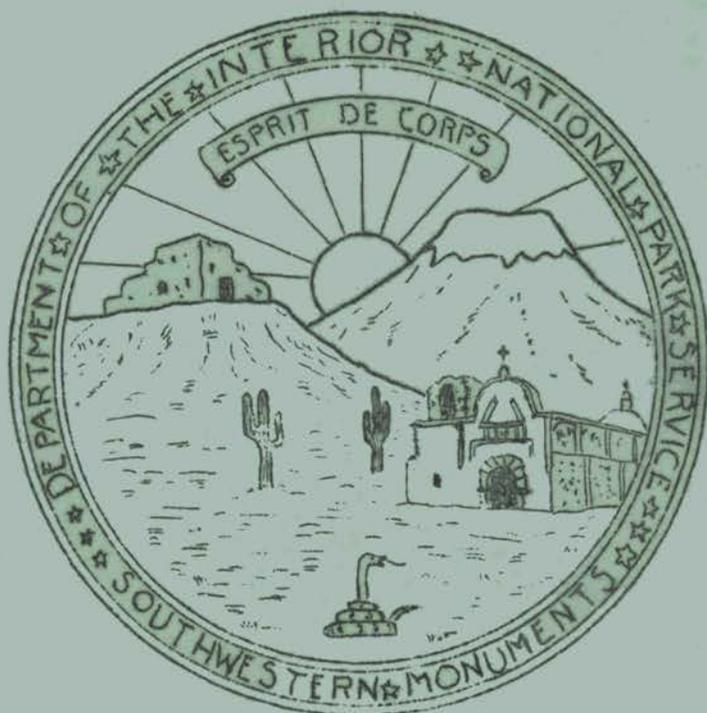


# SOUTHWESTERN MONUMENTS

## MONTHLY REPORT

JULY, 1937



DEPARTMENT OF THE INTERIOR

NATIONAL PARK

SERVICE

# SOUTHWESTERN MONUMENTS

## JULY, 1937, REPORT

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# SOUTHWESTERN MONUMENTS

## PERSONNEL

HEADQUARTERS, Southwestern Monuments, Coolidge, Arizona: Frank Pinkley, Superintendent; Hugh M. Miller, Assistant Superintendent; James Luther, Chief Clerk; J. H. Tovrea, Assistant Engineer; Dale S. King, Assistant Park Naturalist; Charlie R. Steen, Jr. Park Archeologist; Millard Singerman, Clerk-Stenographer; Luis Gastellum and W. H. Sharpe, ECW Clerks; James W. Brewer, Roving Ranger; Gertrude Hill, Student Technician.

### FIELD STATIONS

AREA (acres)

1. <u>Arches</u> - Moab, Utah. J. M. Turnbow, Cu.	4,520
2. <u>Aztec Ruins</u> - Aztec, N. Mex. T. C. Miller, Cu.	25.88
3. <u>Bandelier</u> - Santa Fe, N. M. C. G. Harkins, Cu.	26,026.20
Jerome W. Hendron, Woodrow Spires, and Donald J. Lehmer, Temporary Park Rangers.	
4. <u>Canyon de Chelly</u> - Chin Lee, Ariz. Johnwill Faris, Cu.	83,840.
Alfred Peterson, Temporary Park Ranger. Thomas B. Onstott, " " "	
5. <u>Capulin Mountain</u> - Capulin, N. M. Homer J. Farr, Cu.	680.37
6. <u>Casa Grande</u> - Coolidge, Ariz. A. T. Bicknell, Cu.	472.5
J. Donald Erskine, Park Ranger.	
7. <u>Chaco Canyon</u> - Chaco Canyon, N. M. L. T. McKinney, Cu.	21,512.37
Homer Hastings, Temporary Park Ranger	
8. <u>Chiricahua</u> - Douglas, Ariz. Frank L. Fish, Cu.	4,480.
Homer Bennett and Bronson Harris, CCC Guides	
9. <u>El Morro</u> - Ramah, N. M. Robert R. Budlong, Cu.	240.
10. <u>Gila Cliff Dwellings</u> - Cliff, N. M. No Custodian	160.
11. <u>Gran Quivira</u> - Gran Quivira, N. M. Geo. L. Boundey, Cu.	610.94
12. <u>Hovenweep</u> - Cortez, Colo. No Custodian	285.8
13. <u>Montezuma Castle</u> - Camp Verde, Ariz. Earl Jackson, Cu.	560.
14. <u>Natural Bridges</u> - Blanding, Utah. Zeke Johnson, Cu.	2,740.
15. <u>Navajo - Kayenta</u> , Ariz. John Wetherill, Cu.	360.
Milton Wetherill, Senior Laborer	
16. <u>Organ Pipe Cactus</u> - Ajo, Ariz. No Custodian	330,670.
17. <u>Pipe Spring</u> - Moccasín, Ariz. L. Heaton, Acting Cu.	40.
18. <u>Rainbow Bridge</u> - Rainbow Lodge, Ariz. No Custodian	160.
19. <u>Saguaro</u> - Tucson, Arizona. No Custodian	63,284.
20. <u>Sunset Crater</u> - Flagstaff, Ariz. No Custodian	3,040.
21. <u>Tonto</u> - Roosevelt, Ariz. Irving McNeil, Temp. Park Ran.	1,120.
22. <u>Tumacacori</u> - Louis R. Caywood, Cu. Box 2225, Tucson, Ariz.	10.
James Felton, Park Ranger.	
23. <u>Walnut Canyon</u> - Flagstaff, Ariz. P. Beaubien, Jr. Park Arch.	960.
24. <u>White Sands</u> - Alamogordo, N. M. Tom Charles, Cu.	142,987.
25. <u>Wupatki</u> - Flagstaff, Ariz. Clyde Peshlaki, Caretaker	35,865.30
26. <u>Yucca House</u> - Cortez, Colorado. No Custodian	9.6

Total Area (in acres)

724,659.96

# CONDENSED REPORT

## IN WHICH IS GIVEN THE HIGHLIGHTS OF THE MONTH

Coolidge, Arizona  
August 1, 1937

The Director,  
National Park Service,  
Washington, D. C.

Dear Mr. Director:

The Condensed Report for the month of July, 1937, follows:

<u>TRAVEL</u>	<u>July, 1937</u>	<u>July, 1936</u>	<u>July, 1935</u>
Aztec Ruins	1,881	2,089	1,675
Bandelier	2,665	2,162	2,092
Canyon de Chelly	237	159	163
Capulin Mountain	6,000	2,500	5,000
Casa Grande	1,613	1,142	1,198
Chaco Canyon	1,026	929	672
Chiricahua	1,247	1,017	1,760
El Morro	383	415	381
Gran Quivira	417	281	950
Montezuma Castle	1,507	1,482	1,847
Natural Bridges	146	---	---
Navajo	---	133	86
Pipe Spring	185	406	930
Sunset Crater	1,212	1,177	909
Tonto	399	289	324
Tumacacori	1,157	818	712
Walnut Canyon	1,954	2,384	1,982
White Sands	12,421	12,406	4,755
Wupatki	341	321	268
<b>TOTALS</b>	<b>34,791</b>	<b>30,110</b>	<b>25,710</b>

A gain of 4,680 visitors, or 15.5 percent more than were reported in July, 1936, was mostly made up by an increase in travel to Capulin Mountain, where, unfortunately, we have no full-time personnel nor facilities except a road up to the crater. But sufficient other monuments showed increases to justify the belief that 1937 is a much better travel year than 1936. A striking difference is noted when 1935 figures are consulted; 35.3 percent more travelers visited the monuments in July than two years ago.

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CONDENSED REPORT (CONT.)

010 MATTERS OF UNUSUAL IMPORTANCE

The Roving Ranger reports the Cajon group of ruins at Hovenweep National Monument much injured by water development work. Cavate rooms were removed, prehistoric stone used in constructing revetments, and sheep now clamber all over ancient walls.

123 VISITS BY NATIONAL PARK SERVICE PERSONNEL

Headquarters: Lyle Bennett, Everett Underhill, Richard Sias, John H. Haile, Jr., Wm. Stevenson, Clinton Rose, Kenneth B. Disher.

Aztec Ruins: D. J. Lehmer, Jack Diehl, Stanley Dinsmore, Chester Markley, Johnwill Faris.

Bandelier: Charles Richey, Jack Diehl.

Canyon de Chelly: James W. Brewer, Jr., Erik Reed.

Casa Grande: Chas. Wallace, R. Neil Grunegan.

Chaco Canyon: Robert R. Budlong, Jack Diehl, T. C. Miller, A. E. Borell, Chester Markley, W. W. Yeager.

Chiricahua: Richard Sias, John H. Haile, Jr., Lyle Bennett, Jack Diehl, Clinton Rose, George Cornell.

Natural Bridges: Hugh M. Miller, J. H. Tovrea, Charlie Steen, Chas. Richey

Navajo: Hugh M. Miller, J. H. Tovrea, Charlie Steen, Chas. Richey.

Pipe Spring: Al Kuehl, M. R. Tillotson, Chas. Richey.

Tonto: Luis Gastellum, Al Bicknell.

Tumacacori: Lyle Bennett, L. Gastellum, Jack Diehl, Kenneth B. Disher.

Walnut Canyon: J. B. Hamilton, Dorothea J. Lewis, J. W. Faris, Milton Wetherill, Erik Reed, J. H. Tovrea, Hugh M. Miller, Charlie Steen.

125 OTHER VISITING GOVERNMENT OFFICERS

Aztec Ruins: Dr. E. P. Meinecke, Forest Service.

Bandelier: H. H. Bennett, F. G. Reimer, W. H. Manifold of the Soil Conservation Service, Washington.

Chaco: Dr. E. P. Meinecke.

Canyon de Chelly: Dr. E. P. Meinecke.

Casa Grande: Chas. Cunningham, Forest Service, Phoenix.

Pipe Spring: Ward, Nelson, and Carpenter of the Bureau of Public Roads.

Tumacacori: Fred Winn, supervisor of Coronado National Forest.

150 NEW EQUIPMENT

Aztec Ruins: New gasoline pump for water system.

Gran Quivira: Dump truck and hoisting apparatus for deep well.

210 MAINTENANCE, UNUSUAL

Mobile Unit for ruins stabilization started work July 7 at Chaco Canyon.

After camp is established and water supplies augmented, the Pueblo Bonito ruins will receive attention as to drainage, wall capping, and foundation strengthening.

Aztec Ruins: Heavy rains damaged the roof of the administration building requiring repairs not only to the roof but repainting of two walls.

Capulin Mountain: Much rain caused more than normal damage to the crater road which badly needs a retaining wall for cinders.

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CONDENSED REPORT (CONT.)

Bandelier: Repairs to large kiva progressing nicely; fill and debris are removed from floor and rims sloped for drainage. Ground plan and section drawings under way.

Chaco Canyon: All ruins suffered much damage in heavy rains in July, the worst in history at Chaco. Floors were flooded and walls collapsed. The SCS dikes were somewhat damaged.

Chiricahua: A cloudburst July 19 took 75 feet of surfacing off the road at the headquarters parking area, damaged all roads and trails and blocked the Pinery Canyon road completely.

220 IMPROVEMENTS

Headquarters: Installation of an "Arizona Cooler" makes working conditions for the clerical force much more bearable. A partition was knocked out, enlarging working space and making the building more easy to cool.

Casa Grande: Sewer overflow wall was bricked up and cemented and a small workshop started.

Tumcacacori: Electric system switched over to regular AC current and the new pressure water system put into use.

230 NEW CONSTRUCTION

Bandelier CCC

Garage unit of hotel to viga height.

Portal from gas and oil house to garage of hotel completed.

Hotel dining room and kitchen completed, including ceiling and roof deck, except for finish. Half of kitchen floors, rough plumbing and wiring, and some of kitchen cabinets finished.

Water intake completed except for connecting with outlet main to water line.

One hand-carved table completed and five hand-carved chairs started for use in Bandelier buildings.

Tumacacori Museum doors 75 percent complete.

Quarry and timber crews busy all month.

Chiricahua CCC

Rhyolite-Balance Rock trail advanced 1,150 feet.

Wildlife pool constructed in Hunt Canyon with excess materials from trail.

One fourth mile of Rhyolite trail maintained, due to damage of cloudburst July 19.

Two backsloping crews on Bonita highway sloped 500 square yards.

Much highway maintenance, including ditch and culvert clearance.

East wing of administration building to six foot height.

Masonry walls of basement entrance completed.

Rock quarry in operation all month.

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CONDENSED REPORT (CONT.)

300 ACTIVITIES OF OTHER AGENCIES IN MONUMENTS

320 COOPERATING GOVERNMENT AGENCIES

Chaco Canyon: Indian CCC cooperating with Park Service CCC established Mobile Unit for ruins stabilization. See under "Maintenance, Unusual."

320 NON-GOVERNMENT AGENCIES

Chaco Canyon: School of American Research repairing Talus Unit No. 1 at Chetro Ketl. Three test holes dug on south side of Chetro Ketl.

350 DONATIONS AND ACCESSIONS

Aztec Ruins: From Western Museum Laboratories at Berkeley: the exhibit for Case No. 7, including 1 key label, four paintings, nine display shelves, and two metal casts of animals.

Chaco Canyon: Large prehistoric beam specimen from Talus Unit No. 1 for inclusion in Tree Ring display.

400 FLORA, FAUNA, NATURAL PHENOMENA

At Capulin Mountain are more wild flowers and greater growth of vegetation than at any time in the last five years.

420 MUSEUMS

Casa Grande: Nine new cases temporarily installed with exhibits.

440 INSECT CONTROL

Bandelier: Web worm infestation not sufficiently serious this year to require spraying.

460 BIRDS

Bird banding activities at a standstill due to heat and abundance of natural food which keeps birds from traps.

Walnut Canyon: Turkey with poults seen July 4, the first in some years, due to lack of water on monument. Inasmuch as the canyon once held water before dams were placed above the monument, artificial means of watering the fauna should be established.

470 ANIMALS

Chaco Canyon: Rodent damage to vegetation reported. Wildlife Technician Borell estimates rabbits are ten times more numerous than a year ago.

El Morro: Surrounding farmers complain of damage to crops by rabbits foraging from the monument.

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CONDENSED REPORT (CONT.)

480 MISCELLANEOUS

Cataloging of the Headquarters Loan Library progressed rapidly with 1,522 cards prepared for 186 books during July.

Informational circulars were prepared during the month on Organ Pipe Cactus National Monument and on Gila Monsters, the latter for the Douglas, Arizona, Chamber of Commerce.

600 PROTECTION

Cattle, wearing an unrecorded brand, and therefore of unknown ownership, continue to be a problem on the Detached Section at Bandelier.

620 FIRE PROTECTION

Bandelier: New telephone connection installed to better control fires in an isolated section near the monument.

On June 24 a one-acre fire on South Mesa between Alamo and Frijoles Canyons. Foreman and seven men controlled it in one day, and three man patrol worked 12 hours more.

Chiricahua: CCC lookouts have been praised by Forest Service officials for alertness in reporting fires before Forest stations.

650 SIGNS

Bandelier: Three new entrance signs placed in Detached Section.

Walnut Canyon: The second of two entrance signs put in place at junction of approach road and Highway 66. First month's use would indicate they are too small as visitors complain of having missed them.

MISCELLANEOUS

MAIL COUNT

Incoming:		
Official	1,592	
Personal	836	
Total incoming		2,428
Outgoing:		
Official only	1,798	1,798
Total postal mail		4,226
Telegrams:		
Incoming	64	
Outgoing	56	
Total telegrams		120

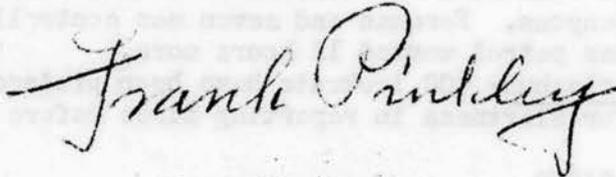
GRAND TOTAL PIECES OF MAIL HANDLED 4,346

CONDENSED REPORT (CONT.)

OTHER OFFICE ACTIVITIES:

Direct Settlements	18
Vouchers for payment	216
Schedules of vouchers	52
Total of vouchers for month	\$24,105.20
Purchase orders issued	107
Collection Bills issued	23
Total of collections made	210.86
Allotment Ledger pages made up	195
Authorized expenditures for month	\$37,266.55

Cordially,



Frank Pinkley,  
Superintendent.

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# REPORTS FROM MEN IN THE FIELD

## AZTEC RUIN

By Thomas C. Miller, Custodian

### GENERAL

This report is going to be a hard one for me to make. If I understand monthly reports right, one is supposed to report the unusual happenings. Chaco Canyon suffered the loss of one of its best citizens, this month. Lena McKinney, wife of Custodian McKinney passed away on the 17th. Funeral services were held in Carlsbad on the 20th. Mrs. McKinney took sick on July 3, and was moved to the hospital in Gallup on that date. Two of the best doctors in Gallup were in charge of the case. Mrs. McKinney leaves three children, ages 10, 8, and 4. Lena is surely going to be missed, not only by the McKinney family but by her many friends, as she was an entirely unselfish person.

The weather for the month of July has been warm, but not too hot, as we have recorded some of the largest rains in history. The approach road to this monument was under construction part of the time this month, and naturally the appearance of the roads would keep out some of our visitors. Also the road was quite slippery during the first part of the month when the rains were recorded.

Our travel during the month of July is a little under last July, but when the new road is completed it will greatly increase our travel. Wolf Creek Pass has been closed the entire month and will probably be closed all summer, account of new construction.

Three trips were made to Chaco Canyon during the month. The Mobile Unit under supervision of Bob Harris is shapping up nicely. It is believed that this camp is going to do Chaco more good on ruins repair than anything we have ever started in that monument.

The School of American Research is doing some ruins repair on Talus Unit No. 1, Chetro Ketl. Several test holes have been dug at Chetro Ketl, on the south side of the ruins. All the ruins in Chaco and the Aztec Ruins suffered much damage due to heavy rains during the month.

### WEATHER STATISTICS

Maximum Temperature -----	97	July 23.
Minimum Temperature -----	50	July 13.
Precipitation -----	2.55	Inches
Greatest amount in 24 hours-	1.39	Inches, July 10.
Clear Days,-----	14	
Cloudy Days -----	5	
Partly Cloudy Days -----	12	

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AZTEC RUINS (CONT.)

BUILDINGS

On July 10 it rained almost an inch and one half in about 35 minutes. The administration building and the Great Kiva leaked quite badly in a number of places. It was necessary to repair the roofs of these buildings and repaint the walls of the two big rooms in the administration building. The custodian's residence has also received a new coat of paint. Our museum is now ready and waiting for the new cases that are being made at headquarters.

During the month we received from the Berkeley Office one crate containing exhibit for museum case No. 7 (panel with mounted water color drawings), one key label "Both Plants and Animals furnished." Four paintings (each double picture) titled as follows:

Hunting Deer and Skinning Deer.  
Planting Corn and Grinding Corn.  
Hunting Rabbit and Hunting Turkey.  
Winnowing Beans and Gathering Pinon

Display shelves:

1 for arrow points  
1 for rabbit stick. (No rabbit stick in Aztec collection)  
1 for knives  
1 for corn  
1 for sage  
1 for juniper  
1 for beans  
1 for squash  
1 for piñon  
2 metal casts of animals  
1 antelope and one mountain sheep.

The above exhibit seems to create a lot of interest with our visitors. We have plenty of charts and paintings for our displays and when we receive the cases for our fine collection of pottery and other artifacts it will greatly simplify the handling of large crowds of people that visit this monument.

NATIONAL PARK SERVICE OFFICERS

Donald J. Lehmer, Temporary Park Ranger, Bandelier National Monument, visited here July 1. Regional Engineer Jack Diehl, from the Oklahoma City Office, was here on the seventh. Stanley Dinsmore and family from Petrified Forest were monument visitors on the 10th. Dr. Meinecke, Department of Agriculture, San Francisco, and Chief Ranger Markley, Mesa Verde National Park, were here on the 13th and 15th. Custodian J. L. Paris was here to meet Dr. Meinecke on the 15th.

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## AZTEC RUINS (CONT.)

### NEW DEVELOPMENTS

A new gasoline pump was installed and added to our equipment list during the latter part of the month. The 550 gallon tank was on hand and the gasoline pump was purchased under equipment cost account 30.1 during the latter part of the fiscal year 1937.

### PERSONNEL

One guide was employed the entire month, and it was necessary to employ another guide on the 18th due to the death of Mrs. McKinney, mentioned elsewhere in this report. It was necessary for the custodian to make a trip to Gallup and to Chaco Canyon on that date.

Wayne Karlin has been employed as guide under direction of Ranger Hastings until Custodian McKinney returns to Chaco. He is now taking some annual leave.

### TRAVEL

1,881 people entered the monument in 527 automobiles coming from 44 states and the District of Columbia. Foreign countries represented were: Canada, Ireland, Mexico and Scotland. The above number of visitors were guided through the ruins in 285 parties, and the same number of museum trips were made.

\*O\*

From Mr. Miller's report we can see that he has been busy during the month and we might say here as a matter of general information that the cases for Aztec are finished at Headquarters and awaiting transportation to Aztec. By next month we hope they will be delivered and installed. FP.

\*\*\*\*\*OOO\*\*\*\*\*

## CANYON DE CHELLY

By Johnwill Faris, Custodian

Perhaps it is the known month of rains, perhaps the dread of our Arizona heat, but call it what you may we have only 237 visitors for the month. This seems a very small number for July but we have had some rains that undoubtedly scared some away.

Late June and early July were unsettled and not many tried the canyons. Early this month a party from California and myself in going to Mummy Cave in Del Muerto plowed through water about eight miles. It is certainly anything but an easy feeling to come through water for any distance at all. A few days later two Government cars were left in the stream overnight due to water shorting the motors and then sinking in the quicksand. The next day we recovered one of the cars and it was not damaged at all.

---

CANYON DE CHELLY (CONT.)

The other was down over the hood. Several Indians were employed to dig it out and a few days later it was towed into camp with a two truck. No attempt has been made to operate it and it is doubtful if it will ever be of much service.

On the sixth Thomas Onstott arrived to assume his share of the work along with some of Pete's and my own when it comes to pick and shovel. I have not been able to get the work organized as I wish yet but things are moving along very well and both the boys are just on edge awaiting the assignment to that sewer job. We have Hommon's report and recommendations which both the boys have studied and it is hoped that we can get at that the first part of next week. Our funds will not allow any outside labor but Tommy and Pete are confident of being able to master the problem. The trail work we had hoped to do I am delaying for a time in the hopes that I might be able to talk some of the points over with some of the technical men from the Santa Fe office.

Close upon Tommie's heels came Jimmie and Sallie Brewer. I had the pleasure of meeting Jimmie last year at Casa Grande, but this is the first time I had met Sallie and I see now why so many people liked Wupatki.

The middle of the month I was called to Aztec to meet Dr. E. P. Meinecke of the Agricultural Department. We came back to Chin Lee over the mountain from Shiprock, stayed here a couple of days, and went to Kayenta, on to Monument Valley the next day to Betatakin and Flagstaff, where the Dr. took the train for San Francisco. It was a delightful trip without even a flat tire to mar the pleasure, and the graciousness of the Wetherills at Kayenta and the Gouldings at Monument Valley is without equal. I feel too that I should say a word about Milton and his ability as cook.

While John Wetherill was explaining some of the many features of Betatakin, Milton really put out a feed. The doctor, two daughter-in-laws of the late Hubert Bancroft, and myself really made short order of the spread. All in all, I am very much enriched by the trip and have only the highest praise for Dr. Meinecke as a traveling companion.

On my return from Flagstaff I stopped in a few minutes with Beaubien and found him to be just as pleasant as I have always heard. He was a splendid host and I regretted that I was forced to leave so soon. I have hopes of contacting many of these good people again and really seeing what they have to show. Milton and John tell me that "I aint seen nothin until I have been to Kit Siel." I am sorry that I did not get to take in Wupatki and Sunset Crater and find out the cause of the fever Jimmie has, but I had to cut out something and they came under the axe this trip.

Following Dr. Meinecke our own Eric Reed dropped in for a short visit and left the same afternoon. It being Peterson's day off he had to show Eric a point or two of our attraction. A sorta postman's holiday, as it were.

CANYON DE CHELLY (CONT.)

All in all, Boss, things are just fine in De Chelly. We have had some mighty fine people the past month and with the Ceremonial in Gallup the last of next month we are looking forward to many more equally as nice in August.

On my return from the trip with Dr. Meinecke, I was shocked to learn of the death of Mrs. McKinney. Lewis has the sincere regrets of our entire force. The many kind reports we have received regarding Mrs. McKinney make us realize how great the loss, aside from the fine wife and mother she must have been.

So closing July, Boss, we pass on to August with great expectations. The boys and myself extend out sympathies to your fellows down there in the heat. We would like to share some of our natural resources with you but to take them away from the setting would mean they could not be fully appreciated, so come up and enjoy them with us.

\*o\*

It should probably be noted here, in order to keep the record clear, that the two automobiles which had quicksand troubles in the canyons as described in Johnwill's report did not belong to our Service but to another Government service which is working in the canyons.

We are glad to hear that Tom Onstott with his bag and baggage arrived at de Chelly all right; he has worked for us at Tonto where it is a long hot trail up to the ruins, and now he will find a long hot trail down to the White House Ruins in Canyon de Chelly.

Sorry not to have been able to include the visitor's statistics for de Chelly this month. Next time you run low on those forms, Johnwill, stir the boys at Headquarters up with a special letter. As a general statement to the men in the field, don't trust to your monthly report for ordering materials and supplies; when the field reports are being received and worked up into the Monthly Report there is a hectic period around Headquarters and it is not time to pick out and fill orders from the field reports. F.P.

\*\*\*\*\*OOO\*\*\*\*\*

## BANDELIER

By C. G. Harkins, Custodian.

### VISITORS

Our visitors totaled 2,665, arriving in 705 cars from 45 states and 12 foreign countries, the District of Columbia and Alaska.

The foreign countries represented were: Italy, Austria, Belgium, Bahama Islands, East Africa, Rhodesia South Africa, Mexico, Brazil, England, Ireland, Scotland, and Poland.

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BANDELIER (CONT.)

The six highest states by visitor count were as follows:

New Mexico -----	1,091
Texas -----	350
Oklahoma -----	166
Colorado -----	112
California -----	90
Illinois -----	66

192 guided trips were given averaging six persons to the party, and 90 minutes to the trip.

Total travel this year to date is as follows:

Travel to date -----	4,346
Travel for the month -----	2,665
Total for the year -----	7,011

RUINS REPAIR

Repairs to the large kiva has progressed nicely the past month under the direction of J. W. Hendron; his report is included with this one.

Weekly inspections have been made of the ruins in the Detached Section to insure there are no pot hunters molesting the ruins there.

ROADS AND WEATHER

Several good showers the first part of the month enabled us to put our roads in first class shape, with the exception of the Pojoaque wash, which has had water in it all month, and at times necessitated a wait of several hours. Two cars were stalled overnight July 10. At the present time our entrance road is in very good shape.

Ideal weather has prevailed the entire month, with a few hot days followed by showers and cooler weather.

Weather

Maximum temperature -----	104, July 14.
Minimum temperature -----	42, July 14.
Mean maximum -----	86
Mean minimum -----	56
Mean -----	72
Days clear -----	16
Days cloudy -----	6
Days partly cloudy -----	8

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BANDELIER (CONT.)

SPECIAL VISITORS

June 28 - United Churches summer school group of 76 people from six states.

June 29 - Alden Jones, writer of articles about the Papago Vikita, which appeared in the Supplement to the Monthly Report for May.

July 4 - Donald D. Brand, head of the Department of Anthropology of the University of New Mexico.

July 5 - Paul, A. F. Walters, president of the First National Bank in Santa Fe; Mr. Walters worked here 28 years ago on excavations carried on by Dr. Hewett, director of the School of American Research of the Archeological Institute of America. Mrs. H. S. Kaune, Santa Fe, a cousin of Adolph Bandelier, after whom the monument was named.

July 11 - W. J. Holloway, lieutenant governor of Oklahoma, and party of five made a short trip through the ruins. Governor Tingley of New Mexico, and party of three were in but did not take a ruins trip.

July 12 - Col. La Flamme, and son, Fort Sam Houston, Texas.

July 15 - Governor Marland and Mrs. Marland, Oklahoma, made a trip through the ruins.

July 23 - Count and Countess Menicca, Naples, Italy.

NATIONAL PARK SERVICE VISITORS

July 7 - Mr. and Mrs. Chuck Richey, Santa Fe; Mr. and Mrs. Miller, Oklahoma City.

June 24 - Mr. H. H. Bennett, Mr. F. G. Reimer, and Mr. W. H. Manifold, of the Soil Conservation Service, Washington, D. C.

July 3 - Regional Engineer John H. Diehl, Oklahoma City.

July 15 - Mr. Kruger, landscape architect, from Mr. Richey's office.

FOREST FIRES

At 6:30 p.m. June 24, a fire was reported on the South Mesa between Alamo and Frijoles Canyons, a mile below the west boundary. Forester Fulton left immediately with a crew of fire fighters. The problem of getting to the fire proved more difficult than suppression. The area burnt was only one and a half acres. Rains the last month have lessened our fire hazard considerably, altho the forest cover is very dry at present.

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BANDELIER (CONT.)

PERSONNEL

Donald J. Lehmer entered on duty at this monument July 3. He comes from the University of New Mexico where he is a junior in anthropology.

Mr. Woodrow Spires, temporary park ranger, was called to his home in Tempe, Arizona, July 12, due to the death of his father who has been in ill health for a number of years.

GENERAL

Three new entrance signs have been erected in the Detached Section on the highway. Cattle are still quite a problem there - they are all wearing unrecorded brands and no evidence of their ownership has been secured at the present time.

In a short time we will have one room of the museum ready for visitors. This has been rather slow in forming, but what we have will be a credit to our monument.

\*o\*

We are very glad to have Cy tell us his museum will soon be ready to open to the public. We had hoped to get it open for the heavy part of this season but it looks like we will be disappointed in that.

The road to Bandelier will never be an all-weather road until the Pojoaque Wash is bridged. This is a State highway but for some reason the authorities are not expending sufficient funds to keep it in good condition. - F.P.

\*\*\*\*\*ooo\*\*\*\*\*

BANDELIER CCC

By H. B. Chase, Project Superintendent.

Wall construction of the garage unit in the hotel area was completed this month to viga height at both ends of the structure. The longitudinal wall of this structure was purposely omitted to allow the transportation of materials into the hotel utility area. It is contemplated constructing the wall connecting the two ends early in the forthcoming month. In conjunction with this project a timber crew has been cutting and hewing lintels and vigas from adjacent forested areas to complete construction of this unit.

Portal construction, part of the gas and oil house unit, connecting the gas and oil house and the garage unit was completed this past month. The arrival of the gasoline pump and tank to be installed in the gas and oil house will allow installation in the near future, which will complete the building for final finish work. Door and window openings have been constructed and fitted in readiness for installation upon completion of

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BANDELIER ECW (CONT.)

the floors.

Unit No. 1, dining room and kitchen of the hotel development area, now has been completed, including ceiling and roof deck construction. Within the next few days all parapet walls will be complete to plan height at which time the built up mopped roof will be installed, which will bring the unit to the part of only finish construction work. During the past month all rough plumbing and approximately one-half the kitchen floors have been completed, also the rough wiring and wire pulling has been completed in the entire unit. In conjunction with this project the carpenter crew has completed a portion of the kitchen cabinet units, in readiness for installation upon the completion of the kitchen floors.

The water intake project has been completed this month, there remaining only the outlet main to be connected with the water line service that supplies the entire canyon development. This connection will be completed immediately upon arrival of certain materials to make the connection.

In addition to the progress of the carpenter work in conjunction with the various building projects, the carpenter crew has completed one hand-carved table and considerable materials shaped ready of assembly of five hand-carved chairs for delivery and use in the monument and administration building. Also additional work has gone forward on the Tumacacori museum doors and at this time the carving is approximately 75 percent complete.

The fill or dump is now being screened for all artifacts in the Big Kiva of the ruins repair project. A ground plan drawing has been completed and work on sectional wall drawings has begun.

There has been a small crew of men in the rock quarry the entire month, quarrying and shaping stone for the various building projects.

A recently held company meeting informed the enrollees of this camp of those who were not eligible for reenrollment due to age and length of service in accordance with the new CCC act has emphasized in the minds of this personnel the serious proposition we will encounter about Sept. 30, the end of the present enrollment period. It is an unquestionable fact that our realization of the building projects at this camp has been in a major percent due to the experience and efforts of the older men, especially the LEM's, in assisting the foremen on their respective projects.

It is not only in the light of their ability of semi-skilled labor to perform a certain form of work, but also their presence by lending influence and help to the younger enrollees. In most cases these older men have been leaders and assistant leaders and through their assistance a

reasonable degree of efficiency has been maintained but with the realization that this class of help will soon be among those absent and the prospect of their replacement being young inexperienced boys certainly brings a discouraging picture as to our future progress in this type of work.

\*o\*

The Bandelier CCC Camp, under the supervision of Hub Chase, is doing an excellent job on the hotel area construction, but he will be, as he says, hard hit by the present orders cutting off his local enlisted men. We have written you about this and if there is any way whereby this camp can be made an exception to that order it should be done. With our funds cut to the minimum we cannot hire skilled laborers or foremen and we just cannot see how we can get through on this long program of construction without the local enlisted men to guide the boys in the work.

\*\*\*\*\*OOO\*\*\*\*\*

## BANDELIER RUINS STABILIZATION

By J. W. Hendron

This month has been spent almost entirely on removing fill and debris from around the large kiva, and cleaning of the floor. The cleaning of the floor was an awkward job due to its disintegration. A boxelder, apparently about five years old, was growing to the north side of the kiva. It was removed as carefully as possible, but the roots imbedded in the floor and extending for about six feet in all directions ruined a large portion of the floor. This can be repaired, however. Seasonal rains have also brought on undesirable effects, making it difficult to distinguish between debris and plaster.

Several outcroppings of stones in the floor of the structure appeared as settings for the roof supports. At this writing I am convinced that they are the post holes because of flat stones in the bottom of them. Three of these holes are to the north side, about four feet from the wall, and on the south side are three additional ones about the same distance from the wall, making a total of six. The three on the north side and one on the south have smooth flat stones set in the bottom and surrounded by chunks of ash and basalt set in an upright position to form a sort of a cup for filling with stones and mud, thus holding the uprights tightly in place. Two of the post holes to the south have no stones setting in the bottom but just a hole tapering down to a point, and with stones placed in an upright position around them. At the present time it appears that there were three main vigas for the roof supported by posts from the inside of the kiva. It is planned to show the method of roofing in a subsequent report.

The removing of fill and debris from around the outside of the structure seems to be the biggest task. At the present time it is almost completed and screening has begun, to remove all artifacts before backfilling.

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## BANDELIER RUINS STABILIZATION (CONT.)

A considerable number of potsherds have been recovered and sacked and it is hoped that when analyzed they will reflect a true picture of at least part of the ceramic history of the Frijoles Canyon dwellers. A considerable amount of the fill removed will be used to stabilize the secondary or outside wall of the structure, that is, building it up high enough on the inside and sloping it to the outside so that there will be no drainage into the kiva.

While making a more thorough cleaning of the floor, what appeared to be the sipapu or ceremonial entrance from the underworld, was found two feet six inches in a northeasterly direction from a center point in the floor. It was a block of tuff seven inches long and almost six inches wide and appeared to be about four inches thick, although it was not removed from the floor. In the center was a hole ground out to a diameter of nearly three inches at the top and narrowed down to two inches at the bottom. The hole extended through the slab. Hewett in "The Excavations at Tyuonyi, New Mexico, in 1908" says, "If there was an altar it probably occupied a place on the floor between the sipapu and the wall back of the fireplace, and was doubtless built in terraced form of stone and adobe, three or four feet wide, about a foot thick, and rising to a height of three or four feet. This conjecture concerning the arrangement of the altar is based on what is to be seen in similar sanctuaries now in use in various pueblos of the Rio Grande valley. It is not to be accepted as conclusive, for in the three kivas excavated by us in the Rito, the altar, if it ever existed, has disappeared." The floor at this point was very carefully cleaned. Although there were some outcroppings of small stones, the outline of the altar never came to light. The sipapu in this case is almost in the center, while in the so-called Sun Kiva in the cliffs it is placed to the northeast and not more than 36" from the wall.

At present a ground plan drawing of the kiva has been completed in pencil and drawings of the walls are in process.

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This is an interesting report from Mr. Hendron.

As his work progresses we hope to build up a series of these reports which can eventually be compiled into a Special Report on Bandelier Ruins Stabilization. - F.P.

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## BANDELIER FORESTRY

By James T. Fulton, Forestry Foreman

General forest fire situation: From June 23 to June 27 a total of 2.09 inches of rain fell. That amount and .95 inches which fell between July 1 and 10, served to make fire danger at Bandelier very small. However, during the past two weeks duff and litter has been dry enough that we have been on the alert for fires.

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BANDELIER FORESTRY (CONT.)

On June 24, we had a fire one acre in extent on the north rim of Alamo Canyon. A control crew of seven men was used for one day and two patrolmen with myself were busy mopping up for the next 12 hours when a rain occurred which completed the work.

Fire Prevention and Presuppression: On June 30, I installed a telephone at a point south of Alamo Canyon where the Forest Service telephone line crosses the Stone Lion's trail. It is enclosed in a box and locked with a seal and padlock. A switch in the line permits the telephone to be kept out of the line so that no "line drag" will occur. It is expected that this telephone will improve communication between fire crews and headquarters when fires occur south of Alamo Canyon where travel time is necessarily high.

Insect Control Program: Our web worm infestation is proving to be quite mild this year. Occasional trees have a few webs just now beginning to show. In the years previous to 1935 and thus before my time, it seems that the infestation was in full swing by the latter part of June. In 1935 the worms were hatching about July 1. In 1936 they were about a week later in hatching and the defoliation amounted to considerable less than in years previous. From present appearances I would judge spraying to be unnecessary this year. My conclusion is that the infestation reached a peak during 1934 and 1935 and is now almost to the end of its cycle.

Miscellaneous: This month I have had a crew cutting a few lintels for the hotel development. Starting July 21, I began cutting timber to be converted into lintels and vigas for the hotel development. It is planned to cut enough to finish the project. All of this timber is being obtained from the Ramon Vigil Grant by authority of the SCS.

\*\*\*\*\*OOO\*\*\*\*\*

## CAPULIN MOUNTAIN

By Homer J. Farr, Custodian

More travel this month than we have ever had before - I estimate almost 300 daily which makes a total of about 8,000 visitors for the month. Our recent travel comes from a more widespread territory than before. In months past I have noticed 80 percent of our travel comes from Texas and Oklahoma, but this month I have seen many cars from almost all the states and several provinces in Canada.

Today a fellow from the Brownsville, Texas, district representing a group of South Texas newspapers is writing a story concerning this monument. The custodian has been busy this morning answering questions concerning the roads to and from, the height, the size, when it last erupted, and when the custodian expects another eruption.

The weather man has been good to us this month - some good rains, considerable real warm weather and very nice quiet sleeping nights.

## CAPULIN (CONT.)

The road to the top of the crater is in good condition all the time, altho I have had to maintain the road twice this month, because of heavy rains and a continuous slough of cinders into the road. Goodness, how we need that retaining wall to save this extra maintenance work.

The mountainside has been a riot of beautiful wild flowers all spring and summer and they are still blooming in profusion. All vegetation on the monument is growing more this summer than for more than five years. We have some very gentle and lovely does and fawns with us, more birds, rabbits, squirrels and other wildlife than ever before, apparently Nature advised them we would have a bounteous crop of "flora" this season.

The custodian's son, Lloyd, was married to Betty Brown in Houston, Texas, on July 11. They will probably make their home in Houston as Lloyd is employed there by the Crown Refining Company of that city.

The custodian's home has been a sort of stopping and stamping ground for many friends from Oklahoma, Kansas, Texas, and Missouri, this month. I think they come here to get away from a 110-degree temperature and "kinda like" our 85 here in July, and especially our 60-degrees at night, "Where they can really sleep."

\*o\*

We add our word to what Homer says about the need for a retaining wall on the inside of his road to stop the cinders from sloughing down and filling his roadway. We don't seem able to get the engineers and landscapers to agree upon what should be done. In the meantime the mountain goes on unravelling. - F.P.

\*\*\*\*\*OOO\*\*\*\*\*

## CASA GRANDE

By Albert T. Bicknell, Custodian

### WEATHER

Days clear -----	19
Days part cloudy -----	9
Days cloudy -----	2
Maximum temperature -----	117 degrees on July 2.
Minimum temperature -----	64 degrees on June 25.
Precipitation -----	.95 inch on July 7, 9, and 10.

### GENERAL

Travel fell off considerably during the month, but the figures still show quite an increase over the corresponding period of last year, and from the guiding standpoint it seems as though we are having nearly as many trips through the ruins but the number of persons per party is lower than at other

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## CASA GRANDE (CONT.)

seasons of the year.

Of our total of 1,613 visitors to the monument, 1,392 were contacted, leaving 221 persons to be accounted for by picnic parties and those visitors who simply drive in and look from their cars. But even if we were to omit counting the 221 persons we would still be 250 ahead of July of last year. A noteworthy feature of our travel is the high percentage of out-of-state visitors we are having. Usually during the hot weather we have mostly local people, but this year the dudes seem to be on the road in spite of the heat. Visitors during the month came from 35 states, Washington, D. C., Canal Zone, Canada, New Zealand, and Germany. It seems to the writer that the class of visitors this year is somewhat above that of last year.

On June 29 Irving McNeil started helping with guide work until July 2 when he was sent to Tonto National Monument as temporary ranger. On July 1 Eugene Stonehocker entered on duty as mechanic to be in charge of all of our numerous broken-down vehicles. It is now hoped that our cars will operate more efficiently and consistently than heretofore when no one was responsible for them. Back from three weeks annual leave Ranger Don Erskine returned to duty on July 11.

The weather has been typical of summer with consistently high temperatures, thunder and lightning nearby nearly every evening, and an occasional shower. Nearly every evening threatening black clouds slide past us or can be seen in the distance, but very little rain has actually fallen here.

### Use of Monument Facilities by the Public

Total travel: 1937 --- 1613; 1936 --- 1142; 1935 --- 1198.

Of the 1,613 visitors to the monument 1,392 were contacted on guided trips through either the ruins or the museum or both. 7,047 minutes were spent guiding 212 parties through the ruins for an average time of 33.2 minutes per party. 3,353 minutes were spent guiding 166 parties thru the museum for an average of 20.2 minutes per party. As usual many visitors availed themselves of the picnic grounds. There was one overnight camping party.

The Coolidge Lions Club held a steak fry in the picnic grounds on the evening of July 20. Julian Hayden and 20 CCC boys from Phoenix were visitors and picnickers on July 11. On July 7, 37 visitors arrived in 14 cars all part of the Texaco Test Fleet #7 touring every state in the Union.

### Newsworthy Visitors

National Park Service visitors to headquarters included: Associate

## CASA GRANDE (CONT.)

Landscape Architect Lyle Bennett; Engineer Everett Underhill; ECW State Inspector Richard Sias; John H. Haile, Jr., who is replacing Mr. Sias; Project Superintendent Wm. Stevenson from Chiricahua National Monument; Clinton Rose, landscape architect; and Associate Museum Expert Kenneth Disher from Washington, D. C. Park Service visitors to the monument include: Charles Wallace and R. Neil Grunigen, both engineers at Sequoia National Park.

Other newsworthy visitors include: H. Arden Edwards, director, Antelope Valley Indian Research Museum, Lancaster, California, who promised to send us a picture of the Casa Grande before any repair work was started on it; Charles Cunningham of the Forest Service Phoenix office; Paul and Robert Martin and Carl Lloyd, all of the Field Museum, Chicago.

### Improvements

On June 30 Doc Gipe finished building the new museum cases, and they have been placed in the museum temporarily until the naturalists can get around to installing the exhibits in them properly. On July 1 work was started on an Arizona home-made air cooler for the headquarters office which was completed a few days later; the cooler has made the headquarters a much more pleasant place in which to work. Another improvement for the headquarters office was accomplished between July 10 and July 14 with the removal of a wall between the clerks' room and the naturalists' room thus creating one large room for the sole use of the clerical force, the naturalists having previously moved to other offices. This is a very great improvement and seems to be much appreciated by the men working in that room.

During the month it was found necessary to replace a 35 amp. unit in the master switch with a 50 amp. unit. Another improvement during the month was the bricking up and cementing over the sewer overflow well.

With the appointment of Eugene Stonehocker as mechanic a small workshop has been set up in the garage, which will serve until such time as better housing facilities are available. Most of the workshop equipment has arrived.

### NATURE NOTES

On June 26 the first brood of quail for the season was observed. There were 11 chicks. Since then other broods have been seen. Several days during the month a large Western Whipsnake and a large Gopher Snake have taken turns frightening visitors in the Casa Grande as they hunt the cracks in the building for bats. Three more buds on our Night Blooming Cereus plants opened during the month and were of much interest to all. After a heavy rain the morning of July 11 found what seemed to be millions of large flying ants swarming all around and in the Casa Grande. They were mostly dead by the next morning. That same day many large millipedes were seen crossing our entrance road.

# CHACO CANYON

By Homer F. Hastings, Park Ranger

We have all been saddened by the death of Mrs. McKinney, who passed away on July 17 as the result of complications arising from an operation. She was taken to Gallup on July 2 in a serious condition and remained there until the time of her death. Since Mr. McKinney has gone to Carlsbad, New Mexico, where the funeral is being held, I shall submit this report.

## PERSONNEL

On July 20 W. A. Karlin arrived from Aztec having been sent here by Custodian T. C. Miller. Mr. Karlin will assist in guiding the visitors until Mr. McKinney's return.

## TRAVEL

The heavy rain July 11 tended to decrease the number of incoming cars from the north. Travel from that direction has further been decreased by the closing of Wolf Creek Pass for an indefinite period to permit the construction of a new road. Our travel count shows 366 cars brought 1,026 visitors, who came from 20 states, the District of Columbia, Mexico, and England.

## WEATHER

Maximum temperature of 98 degrees was recorded on July 21. Minimum of 49 degrees was recorded on July 19. Total precipitation for the month amounted to 1.81 inches. On July 11 we had a cloudburst during which 1.32 inches of rain fell, the most of it coming within three-quarters of an hour. Water in the Chaco Wash flowed to a depth of 2.2 feet. This dwindled to an average flow of six inches which continued for the two succeeding days.

## NEWSWORTHY VISITORS

June 28 Dr. and Mrs. John D. Clark made a short visit to the monument. Dr. Clark is head of the chemistry department at the University of New Mexico.

The same day Mr. and Mrs. O. S. Halseth and son were visitors. Mr. Halseth is in charge of Pueblo Grande near Phoenix, Arizona.

Dr. W. C. Holden, head of the departments of history and anthropology at the Texas Technological College, arrived on July 8 with a party of 16 students who were making a field trip from their base camp at Glorieta Pass. After staying overnight the party departed from here on their way to Aztec Ruins and Mesa Verde.

Mr. Jesse Peter and family visited the monument July 18. Mr. Peter is curator for the Santa Rosa Junior College Museum in California.

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## CHACO CANYON (CONT.)

Dr. and Mrs. John Yak Keur (Dot and John) arrived on July 21. Dr. Keur expects to resume his studies of Threatening Rock.

### National Park Service Visitors

Custodian Robert R. Budlong, July, 6, from El Morro.

Regional Engineer John H. Diehl, July 7.

Custodian T. C. Miller, Aztec Ruins, July 9, 18, 21.

Dr. E. P. Meinecke (Dept. of Agriculture) and Chief Ranger Markley of Mesa Verde, July 14 and 15.

Mr. and Mrs. A. E. Borell, district wildlife technician, July 18 and 19  
District Forester and Mrs. W. W. Yeager, and daughter, July 19.

### Cooperating Government Agencies

Mr. and Mrs. Robert S. Harris reached this monument July 7 to establish a CCC Mobile Unit. Since his arrival he has had a crew of men digging a trench for a water line from the government well to the custodian's residence and on to their camp site, which will be east of Bonito in the area enclosed by the fence around the ruins. The cloudburst washed out part of the south approach to the bridge across the Chaco and caved in the top of the cesspool. This damage was quickly repaired by the CCC workmen.

### Activities of Other Agencies

Excavation at Talus Unit No. 1 was resumed June 22 by Miss Margaret Woods of the School of American Research. Repair work at that ruin is being carried on under the direction of Miss Dorothy Luhrs of the same institution. Approximately three rooms have been excavated in which were found a number of restorable pieces of pottery. The south wall of Chetro Ketl was exposed by three test pits which were dug to determine the extent of the moat along the outer wall.

Preparations are under way for the General Field Session of the Department of Anthropology of the University of New Mexico. Sixty students are expected to attend this session.

### WILDLIFE

Both Mr. Yeager and Mr. Borell observed that rodents, especially rabbits, were doing considerable damage to the vegetation. Mr. Borell estimated that the rabbits were now ten times more numerous than they were a year ago.

Following the rain a multitude of toads made their appearance and started a chorus which continued for days. Now that the puddles have dried up, they have all disappeared.

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## CHACO CANYON (CONT.)

### GENERAL

Old timers tell us the cloudburst we had July 11 was the worst they have ever seen in this region. A huge water fall poured over the cliff behind Pueblo Bonito and overflowed the dyke constructed by the S. C. S. Both the dyke and the water drop near Kin Kletson were considerably damaged. Since the S. C. S. terminated their work here June 30, we do not know how soon these can be repaired.

The floors of many rooms and kivas in the pueblo were flooded and small sections of wall collapsed in several places. Damage was also done at Chetro Keti where water stood to a depth of two feet in the most recently excavated kiva.

Considerable difficulty was encountered in taking measurements of the movement of Threatening Rock. I found there was a possible variation in the measurements depending upon the exact point at which the gap between the mark in the rod and the end of the pipe was measured. I feel we are in need of a more precise method as well as a uniform system for taking the measurements.

I have been fortunate in obtaining a large prehistoric beam specimen from Talus Unit No. 1. This fits in nicely with our present tree-ring data exhibits, and although it is rather badly disintegrated, I hope we can satisfactorily preserve it.

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Mr. McKinney has the sympathy of all the employees at Headquarters, and we are glad he had men of our Service near him to help in his hour of need.

I am sure we are all glad to welcome Dot and John Deur back into the Southwest for another little visit and we hope they will come on down through the country and see the rest of us. Last year they went off to Holland - a nice trip of course and fine for John to get home and see the folks - but we missed them and are glad to have them back. To any of our newer employees we might explain that Dot and John are on the staffs of a couple of Eastern universities, are ideal visitors and you will certainly enjoy meeting them, for they are real folks.

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## CHIRICAHUA

By Frank L. Fish, Custodian

The weather has been varied during the month. From June 24 to July 4 daily rains in the vicinity kept things cool. This was followed by hot spells with some showers until July 19 when a heavy storm occurred in the evening, reaching cloudburst proportions in upper Rhyolite and Sara Deming

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CHIRICAHUA (CONT.)

Canyons.

A large quantity of hail fell in this storm accumulating to the depth of four inches in places in Sara Deming. Rhyolite Canyon was a raging torrent for a few hours carrying large boulders with leaves and hail riding the crest which blocked the culvert on the Bonita Canyon Highway for a long enough period to flood the Headquarters Parking Area, and wash about 75 feet of the surfacing off of the road at that location.

The enrollees along with the rest of the locals congregated to watch the flood and one added a little humor to the occasion by mistaking the accumulated debris for a log and going in up to his neck for an icy bath but fortunately with no added ill effects. Since July 19 it has been warm and sultry with an occasional light shower.

Charles Warfield and Elijah Alton, two enrollees on the lookout, made a good record for the month reporting the only two fires in the neighboring Forest Service area ahead of the Forest lookouts. One, the night of July 22 at 9:15 p.m. in Rock Creek, could have been a bad fire by morning if it hadn't been for their watchfulness. Mr. Sykes, district forest ranger, complimented them on this fire. Due to their good work it was suppressed in 15 minutes by a fly camp in that area.

Approach roads are being improved and maintained in good condition for this time of the year with the exception of the Pinery Canyon road that was badly damaged by the cloudburst of July 19 and at the present time is still impassable as a number of culverts were washed out.

Monument roads have been maintained regularly during the month.

The backsloping along the Bonita Canyon road has improved the appearance greatly in ragged cuts that have been finished. With good moisture periods it should not be many years before the roadside has a cover of plants, trees and shrubs. The placing of extra materials along the outside slopes at least will serve as excellent catch basins for moisture and fine particles and aid the natural reproduction of plant life.

Visitors for the month numbered 1,247 coming in 279 cars and trucks. There were 24 states and Australia represented as against 24 states and 1,017 visitors for July of last year. There were not any large parties this month as reported for last month.

Park Service officials for the month included: Richard Sias, accompanied by Mrs. Sias and his nephew Tom Sias; John H. Haile, Jr., inspector trading places with Mr. Sias. Mr. and Mrs. Lyle Bennett, landscape architect; Mr. and Mrs. Jack Diehl, regional engineer; Clinton Rose, landscape architect and George Cornell, Regional landscape architect.

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CHIRICAHUA (CONT.)

In a few months our administration building shall be completed and a display of the natural features of this monument will be in order. Personally, I do not consider my experience to be enough to warrant laying out the entire plans for such a display and as we have an educational division I take this opportunity to acquaint them that this space will be available for their best efforts.

"Boss", I should take offense in your statement in last month's report including Chiricahua as one of the "Hot Spots"; after all, the least elevation within the monument boundaries is a little more than a mile high and while we have hot days I believe the climate is cooler than at any other monument I have worked in, as Casa Grande, Tumacacori, Montezuma Castle, Chaco and Aztec. I also found it quite hot changing a tire at Tonto. The main reason for bringing this up is so some of my fellow workers will not get the wrong impression about the "Wonderland of Rocks."

I notice publicity items in many of the papers indicate some of the large parks have publicity men employed for advertisement purposes. It occurs to me that taken as a whole the Southwestern National Monuments make a good sized area as well as accounting for a large attendance each year. I also find that many people travel through an area and do not know just what they were or where.

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Due apology to Frank for calling his place a "Hot Spot". It isn't anything of the kind for it starts at a mile high and goes on up and everybody knows that the mile high cities of Denver and Prescott have lovely summer weather, so just class Chiricahua along with them. As a matter of fact, Frank, I think Charlie Steen's mind was elsewhere when that was written, but I'll accept the blame. - F.P.

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## CHIRICAHUA CCC

By Wm. Stevenson, Project Superintendent.

The Rhyolite-Balanced Rock trail advanced 1,150 feet which carried through all the heavy work. Approximately one quarter mile remains to be completed in Hunt Canyon. A wild life pool was constructed in Hunt Canyon with excess materials.

One quarter mile of Rhyolite trail was maintained. On July 19 a cloudburst occurred in upper Sara Deming Canyon damaging several sections of the trail.

Two crews continued work on the backsloping project this month. Two hundred square yards of banks were sloped one half mile above Bonita Park and the materials were used in widening fill sections. 300 square yards of rock banks were sloped one mile above Bonita Park and all suitable materials were used for surfacing in the vicinity of Massai Point.

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## CHIRICAHUA ECW (CONT.)

Highway maintenance has been a project of major importance for the past week due to heavy storms. Ditches and culverts basins are being cleared and sections resurfaced.

The masonry walls on the east wing of the administration building were completed to a height of six feet and masonry walls to basement entrance were completed. Excavation for the basement of the employee's residence was 75 percent complete.

Work continued throughout the month on the rock quarry.

\*o\*

The trail work at Chiricahua is approaching completion and I wish you could drop in there some time for a day and see some of those trails old Bill and his CCC crew have built. - F.P.

\*\*\*\*\*oo\*\*\*\*\*

## EL MORRO

By Robert R. Budlong, Custodian

The month of July has nearly gone, and as yet we have not received notice of our appropriations for the new fiscal year, so we have been running the monument on a shoestring during the month. The shoestring has by now become badly frayed and thin.

### VISITORS

During July 383 persons visited this national monument. Of these, 334 received guided trips. Total time spent, 5,745 minutes; total trips, 62; average time per guided trip, 92.66 minutes.

### WEATHER

The rainy season is supposed to begin in earnest during July, but this year it didn't adhere to the usual schedule. We had about a week of light rains, but now the skies have been clear for days, everything is drying out, and nearby farmers report their corn and beans wilting. Rain is needed at once. Temperatures have been high, and many of our visitors have taken only short guided trips, due to the heat.

### WATER

I know that this subject must be growing rather tiresome to read about, but it is growing far more tiresome to have to continue to drink what we politely term "drinking-water" from the pool. At the present time the custodian is experiencing marked symptoms of having absorbed some of the more insidious bacteria from the water. Certainly, however, the water should be nourishing, if nothing else, since it contains such

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## EL MORRO (CONT.)

a high content of animal and vegetable matter. The remarks made by visitors relative to this water are now accepted as part of the normal conversation of every party, but their remarks can not be included here.

### WILDLIFE

Our visitors continue to take great interest in the Golden Eagles. The two young ones are now flying well, and it is a fine sight to see all four eagles flying around the rock.

We have a problem on our hands: rabbits are multiplying rapidly (I believe this is characteristic of rabbits) and our boundaries now contain great numbers of them. Nearby farmers are greatly worried, for our rabbits are growing educated. They wait until our neighbors have their backs turned, then jump through the fence, eat up an acre or two of growing beans and corn, and when the irate neighbors come running with shotguns, the rabbits jump back inside the fence. It is reported that once they have gained the safety of our boundaries, they make derisive gestures at the farmers who believe in respecting our regulations. Something will have to be done about it.

### ROADS

On July 11 the custodian rubbed his eyes in amazement when he beheld FIVE road-scrappers moving along the road past the Rock. They returned a few days later, on their way back to Gallup. While the road will stand more improvement, it is now possible, for a time at least, to experience the novelty of having the car one is driving progress in a horizontal direction, whereas formerly most of the travel was made vertically. Now, if we can just have the road gravelled, so wet weather won't turn it into a bottomless morass and shaking quagmire, we can expect greatly increased visitor attendance.

### GENERAL

Early in the month the custodian took a flying trip out to Chaco Canyon while his car was being given a periodic check-up. I went in company with Custodian McKinney, was guided about by Ranger Hastings, and greatly admired both their monument and the service they render visitors.

As I conclude this report, word reaches us of the passing-away of Mrs. McKinney. It comes as a great shock to both of us, as it will to all who knew her.

\*o\*

In the earlier days of El Morro, when E. Z. Vogt first developed that water supply we found out visitors objected to it, more or less, and that was one reason we ran that couple of hundred feet of pipe

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EL MORRO (CONT.)

down the slope and put a faucet on it. The visitor, too lazy to walk up to the pool, got his water at the faucet and, there being a strainer on the outlet where the pipe left the reservoir, the water was very satisfactory. I think Jesse Nusbaum suggested that solution of the water problem, anyway it worked fairly well.

We have the El Morro water problem up near the head of our WPA requests and have urged the Washington Office to do all they can to get us enough to drill and equip a well. - F.P.

\*\*\*\*\*ooo\*\*\*\*\*

## GRAN QUIVIRA

By Geo. L. Boundey, Custodian

Visitors for July totaled 417, of which better than 95% were tourists. The month has been extremely hot with several good rains which have filled up all cisterns. The rains have saved the corn and bean crop, and the grass is better than it has been in some years.

Have taken up the matter of roads with Carrizozo and in dry weather they are directing cars over the short cut to the south. People coming from that direction report the roads as good desert roads and are enthusiastic over the mileage saved.

During the month we had a party of six from the Taylor Museum at Colorado Springs - Mr. and Mrs. Kubler, Mr. and Mrs. Wilder, a Mr. Kibbler and Miss Taylor. They took very careful measurements of the church and monastery and spent considerable time in looking over the ruins.

A party of seven from the State University at Albuquerque, among them Dr. Brand, spent some time at the monument on the 25th.

Since Carrizozo has begun to route cars in from the south, Corona residents are getting busy and improving their road in from the east. A little competition is the very life of trade in this section of the country.

The bird we were inquiring about some time ago is the same bird Betty Jackson inquires about in the last report. Our two pairs have raised their young and have gone to singing and instead of being ground dwellers they have graduated into tree birds and sing from the highest point they can find.

A dump truck and the hoisting apparatus for the deep well arrived during the month and we are now equipped to handle almost any emergency. The rains have filled the two cisterns and we should have enough drinking water for the next year or two.

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The man who financed the last treasure hunter shaft dug on the

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GRAN QUIVIRA (CONT.)

monument paid us a visit last week. He is a lawyer from Albuquerque. The man who had direct charge of the work died a few weeks ago.

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## MONTEZUMA CASTLE

By Earl Jackson, Custodian.

### STATISTICAL

Visitors: - - - - - 1,507; July, 1936, 1,482.

Arizona visitors by cars - - - 916; % of total 60.78.

California visitors by cars - 272

Texas visitors by cars - - - 61

Total states (incl. Wash. D.C.) - 37

Foreign countries - - - - - 2

Conveyance:

Cars - - - - - 400

Arizona cars - - - - - 232

Contacts: - All visitors contacted.

Trips - - - - - 231

Attendance - - - - - 1,099

Those who climbed ladders - - 830 or 75.5%.

Average trip time - - - - - 33.37 minutes.

Museum lectures - - - - - 236

Attendance - - - - - 1,049

Average museum time - - - - - 16.07 minutes

### WEATHER AND ROADS

Weather has been somewhat freakish. The July rains started early, on June 29, and it rained on July 3, 4, 6, 7, 9. Since then there has been no rain. Total precipitation for the 30-day period was 2.2. Since you omitted my report of precipitation for June, it will be repeated here to keep the record straight. It was .12.

The past two weeks have produced excessively depressing weather, with high thermometer readings and much "sticky" weather, with a total of four cloudy days and 15 partly cloudy.

Approach roads into the valley were somewhat rough during the early days of the month, but are now in pretty fair shape. The entrance road to the monument is looking better than I have seen it this year, thanks to a highway department grader which went over it day before yesterday.

### SPECIAL VISITORS

Park Service: None; guess it's too hot to travel.

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## MONTEZUMA CASTLE (CONT.)

### Other Visitors

June 27 - Dr. H. W. James, president of State Teachers' College at Silver City, New Mexico, was in with 21 teachers and students.

June 29 - Jim Walkup, secretary of the Flagstaff Chamber of Commerce, was in for a short visit.

July 3 - Dr. and Mrs. A. E. Douglas, accompanied by Mr. Thomas Hale, an archeological friend of mine, were interested visitors. Dr. Douglas needs no introduction.

July 8 - Thomas R. Burnett, of Mission, Texas, a lieutenant-colonel in the U. S. A. R. was an interested visitor.

### Comments

While visitor travel seems about normal at the Castle, people of central Arizona, and especially in Prescott, are bemoaning the fact that Boulder Dam is drawing away a great deal of summer tourist trade. With the new road completed into Mead Lake it seems that coast-bound visitors go straight west from Flagstaff, instead of dropping south from that point and going through the Verde Valley and Prescott to the Wickenburg and Phoenix roads.

Our peak day of tourist travel at the Castle was 187 visitors, on the Fourth. That crowd was harder to handle than most. While the ranger and the custodian were very busy doing their stuff, our friend the vandal (drat his hide) took advantage of the opportunity to write his name in three places in one room of the Castle. This matter has already been taken up with you by letter.

Yesterday a young man who had lost both his legs climbed up all four ladders to the Castle and went all through it, doing the climbing in quicker time than most normal individuals.

A party of Pima Indians, William Nelson and family, were very interested visitors. They are from near Coolidge, now living in Phoenix, and Nelson can remember Mr. Pinkley 25 years when he still owned the Four Mile Trading Post near Sacaton.

### PERSONNEL

Roy Young, who served as temporary guide after Ranger Farmer resigned, was released from duty on July 19, his 30 days of per diem employment being finished. It was expected that Mr. Jennings, the new ranger slated for this post, would be here by the 21st, but he has not arrived yet.

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MONTEZUMA CASTLE (CONT.)

NATURE NOTES

On the 25th of June two coyotes were heard yapping a short distance up the creek. Coyotes seem more numerous in this region than for many years. On July 9 raccoon tracks were seen a short distance down the creek.

A six-inch centipede, caught while roaming familiarly about a bedroom here, now reposes in alcohol in the museum, and attracts considerable interest.

Recently we saw something interesting in the creek which I'll bet most of you never heard of. It was a swarm of very tiny catfish, less than a half-inch long, occupying a space about as big as the opening of a small skillet, and guarding the swarm was a mature catfish, whether male or female we couldn't tell. This sight is often seen along the creek, but that was the first time this year.

Thanks to Roy Young and his knowledge of botany, we have some new tentative plant identifications. We are pretty sure of these, but would not swear to them on a stack of bibles yet.

"Dove Weed."	Croton texensis
"Silver Leaf Nightshade"	Solanum eleagnifolium
"Aster"	Aster Andersonii
"Rocky Mountain Bee Plant"	Cleome lutea

One of the most dastardly of tricks we have seen in a long time was pulled off by two young men here on July 6. After seeing the Castle and the museum they were at the parking area preparing to leave when they espied one of the tame rabbits. They immediately set upon it with rocks, stoning it to death. When I accosted them they were executing an imitation of a Comanche victory dance and uttering war whoops. Their matter has been taken up with your office by letter.

For birds at Montezuma Castle see Betty Jackson's report in the Supplement.

\*o\*

Earl speaks incidentally of something that is bothering us in several places: the time it takes to get appointments through. I know, of course, something of the hectic conditions back there with all the thousands of appointments going through, but it is very hard on the field man. One of our men goes out of the Service. We pick up a local man on a field agreement and rush the papers through for a new man. We have to drop the temporary man before the papers on the new man come through and there is no other local man available. It is hard on the quality of the service we can give. - F.P.

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# NATURAL BRIDGES

By Zeke Johnson, Custodian

I told you in last month's report that I needed rain, of course, mostly to kill the gnats. Well, I have had rain and the little flyers are all gone. July has been a very pleasant month out here - very many fine showers and, of course, lots of good water after I got it carried up the hill.

There have been 146 visitors and not one that was not contacted. I have made the nine-mile hike ten times and the 13-mile hike twice. I have taken 84 visitors into the new ruins. 29 people made the nine mile hike alone and 11 made the 13 mile hike alone, leaving 24 that went only to the first bridge. 62 males and 23 females took a plunge into my dandy bathing pool. I spent 410 minutes talking to those people with whom I did not hike, and, of course, I talked all day to those I hiked with, so I don't know how much time I should have for that. I do know, however, that I have had plenty of exercise this month, and I am very glad, for I love to hike with the class of people that come to see the Bridges since they all seem to have a little pioneer blood in their veins and can see beauty in every crack and ledge. They are also very enthusiastic over the country and its many beauty spots.

The roads and trails never were as good before. Although the road in some places is very crooked with many narrow grades or dugways, there has never been an accident, or not one has ever failed to get through O.K.

I was very happy to have the privilege of hiking with Hugh M. Miller, Charlie Steen, J. H. Tovrea from Coolidge, Charles Richey from Santa Fe, and A. C. Kuehl from Grand Canyon. These gentlemen dropped in on an inspection trip about the middle of the month. They seemed to enjoy the trip; I am very sure I did, and I wish I could have kept them longer, as there were many beauty spots they could not see in so short a time, but maybe they will come again. I hope so. I was also pleased to have a visit with James W. Brewer, the roving ranger. He will come again and bring Sallie with him.

A few days ago while in Blanding after my mail I sent a Mr. Peterson, his wife, and two small children out to the Bridges and told them I would follow up as soon as the mail came in at 2:00 p.m. When I arrived at my camp I found Mr. Peterson at camp weeping with his two small children. I inquired as to what the matter was, and he just could not talk for a moment or two. Finally he said "I have lost my wife." Then he told me he had sent her off alone to see the Augusta Bridge while he took care of the kiddies.

At 5:00 p.m. Junior, who was working trail, rode into camp and found Mr. Peterson very uneasy about his wife not returning, so Junior told him he would take care of the little ones while he went to meet his wife. After being gone about an hour he returned alone, having failed to find her, so off Junior went on his horse to try his luck. He had been gone

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## NATURAL BRIDGES (CONT.)

only a few minutes when Mrs. Johnson and I drove up, and after Mr. Peterson got control of himself he told me the story. Mrs. Johnson promptly suggested that she take care of the children while Mr. Peterson and I went out to look for Mrs. Peterson. So off we went with a bag of water and a flashlight apiece, and just before dark we found her. She got off the trail somehow and wandered southwest for several miles; then went east and crossed trail and wandered for about seven miles. She could not tell where she lost trail nor why, but Junior trailed her up and was almost caught up to her when I called and she answered. It was a very exciting experience for us, and we cannot tell why she left the trail. She had been gone about six hours and was about famished for water. She is the first to cause a man hunt at this monument, and I don't believe any voice ever sounded better to me than hers when I first heard it away in the distance. I hope I never have another experience like it.

The weather is all that could be asked for, and I am raring to go for the coming month.

\*o\*

We are glad Mrs. Peterson's experience resulted as happily as Zeke reports it, and one who knows the country will understand both Zeke and Junior did some plain and fancy trailing in the few hours they had between taking the trail and the coming of night. Of course, Zeke wouldn't mention that because reading desert records is part of his every day life, but we thank Heaven we had the right man in the right place that afternoon.

\*\*\*\*\*OOO\*\*\*\*\*

## TUMACACORI

By Louis R. Caywood, Custodian

This is one month I thought I would not have to say anything about visitor travel showing an increase over the same month last year, but the increase has been so large that I just have to mention it. This year gives us a total of 1,157 visitors that were contacted or in some way used the monument facilities during the month of July, while last year only 818 visitors were reported. This increase amounts to 339 visitors or 41.4 percent over last July.

Will the same month in 1938 show a corresponding increase over this month's record? Part of this increase belongs to a normal trend which comes with a period of better employment, higher wages and the resumption of vacations by large corporations. With the added travel due to better conditions and improved roads comes the urge of many to see Mexico. People who normally visit only our northern areas now take a few additional days to run into Mexico while they are this close feeling that they may not visit the Southwest again. Naturally a visit to Mexico via Nogales means a visitor to Tumacacori.

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TUMACACORI (CONT.)

Special visitors included the following:

July 4 - Mr. and Mrs. Lyle Bennett were here from Santa Fe. Mr. Bennett was especially interested in the proposed museum building.

July 5 - Luis Gastellum paid us a visit while in Tubac for a few days with his family.

July 9 - brought Fred Winn, Supervisor of the Coronado National Forest.

July 14 - Mr. and Mrs. Jack Diehl were here for a short visit. Of course, we were glad to see Jack, but we were very pleased to make the acquaintance of Mrs. Diehl and hope they will pay us a visit again before too long. Jack finally caught me at the monument and really working too. Jim Felton and myself were pouring the concrete base for the pump when they arrived.

An old friend of the Southwestern Monuments family, Dr. H. V. Halladay, was here on July 22.

On July 23 Kenneth B. Disher, associate museum expert of the Eastern Museum Division, Washington, D. C., was here. Mr. Disher arrived at 10:30 P.M., stayed at the monument that night, and went over a great many details with us the next day. This was his first visit to Tumacacori.

The weather during the month has been warm and sultry with many attempts at rain but little to speak of so far. For a few days in the latter part of June it seemed as though there would be plenty of rain this year, but since that time there have been only a few drops or very light showers which do not do any good as far as vegetation is concerned.

Because of the press of other work no bird banding has been done this month. Almost all of the birds are through nesting now and the young birds are making their appearance around the monument. A quail nest was noted near the canal, but some predator took all the eggs. There wasn't even so much as a piece of shell left. The predator could have been a local cat, a raccoon or a skunk. The same thing happened last year to the same pair of quail. However, a number of new quail families ranging from 2 to 14 chicks have been seen around the monument.

The most important events of the month were "cut over" days. On July 23 the electric system was cut over from the Westinghouse DC plant to regular AC current and on July 24 the old water system was cut over to the new pressure system. This means that we should have uninterrupted water and light service. The water system consists of two 525-gallon pressure tanks and a 72-foot well cased with 6" casing to a depth of 55 feet and cased with 4" perforated casing for the last 17 feet. The column pipe is 47 feet long and attached to the bottom is a 42" brass

double acting pump cylinder. To the bottom of the cylinder is 15 feet of sucker pipe. The pump is a 10" stroke Dayton operated by a  $1\frac{1}{2}$  H.P. electric motor. The entire outfit is installed in a cement lined pit, according to your suggestion, Boss, and will eventually be the basement of the proposed work room of the museum building.

The Los Angeles Times - Gilmore scouting party recently motored into Mexico in a Chevrolet sedan. On their return Mr. Lynn J. Rogers stopped at the Mission to get information and to let the staff photographer take some pictures. On July 11, an article appeared in the Los Angeles Times which told of San Xavier, Tumacacori and other missions of this group. The article was illustrated with photographs and drawings.

\*o\*

We can all heave a big sigh of relief now that Louis has a permanent well of good water. We have been fussing with that water supply off and on for many years and now we can feel that our troubles are over so far as water is concerned.

I wonder what Padre Kino would have thought, in 1691, of an automatic water supply, light at the turn of a button, and an electric refrigerator? - F.P.

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## WALNUT CANYON

By Paul L. Beaubien, Jr. Park Archeologist

This month 1,904 visitors registered, and 1,344 were contacted. Some 50 or 60 others picnicked here after dark without registering. Rain is unusual early in July, but this month several rains cut heavily into our travel figures.

Park Service visitors included J. B. Hamilton, Dorothea J. Lewis, Johnwill Faris, Milton Wetherill and Erik Reed. I believe that Hugh Miller, J. H. Tovrea and Charlie Steen were here with a party while I was down on trail, but none registered.

Johnwill came while I was out, and was busy guiding visitors when I arrived. He seemed to think that de Chelly was a great place, but of course more visitors are enthusiastic about Walnut in a couple of days than will go see de Chelly in a month.

The other road sign was erected early in month. Both have been in place for some time, and I can positively state they are inadequate. I have had as many as five complaints in one day from parties that drove by the entrance roads and then had to return after inquiring their location from filling stations.

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## WALNUT CANYON (CONT.)

The county has scraped the roads several times, and they are in fine condition.

In the canyon there are several water holes remaining from the overflow of Lake Mary this spring. Evidently there was water available during the dry springs before the dam at Lake Mary was constructed.

A turkey with poults was seen near the Observation Point July 4. No other turkeys have been seen here during July for several years, due to lack of water. I believe it would be consistent with Park Service policy to plan some artificial means of watering game now that the normal supply has been altered.

Under some government relief set-up which I do not fully understand, some springs in Shultz Pass and on Eldon Mountain have been improved and the water piped to Black Bill Park, Doney Park, and to a stock tank within three miles of this monument. I believe that an investigation by the proper Park Service officials might result in the acquisition of a good water supply for Walnut.

I went to Sunset Crater and Wupatki July 23. 1,212 visitors had registered at Sunset, 104 at Wupatki, and 237 at Citadel.

\*o\*

Paul won't believe it but we had a visitor down at headquarters this month who said we could pull out of Walnut Canyon and fill it up as far as he was concerned. It developed, upon questioning, that he was there several years ago when there was no one to show him around or tell him anything so that the net result of the trip was pretty low. I tried to send him back and have Paul convert him but he was rushed for time and couldn't go back. It shows the value of a real guide who can explain things. - F.P.

\*\*\*\*\*OOO\*\*\*\*\*

## NAVAJO

By Milton Wetherill

Have come out of the poison ivy O.K., but that is all part of the game. Have been busy up here so can not take time to be on the sick list.

Went to Chin Lee on June 28 with Uncle John after Mr. and Mrs. Oenslager of New York, who were taking a trip to Rainbow Bridge. While at Chin Lee enjoyed a nice visit with J. W. Faris. On returning to Kayenta took party to Betatakin, Kit Siel and went on through to Navajo Mountain; from the mountain returned to Betatakin.

While on the mountain found that the tent caterpillars had killed about three acres of Aspens. They are bad this year; at the time I was

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NAVAJO (CONT.)

up there the moths were in full flight. They were so thick that there seemed to be thousands of them.

Park visitors: Hugh Miller and party of four. They visited Betatakin and Kit Siel. Johnwill Faris and E. P. Meinecke were in for a visit to Betatakin.

Weather has been hot with several showers which have washed the roads in several places.

Trails: The trail from the end of road has washed some. The rest of the trail is in good shape. July 17 made pack trip to Kit Siel. The trail had to be worked in several places. I had an Indian with me.

\*o\*

Glad to hear Milton has recovered from his dose of poison ivy.

It seems good to be really planning a headquarters location for Navajo National Monument and we hope the construction money will be forthcoming in the next year. - F.P.

\*\*\*\*\*OOO\*\*\*\*\*

## TONTO

By Irving McNeil, Jr., Temporary Park  
Ranger.

Sale !!!

We are selling to the visitors an interest in this monument. The advertising campaign is conducted by uniform courtesy to all guests, and direct, thorough explanations to all questions possible. The prices we try to obtain are interested visitors, who leave the monument pleased, and with the essential facts.

At the bargain counter, we are selling death and destruction to all insects and reptiles found in the house. In return, as they are local residents, it is expected that we buy from them now and then. However, we have only been "stung" once. We have driven many a family from its home and forced it to the wall by our persistent salesmanship.

Here are a few among the many noted purchasers of our products: Edward McSherry, district passenger agent, Pacific Greyhound Lines at Phoenix, said a campaign was to be started to advertise the Apache Trail. Mrs. E. B. Sayles of Gila Pueblo. Reg Manning of the Arizona Republic; Earl Desmond, member of the California legislature; Rupert N. Richardson, vice-president of Hardin-Simmons University at Abilene, Texas.

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TONTO (CONT.)

Park Service Visitors:

Luis Gastellum and Al Bicknell from headquarters.

Guaranteed Unfading Colors

Total visitors -----	399
Total guided trips -----	81
Total number attending trips -----	284
Total time on trips (minutes) -----	4,291
Average time on trips -----	52.9
Average attendance on trips -----	3.5
Total museum lectures -----	82
Total attendance museum lectures -----	313
Total time museum lectures (minutes) -----	960
Average time museum lecture -----	11.7
Average attendance museum lecture -----	3.8

Odd lots: We will have no more of this same number and 99 in the number of total visitors even if we have to count this ranger to make the extra hundred. Interesting visit from students of deaf school - one asked questions and interpreted to others. Dr. W. H. Reed, cousin of the late John D. Rockefeller, who is in his eighty-second year, went to the ruins and was the first one of the party down.....Stepped through the floor of Room 6 on the ninth day of July....every type of transportation to the ruins and back has been suggested from burros to electric elevators and escalators.....With the parking area filled with cars, people ask: "Don't you get lonesome?"....A number of rains have washed the trail and road to some extent....One party camped for the night on the monument....Since the rains, everything looks bright and green.... so fresh and green that even the visitors remark about it.

....Bill Duffen put some wire around the firepits to keep people from stepping in them. Somebody in every party wants to know why the Indians put the wire there.....Lots of honey bees in the cliff dwelling. Only one little girl stung so far.....Pleasant surprise in having Luis Gastellum and Al Bicknell on the 15th. They brought a much needed battery....Earliest visitors 6:55 A.M.; latest party, 8:15 P.M....Had a visit from George Henderson who had visited the ruins 50 years ago. Said the reason for the destruction was that it was burned to smoke out the bees to get the honey. He was not of the honey party - rather expensive honey.....Used to be jealous of Casa Grande's mosaic work, but find that we have Charlie's Slit Tapestry.....Appreciate the clean ruin that Tom has left me.....Have thoroughly enjoyed my first month with the Park Service.

\*o\*

You would think Mac was pretty well sold in this new monument of his,

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TONTO (CONT.)

wouldn't you? It may be the light air up there around the Roosevelt Lake for Charlie Steen, Tom Onstott, and several others have been just as enthusiastic about a period of service at that monument. - F.P.

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## PIPE SPRING

By Leonard Heaton, Acting Custodian

I am afraid that this month's report will be rather short, as I have been at the monument only one week and there has not been much to report on in that time. I was in hopes that Clarence Thomas, the man I left in charge of the monument, would be here to make a report of what had been done while I was away. Since he left the camp and did not make a report I will have to let it go with just the travel record he kept.

There have been 185 visitors to the monument in July. Mr. Thomas conducted 28 parties, or 129 people, spending 355 minutes. Robert Nofsinger who was in charge when I got back home had 11 visitors to his credit, and 75 minutes spent with the visitors. I have had the balance of 45 visitors the past week.

The weather has been very hot the past week with only a few clouds yesterday. There had been some rain some two or three weeks ago that did help some, but we need another shower to help bring along the trees and plants. Some of the trees that were set out this year are drying and I can't seem to get the water to them often enough.

Al Kuchl has been in to visit the monument twice since my last report, once while I was away and again July 20, in company with Superintendent Tillotson of Grand Canyon, Chuck Richey, district landscape architect, and Ward, Carpenter, and Nelson of the BPR, going over the route for the new road from Fredonia by way of Pipe Spring to Toroweep. They stayed here only a few minutes, and I expected Al back here July 21, but he did not show up. I have several things that I want to discuss with him.

Our CCC projects are about all worked up that have been approved, and the truck that we were using broke down and there is no telling when we will get it again. Have had the boys do a lot of clean-up work this week. Will turn all but two or three boys back to the CCC unless Al gets in and we can figure out some work for them to do that can be accomplished without the use of a truck.

On July 20 my Grandmother, Mrs. Lucy E. Heaton, passed away, and services were held July 22 at Orderville, Utah. She came to this country when she was but a child in the middle 70's and has been a wonderful pioneer in the development of this region.

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## PIPE SPRING (CONT.)

The new office desk is great and I am well pleased with it. Thanks a lot for getting it for me.

While in Washington, D. C., I called on some of the Park Officials and enjoyed the visit with them very much. I only wish that I had more time to spend there and get better acquainted with them and the work that they are doing.

The Scout trip was well worth the time and effort it took. I wish that all organizations could conduct themselves as did the Scouts when they visit the National Capitol, and it would take a lot of worry off the minds of the President and his co-workers. I am sold completely to the Scout organization and believe it is one of the things that will keep us out of trouble with other nations if we can but get the scouting principles over to the boys and then have them live them.

This may sound like preaching but it is good stuff for anybody to take up with. So much for that.

Don't think of any more to write for this report, so will close.

\*o\*

It looks like Pipe Spring will be coming back into the spotlight again.

Several years ago it was a stopping point on the Zion-Grand Canyon road and was then a heavily visited monument. When the Zion-Mount Carmel road was put through the traffic at Pipe Spring fell to almost nothing. Now if the road from Fredonia to Lake Mead is built Pipe will again be on a through road and one which will have heavy travel. - F.P.

\*\*\*\*\*OOO\*\*\*\*\*

## WHITE SANDS

By Tom Charles, Custodian

What has become of our school of technique in handling the crowd? Seems to me that I can pass the responsibility on most every problem but this one. If it is a wildlife problem I can pass it to Adrey Borell; if it is geological, I have a whole book on the geology of the Sands by Vincent Vandiver; if it is engineering, I'm not supposed to know it, and so on, but if the problem is one of personal contact it must be handled immediately. And this personal contact business is so sensitive, so exacting that even a word or a smile or the lack of it may be the difference between a successful contact and a bungled one.

The average tourist responds to a friendly contact but a touch too friendly is an unpardonable error. One group wants you to talk to them and the next crowd wants you to let them alone. One group is skeptical

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(WHITE SANDS, CONT.)

and will argue with you at the slightest opportunity, you cannot put your story over strong enough for them, while the next will take the whole thing, hook and line and bobber, and there is danger of making the story too strong. Isn't there some rule, some line of approach which is safe and then a "closing" as the insurance men say?

On Saturday, July 3, the State Highway Department counted 1,677 cars at the south entrance to Alamogordo. On Sunday, the Fourth, there were 1,877; on Monday 2,123 and on Tuesday 1,322. It is safe to say that nearly half of these cars passed the Great White Sands or there was a car a minute for four days, 16 hours a day. Last Sunday, a week after the Fourth of July crowds were over, I counted 72 cars past the entrance to the Sands in 60 minutes. Thirty-six percent of these cars went into the Heart of the Sands. On the night of July 4, 53 cars drove into the picnic ground in a little over an hour. Most of these were loaded with children and fireworks. The children had prevailed on the parents to take them to the White Sands where they could enjoy the pyrotechnic display which has become an annual attraction.

On the evening of July 3 there were many parties at the Sands enjoying their display of skyrockets, Roman candles, spinners and fire crackers. There was one group of 36 boy scouts from the camp beyond Weed which is 70 miles from the Sands and their business was still good when I went to sleep in the next canyon about 10 o'clock. And at daylight the next morning cars began to roll in for "breakfast at the Sands."

So you can see, Boss, that there is plenty of contact. There are from 25 to 100 visitors at the Sands every day and from 100 to 500 there every Sunday, a continual case of contact - easy, to be sure - for the man who couldn't sell the White Sands couldn't sell new greenbacks. Still you often wonder if you had the best line of approach, if the "technique" was good, etc.; are there any rules to go by?

Friendly writers have been kind to us the past month. Alpha Hart, special writer and staff photographer of the Daily Oklahoman, of Oklahoma City, made us a special visit and on his return to work gave us nearly a full front page of half tones and a column and a half of reading matter. Mr. Hart was especially impressed with the Sands' cleanliness: "You are the very first visitor," said he, "there is not a trace of the thousands who have gone before." Carveth Wells, that famous author, explorer and lecturer who talks over the National hookup for the Conoco Company, gave us a nice story in the August Cosmopolitan: "Here you will view a dazzling sea of pure white crystals of alabaster, 30 miles long and nine miles wide - a fairy land not duplicated anywhere else in the world," says Mr. Wells. "In this astonishing region the animals are white, the lakes are red and you play golf with balls that are black." Last week, also, a tourist bureau, speaking from Des Moines, Iowa, gave the White Sands a real "spread", urging their listeners to come this way. While both daily papers in Albuquerque have asked for descriptive articles of the Sands

for their Harvest Home editions coming out in the last of August.

John Veale, associate engineer of the Park Service, has taken Mr. Happer's place as project manager of the building program at the Sands. It is putting it mildly to say that John is busy; he is more than busy, but he is getting the job done.

According to the registration book we have had visitors from 41 states and eight foreign countries this month. There were 1,739 who voluntarily registered at the Turn-Around and on the basis of 14% registration it gives us 12,421 visitors this month.

\*o\*

Tom, I wrote you what I thought about handling visitors, which in its last analysis is just to consider them as dumb as you and I, approach them with a smile, and after that be governed by circumstances.

The trouble was I mixed in a lot of other stuff that the copy reader won't let go through and now I am having to rewrite this, cutting out ninety percent of it and getting it down to the case cards, as it were, which I have put in that first sentence. These boys are right, of course, but I still think what I wrote the first time was pretty good and I will persuade Luis to make a fair copy of it and send one to you personally.F.P.

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## HOVENWEEP

By James W. Brewer, Jr.

This has been a full month of ups and downs with the bad mixed in with lots of good.

Two good rainstorms made roads very bad and one cloudburst took a road away.

On the bad side comes my visit to the Cajon group of Hovenweep National Monument (June 23). This group has been taken over for water development.

Like most of the ruins on this monument, the Cajon group is built on the cap stone ledge where a water course suddenly deepens. Known as Cool Spring House (Fewkes Bull. 70 BAE) it was once a fine ruin. Now, most of the Cavate ruins under the ledge (Morrison? sandstone) are removed and a revetment wall closes the whole recess except a couple of small rooms on the east. (One of these rooms has some petroglyphs and a painting, in white, is a Greek key-like design still well preserved. This has been photographed and the negative sent to your office).

The spring has been piped only about 50 feet and, after watering,

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ROVING RANGER'S REPORT (CONT.)

the sheep climb all over the ruin. Prehistoric building stones taken from standing walls were used to construct revetment walls.

We camped at Hovenweep until the 26th, at which time it seemed advisable to make the Kayenta-Lukachukai inspection trip.

Leaving Hovenweep on the morning of the 26th, we took the dim trail across Montezuma creek to the Bluff-Blanding road thence through Bluff to Comb ridge (see monthly report, June, 1937, page 392). At this critical point, (Navajo Pass) around which point there is no possible detour, we found the road washed out. Norman Nevills was there organizing a highway crew to make temporary repair. Gullies three feet deep had washed both sides and the center of the road out.

We pitched in (Sallie cooked up some chow for the highway boys (11) and we all threw rocks into the washouts for four and a half hours). After a thrilling descent (no brakes, no compression) on almost no road, we reached the bottom of Navajo Hill (32% grade).

Comb wash was a sea of slick silt but we somehow slopped across it. Several culverts and road fills were washed out but we reached Mexican Hat at dark.

On the 27th we stopped at Gouldings where I was presented with a fine photograph of a nearby double arch which I have forwarded to your office (the photo).

On to Kayenta where I learned that the Monument Valley Expedition was going to cross from Mesa Verde to Hovenweep to Kayenta. I wanted to be at Hovenweep when this party passed through so I rode along with Field Director Dr. Winning to Mesa Verde, returning through Hovenweep on the 29th.

Leaving Kayenta in good old 8113 USDI I had carburetor trouble and decided to go to Flagstaff for repairs.

Six miles from Red Lake the big green job just quit altogether. You know the place, Boss, the deep sand-dunes where the sun comes down the short way and its a million miles to the nearest shade tree.

I cleaned the carburetor and fuel pump and line then assembled it already to take off - but no go. At this point, amid much language, Dr. Stitts, U.S.I.S., came along and gave me a lift to Tuba City where I got a mechanic to go back with me. He worked it over for about an hour and I drove it about one half mile when it gave up again. Nothing we did seemed to get it going so we towed it to Tuba City where a welding outfit and a half mile of friction tape enabled me to limp into Flagstaff.

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ROVING RANGER REPORT (CONT.)

We returned via Chin Lee and the Lukachukais (Had a nice visit with Johnwill, Pete and Tom).

Arriving back at Cortez on the eighth we took off for Mesa Verde to get some ruins protection signs which, I believed, were being kept in storage there for us. Six miles from headquarters area the rear axle broke and we had to send in for a tow. The splendid cooperation we got at Mesa Verde comes distinctly in the "good" column. I think everybody on the staff helped in some way to make our wait for parts pleasant. Superintendent Nusbaum outlined the most expedient procedure for the repair parts and Mr. Boylan, mechanic, installed them on his Saturday off!

A heavy rain on the 11th washed a bridge out on the Yucca House alternate road and left a two-foot silt deposit blocking the short road.

Ranger Burgh and Nurse Jones of Mesa Verde were met on the 16th at Hovenweep. Ranger Burgh told me he had seen a CCC truck scouting the ruins for water development projects.

At the Ackmen spike camp, Division of Grazing, Engineer Connell informed me he had an approved project to develop the Hackberry spring for stock. This project has been suspended until it gets NPS approval. If this water could be piped off the monument (1/4 mile) it would help eliminate sheep camps on and near the ruins. As it is they camp close to the ruins spring in the winter. I have gone over the monument with Mr. Connell and pointed out the landmarks and the lands under reservation.

I found that all of our carved signs in storage at Mesa Verde are for Arches and I'll see that they are installed soon.

I hear that the San Francisco office has a supply of National Monument boundary signs and I'd sure like to have some. Also some Antiquities act posters.

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Sure, I know the place in the deep sand dunes, Jimmie - last time I was stuck there was two years ago last April with Tom Vint and Hillory Tolson. For your information we found upon our return trip a mess of little roads working to the south of the main road by which you can avoid that sand patch.

Ask Boylan if he remembers that time we had that flat and, upon breaking a bran new inner tube out of the original package, we found a four inch bolt inside it. That at least added interest to the episode of the flat.

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ROVING RANGERS REPORT (CONT.)

Thank Harry Goulding for that print next time you pass and give my regards to both Harry and Mrs. Goulding. Isn't that a wonderful front yard they have? About 2,500 square miles of it and it changes color every hour of the day!

Your story of the washout on the Comb Ridge road reminds me of the old days before it was filled up when a fellow from Ohio bouncing from rock to rock broke the side members of his Model T Ford when he was about half way down that hill. Being a Ford, he wired her together and was going strong when I met him a couple of days later between Red Lake and Rainbow Lodge on what was then another bad piece of road.F.P.

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## MOBILE UNIT

By Robert S. Harris, Engineer Foreman

I respectfully submit the following report on the Indian C.C.C. Mobile Unit for the month of July, 1937.

Enrollment of personnel for the group, and camp construction were started on July 7, 1937. To date 133 man-days have been expended excavating a water pipe line trench for the camp. This line will also make water available for the custodian.

A heavy rain which occurred July 11 did considerable damage to the bridge approaches and caused the cesspool for the custodian's residence to cave in. Sixteen man-days were expended repairing this damage.

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For many years Superintendent Pinkley has emphasized the crying need for a comprehensive, long-term program of ruins stabilization in the Southwestern Monuments, and this first report from the Mobile Unit marks initial fulfillment of his wishes.

Beginning in January, 1937, a series of arrangements culminated in the establishment late in June of a cooperative project between National Park Service CCC and Indian Service CCC, the former to furnish supervisory personnel, automotive equipment, and tools, the latter supplying enrollees, the camp, and subsistence. Personnel will consist of 25 enrollees, an engineering foreman, and an archeologist foreman.

The unit is mobile in the sense that it can be shifted from monument to monument as needs arise, but ordinarily it will stay at a monument during favorable weather conditions until pressing work is exhausted.

First project is Pueblo Bonito in Chaco Canyon---creating effective drainage, strengthening foundations, capping walls, and placing

## CCC MOBILE UNIT (CONT.)

inconspicuous bracing where needed. If time permits, emergency stabilization may be effected on other Chaco ruins, but the unit will move at the break of winter weather---possibly to Wupatki, Tonto, or Montezuma Castle---and return to the north in the spring. Sufficient funds have been set up to carry the unit for one year, but expectations are that appropriations will be forthcoming for at least another year, and, we hope, indefinitely. Ten such crews could work in the monuments for two years without catching up the work now immediately necessary.

Full notes and photographic records will be kept of work accomplished and copies of reports will be filed with the monument, the Southwestern Monuments Loan Library, the Washington Office, the Bureau of American Ethnology, etc. Ground plans and profile drawings will be executed according to standards of the Historic American Buildings Survey. The crew will confine its activities entirely to stabilization and repair---no restoration is contemplated.

Various new methods will be tried out, particularly the use of Bitumuls Stabilizer in wall capping and pointing, and it is hoped the crew will perfect and standardize ruins stabilization techniques.

The unit at present is occupied in establishing camp and obtaining sufficient water supplies. It will limit its efforts to simpler drainage problems until the archeological foreman, now in process of selection, arrives to share the supervisory burden with Foreman Harris.

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## HEADQUARTERS STUFF

## BRANCH OF EDUCATION

By Park Naturalist Dale S. King

Park Naturalist King was on office duty the entire period from June 24 to July 23. Major portion of his time was spent editing the June Monthly Report and assembling the Annual Report of the Southwestern Monuments. Other completed projects were the preparation of the following: Instructions and forms for archeological work of the ruins stabilization Mobile Unit; informational circulars concerning Organ Pipe Cactus National Monument; an informational circular on the subject of Gila Monsters for distribution by the Douglas, Arizona, Chamber of Commerce; reading of copy for new Southwestern Monuments folder being published by Washington Office; reading of mimeographed informational copy on all monuments, to be issued by Washington; checking of art work for above-mentioned folder.

Junior Archeologist Charlie R. Steen was on duty except for a period, July 20-25, on annual leave. In company with Assistant Superintendent

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BRANCH OF EDUCATION (CONT.)

Miller, Engineer Tovrea, and Landscape Architects Richey and Kuehl, he traveled through our northern monuments from July 8 to 19. Navajo, Rainbow Bridge, Natural Bridges, Arches, and Walnut Canyon were visited and administrative and educational problems discussed. For the remainder of the month Steen aided with the June Monthly Report and Annual Report and spent some time arranging material in the Casa Grande museum. He made a short business trip to Tonto July 2 and 3.

REPORT OF THE HEADQUARTERS LIBRARY, By Gertrude F. Hill, Student Technician

From June 28 to July 28, 1937, work on the Headquarters Library progressed fairly rapidly. The major activity for the month was the cataloging of our sets of the Smithsonian Institution Annual Reports and the National Geographic Magazine, a project which involved typing subject (and in some cases, author) cards for the outstanding articles which might be of use in the work of the educational division. Complete files of the Southwestern Monuments Special Reports and Broadcast, and a partially complete run of the Monthly Reports were dug out from obscure corners, cataloged, and placed in the collection.

Growth of the library has necessitated a good deal of shifting and rearrangement of shelves. At present we have 11 cases of books completely cataloged, marked, and in use, with 12 additional shelves, all full, awaiting cataloging. A marked increase in the librarian's stenographic duties somewhat curtailed fond hopes of bettering the previous month's work record.

Summary of activities from June 28 to July 28, 1937

Books cataloged: 186

Catalog cards made:

Author: 261

Subject: 796

Title: 96

Joint author and cross reference: 48

Shelf list: 321

Total cards made in July: 1,522

Total cards since start of project: 3,102

Books repaired: 3

Letters written, stencils cut, sketches made, etc.: 49

Time expended:

Library activities: 185 hours, 55 minutes

Stenographic duties: 14 hours, 5 minutes.

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HEADQUARTERS STUFF (CONT.)  
VISITOR STATISTICS

By the Boss

Total Visitors

Our July visitors total of 34,717 is considerably larger than the 30,110 visitors of a year ago, but it will be seen, upon a little study, that the increase falls at Capulin where we render no service.

El Morro, Pipe Spring and Wupatki show decreases over a year ago and the others show some increase but, aside from Capulin, nothing unusual, and with the sharp increase at Capulin we had nothing to do.

Strange as it may seem to the average Park Service official who may read this report, this fact that we are having only a mild increase over last year is very satisfactory to us. We are yet so undermanned, underfinanced and underequipped at several places that we are anxious to catch up with the traffic we now have before we will be pleased to see the figures rise.

Visitor Contacts

For statistical purposes, in order to compare with service records in the parks, we count a double contact at various monuments where we take a visitor through a field trip and then through a museum trip. Even with this double count of certain visitors (some 5,000 vases) we made only 14,525 contacts with 34,717 visitors. This is only a 41% contact and is nothing to feel very proud about, especially seeing that last year in July with only 30,110 visitors we made 17,019 contacts - 56%. This will bear a little investigation.

White Sands reported 2,324 contacts last year and none at all this year on practically the same attendance. This is the major error in the table and does not mean that Tom talked to nobody about White Sands last month. That is unthinkable. It means he didn't keep a record.

Aztec seems to have made about the same percent of contacts this year as last and kept the average party seven minutes longer in the ruins and the same length of time (16 plus minutes) in the museum. The percentage of contact is 191 out of a possible 200, which is very good indeed.

Bandelier had about 500 more visitors but made no more contacts than last year. It ran a less number of parties, 191 to 220; to about the same number of visitors (1,258 to 1,278), but gave them a little longer service, an average trip of 88 minutes as against 69 minutes last year.

Casa Grande made a nice gain in number of visitors with a not so heavy percentage of contacts (154% this year; 191% last year). It ran 212 field trips this year against 232 last year but it gave each party nearly four minutes more service. In the museum it gave 166 trips as against 203 last year, averaging 20 minutes each this year as against

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HEADQUARTERS, VISITOR CONTACTS (CONT.)

25 minutes each last year. The apparent explanation for the fall in museum time lies in the fact that the museum was being overhauled and was badly disarranged all month.

Chaco gained a little in visitors, lost in percentage of contacts; gave an additional seven minutes to each field party and took  $1\frac{1}{2}$  minutes off each museum party.

Chiricahua had an increase in visitors, a decrease in percentage of contacts, gave one more guided trip but decreased the average time from 140 minutes to 107 minutes. It is noted that there is less than a 10% contact at Chiricahua and the Educational Division will be asked to study the problem and see if more service cannot be given.

El Morro has a light decrease in number of visitors, a 3% decrease in possible contacts and a large increase in time per party, from 56 to 92 minutes.

Gran Quivira shows an increase in number of visitors and a 16-minute increase in the average party time.

Montezuma Castle, holds the same number of visitors 1,507 as against 1,482, shows a less number of contacts, 2,148 as against 2,333 last year, a decrease in field trip time 31 minutes as against 44 last year and a decrease in museum trip time 16 minutes as against 22 last year.

Tonto had a good increase in visitors, from 289 last year to 399, an increase in percentage of contacts, 134% to 149%, a sharpe increase in field trip time, from 21 to 52 minutes, and a sharp decrease in museum trip time, from 21 to 11 minutes. This last is caused, we think, by a new man on the Tonto job who is eager and willing to give service but is not yet able to talk Southwestern archeology. Give Irv. time and he will raise that museum average.

Tumacacori had a sharp increase, from 818 to 1,157 visitors, but the visitor contact dropped from 92 to 76%. Field trip time dropped one minute.

Walnut Canyon had a drop in number of visitors and also dropped from 85% of contacts last year to 76% this year. The field trip time dropped from 22 to 17 minutes and museum time dropped from 28 to 18 minutes.

No one is more aware than I that these figures are not precise. My claim is that they do show trends, and it must be no accident that the six museums reporting each show a decrease in party time in the museum. Allowing for the factors which we can count out, such as a new man at Tonto and the upset condition of the museum at Casa Grande,

## VISITOR STATISTICS FOR JULY, 1937

## SOUTHWESTERN MONUMENTS

MONUMENT	Employees		GUIDED TRIPS			MUSEUM LECTURES			Museum Unatt'd	Lectures Outside	Total Educa'l Contacts	Total Travel	Per-cent
	Per Trip	No.	Att'd	Time	AV. Att. Time	No. Att'd	Time	AV. Att. Time					
Arches													
Aztec Ruins	2	278	1781	12155	6.143.7	281	1881	4675	6.6	16.6	3,599	1,881	191%
Bandelier	2	191	1273	16900	6.688.4						1,278	2,665	47%
C. de Chelly	1	2									237	237	
Capulin Mt.	1											6,000	
Casa Grande	2	212	1392	7047	6.533.2	166	1093	3353	6.4	20.2	2,485	1,613	154%
Chaco Canyon	2	76	320	6394	4.284.1	62	247	1219	3.9	19.6	467	1,026	
Chiricahua	1	2000	121	2040	6.4						121	1,247	
El Morro	1	62	334	5745	5.392.6						334	383	
Gila Cliff													
Gran Quivira	1	88	417	5215	4.759.2						417	417	
Hovenweep													
Montezuma	2	231	1099	7386	4.731.9	236	1049	3783	4.4	16.07	2148	1507	142
Natural Bridge	1	24	146	6350	6	264					146	146	
Navajo	1	22	67	3800	3.1	173					67	67	
Organ Pipe													
Pipe Spring	1	43	185	1205	4.1	28					185	185	
Rainbow Bridge													
Saguaro													
Sunset Crater												1,212	
Tonto	1	81	284	4291	3.5	52.9	82	313	960	3.8	11.7	399	149
Tumacacori	2	189	979	6631	5.1	35.0					979	1,157	84
Walnut Canyon	1	132	530	2345	4.0	17.7	224	935	4195	4.1	18.7	1,904	76
White Sands	1											12,421	
Wupatki	1											250	
Yucca House													
TOTALS		1,6488,933	87504	5.3	48.6	1051	5518	18185	5.2	17.3	14,525	34,717	

STATISTICAL SUMMARY OF EDUCATIONAL CONTACTS FOR MARCH, 1937

SOUTHWESTERN NATIONAL MONUMENT

MONUMENT	No. Em- ployees per Tem	GUIDED TRIPS			MUSEUM TRIPS			Unatt'd. Lectures		Total Educ'l Contact	Total Travel	
		No. Att'd	Time	Av. Att. Time	No. Att'd	Time	Av. Att. Time	No. Att'd	No. Att'd			
Arches	1	103	4183	5	41	103	551	1970	5.5	19	1,068	551
Aztec	1	3	42	170	3105	4	74				170	327
Bandelier	1											800
De Chelly	1											
Capulin	P											
Casa Grande	2	1	393	3686	120269.3	30.6	3252856	5559	8.7	17.1	6,542	3,912
Chaco Canyon	1											303
Chiricahua	1	2	17	47	17202.8	101					47	488
El Morro	1											
Gila Cliff												
Gran Quivira	1		42	156	22153.7	53					156	156
Hovenweep												
Montezuma	2		134	403	4148	3	121	386	2400	3.1	19.8	655
Natural Bridge											4	855
Navajo												
Pipe Spring	1		6	11	155	2	26				11	11
Rainbow												
Saguaro	1		64	365	22855.7	35.7					365	1,545
Sunset Crater												
Tonto	1		159	634	7235	4	82	315	1155	3.8	13	900
Tumacacori	2		305	1844	11590	6	38				1,844	2,188
Walnut Canyon	1											34
White Sands	1											7,386
Wupatki	1		1	4	20	4	20				4	90
Yucca House												
Headquarters												
TOTALS											12,800	19,345

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## HEADQUARTERS, VISITOR STATISTICS (CONT.)

I am wondering if this shows a tendency on the part of the public to "speed up" and have less time to spend at the stops during the day. The argument against this theory would be that in several cases it will be noted that we have been able to raise the field trip time.

It has been argued that there is no point to increasing the museum trip time or the field trip time. I am far from trying to claim that the time spent in a museum is a positive gauge of the amount of good received by the visitor, but if you can arrange or disarrange your museum so that 5,000 visitors average five minutes more or five minutes less in your museum, I am of the opinion you are increasing or decreasing the total value of your museum to the public in an appreciable amount and that museum trip time and field trip time are thus factors in the measurement of services rendered if taken over a large enough number of individuals or of trips.

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## FIELD TRIP

By Assistant Superintendent Hugh M. Miller.

Pursuant to your instructions I left Headquarters on July 8 en route to Navajo, Rainbow Bridge, Natural Bridges, Arches, and Hovenweep National Monuments on inspection trip. I was accompanied by Junior Park Archeologist Charlie R. Steen and joined at Cameron by Engineer J. H. Tovrea, District Architect Charles A. Richey, and Resident Architect Alfred C. Kuehl.

At Cameron the party met and had a short conference with Regional Engineer Diehl and District Engineer J. B. Hamilton who proceeded from Cameron to the north rim of Grand Canyon.

The party reached Betatakin Ruin in Navajo National Monument on the afternoon of July 9, completed inspection at that point and proceeded over very difficult roads to Kayenta for the night. On July 10 the party walked in to Kit Siel Ruin, a detached section of Navajo National Monument. Returned that night arriving at Shonto Trading Post for the night about 9:30 p.m.

On July 11 we proceeded from Shonto to Rainbow Lodge, arriving about 1:00 p.m. We could not get stock for the trip to Rainbow Bridge until the following morning. July 12 we made the 14-mile saddle trip to Rainbow Bridge, remaining overnight at the Bridge and returning on July 13. From Rainbow Lodge we reached Inscription House Lodge for the night of July 13.

On July 14 we made the hike into Inscription House Ruin, detached section of Navajo National Monument, and got out in time to reach Blanding, via Kayenta, for the night. On July 15 we made the 50-mile drive to Natural Bridges National Monument, walked the nine miles of trails between

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HEADQUARTERS, FIELD TRIP (CONT.)

the three bridges and got back to Blanding for the night. July 16 we drove from Blanding to Moab, Utah, and remained in Moab for the remainder of the 16th, the 17th, and night of the 17th in connection with business at Arches National Monument.

On the morning of July 18 we left Moab about 8:00 a.m. for Cortez, Colorado, planning to visit Hovenweep National Monument that day and get into Gallup for the night. It was necessary, however, to have the automobile repaired and in view of the need to return to headquarters we were compelled to abandon the trip to Hovenweep. Arrived Gallup for the night about 7:30 p.m.

Return home was made from Gallup to Coolidge on July 19.

Individual reports on the various areas visited follow.

ARCHES

The night of July 15 was spent in Blanding, Utah, after return from Natural Bridges National Monument. The party arrived at Moab, Utah, about 9:30 a.m. July 16. We promptly met Mr. L. L. Taylor, editor of the Moab Times Independent, Dr. J. W. Williams, Mr. Mars Pope, Mr. Mitchell Melich, Mr. Harry Reed, and others. The remainder of the morning was spent with these gentlemen discussing general matters affecting the monument.

In the afternoon the party proceeded with Mr. Harry Reed and Dr. J. W. Williams to the Windows Section of the Monument. The low grade temporary road constructed as a result of local effort from U. S. Highway No. 450 to the Windows Section was passable and in fair condition. It affords a practical means of access to the Windows Section by automobile though neither in location nor construction should it be regarded as suitable for a permanent entrance road.

The Windows Section offers a profusion of fine natural arches and, pending the development of permanent roads, should be regarded as the objective of automobile tourists. Either saddle stock or long hikes are now necessary if other sections of the monument are to be visited.

Returning to Moab at about 6:30 p.m. the party had dinner and in the evening looked at motion pictures prepared by Mr. Harry Reed which were exhibited through the courtesy of the Moab Lions Club. The remainder of the evening was given over to further conference with members of the Lions Club Committee.

The following morning, in company with Mr. Reed and Dr. Williams, we drove up the Colorado River road a distance of approximately 20 miles. This narrow road up the floor of the Colorado River Canyon offers undoubted scenic attractions. In the afternoon, again with Mr. Reed and

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## HEADQUARTERS, FIELD TRIP (CONT.)

Dr. Williams, we drove to the point at which the presently proposed boundary extension abuts on U. S. Highway No. 450 from which it is now proposed to construct a permanent entrance road over the ridge into and through the Courthouse Towers area to the Windows Section; thence northward to the Devil's Garden Section; thence to the proposed Klondike Bluffs Section; thence loop and return. Return to Moab about 6:30 p.m.

The first matter for discussion was the proposed boundary extension. I am still of the opinion that the proposed extensions indicated on Map NM/ARC-4934 would serve all absolutely essential purposes. There is, however, no doubt that fine additional scenery, though not of closely related type, would be added if all of the lands south of the proposed boundaries as shown on Map NM/ARC-4934 to U. S. Highway 450 and the Colorado River, respectively, were added to the monument. This land is worthless, or practically so, for grazing purposes and if a stub road might be built off the entrance road providing a short river rim drive with possibly a parking area and lookout point on the high ground at the big bend of the river commanding a fine vista of river and cliff, the added land would give added enjoyment to the public.

I am well pleased with the proposal to take the entrance road off U. S. Highway 450 at a point where it coincides with the boundary thence up a natural shelf along the canyon wall; thence into and through the Courthouse Towers area to the Windows Section; thence to the Devil's Garden; thence to the Klondike Bluffs area; thence return by short loop to the entrance road. In view of the relative inaccessibility of Rainbow Bridge National Monument and Natural Bridges National Monument, and the stated policy of holding these areas as authentic undeveloped back country, I feel that the Arches National Monument is the logical unit for construction of an entrance road which will give automobile tourists easy access to a group of natural arches. Arches National Monument would thus, presumably, serve that predominantly large section of the public which is willing to give neither the time, money, nor effort necessary to ride or hike into Rainbow Bridge or the Natural Bridges. I feel that the entrance road should approach to within not more than half a mile from interesting formations in the Windows and the Devil's Garden Sections from which some at least of the arches would be visible and could be reached over relatively short foot trails.

With this thought in mind I would suggest for consideration the development of small elastic parking areas at advantageous points along the road near the Windows and the Devil's Garden sections with construction of fairly high standard, easily negotiable foot trails to at least some of the important formations in each section.

The party discussed only very tentatively the location of a headquarters area. It would seem logical to set the headquarters down at a point near the junction of the proposed entrance road with U. S. Highway No. 450. From a control standpoint, such location would seem to be



## HEADQUARTERS, FIELD TRIP (CONT.)

at very small expense. The run-off from this slick rock area could be stored in a concrete reservoir of adequate capacity situated at a point which would permit gravity delivery to the headquarters area. Study of this proposal is recommended for preparation of estimates and inclusion in the development program.

For future consideration, it is recorded that there are two good perpetual springs, each at a distance of approximately seven miles from the headquarters area from which it would be entirely feasible to pipe water by gravity to the monument. Both springs are now on lands owned by the government. Expense would, of course, be considerably greater than development of the catchment described above. It is conceivable, however, that future travel to this monument may, whether we wish it or not, increase to the point where the catchment plan would not provide sufficient water. Piping water from one of these good springs to the monument would present a permanent and fully satisfactory solution of the water problem. As you know the problem of obtaining water at Natural Bridges is now one of our greatest difficulties. The custodian has been bringing drinking water in with him from a spring about ten miles by road. The only other water available is rain water which accumulates in potholes in the bottom of the canyon. Immediately after rains this water is muddy. By the time it has cleared up it is full of wigglers, stagnant and unsafe for human consumption. We need a house badly at Natural Bridges but I should say that the need for an adequate water supply is even more acute and I would recommend adequate engineering study, firm estimates, and inclusion of the item with high priority on the development plan for the Southwestern Monuments as a whole.

I should like to express my appreciation of the cordial reception and fine courtesy which Mr. Johnson extended to all members of the party.

### NAVAJO

After conference with Regional Engineer John H. Diehl and District Engineer J. B. Hamilton at Cameron, the inspection party proceeded through Tuba City to Betatakin Ruin, Navajo National Monument. The party left Cameron about ten o'clock in the morning and arrived at the head of the trail at Betatakin about 3:00 p.m. over difficult roads.

#### Betatakin Section

The entrance trail from the end of the road at Betatakin to the ruin constructed under CWA in 1933-34 had suffered severely from recent heavy rains.

The essential discussion centered around location of a headquarters area necessary to spot a building site for a residence for the permanent employee authorized under the 1938 appropriation. The inspection party were in agreement that it would be a mistake to establish even a small

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HEADQUARTERS, FIELD TRIP (CONT.)

headquarters development on the floor of the canyon and unanimously agreed that it would be preferable to locate the employee's residence and the equipment shed at some point near the end of the existing truck trail and the head of the horse trail into the canyon. In later conversation with Mr. John Wetherill he agreed that such location would be desirable. The exact location at the head of the trail will necessarily receive further consideration before final decision. At any point now apparently available space will be limited but adequate if travel remains small.

Determination of the headquarters site at the head of the trail complicates the water problem. Present reliance for water is on the spring near Betatakin. Engineer Tovrea expressed an opinion that no serious engineering difficulties would be encountered in pumping this water up to a headquarters development on the rim. It was tentatively suggested that the problem might be solved by developing a concrete storage tank practically underground on the floor of the canyon to which the water from the spring would be delivered by gravity flow at a point not within sight of the ruins. At this point it would be necessary to install a gasoline pump to transfer the water from the storage tank on the floor of the canyon to the rim. It was tentatively agreed that it would be possible to pump this water to a second storage reservoir at a point on the rim high enough to permit gravity delivery with sufficient pressure head to operate necessary valves, faucets, etc., in the development at the head of the trail. No firm estimate of the length of pipe line required could be made but the line probably would not exceed 2,000 feet in length.

Two methods were proposed for consideration. One was to bring the pipe line to the rim through a shaft drilled vertically from above, thus concealing all evidence of the existence of the line. The other was to run the line up an existing fault or crack in which it could be concealed without excessive expense. Both suggestions should be regarded as highly tentative and subject to modification after exhaustive engineering study. Mr. John Wetherill offered as an alternate proposal the possibility of drilling a deep well. He believes that an adequate supply of water might be secured by drilling a well 700 to 800 feet on the mesa. Objection appears to be that such a well would probably cost as much as a plan whereby the water from the spring would be utilized. There would appear to be a chance that the well might be drilled and fail to produce water while it is certain that the water from the spring near the ruin, while not a copious source, could be relied upon. Flow from the spring was roughly estimated at from 60 to 90 gallons an hour, a yield which would be adequate unless travel to the area should become much heavier than is now contemplated.

Should funds become available for construction of an employee's residence before funds become available for development of a water system, it was proposed to construct a cistern to collect run-off waters from

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## HEADQUARTERS, FIELD TRIP (CONT.)

the roof of the dwelling. Such an arrangement could probably be relied upon to store sufficient water for the use of one family and would be justified as a temporary expedient though it would represent neither a satisfactory nor a permanent solution of the water problem.

It appears logical to place the headquarters development for Navajo National Monument at the head of the Betatakin trail as this location would give control of both the Betatakin and Kit Siel sections. It will be recalled, however, that the land at the head of the trail is a part of the Indian Reservation and is not included in the monument. It is assumed that arrangement could be made through the Indian Service to permit development at that point.

### Kit Siel

The trip to Kit Siel was made on July 10. No stock was available and the party walked in from the end of the road, a distance of eight miles and return, total 16 miles. Kit Siel Ruin was found in an excellent state of preservation without evidence of vandalism. It is well protected by its isolation and should never be made easily accessible to the casual visitor. It is, however, regarded as extremely unfortunate that the Park Service does not control at least a stretch up Kit Siel Creek from Betatakin connecting Betatakin and Kit Siel. No developments are recommended at Kit Siel. It was the feeling of all members of the party that it should be held in its present primitive state. It was felt, however, that some improvement work should be done on certain difficult sections of the existing trail, which is in no sense a constructed trail, being little more than a route over which it is possible to reach Kit Siel. Such development cannot apparently be done legally since practically all of the trail lies outside the two small areas surrounding Kit Siel and Betatakin ruins. It is felt that consideration should be given to the possibility of extending the boundaries by at least a narrow strip between Betatakin and Kit Siel to protect the approach to Kit Siel and to legalize a minimum of work on the connecting trail.

### Inscription House Section

Inscription House was visited on July 13 after return from the trip to Rainbow Bridge National Monument. The night of the 12th was spent at Inscription House Lodge operated by the Richards family and the trip to the Inscription House Section of the monument was made on the morning of the 13th. A poorly defined desert road reaches from Inscription House Lodge and Trading Post to a point approximately  $2\frac{1}{2}$  miles from the Inscription House section of Navajo National Monument. No evidences of recent vandalism were observed except for the damage done to prehistoric timbers in 1933, which has been previously reported upon by other persons in considerable detail. Existing trail to Inscription House is fairly good standard, showing evidences of construction. It does not lie within the boundaries of the Inscription House Section of Navajo National Monument and I am unable to report who was responsible for its construction. Possibly the Indian Service, as

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## HEADQUARTERS, FIELD TRIP (CONT.)

there was evidence that the trail is now in use by the Navajo Indians who live in the canyon. The canyon appears to be fairly populous and several cultivated Indian farms were observed along the floor of the canyon. There is a considerable acreage of bottom grazing land and cultivated farm land directly in the foreground of the ruin.

No developments of any nature are recommended. It is felt that Inscription House enjoys a reasonable degree of protection by its isolation. White visitors certainly are not numerous. Recommended that the permanent employee to be stationed at Betatakin should make a monthly inspection trip to Inscription House and that possibly at some future date arrangements be made to place a temporary ranger near the site during the summer travel months. In the meantime reasonable protection may be given simply by inspection trips at monthly but somewhat irregular and unannounced intervals.

### RAINBOW BRIDGE

The inspection party spent the night of July 10 at the Shonto Trading Post. Proceeded by automobile to Rainbow Lodge over poorly developed roads, arriving at Rainbow Lodge about 1:00 p.m. July 11. Since the Lodge has no telephone it was impossible to make advance arrangements for stock. Mrs. Wilson informed us that it would take two hours to get stock up and that it would then be too late to attempt the trip to the Bridge, a distance of 14 miles by saddle animal over difficult mountain trails. Since it was Sunday, the party took the remainder of the afternoon for a much needed rest. Actual pack trip to the Bridge began on the morning of July 12. The pack requires seven hours. The Rainbow Bridge was inspected late that afternoon and early the following morning. Return to Rainbow Lodge was made on July 12.

The 14 miles of trail from the Lodge to the Bridge are entirely outside the boundaries of Rainbow Bridge National Monument, an area of only 160 acres. Considerable construction has been done on this trail, originally, it is understood, with funds provided by Mr. Hubert Richardson, who owns the Rainbow Lodge. Some later work, we were informed, was performed by the Indian Service. There are several sections of the trail on which reconstruction work and possibly relocation to reduce grades should be performed. One of these is the section which makes a big drop into Cliff Canyon. Another is the Red Bud section of the trail. Large portions of the trail, while they are in no sense to be compared with developed trails in the National Parks are picturesque and adequate and in the opinion of the inspection party would require little attention. It was felt, however, that the item carried in the Six-Year Program for trail development might well be spent on the single section of trail which drops from the rim into Cliff Canyon. A similar sum could be spent with great advantage and no detriment to the remarkably primeval scenery in the

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## HEADQUARTERS, FIELD TRIP (CONT.)

Red Bud section.

With the exception of acutely needed improvement on certain sections of the approach trail, no modern developments are recommended. It was felt by all members of the party that the Rainbow Bridge National Monument and approach should remain undeveloped for the satisfaction of that small but important section of the traveling public to whom a pack trip into authentic back country in which primeval scenery is unmarred by the hand of civilization gives a thrill and satisfaction which would be lost upon the introduction of houses and sanitary facilities.

I should say that the most emphatic impression which I received from the trip to Rainbow Bridge was that the area of the monument is disappointingly inadequate. The word inadequate is too weak to convey the almost tragic deficiency. Practically all of the 14 miles of approach trail traverses an area of superb scenery which is surely of national park caliber. I feel very strongly that the Service should not rest until the magnificent approach scenery is included within the boundaries of the monument.

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## CLOSING

By the Boss

Our growth has been so slow and steady that we hardly realize there is any until something happens to awaken us to the progress we have made.

About a month ago one of our men wrote a spoofing letter to headquarters, which, being misinterpreted, raised trouble and called for a letter from the Boss setting things straight again. Mine wasn't much of a letter, just a sort of gentle admonition such as I have received now and again from you and from Horace before you, but it brought out a dandy response which explains the field man's position so clearly I want to quote some of it here:

"I realize that your criticism is utterly just and correct. My letters have frequently been too rambling and verbose, and I appreciate the fact that for efficiency all official letters should be simple and direct. I can assure you that in the future they will be that way, and will lack questionable humor. I also appreciate the fact that you are applying the same advice as regards sarcastic humor in relation to the public. Lord! I didn't know my humor was so awful! Do all humorists have to have their ears set down?

"If I am the only custodian who attempts crude humor or inclusion of too informal jots in his letters, what follows

will have no meaning, but if other field men have some of the same tendencies, I think I know what causes it. Out in the field we get lonely as hell at times. When the day's work is done, and we are through contacting the ninety percent of slightly interested visitors and the ten percent of really interested ones, we feel the need to jaw a little with others of our kind. It is a universal need of humans to consort with others who have similar work, face the same problems, and are somewhat closely associated in their jobs. We need those contacts so that our little egos can flatter themselves a bit by generously listening to others expound their pet ideas and can swell a bit by expounding brilliant ideas of their own. Each man wants to strut a little and if he isn't around others who do the same kind of work and face the same problems, he finds it difficult.

"So, in these remote field stations, when a man can't see his associates he likes to strut a little on paper, that being the only way to show his stuff to his fellows. It was an urge like that which got me into all this trouble."

Now I was on a lone post for some 16 or 18 years in the earlier days and I know what this man is talking about. You do get lonely for folks of your kind with whom you can talk sense and nonsense and have both understood and appreciated. I also know how you get blue and discouraged and think the central office has intentionally forgotten you and is giving every one else the gravy and you get nothing but the bones. This tends toward despair and general criticism of the whole outfit. I know about these mistakes because I made them all, and many more, years ago, and am not yet free from such feelings at times. The only amusing thing about this is that each lone post man thinks he is the first and only man to go through this experience. I can remember years ago how surprized I was when it first dawned on me that nearly every lone post man had to go through it.

This all sifts down to the fact that we are operating an area of over a thousand square miles having about 300,000 visitors this year with an operating force of forty-odd folks, and all this constitutes a real big-park operation, but, due to our peculiar condition of having this thousand square miles scattered over 26 different spots in four states, our personnel and many of our other problems are not big-park ones but are still pioneering problems, which is lucky for us because we have had quite a bit of experience along that line.

The answer to all this, it seems to me, Chief, will be to run the aggregation of units as a big-park outfit around the headquarters with its couple of hundred pieces of in-and-out mail per working day and its other office work in proportion, but among ourselves to never forget for a moment that "Out in the field they get lonely as hell at times." In

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CLOSING (CONT.)

other words we are likely to remain in a pioneering stage.

This explains why we asked and received permission several years ago to work out our monthly report on our own lines and it is here we are trying to bring these lone post men together where they can meet upon the level and "Strut a little on paper."

Personally we wouldn't run a big park on a bit unless you ordered us to do so, but if you put our outfit over in a big park we will bet it would be easy to run it as compared with herding these 26 Southwestern Monuments through their various growing pains.

But it is a lot of fun!

Cordially,

*Frank Pinkley*

Frank Pinkley,  
Superintendent.

# THE Supplement

S·M· MONTHLY REPORT

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# TONTO RUINS STABILIZATION

## MAY 27 TO JUNE 30, 1937

By William A. Duffen

Work began May 27 and continued until June 30.

The working crew consisted of the writer, who was in charge, two laborers and two burros, the latter being used for transportation of water and adobe from the ranger cabin up to the ruin.

This period of work was wholly upon the lower group, which was really in a bad state of repair, and consisted of the rebuilding of retaining walls, and cleaning of rooms which had been dug out at earlier times. In many cases the debris had just been muddled over in the quest for "antiques". The slowest part of the job was the rebuilding of the rear wall of Room 2 (Stoner's map. See Southwestern Monuments Monthly Report for April, 1936, page 305).

The first unit of work accomplished was that of rebuilding the retaining wall in front of the cave, and the continuation of the same across in as near level manner as possible until it reached the remnant of the south wall of Room 1. This latter chore also added much strength to the front wall of Room 2. The dry masonry retaining walls now in place, we had a place to put the debris from the rooms.

The second work unit was removal of the aforementioned accumulation of trash in excavated rooms. All rooms of the ruin had been gutted before the ruin was put under protection of the National Park Service with the exception of Room 16 which we left undisturbed. Removal of this debris brought to light features that had not been reported to date as well as some very interesting artifacts. Room features will be included in the section of the report on room descriptions; artifacts were entered in the catalog of Tonto National Monument museum and will be described in a future Southwestern Monuments report.

In some cases only a couple of inches of dust would be found on the floor and in several cases as much as two feet of trash was removed. Even though the rooms had previously been "gutted" great care was taken by the writer in the removal of this material and as a consequence the artifacts were removed in good shape. In most cases the floors which have been left as such are in reality false floors which are the result of careless housekeeping by the ancient dwellers. The firepits will however in all cases be filled in save one which is in Room 15. This room will not be entered by visitors. However, its features may be observed from Room 16. This is a safety measure as well as one of exhibition, in that the room may be seen in its original floored condition with fire-pit, metate, etc.

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TONTO RUINS STABILIZATION (CONT.)

The third work unit was the removal of the old ramp that used to lead from the cave floor to Room 7. Its removal allowed much more space and was in reality unnecessary in the exhibition of the site. The slats of a cradle were uncovered at the base of this ramp.

The fourth chore was to get good adobe for the reconstruction of a wall of Room 2. It was necessary to go as far as Windy Point, several miles from the ruin, to obtain this material. The adobe then had to be handled a second time. The transportation of same from the parking lot to the ruin was a slow tedious one. The beasts of burden would balk when one pound too much was hoisted upon their lazy little backs. The trip up was then very slow, as only a burro can make it. Five-gallon oil cans were used as containers for getting water to the site. All materials now being in place, the last task was ready to begin.

This consisted of cutting down to bed rock and obtaining a good foundation on which was laid dry masonry on which to build the wall. The steps built by the Southern Pacific Railroad Company leading to the little court, or Room 11, were moved to the spot where the door once penetrated this room.

It was found necessary to build up the wall in courses not much over a foot in height and let this set before the next layer was put on. The wall was constructed a trifle higher than beam height and then stepped off gradually down to about a foot high, the stepping commencing just beyond the beam axis. The large beam that had for years lain in Room 10 was replaced for exhibition purposes as well as to strengthen the newly built wall and to support the roof timbers which had for so long projected into Room 10. They form the roof for Room 9, or hallway, and part of the roof of Room 10. This part of the work really added much to the appearance of the ruin. It was the writer's wish to clean up and strengthen so far as such work would stabilize the ruin and yet not polish it up to the extent of looking too new or artificial. He hopes that it will be satisfactory.

The construction of several steps of stone and adobe in several of the rooms was deemed necessary to preserve walls that must be stepped over by visitors.

The final bit of work was the policing up of the area traversed by the burros and the return of tools borrowed to complete the work.

The cooperation of local people and the Forest Service, who lent equipment, is to be highly commended.

## LOWER RUIN: ROOM DESCRIPTION

(Note: Room numbers taken from Victor R. Stoner, "A Reconnaissance of Tonto," Southwestern Monuments Monthly Report, April, 1936, opp. p. 306)

### Room 1

Only a bare remnant of this room remains today, and none of the floor level. The room had without doubt been built on the edge of the cave floor and partially on fill. When depredations were begun at this site it is possible that this was one of the first rooms to go.

### Room 2

In its original state this room was in all probability two rooms. A map of the lower ruin taken in 1920 shows the complete back wall standing, being pierced with a doorway at the point where the steps now lead visitors into a small open court. (Room 11). There were no floor features remaining. Room 2 was two stories in height, a fact substantiated by remnants of walls still erect at the south end.

### Room 3

Practically nothing remains of this feature. A rock which anciently had fallen from the roof of the cave had formed part of the back wall to this room. The crevice between the floor and stone was walled up with adobe masonry. There had been a door connecting this room and Room 4, but it has been destroyed. On top of the stone remains a bit of cross-wall. The dimensions are indeterminable as practically all of this room has sloughed over the cliff edge.

At the edge of the large rock is a small firepit made of small stone slabs set upright.

### Room 4

This room in its complete state was 19 feet long by an unknown width. Only a small amount of floor remains and that is in the southwest corner.

A small firepit, circular in form and clay lined, having a diameter of 10 inches and a depth of 6 inches is located 19 inches from the back wall and 12 inches from the south wall.

Due to the height of the door leading to Room 7 it was necessary for the dwellers to place a stone in front of it as a step. This feature remains.

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TONTO RUINS STABILIZATION (CONT.)

Room 5

Stoner's map errs in regards this room. The south wall should be shown to continue completely across shutting Room 6 off from Room 5. The east wall does not continue across in front of Room 5 but terminates as the corner of Room 6. There is nothing to show that this room ever had a front wall. It is sure that Room 5 was used as there is much smoke on the roof and walls. The roof was formed by the cave top itself and the south wall continued up to it. The floor consists of a natural ledge. This room was roughly 6 by 11 feet.

Room 6

This room belongs to the early period of occupation and was never more than one story in height. The south wall is 8 feet, 3 inches long. The north: 10 feet; the west, 12 feet; and the east, 10 feet, 7 inches.

A circular clay-lined firepit 20 inches in diameter by 8 inches in depth is situated 3 feet, 10 inches from the east wall and 3 feet 5 inches from the north wall.

There is a possibility that a door led into Room 16 but as no lintel marks remain we cannot be certain.

Room 7

Room 7 shows all evidence of having been two stories in height. Dimensions are: north wall, 10 feet 11 inches; south wall, 10 feet 2 inches; east wall, 12 feet 11 inches; west wall, 12 feet

This room had three exits: in the east, west, and south walls. In order to enter Room 15 it was necessary to make a step up of two feet.

A circular clay-lined firepit was situated two feet from the east wall and five feet 4 inches from the south wall. This feature was 10 inches in diameter by five inches deep.

The ceiling in this room had been about seven feet high. It is an interesting point to note that the ceilings were all of a good height in this ruin.

A fine example of a wooden lintel remains in the west wall. It is 15 inches wide by two and one-half inches thick by four feet three inches long. This door is two feet wide by two feet five inches high and 17 inches above the floor of Room 15.

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TONTO RUINS STABILIZATION (CONT.)

Room 8

A large part of the east wall of this room is made up of a large stone from the roof.

Room 8 measures along the east wall 12 feet 11 inches and along the west wall 11 feet one inch. The south wall is 10 feet four inches and the north wall 10 feet five inches.

This was a two story room. A door pierces the south wall entering into the hall which is of an undetermined width, while the height is two feet four inches. A blocked doorway exists between this room and Room 14. This was brought about probably by the addition of Room 8.

Room 9

This hallway is probably the dividing line between the old and the newer construction units. As it exists now it measures 23 feet 10 inches along the north wall, 18 feet 10 inches on the south wall, with an average width of three feet four inches.

The roof also forms part of the roof of Room 10. Apparently Room 9 was never more than a single story.

Room 10.

This room was very badly damaged and was the focus of a goodly part of the stabilization work carried on. Walls that were standing gave a width of 11 feet five inches along the back wall while the north wall measures 18 feet five inches. A beam which had for a long time lain on the floor of this room was replaced in the ceiling, and some of the walls were repaired.

A circular clay-lined firepit is located a couple of feet in from the north doorway.

Several fine artifacts came from this room.

Room 11

The feature designated as such is a small alcove or patio and probably was not used as a room. There is an outdoor firepit without much form against the west wall. The floor is formed by the bare rock of the cave floor.

Room 12

Room 12 on Stoner's map appears not to have been a room. The remnants of walls which exist probably were of a defensive nature.

(L. 220) TONTON STABILIZATION SURVEY

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TONTO RUINS STABILIZATION (CONT.)

Room 13

This was a small room formed by building a wall across a natural recess in the cave wall. The great amount of smoke on the ceiling labels it a living room. Had it been a storage room and had it been destroyed by fire there would have been burnt deposits on the floor. They were missing. The debris was dust and decayed organic material.

No clay-lined firepit was present but there is a small depression in the rock floor that gave up some wood ashes.

This room contains a very interesting type of door.

Room 14

This room is the most complete in the entire ruin, having the roof intact.

The north wall measures 12 feet seven inches; the south, 11 feet seven inches; and the east wall is 15 feet three inches. The west wall is 13 feet three inches long.

This room was one story high and was one of the first to be built in the cave.

The hatchway leading to the roof is 17 inches wide by two feet nine inches long. The roof is six feet seven inches above the floor, which is a generous height for cliff dwelling rooms.

A doorway on the south side of the room measures 28 inches wide by three feet high, and exhibits a four-pole lintel.

On close examination it will be noted that the crotch in the center post has been padded with grass. Could it have been done to prevent the creaking of the timber as it lay in it?

Room 15

Room 15 produced some of the good artifacts which were obtained. This room had been burned out and there was a goodly amount of trash in the back mixed with pack rat nests, composed largely of cholla cactus. This room, along with Room 14, is the oldest in the ruin. The floor is largely the natural floor of the cave.

A firepit 12 inches in diameter by six inches deep is located three feet seven inches from the north wall and six feet two inches from the east one.

This room was one story, and the roof was six feet eight inches above

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TONTO RUINS STABILIZATION (CONT.)

the floor. Dimensions of walls: east, 11 feet 10 inches; west, 12 feet seven inches; north, 12 feet three inches; south, 12 feet six inches.

Room 16

Was this a room or an open court? The writer does not see how it could have been roofed over. There is a hole which might have well been one to hold a support post, but, the diameter of the post which this hole could have taken could not have supported the great weight that would have been produced by two beams at right angles. This hole is found on the rock ledge in the floor.

Room 16 is unexcavated, and should at some later date give some good information. Then, perhaps, the former existence of a roof can be proved or disproved.

The rough measurements on this room are: 15 feet nine inches north and south by 21 feet eight inches east and west.

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## HYPOTHETICAL RECONSTRUCTION OF BUILDING PERIODS

This reconstruction is based largely upon evidence presented by wall joints, blocked doorways, etc.

It appears that the first unit was composed of Rooms 14, 15, and 16. Later Room 6 was added and automatically brought Alcove 5 into being. At a later time Rooms 7 and 8 were added and two doorways that had been in the original part were blocked. Rooms 7 and 8 were two story affairs. A parapet was added to Room 15 where it overlooks Room 16. Rooms 14 and 15 appear never to have been more than one story in height. Room 16 appears never to have been roofed, but this fact will not be known until it is excavated.

Following the building of Rooms 7 and 8, the hallway or Room 9 was brought into being as were Rooms 10 to 13, inclusive. From all appearances Room 10 was a single story. The north wall of the hallway shows that it is a later addition in that the cross beams for the ceiling were set into holes which had been pecked into the wall. The roof of the hall extended on over and formed the north half of the Room 10 roof.

Room 11 was no room but an alcove having an outdoor fireplace.

TONTO RUINS STABILIZATION (CONT.)

It does not seem logical that such a room as Number 12 could have ever existed. The wall remnants might have been no more than a defensive measure, and it would help keep the aboriginal kiddies who might have played in the alcove out of the canyon below.

Room 13 has much smoke blackening on the roof which would seem to set it off as having been living quarters in place of a storage room. Just when this was built is unknown. It could have been constructed at any time without altering the setup in any way.

Evidence of Room 1 is nil. No statement is safe.

Room 2 had been two stories high as is shown by a picture taken in 1920. The major part of this room has gone over the edge.

\*\*\*\*\*OO\*\*\*\*\*

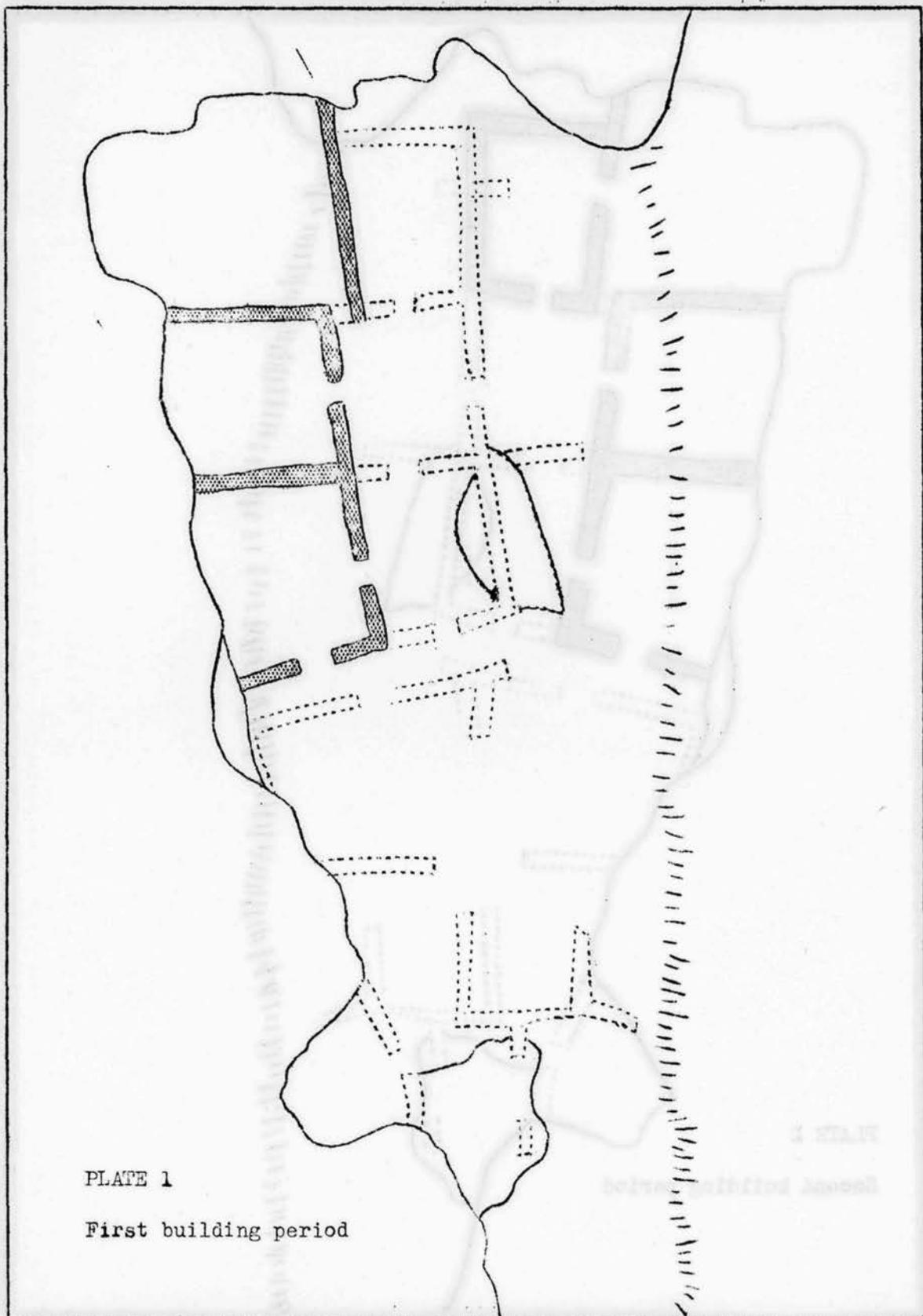


PLATE 1

First building period

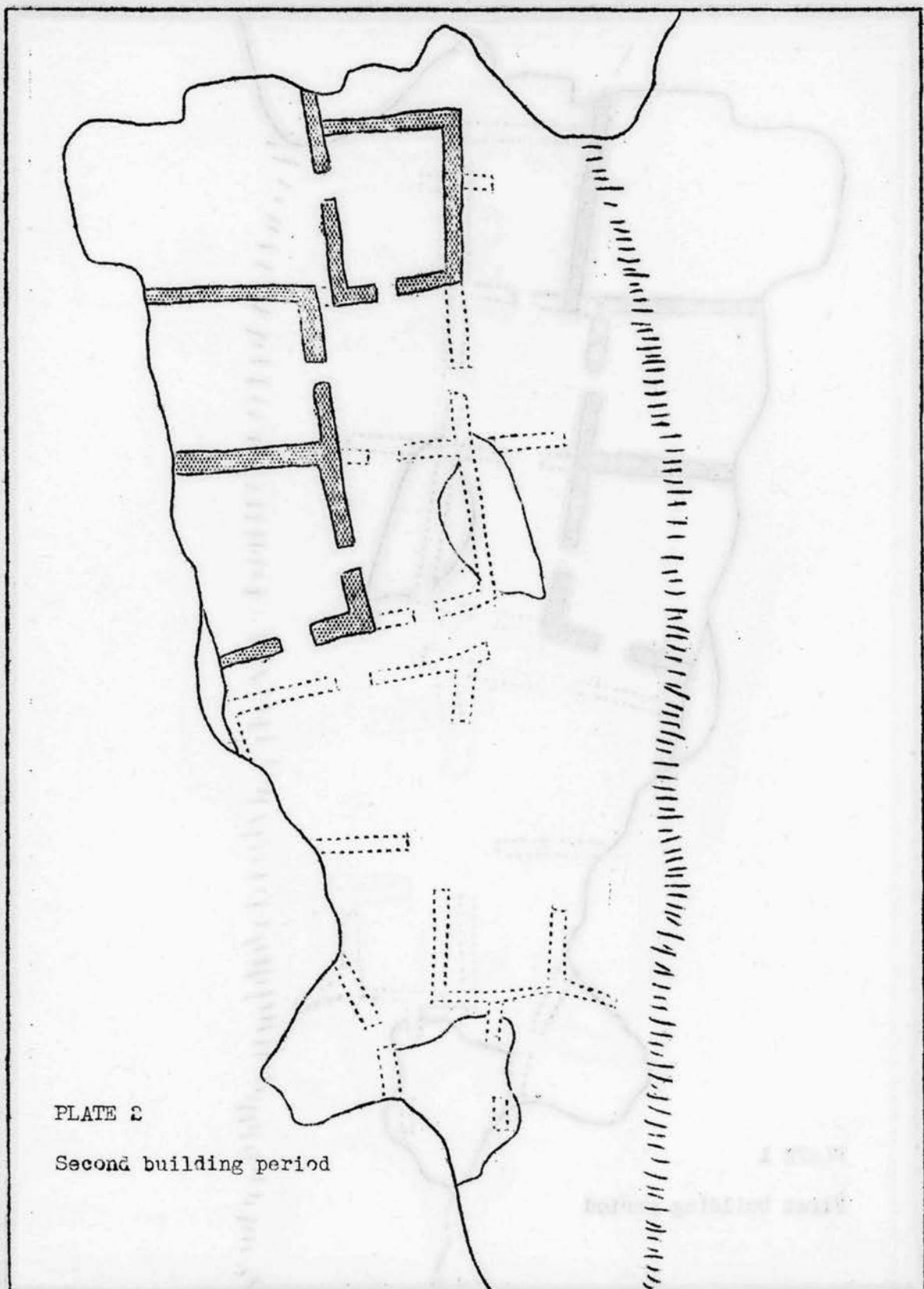


PLATE 2

Second building period

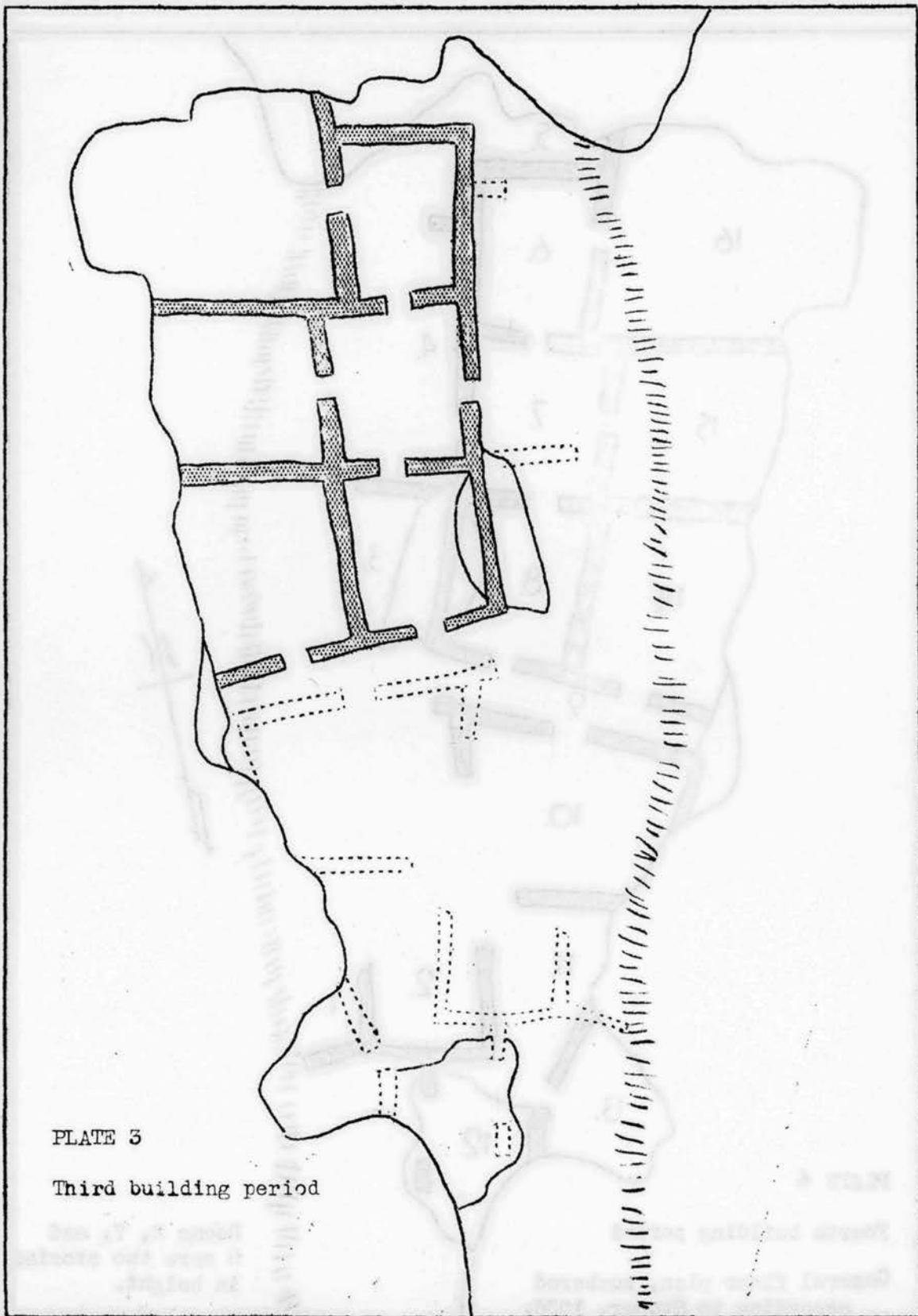


PLATE 3

Third building period

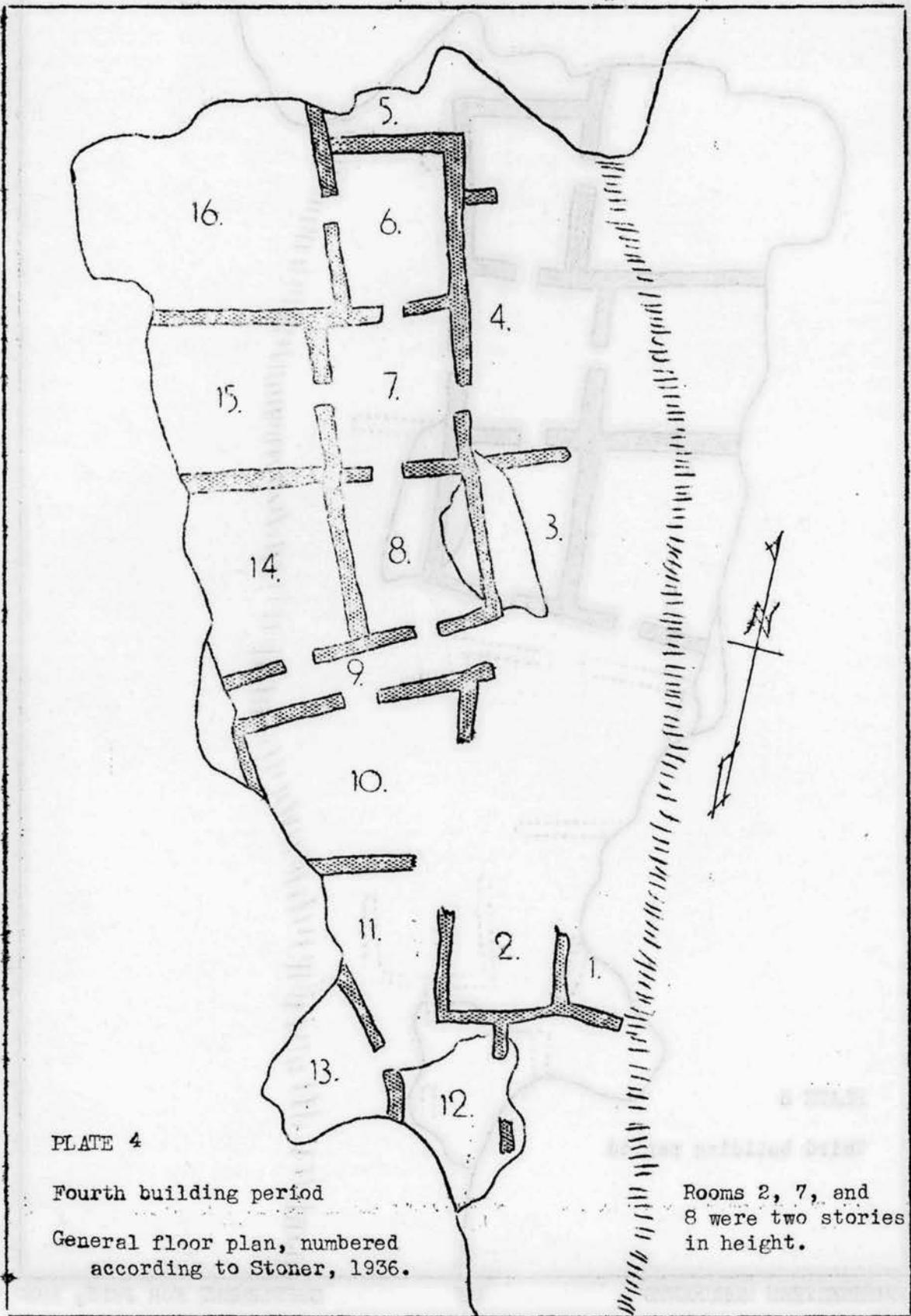


PLATE 4

Fourth building period

General floor plan, numbered according to Stoner, 1936.

Rooms 2, 7, and 8 were two stories in height.

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# GEOLOGIC REPORT, CANYON DE CHELLY

By Vincent W. Vandiver, Associate Regional Geologist

## INTRODUCTION AND LOCATION

This report is intended to supply the main geologic facts regarding one of the most important Monuments of the Southwestern group, Canyon de Chelly, pronounced "shay". The Monument is situated in northeastern Arizona, near the center of the large Navajo Reservation, and consists of approximately 83,840 acres. It was established by Presidential Proclamation on February 14, 1931, and the description of the lands was amended by a Second Proclamation on March 3, 1933. The latter Proclamation defines the boundaries as follows:

"All land in Del Muerto, de Chelly, and Monument Canyons, and the canyons tributary thereto, and the lands within one-half mile of the rims of the said canyons, situated in unsurveyed Townships 4 and 5 North, Range 7 West; Townships 4, 5 and 6 North, Range 8 West; Townships 4 and 5 North, Range 9 West; and in surveyed Townships 4 and 5 North, Range 6 West; Townships 3, 6, and 7 North, Range 7 West; Township 6 North, Range 9 West; and Township 5 North, Range 10 West; all of the Navajo meridian in Arizona."

Existing approach roads to Canyon de Chelly are as follows: (1) Gallup to Chinle via St. Michaels and Ganado: 101 miles. (2) - Gallup to Canyon de Chelly via Ft. Defiance: 76 miles. (3) - Winslow via Hopi Indian Villages to Canyon de Chelly: approximately 128 miles. (4) - Shiprock to Chinle, via Redrock, Lukachukai, and Greasewood: 70 miles. (5) - Kayenta to Chinle via Rough Rock: 80 miles.

The settlement of Chinle, near the mouth of Canyon de Chelly, was so named by the Navajos meaning "a place where water flows out of a canyon." Here the Custodian has a splendid Pueblo style residence with a more or less separate office to contact visitors. There is a large Indian Day School in the village and two trading posts. One of the trading posts has been operated for years by Cozy McSparron and is known as the Thunderbird Dude Ranch. In certain seasons arrangements may be made at this ranch to secure cars for trips into the canyons and horses may likewise be procured during most of the year. Visitors at the Monument during the year ending September, 1936, numbered 1,091.

Much of the enchantment of the area lies in the primitive and picturesque background. In order to properly assimilate this setting it is preferable to spend several days at the Monument, to view the canyons from the rim, and then to take trips along the floor of the canyons and observe the towering cliff buttes, obelisks, pinnacles, not to mention the numerous arches and alcoves where the ruins of many Pueblo settlements

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## CANYON DE CHELLEY GEOLOGICAL REPORT (CONT.)

are located. Many Navajos are living in the canyons at the present time. The Monument therefore offers to the visitor the rather unique experience of observing the ruins of the Pueblos and at the same time seeing the modern Navajo in his daily routine. It is with due regard to this glorious natural background, as well as the wishes of the present inhabitants of the canyons, that the Park Service has always endeavored to keep this area as nearly as possible in its original primitive state. Only the very limited and absolutely necessary development is contemplated.

### HISTORY

Records remain of the cliff-dwelling habitation of the canyons by the Basket Makers and later by the Pueblos. The most important ruins are the White House, which has been dated by the tree ring method at 1050-1300 A.D., Antelope House and Mummy Cave at 1200-1300 A.D. Archeological expeditions were made by the Mindeleff's in 1894 (8) and by Earl Morris of the American Museum of Natural History in 1923 (9).

According to Colton (5), Canyon de Chelly was first explored by Americans in 1849, when it was found not to be the impregnable Navajo stronghold that had been reported. He further states that "By 1858 the Navajos had occupied Arizona east of the Hopi country, but had progressed very little farther. By 1863, because the U. S. troops had been withdrawn on account of the Civil War, the depredations of the Navajos had become serious. In that year a special expedition under Col. Kit Carson was sent against them. He rounded them up in Canyon de Chelly, captured about 8000 from all over the whole reservation and deported them to a reservation called Bosque Redondo near Fort Sumner in New Mexico. They were not all captured and the bands scattered. Some took refuge in the maze of canyons in the Rainbow Plateau and others invaded the Coconino Basin near the Grand Canyon. In 1868 the 8000 were returned from Bosque Redondo to their old desert home. Here they increased rapidly until their great reservation is now overpopulated. Spreading north of the Utah line and west to the Little Colorado River, the Navajos, estimated at 50,000 souls, occupy the largest Indian Reservation in the United States - a great area of 25,000 square miles. On the vast plains and juniper-covered mesas they tend their flocks of sheep and goats. They may be truly called "The Arabs of the American Desert."

At present there are from 350 to 400 Navajos living along the 60 miles of canyon floors within the Monument. Water may be secured from pit holes in the sandy flood plain at depths of 3 to 4 feet. The higher portions of this plain are utilized for their homes ("hogans") built of earth and logs, and adjacent plots of land are being farmed in much the same way as they were centuries ago.

### GEOGRAPHY

### Land Forms

Canyon de Chelly lies in the south-central portion of the Colorado Plateau Province. The rocks of this section of the province are in the main horizontal or gently folded, in some instances they are sharply folded and faulted. Vegetation is scant and streams have cut deeply into the surface with the controlling factors generally conforming to the attitude or structure of the beds and to the relative resistance of the various strata. The soft shale members form broad valleys and slopes, with the hard sandstone layers forming steep walled canyons and cap rocks of the many escarpments or mesas. These briefly mentioned land forms are in evidence at Chinle, where to the west may be observed the enormous Black Mesa, containing some 2,400 square miles, capped largely by competent Upper Cretaceous sandstones; also in this same direction the broad Chinle valley composed of soft shales or "marls"; and to the east the west flank of the Defiance uplift where streams have been given added gradient to carve deep canyons in resistant strata.

### Drainage

Canyon del Muerto drainage has its headwaters in Spruce Brook, to the northeast in the Lukachukai Mountains, and Canyon de Chelly in the Cushka Mountains proper to the eastward. Both canyons drain into Chinle creek and the waters ultimately reach the master stream of the province, the Colorado River, through the tributary San Juan. South of the Monument, drainage from the west flank of the Defiance uplift, reaches the Colorado River via the Little Colorado. Streams in the general area are mainly intermittent though some in their lower drainage and near their sources, at higher elevations, are perennial. The stream occupying Canyon de Chelly flows for a distance of some 15 miles as a permanent stream. The large valley of Chinle creek, of which de Chelly and del Muerto are tributaries, drains an area of approximately 4,800 square miles.

### Climate

Topography is the prime factor as regards to climate in the Navajo country. The cliff-dwellers were aware of this fact and gave consideration of this feature in the establishment of their settlements along the canyon walls. Rainfall averages approximately 10 inches per year at Canyon de Chelly with around two-fifths of the precipitation generally falling in July, August, and September. Temperatures of  $-24^{\circ}$  have been recorded at Ft. Defiance and highs of over  $100^{\circ}$  are not uncommon during the summer months. The prevailing winds are from the southwest.

Dr. Gregory (1) expresses these points regarding Navajo climate, - "The keynote of the climate of the Navajo country is variability, marked by sudden changes in temperature and wide fluctuation in rainfall. An intensely hot summer day may be followed by a chilly night; sunlight is

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## CANYON DE CHELLY GEOLOGICAL REPORT (CONT.)

synonymous with heat, shade with cold. The high temperature of the forenoon may be lowered by a cold rain or by a hailstorm, only to become re-established within an hour. When storms come the country is flooded; at other times the task of finding water for man or beast taxes the skill of the most experienced explorer.

### GEOLOGY

#### General

Only sedimentary rocks are exposed at the surface on the Monument. The geology of the area is shown on the attached sketch map. It will be recalled that the boundaries define lands within one-half mile of the rims of Canyon de Chelly, del Muerto and Monument canyon as well as their tributaries.

It is known from the records of wells drilled along the Defiance uplift that there is a granite ridge which forms the core of this structural feature. The granite occurs at relatively shallow depths, around 600 feet at Nazlini canyon, 18 miles southeast of Chinle. This pre-Cambrian ridge was probably an old land mass throughout most of the Paleozoic, until the Permian, when it was buried by the Supai red beds. Overlying the Supai formation is the de Chelly sandstone, most recently considered to have been deposited at the same time interval as the Coconino sandstone to the west and southwest, but the material as will be explained later was probably derived from different sources. Both the de Chelly sandstone and the Coconino sandstone are now generally recognized to be mainly dunes deposited by the winds, or principally eolian in origin. Triassic and Jurassic formations have in turn been deposited over the de Chelly sandstones and we have every reason to believe from regional criteria that Cretaceous sediments once covered the area of the Monument to depths of several thousands of feet, however, these strata have since been removed by erosion.

#### Stratigraphy

The stratigraphy of the general area is shown on the table, page 59 following. Brief description of the various formations are listed on this table which includes the oldest rocks known up to and including those most recently deposited.

Interesting features in the stratigraphy of the Defiance uplift are the absence of the Kaibab limestone (Permian) and the thinning out of the Moenkopi formation (Triassic) in the central portion along the east flank. The Kaibab limestone, which caps large areas west and south of Black Mesa, and likewise forms the rim rock at Grand Canyon, thins out in the vicinity of Holbrook and is absent on the uplift, where in the southern portion the Moenkopi formation rests directly on de Chelly sandstone. The Moenkopi in turn thins out not far north of Ft. Defiance.

GENERALIZED STRATIGRAPHIC TABLE

ERA	PERIOD	FORMATION	THICKNESS (FEET)	LITHOLOGY
GENEZOIC	QUATERNARY			Alluvium, gravel and eolian deposits.
		Mesa Verde		Grey, yellow, brown sandstone and
	CRETACEOUS	Mancos Shale	2500 /	blue grey to iron grey shales.
	Unconformity	Dakota ss.		Contain coal, Conglomerate.
				Buff to grey and pink sandstone.
MESOZOIC	JURASSIC	Morrison	200 /	Variable in thickness. Contains reptilian remains, non-marine invertebrates, silicified wood.
	Unconformity			Formerly McElmo Formation.
		Navajo ss.	100 /	Usually buff to grey, white and red, massive, intricately cross-bedded sandstone. Contains quartz with some feldspar poorly cemented by lime and silica.
	JURASSIC(?)	Kayenta	40	Reddish irregularly bedded sandstone with grits and fine conglomerates. Minor shales and impure limestone. Contains dinosaur tracks, pelecypods, and plant remains. Formerly Todilto.
	(Glen Canyon Group)*			
	Unconformity	Wingate ss.	275	Massive cross-bedded cliff forming, pale red to light buff sandstone; mainly quartz grains poorly cemented with lime and silica.
		Chinle	1182	Non-marine varicolored marls, thin sandstone and limestone conglomerate. Contains vertebrate, fresh water invertebrate fossils and silicified wood.
	TRIASSIC	Shinarump	20-60	Coarse sandstone, irregularly conglomeratic, grey in color. Fragments of petrified wood.
	Unconformity	Moenkopi	50	Chocolate, red and grey sandstone and alternating red shale. Partially marine to westward.
		De Chelly ss.	825	Reddish cross-bedded sandstone. Composed variable sized grains white and red grains quartz with kaolin. Calcareous and iron cement. Cliff forming.
PALEOZOIC	PERMIAN	Supai	600 /	Red sandstone and shales, uniformly bedded. Fossil plants.
PROTERZOIC	PRE-CAMBRIAN			Massive and bedded grey quartzite. Granite.

\*No diagnostic fossils discovered.

Compiled from various USGS reports by Vincent W. Vandiver, NPS, Santa Fe, N.M.

is absent on the north end of the uplift. It can be observed everywhere in the vicinity of the Monument that the Shinarump conglomerate (Triassic) rests unconformably on the de Chelly sandstones.

#### Pre-Cambrian

The oldest rocks on the Defiance uplift are quartzites, probably pre-Cambrian in age. They occur in Quartzite canyon, northwest of Ft. Defiance. Moenkopi sandy shales overlie the quartzite unconformably but the underlying strata are not exposed. Darton (2) states that the quartzite which occurs along the axis of the Defiance uplift is an old ridge which extends northwest from the Zuni mountain uplift in New Mexico and apparently persisted through a large part of Paleozoic time, since Permian rocks now abut against it. From well records we know that granite forms the core of the Defiance uplift.

#### Permian

##### Supai Formation

The type locality for the Supai formation, which consists of red sandstones and shales, is in Havasu canyon and adjacent portions of Grand Canyon. Here it consists of 100 to 1200 feet of red beds. A well drilled 18 miles southeast of Chinle, on the west flank of the Defiance uplift, encountered granite at 806 feet. In this well which started in the de Chelly sandstone, the Supai red beds were reached at 210 feet. Supai strata may be observed in Canyon de Chelly east of the junction with Monument canyon where the beds are composed of red sandy shales and fine grained sandstones. Supai red beds overlap on granite on the Defiance uplift. Darton (2) observed a short distance west of Ft. Defiance that there is a fairly strong break between the Supai formation and the overlying cross-bedded sandstones. He states that to the northward the distinction is lost somewhat by the development of coarser and lighter beds in the upper part of the Supai; suggesting transition. Fossil plants have been found in this formation three miles west of Ft. Defiance and they have been determined by paleobotanists (1) to be Permian in age.

##### De Chelly Sandstone

Conformably overlying the Supai formation in Canyon de Chelly are the vermilion, highly cross-bedded sandstones, which have been termed the De Chelly sandstones by Gregory (1). Edwin D. McKee, park naturalist at Grand Canyon National Park, has written a very interesting paper (4) on the De Chelly sandstone and its relation to the Coconino and other cross-bedded Permian sandstones of the southern portion of the Colorado plateau. The writer of this paper has taken the liberty to use portions of this reference by McKee.

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CANYON DE CHELLY NATIONAL MONUMENT GEOLOGICAL REPORT (CONT.)

Sandstones comprising the vertical walls of Canyon de Chelly were originally considered to be the equivalent of the Vermilion Cliff or Wingate sandstone of the Mesozoic by early geologists. As above stated they were termed the De Chelly sandstone in 1917 by Gregory and assigned to the Permian due to their stratigraphic position unconformably beneath the Shinarump conglomerate of the Triassic, and conformably above the Supai red beds containing a Permian flora. They have since been considered by Darton (2) and by Baker and Reeside (10) to be a continuation of the Coconino sandstone found to the west and southwest. McKee, in the more recent paper mentioned above, states that the De Chelly sandstones of Canyon de Chelly are a well defined formation composed principally of red cross-bedded sandstones which are different from the Coconino in the type of cross-bedding, variety of grain size, mineral composition and kind of cement. He concludes that the upper De Chelly sandstone and the Coconino sandstone were formed contemporaneously, but under different conditions of deposition and from materials derived from different sources. The source of the Coconino is regarded by McKee (3), in another paper, to be from the south and to have been deposited in the main as dune sands by the winds. The De Chelly was at the same time being formed from sands of a different source, probably from the north, as suggested by the remarkable uniformity of dip in the opposite direction. Most of the De Chelly section contains cross-bedding indicative of wind deposition, however, some portions especially in the upper part are deposited or at least reworked by water, as shown by the non-cross-bedded layers of shaly sand.

McKee finds that where the entire thickness of the De Chelly sandstone is obtained that there appears to be two well defined units separated by some horizontally bedded layers of very fine-grained, red, argillaceous sandstone. Also that by the color, type of cross-bedding and erosional behavior, the upper and lower sandstone members may be readily distinguished, but that in mineral composition they are similar in most places. The upper member generally forms bright red vertical cliffs while the lower member is reddish brown in color and usually weathers into rounded slopes containing many alcoves and cavities. Cross-bedding in the lower member shows dips in nearly every direction, whereas in the upper portion the beds are much longer and the slope is remarkably constant, ranging from southwest to southeast and suggesting that the source of the latter beds must have been from the north.

CANYON DE CHELLY GEOLOGICAL REPORT (CONT.)

The following section was measured by McKee near the mouth of Monument Canyon:

	Feet
<u>Shinarump Conglomerate</u>	
<u>Unconformity</u>	
<u>De Chelly Sandstone</u>	
1. Sandstone, fine grained: Vermilion red, cliff-forming. Cross-bedded. Composed in vertical section of a series of similar units, each with long, sloping, nearly parallel laminae which curve at their bases tangential to flat-lying, brown, shaly sandstone layers 6" to 3' thick, that separate the units. Twelve to twenty units ranging in thickness from four to eighty feet constitute this member. Sand grains of two sizes . . . . .	.569.5
2. Sandstone, argillaceous. Deep red, very fine-grained, non-cross-bedded. Rests on truncated surface of underlying sandstone. Some traces of sand of type found in upper and lower members . . . . .	36.0
3. Sandstone, fine-grained; Red-brown, weathers to rounded surfaces. Cross-bedded with short curving surfaces forming irregular wedges, truncated at bases. Sand grains of two sizes . . . . .	<u>.219.0</u>
Total . . . . .	624.5 ft.

Red Permian shales and flat-lying beds of sandstone.

Many geologists have observed the formation of arches, alcoves, and caves in the cross-bedded sandstones of the southern part of the Colorado Plateau, and numerous explanations have been offered as to their origin. These features are so constant in some sections that it would almost seem that one could chart a formation by spotting the cliff dwellings on a map, for almost invariably the Pueblo people have utilized these alcoves at one time or another for their settlements. These erosional features have been observed by the writer throughout southern Utah, northern Arizona and southwestern Colorado and it is concluded that they are the result of several factors, the most important of which are the structure and porous nature of the rocks in which they occur. The tangential cross-bedding permits ready access of the surface waters along the angular bedding planes in the porous sandstone. Such waters percolate into the face of the cliff and thus at first small units are weakened as the loose cement is dissolved and the shell-like forms are carried down by gravity.

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CANYON DE CHELLEY GEOLOGICAL REPORT (CONT.)

These processes are repeated over long periods of time, the curved laminae being removed on an increasing larger scale, until the shells have cut back into the cliff to form alcoves large enough to house whole settlements of Pueblo people. The jointing is generally of lesser importance than the tangential cross-bedding in this process although in some instances it is a major factor. For many of the larger alcoves especially in Navajo Canyon, at Mesa Verde, and at Zion Park it is a common occurrence to observe a concentration of surface water at the top of a cliff directly over the alcove, giving a funnel effect, with the result that there is a concentration of water above the cave site. Alcoves and recesses may be observed in all stages of formation. In some cases the shells are so loose that they might seemingly be expected to crash to the floor at any minute, as in the alcoves in Navajo Canyon.

Near the head of the trail leading from the rim of Canyon de Chelly to the White House ruins are some minute erosion forms in the De Chelly sandstone which have been termed as worm borings by some and to the work of the wind by others. It appears that the wind has played only a very minor part in the formation of such features and that they may be attributed to normal processes of surface water carrying away the softer, less resistant, and more poorly cemented material to form the fine holes along the face of the cliff.

### Triassic

#### Moenkopi Formation

This formation consists of chocolate, red and grey sandstone with alternating red shales. The Moenkopi does not occur in the vicinity of the Monument but is mentioned for completeness since it is present on the southern portion of the Defiance uplift. In this section, with the Kaibab limestone absent, the Moenkopi rests directly on De Chelly sandstone, and thins out just north of Ft. Defiance.

#### Shinarump Conglomerate

The Shinarump consists of coarse grey sandstone and conglomerate. It occupies much of the surface over the northern sector of the Defiance uplift and forms a resistant cap as may be noted from contacts along the rim of the canyons within the Monument boundaries. The conglomerate is unconformable with the underlying De Chelly sandstone and that there was a considerable period of erosion in post-De Chelly time and prior to the deposition of the Shinarump is attested from the very irregular contact, with numerous ancient valleys carved in the sandstone, and now filled with Shinarump conglomerate. Fragments of petrified wood are common in the Shinarump.

Chinle Formation

The name Chinle was proposed by Gregory (1) in 1917 to include a group of shales, "marls", thin soft sandstones and conglomerates lying above the Shinarump and below the Wingate formations. This formation although widely distributed in the Colorado Plateau province was named from the type locality in the Chinle valley, immediately west of Canyon de Chelly, where the entire section of 1,182 feet has been measured. The Chinle is usually considered to be the most beautifully colored formation in the Navajo country, certainly it is the most highly colored. These marvelous color effects may be seen in Beautiful Valley along the route north from U. S. Highway 66 to Canyon de Chelly; at Petrified Forest National Monument, east of Holbrook, Arizona; and in the vicinity of Cameron, on U. S. Highway 89, north of Flagstaff, Arizona. The rather pastel tones change with the angle of the sun but they are probably more effective at sunrise and sunset. The sediments are considered to be non-marine and to have been deposited by great shifting streams and in shallow bodies of water. During deposition there were occasional outbursts of volcanic activity in nearby areas with the result that there is considerable volcanic ash in the Chinle and some of the color variations are due to the presence of ash. Fossil vertebrates, fresh-water invertebrates, and quantities of silicified wood have been found in the Chinle which further attest to its non-marine character.

Jurassic (?)

Glen Canyon Group

This group consisting of the Wingate sandstone, Kayenta formation, and the Navajo sandstone contain no diagnostic fossils and are therefore assigned with some question to the Jurassic. They do not occur on the Defiance uplift proper and the details of the formations will therefore be omitted. A ridge of these sandstones form a prominent erosional feature on the west side of the Chinle valley. These massive sandstones are merely a remnant of a much more extensive deposit but rarely fail to attract attention of visitors. It should probably be stated that the uniformly bedded reddish sandstone which separates the Wingate and the Navajo is now called the Kayenta formation. It was formerly known in this area as the Todilto. Zion National Park is carved largely in the Navajo sandstone.

Jurassic

Morrison Formation

Unconformably overlying the Navajo sandstone is the Morrison formation. It is composed of buff, grey and pink sandstones and varies considerably in thickness. It has until recently been largely included in the McElmo formation. Important reptilian remains have been found in

these strata, also non-marine invertebrates and considerable petrified wood. Many complete dinosaur remains have been taken from the Morrison in the vicinity of Dinosaur National Monument in northeastern Utah.

### Cretaceous

Black Mesa to the west of Canyon de Chelly is made up principally of Cretaceous formations, namely, the Dakota sandstone, Mancos shale, and the Mesa Verde group. This is a thick series of grey, yellow, and brown sandstone, and blue-grey or iron grey shale. The strata is drab in appearance and is somewhat monotonous as compared with the highly colored Jurassic and Triassic formations. Coal is mined from Cretaceous rocks on Black Mesa by the Hopis and Navajos. In the Gallup basin, in northwestern New Mexico, there is considerable coal mined for commercial purposes. These strata comprise the section at Mesa Verde National Park, in southwest Colorado, northeast of Canyon de Chelly.

### Quaternary

Recent alluvium, gravels and wind blown sands are in evidence throughout the area.

### Structure

Sedimentary strata are in most instances deposited in a horizontal position. Exceptions to this rule may be found in the walls of Canyon de Chelly where the rocks are cross-bedded and largely eolian in character deposited by the wind. Sediments after deposition are often times uplifted resulting in tilted, folded and broken or faulted strata. Their present attitude, or position, is called the geologic structure and this feature must not be confused with the land surface or the topography of the area since the sub-surface attitude of rocks does not necessarily bear any relationship to the configuration of the earth's surface.

The principal structural feature of the Monument area is, of course, the Defiance uplift. It is an anticline, with axis almost due north and south, extending from near the Santa Fe railroad almost to the Utah line, or a distance of over 100 miles. The structure is 30 miles or more in width. The attitude of the strata on the Defiance uplift are well illustrated by Darton (2) Plate 52, page 148). It will be observed that the last flank is the steeper, is faulted on the southeast, and that the beds then flatten to form the Gallup basin to rise again sharply along the Zuni mountain uplift. To the west, beds forming this flank of the uplift, dip gently at angles of  $2^{\circ}$  to  $4^{\circ}$  to form the great Black Mesa Coal Basin.

Structural considerations are important in a study of the Monument area since it is due to the uplift that streams have been given increased

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CANYON DE CHELLY GEOLOGICAL REPORT (CONT.)

gradient or added power to carve the beautiful canyons of de Chelly, Del Muerto, and Monument as we see them today.

The most detailed study of the structural history of the Navajo country has been made by Gregory (1) and the following is taken from his paper:

"The dates assigned to the several epochs of faulting, folding, and peneplanation during the history of the Plateau province rest on the assumptions that the upwarps trenched by the middle Colorado date from Pliocene, Miocene or late Eocene time. There is reason to believe, however, that the first profound faulting and flexing, which built the horizontal strata into a series of domes and monoclines, occurred at the end of the Cretaceous period....."

- "Among the probable events in the Tertiary and Quaternary history of the Navajo country, the following are recorded:

1. A period of widespread folding associated with regional uplift from the Cretaceous sea. The Defiance uplift was one of the major structural features developed during this period, which is believed to date from the Cretaceous-Tertiary interval.

2. A period of erosion, during which the domes and ridges of Cretaceous rock were much reduced in height and a system of subsequent streams was developed. Earliest Tertiary.

3. A second period of differential warping, perhaps associated with regional depression. On the long slopes and on the floors of the basins thus formed the Eocene beds of continental origin were laid down.

4. Post-Eocene uplift.

5. A period of extensive and long-continued erosion, interrupted by intervals of quiescence and uplifts. During this period most of the Tertiary beds were removed, the present plateau blocks were outlined, and erosion surfaces of low relief were developed.

6. A regional uplift that revived the streams of the region and provided favorable conditions for the cutting of Glen Canyon and its many companions.

7. A period of aggradation - the filling of the rock canyons with alluvium in consequence of regional downwarp or climatic change.

8. A period of degradation - the trenching of gravel floors, of canyons, and of alluvial slopes on mountains.

The filling and trenching of the rock-walled canyons are not events of great antiquity and may have been accomplished within the period of

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## CANYON DE CHELLY GEOLOGICAL REPORT (CONT.)

human occupation. The cutting of Canyon de Chelly, and other profound gorges - gigantic pieces of river sculpture - does not demand a long period of geologic time. The conditions for river erosion in this region are so favorable that even a part of Quaternary time is sufficient."

### Water Facilities

Water for the headquarters area is obtained from a well 100 feet deep. A gravel strata at from 46 to 50 supplies 25 gallons per minute with water level in the well at 20 feet from the top. The well is cased with 6" pipe. A three h.p. engine with deep well pump was installed by PWA in 1936 and supplies from ten to fifteen gallons per minute. From the well the water is pumped through a 1½" pipe line to a 5,000 gallon concrete reservoir which is buried on a hill near the Custodian's residence.

The well seems adequate to meet the requirements of present facilities.

### ROADS AND TRAILS

There is at present a low standard road, about eight miles in length, from headquarters along the rim of Canyon de Chelly to the overlook opposite White House ruins. This road should be improved to enable the hurried traveler some knowledge of the Monument, especially for those who do not go into the canyons. Modern cars could not get over this road at the time of my last visit. Parking area near the overlook has been proposed. The roads leading into the canyons all have to be taken with care and preferably under the guidance of the Custodian.

A horse trail has been constructed in recent years to enable visitors to reach White House ruins from the rim of the Canyon. This trail is about 4,000 feet in length, contains several short tunnels to pass vertical ledges, and was treated with bituminous surface in 1936. No other trails are being considered for the present and I do not see that any are needed.

### SIGNS AND MARKERS

This is one of the few Parks and Monuments that I have visited where I hesitate to recommend construction of signs to call attention of the visitors to geologic features. I feel quite sure that with the small number of visitors at Canyon de Chelly the Custodian will be able to handle the situation, at least for the present, and get across to those who seem interested the main geologic facts which I have endeavored to portray in this paper. This is especially true since I understand that a Park Service representative accompanies all parties on trail and canyon trips. A geologic map of at least the northeast portion of Arizona should be exhibited in the office.

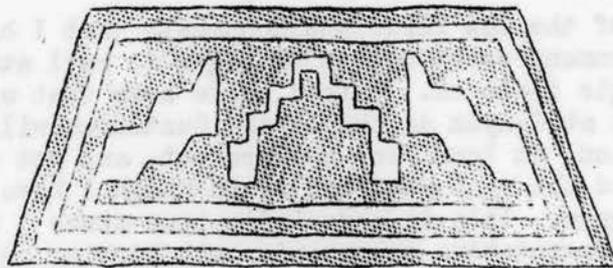
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CANYON DE CHELLY GEOLOGICAL REPORT (CONT.)

It is also suggested that the references included in the attached bibliography be obtained for the Monument library. Those by Gregory (1), McKee (3 and 4) and Baker (6) will supply the geologic facts.

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By Milton Wetherill

Birds seen at Betatakin and Kit Siel

Sharp-shinned Hawk	Cooper Hawk
Western Mourning Dove	White-throated Swift
Red-shafted Flicker	Ash-throated Flycatcher
Western Flycatcher	Northern Violet-green Swallow
Long-crested Jay	Woodhouse Jay
American Raven	Pinyon Jay
Mountain Chickadee	Gray Titmouse
Lead-colored Bush-tit	Rock Wren
Canyon Wren	Western Tanager
Black-headed Grosbeak	Audubon Hermit Thrush
Spurred Towhee	Virginia Warbler

Plants collected July 7, 1937, by Neiclory Begay for a sing to be held at Ushin Elclisco Begay, Hogon, Ca., 1 mile from Marsh Pass up Tsegie Biko:

Cliff Rose : *Corvania mexicana*  
Wild Rose : *Rosa Fendleri*  
Current : *Ribes*  
Gooseberry : *Grossularia*  
Oregon Grape : *Berberis aquifolium*  
Fendlerbush : *Fendlera*  
Skunkbrush : *Rhus trilobate*  
Gambel Oak : *Quercus gambelii*  
Canyon Live Oak : *Quercus chrysolepis*  
Utah Juniper : *Juniperus utahensis*  
Pinyon Pine : *Pinus edulis*  
Douglas Fir : *Pseudotsuga taxifolia*  
Cherry : *Prunus*  
Serviceberry : *Amelanchier*  
Dogwood : *Cornus stolonifera*  
Willow : *Salix* (2 kinds)  
Pentslemon *Eatonii*  
Pentslemon *strictus*  
Paintbrush : *Castilleja* spp.?  
Globemallow : *Sphaeralcea*  
Scarlet Gila : *Gila* spp.?  
Buttercup : *Ranunculus cymbalaria*  
Marsh Grass : *Spartina cynosuroidis*  
Mare tail  
Common Reed : *Phragmites communis*  
Broad Leaf Yucca  
Horned Yucca  
Ya Yucca  
Slim Yucca

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NAVAJO NATURE NOTES (CONT.)

June 30, 1937, birds noted on trip to Hawks Nest, Noki Wash, Navajo Co., Arizona, from Betatakin Ruins, Navajo National Monument, Navajo Co., Arizona, Upper Sonoran Grassland, Upper Sonoran Forest and Transition Zone, a distance of 22 miles.

Sharp-shinned Hawk : *Accipiter velox* (1 pair)  
Cooper Hawk : *Accipiter cooperi* (1)  
Western Mourning Dove : *Zenaidura macroura marginella* (2 pair)  
White-throated Swift : *Aeronautes saxatalis* (Ca. 50)  
Red-shafted Flicker : *Colaptes cafer collaris* (2 others heard)  
Ash-throated Flycatcher : *Myiarchus cinerascens cinerascens* (2 pair)  
Western Flycatcher : *Empidonax difficilis difficilis* (Ca. 70)  
Horned Lark : *Otocoris alpestris* Spc. ? (Several seen, other heard)  
Northern Violet-green Swallow : *Tachycineta thalassina lepida* (6 pair)  
Long crested Jay : *Cyanocitta stelleri diademata* (2, others heard)  
Woodhouse Jay : *Aphelocoma californica woodhousei* (Several seen)  
American Raven : *Corvus corax sinuatus* (6 seen)  
Pinyon Jay : *Cyanocephalus cyanocephalus* (Several small seen)  
Mountain Chickadee : *Penthestes gambeli gambeli* (Ca. 15, others heard)  
Gray Titmouse : *Baeolophus inornatus griseus* (Ca. 30, others heard)  
Lead-colored Bush-tit : *Psaltriparus plumbeus* (Ca. 20 Seen)  
Rocky Mountain Nuthatch : *Sitta carolinensis nelsoni* (3 seen)  
Rock Wren : *Salpinctes obsoletus obsoletus* (10 seen, young and old together)  
Chestnut-backed Bluebird : *Sialia mexicana baridi* (several seen)  
Mountain Bluebird : *Sialia currucoides* (Several seen)  
Meadowlark : *Sturnella* Spc.? (2 heard)  
Spurred Towhee : *Pipilo maculatus montanus* (2 seen)  
Western Vesper Sparrow : *Pooecetes gramineus confinus* (6 seen, others heard)  
Desert Black-throated Sparrow : *Amphispiza bilineata deserticola* (Ca. 10 seen)  
Northern Sage Sparrow : *Amphispiza nevadensis nevadensis* (Several seen)  
Brewer Sparrow : *Spizella breweri* (6 seen)

July 1, 1937, trip from Hawks, Noki Wash, Navajo Co., Arizona, to Navajo Mountain Camp at War God Spring, San Juan Co., Utah. This trip covered Upper Sonoran Grassland, Upper Sonoran Forest, the bottom of Piute Canyon, Lower Upper Sonoran Grassland, with Transition under the Canyon Rim; Navajo Mountain Upper Sonoran Forest, Transition, Canadian and lower Hudsonian

Hawks Nest to head of Piute Canyon:

Turkey Vulture: *Cathartes aura septentrionalis* (2 seen)  
Sharp-shinned Hawk : *Accipiter velox* (1 pair)  
Cooper Hawk : *Accipiter cooperi* (1 seen)  
Western Mourning Dove : *Zenaidura macroura marginella* (2 pair)  
Red-shafted Flicker : *Colaptes cafer collaris* (2 seen)  
Western Flycatcher : *Empidonax difficilis difficilis* (Ca. 15 seen)

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NAVAJO NATURE NOTES (CONT.)

Woodhouse Jay : *Aphelocoma californica woodhousei* (2 seen)  
American Raven : *Corvus corax sinuatus* (3 seen)  
Pinyon Jay : *Cyanocephalus cyanocephalus* (2 small flocks seen)  
Gray Titmouse : *Baeolophus inornatus griseus* (3 seen, others heard)  
Lead-colored Bush-tit : *Psaltripharus plumbeus* (6 seen)  
Canyon Wren : *Catherpes mexicanus conspersus* (3 seen)  
Western Gnatcatcher : *Polioptila caerulea obscura* (2 seen)  
Spurred Towhee : *Pipilo maculatus montanus* (1 pair)  
Desert Black-throated Sparrow : *Amphispiza bilineata deserticola* (8 seen)  
Northern Sage Sparrow : *Amphispiza nevadensis nevadensis* (6 seen)  
Brewer Sparrow : *Spizella breweri* (2 seen)

Head of Piute Canyon, to Navajo Mesa:

Western Mourning Dove : *Zenaidura macroura marginella* (1 pair)  
Woodhouse Jay : *Aphelocoma californica woodhousei* (2 seen)  
Rock Wren : *Salpinctes obsoletus obsoletus* (8 seen young and old together)  
Audubon Hermit Thrush : *Hylocichla guttata auduboni* (2 heard)  
Black-throated Gray Warbler : *Dendroica nigrescens* (1 seen)  
House Finch : *Carpodacus mexicanus frontatis* (4 males, 6 females seen)  
Western Vesper Sparrow : *Poocetes Gramineus confinis* (4 seen)  
Brewer Sparrow : *Spizella Breweri* (6 seen)

NAVAJO MESA TO NAVAJO MOUNTAIN

Gray Flycatcher : (Ca. 20 seen)  
Woodhouse Jay : *Aphelocoma californica woodhousei* (8 seen)  
Pinyon Jay : *Cyanocephalus cyanocephalus* (3 flocks of Ca. 15 each)  
Gray Titmouse : *Baeolophus inornatus griseus* (6 seen)  
Lead-colored Bush-tit : *Psaltriparus plumbeus* (2 seen)  
Chestnut-backed Bluebird : *Sialia mexicanus baridi* (4 seen)  
Mountain Bluebird : *Sialia currucoides* (6 seen)  
Western Gnatcatcher : *Polioptila caerulea obscura* (6 seen)  
White-rumped Shrike : *Lanius ludovicianus excubitorides* (4 pair seen,  
from action they apparently had a nest in the near vicinity)  
Northern Sage Sparrow : *Amphispiza nevadensis nevadensis* (4 seen)  
Brewer Sparrow : *Spizella breweri* (6 seen)  
Screech Owl : *Otus spc.?* (4 heard)  
Broad-tailed Hummingbird : *Selasphorus platyceris* (several seen, others  
heard)  
Red-shafted Flicker : *Colaptes cafer collaris* (2 seen)  
Long-crested Jay : *Cyanocitta stelleri diademata* (Ca. 10 seen)  
Clark Nutcracker : *Nucifraga columbiana* (2 seen)  
Pygmy Nuthatch : *Sitta pygmaea pygmaea* (Ca. 30 seen)  
House Wren : *Nannus* (2 pair seen)  
Western Robin : *Turdus migratorius propinquus* (10 seen)  
Townsend Solitaire : *Myadestes townsendi* (2 seen)

NAVAJO NATURE NOTES (CONT.)

July 2, 1937, Navajo Mountain, War God Spring to top of the Mountain, San Juan Co., Utah. Transition, Canadian and Lower Hudsonian:

- Sharp-shinned Hawk : *Accipiter velox* (1 seen)  
Western Mourning Dove : *Zenaidura macroura marginella* (2 pair)  
Broad-tailed Hummingbird : *Selasphorus platycercus* (several seen, others heard)  
White-breasted Woodpecker : *Dryobates villosus leucothorectis* (1 heard)  
Long-crested Jay : *Cyanocitta stelleri diademata* (Ca. 10 seen)  
Woodhouse Jay : *Aphelocoma californica woodhousei* (2 heard)  
Clark Nutcracker : *Nucifraga columbiana* (2 seen, others heard)  
Mountain Chickadee : *Penthestes gambeli gambeli* (3 seen)  
Gray Titmouse : *Baeolophus inornatus griseus* (4 seen)  
House Wren : *Nannus heimalis pacificus* (2 pair seen)  
Western Robin : *Turdus migratorius propinquus* (Ca. 10 seen)  
Townsend Solitaire : *Myadestes townsendi* (2 seen)  
Spurred Towhee : *Pipilo maculatus montanus* (1 heard)

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MONTEZUM CASTLE  
BIRD NOTES

By Betty Jackson

A list of the birds seen this month follows:

- |                                    |                               |
|------------------------------------|-------------------------------|
| Arizona Cardinal                   | Western Mockingbird           |
| Yellow-billed Cuckoo               | American Merganser            |
| Mourning Dove                      | Texas Nighthawk               |
| White-winged Dove                  | Arizona Hooded Oriole         |
| House Finch                        | Black Phoebe                  |
| Red-shafted Flicker                | Say Phoebe                    |
| Vermillion Flycatcher              | Gambel Quail                  |
| Black-crowned Night Heron          | Cliff Swallow                 |
| Green Heron                        | Desert Black-throated Sparrow |
| Treganza Blue Heron                | Hepatic Tanager               |
| Hummingbird (Ariz. Blue-throated)? | Western Tanager               |
| Killdeer                           | Sonora Yellow Warbler         |
| Arkansas Kingbird                  | Canyon Wren                   |
| Cassin Kingbird                    | Aplomado Falcon ? (Norman)    |

We've seen a lot of young birds this month. On June 26 we got a good look at the baby American Mergansers. They were well feathered, and, though they couldn't seem to fly yet, were very good at diving and swimming. Earl and I were wading up a long hole in the creek, counting the carp population, when we saw the whole family of Mergansers ahead. As we came close to the end of the hole, the old male decided to lead them back between us rather than try to take them to the next hole. He flew over us, and the babies all dove and swam around and between us. One of them had an awful shock when he came up a few feet in front of Earl, instead of on the other side. There were seven of them, and all got by us safely,

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BIRDS AT MONTEZUMA (CONT.)

and with very little fuss.

The same day we saw five baby Green Herons, well able to fly, but extremely clumsy about it. One almost fell out of a tree after lighting there.

A young Kingbird and several young Mourning doves have been seen. The doves are fairly tame, I suppose because they want to put off flying as long as possible, even though they are good at it.

Our Say Phoebe finally gave up her second nest of eggs. On July 1 she was very inattentive, and by the eighth had abandoned the nest and left the vicinity. I wonder if she found out that the young were dead in the eggs. The shells looked dark.

The birds that were missing last month must simply have evaded me, because they are all back again, Vermillion Flycatcher, Texas Nighthawk, and Cliff Swallows. The Great Horned Owl we have heard, but not seen. July 8, I saw the Cliff Swallows wheeling through the air by the cliff west of the Castle, and from the tenth on they have been seen nearly every day around the Castle itself.

On July 15 Norman Jackson first identified the call of the Yellow-billed Cuckoo. It has been around since then, and we were both lucky enough to see it, on the 22nd and 23rd.

Earl and I ran into a covey of baby Quail on the evening of July 19. They were second brood (?) smaller than baby chicks, striped and spotted. The father fussed about and clucked to them and they stayed under a bush, where they were very hard to see. When we moved on, his notes changed, and they came scurrying towards him through the brush. We could only be sure of a count of six, though there may have been more.

On the 23rd, while swimming, I saw a Desert Black-throated Sparrow hopping about among the rocks and brush of the bank. He is one of the very "chic" members of the Sparrow family.

Two last minute bird notes include a tentative identification of a Green-backed Goldfinch and an immature, and of a Swainson Hawk.

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## RUMINATIONS

By the Boss

Chief, it was just four years ago that you took over as Director and our monthly report carried the following as a foreward:

"This is the first monthly report we men of the

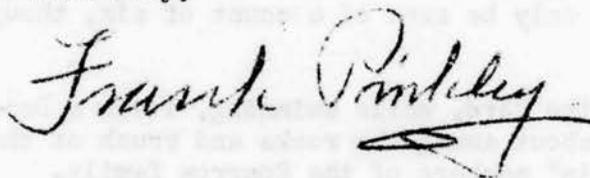
Southwestern Monuments have the pleasure of making to you as Director. May it be the first of a long line of reports reaching down through the coming years!

"Some of us have worked with you for about 14 years and you have bound us to you by your patience, kindness and courtesy. We are your men and we will back you with our money, chalk and marbles. We know the duties we owe to the Government and I believe you will find we will fulfill them always to the best of our ability, but I wish you would feel that after our official loyalty to the Director is given, there is a personal loyalty to you which we wish you would call upon when things look black and you need some extra service not called for in our regular line of duty; you will get it promptly and it will be delivered with a smile."

I don't know that we can add much to that after the first four years service with you as Director, Chief, but there most certainly isn't a word of it that we want to take away; we are still your men and we still have that personal loyalty to you in addition to the official loyalty to your position.

All the hectic days of CWA, WPA and ECW have beaten upon us and gone their way. We have grown beyond any dreams of four years ago; we measure our forces by the thousands now where we measured them by the hundreds then; but I am sure the nucleus of old-timers will join us in wishing you many more years of hard work as the head of the Service.

Cordially,

A handwritten signature in cursive script that reads "Frank Pindley". The signature is written in dark ink and has a fluid, somewhat stylized appearance with a long horizontal stroke at the end.