

Picture
Index Map

Possibility of New Volcanism
in Oregon
11,000 years or younger Volcanism

RECENT VOLCANIC LANDFORMS IN CENTRAL OREGON

general description of
volcanism -
Eocene to Recent

In cooperation with the Bend, Oregon Chamber of Commerce a reconnaissance of the area to the south and east of Bend was made to determine the variety and extent of the landforms associated with recent lava flows.

Description
mainly
pictures
of

The area investigated includes southern Deschutes County and northern Lake County extending eastward to the northern part of the Fort Rock and Christmas Lake valleys.

recent
volcanism
in Bend Area

There are several localities in which recent volcanic activity has been concentrated and these are indicated on the accompanying index map. The areas shown that have not previously been described in the geological literature or so well known are described in some detail.

Here is where
it might
happen

Bullseye
Crater

The Newberry Volcano about 25 miles southeast of Bend is the largest and most spectacular area and much of the country surrounding it contains features that are probably directly related to it. Williams (1935) has described the features of the Newberry Crater area in detail in GSA Bulletin 46 no. 2.

Crater
Belt of
volcanic
activity

The Lava Butte area about 8 miles south of Bend is an area of fresh basaltic lava which welled out from a fissure at the base of Lava Butte. Some of the landforms are pictured and briefly described below.



O.K.

Fig. 7

Figure 1 - Lava Butte, looking north showing the typical shape of a cinder cone (scoria cone). The flattened area at the top is the rim of the steep sided summit crater. The rim is slightly higher on the north side. Cinders and scoria of reddish to black basalt at the angle of repose on flanks. The photo also shows the vent that is the source of the later lava flows that surround Lava Butte on all sides except the northeast and east sides.



O.K.

Figure 2

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Figure 2 - Closeup of vent and lava gutter on south flank of Lava Butte. Lava flowed south then veered to the west and finally to the north.



O.K.

Fig 3

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Figure 3 - View of lava gutter showing mixed pahoehoe and block lava.



Figure 4 - Looking east toward Lava Butte, vent and lava gutter upper right and field of clinkery aa basalt lava.

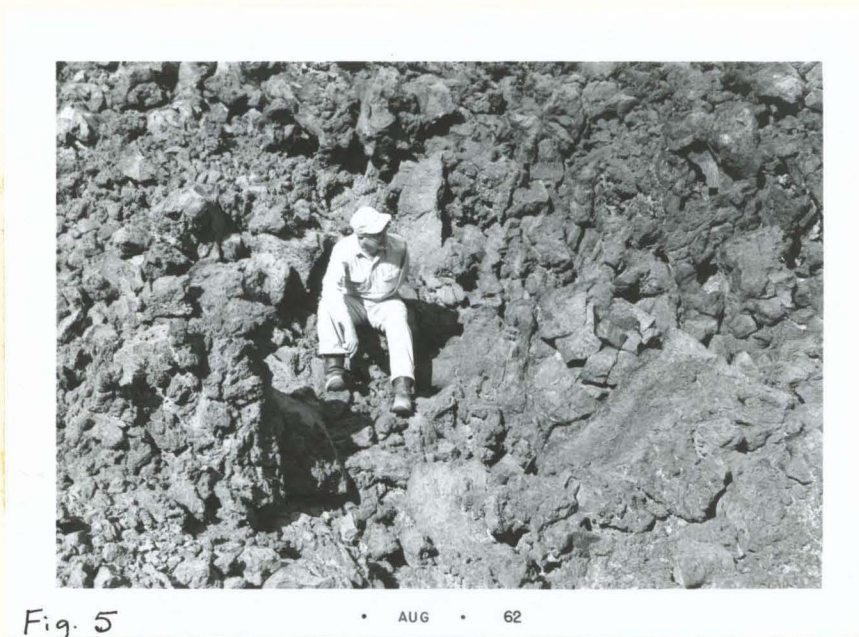


Figure 5 - Closeup of clinkery, spiny aa lava west of Lava Butte.



Figure 6

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Figure 6 - Spatter rampart of reddish scoria agglutinate, elongate northwest trending ridge along the same fissure as Lava Butte. This feature is southeast across U.S. Hwy. 97 from Lava Butte.

The Devils Garden volcanic area covers about 40 square miles of the northern part of the Fort Rock Valley in northern Lake County mainly in T. 24 S. and T. 25 S., R. 15 E. Thin flows of black pahoehoe lavas originating from fissures in the north and northeast part flowed south and southwestward. Several rounded hills and higher areas stand out as islands of older rocks completely surrounded by the fresh black lava. Excellent examples of fresh pahoehoe lava surfaces, collapse features, spatter cones, spatter ramparts, and lava tubes are present especially in the northeast part.

O.K.



Figure 7

96.

General view of the flat but irregularly collapsed pahoehoe lava surface within the Devils Garden.



Figure 8

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Figure 8 - Just south of Buzzard Rock on the northeast edge of Devils Garden. Lava Gutter or collapsed lava tube over fissure through which lava came to the surface. Buzzard Rock in background, is an older eroded dome of porphyritic andesite/dacite. Trend of this fissure is N. 10° W.



Figure 9

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Figure 9 - Scoria rampart or scoria mount^d - an elongate low ridge of scoria (300 feet long and 50 feet wide) that trends N. 10° W. adjacent to the fissure shown in Fig. 9. This is one of 3 parallel scoria mounds that rise above the pahoehoe lava surface.



Figure 10

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10. Surface opening into a small lava tube.
11. Entrance to Derrick Cave lava tube near the center of sec. 1, T. 24 S., R. 15 E.
12. Collapsed ceiling of Derrick Cave lava tube.



*O.K.
Use this with
more explanations.*



Figure 13 - Small hornito or spatter cone near Derrick Cave showing the typical beehive structure of this feature.



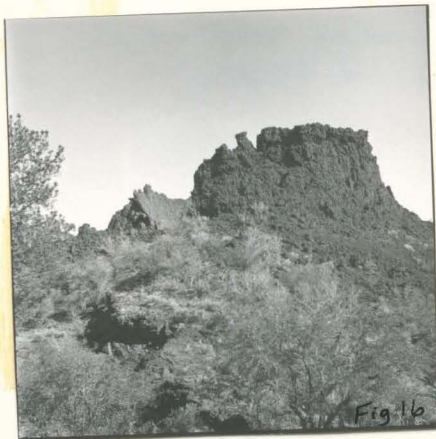
Figure 14 - Closeup of hornito shown in Fig. 13 showing how the clots of lava have become flattened as they built up the cone.



o.k

Fig. 15

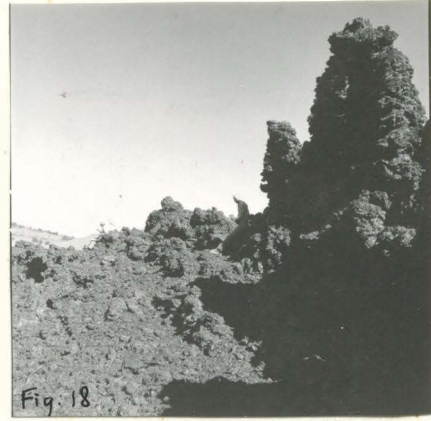
Figure 15 - Looking north along a row of small spatter cones (hornitos) toward "The Blowouts", two giant spatter cones. These again are on the eastern margin of the Devils Garden in sec. 12, T. 24 S., R. 15 E.



o.k

Fig. 16

Figure 16 - South "Blowout" spatter cone with the breached west wall of the North "Blowout" in the left foreground. After firefountaining along the fissure had built the spatter cones lava welled up and flowed north and west.



Figures 17 & 18 - Two views of the south "Blowout" spatter cone showing the reddish black agglutinate that makes up the walls.

Another large fan shaped area covered by fresh black lavas is centered about 7 miles east of the Devils Garden. This area was not examined in detail but both pahoehoe and aa lava surfaces were both noted. Aerial photographs show at least one cratered cinder cone near the center of the area. This is tentatively named the Squaw Ridge Lava Field.



Figure 19 - The southern edge of the Squaw Ridge Lava Field in which rough aa and block lava surfaces as well as pahoehoe lavas occur.

South and east of the Devils Garden and the Squaw Ridge Lava Field is another smaller area of very recent lava flows and cinder cones. This is unnamed on the available maps and for this report will be called the Four Craters Lava Field. Maps and aerial photographs show four main cinder cones all with craters aligned along a fault or fissure that trends about N. 20° W. through the area. Juniper trees over 2 feet in diameter growing on aa lava and in the craters indicate that it has been at least 500 years since the volcanic activity ceased in this area. The lava appears to be about the same age as those of Lava Butte.

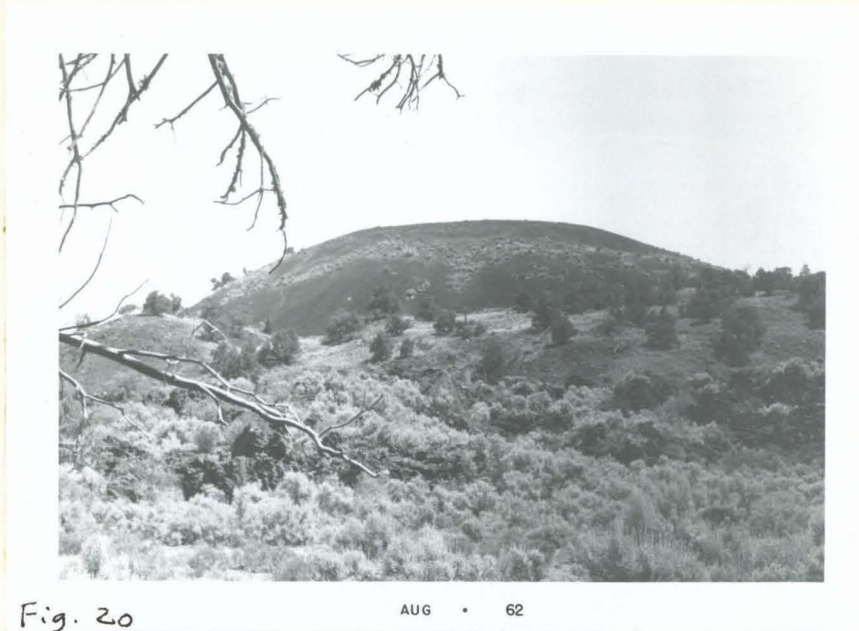


Fig. 20

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Figure 20 - Looking east toward the northernmost cinder cone in the Four Craters Lava Field.



Figure 21 - View from the top of the north cinder cone showing the steep walls of the crater which is about 500 feet in diameter and 200 feet deep.



Figure 22 - Looking south toward the #2 cinder cone shows the broad shallow off center crater completely surrounded by thin flows of black lava.



Fig. 23

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Figure 23 - Looking east toward #3 cinder cone, again the
 terrain to the east.



Fig. 24

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crater part
 Figure 24 - South edge of Four Craters Lava Field showing
 cones with craters and the surrounding spiny aa lava flows.
 Smaller parasitic mounds of scoria are common around all
 the cones adjacent to the fissures over which the cones
 were built.

Many miscellaneous features were noted and some of these are listed as follows.

32°

Figure 25 - Quarry on the west side of Finley Butte in sec. 20, T. 22 S., R. 11 E. showing the steep initial dips of the layers of cinders and scoria within a typical cinder cone.



Figure 26

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Figure 26 - A Highway 31 roadcut about 15 miles SE of Lapine, exposes the inside of a large tumulus in light gray dikty-taxitic basalt. Note the columnar jointing and the horizontal jointing of the vesicular flow basalt.



Figure 27

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Figure 27 - Large tumulus just south of Flat Top Butte in sec. 25, T. 24 S., R. 13 E. This one is at least 100 feet in diameter and has the typical split open top surface. There are abundant excellent examples of this type volcanic feature in this immediate vicinity.



Figure 28

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Figure 28 - Small hornito (spatter cone) in sec. 32, T. 24 S., R. 12 E. along the Katati Butte road. This is an almost perfect example of a hollow cone, the thin walls built of lava spatter.