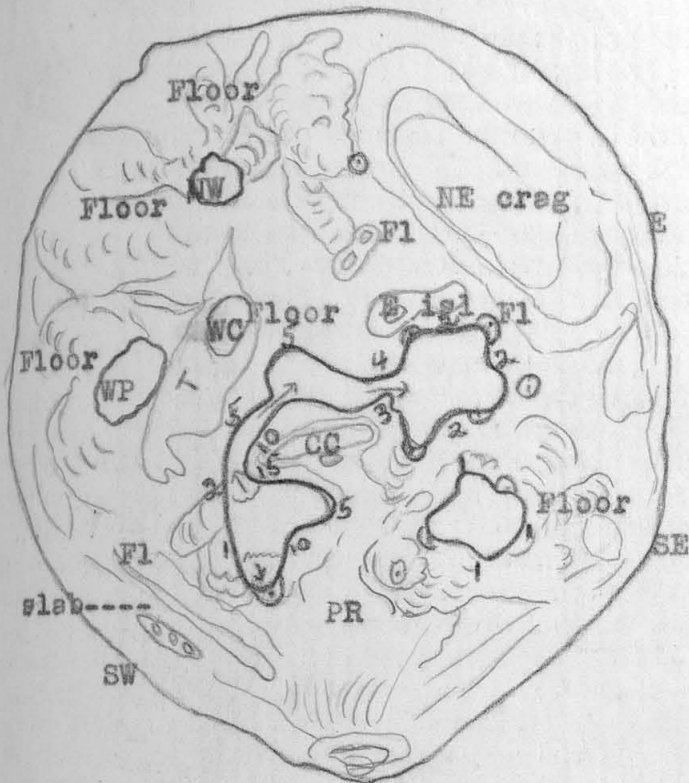
Jag

Day **Monday** Date **April 8, 1918.**  
**Tuesday** " **9, "**

Apr. 8.  
11:45 a.m.

Halimaumau from S:-

Figures show bench heights. Fl means floor.



Lake margin bench higher westward, lowest SW and SE. SE pond blowing grotto and spraying. Central pond cone hissing. Crags rising on W side apparently; i.e. in direction of conduit W pond. New driblet flow field all over region of N lake. NW pond a small pit of live lava 6 feet deep. W pond a floor of new flows. Floor of new flows all around NW pond. High hissing spiracle cone base of N smoke crag. SW arm connected through to SW pond.

Apr. 9.

6:00 p.m. After rainy day it appears much the same. SE pond two to three feet down, crusted with two spraying border fountains on N side, gas escaping from under crust. SW pond crusted. Streaming in main lake eastward, polygonal crusts with bright lines, fewer border fountains than at first, several active grottoes at E end. New extension of SE arm eastward over talus as though reopening SE channel. Flaming and hissing cone on E cove floor. Another cone with glowing filagree in N central region. Fountaining pot or pool in NE cove. Pool open apparently at N pond; three fountaining grottoes seen with openings eastward. The central region has banks of lake somewhat higher than yesterday as though there may have been temporary subsidence since, which opened the northern pools and the eastward extension, and this would check with the evidence from more fume this morning and one small earthquake felt last night. No sign, however, of subsidence this evening nor of diminished gas pressure.

T.A.J.

Day Wednesday Date April 10, 1918.  
Thursday " 11, "

Apr. 10.

10:30 a.m.

Talus possibly accessible below W niche. Inner pits of lakes much deeper. Five foot bank SE arm and SE pond. Entire summit block of central steeple has fallen, new talus S of it, and much of N side of central crag appears to have fallen. This means new movements of adjustment and rain effect? Two fountains N side and NE side of SE pond. SE arm extended to E cove dome grotto and streaming in and fountaining there. Three fountains around SE arm. Small open pot NE cove site. Much fume from floors. Central pond dome still there, floor merged northward and eastward with floors of SE pond and central depression. Floor margin of main lake much higher westward. Streaming outward from SW pond. All lakes crusted, occasionally cracking and foundering. Noises fountain puff and splash. Pit funny. From NNW, NW pond seen strongly overflowing at 12 noon to 1 p.m. and later. High dribble cone with pot at its base under N smoke crag only sign of N cove pond. Cavern under SW side of NW pond. Open small pot 5 feet deep at N central pond site. Fuming place farther S. W chasm pond all crusted except glow on E side. SW channel fountain "O.F." still erupting every 40 seconds. The N bank of central region appears highest in center. SW pond crusted. White fume from S cone on rim of pit. Pinnacle of central crag still there.

T.A.J.

Apr. 11.

4:10 p.m.

From E. Liquid lava about 20 feet below floor of E crag. Many rock slides around pit.

7:30 p.m.

Subsidence of 10 feet with great activity in SE arm. Great blocks of pit walls falling but no glowing lava from NE fill breaks.

Alex.





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zag



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Fog



5



9



12



11

Fog

Day Friday Date April 12, 1918.  
Saturday " 13, "

Apr. 12.  
3-5 p.m.

Lake and crags much lower as shown by angles taken. Pit very smoky. General relations same. Inner pits, main lake, SW and SE ponds 15 feet deep towards the east, 20 feet towards the west. Activity dull. Outward streaming SW bend; rhythmic fountain there somewhat shorter interval and smaller. Lakes elsewhere mostly crusted. No avalanches heard falling and lakes appear rising as compared with yesterday. The pit walls from recent fall show lower talus summits and wider wall spaces. Crevasse in pit edge S of E station is gone and block outside of it has fallen. Talus under NE fill much lower. Pit edge much farther back under N station, all the 1918 bench there gone. Movement has wrecked NW station; the old crevassed block has fallen on new bench just below. Talus under W niche much lower, for two days ago it appeared quite accessible from above -- now wholly inaccessible. Hanging bench block just below W niche still in place but very unstable in appearance. Central crag mass has so collapsed as to make deep indentation into it from N side where steeple was and only E end of steeple mass remains. Poised high pinnacle still in place. SE pond appears shifted farther west than when lava was high.

T.A.J.

Apr. 13.

2:25 p.m.

From E.

Lava about 10 feet down in SE arm and 20 feet down in SE pond. Ponds all crusted. Smoke NW very dense; could hear puffing in that locality but could see nothing. No avalanches.

3:40 p.m.

From E.

Large fall of rock from the NE wall followed in a few minutes by one from under the N Rest House. Some sliding also on the NW side of pit. Much fountaining in SE arm.

Alex.

Day Sunday Date April 14, 1918.

- 10:45 a.m. Inner bench around SE pit appears 12 feet high, around lake E arm 10 feet high. Rock slides heard N and W. Occasional sharp blast of gas heard toward the N. Lake apparently rising. Three border fountains in E arm, one or two in SE pond. Pit excessively smoky, largely from N vents. Central crag pinnacle still in place.  
From SW.  
Rhythmic fountain and inrush at SW bend point continues. SW pond is triangular; narrow gorge and bridge between it and the end of SW arm. Wall 20 feet high over SW pond, very marked tilt of bench level from here to middle region of lake. E ledge very low with reference to lake. Hissing and flaming cone in floor N of central region.  
SW fountain 25 to 40 second interval, secondary explosion 10 seconds, more or less, after main one.  
N smoke crag looks low as compared to the new flood floor beneath it.  
The present adjustment appears to involve lift SW and sinking NE and much flooding with liquid with the center of accumulation N and NE. The W chasm pond shows distinct lift of its E floor with the uptilting W crag mass, and gentle slope to its W floor.  
Small avalanches all sides.
- 11:40 a.m. Cave-in of E wall of rhythmic fountain (R.F.) pool and very violent fountains; the explosions are dome fountains 20 feet in diameter. Very noisy. NW pond is active.  
Remnant 1918 bench clinging 6 feet down just S of W station and all along from there to W niche. Two-foot open pot E side W pond. Narrow remnant 1918 bench still clings under NW station.
- 4:30 p.m. From the SE.  
Slides of rock from the NE wall and a few from under E Rest House. Some very large boulders falling. Central crag appears to be slowly subsiding. SE pond very quiet; and activity in the grotto on NE side of SE arm only. Small rock slides from different parts of pit continue.

T.A.J.

Alex.

t	sta	pt	hor	vert	lev	dist	elev	h. l.
<u>Brunton Transit.</u>								
<u>Apr. 12.</u>								
3-5p.m.	E	Central crag		12 5		640	136	
	"	E islend point (top of 15-foot± bench)		23 5		555	236	
	"	Lake base of central crag cliff		23 2				
<u>Apr. 14.</u>								
10:45a	E	Central crag summit		13 0				
	"	E isl. pt. on bench		24 6				
	"	Lake level under cen- tral crag		22 30				
<u>Apr. 15.</u>								
5:15p	E	E isl. pt. bench		22 30				
	"	Lake under cent. crag		23 00				
	"	Central crag		12 42				
<u>Apr. 16.</u>								
12:15p	E	Central crag		13 7				
	"	E isl. point		24 30				
	"	Lake under central crag		21 15				

			no	pl	scr	stop	ex	cam
<u>Apr. 14.</u>								
10:45a	S } hump }	SW margin pit	1				snep	Bullseye
	W of S	SW sta. & slab below	2				"	"
	"	Center (smoky)	3				"	"
	Near view of	SW station	4				"	"
	SW	SE (smoky)	5				"	"
								T.A.J.



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2



3

360



4



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5067

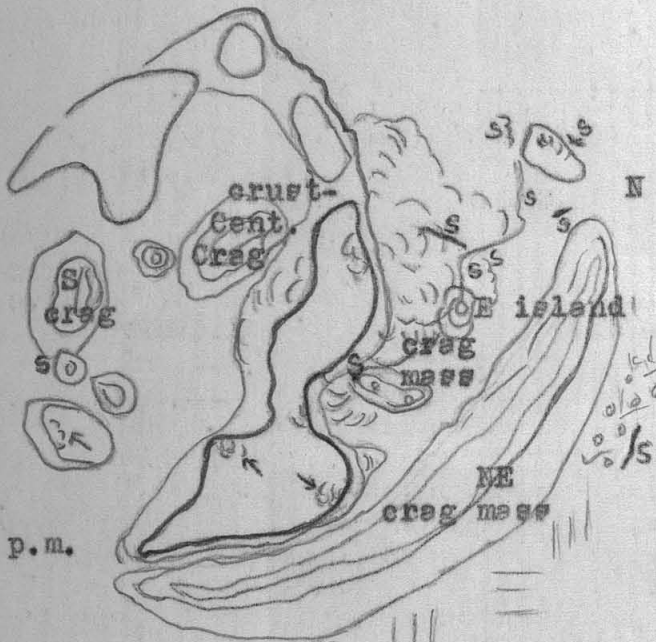
Day **Monday** Date **April 15, 1918.**  
**Tuesday** " **16, "**

Apr. 15.  
 5:15 p.m.

Made circuit of pit by S. SE pond and E arm 10 feet down. Activity usual. Streaming E. Avalanches few. Central pond cone glowing. Break up in SW pond. R.F. rather small. W pond crusted. Glow spots seen N, smoke there excessive. Fume to leeward not bad breathing. SW margin pit has broken back fully 15 feet in all recently.

Apr. 16.  
 12:15 p.m.

Plan of new overflows from lake center and smoke areas N, and crusted pools of lake. From E.



12:20 p.m.

Lake higher; new dribblet cones; noises puff and plash. Streaming E. SE pond crusted. New flow on E island point floor from central N floor apparently. A remarkable adjustment is the new relative height of shorelines. SE pond 10 feet down; E arm 5 feet down; central region 2 feet down! SW arm shore higher and SW pond 10 feet down. Are shores subsiding toward middle?

Prolonged avalanche N. Occasional slides elsewhere. Subsidence of lake. Slides from central crag.

The lake has risen and crags sunk since yesterday. Central overflows from lake extensive. NW pond splashing. Occasional hissing and outbreak of fountain S side SE pond. Lakes mostly crusted and main lake divided into pools with arches of crust between and much narrowed central channel. Central pinnacle persists.

T.A.J.

Day **Wednesday** Date **April 17, 1918.**  
**Thursday** " **18, "**

Apr. 17.  
 12:10 p.m.

Lake conditions similar to yesterday, crags subsiding, lake rising. Lake brimming in center and fresh overflows; two or three feet down NW pond, E arm and W pools; SE pond deeper; SW pond deepest of all. Avalanches falling on all sides. Red dust sliding into smoke hole half way up N wall. From E and N seven pools identifiable; namely SE, SW, E, center, W, N and NW. The N pool a crack-like depression rather deep, the NW pond a shallower oval crusted over. The W pool of the main lake had the R.P. nearly covered over with crust, a glowing chimney above; occasional explosions from under the crust. In addition to the pools named there are the W pond and the central pond, both crusted over. The outward hanging slab under W niche had broken away so as to become an upright block with crevassed slices on both sides making a conspicuous irregularity in the slope. Blowing in N pond region.

T, A. J.

Apr. 18.  
 4:35 p.m.

From SE.

Lava in SE pond 5 feet below bench around it. A few fountains in this pond. SE arm very active with streaming to the SE. The upper channel is floored over. The N pond active. Fumes thick.

5:30 p.m.

From E.

Noisy rock slide from NE wall; slides in other parts of pit.

5:50 p.m.

Lava in SE arm within one foot of bench level; arm is divided into three small ponds. Many small fountaining grottoes.

Alex.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Tripod Brunton Survey.</u>								
12:10p	E	NE		+ 5				
	E	Central crag (+10°)	103 40	13 28		637	152	
	"	E isl. pt. " "	96 10	25 20		475	225	
	"	Lake under cent. crag (+10°)	108 10	22 8		540	220	
	"	SE pond grotto	144 40	28 30		426	231	
	"	Wall smoke N	41 10	11 55		661	137	
	"	N smoke crag	68 0	15 47				
	"	Grotto N side central channel	110 30	28 30		396	215	
	"	W crag mass	94 50	13 42		786	190	
		40 ft. W of NW sta. in line of O.R.H. to W station	-19 30					
	Ditto	to central crag	+25 0					Depression cent. floor 220 ft.
	"	E isl. point	37 40					" SE pond lava 230 "
	"	Lake under cent. crag	31 10					" central crag 152 "
	"	SE pond grotto	39 0					" W crag 190 "
	"	Wall smoke N	81 50					
	"	N smoke crag	60 40					Cent. crag thus 68 ft. high
	"	Grot. N side cent. chan.	40 00					West " " 30 " "
	"	W crag mass	14 20					
	NW	R.F.	8 0					
	"	S tunnel SW pond	16 0					
	"	Cent. steeple remnant	36 10					
	"	E wall W chasm pond	2 30					
	"	NW pond	36 00					
	"	SE grotto E arm	45 30					
	"	W niche slipped down slab	-25 40					
	"	N pond	48 0					

SE pond 10 ft. lower than main lake at time of measurement.  
 Summit central crag 25 ft. farther N than in February.  
 SE pond has moved to the NW from position of old SE cove.  
 The old W crag summit has moved southward.

	no	pl	scr	stop	ex	cam
NE	1				snap	Bullseye
NW	2				"	"
"	3				"	"
W height)	4				"	"
"	5				"	"

T.A.J.



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509



4



5

Fog

Day Friday Date April 19, 1918.

11 to 12 a.m. Found S cone collapsed with roof two to three feet thick; typical grape stalactites of small size inside. Large tube leading southward from it, too hot to explore. SE arm overflowing on all sides; spatter cones in many places; much hissing noise; several filagree cones; ten fountains in action. Streaming E in main lake and SW pond. The order of overflowing was first the E arm, then the SE pond, and still later the SW pond rose until it was only one to two feet below its E and S banks. The flood from E arm poured through the gap between the E island and NE crag mass. There were fresh flows evidently from the northern pools over the N central floor. Glowing cracks could be seen in the northern region. Spouting cone at S tunnel. Dark hole in central pond cone. The lakes were rising and falling, and when the E arm first subsided the SE pond lagged 10 to 15 minutes behind it before it began to go down. There were seventeen fume vents including wall chimneys N, SW and SE. One slide took place in the talus SE, another from SW side of central crag. Otherwise there was little sliding.

8 to 9 p.m. After 12 noon lakes subsided about a foot. Many flames, puffing border grottoes, filagree cones, spurting from under marginal crusts. High gas pressure. Subsidence spell, lakes 5 to 6 feet down. Some collapse central channel arch. Streaming eastward. Much rumbling. Fume thin. Little glow on fume cloud. Slides trivial. Glow cracks in fresh flows N and E. Glow and flame and spurts central pond cone. Largest flames SE, E and N. No open pools seen N and no fountaining at R.F. High chimney there. Glow from W chasm pond. SE pond distinctly hexagonal within its new inner bench -- a hexagon with rounded corners like some of the lunar craters. No glow from N wall chimney.

T.A.J.

509



6



5005



508

4



bag

Day

Date Apr. 19, 20, 23, 25, 26, '18.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
<u>Apr. 19.</u>		<u>Brunton Survey.</u>							
11-12a	E	Central crag		13 6					
	"	E island point		24 8					
	"	SE pond grotto		28 39					
	"	Summit W crag		12 55					
	"	Grotto N of cent.chan.		23 0	(?)				
<u>Apr. 20.</u>									
9:45 a	E	Central crag		13 15			149		
	"	Grotto N side cent.chan.		26 23			196		
<u>Apr. 23.</u>									
Noon	E	Central crag		11 40			131		
	"	SE pond grotto		28 11					
	"	N side cent. chan.		25 0			185		
	"	Grot. S side central } chan. base steeple }		23 42			186		
	"	W crag summit		11 50					
	"	Tunnel bridge W of } central lake }		16 5					
	"	E island point		22 42					
<u>Apr. 25.</u>									
10:15a	E	E isl. point bench		22 40					
	"	Grotto cent. steeple		23 0		423	179		
	"	Central crag		11 5			124		
	"	SE pond cone		26 35					
	"	Central glow cone		16 32					
	"	Cove N side cent.chan.		24 30		396	180		
	"	Cavern bridge W side } central region }		15 40					
<u>Apr. 26.</u>									
Noon	E	SE pond cone		27 00					
	"	Central crag		11 5		637	124		
	"	W crag		11 5					
	"	Grotto under steeple		22 25			174		
			no	pl	scr	stop	vane	cam	
<u>Apr. 19.</u>		<u>Bright cloudy.</u>							
11-12a	of S	NE	1		none	f/26	none	A V	
	"	NW	2		"	"	"	"	
	"	Center	3		"	"	"	"	
	"	"	4		old	"	5	"	
<u>Apr. 26.</u>									
Noon	ESE	Central crag	1				snap	Bullseye	
	"	N stack	2				"	"	
	"	Main lake	3				"	"	

T.A.J.

Day Saturday Date April 20, 1918.  
Sunday " 21, "

Apr. 20.  
 9:45 a.m.

Pit funny, lakes 3 to 4 feet down. SE pond a marked hexagon with rounded angles within its own inner floor as though the hexagonal outline were from a process of building inward of the banks rather than of collapse.



Flames, streaming and puffing same as last night. Everything appears lower than yesterday morning. One or two small slides heard but no sign of

marked changes anywhere. Good gas pressure but less so than yesterday.

Strong overflow at noon reported.

T.A.J.

- 3:10 p.m. From E station.  
 Lava 5 feet down in all the small ponds which are very active. A few fountains in SE arm, one large one in the central region. The small cone in N arm blowing loudly.
- 3:25 p.m. From S.  
 SW pond level with bank around it. Four fountains boiling in it.
- 4:05 p.m. Large slide lasting about four seconds on NW side. A few small ones occasionally.

Alex.

Apr. 21.  
 4:30 p.m.

From SE.  
 SE pond overflowing -- lasts almost an hour. Then it subsides about four feet, leaving the pond about 30 feet long by 20 feet wide. SE arm level with banks but quiet, until it began to sink when there was much fountaining. Central lake active also. The cones in northern part of pit blowing loudly. A few slides, one small one on the SW side.

Alex.

Day **Tuesday** Date **April 23, 1918.**  
 " **Thursday** " **25, "**

Apr. 23.  
Morning.

Lake 2 feet below margin E, 5 feet in center and more farther W. Fresh overflows at extreme E end. Filagree cone E end and spatter cones building E and central cove under central crag mass and N side of central region. Glowing cones N central floor and N pond site. Harsh hissing at latter and also at eastern glow cone. New floor SE, E and N; E island remnant nearly buried under new floor. If building of floor continues, flows may penetrate NE valley around E end of ledge as before. SE pond region all covered by new flows and pond a narrow pot 4 or 5 feet deep to the lava surface. Very small slide heard SE. Central channel open again so that central and eastern pools are again merged. Streaming eastward from under a bridge of crust making a tunnel leading from central pool to W arm. No sign of fountaining at R.F. cove. No open pools visible N and NW. SW pond appears unchanged. Much vapor owing to rain. General condition high gas pressure and gradual building. Central crag higher and again western crags in general appear rising more than eastern.

Apr. 25.

10:15 a.m. SE pond pot smaller. Lake 3 feet down E, 8 feet down at W bridge, 10 feet down W channel. S side SW pond 5 feet down. SE pond 5 or 6 feet down. Large floods from E end lake along base of NE crag mass showing depression there. Lakes crusted. Fresh overflow S side SW pond, also W pond and along N and NW talus. Plain seeing but hazy. Wide new bench N base of central crag mass. Central pond cone half buried. Fresh floor high up E base of W crag mass. Fume thinner from H.V.O. but markedly fluctuating at different times within short intervals.

T.A.J

4:30 p.m. From E.

Lava only one foot down in SE arm and very quiet.

5:45 p.m.

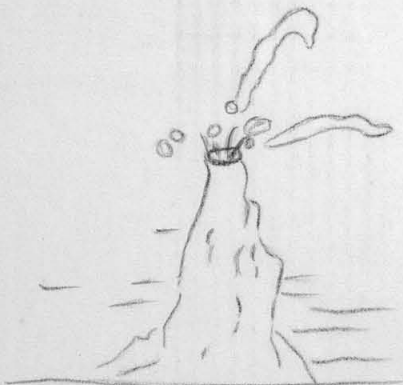
Sinking began until in half an hour the lava was six feet lower. All ponds active except the SE pond which was almost entirely crusted over. Some small rock slides in different parts of pit.

Alex.

Day Friday Date April 26, 1918.

Noon.

Rising and overflowing of lake in general continues. High gas pressure. Lakes mostly crusted. SE pond totally arched over during morning by the building over its grotto of a high blowing cone with open hole at its base. Streaming eastward in main lake, occasional cracking and foundering and central fountain. Active marginal grottoes at E end of main lake, N and S sides of E arm, and on N and S sides of central region. Glow cone N center and at N pond site under N smoke crag a high stack built with circular hole, perhaps two feet across, in its summit, exploding inside at irregular intervals with noise like a gasoline stationary engine exhaust, each explosion flinging up an umbrella of melt. These explosions accompanied by a bell-like ringing noise, but the explosions sound, not like mere accumulation of gas, but like an ignition with oxygen, a true chemical explosion. The noise a muffled report, like a weak pistol shot.



North exploding cone, 10+ feet high.

Much blowing elsewhere, N central glow-cone, SE, etc. Shore of lake 2 feet high E, 10 feet high W. Bridge at entrance to W arm more slender. Violent fountaining in W arm. NE valley low relative to growing floor. Fresh overflow pattern all over E and SE floors, wide floor of fresh overflow S and W of SW pond. Letter active. Rising at noon, both E arm and SW pond. Much fresh flow material NW seen dimly through fume and rain vapor. The fall of rain produced dense clouds of steam all over floors, showing their heat and freshness. Four soldiers in afternoon descended to floor with aid of rope by way of ESE wall.

T.A.J.

Fume thinner from H.V.O. but markedly fluctuating at different times within short intervals.



2



3

Jag

- 1 - Day Saturday Date April 27, 1918.

3:30 to 7:30 and 9 to 11 p.m. (With General Wisser and party).  
 Lake E 3 to 5 feet down at first. Babke at W arm much higher. Activity sluggish. Pools crusted, with rising tendency. Blowing fountains from under crusts around margins. SE pond cone occasionally hisses. Much hissing N and W. Made circuit of pit E to N. Flows pushing across NW and W floors, vents at or near NW and W ponds. Stack at N pond site 20 feet high, not now active. High gas pressure NW and W vents. Flaming cone in N central floor. SW pond streaming eastward, W arm streaming westward. Streaming at first eastward in central channel. At 5 p.m. E arm started overflowing, at 8 p.m. the SE pond cone started artesian flow and about 9:30 p.m. strong overflowing from SW pond. The E arm overflows increased in volume 5 to 7 p.m. with very strong spurts and two heavy flows were developed, pouring N and S from the E end of the pool, the pool thereupon becoming covered with quiet crust and remaining so except for occasional crackings and founderingings.

After the first half hour of steady overflow there came a sudden marked increase of overflowing and about the same time it was evident that the lake from the central channel westward was exhibiting a glowing rim of overhang as though sinking while the same lake in the E arm filled its basin to the brim and overflowed in strong pulsations. There was also strong cracking, foundering and fountaining in the center and at the W. This relation checked with the observed greater height of banks westward, and it appeared that the overflow weighting at the E was tipping the whole bench magma surface downward on the E side and upward on the W about an axial line in the narrows. The central crag summit measurably rose during the afternoon as shown by survey. In view of the shift of overflows during the afternoon in a circle from W to N to E to SW, it seems probable that the disk of bench magma topography executed a somewhat spiral tilting movement as the weighting of the overflows spread in the sequence indicated. The tendency of the overflows to follow the periphery is in marked contrast to the central overflows of a few days ago and suggests central intumescence at present.

The overflows E spread until the whole southeastern basin was full including the central pond area, the southeast pond cone proving to be an elevation surrounded by the new flows. On the N side the flow spread in a great pool over much of the former E island site and finally stagnated and reached such a depth that the flood overtopped the low saddle of the NE crag mass and sent two narrow streams down the back of that mass into the NE valley reaching the foot of the talus there.

About 8 p.m. the SE cone broke into violent spouting sending up a column of lava to a height estimated 20 to 30 feet and this artesian effect continued for several minutes and then flows poured from this vent for hours, pooling over the whole area between the central crags and the E ledge. The eastern floods had now ponded level with the lake surface and the overwelling of the latter showed no tendency to diminish. Later in the evening the SW pond was seen to be overflowing profusely westward and southward.

Flames were abundant at the SE cone, a northeastern glowing cone, the N central glowing cone and late in the night from the SE-pond cone which became 6 or 8 feet high with a spouting and flam-

- 2 - Day Saturday Date April 27, 1918.  
Sunday " 28, "

Apr. 27 cont'd.

ing pot in its summit.

Far to the N near the NW pond locality there developed a blowing cone similar to the stack of the previous day with the same explosive detonations like musketry and the upward fling of umbrellas of melt. The growth of a dribble structure around this vent finally deflected the spurtings from vertical to northeastward at 45° and later at almost horizontal angles a built up pipe confining the blast and forcing it out laterally. The fumes were very thin and the seeing very clear. All the noises were of strong gas pressure and the only talus adjustments were small, due to the shiftings of the bench magma. Occasional fountaining would break out in the W pond and fresh floods could be seen pouring over the northwestern floor.

T.A.J.

Apr. 28.

4:35 p.m.

From SE.

Lava level with rim of SE arm. Fresh flow material could be seen on floor near SE pond.

5:30 p.m.

From N.

Much fresh lava seen on floor N. Lava flowing from the cone on this side. One fountain seen.

5:50 p.m.

Wide overflow from S side of SE arm pouring toward the SE pond. All the ponds active. A few small rock slides SE and N.

Alex.

5:00 p.m.

Rainy afternoon. Pit seen this morning still overflowing, especially SE; and during night new overflows had added somewhat to the two streams down the back of the NE crag mass. Now the whole floor showed overflowing to be continuing without abatement, great pooled floods pushing out toes around their margins, especially NW and SE. There was the same hissing and spurting everywhere; source vents were (1) the SE pond, (2) the northern cones, (3) the W pond and (4) the circular pot at the W bend recently the site of the R.F. From this place the streaming was northward in the W arm and eastward in the SW pond. The main lake was brimming in the E arm and probably overflowing beneath the crusts which masked its margin. There were many V-shaped glowing flow sources and at the SE cone it was apparent that the center stood higher than the flows radiating from it. The activity was of the same type as on the previous day, but less spectacular. The N stack still stood with new flows around its base.

T.A.J.

Day **Monday** Date **Apr. 29, 1918**  
**Tuesday** " **30,** "

Apr. 29.

11:00 a.m. Lake still high. Gas pressure strong but somewhat less. Fresh overflows on floor from E arm and others from the N on NE floor and another from an oven cone at SE pond site. Hissing filagree cone at E end of E arm, others SE and N. Strongest puffing somewhere to the N. Glowing lava can be seen at NW pond. N stack still standing. SW pond one foot below bank, E arm three feet.

1:00 p.m. Strong rising and vigorous overflow began at SE corner of E arm. SW pond also brimming at its S margin. Both SW pond and E arm show shorelines lifting in the direction of the W arm.

The floor now makes three crescents which with continued overflow will soon join at their horns so as to completely encircle the crags. The SW pond crescent has nearly joined through at the base of the talus with the W pond floods and the SE pond floods. The E arm overflows must first fill the NE valley and then they will merge with the northern flows. They have already merged with them on the W side of the NE crag mass. The northern crescent has completely merged on the W with the floods from the W pond. Everywhere the liquid lava is gaining on the crags. A few rock slides occurred during the morning.

Apr. 30.

4:30 p.m. Crag down, lake up. Tremendous noon overflows. The new floor flows, glowing and with smooth surfaces as of deep pooling, extend from E arm to S through valley S of S crag mass joining with flood from SW pond and going around to SW crag. Other fresh flows from W pond to N smoke crag. Others over E island site N of E arm and the E floods have poured over E ledge at end burying it; also following course of flows thru NE crag mass saddle. A wide new floor extends the length of NE valley.

Lakes now 3-foot margins. SW pond more constricted and rounder. W bridge wide again. Only a glowing flat crust heap to mark site of SE pond. SE pond and SW pond appear to have been sources of greatest S flowing. Central pool somewhat higher margins. Former central pond wholly gone and area now flat flows. No trace any longer of former SE crag, for some time buried under flows. Flow margin high on talus all around except for the two breaks N and SW.

The floor floods now so evenly balanced that the bench magma must be equally compressed, unless there is some rising of central shores.

Hissing strong from SE, E end glow heap, N glow heap. N stack still in place. Glow at NW pond site. Activity of lakes usual. One or two rock slips heard.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Apr. 27.</u>								
3:30p	E	Central crag		10 18				
		N side channel		23 50				
		E island point		22 00				
5:20p		Central crag		10 10				
		N side channel		23 45				
		E island point		21 10				
		SE pond cone		25 22				
		W crag summit		9 47				
<u>Apr. 28.</u>								
5:00p	E	Central channel		23 5				
		" crag		10 0				
Apr. 26 to 28, lake rose 5 feet, (depression 174 to 169)								
crag " 13, " ( " 124 " 111)								
<u>Apr. 29.</u>								
11a.m.	E	N side central channel		22 55				
		Central crag		10 05				
<u>Apr. 30.</u>								
4:30p	E	Central crag		10 25				
		" channel grotto		21 55				
Apr. 29 to 30, lake rose 10 feet (depression 169 to 159)								
crag sank 5 " " 111 " 116)								
			no	pl	scr	stop	ex	cam

Apr. 29. Bullseye in hand. (Plaster over fogging edge)

E	Central crag	1					snap
	Lake	2					"
	N smoke	3					"

T.A.J.



1



2

Fog



3

Day Wednesday Date May 1, 1918.  
Thursday " 2, "

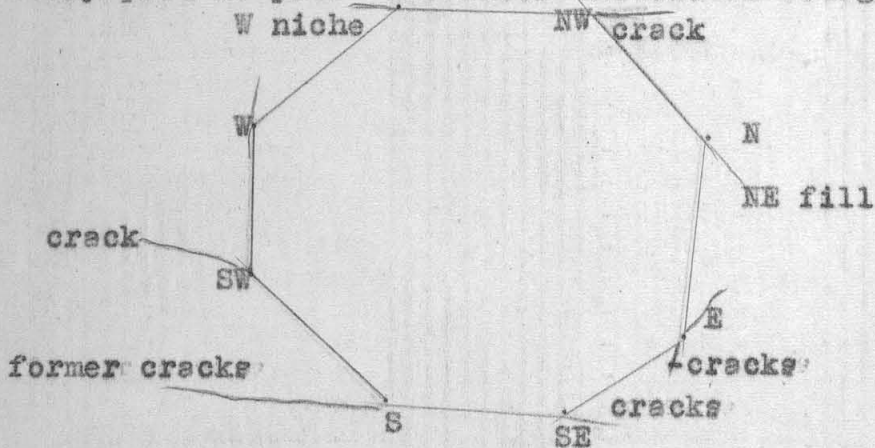
May 1.

11:30 a.m. Floor construction still higher, and joined through at the three breaks; a flow cascade through from N to NE valley; one through from W to SW floor; and merged through yesterday SW to SE.

At 11 a.m. and thereafter an "artesian" fountain at W pond sending a flood westward to the talus which pools right and left and extends all the way to SW pond floor and to floor under N station. Recent fresh overflows from center northward and at other places; so that N stack is only 4 or 5 feet high, the dome grotto NE of E end of E arm pool is half submerged and the cone at E end is new.

At 11:30 a.m. lake margins 5 feet high while the W pond was flooding strongly. SW pond also 4 feet down. An hour later SW pond and lake rose to brimming and lake overflowed on channel margin under central steeple while E and W pools were both a foot or more down. This showed a downward sag in middle of pit. The floods everywhere gaining now on the crags: SE, E island, E ledge and NW crags are gone, and central mass (including S crag and S pressure ridge), W mass (including SW) and NE mass are surrounded. The rising floods promise a maximum like those of 1910 and 1912 with "islands" wholly drowned.

The pit very free from fume and seeing from E station reaches every part of pit. The floor outline an octagon:-



T.A.J.

May 2.

4:50 p.m. From SE.  
SE arm 4 feet down and active.

5:30 p.m. From N.

Small cone over SW lake blowing loudly; no fresh flows there.

6:00 p.m. From E.

Leve in SE arm almost level with top of bank. A few rock slides from SW wall.

Alex.

Day Wednesday Date May 1, 1918.

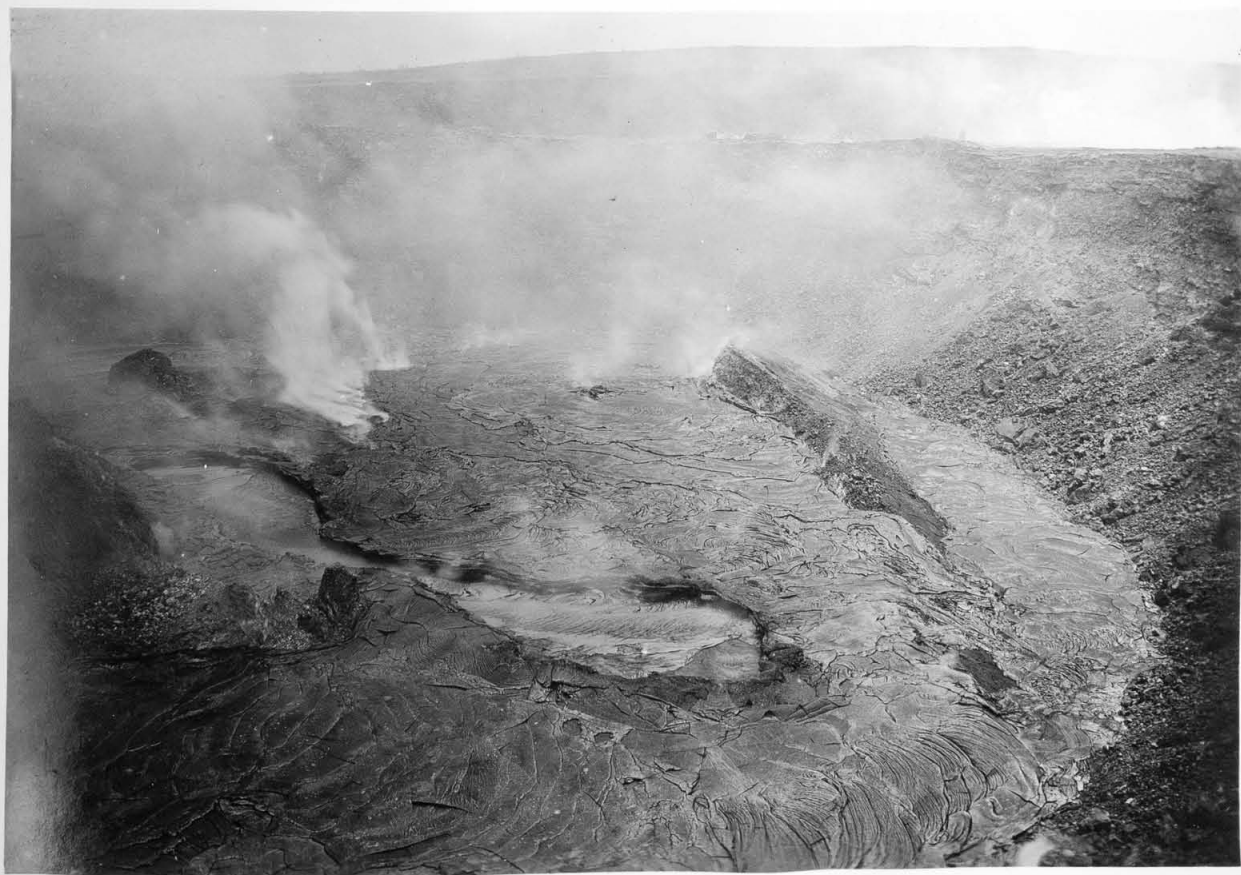
t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30a	E	Central channel N		22 25			163	
Noon	"	" " "		22 47				
11:30a	"	" crag		10 0			111	
		W crag summit		10 15				
		SE pond glow cone		24 5				
		N smoke crag		14 12				
		N central glow cone		15 20				
		W pond artesian		11 5				
		NW glow cone		12 55				
		NE glow cone		15 52				
		Summit N stack		14 5				
		S grotto SW pond		12 25				
		Summit S pressure ridge		12 18				
		Grotto N base of central steeple		20 45				
		Dome E end E arm		30 20				
		W bridge tunnel		14 47				
		Floor margin S (narrows)		15 3				
		" " N "		17 8				
		" " E "		42 47				
		" " WSW "		10 20				
		Summit SW crag		9 58				
		Westernmost end lake		11 58				
		W end W deck		11 0				
		Central steeple remnant		17 50				

			no	pl	scr	stop	ex	cam
11:30a	SE	SW pond. (pan). Tessar.	1	W P	8x	f/13	1/2	5x7
	"	NE floor " "	2	"	"	"	"	"

T.A.J.



1

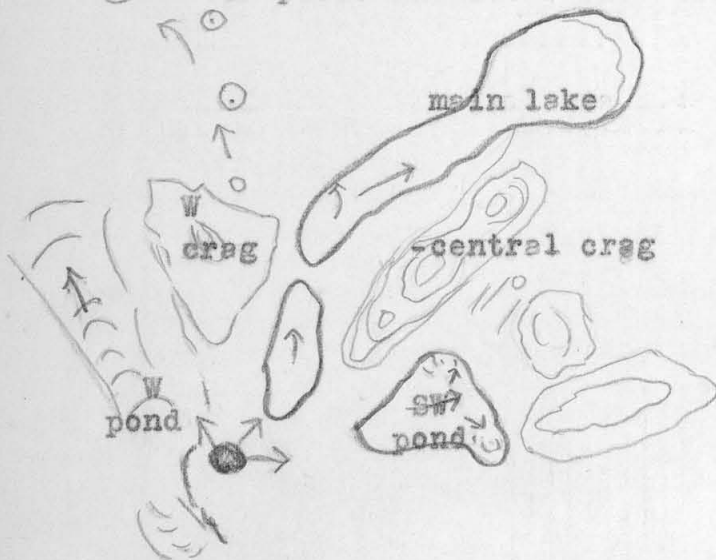


2

309

12:15 p.m. Last two days time of upwarping bench magma. Fresh small flow from SE cone southeastward which appears to have been very liquid (rain explosion?). This cone glowing and puffing. Lake east 4 feet down, center 6 feet down, west 10 feet down; SW pond 2 feet down with bank higher on N side. Cones at W pond, N center floor, NE floor; remnant of N stack 5 feet high. Two small heaps and smoking cracks at NW pond site, and dome at SE pond site. Fresh short flows from lake across E ledge now nearly completely covered, and dribble puddles on NE floor. Appear about two days old. Central crag more fallen away on its SE aspect, and a little fresh tumble from it on new floor. Central pinnacle leans farther southward. Lake rising. East pool crusted and cracking around edges; bubble fountaining and cracking in central region. W bridge narrow and thick, three feet of air space below it. Festoons from W pond northward as of a last long flow in that direction. Gas pressure moderate, few fountains. Many small fuming cracks. A long crack gaping upward, straight, from spatter dome on SE edge of E pool to SE talus. After 1 p.m. streaming to E slowly. Seven marginal grottoes with stalactites center and E pools. Bubbling and blistered skins W. No hissing heard N. No trace of lake outlines N or NW.

Sketch map from SW showing radiation from WSW uplift, of pools and flows and streaming:-



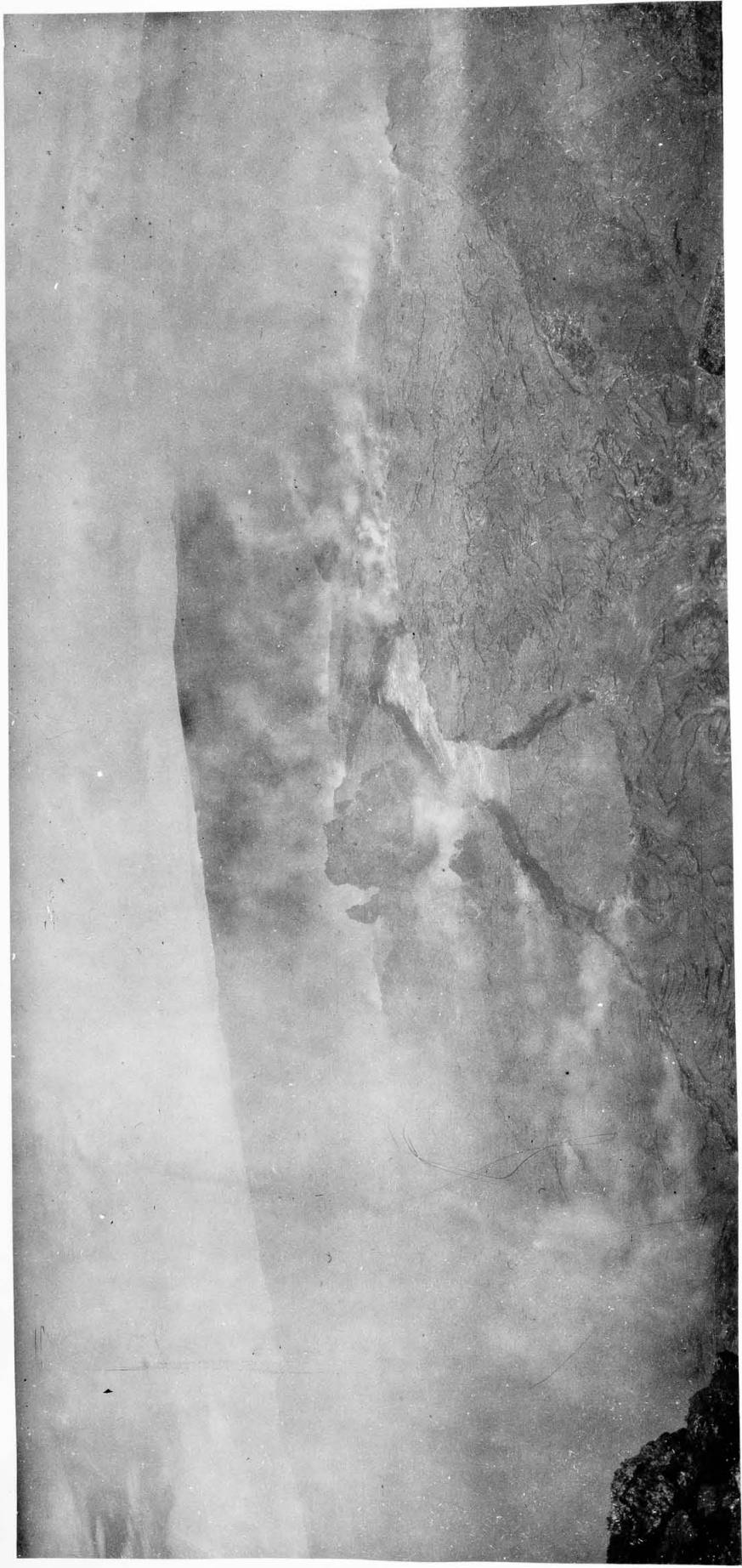
On making circuit of pit find glowing holes with stalactites NE and NW. Fountaining grotto tunnel E corner of SW pond direction of chasm of central pinnacle. Another S corner SW pond (S tunnel leading to S pressure ridge). W end of deck uplifted. SW crag a center of uplift and near a source of lake magma.

T.A.J

- 4:15 p.m. From E. SE arm 10 feet down. Streaming from W to SE grotto; latter and E grotto fountaining. Stream rushing to E grotto also.
- 4:40 p.m. From N the bridge was seen to collapse. Then a fall from W side of central crag.
- 6:30 p.m. Slide lasting some time from under W station. Top of SE grotto fell in causing much fountaining. Otherwise lake quiet. Central pinnacle still in place.

Alex.

802



2



308

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day

Date **May 5, 6 & 7, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>May 5.</u>								
12:15p	E	Central crag		8 25		632	93	
		" channel		20 15		449	166	
		W crag		8 55				
		N "		13 31				
<u>May 6.</u>								
5:30p	E	Central crag		8 15			91	
		" channel		19 30			159	
		W crag		8 22				
		N smoke crag		13 30				
<u>May 7.</u>								
3:45p	E	Central channel, N )		20 15			166	
		side (lake)						
		Central crag		8 10			90	
		SW pond grotto		11 40				
		SE cone		22 30				
		W crag		8 45				
		N pot (NE cone)		14 45				
		N smoke crag		14 40				

			no	pl	scr	<del>stop</del>	stop	cam
<u>May 5.</u>								
12:15p	E	Center (sun)	1		3x	no vane	f/26	A V
	NW } height	" (better)	2		"	vane #3	"	"
								T.A.J.

May 6.

5:30 p.m.

Increased gas pressure. Four spurting border fountains main lake. SW pond overflowing strongly on its SW side, flood from it extends from SW crag to beneath S station. Puffing filagree cone SE. SE crack in floor more pronounced and glowing and smoking; S side of it appears lifted. Central pinnacle has fallen! to jumble of boulders in notch S of it and only a stump remains. Spatter grotto very active; appears to be tunnel, glowing rift above, at lake end of SE crack. Glowing heap at lake margin under N side central steeple. Large boulder newly fallen from E talus on floor N side of SE crack. W bridge entirely gone and W arm greatly widened. Lava splashing inside of NE floor cone. Increase of fume at W pond and from floor E side of W crag and also W of NW pond site. Looks as though western bench magma were lifting. Overflow SW suggests that lifting effect is extending northward along base of W wall. S side of E pool has cracked margin smoking. Lake occasionally breaks up, generally crusted. Glow in all cones. Hissing to NW.

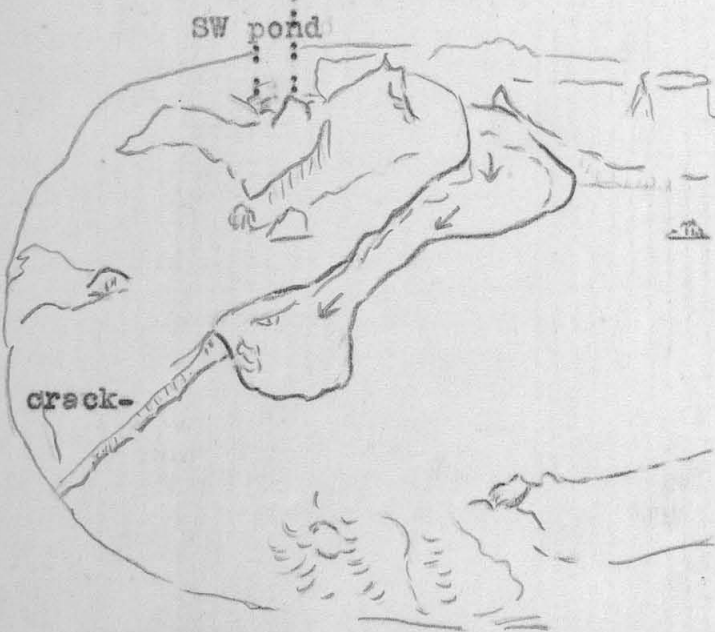
6:00 p.m.

Overflow SW continues. Lake 3 feet down E pool, 8 feet more or less in W arm. Filagree cones E and S corners of SW pond.

May 7.

3:45 p.m.

Sketch from E:  
stump of pinnacle



Lakes down; inner pit of main lake has 8-foot walls E, 10-foot walls W, but SW pond only 3 feet down and appears topographically higher than main lake. Pounding rumbling cavernous grottoes under S and SE sides of E pool. Streaming in main lake vigorous eastward. Thin crusts and bright lines. Large filagree cone puffing SE. N pot (NE cone) occasionally starts prolonged blowing after accumulation of gas. Much blue fume, especially W and SE. One avalanche S. Stained floor cracks.

T.A.J.

Day Wednesday Date May 8, 1918.  
 Thursday " 9, "  
 Friday " 10, "

May 8.  
 11:00 a.m.

Lake a little higher; 6 to 8 feet down; banks higher toward the W. SW pond margin 3 feet high. SE cone hissing. Marginal grottoes E pool blowing and rumbling. Streaming eastward. Some bubble fountaining. N pot glowing. General condition higher gas pressure than yesterday. Stalactites in marginal grottoes main lake. Many fuming cracks. One or two small rock slips heard. Large cracks with stained margins at NW pond site, near N stack, and line of fuming cracks along N central region suggest intumescence and tunnel chambers below. Similar cracks smoke and staining W pond.

T.A.J.

May 9.  
 3:55 p.m.

From E.  
 Lake 10 to 12 feet down and very quiet. An hour later there was a break up W with streaming to the SE. This continued for some time. Many fountains playing in channel. Fume dense so that at times everything was obscured.

Alex.

May 10.  
 5:30 p.m.

Lake appears low and smoky but many signs indicate lava column is really rising. Hissing blowing-cones SE, E, N and elsewhere. Point between E pool and N side of central pool is rising and becoming a crag apparently borne upward by the old E island mass buried beneath. This ledge is 15 feet high above the lake while the edge of the E pool is only 5 feet high. Signs of motion in the NE bench magma were given by one fall of rocks from the N wall and by a second crack developing near and parallel to the long SE crack and on its N side. The increase of smoke is probably due to the opening of tunnels which make condensation chambers through the faster rising of the bench magma. The streaming today was westward in the W arm, southwestward against the bank on the SW side of the E pool and southward in the SW pond. The main lake and E pool were mostly crusted with occasional crackings up. The gas pressure was strong but not remarkably so.

T.A.J.

- 1 - Day Wednesday Date May 8, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11a.m.	E	N	0					
	N	W	0					
	E	Boulder N base N crag	10 39	16 19	+7	627	181	
	N	Ditto	41 21					
	E	Remnant E ledge	67 37	35 12	+3	217	152	
	N	Ditto	64 15					
	E	SE cone summit	97 33	21 45	+4	383	152	
	N	Ditto	55 38					
	E	Floor tangent S	119 39					
	E	" " N	8 7					
	N	Tangent E	73 49					
	N	" W	-16 0					
	E	Central crag	72 37	7 48	+5	608	82	
	N	Ditto	35 24					
	E	Steeple remnant	76 0	15 24	+5	474	130	
	N	Ditto	45 8					
	E	W crag	50 22	8 27	+6	817	119	
	N	Ditto	11 4					
	E	N smoke crag	21 38	12 53	+7	576	130	
	N	Ditto	36 34					
	E	N glow pot	31 2	14 30	+6	607	153	
	N	Ditto	27 40					
	E	Lake N side central channel	64 48	20 21	+6	430	160	
	N	Ditto	46 25					
	E	Lake SE crack	78 36	27 0	+6	291	148	
	N	Ditto	58 29					
	E	SE end SE crack	100 0	32 41	+5	238	152	
	N	Ditto	64 28					
	E	Dome SW margin SW pond (lake level)	76 14	11 2	+6	863	166	
	N	Ditto	22 30					
	E	Ditto dome summit	76 14	10 36	+6			
	E	Base talus under S sta.	102 36	16 0	+5			
	N	Ditto	48 34					
	E	N side overflows across E ledge	35 36	29 36	+6	315	178	
	N	Ditto	60 24					
	E	N central cone	46 0	12 42	+6	618	144	
	N	Ditto	24 0					
			no	pl	scr	stop	ex	cam

- 2 - Day Wednesday Date May 8, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
E		W pond cone	53 51	9 22	6	910	148	
N		Ditto	7 16					
E		Summit SW crag	63 2	8 35	6	951	141	
N		Ditto	11 33					
E		NW cone	32 50	11 39	7	762	155	
N		Ditto	6 9					
E		N corner E pool	62 5					
N		Ditto	57 6					
E		S grotto E pool	75 10			398		
N		Ditto	51 28					
E		Smoke crack S side channel	69 0					
N		Ditto	44 50					
E		Pt. N side W end chan.	63 8					
N		Ditto	40 41					
E		N cor, central pool	55 0					
N		Ditto	32 47					
E		Pt. S side cent. pool	61 40					
N		Ditto	30 22					
E		Smoke W cove	65 50					
N		Ditto	17 0					
E		W end deck	68 36	8 53	6	813	125	
N		Ditto	22 6					
E		S end W crag mass deck	62 22	9 8	6	700	142	
N		Ditto	13 58					
E		Boulder base W talus	54 19	8 52	6	—		
N		Ditto	0 23					
E		Boulder " NE "	31 0	44 22	7	175	170	
N		Ditto	72 30					
E		N stack base	23 38	13 24	7	664	156	
N		Ditto	19 20					
			no	pl	scr	stop	ex	cam

T.A.J.

## JOURNAL

Day Saturday Date May 11, 1918.  
Sunday " 12, "

May 11.  
11:25 a.m.

Lakes much the same. At 8 a.m. the fume from pit very thin. Now there is much fume in thin blue haze and floor patches. At 4 p.m. the fumes were considerable as seen from H.V.O., also much floor vapor.

E pool 8-foot walls, center pool 12-foot walls, W arm 15-foot walls, SW pond 4-foot walls. Pot broken open, glowing beside SE cone. N glow-pot looks more broken. SE crack shows slumping of floor on N side and a second crack there more developed. Another crack trending NE crosses the new flows about middle of NE crag mass where the new flows crossed it. Hissing today mild, and occasionally heard N and W. Activity of lakes sometimes almost nil, quiet crust. At other times rumbling grottoes and cracking followed by foundering. Streaming wholly local into the grottoes or tunnels SE, S (central cove), NE and NW corners of E pool, N side of W arm, S side of SW pond. The lifted point N of the W end of the central channel no longer shows the lifted appearance and the measurement shows that it is down again, whereas the central crag and other features are higher. The cracks SE and E suggest renewed general tumescence or body rising of the lava column in excess of the rising of the lake magma: this is like December last.

T.A.J.

May 12.  
3:55 p.m.

From E.  
Lava only a few feet down. SE arm active, a few fountains in the channel and SE and E grottoes splashing and boiling. A few small rock slides on NW side.

Alex.



808



1

1918 May

6



5a

Day Tuesday Date May 14, 1918.

6:15 p.m.

Lake and crags higher. SW pond one foot below margins and the margin a rampart of fresh overflow. Main lake has much higher inner cliffs than SW pond, 4 feet high E, 8 to 10 feet high center and W. Cracks in bench SE increasing and the two parallel ones extending to the talus have about the pattern of the former SE channel. There is an extension of these cracks southward across the floor E of the SE cone. The latter glowing, flaming and hissing and other such cones with many flames at following places; on bench above lake over grotto at E base of central steeple, N central cone, N glow pot, new cone E of N stack remnant, cone at former NW pond.

Most conspicuous feature this evening extensive flooded overflows which have pooled all the way around the northern and western talus from the W pond to a new flow extending half the length of the NE valley from the northern gap leading into it. These flows all glowing vividly and fed probably from the northern cones as well as from the W and NW ponds. Much blowing, spurting and flaming everywhere and the bench surrounding the eastern end of the lake appeared to be rising for there was strong cracking, foundering, marginal glow and collapse of banks in the E pool with streaming from under crust at the central narrows into it whereas from here westward the lake appeared quiet and crusted as though rising. This seemed to indicate a new disposition of the bench magma to tilt up toward the E and down toward the W. Very large banners of flame played from under the bank NE margin E pool. Smoke rose densely from N central floor as though collapse to an open pool might be expected there. Elsewhere smoke was rather thin. Rapid adjustments of the bench magma were evidently in progress for one strong avalanche from the NNE wall sent up a salmon colored cloud of dust and small slides were heard E and S. It should be noted that this flood following the floor magma in a semi-circle from the W to the NE, finding always a down grade in that direction after repeated other floods over the same course which would be bound to bring the floor to a common level if continued without compensatory rising, clearly demonstrates that there has been a swelling up at the center and toward the W and the NE valley appears to be the lowest part of the pit.

T.A.J.

Day Thursday Date May 16, 1918.

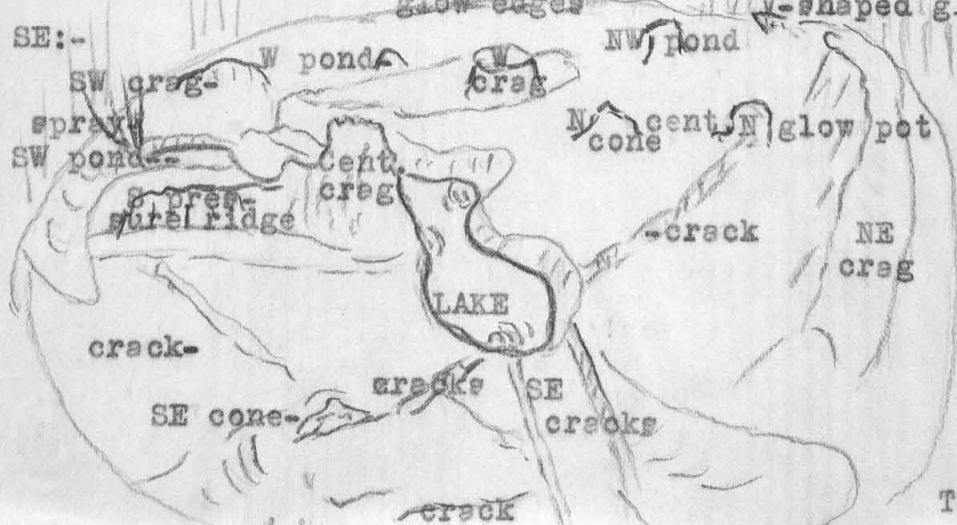
- 4:25 p.m. From E.  
Lava down about 20 feet all around. SE and E coves very active. Rapid streaming toward the SE. SW pond four fountains boiling.
- 7:00 p.m. Lava 15 feet down. Several grottoes active along the sides of the SE channel with some fountains in center of channel.

Alex.

- 6:30 p.m. Lake relatively down and floor center up. W and N floods glowing still and cones blowing and flaming. Lake crusted and occasional violent outbreaks around margin with high spray, fountain fling, breaking and insucking of crusts. This seen S side SW pond and E end main lake. Three spraying border fountains SW pond; three principal places of border fountaining in lake, respectively E end, N side central crag mass and N corner central pool. Hissing from N glow pot and SW pond border cone (probably S tunnel) and during outbreak at E end lake strong hissing from glow crack back from lake a few feet.
- A new feature of great interest is the spread of floor cracking and glow in these cracks only a foot or two inside. The principal cracks appear to be concentric to the pit and in a line from S pressure ridge (old central pond site) to SE cone (now a glowing chasm, flaming), from SE cone to S side E pool, from N side E pool to N glow pot (now a high glowing cone.) This last follows about the line of old NE tunnel. The two SE cracks from E pool to SE talus have enlarged, gaping upward as crevassees and the block of floor between them has subsided, as though the old SE channel were going to reassert itself. The SE cone region has glowing cracks also, as though perhaps the old SE cove might develop again. As the walls around E pool are 10 feet high and around central pool 20 or more feet high, it looks as though the central circular block of bench magma were rising differentially and these cracks part of the evidence. The four cracks, one N, one S and two SE from E pool, look like tumescence under the pool and radial cracking over uplift. The SW pond banks are 5 feet high.

Glow in W pond cone, NW pond cone, N central cone and N glow pot cone; glow streaks as of crust edges from S and W pond all along W and NW and V-shaped glow as of flowing lava near edge of new flows under N talus. No new flows SW or NE. Apparently the heavy flows NW have made intumescence center and SE. Many flames from cones. Much fume N central and NW regions.

Pit from SE:-  
glow edges V-shaped glow



T.A.J.

Day **Friday** Date **May 17, 1918.**  
**Saturday** " **18, "**

May 17.  
5:00 p.m.

Lake about 15 to 20 feet down all around, SW pond 4 feet down. Radial cracking from E pool outward very pronounced; large crack north from E pool goes through N glow pot, thence to N stack and to base of N talus under N station. Blowing heard. Lake crusted and explosive outbreaks from under crust at margins. Lava splashing in SE pot beside SE cone. Angle from E to W end central crag deck appears greatly changed and SW pond more shut off by rising crag mass. Apparently E end bench magma has risen. At 5 p.m. prolonged avalanche two minutes or more undermines wall of pit above N crag gulch just E of N station and carries away old and new rock, making new shallow bay in edge. Pink dust cloud, W end NE valley covered with boulders and dust. Snapping heard like gun SW.

May 18.

11:00 a.m. and later. Strong overflow from SW pond; S valley through to SE floor. More falls N wall. Cracking and intumescence more pronounced. Lava splash in N glow pot and SE pot; latter 5 feet down. Lake 10 to 12 feet down its inner pit, SW pond 3 feet down. Glow and flames from all the pots and cones; including cone by N stack and crack therefrom to N glow-pot. Activity intense gas pressure under crusted lake, high spraying from under edge of crust, booming noises from lava in N pot, high glow streaks SW beyond and above SW pond as seen from SE. Streaming from central pool westward to W grotto where current bends northward under bank. W grotto N side of W arm. E pool mostly crusted, but cracks up and subsides during a gas spraying spell. Fume quite dense from many places, especially central and NW floors. SW flow glowing and SW pond appears to have built its bank higher than yesterday. SE floor block between the two SE crevasses has sunk somewhat.

T. A. JI

1:50 p.m. From N.

Lava 15 feet down in the SE arm and active. Dense fume NW. Long crack below N station getting wider.

2:20 p.m. From E.

Lava rising. Fountaining in W part of SE arm with streaming from there to SE grotto.

2:35 p.m. From SE.

Lava in SW pond within one foot of top of bench around it. Active grotto on SW side of SW pond.

10:30 p.m. A long narrow flow from under SW wall extended around to the SE and at 11:10 p.m. there was another flow from the same place which was broad and which extended past the SE pond, spreading almost to the edge of this pond. Banks of E pond 20 feet high on the SE side and 30 feet on the NW side. Fumes thin. A few slides of rock on the NW side of pit.

Alex.

Day

Date **May 14, 17 & 18, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>May 14.</u>								
6:15 p	E	Central crag		6 50			75	
		Pt. N side E end chan- nel (lake level)		19 52		399	144	
		Grotto under steeple (central cove)		19 55				
		W crag		7 40				
		N "		11 45				
		SE cone		20 51				
		SW pond grotto		10 10				
		NW cone		10 55				
		N pot		12 55				
<u>May 17.</u>								
5 p.m.	E	Central crag		5 50			64	
		Lake N of channel		19 0			137	
		W crag		6 52				
		N "		10 45				
		W end deck		7 19				
		N glow pot		12 5				
		Base of avalanche N (base lava cascade same as boulder before)		14 50				
		SE pot		20 12				
		S grotto tunnel SW pond		10 15				
<u>May 18.</u>								
6:40 p	E	Central crag		5 5		632	56	
		N point channel		18 0		399	130	
		SW pond		9 12				
		W cone		8 5				
		SE pot		19 50				
		N crag		10 55				
		NW cone		10 7				
		N central cone base (pot)		10 15				
		N glow pot		11 42				
		N stack		11 40				
								T.A.J.
			no	pl	scr	stop	ex	cam

## JOURNAL

Day	Monday	Date	May 20, 1918.
	Tuesday	"	21, "
	Wednesday	"	22, "

May 20.  
6:00 p.m.

Flow pouring across floor eastward on SW side SW pond. Lake 10 feet down, SW pond 2 feet down. Cracking and crevassing of floors increasing. Glowing flow and driblet toes moving around S floor from W to SE. Crack spurting SE and making explosion noise like exhaust, some distance away from lake. Smoke dense N of center and NW. Flaming lava pot SE, and large pot N. Bench N of central region rising from narrows to a point E of W crag, much higher than corresponding bench S side of lake -- perhaps twice as high -- making scarp out-facing NE. Crack back of edge of NE crag mass parallel to edge. Cracking, foundering and recovery E pool.

May 21.  
5:30 p.m.

Lake lower. SW pond still high. Glowing flows all around W, SW, S and SE from source apparently a high part of floor against wall WSW. (Old W pond site?) SE pot collapsed, now a pit 20 feet across, lava 15 feet down, streaming W in it. Lake 20 feet or more down; six or eight fountaining tunnels or grottoes, otherwise crusted and condition like yesterday but lower with an abandoned shore rim 5 feet above liquid. Crevassing increased. N pot more broken to a pit. Central and NW and SE smoke increased. Strong Hissing W. Talus perhaps a little lower NE. New flow floors wide all around and outside of central, SW and W crag masses on W, SW and S sides of bottom. N crag now little smoke. Remnant of N stack still stands. Bridge again across entrance to W arm and tunnels with fountains on N and NW sides of central pool. E region much crevassed as though it were about to collapse to a pool, and very distinctly swollen up. One very small rock fell N. Fume from pit as a whole greater today since morning. Smart rocking earthquake shock at 3:30 p.m., rocked observatory N and S.

Night.

Artesian flow from W edge floor pouring northward.

T.A.J.

10:00 p.m. From SE.

There has been a large flow from under SW station going a long way toward the SE wall. E arm very active.

11:15 p.m. Flow pouring SW from a spraying vent near the wall W.

Alex.

May 22.  
Morning.

Little change. Fume thinner. Fresh flows. Lake low.

T.A.J.

11:30 a.m. Thunder shower with heavy rain makes cascades over the Uwekahuna bluffs. At road terminus, in lull in rain, with heavy shower pouring over N part of crater, hear distant roar to northward, probably rainfall and rush of water in the cavernous floor lava which shows under the rain cloud an even vaporizing all over, beaten down by the rain.

Made circuit of pit by S and W. Large red stalactites grading into "grapevine" type in broken open S cone cupola. S inner valley has much new lava, cracking with heat, wide floor from SW pond eastward and southward, and the upturned slab of old March floor now nearly buried. At about site of old W cone, base of wall, edge of floor, under a point between former SW and W stations, an "artesian" fountain of lava playing sluggishly in a pot on top of a flat slag-heap of overflow, now 10 or more feet high, and a dribbling cascade pouring festooned into a short flow extending itself eastward. Later in the day this developed into a strong flow.

W pond cone glowing and hissing. Crack goes through N pot, now a pit like the SE pit, with lava in it 15 feet down. This crack extends across the floor to E pool. NW pond site a glowing cone. Striking from the NW is the pronounced tumescence of the whole central region and SW region of high crags, the whole floor NE of main lake rising and tilting northeastward and the NE crag sunken and half buried and appearing a small decadent feature. NE valley lowest surface in the pit. Many cracks in central floors and whole N region fuming, over site of old N arm. Lake 15 to 20 feet down its inner pit, cracks and founders; pool inside SE pit streaming westward and fountaining, tunnel apparently from main lake at SE crack to this pool. At the west end of lake against W base of central crag mass a sluggish rhythmic fountain as before explodes against bank about once in 30 seconds.

T.A.J.

3:50 p.m. From SE.  
Lake very quiet.

4:45 p.m. Large central fountain in E arm, crust breaking up in different parts. 5:30 p.m. flows from new west cone and from west end of lake. These flows joined and flowed into and filled the SW pond, then continued toward the SE. Another long flow from the W side of the W grotto.

6:30 p.m. A prolonged fall of rock from the N wall of the pit followed by smaller ones.

Alex.

KILAUEA DAY SHEET

Day Date May 20, 21 & 24, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>May 20.</u>								
6 p.m.	E	Central crag		5 0		632	55	
		" cove		17 55		398	129	
	N	crag		10 00				
	W	"		6 20				
<u>May 21.</u>								
5:30 p	E	Central crag		5 55		632	56	
		" cove grotto		18 55		398	130	
	N	crag		9 50				
	W	"		6 30				
<u>May 24.</u>								
10:20a	E	N	0					
	N	W	0					
	E	Central crag	74 4	3 52	0		42	
	N	ditto	85 41					
	E	Lake under central steeple (central cove)	75 56	16 32	0		118	
	N	ditto	51 21	ca				
	E	SE crack grotto	85 42					
	N	ditto	60 19	9 24	-2			
	E	Summit W crag	50 22	5 34	0			
	N	ditto	10 39					
	E	Summit N crag	20 8	8 32	-2			
	N	ditto	86 8					

			no	pl	scr	stop	ex	cam
<u>May 24.</u>								
10:20a	E	NE valley	1				snap	Bullseye
	"	N floor	2				"	"
	"	Lake	3				"	"
	NE	W deck	4				"	"
	N	Central crag	6				"	"
								T.A.J.



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6

Ja 8

Day Friday Date May 24, 1918.  
Saturday " 25, "

May 24.

10:20 a.m.

Lake 20 to 30 feet down, only active spots SE and W grottoes. Steely fresh heavy crackling flow from SW cone to under NW height. Flow making toes and pushing forward. Heavy stalactite curtain SE grotto. Intumescence of whole middle region very pronounced. Roaring blowing noise W. N floor makes much fume. N pit lava 20 feet or more down. Lift of lava column pushing up masses of talus in places, notably under ESE wall, where the talus shows a depression or valley between it and the wall.

The notch made by recent avalanches just E of N station is an even inward sloping wall with high talus below; appears good place for descent with ladders.

T.A.J.

May 25.

2:25 p.m.

From N.

A pool of red lava with many bubble fountains below old Rest House; about 10 feet beyond there is another and larger pool. Toes pushing out from fresh flow lava under W station.

2:50 p.m.

From SW.

W arm and SW pond active with banks 5 feet high.

3:00 p.m.

From S.

A long flow pouring over the S floor and spreading out on both sides.

3:10 p.m.

From SE.

E arm about 20 feet down and quiet.

3:20 p.m.

A fresh flow welled up from under SW wall of pit and ran along on S floor for a short distance.

Alex.

Day Sunday Date May 26, 1918.  
Tuesday " 28, "

May 26.

- 3:50 p.m. From SE.  
Lake crusted and only fountaining was in SW pond.  
5:00 p.m. Fountaining began in grottoes along the margins of E arm and there was some activity in channel. Several falls of rock on NW side of pit.  
6:10 p.m. A portion of SE bench fell into lake starting fountain activity; and a little later there was a rock slide from NE crag.

Alex.

4:30 to 7:30 p.m. SE pit larger. Lake walls higher. Activity at first slight. Made circuit of pit by E and N. N pit more open, arch under crevasse shows lava of pit from old rest house. Glow within two openings between N pit and central pool, one of them flaming. Another glowing hole NW. Incandescent flows sluggishly making toes here and there all over W and SW regions. Rhythmic fountain explodes occasionally in W arm. SW pond continuously fountaining against its NE bank and streaming was westward from under tunnel at its E end. Heavy fall of bank into E pool at SE crevasse seen and smaller falls into SE pool, all indicating that the region between the two pools is slumping. This the result of upward warping of bench magma making tumble of the blocks between crevasses. Strong slide of rocks down backslope of NE crag mass into NE valley, indicating that mass is tilting farther northeastward. Fall of rocks into SW pond from wall of central crag mass. Evidence that rock falls into main lake had been numerous shown by glistening splash marks on shores at various places. Glowing and flaming spot high above liquid level on NE wall of SE pit where crevasses lead toward lake. Some other small rock slides from walls of pit.

May 28.

3:00 p.m. Fresh flood of lava in motion on S floor; SW pond overflowing and splashing against its S bank, W cone also flowing. Central region of bench magma lifted more and crevasses wider open. E and SE pools greatly increased in size and cracked isthmus separating them much narrower. Whole SE floor tilted southward so that S bank of SE pool is low. Whole NE floor tilted northeastward so that E bank of main lake much lower than cliff over central region. N pit appears enlarged and broken in and a new escarpment with northeastward tilt extends from N side of NW pond depression while the smoking N central floor appears to have subsided toward the N pit so as to make a second escarpment on the N side of the central pool. In general there appears to have been further lift of the bench magma occasioned by the recent floods W and S, so that the upward push is now toward the NE. E pool greatly enlarged in the directions of the crevasses N and SE of it so that a sudden rise of the liquid lava would flood the NE valley and in the SE pool would flood the SE well valley. The S wall valley appears much sunken. Large falls of rock SE pool reported last night.

T.A.J.

Day Wednesday Date May 29, 1918.  
Thursday " 30, "May 29.  
5:00 p.m.

Conditions much the same. Swelling of northeastern surfaces higher. N crag escarpment tilted backward at high angle and cliff over lake fully 40 feet high in center and at S side of E pool and N side of SE pool. E end of lake and S side of SE pool 20 feet high. These pools sluggish, four or five spraying fountains which break from under crust explosively near margins. Traces of inner spatter bench. Rocks sliding at SE crevasse above lake. Glowing flows S, SW, W and NW making crackling noises and moving slowly.

From old N rest house most striking change is the irregular breaking up of the whole floor into new crags which are slowly rising and tilting. N chasm pit no longer shows arch. This has collapsed separating two pools, a large one on S side of rising floor blocks, a smaller one on the side of the N stack. The larger one extends to NW pond site and a squarish block of the floor is tending to lift with northward tilt to form a new NW crag. Farther SW the floor slopes down northward into the N pond but rises to an escarpment in the direction of the central pool. In like fashion the block SE which contains the SE pit has risen on side of E pool and sunk toward the S. The general effect is as of a thrust upward and away from the crescent of new flows S and W. SW pond bombarding its S bank; high -- level with rampart. Great quantities of smoke rising from cracks, especially NW central region. The N and NW edge of floor appears low and this wall valley extending around to the NE should be the next place filled. The whole floor is not only rising but becoming chaotic in its breaking up.

T.A.J.

May 30.

- 2:20 p.m. From N.  
A fountain boiling in the N pot. Dense smoke W obscured the view there.
- 2:55 p.m. From E.  
E arm crusted and about 20 feet down. Fumes from floor dense.
- 3:05 p.m. From SE.  
SE pond enlarged. Streaming to a grotto on SW side, outside of which is a large fountain in action.
- 3:15 p.m. Lava in E arm sank 3 feet in a few seconds and was quiet immediately after.
- 3:20 p.m. From SE.  
SW pond level with bench around and quiet.

Alex.

12:45 p.m. Bench magma swollen higher. Small slides falling along top of E talus and at SE crevasse. E talus lifting strongly, deep gully forming between it and wall. Great widening of floor S and W. Lake walls 30 feet high, fresh spatter rims over lake 10 feet high. Lake crusted, cracking and foundering spells. SW pond 3 feet down. Break-ups inaugurated by explosive blowing. Central crag and entire SE, S and SW floors tilting southward so that the northern scarp of central crag is now its summit. In like fashion W crag tilting westward and NE floor tilting northeastward and new NW crag tilting northward. Center swelling up. Large northern pond developing. Clear E and smoky W. Excessive micro-tremors on seismographs but not with overflows, rather with extreme bench magma friction.

Table of Measurements (survey sheet). This table is of much interest. It shows that since the strong revival of rising started there was a maximum at first with lake overflowing the bench magma; then there was a decline in the rate of rising for a fortnight, with rise of bench magma strongly dominant over rise of lake magma; next there was a fortnight of steady rising with the net rate increased 61% and the bench magma still dominant; during the last week the lake has nearly reached the bench magma rate and the net rate has increased 5%. The weekly fluctuation of the lake magma rate was much greater than that of the bench magma and during one fortnight was in the opposite direction (May 10-24). The crag movement was more nearly equable than that shown in either of the other columns, suggesting that the bench magma movement perhaps best represents that of the main underground lava column. A single crag does not, however, accurately represent the mean movement of the whole crater floor, which would, if measured at evenly spaced points, give a still more equable rate.

The average of the weekly means for the composite lava column was 2.8 feet per day for six weeks. For the lake the average was 2.5, and for the crag 3.1. The crag thus rose 24% faster than the lake and 14% faster than the imagined composite lava column (mean of crag and lake), while the lake rose 14% slower than the latter.

The upshot of this computation is that the swelling up of the pit floor 3 feet per day since the April rise began has proceeded nearly 25% faster than the rising of the liquid lava, and is now lifting the slide-rock slopes bodily as the circular plug of semi-solid lava pushes upward. The summit of the great central crag is now less than 20 feet below the edge of the pit; its lowest for the period was 152 feet on April 17. Just as the mass sank bodily after the 26th of March, so it is now rising en masse. The accordance with predicted fall after equinox (March 21) and rise before solstice (June 22) has been nearly perfect. A feature of the measurements which throws light on the older records of travellers is that for some weeks past an observer without instruments would have noted a sinking lake, for the inner basin walls were growing higher, whereas in reality both lake and margin were lifting, but the latter a quarter faster.

Day **Friday** Date **May 31, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
12:45p	E	N	0					
		Boulder base N cascade	9 34	11 10	-11			
		N crag	18 54	5 46	-11			
		W crag	50 22	3 53	-12			
		Central crag (old summit)	74 6	1 38	-11	632	20	
		Central crag (new N summit)	71 156	1 26	-11			
		Lake central cove	77 50	13 34	-11	398	97	
		" SE corner	85 48	18 25	-10			

Table of Measurements.

May 24 to 31, 7 days:-

Central crag rose from depression 42 feet to depression 20 feet  
 Lake " " " 118 " " " 97 "

The rate of rising for six weeks, taking the mean of crag and lake as representing net movement of lava column, was:-

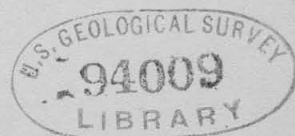
Apr. 19-26,	lake 4.14 ft.,	crag 3.71 ft.,	mean 3.92 ft. daily
Apr. 26-May 3,	" 1.29 "	" 3.14 "	" 2.21 "
May 3-10,	" 1.14 "	" 2.43 "	" 1.78 "
10-17,	" 2.86 "	" 3.00 "	" 2.93 "
17-24,	" 2.71 "	" 3.14 "	" 2.92 "
24-31,	" 3.00 "	" 3.14 "	" 3.07 "

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Hawaiian volcano observatory  
Daily journal

1918

JUNE - DEC.



Day **Saturday** Date **June 1, 1918.**  
           **Sunday**           " 2,       "

June 1.

- 2:00 p.m. From N station.  
 A flow welling up from a wall crack NW and pouring over the slide rock to the wall valley below the old rest house. A blowing cone at the source. The two small northern ponds seemed to be joined together in one pond about 75x100 feet. Two large fountains playing there.
- 2:20 p.m. From NE.  
 There has been caving of the central crag; a large active grotto at its base. SE bench 25 feet above the liquid lava. Frequent falls from the SE bench.
- 2:30 p.m. From E.  
 E channel crusted.
- 2:40 p.m. From SE.  
 SE pond very quiet. SW pond flush with its rim on its S side.

June 2.

- 4:30 p.m. From SE.  
 E arm active with all grottoes boiling. Streaming to the SE grotto with travelling fountains going with the current.
- 5:10 p.m. From N.  
 Lava still flowing from the NW cone. N pond active. Northern side of pit smoky.
- 5:55 p.m. From E.  
 Two falls of portions of the NE bench into lake, followed by a settling down of the whole block about 5 feet. Numerous small flows in S and W wall valleys, those in the latter flowing northward.
- 6:40 p.m. Rock slide NW. Some large rocks falling down the back of the E ledge.
- Alex.
- 7:00 p.m. Marked change appears to culminate recent movement. Crag higher. Lakes relatively low, showing cavern arches at central cove, at cove N side of E pool and strong overhang of inner spatter bench SE pool. Both E and SE pools show inner bench some 8 feet above liquid. Bright trickling stream seen from cone above wall crack base of NW wall. Going around to N rest house find fresh glowing dribble flows on NW floor and brilliantly glowing and flaming cracks at upraised surface NW pond site. These cracks are on N edge of new small NW pool. Next it farther E is a large pool deeply sunken amid surrounding crags. W pond cone has long blue flame in slit in summit and hisses. Another blowing cone W of SE pool about location of recent central pond. Glowing trickle flows on SW floor. Numerous falls into lake reported and movement at various places indicate strong motion going on in bench magma. Activity of streaming, fountaining and glow rims in lake gives the impression of subsidence. SW pond unusually low, its edge some 8 feet high.

T.A.J.

Day **Monday** Date **June 3, 1918.**  
**Tuesday** " **4,** "

June 3.

11:30 a.m. Lake appears somewhat higher. S blowing cone a small stack 4 feet high, still hissing. Driblet flows moving on S floor. Occasional cracking and foundering in the lake and very large fountains in SW pond and at the N and E corners of E pool. Made circuit of pit by E and N. Talus E lifting and in motion. New spatter heap against wall NW hissing and moving trickle flows from wall crack farther W. These flows have come out all along wall crack. Spatter lumps from the NW heap have fallen at site of NW station on high rim and the cliff above the heap is plastered for half its height. W cone blowing and glowing. W crag has lifted on E side of platform of mass so as to create big escarpment. Former SW crag entirely buried and also SW wall slab. W pool of main lake now entirely cut off, a small oval pond. Former S pressure ridge almost completely buried under new flows. The S blowing cone is at the end of a crack which extends through the bench from the E pool on the W side of the SE pond. Much of the steeple remnant has recently fallen. There is a circular pit between the central pool and the N lake and a deep crevassed region between this pit and the old W crag.

June 4,

11:15 a.m. From H.V.O. central crag shows above edge. Bench magma strongly rising; small rock slips S as well as E and NE. Many of these on slope of talus heaps towards wall. Enormous wide crevasses SE and N. Lakes appear low but arch of NE tube submerged. SW pond 3 to 6 feet down; marked subsidence 12:30 p.m. which extended to main lake also. With it eastward streaming, thin skins and turbulent fountaining E, NE and at central cove. Cavern NW side SE pond looks as though headed for central cove. 12:15 p.m. strong flow from W pond cone welling out and spreading between new flows to the W and slope of W crag mass to the E. Lakes sank while this flow bubbled up. NW lava heap over wall crack hissing continuously and appears higher. A heavy driblet flow filling in a belt 50 to 100 feet wide extends from under N station westward clear around outer margin of flow area to about under S station. The lava feeding these flows has welled up wall crack in many places. Thus the western half of pit is weighted and the eastern half is lifting. N face of central crag mass and steeple much fallen away. Summit steadily rising. Marked radial cracks and slope of crag surfaces away from the main lake and away from the N pool. The pools are centers of upward swelling. The radial slopes meet in a sag of NE floor. Large cracks through N crag. NE valley now much below lake level. Glowing cavern leading southward from N pool.

Evening.

Lake higher. Flows on SW floor. Glow at base of S blowing cone. Main lake heavily crusted. Two falls from bank W bridge appeared to rest on a shoal without sinking at once. Violent fountaining when break-ups came. Hissing NW.

T.A.J.

Day \_\_\_\_\_ Date June 3 & 4, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>June 3.</u>								
11:30a	E	Central crag (N summit)		0 50				
		" cove		12 13				
		N crag		4 55				
		W "		4 3				
<u>June 4.</u>								
11:15a	E	Central crag		0 35				
		Lake central cove		12 15				
		W crag		3 25				
		N "		4 40				
Measurements of Dip:-								
		Backslope NE crag mass E end		45°				
		" " " " middle		38°				
		" crag NE side N pond		22°				
		Slope lava heap against NW wall		25°				
		" W of platform W crag mass		25°				

			no	pl	scr	stop	ex	cam
<u>June 3.</u>								
11:30a	SE	SW	1		orange	f/32	1	6½x8½
	"	N	2		"	(US 64)	"	"
	ESE	Center	3		"	"	"	"
	W	NW pond	4		"	"	"	"
	height)							
T.A.J.								

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1918, June

R 25



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509



Jay

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## JOURNAL

Day Wednesday Date June 5, 1918.  
Thursday " 6, "

June 5.

3:00 p.m. From E.  
 Fumes thick. E arm very quiet. Sinking spells about every 10 minutes showing a glow edge around margin of one foot.

3:30 p.m. No fresh lava flow seen in N part of pit. NW cone puffing. N pond quiet. Fume dense.

4-5 p.m. Crag summit down as seen from H.V.O. No changes perceptible as seen from E rim of pit. Inner walls lake 40 feet high, more or less. Point N of channel has fallen away. Central and N coves of E pool pronounced. SW pond 5-foot ramparts. Flows sluggishly moving at SW wall, crack vents and on S floor. NW wall vent hissing. Much smoke from many vents. Alex reports no changes W. No sliding in E talus. One rock fall in SE crevasse. In general, rapid rise seems arrested.

Alex.

T.A.J.

June 6.

5:45 to 7:15 p.m. Pit fummy, much of it coming NW and from bench N side SE pond. Bridge W main lake broken down below, leaving arch about 10 feet high through which rapid stream of lava poured, cascading over ledge about 3 feet higher than lake. Cascade continued for 40 minutes after first being seen. Level of lake becomes higher but inrush continues from SW arm. A stream came in a curve from N side of bridge also. Large open cavern on N side main lake inside of which the lava fountained, making a great noise. Later this became quiet and a large central fountain developed near SE end lake continuing activity for over an hour. Crusts and lava stream poured into it from both W and E. It was still active at time of leaving. Streaming slowly in SE pond toward big grotto SW, which glowed brilliantly. No fountaining. SW pond fountaining and sending up high spray. Steady green flame from S floor cone but no glow seen nor hissing heard. Glowing cone high on S bank main lake. A few small falls of spatter ramparts into lake. About 6:45 a large filagree cone N of W bridge fell into lake in two pieces leaving a raw glowing wall which was still incandescent a half hour later.

I.P.J.

## JOURNAL

Day	Friday	Date	June 7, 1918.
	Saturday	"	8, "
	Sunday	"	9, "
	Monday	"	10, "

- June 7,  
 2:35 p.m. From the N no glow could be seen in N pond there was so much fume but rumbling there could be heard.  
 2:55 p.m. From SE.  
 E arm crusted with only SE grotto active. Fume.  
 3:20 p.m. E arm broke up, then all of main lake, with six fountaining places at margin, and a large central fountain which played every 10 or 15 minutes.
- June 8.  
 3:10 p.m. From SE.  
 E arm active, central fountain continuing activity for about half an hour each time, and strong activity in SE grotto.  
 3:45 p.m. Activity and rapid streaming to the SE grotto started by fall from NE bench.  
 4:25 p.m. Large fall from bench NW side SE pond causing much fountaining. Shortly after the SE grotto collapsed.
- June 9,  
 4:40 p.m. From SE.  
 Wall between the SE pond and E pool crumbling. SE pond and E pool both active. Every 15 or 20 minutes the large fountain in E pool would break into intense activity. Streaming to SE grotto.  
 5:50 p.m. From N.  
 Lava from NW cone flowing eastward in valley. Trickle flows on SW floor.
- June 10.  
 3:10 p.m. From E.  
 Lava in E arm about 5 feet below new bench around it and very quiet. Fumes dense NW. Could hear NW cone blowing, but could see nothing because of the smoke.  
 3:40 p.m. From SE.  
 SE pond full of smoke, no glow could be seen but rumbling there could be heard.

Alex.

Day	Date
Tuesday	June 11, 1918.
Wednesday	" 12, "
Thursday	" 13, "
Friday	" 14, "

June 11.  
 2:45 p.m. From E.  
 Lava in lake down about 5 feet below bench. All heavily crust-  
 ed. Fume thick.  
 2:55 p.m. From E.  
 The whole dome over SE grotto has fallen leaving a straight  
 wall.  
 3:10 p.m. Continuous falls of rock from the sides of SE pit.

June 12.  
 3:15 p.m. From N.  
 N pond completely crusted over. NW cone quiet, with blue fume  
 coming from its summit.  
 4:20 p.m. From SE.  
 SE pond has built a new inner bench. Part of NW bench falling  
 in starts many fountains.

Alex.

June 13.  
 7:00 p.m. With Secretary of the Interior Lane and party.  
 Lakes crusted over and very sluggish. One or two border foun-  
 tains. Breakings up first in main lake with eastward stream-  
 ing, then in SE pit with westward streaming and fountain S  
 side, then in SW pond with fountaining E side. Glow SW and W  
 floors, flame at W grotto (W arm pond). Inner bench 5 feet  
 high around lake. Smoke moderate. No rocks sliding. Every-  
 thing appears stagnant. SW pond slightly higher than main  
 lake.  
 During this period the pit is extraordinarily dark at night;  
 quiet crusted lava.

June 14.  
 6:00 p.m. Much the same. Both lake and SE pond show inner benches. SE  
 cone on floor smoking. Whitish steam on W side NE crag mass.  
 Flaring pale greenish-yellow flame about two feet across from  
 low chimney 6 feet above lake at central cove. NW cone above  
 wall crack and W pond cone on floor both glowing. Activity  
 slight, blowing and spraying fountains occasionally N side  
 central channel and SE corner E arm. Ponds crusted N, NW, N  
 center, main lake, W arm, W pots (rhythmic fountain), SW pond,  
 W pond, SE pond.

T.A.J.

Day **Saturday** Date **June 15, 1918.**  
**Sunday** " **16, "**

June 15.

9:15 a.m.

High lava heaped floor along S and W walls. View of lake cut off from N by raised floors, and view SW pond cut off from E nearly. Much lift of talus. Streaming to NW in SE pond. Some hissing from northern ponds. Activity slight as before. Smoke moderate.

T.A.J.

June 16.

4:10 p.m.

From SE.

E arm quiet but about twenty minutes later the crust began to break up and a few fountains were in action with streaming to the SE grotto.

4:50 p.m.

From N.

N pond fountaining. NW cone blowing but no fresh flow seen on floor.

Alex.



- 1 - Day Tuesday Date June 18, 1918.

4:00 p.m. Slow subsidence continues very gradually. Inner cliffs appear a little higher. Activity is very slight, streaming in long curve of festooned skin on main lake, very slow, from central region to end in bombardment against S bank of E pool. Lakes mostly crusted and no flows or puffing. Floors crusted and cracked. Smoke moderate.

W bridge has by subsidence of lake extended itself into a beach revealed under the central pool which slopes eastward and greatly diminishes the size of that pool. There is a similar wide inner floor on the N side of the E pool.

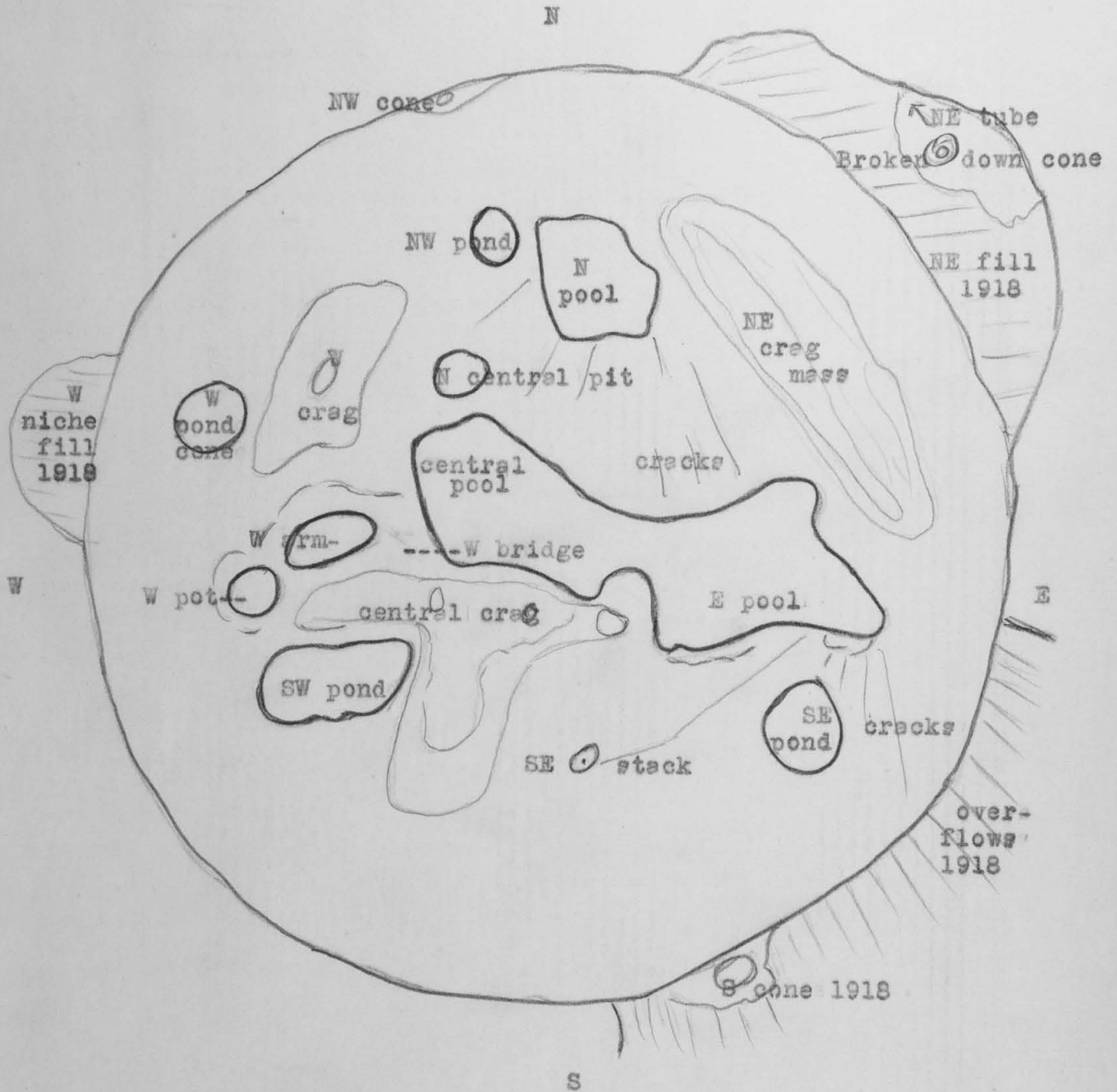
The SW pond is low and shows a cavern from its lava surface northwestward under the isthmus of crust which separates it from the W pot. No activity N or NW pools.

On this day visited the lava cavern or tube leading from the collapsed area of the NE fill of 1918 lava, under the NE station, along the old wall westward toward the spiracles of 1894. This tube was revealed at the time of collapse at the end of March when a lava welled out on the cliff below. It was then red hot inside. It was under the principal vent or cone of the NE fill.

This cave is deep and curves off toward the N station and is still unbearably hot inside. The most interesting feature was the presence of many vermiform stalactites (collected) an inch to 12 inches long, very hot, wholly without water drip, and of the unquestionable wormy or grapevine type. These were formed through remelting by the gases of the tube during the recession of the lava. There were some excrescences on the wall, also of the squeezed or papery type, like the lava barnacles. There were small worm-like excrescences also on the floor protruding vertically. In the marginal shallow portions of the cavern there were stalactites merging with both roof and floor fastened at both ends. The cavern continued for 40 feet more or less and beyond, but on account of the heat could not be penetrated beyond about 25 feet where the longest stalactites were hanging from the roof. There were other rows of vermiform stalactites in an extension of this cavern farther around the collapsed area southward. There was no question of these being true worm stalactites, formed in March 1918 and collected in June 1918. They were too hot to touch with unprotected hands.

Sketch of pit next page.

Sketch of pit:-



T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>June 18.</u>								
4 p.m.	E	Central cove (lake)		16 10				
		" crag		2 10				
		N crag		5 50				
		W "		4 20				
<u>June 20.</u>								
6:30a	E	Central crag		2 50				
		Stump central pinnacle		5 2				
		Central cove		16 20				
		N crag		6 0				
		W "		4 47				
<u>June 21.</u>								
11:45a	E	Central crag		2 50			31	
		" cove		16 45			129	
		W crag		4 42				
		N "		5 55				
<u>June 23.</u>								
5:20p	E	Central crag		2 45			30	
		" cove		16 50			130	
		W crag		4 50				
		N "		6 8				

			no	pl	scr	stop	ex	cam
<u>June 21.</u>								
11:45a	E	shelter to NE wall	1	WM	Goerz screen	f/22.5	1/8	Goerz Stereo
	"	" " N crag	2	"	"	"	"	"
	E	" " central crag	3	"	"	"	"	"
	ESE	" " " "	4	"	"	f/32	"	"
	SE	" " SE pit	5	"	"	"	"	"
	E of S	cone " SW pond	6	"	"	"	"	"

T.A.J.

Day Wednesday Date June 19, 1918.  
Thursday " 20, "  
Friday " 21, "

June 19.  
7:00 a.m.

Lake appears still lower. Some fresh-tumbled rocks on edge of S floor. Streaming eastward in E pool and some fountaining in SE pit. Large central "perpetual" fountain seen in E pool. Smoke moderate, no activity seen N. E talus ridge has sunk somewhat, deep wall gully next it.

Notes. Just where the glassy lava cone of the collapsed area of the NE fill had been, there is revealed light porous lava from below greatly oxidized to a light yellow ochre color like limonite -- i. e. hydrrous oxide of iron -- and it will be remembered that this glossy cone formed during a rainstorm. The wormy stalactites of the adjacent cavern appear covered with hematite.

On this day started laborers at work tearing down and moving up to the Observatory grounds the crater hut of 1912, the Technology Station of the N rim of Halemauau.

June 20.  
6:30 a.m.

Little change. Fountaining center E pool with streaming thither from both E and W and travelling fountains migrating against S bank. Occasional strong fountaining SE pond. Smoke dense NW. Chimney above lake S side central channel. Smoke vent high up E talus developing. Occasional strong hissing SE margin of SE pond.

T.A.J.

4:10 p.m.

From SE.  
SE grotto the only active place in the E pool. This pool remained quiet for nearly two hours when there was a break up, with rapid streaming to the SE and the E grottoes.

5:30 p.m.

From N.  
One fountain in N pond and lava low. Fumes too dense to see NW pond but a sound of rumbling could be heard from that locality.

Alex.

June 21.  
11:45 a.m.

SE floor appears higher than N central region. Latter subsiding with collapse which opened N pool. Marked tunnel NW side SW pond and N side E pool. A little rock-sliding NE wall. Much spatter on walls of main lake. Turbulent fountaining in channel with streaming from both E and W. Inner overhang rim SE pit. Chimneys about 10 feet above lake at central cove and S side of channel. Stump of central pinnacle may be rising. Crusted surface of N pool visible and perhaps higher. NW floor visible from the E and piled high against base of wall just as at the SW. Visited S cone on edge of pit, found it more collapsed on summit, excessively hot inside, the interior coated with deposits of slum. Extensive glossy reddish stalactite accumulations on northern interior of the broken dome. General condition of lava column continues stationary with considerable smoke and few changes.

TAJ

Day	Saturday	Date	June 22,	1918.
	Sunday		" 23,	"
	Monday		" 24,	"

June 22.  
6:00 p.m.

## Solstice.

Lake quiet. Streaming from a fen of crust edge to fountain against S bank. Main and SE pools both higher with reference to inner spatter ledge. Glow renewed at base of SE cone. Active fountaining from time to time E end N lake. Some hissing and spurting from under crusts. Glow from a distance stronger.

T.A.J.

June 23.  
4:10 p.m.

## From SE.

E arm quiet except at the SE grotto. Too much smoke to see N pond.

Alex.

5:15 p.m.

Fall into lake from top of SE bench above S side of E pool. Ten minutes later fall of bank into lake N side of narrows. Lake subsides about a foot with break-up and eastward streaming. Strong bombardment S bank. Prior to this lake crusted, one foot below inner shelf, streaming and bubble fountains to bank at SE corner. Hissing under cavern S edge SE pond continuously. N pool shows glowing edge farther W than yesterday. Glow not so obvious at SE cone, as seen from E, but from S a flaming hole at base of SE cone very conspicuous. Went around pit by E and N. Fumes from NW cone against wall. Glowing and pounding cave with liquid lave on SW side NW pond. Occasional outbursts of fountaining activity E end N lake. W pond cone smoking and a deep glowing and flaming rift on its W side. The SE end of platform of old W crag mass now uplifted into a definite scarp crag. Collapsed oval in NW floor. Fresh-fallen rocks from wall on SW floor. Glowing chimney on S side SW pond, high above pond. Latter streaming E into cavern under central valley. W arm pond an oval glowing quietly under W end of central crag deck. General condition indicates renewed heat.

June 24.  
Evening.

High gas pressure renewed. Ten or more fountains on banks of lake. Glow and flames from cones. Renewal of rising positive.

T.A.J.

Day	Tuesday	Date	June 25,	1918.
	Wednesday		" 26,	"
	Thursday		" 27,	"

June 25.  
8:40 a.m.

Moderate rising gas pressure. Five fountains on margin of main lake. Hissing fountain SE pond. Cavern W end SW pond collapsed to a channel. Smoke greatly diminished. Small movement in talus shows motion. NW pond hissing and possibly W pond cone. Temporary sinking spell 8:50 a.m. with violent bombardment S bank. Streaming to border fountains with building of spatter banks. A crusted round pond N of N lake, apparently.

June 26.  
8:45 a.m.

Fume thin but lake and crags by measurement would appear stationary. Nevertheless the action is that of rising. Occasional small rock slips. Lake rising at 10 a.m. Five or six fountains on banks of main lake. One of these on S bank E pool making a crescent spatter niche. Floor of N lake extended southward and break down of plateau between N and central pools appears to be restoring the old N arm. General conditions unchanged. Occasional break-ups and eastward streaming. Spatter bench of main lake one foot high center, three feet high E.

June 27.  
4:00 p.m.

Lake and crags down, though lake looks higher and has constructed new spatter bench and shows fresh festooned overflow on older inner spatter bench N of channel. Evidently bench magma has sunk faster than lake magma. Glowing chimney with round hole 8 feet above lake at S side of the E pool. Some continuous central fountaining, four or five fountains on bank, one of them building crescent cone N side of E pool. Increased fume. Crack extending from under S station in WNW direction toward SW pond, due apparently to subsidence and breaking away of central and SE crag masses from new SW flow bank.

T.A.J.

4:45 p.m.

From SE.  
Both E arm and SE pond very active; high spraying fountains

6:10 p.m.

From N.  
Good view of N ponds in which there were several fountains. W pond cone blowing, with occasional flings of lava spray.

Alex:

KILAUEA DAY SHEET

Day \_\_\_\_\_ Date June 25, 26, 27 & 29, 1918

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>June 25.</u>								
8:40 a	E	N	0					
	N	W	0					
	E	N crag	19 26	5 58	-13			
	N	ditto	39 44					
	E	W crag	50 20	4 36	-12			
	N	ditto	10 40					
	E	Central crag	70 19	2 37	-12	644	31	
	N	ditto	33 45					
	E	Central cove	77 14	16 44	-12	428	130	
	N	ditto	49 44					
	E	Central pinnacle stump	76 10	5 24	-12			
	N	ditto	37 ca					
	N	NW cone	-31 48					
<u>June 26.</u>								
8:45 a	E	(Transit) Central cove		16 46			129	
		" crag		2 39			29	
		West "		4 26				
		North "		5 58				
<u>June 27.</u>								
4 p.m.	E	(Brunton) Central crag		3 05			34	
		" cove		17 05			131	
		W crag		4 50				
	N	"		6 22				
<u>June 29.</u>								
12:40p	E	(Brunton) Central crag		2 50			31	
		" cove		17 00			131	
		W crag		4 55				
	N	"		6 40				

			no	pl	scr	stop	ex	cam
<u>June 26.</u>								
8:45 a	E	Central crag	1	W M	Goerz	f/22	1	Goerz Stereo
	"	" "	2	"	"	f/16	"	"
	"	looking S	3	"	"	"	"	"
	"	" N	4	"	"	"	"	"
	"	" Mauna Loa	5	"	"	"	"	"
	S of E	" NE	6	"	"	"	"	"

T.A.J.

Day Saturday Date June 29, 1918.  
 Sunday " 30, "

June 29.

12:40 p.m. Strong eastward streaming main lake. Two spatter heaps building S side E pool, two more N side (one large). Central pool constricted by building of marginal shelf inward. Fleming chimney 5 feet above central cove. Bombardment S side SE pond, which is level with inner shelf. Bombardment W end SW pond. Fumes moderate. New heavy festooned overflow around E depression of N lake. Noises pounding and hissing from border grottoes. One migratory central fountain seen during sinking spell of one foot depression of main lake. Deep toned cracking noise heard in E ledge. SE ledge now covered with Pele's hair. Rising activity indicated.

June 30.

3:30 p.m. Pit more smoky. Crags appear lower. Lake active and spattering against banks and streaming. Large travelling and bubble fountains migrate to N corner E pool. SE and main pools 2 feet below inner shelf.

T.A.J.

4:50 p.m. From E.  
 Lava about 40 feet down below S bench. E arm active with many fountains. Fumes dense NW.

Alex.

Day	Monday	Date	July 1, 1918.
	Tuesday	"	2, "
	Wednesday	"	3, "
	Thursday	"	4, "

July 1.

Morning.

Lake reported low with deep overhang under inner bench all around and much smoke.

July 2.

3:45 p.m.

Lake up, crag down. Inner shelf around lake wider and covered with fresh overflow and spatter domes. Chimney at central cove not so high above lake level. Much smoke. Fountaining strongest against N banks of SE pond and E pool; fountain also S bank E pool. Streaming in broad zone eastward. Made circuit of pit E and N. No activity except smoke at NW cone. Hissing somewhere WNW. W pond cone smoking strongly. Active break-up with bubble fountaining seen in W arm pond. SW pond streaming eastward; fountaining N bank. A new glowing chimney hole, with yellow margins, flaming probably, in rock tumble under S side central crag mass E of SW pond and W base of pinnacle; i.e. over central valley tunnel.

Triangular area collapsed next wall in SW flows. A black cavern of collapse in swollen flows S of S crag. No glow seen at SE cone.

July 3.

Fume much thinner as though lake were rising.

July 4.

Noon.

Rising N, sinking center. Fresh overflows N and NW pools. Puffing at N lake. Fume much thinner NW, thicker SE and W of center.

Main lake streaming from E and W, meeting of currents at central channel, sometimes large fountain there; bombardment N bank. Bombardment also central cove. Chimney only 4 feet above bench there. Lake 2 feet below bench which overhangs. SW and SE ponds about as usual, some overhang of inner benches. Some sliding S talus. Noises splash, puff and rumble. No action NW cone.

T.A.J.

## KILAUEA DAY SHEET

Day

Date July 2, 4 &amp; 8, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
July 2.		Brunton.						
3:45p	E	Central crag		3 00			33	
		" cove		16 45			129	
		W crag		5 05				
		N "		6 50				
July 4.		Brunton						
Noon	E	Central crag		3 17			36	
		" cove		17 14			132	
		W crag		5 20				
		N "		6 20				
July 8.		Location of new stations.						
	Old N	W		0				
		New E		83 18				
		" SE		60 51				
		" S		37 59				
		" SW		15 42				
		" W		- 6 55				
		Old S		48 34				
			no	pl	scr	stop	ex	cam

T.A.J.

Day	Friday	Date	July 5, 1918.
	Monday		" 8, "
	Tuesday		" 9, "
	Friday		" 12, "

July 5.

10:05 a.m. Around pit by E and N. No marked changes. Several fountains and shore building in main lake. New spatter dome visible NW shore of N lake. Bombardment and hissing SE corner SW pond. Strong hissing and dome built on inner shelf N corner of E pool over NE tunnel. Fume moderate. The S cone on the high edge of Halemaumau had fallen into the pit on its N side.

July 8.

3:30 p.m. Smoke moderately dense, especially N. Hissing from N lake. Main lake streaming W with numerous fountains. Vigorous fountaining S side SE pool which has completely overflowed its inner ledge and so appears higher. Main lake 3 feet below its inner ledge. NW pond 5 or 6 feet down its pit. SW pond appears 4 or 5 feet below its inner ledge and pounding on SE side. W arm pond low and glowing quietly. Hot smoking sulphurous spots in NE and E talus and E crevasse. Smoking sulphurous cones SE, on ledge W of W arm pond, at W pond cone, in N central region and in various places near northern ponds.

July 9.

11 a.m. Streaming in main lake in broad zone of festooning skin westward from central channel, rushing under N bank of central pool. Sometimes bombards NW bank of E pool. Fountain bombardment most all the time inward at central cove (SW side of E pool). Slight hissing N, fume thin, occasional very slight movements of talus N and E. Main lake 2 feet below inner bench. Conditions appear stationary.

July 12.

11:30 a.m. Slow subsidence apparently. Dense fume SW, W and N, moderate E and SE. Streaming W continues. Four or five border fountains. Lake 3 to 4 feet below inner bench and a second newer rim half way. Fresh break downs at central steeple, NE crag mass, W side NW pond, E side W crag. N and S peaks of central crag mass on same level. Wrinkled satiny skins streaming W from central channel. Streaming against bank N side central pool. E pool crusted. Smoking cone on bench N side E pool. Two fountains under central crag, one at central cove. Fountaining caverns under N and SW sides SE pond, 4-foot inner bench. SW pond has high inner bench. Sulphur stained area above E end main lake. SE cone stained.

4:30 p.m. Lake relatively much higher, overflows of inner bench central, eastern and SE pools. Numerous puffing marginal fountains.



Day	Date	July 14, 1918.
Sunday		
Monday	"	15, "
Tuesday	"	16, "
Wednesday	"	17, "
Thursday	"	18, "

July 14.

3:30 p.m. Main lake streaming eastward. Fountaining as usual. Inner bench 3 to 4 feet high. Some rock-sliding S talus. No fountains visible in N lake from SE.

July 15.

7:45 a.m. Walked around pit by S and W. Lakes high and overflowing inner benches; puffing and splashing border fountains forming crescent niches. Six fountains in main lake, two or three in SE pond. SW pond crusted but fountaining in S corner. Two fountains visible in N lake, one in NW pond. Streaming eastward from central pool. Main lake greatly extended westward by overflow. Very hot-looking smoke rising from W pond cone. General condition rising lake magma, but no sign yet of rising crags. Two glowing holes NE cove (N cove E pool).

1:30 p.m. Lake changed to sinking, inner bench became 5± feet high.

4:30 p.m. Streaming now westward and inner benches 3 feet high. Fountaining violent N side central pool and occasionally in the other pools. E pool crusted but cracking and foundering in SE corner. More smoky.

July 16.

10:30 a.m. Lake streaming W and N. Inner benches generally 3 feet high. Light puffing N. Fountaining ordinary. One glowing hole NE cove. Streaming northeastward in SE pond. W arm and SW pond low; southward streaming in latter. Heavy fall of spatter bench N side of E pool. NW cone against wall has split open and parts fallen down.

July 17.

7:15 a.m. Lake 5 feet down. Fume rather thin.

9 to 10 a.m. Lake level with inner bench. Everything about the same as previous day.

12:30 p.m. Lake down about 3 feet. Numerous border fountains spurting and puffing with gas pressure. Streaming W?

July 18.

5:30 p.m. No change. Westward streaming. Four or five border fountains main lake. Bench 3 feet high. Glow hole NE cove. No fountains visible in N pools from SE. SE pond crusted. Hissing noises from some of the grottoes. SW pond appears relatively higher than of late. Smoky.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
Transit survey for location of new stations. (Three readings)								
10:30 a.m.								
1st.	N	W	00 2	-0 42	-5			43 in N
2nd	"	"	00 0	-0 36	-4			
3rd	"	"	00 0	-0 39	-4			
( - = angle of elevation)								
1st	N	New SE	61 8	-0 16	-10			
2nd	"	" "	61 10	-0 21	-12			
3rd	"	" "	61 9	-0 20	-11			
1st	N	New E	79 155	+0 12	-11			
2nd	"	" "	79 163	+0 12	-11			
3rd	"	" "	79 141	+0 12	-11			
( + = angle of depression)								
	E	Central crag		3 53	-10	644	45	
		" cove		18 30	-10	428	144	
		W crag		5 19	-10			
	N	" "		6 58	-10			
T.A.J.								
			no	pl	scr	stop	ex	cam

Day	Friday	Date	July 19, 1918.
	Sunday	"	21, "
	Monday	"	22, "
	Tuesday	"	23, "
	Wednesday	"	24, "

July 19.

Morning.

During morning lake appeared rising from 7 feet below shelf to 3 feet below shelf. No evident streaming visible. Lake mostly crusted over. After 11 a.m. subsiding again. Puffing N. SE pond appeared 10 feet below inner shelf. SW pond crusted over. Smoky. Only fountaining in main lake was at central cove.

T.A.J.

July 21.

4:35 p.m.

From E.

E arm very quiet. Lava about 5 feet below inner shelf.

4:45 p.m.

Breaking up of crust with streaming to NW.

5:30 p.m.

Prolonged rock slide NE, followed by several smaller ones.

July 22.

9:50 a.m.

From SW.

A few fountains in SW pond.

10:00 a.m.

From SE.

E arm 5 feet down and very quiet and crusted. One fountain in SE pond, lasting for a short time only.

July 23.

8:00 a.m.

From SE.

Lava in E arm down 8 feet. Five border fountains in action. Streaming to the NW grotto. SE pond active, with a large fountain playing in the middle.

Alex.

July 24.

9 a.m. to 12 noon. SE, E and N platforms completed. Finish W platform today.

Lava continues stationary. Sluggish bubble fountaining and some central fountaining, and cracking and foundering in main lake. Streaming against N bank. Bubble fountaining E side N lake, and SE side W arm pond. Occasional violent fountaining S side SW pond. Inner bench 4 feet high SE pond and E pool; 2 feet high central pool; as though E bench magma rising (or central bench magma sinking.) Some puffing noise in fountains of W and SW. Greater part of central pool area is a floor, eastern half only is open. Fountaining is against N side of channel.

T.A.J.

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Day	Date	July 25, 1918.
Thursday	July 25,	"
Friday	" 26,	"
Sunday	" 28,	"
Monday	" 29,	"
Wednesday	" 31,	"

July 25.

- 4:30 p.m. From E.  
Lava 2 feet below inner bench. All the border grottoes active. Streaming toward SE. SE pond very active.
- 5:20 p.m. From N.  
About six fountains in N pond and a few active grottoes. Smoke dense here.

Alex.

July 26.

- 9:30 a.m. Building S station.  
Lake relatively high, 1 foot below inner bench. Puffing fountains changing position and building spatter ramparts; four or five of them in main lake, two in SE pond. SW pond stagnant. Smoky and rainy. Evidently another spasm of relatively rising lake magma in the series of alternations which has been the rule of late: crags sink, lake rises; lake sinks, crags rise.
- Afternoon. Collapse of SW side of SW pond.  
Flame on margin SW pond as seen at night.

T.A.J.

July 28.

- 4:50 p.m. From E.  
E arm 1 foot below inner bench. NW part of E arm quiet but active in the N grotto and in two small grottoes at base of central crag. Many fountains in N pond and much fume.
- 5:10 p.m. Subsidence of about 3 feet with active streaming northward.
- 5:50 p.m. Rapid rising, in 20 minutes lava was level with bench all around and began to overflow NW a little.

July 29.

- 9:45 a.m. From E.  
Lava 1 foot down. Five active grottoes along S margin, rest of pool covered with thin skin. One fountain in SE pond which is about 4 feet down. N pond active and level with bench.
- 10:30 a.m. Large slide of rock from under old S station.

Alex.

July 31.

- 6:00 p.m. N lake and NW pond appear higher from SE and both active. Large cone on S bank N lake with blue flame. General aspect of activity main lake shows high gas pressure, five spurting fountains at inner bench level. Break up and collapses of bank N and W making rapid steaming W. Before that the streaming against N bank. Glow in SE cone and in cone at N corner E pool. SE pond as usual, some blowing fountains. Bright glow in SW pond. Fountaining in NW pond. Fume rather dense.

T.A.J.

KILAUEA DAY SHEET

Day **Friday**

Date **July 26, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9:30a	E	Central crag		4 9	-8		48	
		W crag		5 37	-11			
		N "		7 22	-9			
		Central cove		18 26	-8		143	
								T.A.J.
			no	pl	scr	stop	ex	cam

Day	Thursday	Date	August 1,	1918.
	Friday		" 2,	"
	Sunday		" 4,	"

Aug. 1.

5:30 p.m.

From E.

Lava 1 foot below inner bench. Lake very quiet until about 6:30 p.m. when there was a general breaking up in the E pool with steaming toward the NW grotto and activity in all the grottoes. SW and N ponds active at the same time but the SE pond was very quiet.

Alex.

Aug. 2.

Noon.

Moulded concrete post at new E station.

Pit rather smoky. Lake active and high relative to its inner bench. Crags and floors have slowly subsided so as to make lakes relatively higher. SW pond visible from SE rim; NW and N lakes both visible. A block of crag appears to have fallen E of N lake and stands as a pinnacle. Four or five fountains in main lake flush with bench. Considerable spatter grottoes built around central cove. SE pond nearly circular and appears somewhat higher and has narrow inner bench of even width all around about 1 foot above liquid. Increased fuming. Cracked and stained areas around W pond cone and above S bank of SW pond on the edge of the pond's inner pit.

T.A.J.

Aug. 4.

4:50 p.m.

From E.

Lava in E arm level with bench around it. Two grottoes active on S margin. SE pond quiet.

5:30 p.m.

From N.

Activity in both N and SW ponds with many fountains boiling and rumbling.

6:00 p.m.

The whole of N pond broke into activity.

Alex.

- 3:30 p.m. Both lake and crags have risen rapidly. Central crag much higher than three days ago and NE crag ridge appears more tilted back and parting from the central floor crag along a crack which extends from the NE cove to the N lake. It looks as though strong tumescence in the center of the pit had started again so as to lift up the three sectors of bench magma and tilt them away from the center. There are uplifted inner benches around the main lake. The block of crag and talus under the E station has been lifting and warping outward towards the center of the pit, for the ESE talus gulch has deepened along the wall crack. The W crag mass appears lifted, cutting off the view of the W pond cone from the E station. A most conspicuous effect of the uplift of the central crag mass and adjacent floors is the breaking down of the partition between the SE pond and the E pool, leaving only a low saddle separating them. Crumbling was still going on and rocks falling there. The evidence of strong rising of the lake magma was most conspicuous at the SW pond which had just overflowed its S bank, flooding the region of the W end of former S pressure ridge. Slight subsidence of about a foot had succeeded the overflow. This overflow, it should be noted, crosses what was, on August 2, the fuming cracks at the upper verge of the inner pit of that pond. On account of smoke little could be seen of the northern lakes, but they appeared to be larger than before. The SW pond was fountaining in high spurts at its S margin, the main lake at the central cove and the NE cove, and the SE pond on its S side. Streaming in the main lake was eastward. The lakes were mostly covered with rather stagnant blistering and ballooning slins. The fumes have been thin for three days.
- Evening. Point N of central channel collapsed.

T.A.J.

- 6:30 p.m. From E.  
About 20 feet of the N bench of the E pool fell into the lake starting many fountains.
- 7:10 p.m. A fall of bench into SE pond.

Alex.

Day

Date Aug. 2 & 6, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Aug. 2.</u>								
Noon	E	Central crag		4 25	-10	644	51	
		" cove		18 49	-10	428	147	
		W crag		5 49	-10			
		N "		7 41	-10			
<u>Aug. 6.</u>								
11a.m.	E	N	0					
		Central crag	71 36	-0 46	-5			
		W crag	50 23	2 3	-10			
		N "	17 47	2 38	-10			
		Central cove (slab 6 ft. over lake)	79 1	9 38	-8			

			no	pl	scr	stop	ex	cam
<u>Aug. 6.</u>								
12:30p.	New E	NE (panoraph)	1		8x	f/11.3	1/2	P
	" "	NW "	2		"	"	"	"
	" "	W "	3		"	"	"	"
	" "	SE pond	4		"	"	"	"
	" "	SE "	5		"	"	"	"
	New SE	E pool "	6		"	"	"	"

T.A.J.



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Day Tuesday Date August 6, 1918.  
Wednesday " 7, "

Aug. 6.

11:00 a.m.

All the effects noted yesterday continue with increase. The central crag in the morning was in full view from Volcano House. Seen from the new S station this crag was now well above the edge of the pit. The central tumescence was proceeding very rapidly and there was a fresh flow which had poured from the N end of the N lake along the base of the talus into the NE valley. The tilting away from the center was augmented by rapid subsidence of the wall valleys E and NE, both of these places now being well below the lake levels. The inner benches have been lifted faster than the lake could rise to keep pace with them. There was much sliding and tumbling in the notch between SE pond and E pool. Fountaining was moderately tumultuous and the SW pond during the day showed cracking and foundering spells with crusting over in the intervals.

Cast S station post on this day.

Aug. 7.

1:00 p.m.

Rising of the bench magma has continued very rapidly. All the crags tower high and are tilted over backwards chaotically and the sinking of the wall valleys was going on so continuously that the talus was slipping all around the E and NE cliff bases. The uplift has almost wholly cut off the view of the lake from the E station. The fresh flow of NE valley shows slumped crusts. The view of the northern and western ponds is now entirely cut off from the eastern stations and the crag at the E end of the N lake is nearly on a level with the N crag by uptilt. In like manner the crag overhanging the NE side of the E arm shows great overhang on the lake side and is becoming a very conspicuous scarp. A similar scarp has developed on E side of the SE pond tipping away from the new notch between the two pools and that notch continues to widen and crumble with an unstable pinnacle poised in its midst. The central crag block has moved up, parting from the block next S of it, and the fault chasm emerges on the central cove side. The activity of the lakes is of the usual blowing, spurting and blistering type, such as commonly accompanies rising. There was strong streaming against the bank on the S side of the E pool and also northward at the NE cove. Smoke was not as yet greatly diminished.

T.A.J.

Day **Wednesday** Date **August 7, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
1 p.m.	E	Central crag		-2 02	-16			
		W crag		+0 59	-16			
		N "		+1 07	-16			
		Lake under N bench of )		6 40	-16			
		central crag mass. )						
		Spot on wall 20 feet )		6 48	-16			
		above lake central cove. )						
								T.A.J.
			no	pl	scr	stop	ex	cam

Day Thursday Date August 8, 1918.

3:10 p.m. Made circuit of pit by E and N. Deep wall valley of recent depression ESE full from below to nearly lake level and a vent hissing on surface of crusted fill. Crag all tilted higher. Inner N crag higher now than outer. This crag and W crag visible from H.V.O. in addition to central crag and central steeple. Steeple becoming conspicuous again. Pin-nacle in middle of notch between SE pond and E pool high still. New fill in S valley extending to beneath new S station and coming from SW wall cracks. Puddle of fresh lava under N station apparently from wall valley vent near NW wall cone. Latter hissing. N lake cracking and foundering. Dense white smoke rising from crack W side N lake. Pool of fresh lava up wall crack under new W station, cracking and foundering. Smoking pit probably full of lava where W pond cone had been. S end of W crag mass upraised into a scarp dipping W; mass N of central channel raised into a scarp dipping N; a new SE crag scarp E of the notch between SE pond and E pool; in general all features strikingly repeat the tumescence of February last. The NE crag mass again a long wall tipping northeastward and the E end of it a new E ledge cutting off view of lake entirely from E station. All the wall cracks gaping and talus in motion everywhere. SW pond 2 or 3 feet below bench. Main lake heavy folded crusts; blisters; inrush to bank S side E arm, also N side occasionally with much tumult. Upraised spatter rims, inner pit of main lake deeper than ever. Most extraordinary up-lift in rapid progress of a crag with edge trending E-W extending from E ledge to under new E station; top of it only 30 feet below E station and tilting back to the N leaving a rock filled gulch between it and the SE crag. This gulch is an extension of the E cove of the lake where there is a small fresh overflow over the rocks. It is again the old E gulch. The W arm pond not seen through smoke, but it appears to extend into a gulch also extending to W wall at a point S of old W station -- near old W pond. Everywhere central tumescence, quaquaversal dip, a dome rising, lava welling up wall cracks, lakes rising also but prevented from overflowing by the faster rising of crags.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:10p	E	N	0					
	N	W	0					
	E	Central crag	71 41	-2 51	-16	644	29'	above rim
	N	ditto	84 7					
	E	W crag	50 27	+0 11	-16	634	6	
	N	ditto	10 8				2	
	E	N crag	17 0	-0 4	-16	552		
	N	ditto	45 6				2	
	E	N inner crag	26 42	-0 28	-16	480		
	N	ditto	47 22				14+	
	E	E ledge	74 10	3 39	-16	208		
	N	ditto	64 55					
	E	Spot 30 ft. above lake E cove	80 42	+4 28	-16	402	34	
	N	ditto	50 40	ca				
	E	N central ledge	50 46	+1 40	-16	376	13	
	N	ditto	51 25				00	
	E	Central steeple	74 44	-0 16	-16	448		
	N	ditto	46 32				4	
	E	S scarp W crag mass	58 52	+0 28	-16	601		
	N	ditto	17 15					
	E	SE crag	106 10	+3 25	-16	312	20	
	N	ditto	61 21					
		Depression of lake 62 feet.						
			no	pl	scr	stop	ex	cam
	New E	N	1		8x	f/10	1/2	P
	" "	Center	2		"	"	"	"
	" "	S	3		"	"	"	"
	S of) new E)	New pool in E valley	4		"	"	"	"
	SSE	Lake	5		"	"	"	"
			6		"	"	"	"
	New SE	S valley new fill						

T.A.J.



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Day Friday Date August 9, 1918.

Saturday " 10, "

Aug. 9.

9:00 a.m.

Rising continues. Trickling toes at Margins of valley fills. Central steeple and whole of inner and outer N crags as well as central crag mass visible from H.V.O. and in evening long ridge of NE crag mass visible.

Cracking and foundering in lakes from time to time with escape of gas and temporary rapid subsidence of 2 or 3 feet. Violent hissing and spurting of fountains at such times; in N lake, in main lake against S or NE banks; in SE pond against S bank, in SW pond. Slides numerous, especially from rising scarp under E station.

11:00 a.m.

About this time lava spring with great liquidity and spurting broke through large talus blocks of wall crack under old N station and rivulet poured E along base of wall making a new fill on NE side of NE valley. Dense fume was rising at N lake at 9 a.m., but by 11 a.m. the fume was very thin there.

The motion of lift of the crags has been gradual all through this week, but more rapid at times.

The principal streaming is in a curve from central pool through channel E and then S against a grotto E of central cove and under the saddle and pinnacle separating E pool and SE pond.

Aug. 10.

9:30 a.m.

Made circuit of pit by S and W. Increase of wall-valley fillings; trickling in many places. New W cone developing on floor SW of W arm pond. Overflow stream from S margin SW pond. Cascade from NW wall cone into NW valley. Much fountaining W side W arm pond. Cavernous grottoes at margins N and NW pools. NE valley fill cracking and foundering. All the crags uplifted away from the center and much sliding of talus adjacent to the crags indicating motion. Lava splashing in crack N side of N lake. Main lake streaming into S grotto and NE cove commonly, but sometimes westward streaming in E pool develops, opposing the main current and making travelling fountains at narrows. Remarkable crag uplifted athwart SE end of NE valley with scarp facing SE and strike at right angles to main E ledge. This must be the uplifted crag remnant of one of the old E crags, or the E gulch flows of last winter. Hissing at wall crack cones N, NW, W and SE. Lakes occasionally crack and founder and sink a few feet with violent fountaining. Main lake rose and overflowed its E end making cascade down to SE wall valley fill. Ribbon cascade pouring into latter eastward from a higher vent nearly under new SE sta. When pressure became strong beneath glowing crust of this SE fill bright blue flames played over the surface of the crust as though gas were escaping irregularly through pores. A few of these flames bright yellow. The flames were not at fixed cracks but played over dark surfaces of the lava away from the glowing cracks. There were four or five large grottoes building spatter cones around lake. Trickle flow poured out from under wall valley fillings. Cones broke into spurting eruption occasionally along wall crack NW, N and SE. The rising continues without cessation.

7:00 p.m.

## KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day **Saturday** Date **August 10, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Location of new stations.</u>								
9:30a	Old W	Old N	360					
		New SE	297 37	+16	-2			
		" S	272 32	1 22	-5			
		" SW	252 0	3 09	-4			
		" W	64 30	-0 54	-17			
		" NW	30 00	+10	-17			
		" E	317 54	+0 54	+2			
		" N	7 20	+0 44	-16			
	Old W	Lake S cor. SW pond		6 02	-12			
		S crag		2 24				
		Central crag		-2 34				
		W scarp		2 8				
		W crag		0 54				
		N central crag		0 50				
		N crag		0 30				
		N inner crag		-1 0	-8			
	Old N	Old W	360					
		New W	356 30	-0 48	0			
		" NW	330 06	-0 16	0			
		" N	308 01	3 19	0			
		" NE	100 13	2 23	-5			
		" SE	61 12	-0 14	-5			
		" E	79 19	+19	-5			
		" SW	16 0	+0 10	-4			
			no	pl	scr	stop	ex	cam
	New W	NW cone	1		8x	f/11	$\frac{1}{8}$	P
	" "	N lakes	2		"	"	"	"
	" "	Center	3		"	"	"	"
	Old N	NE valley	4		"	"	"	"
	" "	NE crag mass	5		"	"	"	"
	" "	W crag mass	6		"	"	"	"

T. A. J



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709

Day Sunday Date August 11, 1918.  
Monday " 12, "

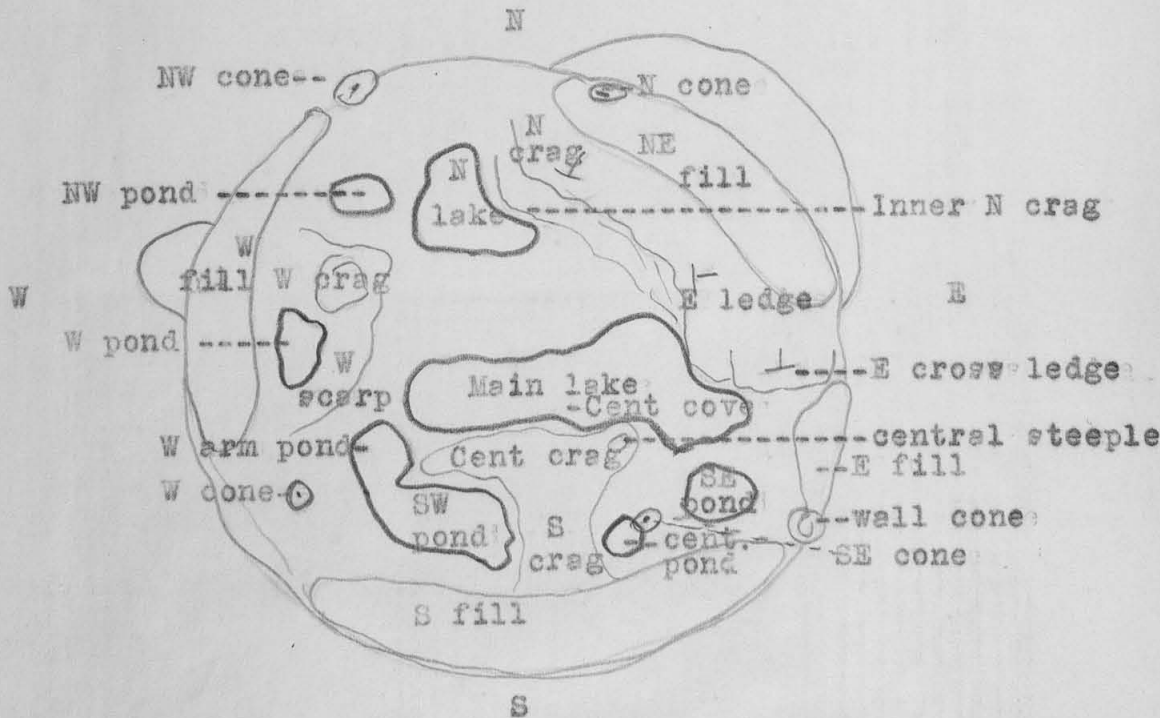
Aug. 11.  
9:45 a.m.

Craggs still higher. Trickle in wall valleys. E cross ledge sliding. Lake building large S and NE grottoes. SE pond higher and with widening inner bench. New circular depression developing around SE cone at former central pond locality. Crack extending out from it southward just as before. Streaming southward in SE pond. Eastward and southward in main lake. Long crack extending from SE cone depression nearly straight to SW pond. This probably surmounts S tunnel. NE crag mass again becoming nearly upright wall, whole length in full view from H.V.O. N wall crack cone spouting continuously a cascade of lava pouring eastward. SE wall crack vent flowing sluggishly. Activity as before. High gas pressure. Fifty foot cliffs over lake. N inner crag now tilted up much higher than old N crag. Fume thinner. Lake appears about 60 feet down.

Aug. 12.  
10:00 p.m.

N cone spurting. E cross-ledge sliding. Bombardment main lake NE and S. Streaming to S. SE pond streaming S. Filagree flaming cone S side SE pond and 6-foot banners of flame S grotto of E arm. Great uplift of crags continues. Wall valleys filled higher. Central pond again revealed next to SE cone as a circular depression.

Plan of pit from S, Aug. 12-13, 1918:-



T.A.J.

Day	Tuesday	Date	August 13,	1918.
	Wednesday		"	14, "
	Thursday		"	15, "

Aug. 13.  
6:00 p.m.

Glowing filagree cone flaming high S wall SE pond. Strong rising continues. Made circuit of pit by S and W. SE pond has overflowed to SE wall fill. Grottoes with stalactites NE cove and W side SE pond. Large grotto S side E arm. Tunnel apparently under NE side SE pond. Central uplift and quaquaversal slope greatly marked at the W and SW. Hot fillings glowing all around wall crack except W and E. S fill has recently been supplied by overflows of SW pond. Latter fountaining violently against S bank. W cone a low flat arched dome glowing inside. SW pond connected through SW channel with W arm pond. W valley ponded fill flat and glowing. W pond a deep chasm active within. View from W shows remarkable dome effect of whole quaquaversal with the glowing lakes wholly concealed from view within the great rampart surrounding them. The crags very unstable, many slides from them. NW cone built high against wall and flaming and hissing. N and NW ponds very active. Great cone of horseshoe form throwing out lava which sinks beneath crust of NE fill, under old N station. NE fill flat and only 30 feet below wall of March fill. Lake appears no more than 30 feet below rim of pit. Lake surface ballooning and streaming from E and W to S.

Aug. 14.  
Evening.

Strong flow whole length NE valley from NW, raising level of fill to within 15 feet of former NE fill. Crags continued rising. About this time also further overflows into E fill from SE lake and into S fill from SW lake.

Aug. 15.  
11:30 a.m.

NE fill high and NE crag mass in motion, slides down its backslope. N cone low and hissing. NW cone built up to the level of brink just W of old rest house, with several glowing, hissing and flaming orifices. Spatter from it on edge pit. Fill below higher than NW fill which stands at a level 15 feet, more or less, below, with a slope between. Crags still higher, central crag cut off from view E sta. by E ledge. SW pond 2 feet down, main lake and SE pond 3 or 4 feet down; activity moderate. E fill has collapsed crust about 6 feet below maximum level. E of old E station the NE fill only 15 feet below NE fill of March and at new S station the S fill only 20 feet down. Today crags stationary and activity less for first time since rising spell began.

T.A.J.

KILAUEA DAY SHEET

Day

Date Aug. 11, 13 & 15, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Aug. 11.</u>			Brunton.					
9:45a	Old E	Central crag		-4	10			
		W crag		-1	20			
		N inner crag		-3	15			
		N crag		-2	28			
		E ledge		-2	28			
		N central crag		-1	15			
		SE crag		+2	20			
	New SE	NE cove grotto		+6	20			
		NE end SE pond		+14	15			
		S end SW pond		+4	20			
		Central steeple		-1	0			
<u>Aug. 13.</u>								
6 p.m.	New SE	NE grotto		+4	52			
		NE edge of SE pond		10	45			
		Central crag		-6	3			
		Inner N crag		-2	15			
		E ledge		-1	22			
		Central steeple		-3	53			
<u>Aug. 15.</u>								
11:30a	Old E	N crag		-3	25			
		Inner N crag		-5	5			
		Summit E ledge		-7	52			
		Lava fill directly under old N station		+1	55	750	24	
	Old W	Central crag		-5	40	582	60 up	
		W crag		-2	51			
	New SE	NE grotto		4	0		30	
		NE end SE pond		10	5			

			no	pl	scr	stop	ex	cam
<u>Aug. 15.</u>								
	Old E	N crag	1		8x	f/11	1/8	P
	"	N E	2		"	"	"	"
	New N	N lake	3		"	"	"	"
	NE fill	NW cone	4		"	"	"	"
	New NW.	SW	5		"	"	"	"

T.A.J.



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509

Day **Saturday** Date **August 17, 1918.**  
**Sunday** " **18, "**

Aug. 17.

6:30 p.m. Wall cracks S and E have slumped and the fills have swollen in schollendome fashion, this being the main remnant of rising going on. The swelling was strong in NE fill and lava flows were pushing from under the crust at its E end and around the sides. NW cone hissing and flaming, the gas pressure lifting solid. N cone also hissing. Fountaining in the northern ponds. Main lake low with tunnel in N cove. Eastward streaming and rather inactive. Back of NE ledge sliding.

T.A.J.

8:30 p.m. From SE.  
 SE pond and E arm nearly level with surrounding bench; several fountains in action in each of these.

9:20 p.m. From E.  
 Lava flows pushing out in fifteen or twenty places in NE fill, some being quite broad and steady.

9:45 p.m. From N.  
 Lava shooting out from top of NW cone 25 to 50 feet into the air. Many small flows under W station. SW pond brimming.

Alex.

Aug. 18.

3:20 p.m. Swelling of marginal fills continues; especially notable in NE fill, general level of which is flush with lower portions of NE shelf. NW cone continues puffing and flaming. No activity noted in W fill, still slightly below N fill. S fill somewhat higher by swelling with steep downcurving slopes from it into the wall crack. The wall crack vent SE now a depression of collapse. The E fill now a marked depression with irregular slumped crusts for floor. Main lake now relatively down, perhaps due to slow rise of crags. S and E grotto heaps 10 or more feet above liquid. Tunnel grottoes NE cove and W side SE pond. Streaming E and S. Penetrated among crags of N lake crossing N fill without difficulty and found only tumbled rocks and both N and NW ponds small and inactive, 6 or 8 feet below their margins. Floors of the wall valley fills now easily accessible in many places 10 to 30 feet down. Balloons of crust and sudden heavings N side of main lake. Trickle flows around margins of NE fill as before.

T.A.J.

5:20 p.m. From SE.  
 E arm about 5 feet down and active. Large piece of NW wall of SE pond fell in starting many fountains. Main lake very quiet, except for a few active grottoes in E arm, as though slowly rising. Later the crusts broke up with fountains in different parts of lake.

Alex.

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day **Sunday** Date **August 18, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
3:20p	SE	NE end SE ponds		8 0				
		NE grotto		3 40				
		Central crag		-8 2				
		N crag		-3 50				
		E ledge		-3 50				
		Ledge S side central pond		+2 10				
							T. A. J.	
			no	pl	scr	stop	ex	cam

Day	Monday	Date	August 19,	1918.
	Tuesday		" 20,	"
	Wednesday		" 21,	"

Aug. 19.  
Evening.

Lakes low and sluggish. Occasional explosive or ballooning burst through crust on N side of main lake. Lava fills quiet with glow in cracks. One or two heavy falls reported near SE pond and from N side of central crag mass. Hissing puffs occasionally from NW cone. Crags nearly stationary or slightly lower.

Aug. 20.  
9:00 a.m.

Lakes 8 to 10 feet down and sluggish; some fountaining. NE fill above NE shelf and slightly over it. NW cone higher, 4 feet above rim level. NW fill level with N fill, fresh flows on it and glowing caverns in crust. Crags stationary, E fill remains low. S valley filling more arched toward wall crack. SW corner of pit at W cone has raised to within one foot of edge at new SW station by driblet flows, two high W cones; flows moving, this a mass of sneaky glistening pahoehoe from gulch extending W from W arm pond. Appears ready to overflow edge, with long slope to SW of Halemaumau to flow down. Puffing gas pressure at cones. Suggests early March condition.

Aug. 21.  
6:00 p.m.

Main and SE lakes with stalactitic overhang, bright fountaining and in main lake westward streaming. Barely visible from SE edge; about 30 feet below SE edge. Wall valley fillings glowing but not active. N, NW and W cones flaming and hissing. W cone at top of high driblet pile spurting and dribbling and lifting lid; 6 feet above level of edge. Flows trickling from it into large SW crevasse of high edge of Halemaumau and only one to two feet more building necessary in order to make overflow. SW pond spurting violently but surface not visible. NW cone has filagree glow orifice facing N and puffing loudly. Activity in northern lakes. Crags stationary.

T.A.J.

KILAUEA DAY SHEET

- 1 - Day Tuesday Date August 20, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
9 a.m.	Old E	(4 ft. E of old E) to Old N	0					
	Old NE	" "	0	-4				
	"	E New SE	126	5	-1	5	+2	
	"	" " E	150	20	+0	54	+4	
	"	NE ditto	111	32		0	0	
	"	E Summit E ledge	73	32	-11	18	0	
	"	NE ditto	89	50				
	"	E Summit E cross ledge	112	28	-5	38	+4	
	"	NE ditto	103	42	-1	24	0	
	"	E Line of E end NE fill flows 15 ft. below	83	5				
	"	NE ditto	103	36				
	"	E Saddle middle of NE ledge	38	32	-4	21	+3	
	"	NE ditto	72	11				
	"	E Summit inner N crag	24	37	-6	22	+4	
	"	NE ditto	39	22				
	"	E Summit outer W crag	15	0	-4	44	+1	
	"	NE ditto	31	4				
	"	E Base talus middle NE crag mass	14	12	+2	34	+3	
	"	NE ditto	47	40				
	"	E New N	7	33	+0	5	+4	
	"	NE ditto	3	39	+0	4	0	
	"	E Fill under new N	7	33	+0	40	+4	
	"	NE ditto	3	39				
	"	E Fill under old N	0	0	+1	0	+4	
	"	NE ditto	0	0				
	"	E New fill at new NE sta	-21	22	+2	17	+4	
	"	NE ditto	47	3ca				
	"	E Old NE station	-39	16	+6		+4	
	"	NE Central crag	67	35	-5	42	0	581
	"	N New N	0					58
	"	" Central crag	86	48				
	"	NE " steeple	75	35	-4	11	0	
	"	" Summit N central crag	66	52	-3	50	0	
	"	" Crag N side N lake de- pression	18	55	-1	0	0	
	"	N ditto	43	16				
			no	pl	scr	stop	ex	cam
	"	NE Notch E of same	18	0	+1	23	0	
	"	N ditto	74	10				
	"	NE Summit NW cone	11	46	+0	5	0	
	"	N " " "	13	58				
	"	NE NW station (doubtful)	20	13	-0	32	0	
	"	N ditto	24	20				
	"	" Summit W crag	62	29	-3	41	-6	





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508



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Jag

11:15 a.m. No marked changes except in direction of diminished activity. Pit quiet, crags stationary. Lakes appear relatively higher, SE pond 2-foot inner bench, main lake N side 6-foot inner bench. Large fountain near E end, streaming to it from W and NE.  
 Much slumping of wall crack E and S, filled and risen wall cracks W and N. SW heap near W cones flush with edge pit for 100 feet and cones much above edge. Three marked cones, not flowing now. Great heat in whitened March bench adjacent to these cones.  
 NW cone hissing and glowing as before with sharp puffs. No changes apparent in W and NE fills.

T.A.J.

4:30 p.m. From SE.  
 SE pond and E pool very quiet at first but later many fountains broke into activity in E pool.  
 4:40 p.m. Two large fountains to be seen in N pond. A few minutes later a portion of the bank of this pond fell in starting many more fountains.  
 6:30 p.m. A flow from NW cone continued for about two hours nearly reaching a point below N rest house. It flowed very rapidly at the start.

Alex.





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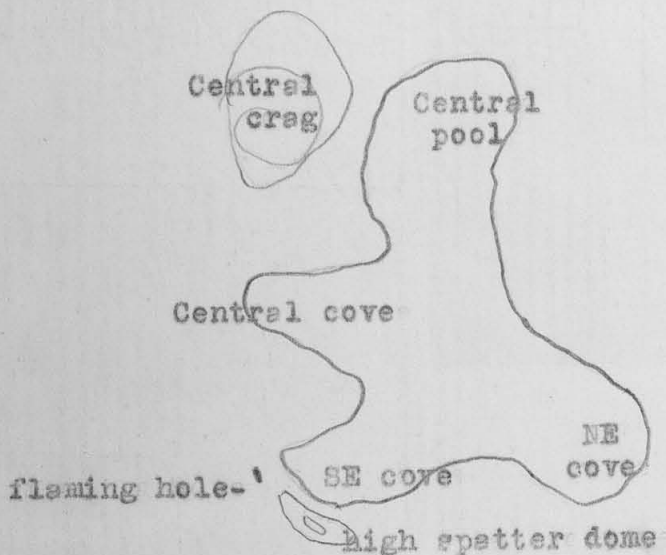
- 1 - Day Friday

Date August 23, 1918.

6:00 p.m.

Circuit of pit by S and W shows lakes about same, rather low; no changes S; SW heap quiet; no slides; crags stationary or lower (slightly). NW cone hissing continuously with three spears of flame under high pressure motionless and continuous. Very harsh noisy blast. N end NE fills increasing and flowing. Climbed E cross ledge for view of main lake. Main lake streaming east slowly, large fountain E end.

Main lake seen from E;-



Continuous infacing escarpment from SE pond to SW pond. Fresh flow observed in crevasse S of SE cone.

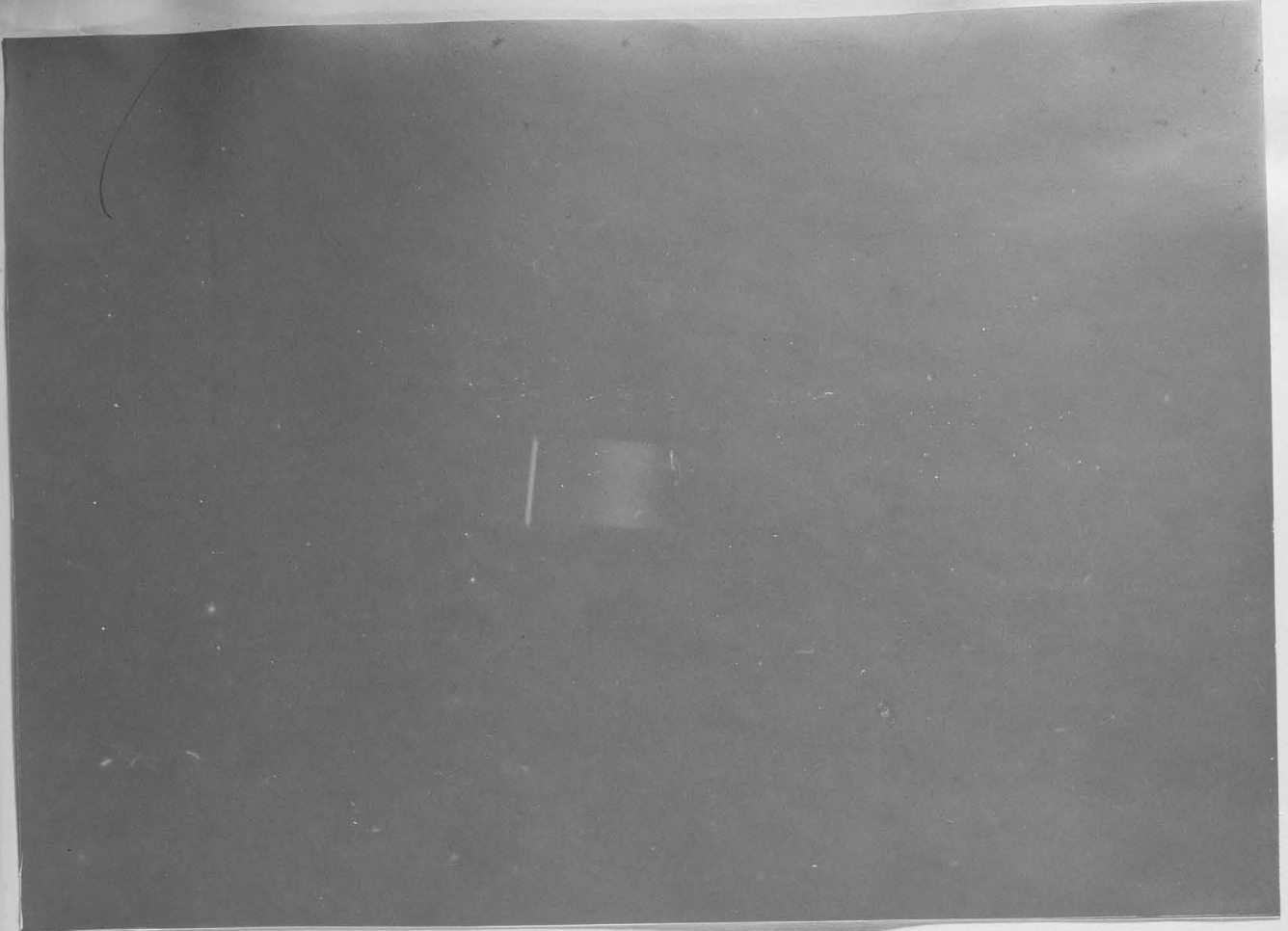
10 to 12 p.m. Returned with Dr. Romberg to NW cone and took photographs and experimental photospectrographs with a direct vision spectroscop, attaching P camera and Tessar lens to same. Examination 15 feet away of 5-inch blowing flames without lenses or slit through prism shows yellow flames and very faint spectrum band from it and all the incandescent spots of filagree in cone make bright continuous spectrum bands. Good method for distinguishing where flames are when the incandescent apertures conceal them by their superior brightness. Applying same method to lake bright lines, grottoes and fountains, saw no flames at all; applying same to banner of flame over SE pond, again the flame appeared yellow and very definite in its form, the lighted fume about it giving a continuous spectrum and the outline of crags against the fume showing hazily. With slit the spectrum of NW cone flames shows the double yellow sodium lines strongly and possibly some others near it; with incandescent holes exposed yellow line in midst of a continuous spectrum. Photographed with and without slit, using Tessar in place of spectroscop objective. Also photographed flames directly 15 feet away looking at filagree and 5 feet away, camera on side of cone, in one case with projecting rock cutting off all but flames.

Evening activity flows N and NE sluggish, occasional bright fountaining in N lakes, high and continuous pressure of gas blast through NW cone.  
No motion in crags observable.

PHOTOGRAPHS:- 10 to 12 p.m.

	:focus:	lens:	pl	scr	stop	ex	cam
1. Flames 5 in. long 15 ft. away looking SW at summit NW: cone. High pressure. Incandescent holes showing. No spurting. Flames motionless:	focus						
2. Spectroscope without telescope, close to orifice of prism, slit showing yellow sodium line, continuous spectrum of melt also.	infinity					30 min	"
3. Near view of flames, from side of cone, 5 ft. away.	focus					30 sec	"
4. Ditto	"	"	"	"	"	70 "	"
5. Ditto	"	"	"	"	"	60 "	"
6. 15 ft. away looking SW at flames thro prism only with outslit. Shows form of flames at right angles to bands of spectrum which represent the glow spots. Faint bands also from the flames (in green and blue) but probably not shown in photo; the flames in the yellow.	"	"	"	"	"	10 min.	"

T.A.J.



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Jog



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Jag



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rag



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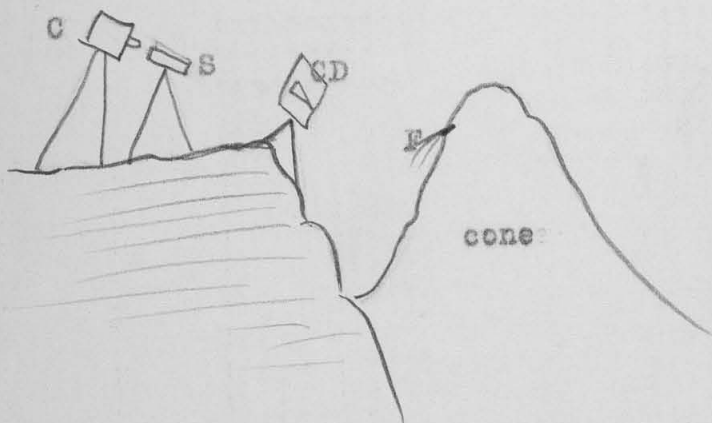
Jag

- 1 - Day Saturday Date August 24, 1918.

7 to 9 p.m. Lakes show increased fountaining. Main and SE lakes higher, crags lower. Under old N station the fill has swollen up with slow flows until there is a large turtleback flow, probably from N cone vent, only 6 feet below rim at new N station. Site of SE cone (former central pond) now an active pond showing glow in its pit. N and NW ponds active with very high spraying fountains in three distinct depressions among the rising inner crags. Glow also seen in W and SW ponds. NW cone still blowing, but upper flames have encased themselves in spiracles so that the flames are smaller in rosettes of orifices. When spiracles were broken off with a stick the larger flames were restored with the same shrieking hiss continuous as before.

#### Spectroscope experiments:-

A flame about 4 inches across was shooting outward and downward from a crack in the face of the cone lower down. Indeed the whole cone showed more glowing cracks than on the previous night. This downward jet of flame was selected for a spectroscopic photograph as follows:-



- C - camera
- S - prism only of spectroscope
- CD - cardboard with V-shaped slit
- F - flame

As the photograph of previous night with only the prisms had been successful in photographing the flames as distinct from the continuous spectrum bands of each of the glow holes and had shown repeated flame images at different portions of the gas spectrum, a sheet of cardboard three feet in front of the apparatus was set up so that a V-shaped slit in it should include in the V tip a sharply outlined image of the flame only, the V axis being at right angles to the length of the spectrum band. It was hoped in this way to get a series of V's at different distances corresponding to characteristic lines of the spectrum, while preserving more illumination than the spectroscope slit permitted. The spectrum so obtained would then be comparable to a solar spectrum similarly photographed. The exposure was doubled over that of the night before. Two exposures

- 2 - Day Saturday Date August 24, 1918.

were made, one of the V slit, 20 minutes; and one of the entire flame and its glow orifice, 20 minutes; Wratten Panchromatic plate, Premo camera, f/6.3, Tessar lens, no filter, prism tube abutted directly against front of lens. Distance from cardboard to flame approximately 7 feet.

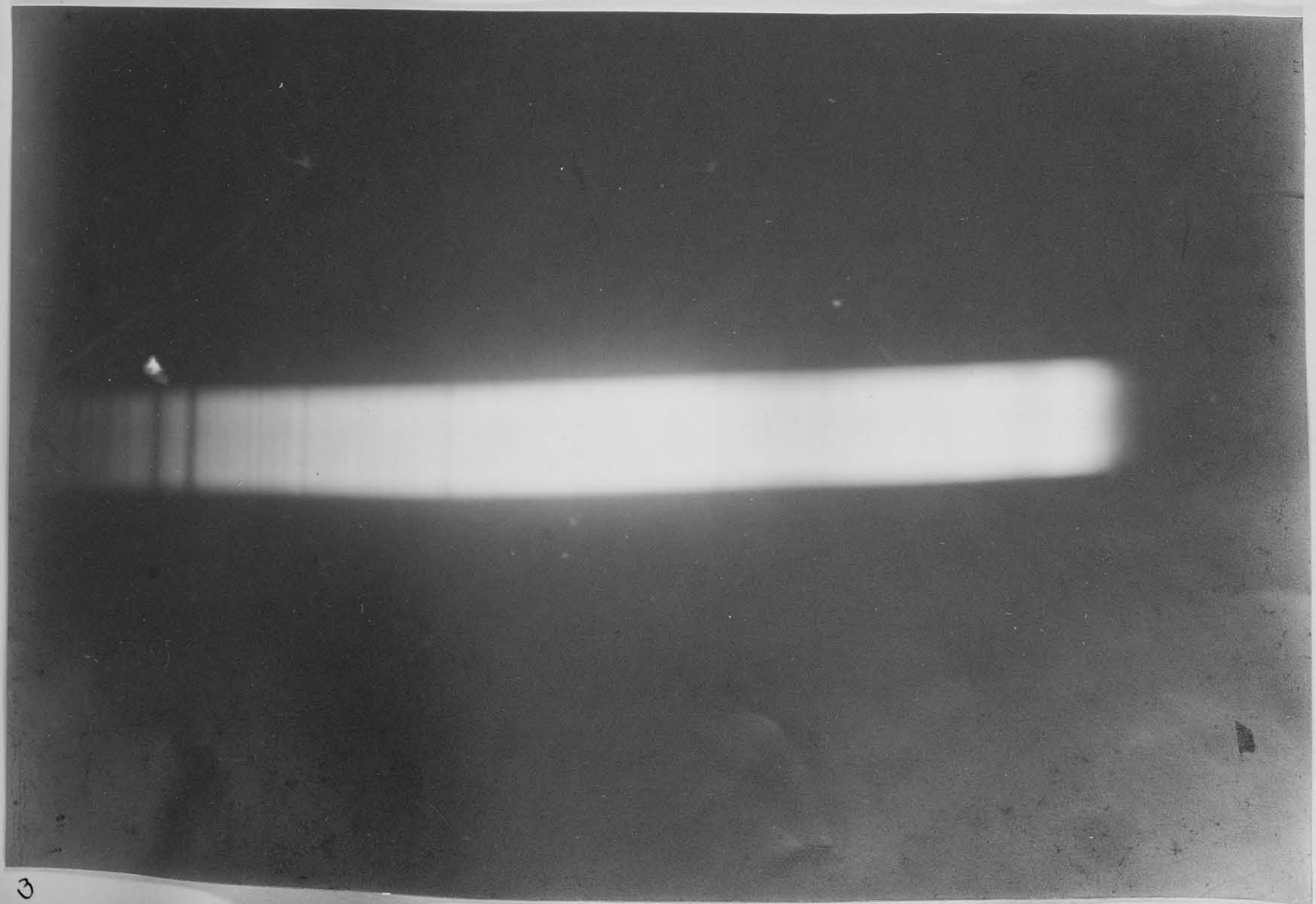
## PHOTOGRAPHS:-

	lens	pl	stop	ex	cam	
1. NW cone flame, (spectroscope prism)	Tess	W P	V slit	f/6.3	20 min	P
2. " " " " "	"	"	no "	"	"	"
3. 4 p.m. from H.V.O. Bright W clouds. Solar spectrum.						

T.A.J.



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308

Day	Sunday	Date	August 25,	1918.
	Monday		" 26,	"
	Tuesday		" 27,	"

Aug. 25.  
4:10 p.m.

From SE.  
SE pond 5 feet down and crusted. E pool about the same until 6 p.m. when it became active though low. Continued activity in N grotto with occasional central fountains. N pond had breaking up spells at times.

Alex.

Aug. 26.  
11:25 a.m.

Valley fills somewhat slumped and general quiet and subsiding tendency. Lakes low, 8 to 10 feet below inner benches. Crusted surfaces and moderate border fountains breaking through crusts with hissing at start. S central pond bubbling and lava bubbling and giving off blue fume in crevasse S of it. Crossed S floor from new S station to S edge SW pond; scarp SW of latter 15 feet above lava; inner bench N of it 8 feet above lava. Channel floored with tumble of rocks, about 6 to 8 feet wide, extending eastward to S central pond, overhung by S escarpment. SW pond crusted; but a fountain broke into action in channel leading to W arm pond. No activity in SW heap, now 4 feet above rim of pit. This heap 15 to 20 feet higher than W and S valley fills. In same way a north heap of flows 8 to 10 feet higher than NW and NE valley fills.

NW cone bubbling inside with hollow chamber sound, occasional slight puffs, flame holes becoming sulphur stained, flames not visible by daylight, much glow in cracks. Occasional fountain noise in N lake.

Descended to floor at E shelter and through E wall valley to E fill and thence to E edge of lake, edge of SE pond and edge of central pond. Lake crusted with periodic heavy bursts at N side channel and fountains NE and S. Streaming to grottoes. Raised spatter dome E end 4 feet above lake and one bench removed from lake, with flaming stalactite oven inside. Lake heaving two feet below innermost bench, 8 to 10 feet of spatter margins around most of it.

SE pond streaming southward to grottoes splashing on its SE side, cracking and foundering. Shelf 6 feet above it on E side S central pond depression a maze of tumbled cracks, with live lava rumbling in S crevasse only. SE cone still in place and inactive.

T.A.J.

Aug. 27.  
9:20 a.m.

From SE.  
SE pond quiet and 10 feet down. E pool crusted with only the NW grotto fountaining.

Alex.

Day	Wednesday	Date	August 28,	1918.
	Friday		"	30,
	Saturday		"	31,

Aug. 28,  
6:30 p.m.

About the same. Crags lower. Lakes 8 to 10 feet below benches. Large fountain near E end main lake. Glow and activity moderate in all the ponds including W pond chasm and S crevasse from central pond depression. Glow in the valley fills. NW cone has open window orifices and rumbling, squelching noises within. SW heap glowing and one orifice flaring. Fumes rather dense. Heard slab fall near SW pond.

Aug. 30.  
11:00 a.m.

Everything low. Some bright flaring at night. Crags lower. Lakes low with occasional bright fountains and bombardment NE cove. NW cone broken, little glow, interior stalactites. Thick fume from SE wall crack, E side central crag mass and elsewhere.

Development of spectrum photos showed flame images in the green and blue portions of the spectrum.

Aug. 31.  
10:00 a.m.

Lakes and crags low. Conditions unchanged. Looked into N lake hollow, saw low lake and tumbled boulders. Nothing new W or SW. Slight rumbling under NW cone. Main and SE lakes barely visible 40 feet below rim of pit. Lake 30 to 40 feet down. Central crag 90 to 100 feet above lake.

T.A.J.

KILAUEA DAY SHEET

316  
 Massachusetts Institute of Technology  
 Hawaiian Volcano Observatory

Day \_\_\_\_\_ Date **Aug. 26 & 30, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
Aug. 26.								
11:25a	New N	Outer N crag		-6 16				
		Inner " "		-7 30				
		Central steeple		-2 55				
		" crag		-5 5				
		S scarp W crag mass		-2 55				
		W crag		-3 30				
		NW crag		-3 10				
		Scarp N of N lake		-1 0				
Aug. 30.								
11 a.m.	New N	N outer crag		-5 10				
		" inner "		-7 0				
		Central steeple		-2 5				
		" crag		-4 47		749	61	
		W crag		-3 10				
		NW "		-2 40				
<p>North U.S.B.M. 3700.2 ft. (Tech. Sta.) has its platform tilted <u>W</u> 2°, level in N-S azimuth (tilt slightly WNW). Perret's platform east (U.S.B.M. 3697) tilts WNW 1°; is level NNE.</p>								

no	pl	scr	stop	ex	cam
Aug. 30. 11:00 a.m.					
ESE	Central crag	1	W P	8x	f/11
New E	N crag	2	"	"	"
ESE	SE cone across SE pit	3	"	"	"

T.A.J.



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569

Day	Monday	Date	September 2,	1918.
	Wednesday		"	4, "
	Thursday		"	5, "
	Saturday		"	7, "

Sept. 2.

5 to 6 p.m. Stagnant condition continues. Some bombardment with spraying at NE cove suggests renewed gas pressure. No pressure at NW cone, however. Crags stationary. Lake streaming E to S and NE grottoes. Occasional high fountain flings N lake. Some glow in cracks of fills remains. Much smoke shows open cavities below. Stalactite curtain grotto NW side SE pond. Glow occasionally in all the ponds. One sinking spell with cracking, foundering and bubble fountaining.

Sept. 4.

7:00 p.m.

Little change but lake is more active with puffing and spraying, and the streaming is in a curve out of N side central pool to E and S. Stalactite grottoes SE pond and main lake. Bright flaring SW pond. Bright zigzag lines between crusts on lake. One slide from E cross ledge. Gaping crevasse parallel to wall under E shelter in new NE fill with glow 15 feet down. Crags a little lower.

Sept. 5.

6 to 9, p.m.

Same activity and increase of border fountains with gas pressure spraying and some rumble in SE pond. Large dome grotto with stalactites NE cove. N side main lake spatter bench fell in. Balloons and blisters in skin near entrance NE grotto. Streaming from center to NE grotto, and when S grotto breaks out to that also. Streaming S in SE pond. Much more slipping of rocks from slope of E cross ledge. Many smoke areas. Large crust areas sliding over each other eastward.

Sept. 7.

7:00 p.m.

Conditions unchanged. Crags stationary or slightly settling. Streaming to NE grotto. Large crust areas, blocks slide over each other. Violent continuous blowing with flame and spatter at orifice above lake east end. Streaming to NW side of SE pond. Glow in all the ponds. Smoke holes many. No sliding E ledge.

T.A.J.

11:40 a.m. Made circuit of pit by E and N. Lakes appear somewhat higher built up and great quantity of Pele's hair on face of E ledge. Spatter margin SE pool high with dome on W side. Large dome of NE cove appears to have broken down but there was a smaller one W of it. Lake fountaining with high viscous flings near SE edge. NE fill has subsided and a border crevasse adjacent to a border pressure ridge follows wall edge of NE fill, while the central parts are dish'd downward. The NW cone is now broken asunder so that daylight shows through it as seen from its E side and a stactite cupola is revealed inside. There was some fume from adjacent cracks but I climbed on the cone and looked down inside; the cupola appeared to have a flat floor and beside that there was a fresh crack. There was no evidence of any deep well. Probably the feeding conduit was a relatively small gas crack along the wall crack. There appeared to be a pressure ridge and tunnel extending along the fill above the wall crack eastward from the cone. There was a large crevasse extending across the region between the N and NW fills from the northwestern gateway between the NW crag and the smaller crag next E of it. On looking through this gate into the N lake depression, the lake appeared to be crusted at a rather high level, without evident activity and with domes and cracks in the crust. On going around to the SW side of the pit the only changes noticed were marked subsidence of the SW cone area in the depression W of the W arm pond. The cones near the wall of the pit were still in place but somewhat slumped. Other slumping appeared along the line of chasm extending E from the SW pond to the SE cone depression. The smoke was dense, the crags stationary and the gas pressure only moderate. Sulphur stain of bright yellow color had developed at a very hot fuming crack at the top of the cliff bounding the S side of the SE pond and also on the E side of the NW cone. The crevasse extending S from the SE cone depression and also the wall crack vent under the new SE station were both smoking excessively. No rock slides were heard.

T.A.J.

Day

Date Sept. 10 & 13, 1918.

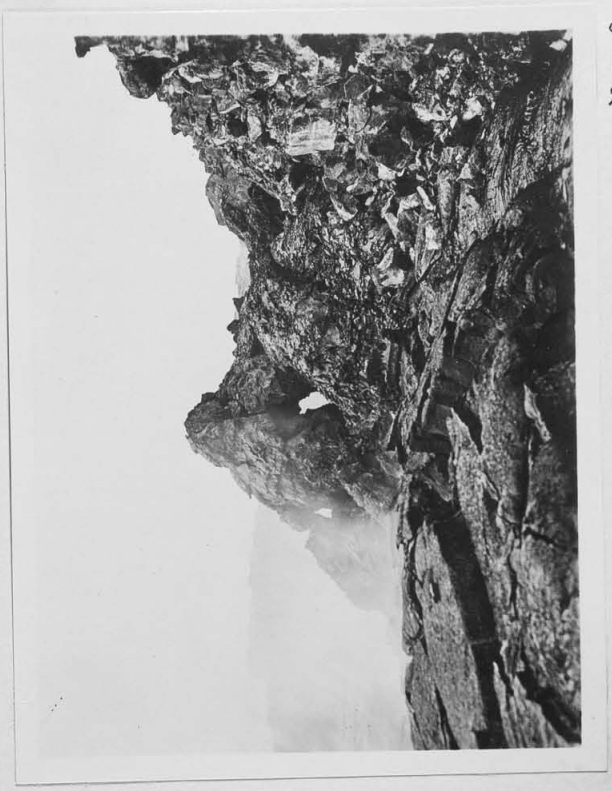
t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Sept. 10.</u> Transit.								
11:40a	New N.	Inner N crag		-5 12				
		Central crag		-5 1		749	51	
		W crag		-2 4				
		NW "		-0 58				
		Inner crust N lake		4 23				
	New SE	Lake level N side SE						
		SE pond		12 16				
 <u>Sept. 13.</u> Brunton.								
5 p.m.	New SE.	N side SE ponds		13 20				
		" " main lake un- der N central crag		7 0				
		Central crag		-4 55		542	47	
		Inner N crag		-2 17				

			no	pl	scr	stop	ex	cam
<u>Sept. 10.</u>								
11:40a	ESE	SE ponds pit	1	WP	8x	f/11	1/2	P
	"	N crag across E cross ledge.	2	"	"	"	"	"
	New N.	Cracked margin NE fill	3	"	"	"	"	"
	Looking W	at NW cone, near view.	4	"	"	"	"	"

T.A.J.

book

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1

Day Thursday Date September 12, 1918.

4:30 to 5:30 p.m. Made circuit of pit by E and N. Eastern lakes relatively high and active. No overhang visible. Much Pele's hair. Fume increased since morning. Streaming eastward. Active marginal grottoes. Large gaping crevasse concentric to pit in bottom of east fill. Pinnacle between SE pond and main lake has collapsed. NE wall crevasse under E shelter wider but no glow; hot air rising from it. Fumes from site of former N cone and from just E of NW cone. Latter broken open still wider by gaping of wall crack crevasse and interior cross section showing heavy stalactites in cupola is well revealed. View into N lake shows glowing pond there and the bounding northern scarps appear relatively lower, showing more of the interior of the northern lake depressions. The N valley fill, however, is still swollen up close to the level of the rim of the pit. The W crag escarpment is now a long wall high above the main lake as seen from the east with the old W crag knob surmounting it. Smoking patch in middle of W fill. From SW rim the SW heap remnant has broken down on the side of the depression leading from the W arm pond. The lava there being 20 to 30 feet down. The portion next to the old rim of the pit, however, still clings to the high level and the driblet cone close to the rim is still in place. The W arm pond was fountaining continuously and noisily with much spraying. No activity observed in SW pond. Great clouds of white water vapor rising from the tube under S cone.

T.A.J.

Day	Friday	Date	September 13,	1918.
	Saturday		"	14, "
	Monday		"	16, "

Sept. 13.  
5:00 p.m.

Same stagnant condition and stationary crags but fumes notably thinner and lakes high and active. Seven fountains in main lake, two or three in SE pond, and some construction of spatter ramparts. Heavy masses of Pele's hair on crags. Glowing filagree of flame holes above S grotto of main lake and W grotto of SE pond. Hot solfataras with puffing fume and sulphur stain at SE wall crack, SE cone crevasse, and S side of E cross ledge. While there has been pronounced subsidence recently of SE small crag, E fill, middle part of NE fill, and SW depression, yet the broad field of humpy lava occupying the S valley appears swollen up and the crags appear to have moved somewhat differentially, the central ones down and the outer ring relatively up.

Streaming in main lake irregular but eastward and occasional central fountains show much spurting and spraying and the marginal ones have a combined rumble and puff noise with a good deal of spraying. No rocks were seen in motion but the general situation suggests a pending change. There have been very sharp tilts during the last two days, first to the S and E, now to the N and W. The activity at night appears to vary in spasms of bright flaring followed by relatively dull spells.

The main lake has contracted from the W, the central pool being crusted over on its western and northern sides so as to make a tunnel arch leading northward, out of which flows the streaming of the lake surface in a broad zone. The SE cone is still in place.

Sept. 14.  
12:25 p.m.

Depression rate increased. Lake only moderately active, basin full, appears rising. Smoky. Lakes lower than yesterday. Streaming eastward to N and S grottoes. Crevasse in E fill appears less open. Slight rock slips on N crag and from E outer wall near old E station. Crust on central pool and arch from which streaming proceeds. Occasional central fountains in E arm of main lake.

Sept. 16.

5 to 6 p.m. No change. Lakes occasionally cracking and foundering. SE pool crusted and lake bombarding NE grotto and one or two other grottoes. Slow eastward streaming. E wall crack and crevasse in E fill appear wider. Chasm from SW pond to SE cone has widened into a valley, apparently by downtilting of back slope of central crag mass. Rather slight glow at night.

Crags stationary, with diminished sinking tendency on Sept. 16-17.

KILAUEA DAY SHEET

324

~~MASSACHUSETTS INSTITUTE OF TECHNOLOGY~~

Hawaiian Volcano Observatory

Day **Saturday** Date **September 14, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
12:25p	New SE	N side SE pond N central side of lake Central crag N inner crag		13 55 7 20 -4 20 -1 20				

no	pl	scr	stop	ex	cam
1	W P	8x	f/11	$\frac{1}{8}$	P
2	"	"	"	"	"

NNE N lakes, showing qu-  
versal )  
Near view (30 ft.) of inter-  
ior stalactites NW cone )

T.A.J.



1



2

Fog

Day Wednesday Date September 18, 1918.  
Thursday " 19, "Sept. 18.  
9:30 p.m.

Crags continue stationary. Fume moderate to thinner. Glowing activity center and east, very slight glow N lakes. Seismically very quiet.

Sept. 19.  
2:00 p.m.

During the last two days apparently few changes in level. The E fill appears a little higher and smoke from SE cone crevasse is much less. Level of crags and lakes much the same.

Today, however, very marked increase of gas pressure, wider overflow rim all around SE pond, spatter grotto building on W side SE pond. Large dome grottoes building NE, N and S of main lake. Streaming eastward and continuous hissing noises from the fountains. Sudden sinking spells of SE pond with rapid recovery.

Penetrated N lake enclosure through NW gateway which now presents an even floor of flows which have poured inward to the enclosure through the gate from the NW cone fill. NW pond a heavily crusted circle but a hissing group of vents, building spiracles and overhang by stalactites, lay among the crags to the N of the pond. The N lake was a small oval active pond with a large fresh spatter dome at its N end and two glowing and flaming vents NW of it hissing loudly. On its E bank was a vent 6 inches in diameter continuously hissing and spurting liquid lava, forming papery sheets by glass-blowing around its orifice and making a great deal of noise. This vent was manufacturing much Pele's hair.

The NW cone was puffing and coughing noisily, with glowing spiracle orifices, and an entirely new cone with an elongate orifice in its summit had formed on the W side of the broken cone and the outer surface was covered with splashes and trickle flows.

The W arm pond contained a vent which was blowing very noisily in spasms but could not be seen. Everything indicated strongly renewed gas pressure and the fume to leeward from the numerous revived vents was very disagreeable with sulphurous acid.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
2 p.m.	New SE	Brunton. N side SE pond Grotto N of central channel Central crag N inner crag		14 10 6 55 -4 0 -1 5			38	
			no	pl	scr	stop	ex	cam
	Near NW cone	NW gate	1	W P	8x	f/11	1/4	P
	W	Revived NW cone	2	"	"	"	"	"
	From crag inside	NW gate to N lake blow hole.....	3	"	"	"	"	"
	Cone detail inside	N lake depression looking S .....	4	"	"	"	"	"
	From NW gate to	NW pond depression and W crag.....	5	"	"	"	"	"
	W niche rampart	to central crag	6	"	"	"	"	"

T.A.J.



1



2



4

Fog



3



5



6

fog

Day	Friday	Date	September 20, 1918.
	Sunday		" 22, "
	Tuesday		" 24, "

Sept. 20.  
6:00 p.m. Construction on lake shores has built four high half dome grottoes on N side of main lake toward which all currents stream. Little streaming lengthwise. Bright activity nights main and SE lakes, very slight glow N lakes. SE pond shows overhang all around. Six fountains main lake, sometimes fountaining at grotto S side under central crag mass, sometimes high-flinging perpetual central fountain E end of E pool. Fume somewhat diminished, but crags lower. Stalactite curtains.

Sept. 22.  
11:20 a.m. Crags a little lower. Fume thinnish. SE pond 5 feet below its recent level of inner bench. Main lake slightly down; puffing and splashing border grottoes (5); fume at E end obscures view. Half domes somewhat broken down. N lake 2 to 3 feet below its border rampart, conspicuous grottoes E and S of it, N half-dome no longer conspicuous. Active fountains in lake and puffing vent W of N lake. NW pond a depression of heavy down-slumped crust. NW cone hot and fuming, lava bubbling inside with hollow sound, crack W from it in the fresh dribble lava from the cone. Surfaces all about covered with fresh lava splashes. Nothing new evident W or SW. Much Pele's hair on benches and crags around SE and main lakes. Central region now a small cove in the crust which covers the N and W sides of central pool. Lakes appear about 50 feet down as of late. No change. They are crusted, no evidence of current. At spatter grottoes there are active pools in the crust.

Sept. 24.  
2:15 p.m. Sudden sinking SE pond, about 5 feet, with much bubbling and break up of crust. Afterward pond recovered slowly and crusted over. Main lake streaming eastward, active grottoes along banks. Some of them very large and hung with stalactites. Occasional violent spells with noisy travelling fountains and conflict of currents; wrinkled thin skins. Much smoke from E cross ledge, SE wall crack, SE cone crevasse, N side of SE crag, and S base of E ledge. Smoke all along face of NE crags. N lakes appear same as before. NW cone again hissing continuously and flaming from small gas spiracles. Smoke hole middle W fill more pronounced and sulphur stained.

T.A.J.

KILAUEA DAY SHEET

Day \_\_\_\_\_ Date **Sept. 24 & 26, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Sept. 24.</u>								
2:15 p	SE	New E	0					
	ESE	" "	0					
	SE	Grotto N side main lake	52 3	7 49	+4	443	61	
	ESE	ditto	73 7	8 10	0			
	SE	Central crag			-3 35	541	34 above	
	ESE	Old N	38 21					
	"	New N	45 24					
	New E	Old N	0					
	" "	N inner crag (smoky)			-2 2	0		
	SE	Auxiliary Sta. ESE	-7 38					
	New E	ditto	132 58					
	" "	Summit E ledge	57 34	-1 55	0			

			no	pl	scr	stop	ex	cam
<u>Sept. 26.</u>								
12:30 p	SSW	Central crag	1	W P	8x	f/11.3	1/2	P
	"	West "	2	"	"	"	"	"
	"	SW heap	3	"	"	"	"	"
	"	S cone	4	"	"	"	"	"

T.A.J.



2



4

boat



1



3

Day Thursday Date September 26, 1918.  
Friday " 27, "

Sept. 26.  
12:30 p.m.

SE wind and S side of crater clear. Lakes about 5 feet down. Six or more border grottoes main lake. Streaming against N bank. Grotto Westside SE pond belching and splashing noises. Crags slightly lower but no rocks heard falling or other evidence of motion in progress. Fountaining in N lake and much smoke there. NW cone no longer hissing. Smoke hole middle of W valley fill yellow with sulphur and alum and stands opposite a crevasse gateway leading through W dip slope to interior depression where the lakes are. SW depression lower and violent fountaining at tunnel in N end of extension arm of SW pond which now occupies W arm site. From the S the central and western crag masses appear distinctly depressed inside of outer encircling scarp. General condition stagnant and lower.

T.A.J.

Sept. 27.  
9:30 a.m.

SE pond about 10 to 15 feet below bench, not very active. A slide of rock was heard from the central crag. Main lake about 10 to 15 feet below bench, spectacular display of fountains near the SE cove, appears to be very turbulent. The E fill has risen considerably, there being five long fissures from 2 to 3 feet wide. These cracks seem to be frequently occurring as one was heard snapping during observation. The NE valley seems to be slowly sinking, a fairly large crack running along the Feb. flow about 4 feet wide all along up to the NW cone. The NW lake obscured by smoke. Though lake could not be seen, the splashing of fountains could be heard from N station. No hissing in NW cone. The NW crag has a very large crack running toward the NW lake about 10 feet wide; lake cannot be seen, obscured by heap of rocks. The W arm pond showed plainly activity in a grotto 4 or 5 feet high from which loud puffing could be heard. A portion of the W arm valley has sunk-en down. Along the base of the W niche, at one spot especially, thick smoke was coming out. A tumble of rocks was heard at this place. All crags lower and smoke dense.

Pekelo.

Day **Saturday** Date **September 28, 1918.**  
**Sunday** " **29, "**

Sept. 28.  
 9:30 a.m.

Wind SW. Fumes make seeing of lakes difficult. SE pond heavily crusted and about 4 or 5 feet below inner bench. Main lake about 6 feet below its inner bench. Two border fountains seen and one central fountain in latter -- all sluggishly active. Deep crevice where overflow floor SE has broken away from wall and tipped inward from the pull of subsiding crags. No changes seen at NE. Once the tinkling of small stones in E cross ledge heard. Pounding of fountain in SW pond heard and once some low border spray seen from SSE. Lasted but a few minutes. Great volumes of fume coming from depression in center of SW cone heap. No hissing heard.

10:30 a.m. On return from S found SE pond and main lake heavily crusted and up a foot or two.

I.P.J.

9:20 p.m.

Main lake very active. One large central fountain. SE pond quiet. Flame shooting out from side of lake. Slides of rock from the S side tumbled in.

Pekelo.

Sept. 29.  
 5:00 p.m.

Lakes about 5 feet below inner benches. Sharp withdrawal in SE pond followed by usual recovery. Streaming eastward in main lake. Active grottoes SE and S, as well as along N bank, large spatter domes covered with Pele's hair and somewhat above lake level. Crack across high rampart parallel with lake shore at gap leading from E fill. Spurting and blowing activity in fountains. Crack in floor E fill appears closing.

N lake low but active and fountaining portions appear more extensive than of late. NW cone again cracked through by wall crack but revival of hissing heard inside. Glowing filagree cone at NW pond site. Another filagree cone was noticed NW corner main lake.

Very pronounced downslope inward of N valley fill, the whole quaquaversal of northern crags having subsided, consequently the whole interior of N lake depression is now in view from N station. One small rock tumble heard SE outer cliff.

T.A.J.

Day **Sunday** Date **September 29, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
5 p.m.	SE	Brunton. Central crag		-2 17		541	22	above
		N inner crag		-0 40				
		Grotto N side main lake		8 50		443	69	
		N edge SE pond		16 35				
								T.A.J.
			no	pl	scr	stop	ex	cam

Day **Monday** Date **September 30, 1918.**

10:30 a.m. SE ponds about 4 feet below bench, quiet. Main lake higher -- 2 feet from bench. Several fountains playing. NE valley seems to be a little lower; several little snaps of the floor were heard. Some small rock slides from E ledge. N pond not very active, about 4 feet below bench. NW cone quiet, no hissing of gas. W arm quiet, about 1 foot below bench, just one grotto playing. S valley about the same. Smoke denser, sulphur stronger. A portion of the E bank caved in; a big cave in could be heard at a distance.

Pekelo.

Day	Tuesday	Date	October 1,	1918.
	Wednesday		"	2,
	Friday		"	4,

Oct. 1.  
11:00 a.m.

Lakes about as usual; 4 to 5-foot margins; rising towards noon when bench edge of main lake was only 3 feet high. Streaming eastward, numerous grottoes, one central fountain in E pool. Fumes thinner. Clear seeing across pit in places. N lake moderately active. Sharp hissing from one of the cones in N depression. NW cone more broken open and quiet. Descended to edge of SW pond. Inner cliff around it 15 to 20 feet high. Pond sluggish and crusted; marginal fountains S, E and NW corners. At night part of the time very white glow above pit extending all the way from SE to N lake depression and a faint glow farther W, possibly NW cone.

Oct. 2.  
3:45 p.m.

Lakes high and close to spatter bench level, active puffing marginal fountains as of rising lava. From SE note marked depression of E fill and slope downward towards it of the wall valley horseshoe from N and SW. Distinct pressure ridge or fault wall extending from S side SE pond to SE smoke hole, as though tunnel beneath. Thick fume from the several smoke holes.

4:15 p.m.

N lake brimming and overflowing, followed by fountaining on NW margin and sinking. Hissing in N central region and near NW pond. No fresh activity at NW cone. The W glow at night must have been NW pond cone. On returning to E side found E and main lakes high, puffing fountains, spatter domes building.

Oct. 4.  
5:00 p.m.

Main lake 2 feet below bench. SE pond 4 feet below bench. Overflow floors greatly widened and built up. SE pond floor broader, nearly through gap leading to main lake. Pond constricted by building. Main lake has wider floor margin, especially E and NE, and the point between SE and NE coves obliterated by overflow. Streaming in SE pond to NW and in main lake to an active grotto in W end. Streaming along N bank westward. Much crust. Some rumbling in grotto W of SE pond. N lake greatly overflowed and glowing flows on wide new floor around it. Immense dome grotto flaming on SE side N lake. Glow heap hissing at NW pond site. Glowing, flaming and spurting chimney at W chasm locality (W side W crag under W scarp). Activity in SW pond. No activity at NW cone.

The crags appear lifted and the valleys appear sunken. E fill looks lower, N fill appears distinctly lower opposite NW gap and NW valley still lower and broken away from western extension of NW cone heap. The great crevasse E of NW cone more gaping and fallen on pit side. Other wall crevasses appear wider. At same time the crags W, central and N, appear more uptilted as though strong differential movement in the bench magma were commencing. This checks with three marked spasms of tremor today. Tilt latterly strongly east.

Day Sunday Date October 6, 1918.  
Monday " 7, "

Oct. 6.

12:30 p.m.

SE pond 5 feet below bench and bench of same 5 or 6 feet higher than corresponding bench of main lake. Floor at E end of main lake more extensive and only two feet above lake, whereas under central crag and along N shore of lake the benches were 5 or 6 feet high. Apparently the central group of crags is lifting. Turbulent fountaining activity, freshly constructed spatter domes. Smoke at SE cone chasm greatly diminished. Streaming indefinite, quiet stagnant crusts, large quiet cavern at W end of lake. SE pond greatly constricted.

N lake much constricted to a small round pond at N base of the large spatter dome. Overflow floor greatly extended. Some hissing from NW pond region. No activity NW cone. Some small rock movements indicating motion in bench magma. Main crags higher.

Oct. 7.

5:00 p.m.

SE pond flush with bench, puffing fountain N margin. SW pond noisily flinging lava high at S tunnel corner. Nine fountains around main lake building rampart which is especially high along northern and northwestern shore. Streaming out from W end and diagonally across to N bank; streaming southward to fountains on S bank. Intermediate area mostly covered with quiet crust. Noise plashing, puffing and some rumbling in grottoes. Broad platform E end of lake diminishing size of E arm. Central steeple again a conspicuous peak. Considerable smoke.

SE pond bigger.

No activity NW cone. Hissing in N depression. Heavy stalactite curtain across N lake dome and flame banners from crack on top of dome.

6:00 p.m.

Curtain fell and pond became active and flames ceased. Flaming chimney spurting lava S side W crag mass and another flaming but not spurting on W side. Numerous crevasses more open along wall crack under N station.

T.A.J.

KILAUEA DAY SHEET

Day \_\_\_\_\_ Date **Oct. 1, 6 & 7, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<b>Oct. 1.</b>								
<b>Brunton.</b>								
11 a.m.	SE	Grotto N side main lake			8 17	443	65	
		NE grotto			9 22			
		Grotto N side SE pond			17 12			
		Summit central crag			-2 45	541	26 above	
		" N inner crag			-0 15			
		E ledge			1 35			
<b>Oct. 6.</b>								
12:30 p	SE	Highest fresh lava N side channel			6 15			
		Summit central crag			-3 55			
<b>Oct. 7.</b>								
<b>Transit</b>								
5 p.m.	SE	E			0			
	ESE	E			0			
	SE	Grotto N side main lake	52 14	6 22	-4	446	51	
	ESE	ditto	73 5	6 56	+3	389	49	
	SE	Central crag	81 8	-4 16	-2	496	37 above	
	ESE	ditto	96 16	-4 15	+5	541	41	

			no	pl	scr	stop	ex	cam
<b>Oct. 6.</b>								
12:30p	SE	SE ponds	1		8x	f/11	1/4	P
T.A.J.								



Jog

Day	Tuesday	Date	October 8, 1918.
	Thursday		" 10, "
	Sunday		" 13, "

Oct. 8.  
6:00 p.m.

Lakes low relative to banks but crags higher. Banks 6 to 10 feet high, and stalactite overhang. Large chimney in dome 15 feet above lake on N bank. Six or eight border fountains around main lake, streaming eastward, broken up crusts, occasional central fountains migrating to S grotto, deep glowing cavernous recesses W, S and NE with currents inward at the latter. Glow at SW pond. Much smoke. No rocks heard falling. General situation continued rising of central group of crags and some recession of lakes. Banks seen collapsing at S grotto. In new floor S side of former point which separated NE and E coves, a pond of collapse has formed, occupying former E cove but separated from lake by rampart.

Oct. 10.  
8:00 p.m.

Few changes. Lakes only slightly active. Glowing chimney above W side SE pond. Only one conspicuous grotto N side main lake in middle. Both lakes enlarged. Main lake extended westward and streaming out from N side central pool in a semi-circular curve to the N and NE banks of lake. Glowing fissure on top of rampart SE side of main lake, with flames rising. Light reflected above SW and N lakes. New glow in southward development of cracks in bottom of E fill. One small rock tinkle heard. Crags rising very slightly. Smoke rather dense.

Oct. 13.  
4:15 p.m.

Lake very smoky. SE pond 10 feet below bench, main lake about the same. No conspicuous changes. Some border fountains. Crags stationary. Glow at night more dim. N lake low. Floor of E fill possibly a little higher. Much activity in SW pond in the evening.

T.A.J.

Day	Tuesday	Date	October 15,	1918.
	Wednesday		"	16,
	Thursday		"	17,
	Friday		"	18,

Oct. 15.  
10:00 a.m.

Lakes very dull and smoky. From SE the SE pond 8 feet down and a fountain against N inner wall spurting. In main lake four or five fountains and crusted lake, no evidence of streaming.

From N no view of glow in N lakes. Fresh rather recent fall of rocks on N fill from old wall of pit E of N station (between old N and new N). No hissing in NW cone. From W turbulent fountaining heard but not seen in region of W arm. SW heap more cracked. From S no activity visible in SW pond. Sulphur stained patch at edge of S valley fill, Crag stationary. Glow dull at night.

Oct. 16.  
5-6 p.m.

Distinct revival. Six or seven puffing and spraying fountains. Lakes only 5 feet down inner pits. Flames N and S of SE pond through bench cracks. SW pond flinging spray. Main lake crusted, sometimes cracks and founders; puffing, spraying and constructing marginal grottoes. From N the N lake visible and active N and NW sides. New glow cracks S side NW pond. Spraying S of W crag. Crag stationary. Lakes brighter at night.

T.A.J.

Oct. 17.  
3-4 p.m.

Much activity E and N. Much smoke. Not much fountaining in SE pond, but a spurting crack occasionally active NE side of pond. Lakes about 4 feet down. Much fountaining NE and S coves. Noisy fountaining N lake and W arm.

Allen.

Oct. 18.  
6:00 p.m.

Lakes rising very actively with many constructing marginal fountains and flaming cracks in the bench. SE pond at first having a sinking spell (not shared by main lake) showing curtains of stalactitic material and a bright glow edge 3 feet high. Then in a half hour it recovered, rose to the inner bench level and overflowed the bench. Spears of flame 2 feet long shot up through cracks in the bench N of it and during the rise the pond was covered with a heavy skin through cracks of which there was spurting and flaming. The main lake was streaming in a broad zone from the far W end to fountains along the N bank; fountains against the point on the S side of the narrows were very explosive, throwing up spray 30 feet or more. There were also central fountains in the narrows between the E and central pools. Main lake occasionally showed sinking spells independent of SE pond. Lines of flame in spears played steadily thru cracks on the N side of the narrows. The lake was large, flush with the bench and building ramparts. The N and SW ponds were active at intervals. At night the pit was brighter and moderate rising was resumed in the crags.

T.A.J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day Date Oct. 13 & 15, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Oct. 13.</u>								
4:15 p	SE	Grotto main lake		7 30				
		Central crag		-4 15				
<u>Oct. 15.</u>								
		Transit.						
10 a.m.	SE	Grotto main lake		7 21		446	58	
		Bench level next above		5 55		446	46	
		Summit central crag		-4 12		496	37 above	
								T. A. J.
			no	pl	scr	stop	ex	cam

Day	Sunday	Date	October 20,	1918.
	Monday		" 21,	"
	Tuesday		" 22,	"

Oct. 20.  
4:30 p.m.

Circuit of pit by S and W.

SE pond 4 feet below floor, circular, with a low rampart, and much like a lunar crater. Floor slightly above SE cone depression, and probably 15 feet above floor around main lake. Puffing and flaming cone on floor NE of SE pond. Pond crusted.

Main lake 4 feet down, streaming only in central pool, the remainder crusted and little border activity. Streaming indefinite, but appears to be northwestward. S valley floor under S cone and S station appears lifting, fresh tumbles from wall. Same is true of E cross ledge which is now a flattish pile of stones ridged along lines trending NE-SW and with a sulphurous smoke hole along one of the gullies. SW pond active and noisy. Much sulphur stain on top of scarp SW of W crag mass.

N lake dull, about 4 feet down. The glow hole NW is in the top of a small crag S of the NW pond depression. Crag stationary. Smoky.

Oct. 21.

Evening. Lake high and active. Puffing cone SE pond.

Oct. 22.

8:00 p.m. Lakes high and active and with margins much built up. SE pond and main lake both have 3-foot banks, high flinging fountains. Grotto SE side SE pond, open very bright pott NE side with lava pounding, where the recent cone has collapsed. Small flume chimney NW side.

Main lake streaming steadily E from cove in crust of central pool. Numerous fountains N and S, and some breaking up with cracking and foundering and central fountains. Glowing filagree flame cracks on N and S banks. Flames over grotto SE side. SW pond flinging spray high. Crag stationary. SE pond continues to stand at a level 10 to 15 feet higher than main lake. Noises fountaining chiefly. Glow at night bright all lakes. Fume thinner.

T.A.J.

Day	Date	October 24, 1918.
Thursday		
Friday	"	25, "
Saturday	"	26, "

Oct. 24.  
10:20 a.m.

Around to N side by E.

Lakes 4 feet down more or less. The pot E of SE pond has sealed up except for flaming cracks and a sulphur stained flattish cone and crater. No activity visible in N or SW lakes. Main lake moderately active along N bank and both lakes E showing the usual alternations between rising and falling. Streaming E. Crags stationary. Fume moderately dense.

Oct. 25.  
6 to 7 p.m.

Lakes at first very sluggish and dark and crusted. After nightfall breakings up in both main and SE lakes. Fountains NW and S of SE pond, and along N shore, S and SE shores of main lake. Streaming zone out of W end in curve to S grotto, and from a quiet zone in E pool to S grotto, and on opposite side from same crust to NE grotto. Streaming under NW bank of SE pond. Flaming filagree chimneys over S grotto of main lake and on S and NW banks of SE pond; the cone NE of SE pond flaming through many cracks in pulsations of gas pressure. Fallings-in of the banks on NE side of central pool and NE side of SE pond. Some small rock falls heard. The solfataric patch on S side of E cross ledge decomposing the rocks and extending. SW and N ponds only slight activity. Stalactites SE pond, 6 feet down. Crags stationary. Glow moderate at night. Fume moderately dense.

Oct. 26.  
3 to 4 p.m.

Around pit by E and N.

Lakes very inactive. SE pond 5 feet down, appears rising; glow in cone NE of it; pond crusted. Later breaks up and recrusters. Main lake similarly crusted. One grotto later became active with some blowing and spraying NE corner. No activity visible N lake. SW pond noisily fountaining. Smoke heaviest in N lake depression. Crags rising slowly. Glow at night dim.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:20a	SE	N grotto main lake		6 40		446	52	
		Central crag		-4 41		496	40 above	
		Yellow cone N side SE pond		13 50				
		Grotto NW side SE pond		12 20	0			

no	pl	scr	stop	ex	cam
	E of SE.	SE pond	8x f/11	1/2	

T.A.J.



Loag

Oct. 28.  
2:45 p.m.

Circuit of pit by S and W. Light SW wind to calm. SE pond and main lake fountaining vigorously. Flaming pot NE of SE pond with stalactites. During sinking spell remarkably deep overhang revealed over liquid and beneath 3 feet of platform crust. The overhang extended in 3 or 4 feet at least, for a depth of a foot or more above the liquid. Similar overhang revealed in main lake, which was crusted over its central part but streaming northeastward from a V-shaped glow edge of crust in the region of the northeast cove.

From the south station it was evident that the escarpment overhanging the SE cone depression on its S side had been lifting so as to cut off the view of the SE pond. The ring shaped inner valley encircling the central group of crags was conspicuously shown with the fumes blown northward and was very striking from SSW looking along the W chasm valley, now quite a wide depression extending from the SW pond northward along the western base of the W crag mass. This valley is bounded on its W side by the inface of the escarpment which on its outlook side forms the western wall valley. These two valleys are there as strongly marked as they are to the S of the central crag mass. Saw a very heavy fall of bank material tumble into the western part of the SW pond creating great commotion. Along the base of the SSW outer cliff of the pit the swelling up of the S floor has produced a V-shaped gulch along the wall crack. Grotto pounding at N end of W arm extension of SW pond. NW cone sending up hot steamy fume but without noise. N lake noisily fountaining but out of sight and some hissing from the NW pond depression. At 3:30 p.m. main lake and SE pond depressed and grottoes rumbling. E fill appears low.

Oct. 29.

At night the glow heap of the S side of N lake depression was in plain view from H.V.O. Crags much higher.

T.A.J.

KILAUEA DAY SHEET

349

Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day **Monday** Date **October 28, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
			no	pl	scr	stop	ex	cam
2:45p	SSE	SW wind.	1		8x	f/11	$\frac{1}{8}$	P
	"	SW pond	2		"	"	"	"
	"	Steeple N crag and SE pond	3		"	"	"	"
	"	SE crevasse and central crag	4		"	"	"	"
	S cone	W station	5		"	"	"	"
	SSW	W crag						

T.A.J.



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309



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509

Day Wednesday Date October 30, 1918.  
Thursday " 31, "

Oct. 30.  
 11:00 a.m.

Made circuit of pit by E and N. Climbed to middle saddle NE crag mass and along crest to saddle between the two north crags, thence down tumbled slope to N fill and into N lake depression through NW gap. Crags have been rising strongly. Lakes appear about as before, 4 feet below inner benches. SE pond shows usual alternations of crusting, fountaining and sinking spells. Main lake the same, with some violent fountaining. Pot of SE pond quiet and covered with Pele's hair. E fill remains low but S valley fill has lifted. Streaming eastward.

Some rocks sliding in SE crags.

Looking down from summit N crag mass the N lake seen to be enlarged westward where it is overhung by one of the small crags in a cavernous recess. The western side of this crag, about 20 feet high, shows glowing, hissing and bubbling cracks and this appears to be the glow spot visible from Volcano House. There is another large filagree flaming area among the crusts N of the N lake at the base of N crag. No activity at NW cone and no special activity noticed at driblet spiracles at N side of NW pond depression. The chasm leading northeastward from the N lake depression has a lava cone within it crowned with driblet spiracles and somewhat broken. It is not fresh.

No special activity observed from W and SW. Fume is still abundant, the glow at night is rather dull except for occasional breaking up spells. The crags, however, are undergoing a marked spurt of rising.

Oct. 31.  
 Evening.

Strong fountaining. Crags rising strongly.

T.A.J.

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day **Wednesday** Date **October 30, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11 a.m.	SE	N grotto lake		4 53		446	38	
		Cone E of SE pond		10 45				
		Summit steeple		-4 1				
		" Central crag		-6 39	0	496	58	

T.A.J.

no	pl	scr	stop	ex	cam
----	----	-----	------	----	-----

- 1 - Day Saturday Date November 2, 1918.

11 a.m. to 12 noon.

Strongly felt earthquake last night, generally felt on this island; culminating succession of NE tilts and rising bench magma. Following it find liquid lava welling up and fountaining continuously in two new pots, the one just back (N) of old North Rest House and the other 10 ft. W of old North Corral -- both places outside of old edge of Halemaumau. Floods of lava from these sources pooled over the area between the 1894 driblet cones and the NW cone, and between the corral and the N inner fill. Lava cascading inward over edge of crater W side of new N station. Station surrounded by new lava but not yet submerged. Old Rest House nearly completely buried. Fresh spatter from the corral vent on U.S.G.S. bench mark at site of former Technology Station. Refuse lumber burning. Lava from this vent making a flow northwestward toward Uwekahuna 200 yards long. Heavy doming fountains bubbling at the two vents; lava the usual glistening black pahoehoe. 1918 shelf at edge of pit, adjacent to NW cone, uplifted 5 or 6 feet, becoming a half-dome on the edge of pit. All the sudden changes appear confined to this N rim. Avalanches in Kilauea were heard during the earthquake.

Main lake surrounded by uplifted banks 4 to 6 feet high, streaming eastward, active border grottoes, upending and foundering heavy crusts. SE pond flush with its margin and the vent E of it hissing and glowing. N lake fountaining above its banks especially at NE end. What appears to be fresh lava occupies floor of NW pond depression. SW pond fountaining and escarpment S of it strongly lifted at the eastern end and some suggestion of uplift at SW heap. Crags all rising strongly.

Fresh earthquake debris under glade E side of Keanakakoi at base of cliff; also at talus next S of gravel section base Uwekahuna bluff; also probably at the main Uwekahuna talus and at N cliff of Kilauea. Avalanches were heard tumbling, in these directions, after the shock. The occurrence of this shock on a foggy and rather calm night about Nov. 1 recalls the similar one of Oct. 25, 1913.

10 p.m. The night view of SE and main lakes shows plainly the rising activity. SE pond brimming and overflows around it; heavy folded skins; flaming chimney NW of it; and splashing pot in cone E of it rapidly building up by overspatter. High flings of melt and building of spatter bank SE corner of main lake; slow steady screaming in straight bright lines out in lake from W to E; grottoes along N shore with high half-domes shrouded with stalactite curtains. Activity of the noiseless bright fountaining type. Both lakes and crags very high. N lake shows similar activity and cliff chimney S of NW pond depression flaming brightly. Flaming filagree cone with steady hissing jets of burning gas on N side of N lake.

JOURNAL

- 2 - Day Saturday Date November 2, 1918.

North fill glowing and making lava toes from the cascade flow which was pouring still under crust southward over the edge of the pit on both sides of the new N station. Fresh lava piling up in region between the three 1894 cones and the N station, lava toes making out, and the vent at the old Rest House site buried up. The corral vent converted into a cone 5 feet high, flaming and hissing slightly. Flow extending from this vent northwestward glowing.

Glow observed in W crag chasm. No special activity SW and no revival of NW cone. Crag continue to rise.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11 a.m.	SE	N grotto main lake		2 49	-4	446	23	
		Central steeple		-6 0	-4			
		" creg		-7 58	0	496	70	above
		Cone E of SE ponds		7 38	-4			

no	pl	scr	stop	ex	cam
	NNE	Cascade & new fill N station	1	8x	f/11 1/8 P
		1894 driblet cones to N station	2	"	" "
		N corral to fountaining pot 15' off.	3		f/6.3 1/30 "
		" " " " " "	4		" " 1/50 "
		W of N. North	5	8x	f/11 1/8 "
		Looking E at raised 1918 shelf and NW cone.	6	"	" " " "

T.A.J.



20



5



Jag



3



4



6

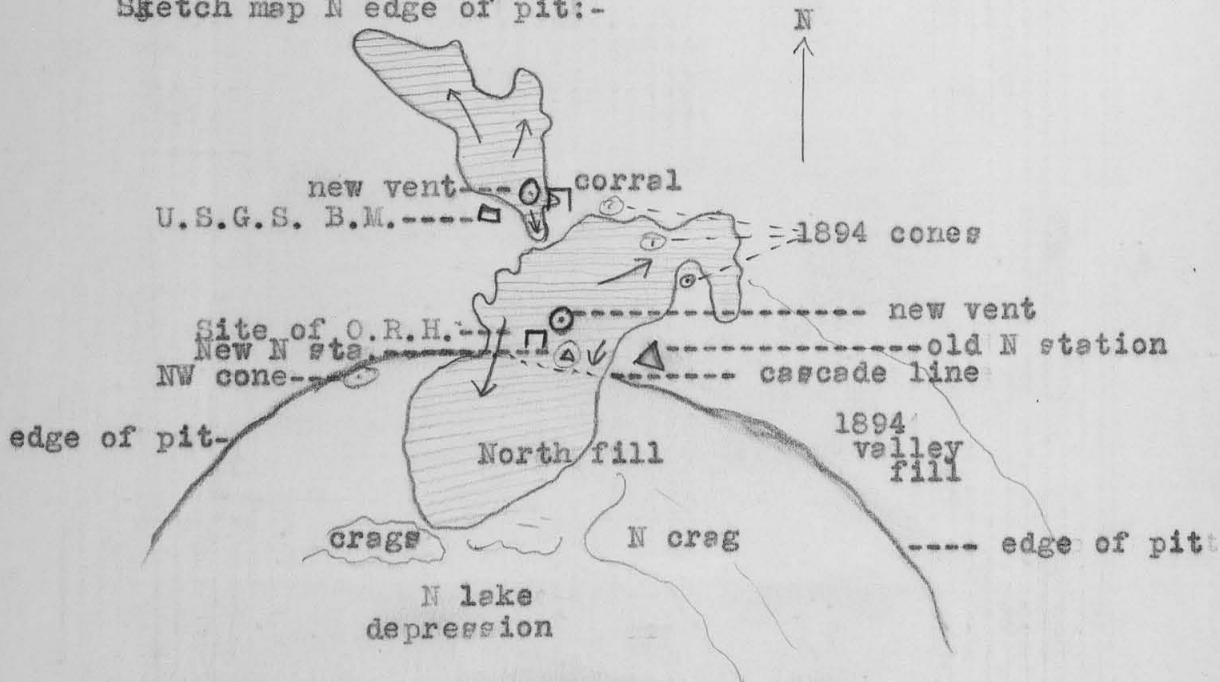
200

5:30 p.m. Lakes very brilliant and rising. SE pond spraying, cone blowing, W chimney flaring. Main lake moving eastward and grottoes heavily curtained and splashing. SW pond brimming and spraying high. N lake flinging and NW chimney flaring. Glow W of W crag. Filagree flame cone N of N lake.

The new flows N have spread and greatly thickened about the North Rest House vent, so that new N station is enveloped by heavy blanket of lava, post only one foot protruding, a quarter of platform on pit side remains. At top of lava heap a filagree flame cone about 15 feet above site of old North Rest House. Fresh lava hard so that I walked to new N station and across whole width of cascade flow. Toes making out sluggishly W of old N station and in N fill. Latter filled high, but wall valley under old N station deep.

Arrangement of flows shown in following sketch.

Sketch map N edge of pit:-



Evening. At some time after 7 p.m. for an hour and more the SE pond was reported to overflow into E fill, filling latter and making a magnificent display, with cracking and foundering. The cone at this pond continued playing. The glow at a distance was very brilliant and fountains seen from H.V.O. at E end of pit.

T.A.J.

- 1 - Day Tuesday Date November 5, 1918.

11 a.m.

Inspection from SE fully confirmed story of overflow from SE pond Sunday night which took place about 8 p.m. The result is shown by a broad fresh fill of the E wall valley making its depth below rim only about 30 feet and the frozen cascade from the SE pond is plainly shown, leading directly from the lip of the pond straight through the gap south-eastward, there about 15 feet wide. No sign of overflow from the main lake, the lifted banks of which are high, cracked and coated with Pele's hair. One glistening black driblet cone stands at the bank level at the S grotto but the lake in general appears to have remained 5 to 10 feet below the bank level. The cone NE of SE pond keeps open as a flaming and hissing filagree vent and also the chimney or flaming pot in the bench northwest of the pond. The whole platform is maintained at a level well above the flood level of the main lake and considerably above the inner valley depression extending off to the SW of the SE pond, which still retains the SE driblet cone, now old and apparently without activity. All of the lakes are now at such a high level that they can be seen from the rim of the pit only when they are brimming.

At 10:30 a.m. when I arrived the SE pond was over 5 feet below its circular confining wall and the surface invisible. Only a corner of the main lake could be seen fountaining at the NE cove. The SW pond was fountaining but not visible and the chief visible activity of the N lake was in the flaming cone N of it and the flaming chimney W of it. Towards noon and thereafter the SE pond and main lake rose rapidly so that the former was only 3 feet down at 1:30 p.m. and during the afternoon it overflowed slightly.

The new flows in the E fill extended along the wall valley nearly to the S station and through the narrow gulch E of the E cross ledge out to the middle of the NE valley where the flow nearly met other fresh flows of the same sort coming from the new northern vents.

The same kind of driblet flow heaps as the S cone of February last have now developed opposite the SW and N lake depressions, along with uplift and heapings above the level of the rim of the pit, and from both of these, as from the SE pond on the other side, flows have pushed right and left along the wall valley. The SW heap has its source in hissing cones about the site of the old cones of August, and the bronzy bell cone of August has broken to pieces by uptilt of its foundation as shown in accompanying diagram.

The N lava heap has its vents at the old Rest House and corral sites but the more active hissing and flaming vent is the former with flows openly pushing across the surface of the heap in the N fill. This heap is now at the old rim level and the pile of lava around the vent has buried the rim for a depth of from 5 to 15 feet in different places. The new N station still shows three quarters buried. The flows from the corral vent have been swelling into schollen-

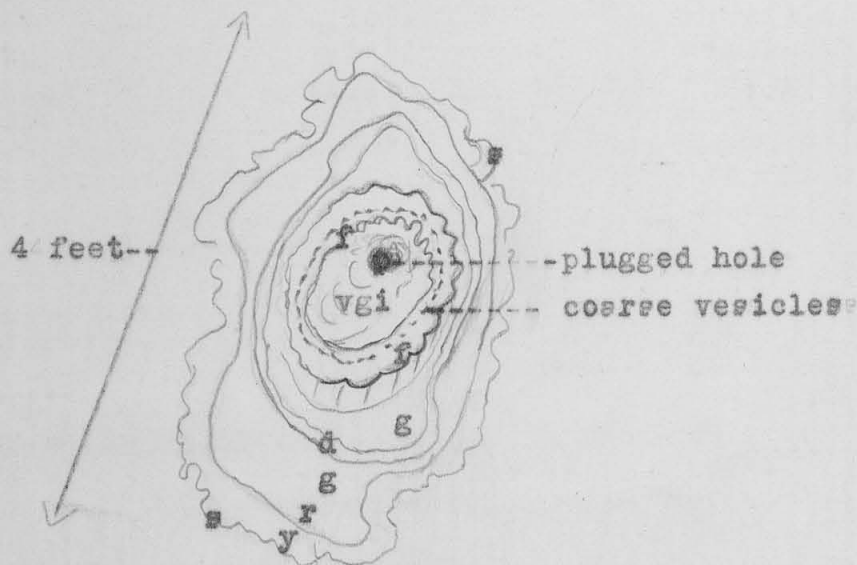
domes and extend for over 100 yards towards the NW. The concrete platform with U.S.G.S bench mark still intact. Old N station still above new flows.

The SW heap of August has been lifted bodily as well as added to through driblet vents, and its summit stands 10 feet above the old rim of the pit. There is also a secondary vent and driblet heap a little farther E in the midst of the circular pond-like shell which was left there after the August activity.

The crags have continued to rise, motion is everywhere in evidence through slightly tumbling rocks, and small earthquake tremor spasms are of daily occurrence on the seismograms.

Note the symmetry of the three overflow centers SE, N and SW, separated by the three elongate crag masses.

Cross section of SW driblet cone broken open:-



- vgi - vesicular gray interior
- f - flutings vertically
- g - gray
- d - dense gray
- r - red
- y - yellow
- s - stalactitic outer surface

More and more reds and yellows toward exterior of cone.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:40a	SE	E	0					
	ESE	E	0					
	SE	E ledge	27 33	-4 42	0			
	ESE	ditto	50 38					
	SE	SE pinnacle bet. E gate and SE pond	38 38	-1 50	0			
	ESE	ditto	95 2					
	SE	Spatter heap SE corner SE pond	70 14	3 41	0	167	10.5	
	ESE	ditto	121 40					
	SE	Central steeple	66 28	-7 0	0			
	ESE	ditto	90 17					
	SE	Central crag	82 43	8 45	0	494	76 above	
	ESE	ditto	97 48					
	SE	New crag S of SE pond	81 24	-0 0	0			
	ESE	ditto	120 0					
	SE	Crag N of main lake	48 38	-2 50	0			
	ESE	ditto	64 20					
	SE	Crag S of central crag (old S crag)	93 47	-3 38	0			
	ESE	ditto	110 10					
	SE	Crag next S of old S crag	108 48	-0 5	0			
	ESE	ditto	121 9	ca				
	SE	Crag W of S chasm	108 39	0 10	0			
	ESE	ditto	129 6					
	SE	E cor. cent. crag mass	57 26	-1 51	0			
	ESE	ditto	95 43	ca				
	SE	S side gap SE pond overflow	62 54	7 21	0			
	ESE	ditto	132 21					
	SE	N side ditto	48 18	7 42	0			
	ESE	ditto	128 32					
	SE	Solf'ra N side E gate	20 34	2 16	0			
	ESE	ditto	63 18					
SE	W edge new E fill	32 8	9 5	0				
ESE	ditto	124 26						
SE	Summit SE crag above this point	32 34	1 13	0				
ESE	ditto	114 14						

		no	pl	scr	stop	ex	cam
10:40a	Gravel flat to Halemaumau	1		8x	f/11	1/2	P
	ESE to overflow SE pond	2		"	"	"	"
	NE to NE fill	3		"	"	"	"
	NE inner bench to N station	4		"	"	"	"
	N fill to N sta., near view	5		"	"	"	"
	Near view flow in N fill	6		"	f/8	1/4	"
3:30p	Uwekahuna to pit	1G		15x	f/32	2sec	G
	ditto, 27 in. extension	2G			f/28?	6 "	"

T.A.J.



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2



3

Jag



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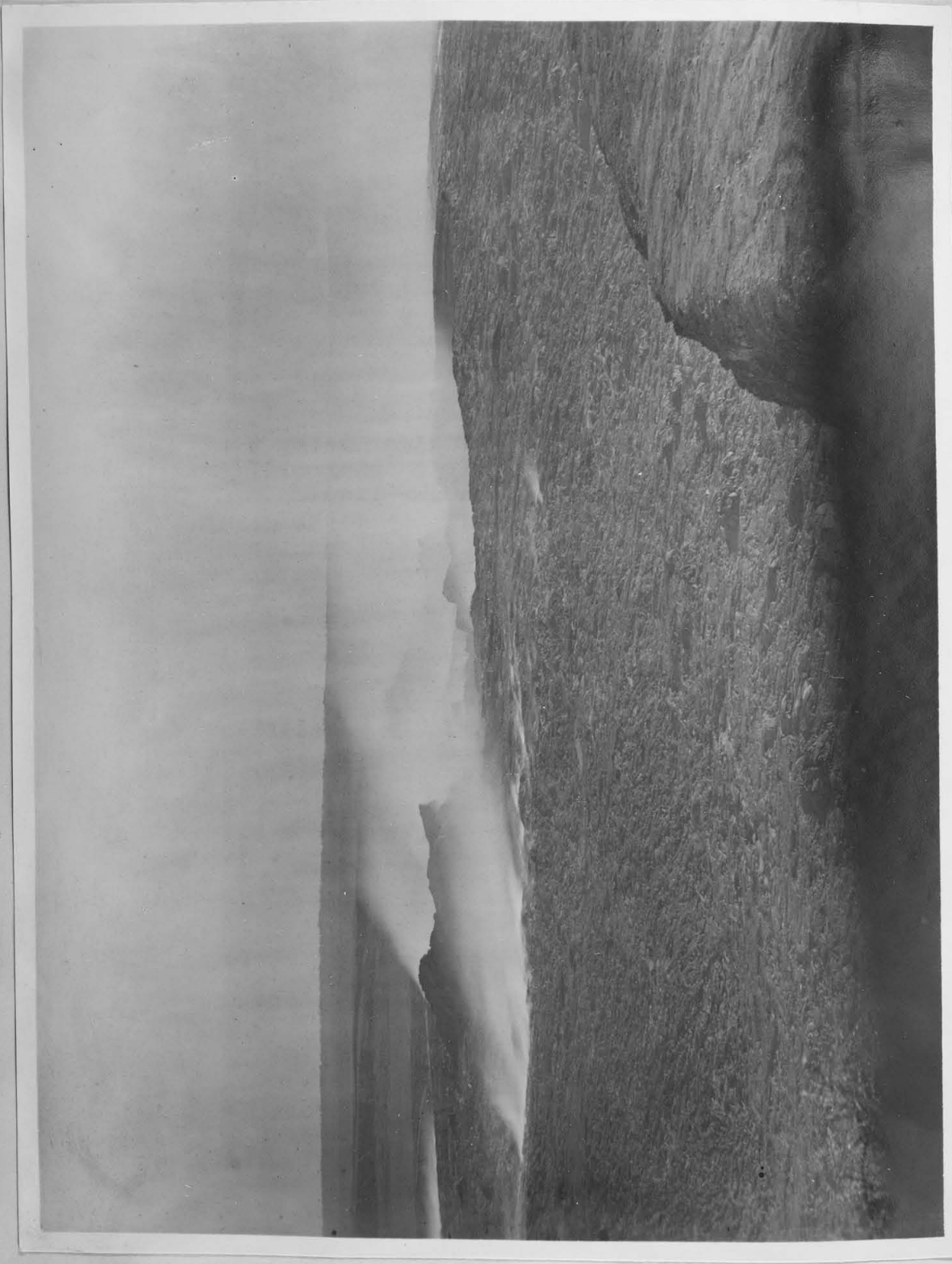
6

zag

bag



91



Boff

2 G

3 p.m.

Slight fresh overflows of the elongate snaky type following the course of the Sunday cascade for 40 feet from the SE pond margin. SE pond 12 feet down, glowing and quiet with considerable overhang. This seen only by going out to edge of pond. Cone NE of it hissing and flaming moderately. Visited edge of main lake E; liquid 10 or 12 feet below; eastern and southern banks fissured shells covered with Pele's hair. Glow hole and sulphurous fumes 20 feet back from edge of S side of eastern gateway and more sulphurous fume coming from the E cross ledge solfatara. Several high and heavily curtained grottoes seen in the lake which was streaming slowly eastward and rising, covered with heavy folding skins. An island has appeared in the lake which looks as though it were the broken off tip of the peninsula on the N side of the narrows between the central pool and the E pool. This island was about 5 feet high and consisted of a row of jagged points with surfaces tipping northward. All around the lake the bank is peculiar in being high and mostly of older rock, the grottoes being plastered against this upright inner cliff as though the basin had risen faster than the liquid.

Looking down from the summit of the NE crag mass the arrangement of things in the central region recalls 1917 strongly, except that the N central part is not an open lake. There is a tumbled NE valley or chasm extending from the NE cove to the N lake proper and beyond that the crag on the N side of the narrows recalls the old E crag of a year ago. The NE cove is an extensive embayment with the lake lapping the talus just as in 1917 and the E ledge hangs over a lake shore which is a relatively low bench. The central pool itself is too smoky to show much detail but the banks N and S appear to be cliffs, while the W looks more like a floor of overflow. All is choked and uplifted, however, in the directions of the old W and N arms.

Inspection of the interior of the N lake depression showed active flaming and hissing solfataras at the N, the W and at the middle crag chimney, and fountaining could be heard in the lake in the midst of smoke.

At the active cone near the N station there was sluggish flowing a few feet from the cone toward the W; otherwise the heap was stagnant.

The NW cone was more cracked and tumbled as result of uplift beneath it.

Crags still in motion and rising. Glow at night less bright. SW side of southern crevasse rising more than the opposite side. Here and elsewhere, as in former uplifts, flat features are rapidly becoming conspicuous crags.

Evening.

Fountains at E end seen from H.V.O.

T.A.J.





1



2

Fog

Day	Date
Thursday	November 7, 1918.
Friday	" 8, "
Saturday	" 9, "

Nov. 7.  
5 p.m.

Circuit pit by S and W. Main feature greatly increased tumescence opposite the three gates N, SW and SE. Sharp earthquake at noon, followed this afternoon by driblet flowing from N vents, toes pushing abundantly in NE valley. SE the lakes 3 to 5 feet down, streaming E, bright glowing melt, numerous fountains and grottoes. Large flames at cone E of SE pond. Island of main lake now a point again from N bank.

Greatly uplifted S floor crag cutting off view of SW heap from SE station.

SW heap greatly uplifted and pushing up the old edge of the pit near new SW station.

Activity only in NW end of SW pond. Large spatter dome visible SW side of SW pond.

Great general uplift of W crag mass tilting back W floor. Uplift at NW cone jamming back old rim of pit and tilting it all the way from old NW station site to new flows. Wall crevasse gaping more at NW cone.

N station vent hot and flaming. Fresh flows swollen everywhere into schollendomes and glowing. N lake spraying high against its N bank and the crag chimney flaming. Flows moving in NE valley from northern heap.

Everything recalls the tumescence period of the February-March high level.

Nov. 8. In morning ponds 6 feet down, no great activity. Glow in NE flows. Crag continue diminished rising. (Crag stationary by measurement next day.)  
Rather dull in evening

Nov. 9.

4:30 p.m.

Conditions sluggish, crags nearly stationary. Lake low. N rim vent hissing and building driblet spiracles with yellow sulphurous deposits at the vents. Concrete post of N station now completely surrounded by heavy flows. NE valley flows making toes at one place only. Evidence of extension of the general upward swelling to the valley floors for the wall crack along the NE margin of the NE valley is closing together all along the rim; from 3 to 5 feet of gaping has closed to less than a foot in many places. The fresh flows of Nov. 3 on the E end of NE valley floor are tilted by the uplift. The E cross ledge has had its tumbled slopes so much tilted that boulders have rolled down on to the fresh E valley fill leaving tracks. One three-ton boulder lies 10 feet out on the floor opposite the E gateway.

T. A. J.

KILAUEA DAY SHEET

Massachusetts Institute of Technology

Hawaiian Volcano Observatory

Day **Saturday** Date **November 9, 1918.**

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

no	pl	scr	stop	ex	cam
----	----	-----	------	----	-----

4:30 p NW cone uplift to N cones  
 N cone to NW cone uplift  
 New N station nearly under

1		8x	f/6.3	$\frac{1}{2}$	P
2		"	"	"	"
3		"	"	1	"

T.A.J.



1



2



3

*fog*

Day	Sunday	Date	November 10,	1918.
	Monday		"	11, "
	Tuesday		"	12, "

Nov. 10.  
6:30 p.m. The N rim vent was spurning in spasms.

Nov. 11.  
5:30 p.m. Circuit of pit by S and W. Crags and floors more swollen up. Glow in E fill floor. Flames abundant in cone of SE pond, in E gate and above S grotto. Lakes only 4 or 5 feet down inner pits, fountain fling visible above margin. Sounds of strong activity in main lake, SW pond both S and NW sides, N lake. Glow W chasm. Bright flare N depression crag chimney.

From rampart of 1894 at W niche noticed long lava flow between there and W wall of Kilauea crater. Crossed to it and found its extremity 1500 feet W of N horse corral, and its source at two new cones flaming and hissing 80 feet W of the corral cone. From there it flows W, parallel to edge of Halemaumau and 200 feet back from edge and then strikes off across the old partly as flows of 1894, varying in width from 30 to 80 feet. This is the result of spurning activity noticed last night. The lava is the usual glassy pahoehoe. I followed up the flow for its whole length walking on its surface most of the time. At the front it was making forward slowly by putting out toes. The cones at its source were 10 to 15 feet across, with filagree crests and small flames. The corral cone was slightly glowing but not breathing. The cones of N station locality were very bright, with recent swelling up into schollendomes and recent new flows piled level with wall of corral and penetrating corral from its E end. U.S.G.S. bench mark still intact. Post of new N station still visible.

NW cone locality domed up 20 feet high and SW heap locality also 20 feet high above old rim of pit. Old rim pushed up in both places. West escarpment pushed up higher and crags all loom greatly. Everything points to high tumescent pressure, abundant burning gas, and a strong supply of liquid lava.

Flow plainly visible far to W of pit, as seen from H.V.O.

Nov. 12.  
8:00 p.m. Toe of W flow plainly visible, active, and farther W than last night.

T.A.J.

Day Wednesday Date November 13, 1918.

10:30 a.m.

Crags lower. Slight sliding of talus. Circuit of pit by E and N. Lakes 5 to 8 feet below banks. Main lake crust stagnant, streaming E end of N bank, W end and S grotto. Spatter building N and W and general appearance of rising lake. E cove has broken back. SE pond also appears rising; quiet crust, fountains against NE bank. Cone sulphur stained but still flaming. Fall of NW bank of SE pond seen. North lake has been overflowing and extending itself voluminously so that with its overflows it is now a horseshoe extending around into NW pond depression and uniting the several cones. Fresh spatter bank where the western flame vent was. North rim cones inactive and the fresh flows hot but not moving. The western long flow about the same, but a second flow from the cone source has poured 400 yards NW straight toward the ash bed at base of Uwekahuna. The toe of this flow was visible glowing last night from H.V.O. No changes W or S. SW pond active.

In the evening to 11 p.m. crags high, all the lakes moderately bright. Felt earthquake early next morning and noted crags down.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
10:30a	SE	Brunton. Cone SE pond Central crag		9 50 -7 55			29 below 69 above	

no	pl	scr	stop	ex	cam
1	W P	8x	f/11	1	P
2	"	"	"	$\frac{1}{2}$	"
3	"	"	"	"	"
4	"	"	"	1	"
5	"	"	"	$\frac{1}{2}$	"

T.A.J.



3



4



5

209



1



2

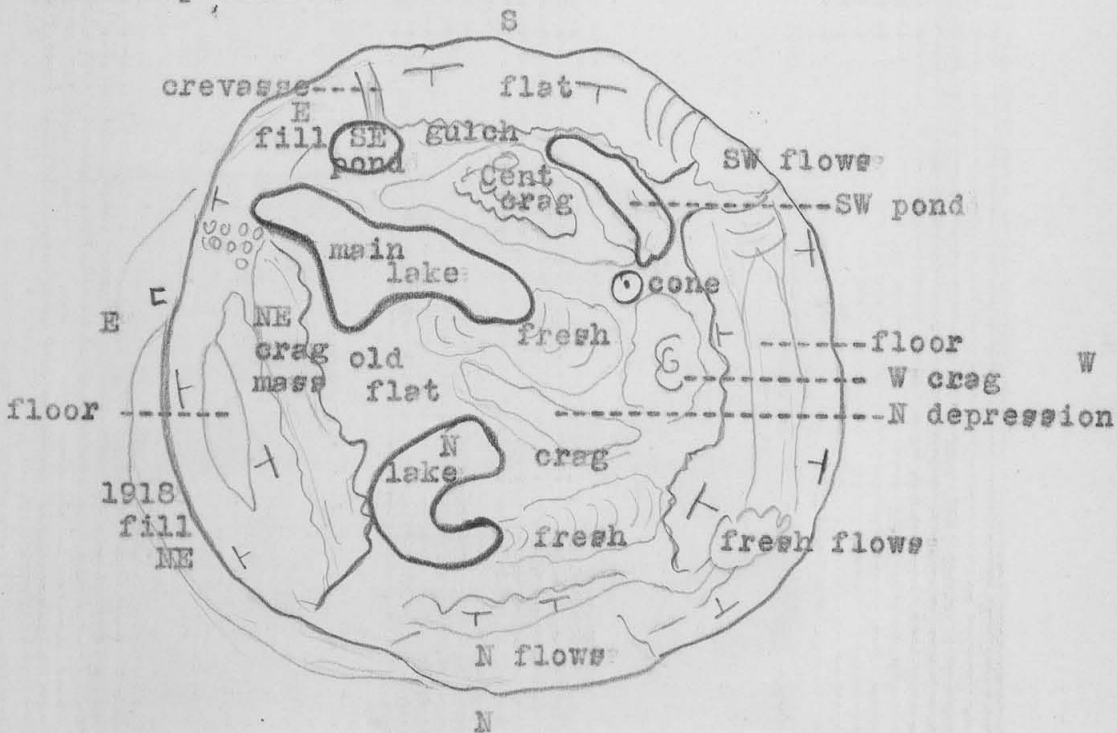
Jog

9:45 a.m.

Circuit of pit by E and N. General subsidence of entire lava column about 50 feet continuing very gradually, accompanied by relative rise and flooding of margins by the lakes. On all sides floors slope inward in a zone about 30 feet wide at angles up to 30° or 40°. The steepest of these slopes with wide gaping crevasses at the top are at the E fill and NE valley. Lakes and crags have subsided together as in April and the avalanches are very small, consisting mostly of tumbling individual blocks about the yawning crevasses. The fume has markedly thinned probably owing to the filling of underground cavities with the liquid lava displaced through the concentration in pit funnel of the heavier material.

Main lake shows wide platform of fresh overflows over entire central region and is building black glistening spatter margins. N lake a U-shaped pool with much fresh overflow from it over whole NW pond depression. Fresh overflows on floor of NW wall valley. Northern rim vents quiet. Continuous fountains against base of W end central crag mass in NW arm of SW pond.

Sketch map from N:-



Edge of pit left by subsidence retains clinging shelves on all sides; the upheaved portions of old rim SW and NNW have settled back and large crevasses all around next inside mark the main boundary of the circular prism which is subsiding. All the interior features keep their integrity as a complete topography. The S floor has the

gentlest inward slope. NE and W an area of floor remains flat, bounded on the inner side by the crag escarpment and on the outer by the annular downbroken zone of the floor itself.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		Transit survey.						
9:45a	SE	E	0					
	E	Old N	0					
	SE	Summit E ledge	28 28	1 51	0	285		
	E	ditto	58 24					
	SE	Summit N crag	47 0	-0 28	0	454		
	E	ditto	23 4					
	SE	Summit W crag	77 28	0 46	0	457		
	E	ditto	50 28	0 2	0			
	SE	Summit central steeple	65 12	2 16	0			
	E	ditto	68 8					
	SE	Summit central crag	81 18	-1 57	0		17 above	
	E	ditto	68 22					
	SE	Summit S peak central crag mass (old S crag)	92 23	3 0	0			
	E	ditto	80 10					
	SE	Crag corner W of S chasm	104 54	8 10	0			
	E	ditto	96 34					
	SE	SE pinnacle crag	40 32	9 42	0			
	E	ditto	91 3					
	ESE	Old N	0					
	SE	Cone E of SE ponds	51 12	16 54	0			
	ESE	ditto	70 32					
	SE	Grotto SW cor: SE pond	71 28	17 16	0		51 below	
	ESE	ditto	71 44					
	SE	Grotto N shore-main lake	57 8	9 9	0		72 "	
	ESE	ditto	38 44					
	SE	Boulder W margin E fill	36 43	21 14	0			
	E	ditto	107 44					
	SE	Solf'ra E cross ledge	23 52	9 49	0			
	E	ditto	89 4ca					
	ESE	ditto	26 15					

			no	pl	scr	stop	ex	cam
	SE	Tumbled E cross ledge	1	W P	8x	f/11	1/2	P
	"	Central pinnacle	2	"	"	"	"	"
	"	S central crag	3	"	"	"	"	"
	ESE	NE valley	4	"	"	"	"	"
	From ENE back of edge to E ledge		5	"	"	"	"	"
	" old N to inner depression		6	"	"	"	"	"

T.A.J.



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2



3

Jag



4



5



6

Tag

Day Friday Date November 15, 1916

11:30 a.m.

Subsidence has continued very evenly with no heavy avalanche clouds but at present practically continuous avalanching in small tumbles on all sides. Fumes extraordinarily thin. All lakes in view from SE rim. Inner shelves of new material SSE, E and N and a thin veneer of such shelf most of the way round. Cliffs below these shelves 40 to 50 feet high and underneath lies the inward-sloping zone of breaking up floor matter lying at high angles. This inner slope zone an even semicircle E, N and W, but the southern half of pit more irregular with the S floor sloping gently inward and broken down in steps. Beginning at the SW gateway the semicircle of southern floor including the entire surface around to the E fill stands at a higher level than the NE and NW floors. The NE floor appears to be the lowest floor surface.

SE and SW ponds occupy depressions 20 feet deep. Escarpment S of the southern inner gulch has flattened out but the surfaces adjacent to central crag mass on the opposite side of gulch have sunk lower. All the lakes are building black overflow margins, fountaining at numerous crescent niches and occasionally having short sinking spells with violent breaking up of crusts and multiple fountaining. The main lake at 11 a.m. did this very suddenly with a subsidence of 4 feet and violent noisy seething, this being followed almost immediately by quiet crusting over and very rapid recovery to the level of its banks. SE pond enlarged to a squarish shape and the platform containing the cone is gone. Streaming indefinite, except in SW pond where it is northwestward. Main fountains in main lake E, N and S. N lake fountains against N and S banks. W of N lake a small pot fountaining at a higher level in the NW pond region; this the former flame vent at base of NW crag. From the N the view smoky. N lake has a very large crescent spatter niche on S side. Wide bench of fresh lava overhanging clings under the cascade locality of the new flows.

NW cone has fallen and the raised old edge and trail back of it have cracked and subsided and become unstable. Wide new cracks back of old N station.

Small quakes felt on edge of pit.

Small quake about 8:30 p.m. while D instrument seismogram was being changed -- felt.

Small felt tremblings all night.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30a	SE	Brunton Central crag (new summit)		3 40			32 below	
		W crag		4 10				
		N "		3 0				
		Grotto N of main lake		14 5			112	
		SW bank SE ponds		26 22			94	

no	pl	scr	stop	ex	cam
1	W P	8x	f/11	1/2	P
2	"	"	"	"	"
1			f/26	no vane	A V
2		orange	f/12	"	"

T.A.J.



1



2

30g



Boe

1 AV

Boer



2 AV

12 noon.

Red hot avalanches reported last night. Slides now incessant. One or two fairly heavy ones. Almost no fume but considerable dust.

Lakes over 200 feet below rim. Floor areas around them increasing in size. Activity building spatter domes. Fountains at N lake, main lake, SE pond, SW pond and W arm. Occasional cracking and foundering and subsidence spells with central fountains but lakes mostly crusted and without definite streaming.

Large shelf of new lava clinging with overhang at the E. Shelf at old N station has fallen and heavy falls in progress at the SW.

Small round pond in the crust of fresh flows in central region.

General condition indicates lava column is becoming stationary, liquid rising and marginal telus coming to adjustment.

T.A.J.





1



2



3

Fog



4



6

Jag



5

- 1 -

Day

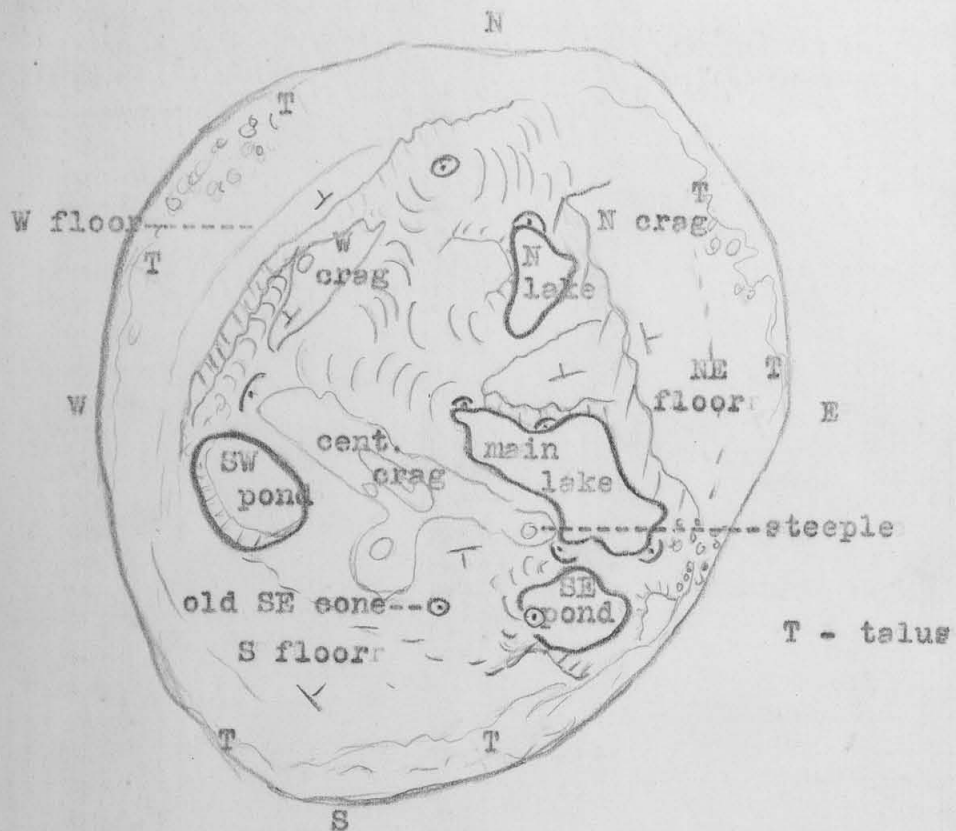
Monday

Date

November 18, 1918.

3 to 4 p.m.

Pit from S:-



Bench magma stationary. Lakes rising and flooding whole central area. Steady artesian fountain at NW pond locality. Spatter domes and crescent niches; blowing and splashing noises everywhere. Fume very thin. Rhythmic fountain at W arm locality. Steady festoon flow from there northward along W chasm. Central region a vast pooled flow, cracking and foundering. Large quantities of Pele's hair rising. Talus sliding very little. Puffing cones N side N lake and SW side of SE pond. Continuously active spatter heaps main lake N, W, E and S. Two active spatter heaps S side SW pond. Boundaries of main lake, northern lakes and W arm pool indistinguishable. W and NE floor mostly covered with talus. S remains a bench sloping gently inward in a semicircle. Very coarse talus SE. Remnant shelves fresh lava NE and S. W crag mass and the small northeastern and northern masses in the central depression fast becoming submerged, also the W floor escarpment. Central and northern crag masses and E ledge remain high. E fill, E cross ledge and SE pinnacles completely buried under talus. Tipped up border ring of broken floor material retains flat surfaces SSE and along base of NW cliff. Elsewhere it has crumbled to talus. Burnt blackish looking well slickensided vertically under SW heap locality; nothing left of SW heap except ragged old edge of pit. There are new humps in profile

of pit edge here and at N station flow locality.  
General condition of pit like a factory city with all furnaces  
in full blast. Ten fountains. Central steeple split in two.

T.A.J.



11 a.m.

Survey for map data as wind light and southerly and pit clear. Smoke vents, however, increasing in number, especially N of central region. Main lake a small kidney shaped pond at the E pool only, 10 feet below its margin with a high grotto in middle of N side, showing hanging stalactites, and other grottoes S and E.

SE pond a flat cone of radial flows surmounted by a five foot open pot leading to brightly glowing interior. Cone 2 or 3 feet high where SW corner of pond had been. No trace of pond outline. Fresh flows cover whole flat W of island base of steep portions of central crag mass. Whole SE cone still in place.

Fresh overflows SE from main lake, only small remnant of SE pinnacle sticking up.

N lake a small pot 5 or 6 feet deep surmounted by a large half-dome facing S.

NW pond cone a small spatter heap with a large elongate pool extending S to the base of the W crag mass and seen in process of cracking and foundering.

W arm pond a small oval 5 or 6 feet deep with a large spatter heap on its E side and occasional high fountain flings there.

SW pond small and circular 6 or 8 feet below its margins. Streaming in main lake eastward. Considerable avalanching from high walls coincident with sinking spells in the lakes. Such sinking spells frequent and accompanied by a good deal of turbulence.

No changes noticed in talus ring or in crags. Middle saddle of western escarpment flooded across by fresh flows and active cracking and foundering seen in northern part of W valley.

General condition suggests beginning of lift of bench magma so as to produce open condensation chambers in the tunnels and wells.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
		Transit Survey						
11a.m.	SE	E	0					
	E	NE?	0					
	E	Old N	35	33				
	E	New N	42	44				
	SE	Boulder middle NE val- ley	35	9	19	50	0	
	E	ditto	51	24				
	SE	SE end E ledge where talus overlaps	30	14	32	58	0	
	E	ditto	115	32				
	SE	Old N crag	42	50	11	3	0	
	E	ditto	51	40				
	SE	Base N lake cone	52	40	14	33	0	812 209
	E	ditto	63	10				
	SE	Remnant N central crag	58	28	14	0	0	
	E	ditto	67	39				
	SE	NW pond cone	58	40	12	26	0	
	E	ditto	62	16				
	SE	Remnant NNW gate (edge of inner flows)	53	53	11	51	0	
	E	ditto	57	12	ca			
	SE	Summit NW crag	60	54	11	44	0	
	E	ditto	66	9				
	SE	N crag	48	35	11	40	0	767 157
	E	ditto	60	58				
	SE	Inner base N crag	50	0	16	21	0	
	E	ditto	62	53	ca			
	SE	Inner pt. NE crag mass (N of narrows)	61	10	23	5	0	
	E	ditto	90	21				
	SE	Sag middle W escarp- ment (W side NW pool)	67	28	12	53	0	
	E	ditto	74	4				
	SE	E side cracked and foundered area NW pool	65	30	14	8	0	
	E	ditto	74	0				
	SE	S end NW crag escarp- ment	64	53	12	40	0	
	E	ditto	70	48				
			no	pl	scr	stop	ex	cam
	SE	N end W crag mass	71	51	13	51	0	
	E	ditto	79	3				
	SE	Summit W crag mass	77	6	12	28	0	836 183
	E	ditto	85	37				
	SE	S end W crag mass	86	41	15	48	0	
	E	ditto	96	43				
	SE	N side W arm pond	88	20	16	38	0	
	E	ditto	97	44				
	SE	Rhythmic fountain cone (above S end W arm pond)	91	0	16	26	0	
	E	ditto	101	8				
	SE	E end W escarpment, contact talus	91	24	12	53	0	
	E	ditto	96	36				

- 2 -

Day Wednesday Date November 20, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SE	W end central crag mass	91 49	18 52	0			
	E	ditto	104 29	ca				
	SE	N summit ditto	80 50	15 55	0	538	153	
	E	ditto	101 42					
	SE	S summit ditto	82 38	16 47	0	505	152	
	E	ditto	104 53					
	SE	Summit SW pinnacle "	85 0	17 14	0			
	E	ditto	105 24	ca				
	SE	E shoulder ditto	78 18	18 48	0			
	E	ditto	104 40					
	SE	Saddle between cent. crag and steeple	68 16	27 0	0			
	E	ditto	104 6					
	SE	Summit steeple	65 6	24 16	0			
	E	ditto	101 5					
	SE	E base steeple	51 30	27 42	0			
	E	ditto	100 43					
	SE	W end main lake pool	59 0	28 8	0			
	E	ditto	97 16					
	SE	Grot. N side main lake	49 14	28 56	0	409	226	
	E	ditto	95 39					
	SE	NE cove main lake	40 42	28 10	0			
	E	ditto	95 4	ca				
	SE	E corner main lake	43 10	33 14	0			
	E	ditto	105 32					
	SE	S grotto	57 32	31 4	0			
	E	ditto	104 53					
	SE	Pot SE pond	62 21	42 56	0			
	E	ditto	126 30					
	SE	Remnant SE pinnacle	51 24	41 56	0			
	E	ditto	124 2					
	SE	New cone SW of SE pond pot	69 20	42 59	0			
	E	ditto	126 32					
	SE	Escarpment corner SW of SE pond	76 29	41 36	0			
	E	ditto	126 30					
	SE	W limit oval of new flows W of SE pond	83 50	31 24	0			
	E	ditto	117 42					
			no	pl	scr	stop	ex	cam
	SE	Summit old S crag	90 0	24 9	0			
	E	ditto	114 36					
	SE	E limit new flows from SW pond	92 22	23 20	0			
	E	ditto	110 37					
	SE	Cavern W corner SW pond	95 20	18 24	0			
	E	ditto	105 47					
	SE	S side SW pond	99 46	20 8	0			
	E	ditto	111 40					
	SE	NE corner SW pond	92 29	19 58	0			
	E	ditto	107 30					

t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SE	Highest point S margin S floor	123 13	15 13	0			
	E	ditto	128	3ca				
	SE	Middle N side S floor over crevasse	99 52	25 14	0			
	E	ditto	121	14				

			no	pl	scr	stop	ex	cam
11a.m.	Panerama:-							
	{ SE	NE	1	W P	8x	f/11	1/2	P
	{ "	NNW	2	"	"	"	"	"
	{ "	W	3	"	"	"	"	"
	{ "	SW	4	"	"	"	"	"
	{ "	S	5	"	"	"	"	"
			6	W P	8x	f/11	1/2	P

Looking down from SE to E lake

T.A.J.



5



4



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368



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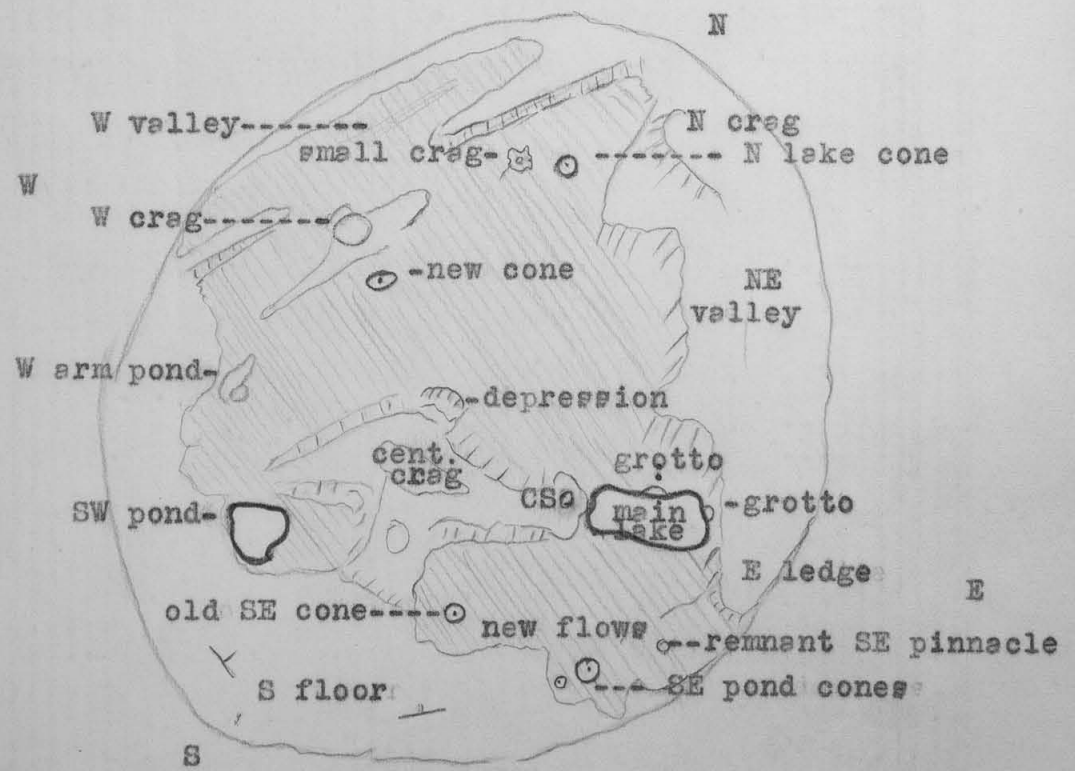
70g

11:30 a.m.

Floor uniformly raised by even coating of flows everywhere. This probably occurred in the night when the pit was observed to be bright. Fresh floods across W escarpment leaving only small remnants at NW crag and under W station. Fresh floor W of SE pond and E of SW pond. SE pond pot replaced by cone. Slight glow cracks and second cone SW of it.

Main lake and SW pond both smaller with 8 to 10 foot walls. Fountaining at N and NE grottoes with stalactites. Small breakdown of pond depression N of central crag. New cone E of W crag. Central extension of NE crag mass nearly obliterated under flows. W arm pond smaller. W crag mass completely surrounded by fresh flows; a narrow elongate scarp with the old knob in middle. Only one small remnant protrudes of the small crag occupying center of northern depression. Some small rock falls heard.

The ponds crusted; occasional, somewhat explosive, fountaining through crust of SW pond. Smoking areas increased, notably N side SW pond, S side W arm pond, over SE pond, W end main lake, at N lake cone and at N central crag remnant. Margin of pit the same.



Shaded areas - new flows.  
CS - central steeple

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.	
11:30a	SE	Brunton.							
		Grot. N side main lake		29 52		409	235		
		Edge of bench vertical-			28 55				
		ly above							
		Base of N lake cone			14 48				
		Summit SE pond central			42 50				
		cone							
		S corner SW pond			20 5				
		N summit central crag			16 20		538	158	
		Summit N crag			11 40				
" steeple			24 55						
" W crag			12 50						
W arm pond cone			16 22						
NW pond smoke (former			12 48						
cone)									

Measurements of week ending Nov. 22:-

Nov. 16,	depression central crag summit	142,	main lake	239	feet
18,	" " " "	156,	" "	220	"
20,	" " " "	152,	" "	226	"

Other measurements Nov. 20 gave the following:-

Depression summit N crag	157	feet
" " W "	183	"
" N lake flows	209	"
" SE pond flows	219	"

There was thus a rise of the liquid lava Nov. 17-18, two days, of 19 feet, and depression of the central crag of 14 feet: equivalent to an actual displacement by the liquid of 33 feet. During the next two days Nov. 19-20, the lake sank 6 feet and the crag rose 4 feet, making the relative movement downward of lake magma to bench magma 10 feet. The net effects relative to a fixed bench mark on the rim of Halemaunau were

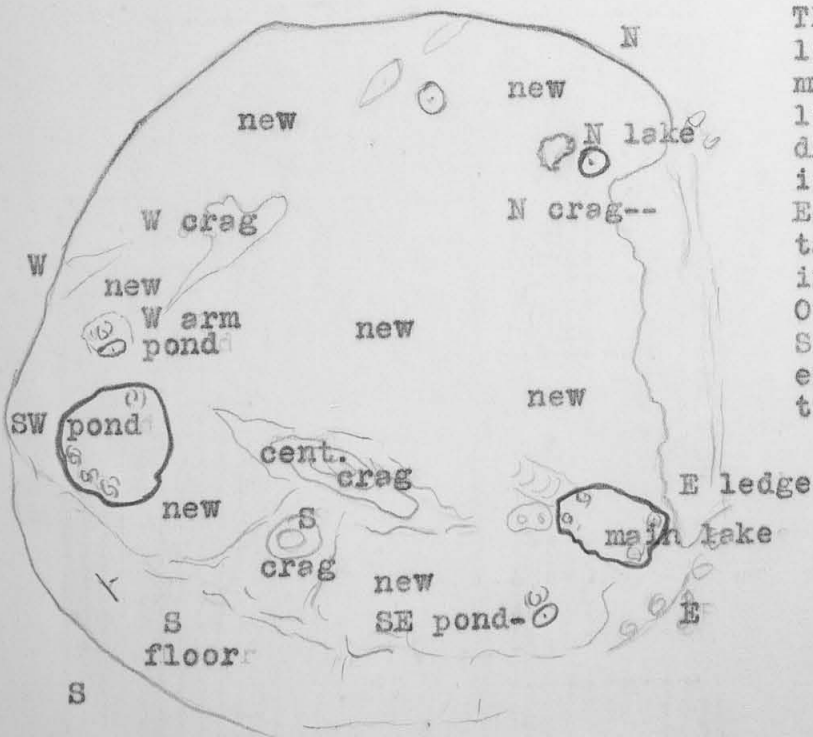
Nov. 17-20,	four days, central crag subsided	10	feet,	or	2.5	ft. per day
" " "	" " lake rose	13	"	"	3.25	" " "

The central crag on Nov. 20 stood above the lake 74 feet, the N crag 69 feet, and the W crag 43 feet. The slope of the newly flooded floor area

was downward 10 feet from the N. lake depression to the SE pond area, the former being a conduit area and the latter a sinkhole. The main lake or E pool lay in an inner pit depressed 10 feet below this floor. Just as in April, 1918, the transition from sinking to rising starts by liquid lava flooding and partial drowning of the crags. Then the crags and floors begin to swell up and smoke holes increase in number.

T.A.J.

11:30 a.m. Almost no fume; factory city type of activity; ten fountaining areas. Lake outlines drowned under spreading floods. Streaming eastward to fountains in main lake and SE pond areas. Flow pouring northeastward from central region, flow pouring westward from N lake. SW region stagnant. Much cracking and foundering in different places from time to time. Intense heat. NE valley not yet invaded and clearly the lowest place. The rest of floor one vast pool of live lava covered with festoon or crack-and-founder pattern. Flow pouring thru S chasm from SE region toward SW pond fill. Central steeple isolated by new floor. Very small scarp remnants of NW crag, the elongate portion of W crag mass and the S end of W valley scarp. Middle promontory of NE crag entirely gone, old SE cone gone, floor cone E of W crag mass gone, small crag of N depression gone. Main lake outlined by four fountains, N, NE, E and S and an eastward streaming flow at the site of the narrows. SE pond marked by a small spatter heap and fountains. SW pond marked by fountains and spatter on S side and one fountain NW corner. W arm pond marked by small circular basin, spatter rampart on its E side and a small hole blowing like locomotive E of it. NW pond marked by black cone hissing. N lake marked by small fountaining pool with large dome E of it. Noises hisses, plashing and pounding. Only fume holes are steamy looking -- at N crag, central steeple and S end W crag mass. Some vapor also from S and SW talus.



The encroachment of liquid lava on crags much the greatest since 1916. Recalls the drowning of Perret's island. Edge of new flood against talus N, NW and W covering whole of W valley. Overlaps inward sloping S floor at its E and W ends, against the heavy talus SE.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30a	SE	Brunton.						
		Central crag		15 55		538	153	
		West "		12 50				
		North "		11 45				
		E ledge		27 45				
		Bottom NE valley		19 50				
		SE pond cone		41 45				
		Fountain N side main lake		25 50		409		198
		N lake cone base		13 55				
		NW pond cone base		11 50				
		W arm pond cone		15 35				
		Fountain S side SW pond		19 5				
		" " NW cor. " "		17 10				
Summit steeple		24 50						

			no	pl	scr	stop	ex	cam
11:30a	SE	Central crag	1	W P	8x	f/11	1/2	P
	"	Main lake and N crag	2	"	"	"	"	"
1 p.m.	High	NW pt. to N lake	3	"	"	"	"	"
	"	" " " W arm ponds	4	"	"	"	"	"
	NE	Striations E wall	5	"	"	"	"	"
	"	S floor	6	"	"	"	"	"

T.A.J.



2



1918

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3



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6

86-8

Day **Monday** Date **November 25, 1918.**  
**Tuesday** " **26, "**

Nov. 25.  
6 p.m.

General flooding of floor has spread so that NE valley is floored with a fresh flow which penetrated its northern end from the N lake region. W crag mass drowned all except summit knob. NW crag and S end of W scarp entirely submerged.

W arm pond spraying at intervals 50 feet, and small bursts in between, intervals 15 to 100 seconds without regularity. SW pond has definite bench around it on the N and E as though the central crag mass were rising; no definition on the W and S where it is merged in a large pooled flow which extends around to the W arm pond. Main lake a small oval pool, with four spatter domes, banks 2 feet high, marginal plashing and flames. N lake half-dome hung with stalactites. SE pond cone flaming and hissing. Flames at the W arm pond and N cone also, and general condition showing glowing live flows everywhere, high gas pressure and much gas combustion. The ESE remnant ledge of recent high level lava and more of the N ledge have fallen in but the noise of slides has mostly ceased. The fumes are again very thin; this accompanying the lava flooding.

Nov. 26.  
6 p.m.

Glowing flows as before and apparently fresh lava in NE valley but the lakes E and SW show deeper inner pits as though floors and crags were beginning to rise. Flames and fountains as before. SW pond defined on its W and S sides. Central crag mass appears higher. Glowing flows more limited than last night. The SE cone a flaming filagree and a marked filagree on the N side main lake. Central region N of central crag mass appears dark, whereas farther N, W and NE the glow of fresh flows is bright. W arm pond splashing less than previous night. Some high spraying SE corner main lake. Stalactite grotto N side main lake. N lake cone bright but not active. Wall around SW pond appears 5 feet high and main lake something similar. No slides.

T.A.J.

Day Thursday Date November 28, 1918.

11 a.m.

The flooding must have ended about night before last with festooned flows southeastward from large cone at SE pond site, festooned flows southwestward from SW pond, dribble flows at NW margin of floor and a broad flow from the N lake cone southward and eastward across the saddle of NE crag mass down the backslopes into NE valley. Glistening spatter domes SE corner main lake and SE corner SW pond. SW pond triangular as before but with low margin on SW side and higher cliff N and E. This higher cliff part of uplifting central area of pit which shows marked swelling and cracking along S chasm ridge and the cracking is marked over southeastern, northeastern and northern central regions.

New small pond has opened NW of steeple, apparently connected with main lake E pool by a tunnel beneath and forming a panhandle to that pool. Main lake depressed 8 feet in its pit, this central pool the same. SW pond 3 feet below its SW margin, 15 feet below northern and eastern cliffs. This SW margin of SW pond part of a depressed valley extending around the wall valley to the westward and bounded on its E side by a newly uplifted scarp extending from the E side of the W arm pool to the NW tunnel of the SW pond.

The whole central floor extending all the way to the N lake cone and pretty well E and W to the talus margins is sulphur stained along small cracks and is being uplifted. SW and NE are the only wall valleys marked off from this uplift, the former extending along the old S floor by reason of the swelling up at the S chasm ridge. That is, the S floor is no longer an insloping remnant but is warped into a definite E-W valley.

N cone yellow with solfataric deposits and no pond there visible. Main lake an oval somewhat broader than before with fountains N, S and E. Streaming eastward. SE pond cone hissing from one small glowing crack. Central pond fountaining. SW pond mostly crusted -- sometimes breaks up. Glowing cavern NW side. Some tumbles from margin main lake.

Central crag stands very high, N crag moderately high, E ledge less so, W crag almost submerged. Smoke has increased especially SE corner main lake, N and W of central crag mass and at base of N crag. Some rain steam rising from talus.

T.A.J.

KILAUEA DAY SHEET

4-09 Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day **Thursday** Date **November 28, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11 a.m.		Transit.						
	SE	Level - 0						
		Central crag		10 58		538	104	
		West "		10 28				
		North "		9 38				
		Grot. N side main lake		22 51		409	173	
		Base N lake cone		11 21				
		S side SW pond		14 36				
		Summit SE pond cone		34 43				
		E ledge		22 43				
		Central steeple		19 38				
		W arm pond cone raised into a W-facing escarp- ment		11 53				

no	pl	scr	stop	ex	cam
----	----	-----	------	----	-----

SE	Central crag	1		8x	f/11	1/2	P
"	Flow across middle NE crag mass	2		"	"	"	"

T.A.J.



1



2

Jog

Day Saturday Date November 30, 1918.

11:30 a.m.

Strong uplift of bench magma. Maximum complex of opening crevasses over SE pond. Strong uplift again of E cross ledge talus. Large crevasse in semicircle from W end main lake curving westward and northward to N lake. Other crevasses around E and N sides of central crag mass. Central crag mass has lifted most.

Main lake greatly enlarged, especially westward, uniting with small pond N side of steeple. Central pool again open as small pond, also SE pond and N lake.

Two new horseshoes of wall valley flows pouring right and left respectively from SW and W arm ponds the one, and from N and NW lake vents the other. Former makes flows covering W, NW and S valleys; W crag knob nearly submerged. Latter makes flows N and NE greatly raising and widening northern part of floor of NE valley. Other flows have poured out as talus cascades from three or more vents at top of talus ESE, E and ENE. The two northernmost surmounted by hissing spiracle cones. The flows from these have poured down into southern end of NE valley. Aa at margins of the pahoehoe of the southern talus cascade E. Further lift of NE crag deforming the fresh flows across saddle.

Streaming in SE pond southwestward; in main lake toward the fountaining grottoes, middle portion crusted with occasional development of central fountains.

One pronounced avalanche from W wall and numerous rock adjustments indicating motion of bench magma. Eastern talus lifting as before and wall crack gaping behind it. Depression of main, central and SE ponds in their cups about 15 feet. N and SW lakes somewhat less.

Central floor shows very distinct arching from SE talus to NW wall valley and main lake inner cliff highest.

Fountaining and fumes moderate.

SE, S and NW the upturned old floor slabs now almost completely submerged.

Occasional falls of W bank of main lake.

T.A.J.

KILAUEA DAY SHEET

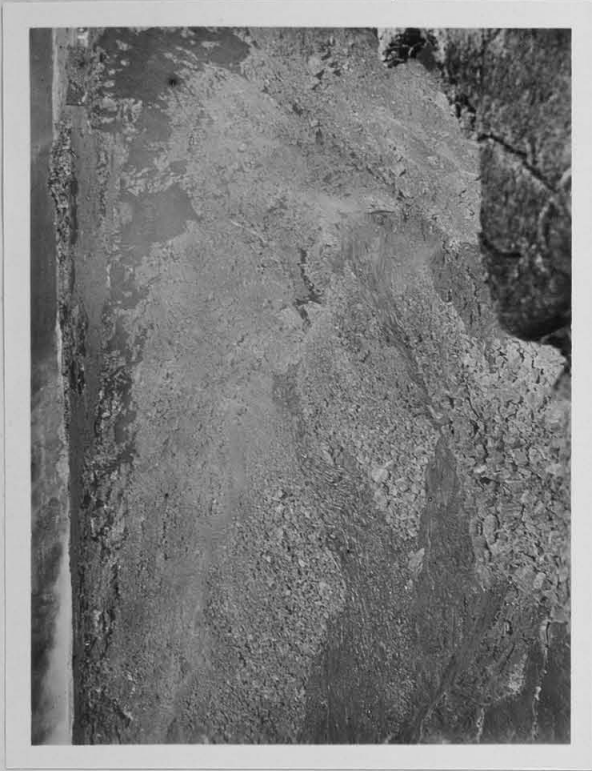
Hawaiian Volcano Observatory

Day **Saturday** Date **November 30, 1918.**

t	sta	pt	hor	vert	lev	dist	elev	h. i.
11:30 <sup>a</sup>	SE	Brunton						
		Central crag		8 25		538	80	
		Remnent W crag		9 20				
		N crag		7 55				
		Grotto N side main lake		18 50		409	140	
		SW corner SE pond		33 20				
		S " SW "		12 50				
		N grotto N lake		10 20				
		New wall crack cone in line of NE station and under old E station		13 40				

			no	pl	scr	stop	ex	cam
SE	New wall crack flows	E and NE	1	W P	8x	f/11	1/2	P
"	Cracks of swelling	main and SE lakes	2	"	"	"	"	"
"	New S valley flow		3	"	"	"	"	"

T.A.J.



1



2

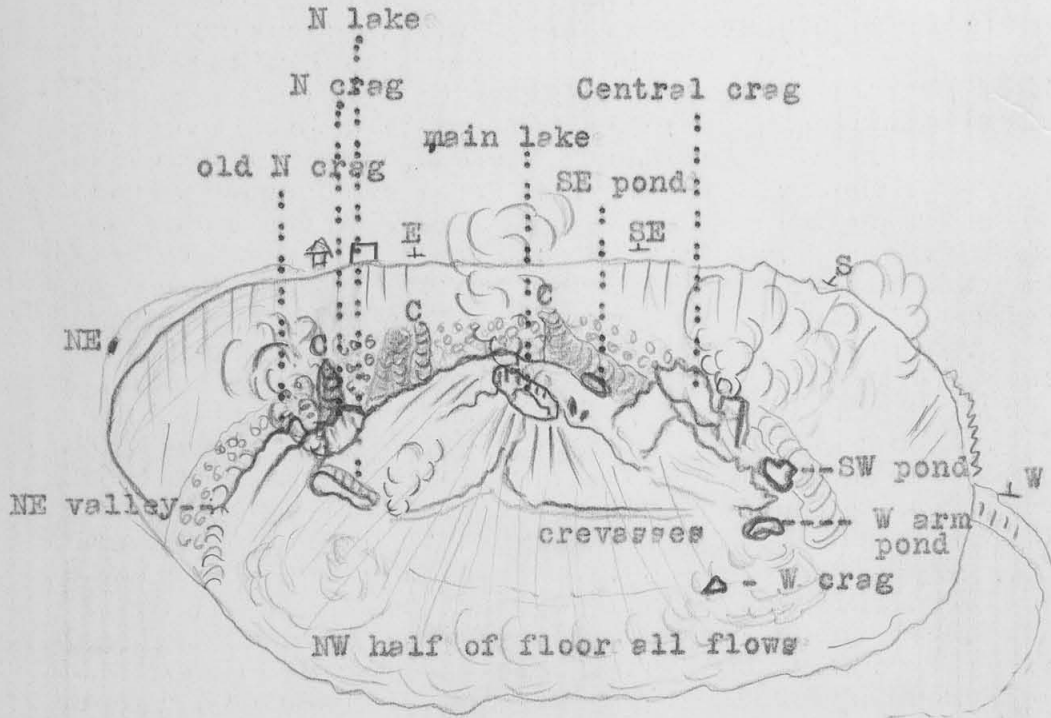


3

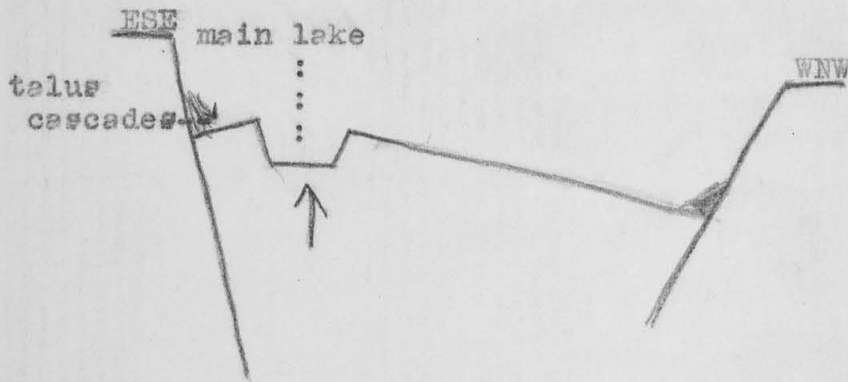
492

1:30 p.m.

Sketch of pit from WNW height showing tumescence SE of center around E lakes. Main lake pit at summit of distinct inner cone. Line of crevasses NNE-SSW and large crevasse from center ESE.



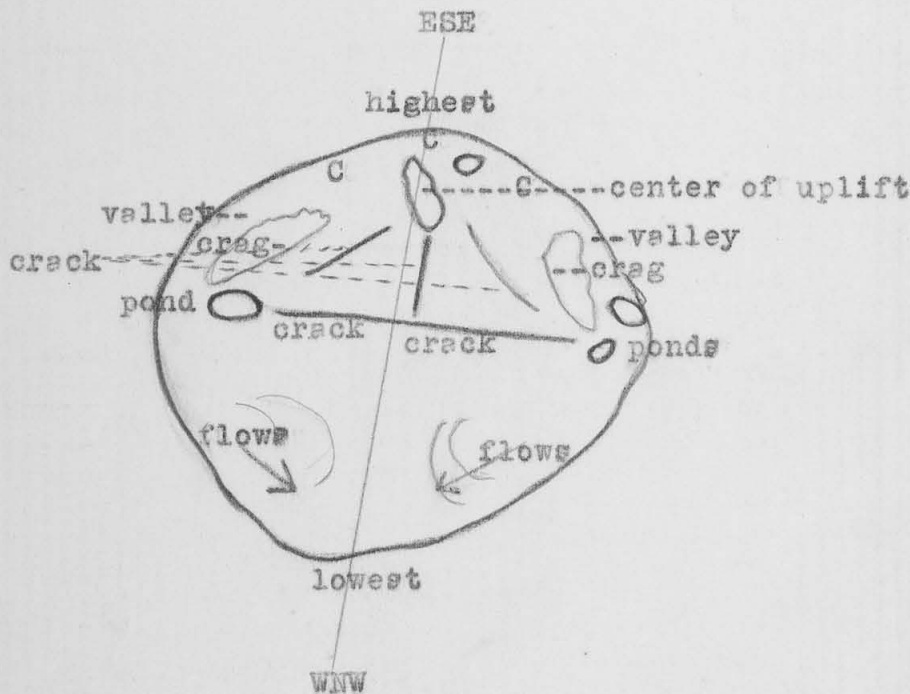
Profile showing tumescence:-



The tumescence under main and SE lakes becoming very marked and this region now the summit of distinct cone, just as Halemaumau is summit of a cone in Kilauea crater. Cliff outer rim of Halemaumau much lower ESE than anywhere else and if this goes on the overflow will be there and the eastern houses destroyed. Three talus cascades ENE, E and ESE, the latter flowing and filling wall valley under SE station. Wall valley now all around

but broad and flat to the NW.  
 N lake a long oval, fountaining at NE. SW pond fountaining S side and overflowing continuously to SW. W pond fountaining occasionally and hissing. Some collapse of scarp E of it.  
 Central crag tilting southward and probably cracking on its S side for much smoke developing there. Fresh lava in NE and S valleys. Steady hissing from ENE talus cone and flowing from ESE one.  
 Main lake walls 20 to 25 feet high. Central pond smoking. Usual grotto fountains, glow high on wall NE grotto of main lake. Floor snapping, occasional avalanches, and rocks moving on crags.  
 NE valley fill flatter and higher. SE and S valley fills have nearly met.

Note symmetry ESE-WNW axis:-



C -- cascade.

T.A.J.

KILAUEA DAY SHEET

416 Massachusetts Institute of Technology  
Hawaiian Volcano Observatory

Day \_\_\_\_\_ Date Dec. 1 & 2, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 1.</u>								
1:30p	SE	Transit: Central crag		6 58		538	66	
		N grotto main lake		17 10		409	126	
		N crag		6 58				
		W "		8 21				
		Bench above grotto N side main lake (floor level)		14 28		414	107	
<u>Dec. 2.</u>								
3 p.m.	SE	Brunton. Central crag		7 10		538	68	
		W crag		8 45				
		N "		7 10				
		N side lake		16 58		409	125	
		Bench above N side main lake		14 15		414	105	
			no	pl	scr	stop	ex	cam

<u>Dec. 2.</u>								
3 p.m.	SSE	Lake		1	no		no	
		NW height to lake		2	scr.	f/30	vane	A V
					" "	f/26	" "	" "

T.A.J.

Box





bag

Day Monday Date December 2, 1918.

3 p.m.

The measurements show that the main lake and cliffs surrounding it have risen but the crags are stationary or slightly down. The pit appears as though the wall valleys were sinking in response to the excessive tumescence under the lake and this has led as before to a pulling open of the wall crack and the welling out of fresh flows. The SE talus is pouring lava down to the wall valley between the SE pond cone and the SE station. The NE wall crack is surmounted by a hissing cone and fresh cascades of lava from it have filled higher the NE valley floor, the middle of which shows the smooth crack and founder surface. The NW floor is covered with a fresh flow with live toes in motion pouring southward and the SW wall valley is covered with a fresh festooned flow the extension of the one seen yesterday pouring over the lip of the SW pond.

The lakes are today all more depressed within their inner pits, the main lake at least 25 feet down, the SE pond 15 feet, the SW and N lakes perhaps 10 feet and the W arm pond 4 or 5 feet. Fountain on S side of latter, another on S side of main lake, little activity noticed in SW and N lakes and the SE pond streaming vigorously southwestward apparently toward a cavern. Occasional activity in NE grotto of main lake and streaming in same various, at one time westward. Great volumes of smoke rising along the immediate SW base of the central crag at the edge of the recently uplifted eastern overflow of the SW pond. Apparently the crag is lifting differentially with reference to such floors at its immediate base and all along the base there is talus. Some slight rock sliding from SW wall of pit. The crevasses have increased in width and in many places show differential uplift of opposite walls. The wall valley is now pronounced all around the pit except at the E where the large talus slope with the fresh cascade flows behind it has lifted bodily surmounting the E cross ledge beneath.

T.A.J.

Day Wednesday Date December 4, 1918.

7 p.m.

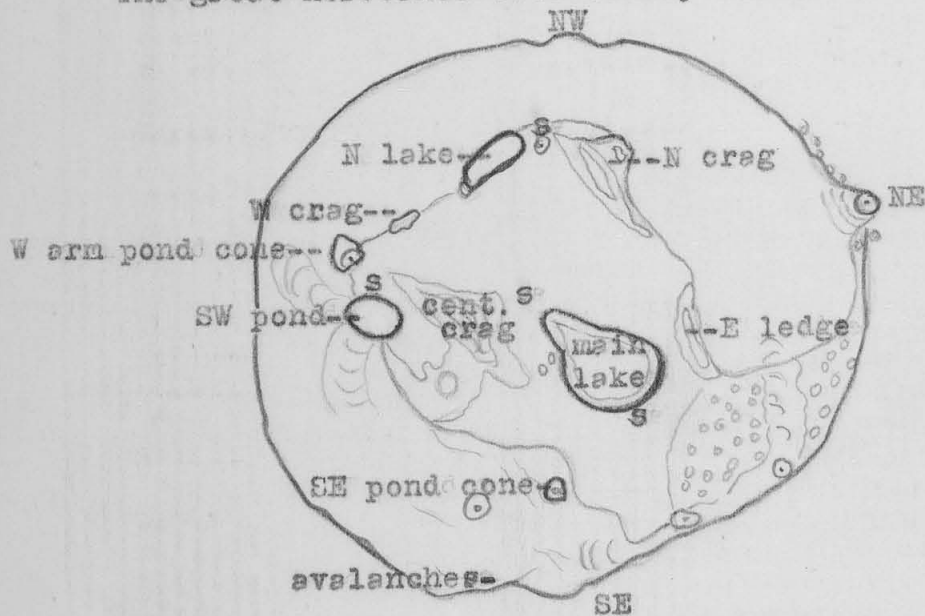
The past two days have shown diminished fume in spite of raging northeasterly storm and this coincided with extensive flooding of the wall valleys, apparently another spell of liquid lava effervescence along with cessation of movement or even subsidence of the bench magma. Tonight a new pond or puddle with a continuous fountain in its midst appears in the talus ESE. SE the cascade from the wall crack is pouring snaky flows to a glowing pile of lava beneath. NE the high wall crack cone is puffing like a locomotive and the NE valley fill is fresh, glowing and larger. NW two streams are pouring from a vent at the base of the outer wall of the pit and lead into another broad fill of fresh glowing lava. The S valley fill is glowing dimly and so far as can be seen appears to merge across the older rocks which had hitherto been a barrier with the southeastern flows. The SE pond is again a glowing and flaming cone and so must have risen and overflowed yesterday. The main lake has 20-foot walls and exhibits the usual activity. The N lake is quiet and dim with blue flames playing. The SW pond is moderately active and a glowing cone can be seen above the W arm pond. The crags appear about as before. Fume thin.

Apparently the NE valley fill is continuous with the fill extending along the wall valley N and NW. The evening glow from the pit less than on the two previous nights.

T.A.J.

1:15 p.m. (Strong avalanche at 2 p.m. SE.)  
 General condition noisy with blasts of gas from vents N, E and SW, like a freight yard full of locomotives. The entire horseshoe of wall valley N, W and S floored with a fresh fill so that the walls of the pit are now only slightly higher W than E. This fill of fresh flows has risen into the embayment between the N crag and the old N crag, and at the SE the fill has entirely submerged the broken rocks which separated the SE talus flows from the S valley and made one continuous wide surface all the way from the SE pond cone to the S margin of the SW pond and beyond. The uplifted quaquaversal around the main lake is greatly diminished in size as the wall valley floor has widened and built up. The sources of the flows constituting the fill have been (1) the E and NE wall cracks, feeding the cascades down the talus; (2) the N lake area where there are several flaming cones; (3) the W arm pond and cone now a very large flaming blowing-cone; (4) the SW pond, small and circular, with the tracks of fresh flows pouring E and W from its southern lip; (5) the SE pond cone now a black heap with a flaming orifice in its crest.

The great horseshoe wall valley fill:-



s -- smoke.

The great eastern talus is the only interruption to the circle of fill, making it a horseshoe. At the top of this talus a cone puffed continuously where there was last an open pot. The SE pond cone puffed harshly occasionally and no trace remained of the recent deep pit of the SE pond; that was entirely submerged under the fresh fill. Looking from the SE station the cracked and uplifted region around the main lake rose from under this fill to

- 2 - Day Friday Date December 6, 1918.

the right and the lake showed about 12 feet of wall of inner pit above a fresh inner bench. This bench was about 3 feet high and the liquid was mostly covered with dark skin with streaming patches to the N, S and SE grottoes, and on one occasion a marked streaming westward of the whole broken up surface. At the W end of the lake the region under the N side of the central crag mass was greatly broken and smoking. The smoke on the SW side of the central crag had diminished.

The SW pond was about 3 feet below its banks and more or less active. The large cone of the W arm pond occasionally gave vent to very loud blasts.

The most sensationally loud of these blowing cones, however, stood above the southern bank of the elongate new N lake, occupying the northern end of the long N-S crevasse recently sketched. This cone at rather regular intervals, about once a minute or so, gave vent to a roaring so loud that it could be heard at the Observatory two miles away, the day being calm with light southerly wind. When these puffs came lava and flame could be seen spraying at the orifice on top of the cone, which stood at least 10 feet above the N lake. Fountains and a high spatter rampart could be seen at the N end of this lake. Farther E between here and the N crag stood the black N lake cone hitherto so called. It will be observed that the blowing cone activities were at the three points of a triangle corresponding to the three former gateways or lake ends.

The old W crag still exhibits its knob at the western limit of the raised area. No flows were observed actually in motion, but western ones may have been so.

Apparently yesterday was a day of rising bench magma and today inaugurates new rising of lake magma. The continuous small avalanches SSE followed by a large one at 2 p.m. from the November lava shelf there, indicated subsidence of the wall valley compensating the continued central rise of yesterday.

Fume has remained thin.

T.A.J.

KILAUEA DAY SHEET

Hawaiian Volcano Observatory

Day

Date Dec. 6, 8 & 9, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 6.</u>		Transit.						
1:15p	SE	Central crag		6 18		538	59	
		West "		6 46				
		E ledge		16 12ca				
		S side SW pond		10 58				
		Base N lake cone		8 20				
		Grotto N side main lake		15 46		409	116	
		SE pond cone		28 12				
		Base W arm pond cone		9 11				
		Summit remnant W crag		8 12ca				
<u>Dec. 8.</u>		Brunton.						
3:30p	E	Central crag		5 0		626	54	
		N crag		8 20		583	85	
		N side lake		18 0		345	112	
		Bench level base central steeple		12 22				
<u>Dec. 9.</u>		Transit.						
12:20p	E	Central crag		4 44	-10	626	51	
		N crag		8 14	-2	583	84	
		E ledge		23 58	-10			
		N side lake		18 26	-10	345	116	
		Base steeple		12 51	-10			

				no	pl	scr	stop	ex	cam
<u>Dec. 6.</u>									
1:15p	S	ESE wall	pan.	1	W P	8x	f/11	1/2	P
	"	Steeple	"	2	"	"	"	"	"
	"	SW pond	"	3	"	"	"	"	"
	"	W wall	"	4	"	"	"	"	"
		SE light wind.							
		T.A.J.							

bag



3



1



4



2

Day Sunday Date December 8, 1918.  
Monday " 9, "

Dec. 8.  
3:30 p.m.

Great increase of smoke; disagreeable fume SE; view from E. Old N crag surrounded by fill. Lake 20 or 30 feet down at W end, 15 feet at E end. Glowing pot open at SE pond. NE fill flush with level of saddle of NE crag mass. Large double cone with high spire at NE talus vent. The E talus vent and cascade from it glowing. Occasional sharp hiss at long intervals from N central cone. Glowing cavern at W end of lake with stalactites; activity mostly along S bank and streaming toward the S. General condition appears to be rather stagnant. In the evening flow reported from E talus vent to NE floor.

Dec. 9.  
12:20 p.m.

Conditions same as yesterday. No puffing from central cone. NE fill evidently fed with flowing liquid lava beneath its crust, for the liquid was seen to break out from the edge of crust and pour into one of the large crevasses in the backslope of the NE crag mass. Measurements show crags higher and lakes lower, and this checks with the remarkable increase of smoke rising from the cracked areas everywhere, but especially from the central pool region where there is an open pot; and the tumbled condition looks as though there would soon be an extension of the lake westward. The fresh smooth surface of the NE fill is arched up and cracked. There is a gray face at the base of wall under the old N station with curved outline above which looks as though it might be the outcrop of the fissure which fed the N station flows from below. Remnant of W crag knob appears to be still in place. A new crescent of floor with scarp facing SW appears to be rising to form a new inner extension of the NE crag mass. The SW pond region shows lumpy cones and much smoke, SE region full of smoke. N lake shows no activity and the scarp on E side of its chasm appears rising. Main lake very active with much bubble fountaining along its S shore and occasional huge central fountains develop and fling up stringy melt. Otherwise the pit is quiet and smoky.

T.A.J.

Dec. 10 & 11. Rainstorm. Fume thinner.

- 1 - Day Thursday Date December 12, 1918.

3:40 p.m. During rain storm of last two days the crags have gone down slightly and renewed flows have poured from the NE wall vent so as to pile up the NE valley fill and cause latter to reverse direction of flow northward through saddle and towards N lake.

Main lake inner basin at first 10 to 15 feet deep. Strong rise during afternoon so as to diminish this to only 5 feet in places and even to produce overflow from lake into the crevasses SE.

N central cone occasionally puffing in prolonged blasts from an open pot at its side which spurts and sprays during blasts. Farther N very high spatter heap ejecting spray horizontally northward. Fresh flows in motion and cracking and foundering confined at first to NE and N.

SE cone two open vents puffing, the northern one a spiracle 3 feet high.

SW pond small and circular with bubble fountaining; large puffing dome SE of it. W pond cone very large, 12 feet high; at first very quiet. Central pond open with chaotic tumble and sag of floor between it and main lake. Latter streaming variously with turbulent travelling fountains in middle and towards the W. Streaming westward from E end and eastward a short distance from the western panhandle cove. Later the streaming was continuously eastward. Much of the time violent bombardment of the SW wall under the steeple. Thin black skins blistering and ballooning.

Entire pit increasingly noisy with rumble and puff from fountains and blowing cones. Smoking areas less dense. Evident that the eastward piling of lava has left the western wall valley again relatively low.

5:00 p.m. About this time great increase in gas pressure and lava flow everywhere. Main and central ponds rose and large flaming crack seen between them. NE wall cone, now a large pile of spiracles open from a low chimney on pit side, began to cascade vigorously and sent a broad flow over the NE floor. W arm pond cone revived through a large pot in its summit with much fountaining and finally a perpetual artesian fountain broke out on its S side and sent a heavy flow northwestward into the wall valley. At the same time the SW pond, in a series of impulses of overflow, finally flooded over its rampart in all directions, the flaming cone SE of it continuing to flame and spurt violently. This settled down into a continuous broad flood of lava sweeping SW and E and filling the S valley, uniting with the western flood at the base of the SW wall. The SE wall vent revived, the southern of the two SE pond vents became the more violent building up its lip. The main lake overflowed spectacularly into the SE crevasses. The N central cone vent became quiet and the vent farther N discharged horizontally with noisy explosions, throwing spray 40 or 50 feet northward across the northern fill. It should be noted that the N lake is a mass of lumpy cones and ramparts and these two vents are its only live places.

- 2 - Day **Thursday** Date **December 12, 1918.**

The old N crag still shows its summit above the floods but the old W crag is no longer identifiable. General situation appears to be another spell of gas release accompanying slight depression of the bench magma and the consequent manufacture of large volumes of liquid. Small rock slides especially N and W took place throughout the afternoon, showing that the wall valleys were subsiding. During the height of the activity a notable symmetry was the rising lakes in the middle of the uplifted floor area and the circle of six blowing cones around them NE, N, W, SW, SE and ESE, the whole circle being not concentric to the pit but southeastward from the pit center.

T.A.J.



Jag

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 12.</u>		Brunton						
3:40p	E	Central crag		5 5		626	55	
		N crag		8 45		583	89	
		N side lake		18 25		345	115	
		E ledge		25 18				
		Summit N central cone		9 5				
		SE pond cone		16 40			119	
		Cone S corner SW pond		8 10				
		Base central steeple		13 0				
<u>Dec. 13.</u>		Brunton.						
3:30p	E	Central crag		4 20		626	47	
		N crag		8 5		583	83	
		N central cone		9 8				
		Base steeple		12 15				
		N side lake		16 0		345	99	
		SW pond cone		7 8			102	
		SE pond fountain		14 20				
		New N lake cone (summit)		8 15				
		(base)		9 50				
		E ledge		24 30				

The SE pond level this day was 3 feet lower than the edge of the main lake in a distance of 90 feet and the base of the large N cone 13 feet lower than the main lake in a distance of 400 feet; indicating that the main lake was at the summit of an inner uplift or flat pyramid with 3% slope approximately.

			no	pl	scr	stop	ex	cam
<u>Dec. 12.</u>								
3:40p	S of E.	NE wall crack cone	1	W P	8x	f/8	1/2	F
<u>Dec. 13.</u>								
3:30p	E	Central crag	1	W M	8x	f/8	1/2	5x7 (4x6 kits)
	"	N lake	2	"	"	"	"	"

T.A.J.



2

Boj

- 1 - Day **Friday** Date **December 13, 1918.**

3:30 p.m. The glow was very bright last night and the result implies that continuous flooding activity has gone on ever since, followed by uplift of the central bench magma as the wall valley circle became increasingly weighted. The measurements show that the floor and crags nearest the lake have risen, lifting the lake basin with them while the outlying region has been relatively stationary as shown by the N central cone.

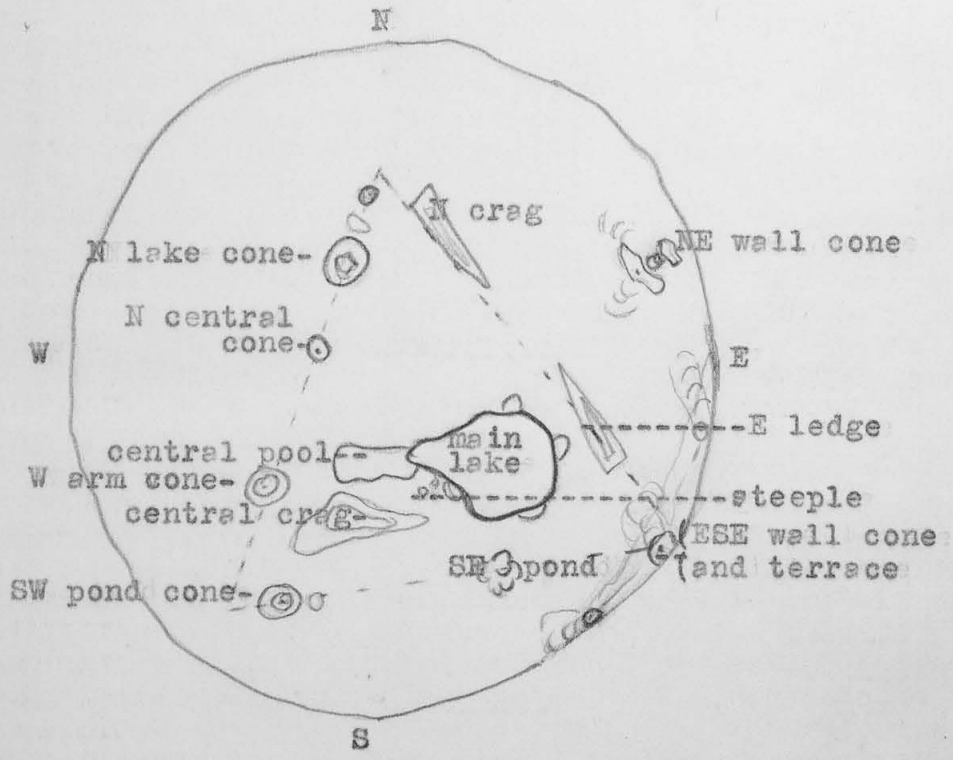
The blowing activity strong but less so than before. Cracking and foundering going on SE and NW. Glowing flat fill greatly extended everywhere, old N crag submerged, new zone of trickle flows through saddle of NE crag mass. Flood has risen around base of central crag mass so that old S crag and S pressure ridge are completely submerged. The E ledge and N crag are small islands in the flood. Entire SE pond region nearly level with the brimming main lake and flooded from it, the site of SE cones maintained by fountaining pot. Crevassed uplift near lake on SE side submerged. Main lake at this high level flush with a flood extending through to central pond which is ill-defined. The only defined old floors remaining are the bench around steeple and the area between main lake and N central cone. This area still shows the crevasses but everything else is live lava, the lowest part of the surface being at base of NW wall and the flood appeared spreading in that direction by both cracking and foundering and flow festoons. Twenty fountains in action.

Only one cone, a large dome with glowing filagree summit, at W arm pond site, height about 7 feet. Very large double cone with gash in the middle splashing at site of NE shore of SW pond. The other cone farther S still persists. Enormous cone with open triangular pot in summit at N end of N lake chasm, by measurement 18 feet high and with broad base. N of this is the horizontally spurting oven of last night and still farther N was a small cone in process of building. The NE wall cone now a complicated pile of spatter humps and spiracles with a splashing pot in its midst which overflowed for a short time. The wall vent ESE had developed another large dome of spatter and this as seen from the S, occupied a middle position in the elongate wall crack heapings which form a terrace along the top of what talus remains unsubmerged on the E side of the pit. This is the highest talus remnant and the talus elsewhere is fast becoming submerged. The main lake was defined by large lumpy spatter ramparts in a diamond shape N, E, S and SW; the northern one collapsed and gave vent to a festooned flow which poured for a time northward. The lake streaming was mostly eastward as it was yesterday in the later evening hours.

Smoke today greatly diminished in marked contrast to recent days. Greatest volumes rising at N base of central crag mass. In contrast to yesterday no rock sliding was heard, implying dominant uplift.

Note. Lycurgus reports that present flooding along with development of blowing cones resembles the December conditions of 1909 and 1911.

Glow bright in night p.m.



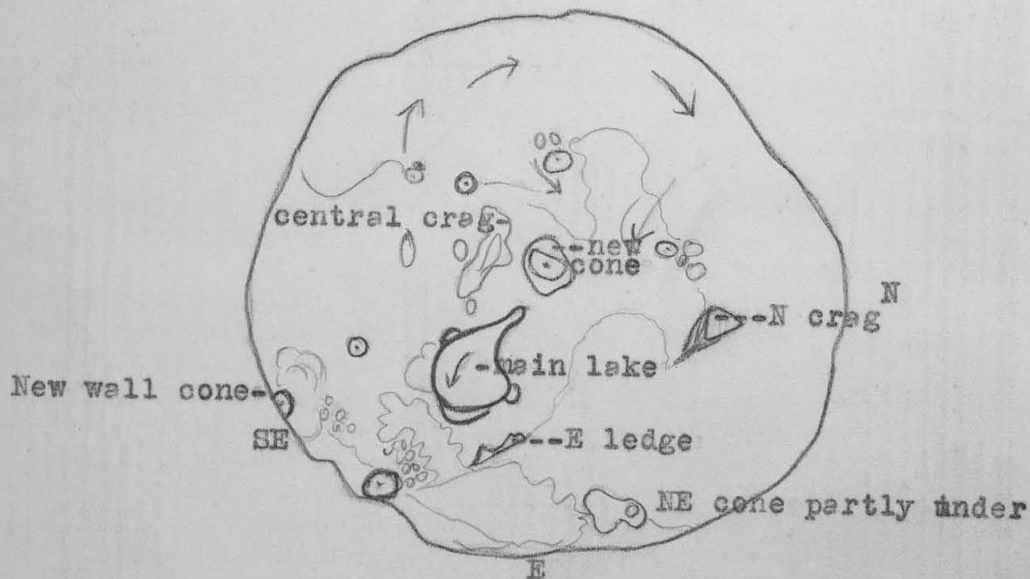
A rather striking triangular arrangement of features brought out by the great liquid fill. Appeared equilateral from SE. Compare photos.

T.A.J.

Day Saturday Date December 14, 1918.

4:45 p.m. Flooding continues. SW pond conduit dominant. Broad festooned zone in motion from latter pouring northwestward. Freshest flows W and S but elsewhere surface has raised so that E ledge is nearly drowned and N crag much smaller. Large cone of conical form with fountaining crater in summit over site of central pool and nearly central to pit. Main lake circular and streaming from narrow neck W; spatter ramparts built up N, NE, E and S. NE wall cone half submerged and changed in shape. E wall cone built up high. New active wall cone with flows from it SSE. SE pond site an inconspicuous spatter spot. Small remnant of old S crag still persists. N lake main cone smaller and converted into an irregular group. Hissing, puffing and splashing noises. Lake brimming. Fume thin. W arm cones splashing and everything indicating continued rise of liquid.

From E:-



Glowing flows everywhere.

T.A.J.

Day **Sunday** Date **December 15, 1918.**  
**Monday** " **16, "**

Dec. 15.  
 2:30 p.m.

Conditions much the same. Broad festooned zone flowing westward from SW pond. Main lake brimming and streaming E. Liquid fill from wall to wall. New flows pushing out in S valley and W central and NW regions from the edges of the flood fed by the two western conduits. Large central cone as before. Fountaining at SE pond and N lake sites. NE floor smooth over very extensive area with crack and founder pattern. E cone hissing and flaming slightly. E ledge submerged entirely. Very small remnant of old S crag. N crag stationary and central crag lower. Lake higher. Glow bright at night. Fume thin. General situation continued filling and widening of the outer ring around the remnant of lake margin uplift. The only trace of the November surface adjacent to main lake a small tumbled area NW of the lake. Cone at SE pond slightly larger. SW pond in spasm of rising overflowed eastward from its lip rampart. Smoke from central region and N crag. Rampart grottoes of main lake building cavernous half domes. Cracks in NE floor parallel with NE wall. Possibly slightly less upbuilding of floods around N crag remnant than yesterday.

Dec. 16.  
 12 noon.

Rain and wind. Flows still higher. Large dome fountain S side of N lake cones spouting in artesian fashion and sending flood W. Lake overflowing its S edge. SE pond a bubbling spot. SW pond overflowing SW, large spatter heaps E of it. N crag very small remnant. Eastern wall cones drowning themselves. No talus blocks now visible. Crack and founder pattern E and NE, western fields mostly pahoehoe trickle. Middle cone now a roundish heap spouting on top. NW of the main group of N cones is a spurting hole. Little remains identifiable of W arm cones. The last of central floor crevasses is submerged. Streaming in lake E. An enclosed pot on SW margin of lake.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 14.</u> Brunton.								
4:45p	E	Central crag		4 5		626	44	
		N side lake		15 40		345	97	
		N crag		8 15		583	84	
<u>Dec. 15.</u> Brunton.								
2:30p	E	Central crag		4 45		626	52	
		N crag		8 20		583	85	
		N side lake		16 5		345	100	
		N lake cone base		9 10		651	104	
		SW pond edge overflowing		6 10				
<u>Dec. 16.</u> Transit.								
12 noon.	SE	Central crag		6 0	0	538	56	
		N crag		5	2-1 34	767	87	
		N side lake		11	22-1 20	409	92	

no	pl	scr	stop	ex	cam			
<u>Dec. 16.</u>								
12 noon	SE	Central crag	1	W M	8x	f/8	$\frac{1}{2}$	4x6
"	"	Main lake	2	"	"	"	"	"

T.A.J.



2

Jay

Day Wednesday Date December 18, 1918.  
Thursday " 19, "

Dec. 18.  
 11:00 a.m. Middle region appears to be lifting. A little gypsum stain. Margin of fresher flows all around. E and NE wall cones nearly submerged, SE wall cone a fountaining puddle, SE pond a glowing cone. N crag submerged. Flows higher around central crag. Central cone gone. N cones inconspicuous and replaced by a flat crusted-over pool with glow on one side. Main lake down 3 feet, streaming E. SW pond an oval down 3 feet. Some moving flows NW and NE. Group of spatter heaps at SW pond. Some hissing but pit much less active than before. Crack and founder pattern NE and SE. Evening pit reported very dull.

Dec. 19.  
 12:45 p.m. Condition like previous day but slight increase of smoke, notably by central crag, and considerable increase of blowing noises. Flows have continued and a noon rise in progress apparently. SW pond overflowing to SW and W arm ponds also probably. Lake has recently overflowed NW and is flush with its margin on that side. Streaming to big grotto domes N, SE and SW. There appear to be small ponds at N and SW lakes. Flows trickling in various places; central cone has reformed. Hissing from E, SE and SW cones loud enough to be heard a quarter a mile away SE. More encroachment of floor on central crag, steeple nearly gone. SE pond a cone. E, SE and NE wall cones all stand out on floor from the wall as the rising floods have widened the floor. Cones at N lake less conspicuous. Hissing from one of the main lake grotto domes. Central cone throwing up splashes.

T.A.J.



2



3

309



1

Jag

Day

Date Dec. 19, 20 & 21, 1918.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 19.</u>		Brunton.						
12:45p	SE	Central crag		6 5		538	57	
		N side lake		11 50		409	86	
		N lake cone		6 0		812	83	
		SW pond cone		7 15				
<u>Dec. 20.</u>		Brunton.						
2:40p	SE	Central crag		5 52		538	55	
		N side main lake		11 50		409	86	
		N lake cone		5 42		812	79	
		SW pond cone		6 52				
		SE pond cone		21 2		235	90	
<u>Dec. 21.</u>		Brunton.						
4:30p	SE	Central crag		5 10		522	47	
		N side lake		11 0		413	80	
		N lake cone		5 45		796	79	
		SW pond cone		6 40		654	76	

			no	pl	scr	stop	ex	cam
<u>Dec. 19.</u>	SE	Central crag	1	W M	8x	f/11	$\frac{1}{4}$	4x6
	"	Lake	2	"	"	"	"	"
	"	E wall cones	3	"	"	"	"	"
<u>Dec. 20.</u>		(cloudy)						
	SE	Central crag	1	W M	8x	f/11	$\frac{3}{4}$	4x6
	"	Lake	2	"	"	"	"	"
	NE	NE cone (near)	3	"	"	"	"	"
	"	Lake and crag	4	"	"	"	"	"
	NNE	New N rim of pitt	5	"	"	f/8	"	"
	SSW	SW ponds and cent. crag	6	"	"	"	"	"

T.A.J.



1 15-30-18



2 15-30-18

2

509

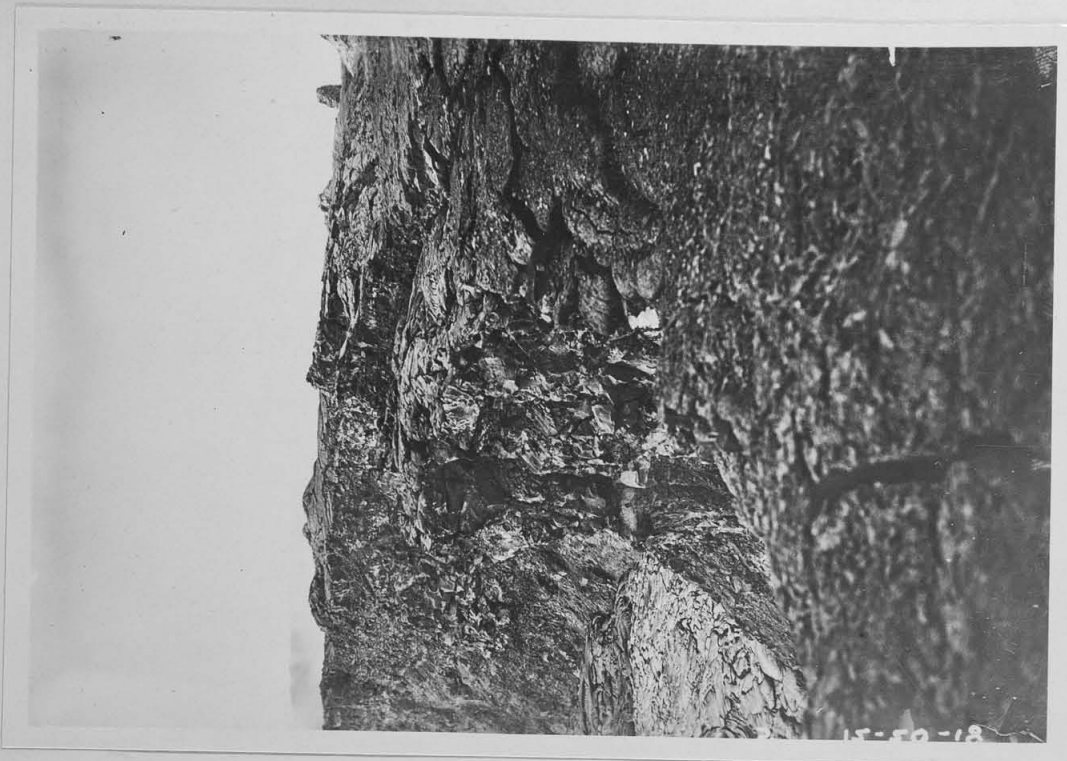


4



6

709



604

5



3

602

Day	Date
Friday	December 20, 1918.
Saturday	" 21, "
Sunday	" 22, "

Dec. 20.  
2:40 p.m.

Hissing less and strong rumbling from the lake grottoes. The lakes with built up ramparts and lowered liquid. Main lake 2 to 3 feet down, high broad grotto domes on E side with violent bombardment, streaming radial from a central patch of skin with strong inrush to SW, to NE and to SE. Occasional violent central fountains. Lake shape now an even oval. SW pond an oval pit with liquid 5 to 10 feet down, deep overhang on its E side and grotto shown beneath, with eastward streaming and stalactites. Cone on that side, recent festooned flow from SW side. Another such flow from W arm pond westward, this place now a glow cone. N lake a small fountaining area and remainder a slumped crust with a large breathing cone on S side, glowing summit orifice. The active area shows a grotto with stalactites on N side, liquid low. Recent flows from it northward, making toes in some few places. Freshest flow a large crack-and-founder smooth surface NE and the NE wall cone a revived spatter cone fountaining and building up. The E and SE wall cones hissing a little, also SE pond cone. Steeple about gone, central crag looks as though it had dragged down the floor about it. Some fresh small rock falls along base of S wall of pit. General appearance from W seems to indicate that SE is still highest part of floor surface and NW lowest. Trickle and festoon patterns W and S, large pooled flat pattern NE. Pele's hair on central floor somewhat. Central cone inactive. No longer any terrace on line of eastern wall cones. The wall of pit lowest NE and S. Smoke holes more numerous.

Dec. 21.  
4:30 p.m.

An evening repeating the spurting and rapid flowing activity noted a week ago. Strong gas pressure, puffing and hissing; high spraying E end of lake; large dome grottoes. Large hissing dome at N lake. Flaming E wall cone. New pair of dribble cones at base of SW wall. W cone spurting. Central region has a pond again. Fountaining vent S of N cone. Flows everywhere with fronts alive and advancing. About 5:30 p.m. strong flow S and W from northern fountaining vent followed by heavy overflows N and W in pulsations from central pond. Main lake streaming eastward. Everything indicates a revival of liquid lava flooding.

Dec. 22. Afternoon flows reported in action. High flat NE fill. Evening dull activity.

T.A.J.

4:00 p.m.

Continued fresh flooding over entire surface. Highest place appears to be between SE pond and main lake. The four lakes, center, E, N, and SW, becoming definite elevations. Central crag much more submerged, with ring-shaped depression around its base. Query - Is this sinking of crag, rising of bench magma around it or merely flows which have piled up without reaching it? Main lake streaming turbulently, mostly westward but with some inrush to SE grotto. New wall cone hissing strongly, also vent at SW pond. Lava pools with glowing edges somewhat raised E and SW of main lake. N lake heapings have steeper slope westward. Central pond now a flattish slag heap, SW pond at the top of a rampart ring with cones NE of it. Western cones large. SE pond and SE wall cone mere spatter spots. There appear to be cones and irregularities along a line extending northwestward from N lake region. A recent flow from the main lake has poured northward.

T.A.J.

10:30 a.m. From 10:30 a.m. to noon excessive flooding by broad sheet flows from SW pond and W cone and by trickle around margins of the high flat topped NE pool which occupies the whole length of the former NE valley. Great additions to the fill SW so that the wall there was much lower. It now looks as though NE and SW were high from filling, SE high from uplift and NW still the relatively lowest part of the floor. Main lake streaming S and E, grotto domes lower. At noon the lake had sunk 2 feet within its basin. SE and E cones hissing. NE cone only a fountaining puddle as the source of NE pool. Southwestern cone of the N lake group a wide heap and the northeastern one a driblet cone heaving a hinged lid half open in spasms revealing a glowing gash. W cone small and source of flows pouring eastward as well as westward. Central pond a broken smoking heap. SW pond rampart high on the E side of the flow source with bubble fountaining, while torrents pouring SW and N sweep to the wall and all the way to the SE floor along the former S valley, while another pours northward and eastward, flooding the base of the central crag. SE pond region a smooth flat with one inactive crack showing spatter markings. Central crag no longer shows the annular depression around its base and the lava floods are drowning it up to the level of the summit of the flat topped pinnacle which has long protruded on its western side. The crag has risen, but less than the floor building. The NE pool is distinctly raised above its surroundings, but its margins do not form spatter ramparts and are merely an abrupt edge to a tabular surface. Here and there flows broke out along this edge and poured eastward, southward and westward. Some of them elongate festooned streams. The surface of the pool was higher than the base of the cliffs E and N and than the NE central floor. The only fountain as yet developed in this pool is at the NE wall cone vent.

Note. The S edge of lake at level of an area covered with Pele's hair S of the lake, which extends to the E cone and is the oldest and most raised (?) surface.

T.A.J.

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 23.</u>		<u>Brunton.</u>						
4 p.m.	SE	N side lake		10 10		413	74	
		Central crag		5 45		522	53	
<u>Dec. 24.</u>		<u>Transit.</u>						
10:30a	SE	E		0				
	E	Old N		0				
	SE	E cone		9 18	13 0	0 291	68	
	E	ditto		103 19				
	SE	NE cone		17 18	6 8	0 624	67	
	E	ditto		-9 50				
	SE	Cavern top level N end						
		NE wall pool (under		48 32	3 36	0 1131	67	
		old Tech Sta.)						
	E	ditto		12 40				
	SE	White spot floor level		72 18	3 14	0 1207	68	
		under N side W niche						
	E	ditto		36 40				
	SE	Wall projection floor		91 0	3 26	0 1132	64	
		level under W sta.						
	E	ditto		55 8				
	SE	SW edge of floor		111 51	4 40	0 825	66	
	E	ditto		77 26				
	SE	White spot floor level		136 32	8 26	0 434	65	
		under S station						
	E	ditto		101 48				
	SE	SW pond source		96 48	6 2	0 654	69	
	E	ditto		74 22				
	SE	W cone		91 0	4 54	0		
	E	ditto		63 46				
	SE	W base central crag		88 14	7 16	0		
	E	ditto		70 22ca				
	SE	E base " "		79 46	8 18	0		
	E	ditto		71 14				
	SE	Summit central crag		82 42	5 2	0 522	46	
	E	ditto		68 6				
	SE	Central pool source		72 28	7 20	0 538	69	
	E	ditto		60 22				
			no	pl	scr	stop	ex	cam

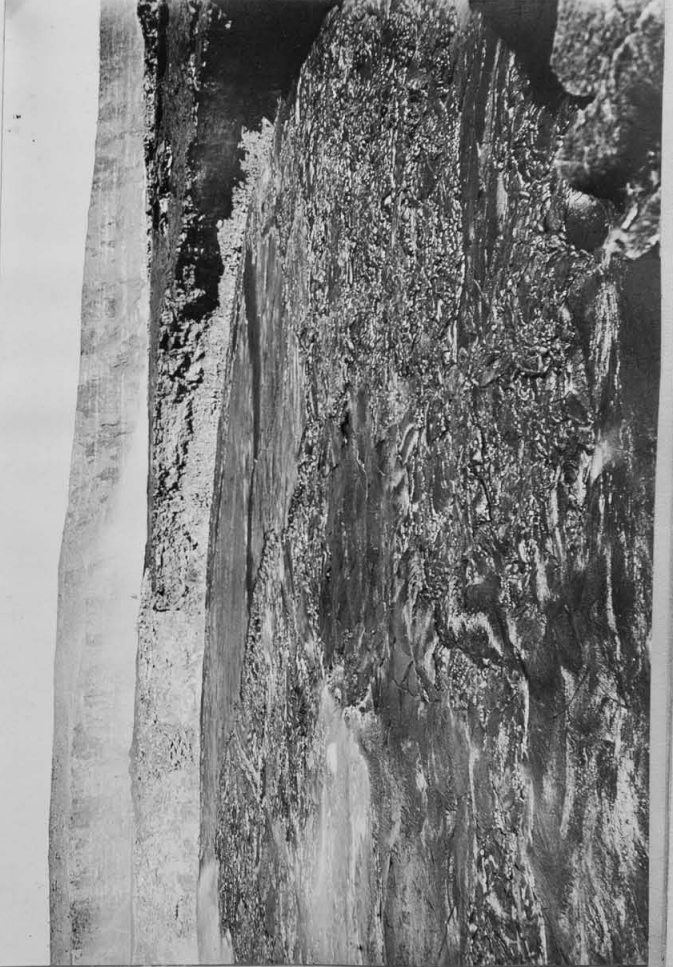
t	sta	pt	hor	vert	lev	dist	elev	h. i.
	SE	N heap summit	57 14	4 44	0			
	E	ditto	33 22					
	SE	Base of small N cone	52 38	5 65	0	796	70	
	E	heaving lid	28 0					
	SE	SW grotto main lake	58 46	11 12	0			
	E	ditto	71 38					
	SE	NW edge lake	56 58	9 54	0	413	72	
	E	ditto	63 0					
	SE	NE grotto	44 26	10 40	0			
	E	ditto	60 35					
	SE	E end lake	40 38	11 3	0			
	E	ditto	64 53					
	SE	SE grotto	42 38	12 5	0			
	E	ditto	70 49					
	SE	S side lake	52 30	12 38	0			
	E	ditto	73 46					
	SE	Flow source middle SW	42 54	5 21	0			
	E	side NE pool	19 29					
	SE	SE pond crack	75 16	18 50	0			
	E	ditto	95 33					
	SE	Crusts middle S floor	121 38	12 2	0			
	E	ditto	99 11					

			no	pl	scr	stop	ex	cam
10:30a	SE	SW flood pouring	1	W M	8x	f/16	1	4x6
	"	Center of pit (live flows	2	"	"	"	"	"
	"	whole SW half of pit)	3	"	"	"	"	"
	"	NE pool	4	"	"	"	"	"
	E	S	5	"	"	"	"	"
	"	Central crag	6	"	"	"	"	"
	E	NW						

Brilliant light.

T.A.J.

56



505

5

5-



4



6

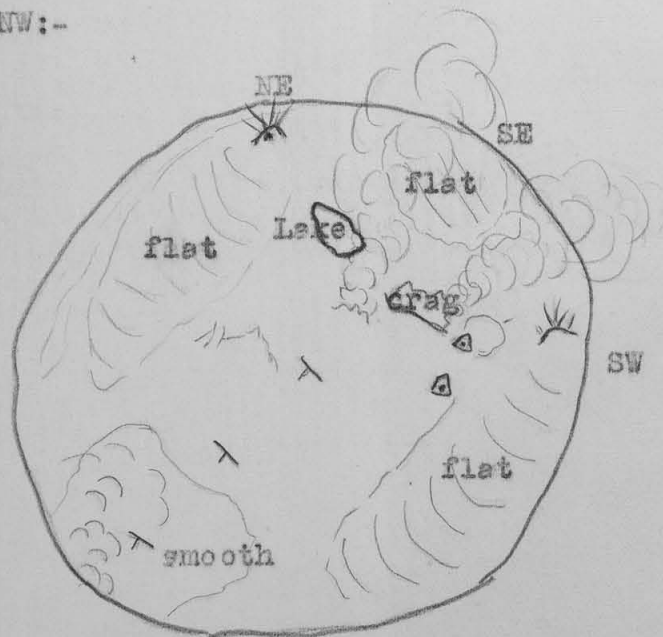
8-0-8

- 1 - Day Wednesday Date December 25, 1918.

2:30 p.m.

With lakes stationary and crags slightly lower there appears to be intense rising of liquid around the semicircle SW, SE and NE; the most conspicuous and continuous artesian fountaining being at the SW wall cone which has built a large spatter heap and oven spouting inward toward the center of the pit. The NE cone was also spouting, the W cone probably giving vent to flows beneath a crust and the southwest pond began to renew overflow at 4 p.m. The SE pond locality and the E cone were feeding live flows which were cascading over the S bank of the lake into the lake and at 4 p.m. the lake began to overflow its NW margin. The most striking feature of this arrangement as seen from the NW high cliff was the broad flat-topped tabular pools now forming over the sites of the former southern and north-eastern wall valleys and an intermediate one highest of all at the SE. Between these the long slope downward of the floor from SE to NW follows the axis of symmetry.

From NW:-



There was loud hissing from the cones SW, E and N, the latter the loudest. The lake was streaming irregularly but mostly southward with marked bubble fountaining and thin skins in addition to the grotto splashing. Twenty or more small fountains would break the surface at one time.

A striking feature of the tabular upbuilding of the NE pool is the marginal slope downward and outward from the edge of the pool, consisting of short and fairly steep festooned flows and this margin exists on the NE wall side as well as on the side toward the center of the pit. The manner of development of this marginal fall-off was illustrated about 3:45 p.m. by a cracking and foundering of the

- 2 - Day Wednesday Date December 25, 1918.

surface of the pool which began near the spouting vent and then spread over the entire tabular area with collapse of the spatter cone at the vent. When the cracking and foundering reached the margin there was overflow voluminously but only for a few minutes and this process evidently illustrated the mechanism of adjustment whereby the tabular crust was repeatedly reformed as the liquid rose beneath it. This pool appears most of the time as a leaf-shaped plateau with an even crusted upper surface and a valley is now developing between it and the northeastern wall of the pit. It has the aspect of an elongate delta lobe developed from the NE cone vent as a source. A similar elongate surface with the smooth crack and founder pattern is developing from the SW wall cone as a source and extending thence northwestward.

In general the floor of the pit was making live toes and exhibited glow cracks everywhere. Smoke had very greatly increased around the central crag and the central pond depression. A new smoking locality appeared at the wall margin of the floor NW. Glowing cavernous crusts were again in evidence E of the main lake. The SW pond showed some fountaining. After 4 p.m. the continuous bubbling of the SW wall cone gave place to more spasmodic spouting, but the SW pond sent extensive sheet floods to the S.

T.A.J.

Box 2



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Tag

t	sta	pt	hor	vert	lev	dist	elev	h. i.
<u>Dec. 25.</u> Brunton.								
2:30p	SE	Central crag		5 30		522	50	
		N side lake		9 50		413	72	
<u>Dec. 27.</u> Transit.								
11:15a	SE	Base E cone		13 50	0	291	72	
		NE cone		4 36	0	624	50	
		Floor N wall cavern		3 42	0	1131	68	
		NW side lake		10 8	0	413	74	
		Base N gash cone		4 43	0	796	64	
		Central pond depression		6 50	0	538	65	
		Floor under N end W niche		3 8	0	1207	66	
		SE pond pot (?)		20 44	0			
		Summit central crag		5 10	0	522	47	
		Floor under S end W niche		3 12	0	1132	60	
		SW edge of floor		4 6	0	825	57	
		Floor under S station		8 12	0	434	63	
		SW pond		5 56	0	654	67	
<u>Dec. 30.</u> Brunton.								
3:30p	SE	N side lake		10 20				
		NE cone		4 15				
		Base N cone		4 55				
		Summit central crag		5 15				
		SW pond		6 45				
		W side SE pond		19 15				
		Top N cave		3 40				
		NW wall base		2 10				
		Base S wall		8 30				

			no	pl	scr	stop	ex	cam
<u>Dec. 25.</u> Very bright.								
2:30 p	E	Center(SW wall fountain over crag)(increase of smoke. Cascade pouring into S side of lake from SE pond)	1	W M	8x	f/20	1	4x6
	W of N	NE fill showing edges of table both sides	2	"	"	f/16	"	"
	NW	SW fill	3	"	"	"	"	"
<u>Dec. 26.</u> Brilliant sunlight.								
11:15a		Uwekahuna to Halemaumau	1	W M	8x	f/22.6	1	4x6
	"	" Puu Huluhulu	2	"	"	"	"	"
	"	" Kamakaia	3	"	"	"	"	"
		Panorama.						

Roaf



2



3

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Day	Thursday	Date	December 26,	1918.
	Friday		" 27,	"
	Saturday		" 28,	"

Dec. 26.  
11:15 a.m. Same type flowing and blowing activity continues. Pit in full view from Uwekahuna. Smoky crag, gleaming floor.

Dec. 27.  
11:15 a.m. Both bench and lake magmas relatively stationary. Sharp hissing from E cone and SW wall cone; at 11:45 a dribble cone 6 feet high at central pool began suddenly to roar and spit lava and roaring continued. N gash cone glowing; NE vent two pots sluggishly heaving at edge of NE slag heap pool. Latter has same flat upper surface greatly diminished in size and much higher, about 200 feet long in NW-SE axis, with dribble slopes away in all directions. Its plateau summit an oval. Evidently the crack-and-found process last described has resulted in constriction along with upbuilding. A few flows trickling in W central region. Lake streaming W and N, with bubbling, mostly to immense curtained grotto at SW end. Lake oval, thin skins. SW pond crusted and 5 feet down. Great volumes of smoke from S and W sides central crag and some from SE pond site, from W side lake, from N heap, and from SW pond. Heaped up floor along SW wall from S station to W niche, and the high NE heap on opposite side (only 25 feet below NE fill of 1894 ledge), leave the central region low, in a triangle from N lake to SW pond to main lake. Region S of main lake again covered with moss of Pele's hair; also near N cones. Lake had slight noon rise, mostly under an overhanging bank 3 feet high. General situation appears stationary, with high gas pressure continuing.

Dec. 28.  
7:00 p.m. Strong increase of smoke today. Lakes depressed within their cups and flaming open pots developed at the N lake heap, the central pond cone and the SE pond crack. High glowing slag heaps NE and SW, cones hissing E and SW (wall cone). Flaming above open ponds at SW pond and W cone localities. Flows pushing steadily in small dribbles at E end of NE heap and N end of SW heap. Flames abundant, especially at N end central ponds. NE cone sputtering, eastern one flaming through filagree orifice. S and central floors dark. Main lake streaming northward in E half and southward in W half, its margin 8 feet high, thin skins dragged by the currents, deep rumble in the grottoes, heavy stalactite curtains across the SW grotto. General situation suggests subsidence and perhaps a crisis, but whether the movement will be a lifting of the bench magma or a general withdrawal does not yet appear. The development of open pots by collapse is a new feature as compared with the processes of the December rise and suggests a turning point towards subsidence.

Day	Sunday	Date	December 29, 1918.
	Monday	"	30, "
	Tuesday	"	31, "

Dec. 29. Lake smoky and lava probably lower. Glow moderate at night, some N flaring.

Dec. 30.

3:30 p.m. Everything much the same. SE pond a 15-foot opening leading to a much larger chamber below with overhang all around and lava 10 feet down streaming to fountaining cavern west. Lake nearly full, streaming first W then E, afterwards sank a little.

N cone has a continuous small jet on its summit. NE cone is very high on top of slag heap near NE wall, spattering. E and SW cones hissing mildly.

Flaming last night reported slight and activity very dull.

West heap extends now well around to NW against the wall.

Smoke abundant concealing S and SW regions. Some further encroachment of lava around central crag but not much.

Lava splashing E side SW pond.

What appears to be a cone between N lake locality and NE grotto of main lake.

Glow dim at night and smoke moderate with considerable fluctuation in amount.

Dec. 31.

Evening. Flows from NE reported and overflow of lake.

T.A.J.