

Hole-in-the-Ground file

P.O. Box 1333,
Stanford University,
Stanford, California,
January 11, 1955.

Mr. Ralph S. Mason,
Oregon State Dept. of Geology,
1069 State Office Bldg.,
Portland 1, Oregon.

Dear Mr. Mason:

I am returning your negatives of Hole-in-the-Ground. Since talking with you I have carried on correspondence with Dr. Howel Williams, University of California, and Mr. Phil Brogan about this depression.

Although Dr. Williams' memory of Hole-in-the-Ground is "pitifully vague" he recalls that he once attributed this structure to the withdrawal of liquid lava from beneath a solid basaltic crust; a structure probably similar to what C. A. Anderson describes as a "subsidence crater" from the Medicine Lake Highlands (Univ. Calif. Public. Dept. Geol. Sci., vol. 25, pp. 380-81, and plates 8 and 9, 1941). Dr. Williams also felt that the depression is "definitely not an explosion crater".

However, Mr. Brogan, in his letter, stated that geologists who have visited "The Hole" say it is a volcanic blow-out. He commented on its great resemblance with Meteor Crater in Arizona, but in many visits there he has been unable to find magnetic material of any kind.

I, personally, am dissatisfied with both the subsidence and explosive theories, and with my father hope to study the depression to the best of our limited abilities this summer.

If you hear of any additional information on this structure I would greatly appreciate hearing from you. Many thanks for your loan of the negatives.

Respectfully yours,
Greg Davis
Greg Davis



UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
GROUND WATER BRANCH
Box 3418 - 1002 N. E. Holladay Street
Portland 8, Oregon

November 9, 1961

Mr. Norman Peterson, Geologist
Oregon Department of Geology
and Mineral Industries
State Office Building, 5th and Columbia
Portland 1, Oregon

Dear Norman:

I enjoyed your Ore-Bin article on the hydro-explosion origin of Hole-in-the-Ground. This is one of the many unappreciated science-interest points on which a committee of the Northwest Science Association will soon be campaigning for suitable highway markers.

Your volcanic-steam origin is the best general explanation of its origin at present, but there are some minor features of the occurrence which this origin only partly explains.

The water-table data published in Trauger's 1951 open-file report of the U.S.G.S. on Lake County shows that the water table of the Fort Rock and adjacent valleys slopes gently northwestward toward, and sinks sharply near, Hole-in-the-Ground. Present horseback guesses are that 25-50,000 acre-feet of water per year discharge from the valley through this ground-water outlet. At this partly known subsurface sink the water table is still about 150 feet above levels of the large springs in the corresponding reach of the Deschutes River northwest of LaPine. Meager water-level data from a very few logging-camp wells indicate a general ground-water gradient may continue northwestward from the subsurface sink to the Deschutes Valley. Thus, the ultimate drainage (subsurface) from the Fort Rock Valley may be to the Deschutes.

Just how this apparent subsurface outlet bears on the old belief that a surface outlet to the Deschutes once existed (as shown by fossil salmon vertebrae in the deposits at Fossil Lake) is obscure at present, but possibly it has some bearing on the age of Hole-in-the-Ground. I have always wondered how pluvial Lake Fort Rock could have existed with a large subsurface outlet draining off water from the basin--or at least how it could have been such a strong lake, apparently comparable to those in nearby basins which were entirely of internal drainage.

Thus, the history of drainage from Fort Rock and the proximity of the present ground-water drain to Hole-in-the-Ground suggest the explosive origin of the latter may have opened up the drain between the time of maximum level of pluvial Lake Fort Rock and the arrival of the Mazama-Newberry pumice fall.

Craters of gaseous eruption-like Hole-in-the-Ground are common in some volcanic areas. The "firing fields," called something like "Campi Fleigri" by the Italians, just west of Naples, Italy, are mostly marked by these types of craters. I have seen them described in Hawaiian occurrences. The Hawaiians even have a name (which I can't recall) for this gaseous-type crater.

Sincerely yours,

R. C. Newcomb

R. C. Newcomb
Research Geologist

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1

April 24, 1961

Mr. Norman V. Peterson
State Assay Laboratory
Grants Pass, Oregon

Dear Norm:

I would like your advice on the following matter - on whether or not you think the idea is a good one and if you would like to participate.

Ed Groh was in the office Friday and discussed at great length why he thinks Hole-in-the-Ground is a meteorite crater. I think a great deal of Ed and his ability to think scientifically. Further I respect his judgment. I do not believe, however, that Hole-in-the-Ground is a meteorite crater - rather I think that it is a crater left by a fairly recent fire pool. Nevertheless the fact that Ed has done considerable work on it and appears to be quite interested I thought might be a good chance to write a little story on Hole-in-the-Ground. Some day somebody is going to and we might just as well be the ones to start it.

I have asked Ed to set down all the reasons why he thinks that it is a meteorite crater and then, after reading literature on volcanics that I have referred him to, write down criteria for a volcanic origin. Then I told him that if it met with your schedule and you were interested, he and you could spend several days to a week in going over the area, checking out the criteria, and seeing what you can find out. The result is to be published in THE ORE.-BIN. I have told him that you are perfectly open-minded about this and there is no need for drawing a definite conclusion that it is of meteoric or volcanic origin, but inasmuch as others have noted its similarity to a meteorite crater, the Department should have something on record regarding it.

What do you think?

Sincerely yours,

Hollis M. Dole
Director

HMD: jr
cc Ed Groh

April 26, 1961

Hollis M. Dole
1069 State Office Building
Portland 1, Oregon

Dear Hollis:

Regarding your letter about the Hole-in-the-Ground, I have only seen it one time and at that time believed it to be a fairly recent volcanic crater. I could be wrong. I would be very interested in spending some time in the field with Ed Groh to do a study on it.

Will you tell Ed this, and have him write me to arrange the time. I also noticed that there are no published topographic maps, at least none that I know about. Perhaps you have some map coverage up there. I will be planning on this trip.

Sincerely,

NVP:amj

Norm

February 25, 1962

Dear Horn:

Received your letter yesterday and I think your draft of the speech is fine. As you say there may be a little more polishing needed, but we'll clean that up easy.

I expect you will check in at the Office later in the afternoon Thursday. In that case, I'll meet you there and after you have things squared away, we'll go out to my place for dinner and then chew the talk over.

See you then.

Sincerely,

Ed

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

February 16, 1962

Mr. Norm Peterson
P.O. Box 417
Grants Pass, Oregon

Dear Norm:

I checked with Ralph today on progress of the slides and he said they were all done. So I stopped by the Office late this afternoon to see them before they went your way.

They are actually emulsion on glass slides and are supposed to be better for black and white types. Fort Rock and the Hole look pretty good to me except for a few dust specks that got in the view. The cross-section may seem a little odd with the projected surface until one remembers the vertical scale is 3X.

Now the index map is being redone as you will note Ridge 28, Moffit Butte and Cow Cave were left off. Ralph suggested originally just a simple index of localities rather the original Ore-Bin index with its confusion of contour lines and roads. I agreed with him, but if that isn't satisfactory to you let me know. The new one should get to you in a few days.

Since the scientific "hatchetmen" will be around, I think one point we didn't realize before is that the youngest basalt of the area is later than the Hole. In the photos, it appears to me to have flowed around the Hole and against the rim or cone, except to the east, the cone acting as a barrier to flow from the west or northwest. Not much left on the photo to see! The lava then flowed down the slope toward Fort Rock basin. This basalt just doesn't match in elevation with that in the wall of the Hole. The ash-flow tuff we found cropping out where the road crosses the fault ties with that in the Hole because of the northeast tilt of the fault block and the basalt we found nearby may be that in the crater wall, but there is still this younger stuff at a higher elevation. ~~What~~ do you think?

By the way, do you want these duplicate slides returned or put in the office file?

Let me know on anything else.

Sincerely,

Ed

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February 19, 1962

Mr. Norman V. Peterson
State Assay Laboratory
P.O. Box 417
Grants Pass, Oregon

Dear Norm:

Ed and I are hopefully(?) awaiting the article on "Geological Interpretation of Lunar Craters" by Shoemaker. I assume you have sent it off by now.

The fellow in the slide is none other than the famous Dr. Green himself. We hope he'll be out here sometime this spring or summer, and then you can meet him in person. I think you will find him most interesting to talk to.

Regards,

A handwritten signature in cursive script that reads "Andy".

Andy

REC:lk

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

February 14, 1962

Mr. Norm Peterson
P.O. Box 417
Grants Pass, Oregon

Dear Norm:

Having received your two letters today, I made a trip to the Office to get things rolling.

With Hollis' okay I went over your requests with Ralph and he will first, have Mac the draftsman, modify the index map and have a 35 mm. transparency made. Second, as the aerial shots of ~~the~~ Hole and Fort Rock were made on 35 mm. film, a positive transparency of each will be made. Third, by changing the cross-section of the Hole used in the Ore-Bin which was on Mylar, Mac will do a little re-doing to show the projected surface as you wanted. I hope he got the idea as I tried to sketch it for him to follow. Anyway I'll follow it up.

Your slides are real good and I see no reason why they won't be satisfactory. After all, you weren't taking a picture of the original view, however nice that would be.

I'll let you know any further developments.

Sincerely,

Ed

Ed

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February 6, 1962

Mr. N. V. Peterson
State Assay Laboratory
P.O. Box 417
Grants Pass, Oregon

Dear Norm:

Under separate cover I am sending you my copy of Jack Green's report. Please keep it as long as you feel you have a need for it.

The Department slide tucked away in the report between page 44 and page 45 is being sent at the request of Ed Groh. He will write you a letter on this.

Sincerely,

A handwritten signature in cursive script that reads "Andy".

Andy

REC:lk

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

February 6, 1962

Mr. Norm Peterson
P. O. Box 417
Grants Pass, Oregon

Dear Norm:

You certainly are going to put on a picture show. If any of your aerial photos are wrinkled or smudged, let me know so I can send you a better one for copying. For an oblique of Meteor Crater, the July 22, 1960 issue of Science had a pretty good one on the cover.

I just read a new report of Jack Green's which had a few details about maars which might be of interest. It was Andy's copy and being at the Office today I suggested it be sent to you. Also, I remembered Andy had taken one shot of a tuff outcrop at the Big Hole, when he was on the tour with Green, and it is being sent, too. It will show that same bedded tuff characteristic of Fort Rock, Moffit Butte, etc.

Let me know if there is anything else.

Sincerely,

Ed

Ed

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Ore.

January 24, 1962

Mr. Norm Peterson
P.O. Box 417
Grants Pass, Oregon

Dear Norm:

I received your letter today regarding the talk for the Oregon Academy of Science.

If you will present the talk, I will be glad to help you work it up. The Ore-Bin article would probably provide the bulk of the material, I suppose. Perhaps a little theorizing or speculation on the distribution of these tuff rings to the south and east in Oregon from the area we studied, might be added. Your work in the Lakeview region would tend to bear this out. Also the connection with the Plio-Pleistocene lakes of this region might be interesting.

For a title I'll throw in these two - "Hole-in-the-Ground and Related Volcanic Explosion Features of Central Oregon" or "Tuff Rings or Maars of Central Oregon". Which brings up a point, Shoemaker seems to use the term maar to cover all these volcanic features. He even calls the Hopi Buttes diatremes, maars. I am interested in seeing his paper for more details.

Anyway, as they would say - if you will fire the gun I will commit myself to helping you load it, Norm. I'll wait for your first draft of your talk.

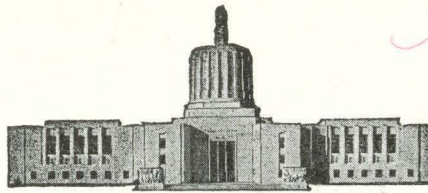
Sincerely,



Ed Groh

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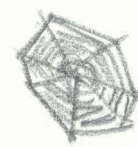


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January 16, 1962



TO: Staff
FROM: Hollis M. Dole

You probably have all received notice from Gilfillan regarding the Oregon Academy of Science meeting to be held early this year.

You are urged to prepare a talk if you have anything to say. Right now the only thing I can think of is something from Norm Peterson and Ed Groh on Hole-in-the-Ground.

Start thinking and send in your titles as promptly as possible.

HMD

HMD: jr

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

October 21, 1961

Mr. Norman Peterson
239 S. E. "H" Street
Grants Pass, Oregon

Dear Norm:

I was up to the Office yesterday afternoon for a final look at the story. It looks real good even though quite a little cutting and glueing has occurred since you last saw it, all for the better I believe. It's headed for the printer Tuesday.

Margaret wasn't able to get me Monday or Tuesday as I was out in the field. Tuesday night some virus bug kicked me in the head and stamped on my chest and Wednesday it took effort even to think, so I didn't talk to Margaret until Thursday morning. She told me that they cleared up the final points with you on the telephone.

Andy and Margaret are pretty sharp and caught a few errors we wouldn't have wanted in print. Having read the script a dozen or more times myself I don't know how a fellow can keep missing them. Also it was suggested that a summary or conclusion was needed to round off the end of the article. I whipped up one, then had some second thoughts and sent Margaret another over last weekend. I hope I didn't take too much literary license in producing it.

Norm, I've enjoyed working with you very much, both ^{in the} field and office, on this project. Maybe our labors will encourage someone else to give the area more attention. Who knows, maybe one of these days a crater will be dumped in our laps that we can stamp officially METEORITE?? Hope it's where a fellow can drive to it!!

Thanks very much again for that sample of ore from the White King. Boy! It is hot! Runs my counter, with the beta shield open, to the end of the meter on the highest scale. Can't let any photo film near that kind of stuff!

Remember, when you're up this way again we would like you to come out for the evening, if you have no other obligations. Until then don't take any wooden meteorites!

Sincerely,

Ed



STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES

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PORTLAND 1, OREGON

September 6, 1961

Mr. Norman V. Peterson
State Assay Laboratory
Grants Pass, Oregon

Dear Norm:

Enclosed are pictures of Hole-in-the-Ground and Fort Rock taken by Dick Bowen.

Ed Groh has looked these over and has indicated his preference on the back. Please do not look at these until you have indicated your preference. Pick out a couple of Hole-in-the-Ground and Fort Rock. Then we will get Leo Simon to develop us a high-contrast print and place these in THE ORE.-BIN. As I visualize it, we will use one print of Hole-in-the-Ground, one of Fort Rock, and one of Big Hole.

Ed is getting worried about the manuscript. We will use Ecola Park for September and shoot for Hole-in-the-Ground for October. So there should be plenty of time.

Sincerely yours,

Hollis M. Dole
Director

HMD:jr
Encl.

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

August 20, 1961

Mr. Norman Peterson
239 S. E. H Street
Grants Pass, Oregon

Dear Norm:

Your slides certainly turned out swell - just like I was there again. Those of the Hole are a dead ringer for a picture taken across the Arizona Crater I saw recently. Hollis gave me a report by Jack Green, the North American Aviation geologist, who is comparing lunar features with volcanic features around the world. This report had a picture taken from the rim of the Arizona Crater; the first I've had a chance to see.

I passed the slides to Hollis last Friday and he was quite impressed, especially the ones of Fort Rock, his old stamping ground. As he and I were the only ones to see them at the office, he gave them to Margaret for the rest of the staff to have a look and then to be returned to you.

Dick was unable to get a picture of the Hole on his return to eastern Oregon. Something regarding a pretty strong wind blowing that day and probably a lot of turbulence. He'll try on his next trip this way.

By gosh, Norm, I sure would like to have a sample of some of that 10% stuff, I never found anything that ran more than maybe 3 or 4%. Evidently, Vance must have known what was down under the lake at the White King. Hollis showed me your letter explaining the tough specs on ore now. Some deal!

I'm not much of a rewrite man so take it easy!!

Sincerely,

Ed

Edward A. Groh
7224 N. Haven Ave.
Portland 3, Oregon

August 6, 1961

Mr. Norman Peterson
239 S. E. H Street
Grants Pass, Oregon

Dear Norm:

Since you saw Dick Bowen over at Cape Sebastian, you know he was going to get some photos of the Hole on his way back to eastern Oregon. As soon as the prints show up here I'll see that they get passed on to you. I hope Dick can get at least one oblique with good contrast.

Another thing that we need for the article is a localities map to cover the Big Hole, Moffitt Butte, Flattop Butte, etc., which you will be tying in with the Hole-in-the-Ground. In checking with Mark a couple weeks ago on this item, it seems a section cut from the AMS Crescent sheet will do the trick with a minimum of work. Moffitt Butte, Nigger Heel Butte, and a couple other points will have to be lettered in to complete the picture.

Norm, the August 1961 issue of Scientific American has an article on "fossil meteorite craters", page 51, that is real interesting. Another article on high speed impact in the October 1960 issue of the same publication, page 120, also provides some thought on what meteorites can do. These and some other material I have read recently makes me want to hedge just a little on the Hole. While I remain convinced after our work that we have a wonderful example of a volcanic explosion crater, I don't think we should be so positive that some future "scientific hatchetman" could chop us to little bits.

Your perlite article was very fine, Norm. I just wish I could have your Locality 8 over in the hills by Linnton and owned in fee title and no other deposits around.

I certainly don't envy the temperatures you've been having down your way. The two 100+ days we had will keep me for a couple years. Have you been painting as you planned?

If there are any odds and ends on our article that need taking care of let me know.

Sincerely,

Ed

7224 N. Haven Ave.
Portland 3, Oregon

June 18, 1961

Mr. Norman Peterson
239 S. E. H Street
Grants Pass, Oregon

Dear Norm:

Say! That was a real nice article on the Hole-in-the-Ground Phil Brogan wrote for today's Oregonian. You must have written quite a letter to him giving him all the dope on our work. I have only one serious criticism of Phil's article and that is where he compares the Hole-in-the-Ground as a miniature of the Arizona Crater. It can hardly be miniature when it is the larger - twin would have been a better word.

Well, Tom came through with the analyses. He had bad luck and double-exposed a plate on our samples #S-3, #S-5, #S-6. These were individual particles, two which I picked for special check. The other #S-3 was the one you picked from the anthill on the SE rim of the Twelve Mile Cr. crater. It was definitely a flake of iron probably from a horseshoe. As he used the complete samples for analysis there wasn't anything left for a second run. As the rest of the samples show nothing positive these three would add nothing I believe.

The soil samples #1 - #5 did not indicate any nickel-cobalt halo around the Twelve Mile Cr. crater. Certainly if meteoritic material had been present at one time the soil should have shown several hundredths percent or more nickel. Likewise, cobalt should have been present as meteoritic iron usually has a Ni:Co ratio of 12:1. Therefore, I guess we can conclude that Twelve Mile Cr. crater is not meteoritic in origin. Of course differential weathering and solution of Ni and Co may have destroyed any halo after the passage of a hundred thousand years or so. But that is in the realm of the unknown.

Samples #S-1 and #S-4 are from anthills on the rim of Twelve Mile Cr. crater. They consisted of magnetite and basalt fragments and the nickel is essentially at background for that type of material.

Sample #S-2 is the tramp iron from the south rim of the Hole-in-the-Ground. The analysis fits a silicon-manganese steel of the S.A.E. 9000 series. These steels usually contain C-.50-.60%, Mn-.60-.90%,

Page 2

Si 1.80-2.20%. The Al was probably added to refine the grain structure. The balance of the elements have no significance and are impurities from the scrap steel used in the melt. This type of steel is fairly abrasion resistant, springy, easily heat-treated in large sections and economical for its purpose. Therefore it is ideal for bull-dozer and grader blades. Exit meteorite!

Well, Norm, that about winds it up. As this negative or inconclusive evidence is given by these analyses for meteoritic origin of the craters, by this very fact, I suppose some of this should be fit into the ORE-BIN article.

The origin of the Twelve Mile Cr. crater I guess will have to remain as unknown. Maybe someone will come up with a new method of proving very old meteorite craters. Then we'll have a crater to try it on.

If there is anything else I can do for you on this thing please let me know.

Sincerely,

Ed

7224 N. Haven Ave.
Portland 3, Oregon

June 12, 1961

Mr. Norman Peterson
239 S. E. H Street
Grants Pass, Oregon

Dear Norm:

I've been waiting to get the results from Tom before writing you so I could give you the complete works. Unfortunately, the spectrograph has been jammed with outside work and our stuff ranks, as usual, at the bottom of the totem pole. Last Friday, Tom figured he could get our samples run through this next week. I sure hope so as he will be on his yearly two week cruise after that.

I saw Hollis the following Monday after our trip and gave him a rundown on what we did. He seemed well pleased with all we covered in the four days over there. In the end, I think he wanted us to turn up a meteorite crater as much as we did. Nevertheless, finding those tuff rings or diatremes? puts an interesting light on that area. Hollis thought he would suggest to one of the universities that they assign a graduate student to give the area a good study and I certainly agreed it could keep a fellow busy for quite awhile.

Your article on perlite is scheduled for the July ORE-BIN and Hollis figured September for our article on the Hole-in-the-Ground. Hollis agreed that an oblique photo and also a cross-section of the crater would work in nicely for the article. Dick Bowen will probably be over in that vicinity sometime during the summer and will get some shots from the air. I'm enclosing a cross-sectional sketch of the Hole. I'm leaving to you the additions and corrections. Also do you think it should be to scale vertically or 2 or 3 times? As Mark Christianson will draw the final picture, its mostly a case of letting him have the pertinent data.

I still haven't found out for sure what was wrong with the nickel tests we ran. One thing mentioned regarding dimethylglyoxime was to avoid an excess of NH_4OH . Dick has a USGS sheet on nickel tests using pyrosulfate fusion, HCl , and alpha-furildoxime for soil tests if you ever need the dope.

There was nothing in any of the samples I could identify under the microscope as meteoritic material. A couple of suspicious particles

Page 2

I'm having checked for Ni & Co. Maybe a nickel anomaly will still show up in the soil samples from the Twelve Mile Cr. crater. I'll shoot copies of the spectro-analyses to you as soon as they come.

Well, Norm, I guess that covers it for now. Whenever you have the rough draft ready I'll be anxious to see it.

Hope you've been getting more sun than we have over the last two weeks. Well the Rose Festival is over now maybe there's hope.

Sincerely,

Ed

7224 N. Haven Ave.
Portland 3, Oregon

May 8, 1961

Mr. Norman Peterson
239 Southeast H Street
Grants Pass, Oregon

Dear Norm:

The 22nd it shall be - at 12:00 Noon, standard time. Your choice of the place to meet can't be improved on. I guess you picked up my telepathic signal.

Thanks very much for sending Cotton to me. He does a good job of presenting the characteristics of various volcanic phenomena and this with Nininger should help us to tie down what the Hole is - volcanic or meteoritic in origin. By the way, another stereo-pair is on the way to you. These are on the Big Hole which is located about six miles to the west from the Hole-in-the-Ground. It seems to fit the picture of a tuff ring and being so near to the other Hole casts its possible volcanic shadow over the Hole-in-the-Ground. More on that when we get together.

I'll be bringing the usual field equipment, including a strong magnet for picking up meteoritic fragments if they still exist in partly metallic form.

If the weather will just treat us good, I think it will be an interesting venture for both of us. I'll be seeing you, Norm.

Sincerely,

Ed

7224 N. Haven Ave.
Portland 3, Oregon

May 1, 1961

Mr. Norman Peterson
239 S. E. "H" Street
Grants Pass, Oregon

Dear Norm:

I'm very glad you want to tackle the Hole-in-the-Ground for a field study. While I consider it can very well be a volcanic feature, certain characteristics indicate it can also as well be a meteorite crater. It is my hope we can find some conclusive evidence such as meteoritic material, to support this supposition.

Rather than a long story here, I think discussion of this would be better face to face. Having seen Hollis today at the Portland office, I arranged to pass along Nininger's book on meteoritics to you. Also a stereo pair on the Hole. If you can look over the chapters I've checked it should provide some thought for this trip. Not that I want to convert you to my thinking, rather to save myself from being shot down right off.

Norm, I'm all set to meet you and get going either the 15th or 22nd of May. You set the time of day (Standard time) and place. Some other material I'm waiting for should be here not later than next week, otherwise I could make it sooner. Bend or LaPine will be headquarters, I guess. The weather might trick us but that is part of the game. If neither of the above dates is satisfactory, Norm, feel free to name one that is and I'm sure I can make it.

About the only maps available for this area are the ranger district sheets of the Deschutes National Forest. I'll bring a couple sets plus some more photos. We may need a shovel. Can you take care of that? Also your altimeter.

By the way, Hollis thinks that you may have his copy of Cotton's-Volcanoes as Landscape Forms- down there. Would you send it to me so I can give the other side a fair trial. It wasn't around anywhere in the Portland office which led Hollis to believe it might be down your way. Our main library has it, but it wasn't on the shelf at the time, so I put in a reservation card. I have no way of knowing when I might get it. Could be a month or more.

Well, Norm, I'm all primed for "Operation Fire Bowl" and anxiously waiting for your go signal. May the meteoritic side be the winner.

Sincerely,

Ed

COPY

STATE DEPARTMENT OF GEOLOGY AND
MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

April 27, 1961

Mr. Edward A. Groh
7224 N. Haven
Portland 3, Oregon

Dear Ed:

I have received a note from Norm, a copy of which is enclosed.

As far as I am concerned this is now up to you.

More power to the both of you.

Sincerely yours,



Hollis M. Dole
Director

HMD:jr
Encl.

✓ cc Norm Peterson

Norm -

Ed Groh's address is given above. His phone number is
Butler 5-7597.

Norm - 8

May 31, 1961

Mr. Phil Brogan
Bend Bulletin
Bend, Oregon

Dear Mr. Brogan:

I am sorry we didn't get a chance to stop back to talk to you after our visit to the Bend area last week.

We looked over the Hole-in-the-Ground thoroughly and could not find any evidence of meteoritic material and we feel that this pretty well rules out a meteoritic origin for the crater. Certainly it is the result of explosion and we did find explosion tuffs and breccias in place in the rim of the crater. There are also welded tuffs overlain by a basalt flow exposed in the crater wall. The coarse-grained basalt porphyry represented by the large blocks on the crater rim is not exposed in place and must be lower in the rock section.

The Big Hole is very similar to the volcanic landform called a tuff ring and as nearly as we can determine this is what it is. Explosion tuffs and breccias are the only rocks exposed in the crater walls and the rim.

Moffit Butte is somewhat larger and more eroded but appears to be again the same, a tuff ring. Like you said Fort Rock is very similar and looks like an erosional remnant of a tuff ring. I'm not an expert on diatremes but what I have read and heard they originate in much the same way. I would have to do a little more looking around before I'd call Ft. Rock a diatreme though.

Anyway we will be writing this up for the Ore-Bin so any new idea we come up with will be there.

I will hope to get to Bend again before too long and will stop in to see you.

Best regards,

NVP:amj

Norm Peterson