

this temporary storage, where it had been protected from the elements, and moved to the village.

These suggestions, of course, in no way negate the premise that these structures were granaries or farm shelters. Firm determination of their use can only come from further excavation and study of minor prehistoric farm buildings.

National Park Service

Santa Fe, N.M.

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NEW PUBLICATIONS

Latest addition to the Ceramic Series is No. 3D, "Pottery Types of the Southwest," edited by Harold S. Colton. Included are Wares 14, 15, 16, 17, 18: Alameda Brown Ware (Colton), Tizon Brown Ware (Robert Euler and Henry Dobyn), Lower Colorado Buff Ware (A. H. Schroeder), Prescott Gray Ware (Colton) and San Francisco Mt. Gray Ware (Colton). The price is \$1.75.

"Typical Seed Plants of the Ponderosa Pine Zone," by Walter B. McDougall and Horace Haskell, has just been published as Bulletin 32. It includes a complete checklist of 293 seed plants found on the Museum and Coyote Range area, and will be useful for identifying plants for many miles around the area, especially in the ponderosa pine forest. It has 63 pages including 3 pages of illustrations.

A free copy will be sent on request to any Contributing, Sustaining or Life member. Other members receive a discount on Bulletin 32. All requests and orders should be addressed to the Publications Manager.

A PREHISTORIC CACHE OF COTTON SEEDS FROM THE HOPI COUNTRY

By ROBERT C. EULER

In February 1959 the writer, in the company of Elizabeth Morris and Paul V. Long, Jr., was in the Hopi towns to attend the Bean Dance, the public performance of the mid-winter observances of the Powamni society.

We stopped one afternoon to see the fairly well-known ruin of Ma-chon-pi (NA 835), a late Pueblo III village occupied near the end of the 13th century and located at the western base of Third Mesa below the present village of Hotevilla.

Ma-chon-pi is a small masonry ruin and probably would not attract attention were it not for the fact that the old dirt road up the mesa to Hotevilla cuts through the site, leaving stone walls and debris exposed to view. We observed the thickness of the walls, the mud plastered floors, and the construction on older and unstable trash and ash deposits.

In one of the rooms which after abandonment had been filled with refuse, we noted the curved surface of a Tusayan Corrugated jar exposed and ready to roll down to the road. In order to preserve the vessel we carefully removed it, only to find that it was badly cracked. In fact, part of the bottom was missing and had been replaced by a larger corrugated sherd simply laid over the opening. The jar was partially filled with dirt and ashes, but we found that small seeds made up about one-fourth of its contents. A sample of these was sent to Volney Jones of the Ethnobotanical Laboratory, University of Michigan, who identified them as cotton, *Gossypium Hophi*.

To be sure, this is a minor archaeological find but it has special interest. We have known for some time that cotton was grown by the Pueblos and their Hopi descendants since as early, perhaps, as AD. 700. Yet our discovery of the cache adds to our knowledge one more example of the prehistoric use of cotton by the ancestors of the Hopi. Had the jar rolled down on the roadway and been destroyed, as surely would have happened after one or two more rainstorms and subsequent erosion, it would have been irrecoverable. Or, had some "pot hunter" come by and taken it, the tiny seeds might have been overlooked or the whole jar discarded because of its poor condition. As it is, archaeologists have a brief published note of the specimen, and the vessel is preserved in the permanent collections of the Museum of Northern Arizona.

Arizona State College

Flagstaff

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NEW PUBLICATIONS

PLATEAU

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The Society will publish in Plateau semi-popular papers resulting from original research on subjects relating to the plateau of northern Arizona. Manuscripts should be typewritten, double spaced, and should not exceed 3000 words. Illustrations must be in shape for publication.

Each contributor will be given free of charge ten copies of the issue of Plateau in which the article appears. Reprints may be procured at cost with or without covers, if ordered at the time the galley proof is submitted. Manuscripts and illustrations should be sent by express prepaid or registered mail to the Editor, Box 402, Flagstaff, Arizona.

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THE OCCURRENCE OF GROUND WATER IN DIATREMES OF THE HOPI BUTTES AREA, ARIZONA¹

By J. T. CALLAHAN, WILLIAM KAM,
and J. P. AKERS

ABSTRACT

Ground water was discovered in diatremes in the Hopi Buttes area of the Navajo Indian Reservation by prospectors drilling for uranium ore in 1953. Subsequently four test wells were drilled in the diatremes for ground water. Two wells yielded sufficient water of good quality for domestic and stock purposes and two wells were unsuccessful, one because of low yield and the other because of poor quality of water.

The diatremes generally are elliptical in plan and range in diameter for a few hundred feet to as much as a mile. They are of volcanic origin, apparently caused by explosions and collapse, and contain inward-dipping beds of tuff, agglomerate, and fragments of sedimentary rocks.

The diatremes occur in an area where potable water is scarce. They are potential reservoirs for small ground-water supplies, because of their inward-dipping strata, the porosity and permeability of the fractured rocks, and the relative impermeability of the surrounding rocks. The development of water supplies from them will make hitherto undeveloped rangeland available for year-round grazing and help support the livestock industry of the Navajo Indians.

The report includes a description of the formation of a modern diatreme on Iwo-jima, and a description of the relationship of the Hopi Buttes diatremes to the stratigraphy of the surrounding Navajo Reservation.

INTRODUCTION

This paper describes the results of a study of the occurrence of ground water in diatremes in the Hopi Buttes area, made as a part of an investigation of the ground-water resources of the Navajo and Hopi Indian Reservations. The investigation was made during 1948-55 by the Geological Survey at the request of the Navajo Indian Agency, U. S. Bureau of Indian Affairs. A water-well development program was begun during this investigation and has continued to the present in cooperation with the U. S. Bureau of

¹Publication authorized by the Director, U. S. Geological Survey.