YELL-259
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FACTS AND THEORIES ABOUT OLD FAITHFUL GEYSER

1. Old Faithful was undoubtedly known to trappers from 1833 on, but was not named or fully described until the Washburn-Langford-Doane expedition of 1870.

2. It plays as regularly and as high now as it did when first described.

3. The height to which Old Faithful erupts has been measured on a number of occasions with a transit. Eruption heights ranged from 106 feet to 184 feet. Few eruptions of this geyser are less than 115 feet, and only one eruption was measured in which the height of the water column reached 184 feet. The average height of an eruption is 130 feet. The stronger the wind, the lower the height of the eruption is apt to be; the wind blows the top off the ascending column of water and thus reduces the height of play.

4. During the 1967 season the 1,537 timed intervals between eruptions indicated that the average interval was 66.2 minutes. The shortest interval between eruptions observed was 36 minutes, and the longest interval was 91 minutes. Of more than 35,000 observed and recorded eruptions in the past 95 years, Old Faithful's average interval has <u>always</u> been between 60 and 67 minutes. In this same period of time, the minimum interval recorded was 33 minutes, and the maximum 98 minutes.

5. The duration of Old Faithful's eruptions varies from 2 to 5 minutes.

6. The amount of water thrown out of the geyser during the eruption was carefully estimated by Drs. Allen and Day of the Carnegie Institute and it was determined that from 10,000 to 12,000 gallons of water were ejected. Most of the water thrown out of Old Faithful runs into the Firehole River.

7. Geyser tubes or wells are not uniform in shape. They are usually crooked or constricted in many places. Attempts to plumb the depth of Old Faithful indicate that there is a constriction at about 70 feet. It is not known how much deeper the geyser tube goes.

8. The tremendous amounts of water erupted from such geysers as Old Faithful, Giant, Giantess, Grand, Great Fountain and other major geysers indicates that large volumes of water move rapidly through the geyser's plumbing during an eruption. Geologists believe that one or more porous, permeable beds of rock, called aquifers, are the reservoirs that supply the water for an eruption.

9. It has been estimated that about 95% to 98% of the water in geysers and hot springs has its origin as surface water from rain and snow. The water is returned to the surface by steam pressure after being heated in the geyser's subterranean plumbing system. The remainder of the water has its origin in condensed steam from the hot gases rising from magma (the molten rock within the earth) at considerable depth.

10. Theory suggests that magma is the source of heat for geysers and hot springs. The heat is transmitted through solid rock to water which has seeped to depths perhaps 10,000 feet below the surface. The very hot water then rises in the plumbing system of a geyser, heating rocks and water that it meets along the way. The amount of heat involved is suggested by the fact that superheated water flows into a number of hot springs.

11. The existence of a geyser depends on:

A. An adequate supply of water.
B. A source of heat.
C. A plumbing system - a series of fissures and fractures that reach deep into the earth.
D. A rock formation that is sufficiently strong to maintain the plumbing system against the pressure of steam explosions.

The eruptions of no two geysers are alike, apparently because of a wide variety of combinations of rates of heat flow, rates of water movement and intricacies in plumbing system.

If more detailed information is desired, a pamphlet entitled THE STORY OF OLD FAITHFUL GEYSER is available. This 44 page, illustrated, paperbound pamphlet sells for 50¢ which includes mailing, insurance, and handling. Another publication of interest is STUDIES OF GEYSERS AND HOT SPRINGS ALONG THE FIREHOLE RIVER, a booklet which describes the marvelous features of the largest area of geysers in the world. Its mail price is 55¢. Orders for these publications should be accompanied by check or money order drawn payable to the Yellowstone Library and Museum Association, Yellowstone National Park, Wyoming 83020. Postage stamps will not be accepted.

"An eruption of Old Faithful when the light and weather are favorable is an awesome and sublime spectacle. The boiling-hot water, even though it is explosively jetted out of the earth, assumes a pronounced symmetry and gracefulness of form. One would have to be dull and unresponsive to the unusual, the beautiful, not to find exhiliration in seeing an eruption of Old Faithful. The myriads of water droplets with all the luster of brilliants projected against the intense blueness of a Yellowstone sky make it one of nature's superb creations..."