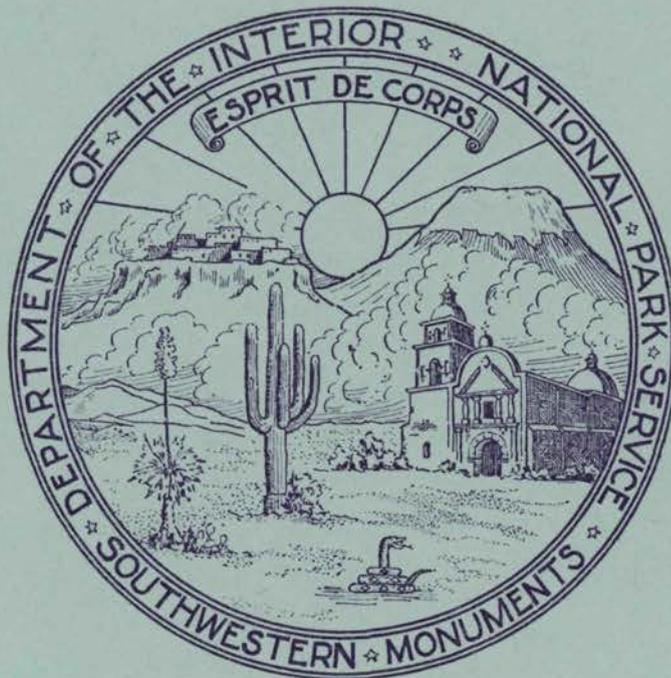


SOUTHWESTERN MONUMENTS

MONTHLY REPORT



D E C E M B E R - - - 1 9 3 7

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DECEMBER, 1937, REPORT INDEX

OPENING, by Superintendent Pinkley 415

CONDENSED GENERAL REPORT

Travel	417	400 Flora, Fauna, and Natural Phenomena	420
700 General.	418	500 Use of Monument Facil- ities by the Public	421
100 Administration	418	600 Protection.	421
200 Maintenance, Improvements and New Construction	419	700 Archeology, Hist., Pre-Hist..	421
300 Activities of Other Agen- cies in the Monuments.	420	800 Miscellaneous	421

REPORTS FROM MEN IN THE FIELD

Arches	433	El Morro.	444
Aztec Ruins.	427	Gran Quivira.	455
Bandelier.	448	Merriam Turkey.	450
Bandelier CCC.	452	Montezuma Castle.	460
Bandelier Forestry	454	Natural Bridges	454
Bandelier Ruins Stabilization.	453	Navajo.	428
Birds at Montezuma Castle.	463	Pipe Spring	433
Canyon de Chelly	440	Rainbow Bridge.	431
Capulin Mountain	437	Tonto	441
Casa Grande.	466	Tumacacori.	443
Chaco Canyon	456	Walnut Canyon	437
Chiricahua	429	White Sands	423

HEADQUARTERS

Branch of Education.	470	Mobile Unit	472b
Visitor Information.	471		

THE SUPPLEMENT

Archeological Report on the Stabilization of Reconstructed Talus House, by J. W. Hendron.	478
Geological Report on Natural Bridges National Monument, by C. N. Gould.	473
Library List (continued)	485
Ruminations, by The Boss	495

Semi-annual Volume Index	472e
------------------------------------	------

SOUTHWESTERN MONUMENTS PERSONNEL

HEADQUARTERS, Southwestern Monuments, Coolidge, Arizona: Frank Pinkley, superintendent; Hugh M. Miller, assistant superintendent; Parke Soule, chief clerk; Millard Singerman and Luis A. Gastellum, clerk-stenographers; J. H. Tovrea, assistant engineer; Dale S. King, assistant park naturalist; Charlie R. Steen, junior park archeologist; Natt N. Dodge, junior park naturalist; Ira G. Goodwin and William Sharpe, CCC clerks; F. E. Stonehocker, machinist; J. L. L. Baehr, utility man.

<u>FIELD STATIONS</u>	<u>AREA</u> in Acres
1. <u>Arches</u> - Moab, Utah; Harry Reed, custodian - - - - -	4,520.00
2. <u>Aztec Ruins</u> - Aztec, N. M.; T. C. Miller, custodian - - -	25.88
3. <u>Bandelier</u> - Santa Fe, N. M.; C. G. Harkins, custodian - -	26,026.20
4. <u>Canyon de Chelly</u> - Chin Lee, Ariz.; Johnwill Faris, cu. -	83,840.00
5. <u>Capulin Mountain</u> - Capulin, N. M.; Homer Farr, custodian -	680.37
6. <u>Casa Grande</u> - Coolidge, Ariz.; A. T. Bicknell, custodian; David J. Jones, park ranger; John Cocks, James Rogers, Strimple Coyle, Marvin Hale, CCC guides - - - - -	472.50
7. <u>Chaco Canyon</u> - Chaco Canyon, N. M.; L. T. McKinney, cu. -	21,512.37
8. <u>Chiricahua</u> - Douglas, Ariz.; Frank L. Fish, custodian; Homer Bennett and William Stone, CCC guides - - - - -	4,480.00
9. <u>El Morro</u> - Ramah, N. M.; Robert R. Budlong, custodian - -	240.00
10. <u>Gila Cliff Dwellings</u> - Cliff, N. M.; No custodian - - - -	160.00
11. <u>Gran Quivira</u> - Gran Quivira, N. M.; George L. Boundey, cu.	610.94
12. <u>Hovenweep</u> - T. C. Miller, Aztec, N. Mex., in charge - - -	285.80
13. <u>Montezuma Castle</u> - Camp Verde, Ariz.; Earl Jackson, custodian; Jesse D. Jennings, park ranger - - - - -	560.00
14. <u>Natural Bridges</u> - Blanding, Utah; Zeke Johnson, custodian	2,740.00
15. <u>Navajo</u> - Kayenta, Ariz.; John Wetherill, custodian; Milton Wetherill, park ranger-historian - - - - -	360.00
16. <u>Organ Pipe Cactus</u> - Ajo, Arizona; no custodian - - - - -	330,670.00
17. <u>Pipe Spring</u> - Moccasin, Ariz.; Leonard Heaton, actg. cu. -	40.00
18. <u>Rainbow Bridge</u> - Tonalea, Arizona; no custodian - - - - -	160.00
19. <u>Saguaro</u> - Tucson, Arizona; no custodian - - - - -	63,284.00
20. <u>Sunset Crater</u> - Flagstaff, Arizona; no custodian - - - - -	3,040.00
21. <u>Tonto</u> - Roosevelt, Ariz.; Thomas Onstott in charge - - - -	1,120.00
22. <u>Tumacacori</u> - Box 2225, Tucson, Ariz.; L.R. Caywood, cu. - -	10.00
23. <u>Walnut Canyon</u> - Flagstaff, Ariz.; Paul Beaubien, junior park archeologist - - - - -	960.00
24. <u>White Sands</u> - Alamogordo, N. Mex.; Tom Charles, custodian; James B. Felton, park ranger - - - - -	142,987.00
25. <u>Wupatki</u> - Flagstaff, Arizona; no custodian - - - - -	35,865.30
26. <u>Yucca House</u> - Cortez, Colo.; T. C. Miller, Aztec, N. Mex., in charge - - - - -	9.60
Total area (in acres) - - -	724,659.96
(1,132.2 square miles)	

OPENING

By Frank Pinkley, Superintendent,
Southwestern Monuments, Coolidge,
Arizona.

Dear Mr. Director:

December as a whole over the district has been good without taking any prizes. Christmas business over our whole district has been reported as good to excellent. In the southern part of the district, the cotton crop is being gathered and marketed and money is changing hands freely but the greater part of it is paying debts and straightening up accounts, the growers complaining that there has been little or no profit in the crop this year.

Winter tourist traffic is coming into the Phoenix and Tucson country but is expected to be much heavier after the first of the new year. It is too early to say yet whether it will be heavier than last year; our southern monuments do not show, on the whole, that the traffic is or will be heavier.

Few personnel changes occurred. Mr. H. Summerfield Day, Ranger at Aztec National Monument resigned, leaving the monument the 15th. At Casa Grande, Stremple Coyle was added to the roll as a CCC guide. At Chiricahua, Elijah Alton, a CCC guide, was replaced by William Stone. At Natural Bridges, Zeke Johnson has changed from a full-time resident employee to a part-time basis and is in Salt Lake City. Johnwill Paris at Canyon de Chelly and George Boundey at Gran Quivira have returned to duty from annual leave. Custodian Caywood returned to duty at Tumacacori from his work at Berkeley. Mr. J. L. L. Baehr, headquarters handy man, was on sick leave several days during the month.

Working conditions for personnel have improved considerably in the last few months with the purchase of several new cars to replace very old equipment. This month saw new oil burning stoves installed at Tumacacori and a refrigerator at Walnut Canyon.

We were unavoidably undermanned during the month at Tumacacori and had bad housing conditions at Navajo, El Morro, and Walnut Canyon. We had bad water conditions at El Morro and White Sands.

Finances continued to worry us and we continue to watch all possible corners. It looks like we may whangle through the fiscal year under the present handicaps but if anything else comes up between now and June 30 which will cost us money, we are sunk.

Construction work continues at our CCC camps at Bandelier and Chiricahua. At Bandelier the new Lodge group of buildings as a whole are beginning to take shape and we think we are getting something there of which you can be very proud. The work at Chiricahua is holding up the same high standard which you saw upon your visit last fall.

We have brought a spur camp from Chiricahua up to Casa Grande, a matter of over 200 miles, and it is now settled down and beginning to

OPENING (CONT.)

turn out work. We had to get special permission for this spur camp and think it is the longest distance a spur camp is being operated in the country.

We have a mobile unit of 24 Indian boys in a CCC camp at Chaco Canyon doing some fine ruins stabilization work. So far as we know, this is the only camp of its kind in the United States. We are working it in cooperation with the Indian Service and we find them just as fine to work with as the Forest Service.

We might call your attention to the fact that we are running one CCC camp at a distance of about 600 miles, another at a distance of 200 miles, and the Mobile Unit is working at present about 300 miles from our headquarters. For the two camps, we keep a complete check of finances, stores, equipment, etc., at headquarters. We think this is about the longest distance operation of CCC camps in the country. While this long distance operation naturally increases the paper work, these two camps do not have their efficiency decreased thereby but are known as outstanding camps in the Southwest by the inspectors, auditors, and other general officials who visit the various camps in the district.

Our real problems are not at the points where we have CCC camps but at the monuments where we do not have them. We are going behind year by year on construction because we cannot get construction money in our regular appropriations; we have not yet been able to share enough in the emergency funds, and we cannot use CCC camps because of the comparatively small size of our projects. Among such problems a typical example is the great need of a house, garage, and water supply at El Morro National Monument. Another would be a similar set-up at Navajo National Monument: another set-up at Wupatki: another at Walnut Canyon, and so it goes.

Please note the amount of this monthly report which is given to the real thing upon which the Park Service is founded: protection and visitors. This is not accidental. In any report to you we must deal with technical matters of construction, finances, general personnel, etc., but I think you will see through this report more than any other which comes to you an intense interest in the visitor, what he is doing, where he is going, how best to reach him through museums, guided trips, and so on. And this is as it should be, for without the visitor, the Park Service would have little need for existence.

Cordially,


Frank Pinkley,
Superintendent.

CONDENSED REPORT

IN WHICH ARE GIVEN THE HIGHLIGHTS OF THE MONTH

Coolidge, Arizona,
January 1, 1937.

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

Dear Mr. Director:

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

<u>TRAVEL</u>	<u>Dec.</u> <u>1937</u>	<u>Dec.</u> <u>1936</u>	<u>Dec.</u> <u>1935</u>	<u>Travel year</u> <u>To Date</u>
Arches	50	----	----	236
Aztec	503	576	391	2,156
Bandelier	263	227	180	2,178
Canyon de Chelly	4	----	23	198
Capulin Mountain	300	800	500	2,000
Casa Grande	2,931	3,052	2,185	8,077
Chaco Canyon	87	220	330	612
Chiricahua	265	273	120	1,709
El Morro	73	75	----	459
Gila Cliff Dwelling	0*	----	----	25
Gran Quivira	199	174	200	610
Hovenweep	0*	----	----	0
Montezuma Castle	403	512	568	1,842
Natural Bridges	0*	----	----	147
Navajo	2	----	----	74
Organ Pipe Cactus	700*	----	----	2,100
Pipe Spring	142	92	214	409
Rainbow Bridge	0*	----	----	66
Saguaro	2,000*	1,000	----	5,100
Sunset Crater	200*	141	55	1,383
Tonto	360	252	362	860
Tumacacori	846	1,375	1,311	2,550
Walnut Canyon	270	280	283	1,655
White Sands	1,830	3,864	1,840	15,001
Wupatki	75	108	63	250
Yucca House	0*	----	----	70
Totals	<u>11,503</u>	<u>13,021</u>	<u>8,525</u>	<u>49,787</u>

* Estimated

Travel for the month of December shows a decrease over that for December, 1936, and also a drop from the attendance at our monuments

CONDENSED REPORT (CONT.)

in November, 1937. A detailed discussion of the possible causes of this decrease is made on pages 471 and 472-a of this report. Travel statistics for December are tabulated on Page 472.

000 GENERAL

010 Matters of Unusual Interest or Importance.

Tumacacori: The new combined Administration Building and Museum has been completed and accepted by the Superintendent (see p. 443).

Chaco Canyon: A survey of the various ruins in the monument by the custodian indicates that the weather has damaged several of them and that there is certainty of considerable loss in the near future. (See p. 457-8).

020 Weather

Throughout the area in which the Southwestern Monuments are located, weather conditions appear to have been unusually uniform with warm sunny days during the first part of the month and storms and cold winds the latter portion. This has been especially true in the northern and high-elevation monuments. In the southern monuments, the weather has been warmer than normal throughout the month.

022 In Approaches

Chiricahua: The Onion Saddle road is reported blocked by snow and will probably be closed until next April (See p. 429).

100 ADMINISTRATIVE

123 Visits by National Park Service Personnel

Aztec Ruins: J. Faris, W. Yeager.

Bandelier: Erik Reed, F. Russell, R. Ferris, L. C. Fuller, A. Merkle, H. Cornell, M. F. Christianson, M. J. McCalm, J. Diehl, H. E. Rothrock, W. H. Wirt, W.W. Yeager, H.L. Bill, F.H. Strieby, F. L. Cook, and Hugh Miller.

Canyon de Chelly: R. Budlon, J. Tovrea, C. Richey.

Casa Grande (and Headquarters): Al Keuhl, Bill Butler, W. J. Lippincott, C. Richey, Paul Franke, Bill Leicht, Earl Jackson, Jesse Jennings, George Boundey, Jim Felton, Louis Caywood, Jack Haile, Bill Stevenson.

Chaco Canyon: Cal Miller.

Chiricahua: Hugh Miller, T. Strieby, C. Richey, J. H. Tovrea.

El Morro: Erik Reed.

Montezuma Castle: Chuck Richey, J. Tovrea.

Pipe Spring: Al Keuhl, Cliff Presnall.

Tonto: J. Tovrea, Chuck Richey.

Tumacacori: Supt. Pinkley, Hugh Miller, J. Tovrea, C. Richey, C. Macquire, David Jones, Parke Soule, Luis Gastellum, Natt Dodge, William Butler.

Walnut Canyon: David Jones.

White Sands: C. N. Gould, W. B. MacDougal, Lyle Bennett, Charles Richey, Cecil Doty, J. E. Kell, E. A. Pesonen, George Boundey.

CONDENSED REPORT (CONT.)

150 New Equipment

Chiricahua: One Electrolux refrigerator

Walnut Canyon: One Electrolux refrigerator.

Tumacacori: Two oil-burning heaters.

Casa Grande: Nine oil-burning heaters, one Chevrolet Coach, three refrigerators, two washing machines and ironers (see p. 468).

170 Plans, Maps, and Surveys

Pipe Spring: Due to the approval of a new main highway which will pass near the monument, a re-location of the residential area has been made on the Master Plan (see p. 436-7).

Bandelier: Plans for the proposed telephone line have been completed (see p. 452).

180 Publicity

Montezuma Castle: A two-column head feature story regarding Montezuma Castle appeared in the "Commonwealth Reporter" of Fond du Lac, Wisconsin (see p. 462).

200 MAINTENANCE, IMPROVEMENTS, AND NEW CONSTRUCTION

210 Maintenance, unusual

Pipe Spring: Irrigation ditches have been lined with clay (see p. 435).

Walnut Canyon: The cistern underwent a thorough cleaning (see p. 438).

Bandelier: Much needed highway repairs have been made in the Detached Section (see p. 449).

El Morro: Penciling of inscriptions has been carried out as a protective measure against weather (see p. 446).

220 Improvements

Pipe Spring: Tools and other equipment have been moved out of the old fort room into the new equipment shed thereby making the old room available for public showing (see p. 435).

Chaco Canyon: A new cess pool is being dug (see p. 460).

230 New Construction

Pipe Spring: The garage and gas house was completed (see p. 434).

Montezuma Castle: One thermometer shelter (see p. 402).

Canyon de Chelly: The new equipment shed is progressing well (see p. 440).

231 CCC Construction

Bandelier: Eight pieces of furniture were completed (see p. 453). The concrete reservoir is almost complete. Walls on Unit #2, Hotel Development, were completed to four feet. Five rooms of the employees' dormitory were completed to lintel height. In the Community House, 110 rooms were completed by the Ruins Stabilization Crew (see p. 452).

Casa Grande: Sufficient adobe bricks have been made to erect one building (see p. 469).

Mobile Unit: Forty one cubic yards of masonry, 160 sq. yards of veneer replaced, and 15 sq. yards repointed (see p. 472-b).

300 ACTIVITIES OF OTHER AGENCIES IN THE MONUMENTS

CONDENSED REPORT (CONT.)

310 Contractors

Chaco Canyon: The Springstead Trading Company (on private land) sold out to A. E. Tanner (see p. 459).

320 Cooperating Agencies

Chaco Canyon: The Soil Conservation Service is continuing maintenance work and plans extensive projects (see p. 459). The School of American Research party has completed the main building and ten hogans and has begun work on the eleventh hogan (see p. 459).

350 Donations and Accessions

Montezuma Castle: Two flat-topped museum cases and one stuffed rattlesnake in lifelike pose (see p. 463).

400 FLORA, FAUNA, AND NATURAL PHENOMENA

410 Ranger, Naturalist and Guide Service

Aztec Ruins: Ranger-archeologist Day resigned Dec. 15 (see p. 428).

Casa Grande: Stremple Coyle and Marvin Hale were added to the guiding force. The work of the CCC guides has shown interesting possibilities (see pgs. 466 and 471-a).

Chiricahua: William Stone replaced Elija Alton as CCC guide (see p. 430).

420 Museum Service

El Morro: Although without building or equipment, the custodian has been showing slides and giving talks (see p. 445).

Tonto: The addition of nine pieces of pottery has increased the visitor interest in the museum (see p. 442).

Tumacacori: The completed museum building is ready for the installation of displays being made at Berkeley (see p. 443).

440 Insect Control

Aztec Ruins: Seasonal control measures were started (see p. 428).

460 Birds

Bandelier: An extensive discussion of the Merriam Turkey written by the custodian begins on page 450.

Gran Quivira: Many birds have been observed coming in for water. The horned owls are cutting down the overpopulation of rabbits. (See p. 456).

Headquarters: In bird-banding operations, 107 birds have been handled (see p. 471).

Montezuma Castle: The longest list of birds yet recorded was observed with 31 species identified and three undetermined species seen (see p. 463).

Navajo: In bird-banding activities, 117 individuals were handled. A list of resident species observed is given on page 429.

Walnut Canyon: Thirty-three birds were banded (see p. 439).

470 Animals

Capulin Mountain: Porcupines were numerous and have been damaging the trees. Deer caused inconvenience by rolling rocks onto the road (see p. 437).

CONDENSED REPORT (CONT.)

Gran Quivira: Deer and other animals migrating into vicinity of monument as forced down by snow in mountains (see p. 456).

Montezuma Castle: Pack rat in nest building stocks up on nails (see p. 462) Lizard and snake observed in December (see p. 462-3).

480 Miscellaneous

Pipe Spring: The acting custodian reports that there is considerable interest still being shown in the new cactus discovered last spring (see p. 436).

Gran Quivira: A heavy pinyon crop has been a boon to wild life (see p. 456).

500 USE OF MONUMENT FACILITIES BY THE PUBLIC

510 Increase or Decrease of Travel

Walnut Canyon: Snow on December 20 marked the beginning of the winter season with a sharp falling off of travel (see p. 437).

Aztec Ruins, Tonto, and Montezuma Castle report decreases over the travel of December, 1936, and the custodians are puzzled as to the reason. (See, respectively, pages 427, 441, and 460).

600 PROTECTION

630 Accidents

Tumacacori: Several persons were injured, none seriously, in an automobile accident occurring on the highway at the monument gate, (see p. 444).

650 Signs

Walnut Canyon: A new set of directional signs is under construction (see p. 438).

White Sands: Nine home-made directional signs have been installed (see p. 426). The State Tourist Bureau has erected an attractive marker directing tourists to the monument entrance (see p. 424).

700 ARCHEOLOGY, HISTORY, AND PRE-HISTORY

Walnut Canyon: A group of Hopi Indians report several ruins, previously considered as rooms, to have been used as pits for roasting pinyon cones (see p. 438).

900 MISCELLANEOUS

Arches: Contrary to the established opinion, one visitor states the belief that winter is the best season for a visit to this area (see p. 433).

Aztec Ruins: Approach roads are reported as in the best condition in the history of the monument (see p. 427).

Chaco Canyon: Some pot hunting is reported as going on at the distant ruins (see pages 456-7-8).

Chiricahua: The U. S. Forest Service has been investigating proposed boundary extensions of the monument (see p. 430).

Montezuma Castle: A new son has arrived at the home of the custodian (see p. 469). A thunder storm occurred in the midst of a winter day (see p. 461). Prehistoric skulls have been photographed

CONDENSED REPORT (CONT.)

in preparation for a paper to be read at a dentists' convention.

Navajo: An unusual Navajo Indian ceremony was held near Kayenta (see p. 428).

Rainbow Bridge: A report of the placing of the plaque which announces the discovery of Rainbow Bridge is given on page 432.

Tonto: "Intelligent" cattle break pipe line to get water (see p. 442).

Walnut Canyon: The U. S. Forest Service is making an extensive study of plants of the Pinyon-juniper association in areas adjoining the monument (see p. 438).

White Sands: Highway 70 through the monument is very rough and corrugated (see p. 425). Two truckloads of "sand" have been furnished to the Hot Springs Hospital for Crippled Children for the sand tables (see p. 424).

MAIL COUNT

Incoming:		
Official	1,843	
Personal	<u>2,057</u>	
Total incoming		3,900
Outgoing:		
Official only	<u>2,852</u>	
Total outgoing		<u>2,852</u>
TOTAL POSTAL MAIL		6,752
Telegrams:		
Incoming	34	
Outgoing	<u>13</u>	
Total telegrams		<u>47</u>
GRAND TOTAL PIECES OF MAIL HANDLED		6,799

Cordially,

Frank Pinkley,
Superintendent.

YOU ARE NOW IN
- DANGER -

of being dropped from the mailing list of the Southwestern Monuments Monthly Report!

Of course we realize this may mean nothing in your young life and if such is the case, yours is the name we are gunning for: if you don't want or need the Monthly Report, we most certainly don't want you to have it because we have a waiting list of persons who do want or need it.

The Monthly Report is not propaganda: it is a report to the Chief of our Service in Washington, telling what we have done during the month which it covers. Since we have a far-flung organization, we have to put out about forty copies of the Report so our own men may keep up with the current events of our work. Thirty or forty libraries have thought there was some historical value about it and have asked to be put on the mailing list. A number of other people, interested in one way or another in the Southwest, have asked us to include their names. I think every address on our list has been put there either for an official reason or upon written or verbal request. Yet I may be wrong and we may be bothering someone with a report he doesn't want, and above all we do not want to do that.

What we propose to do is this: We will give you this copy and one more and then, if we don't get the card which we are printing at the bottom of this page from you, asking us to keep your name on the mailing list, off you go into the outer darkness. If this report isn't worth that much trouble to you, it isn't worth our while to make an extra copy and put it into the mail for you and we will stop. There will be no other chance and we will not urge you again; we are giving sixty days leeway to those who may be away from home or may otherwise not get their mail promptly, then we are going to start a new mailing list with these returned cards and throw the present list away; every name on the new list must have asked to be put there.

Cordially,

Frank Pinkley
Frank Pinkley,
Superintendent.

Please continue to send a copy of your monthly report to the address given below. ()

You may discontinue sending a copy of your monthly report to the address given below. ()

Name

Street or Box Number

City

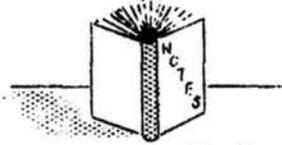
State

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, \$300

Superintendent,
Southwestern Monuments,
National Park Service,
Coolidge, Arizona.

FIELD REPORTS

FROM THE MEN ON THE JOB



WHITE SANDS

By Tom Charles, custodian,
Alamogordo, New Mexico.

It surely seems nice to lean back in the swivel chair and say, "See the Ranger out at the Sands about that; he will look after you." I do not know whether I am most impressed with the convenience or the dignity of the situation. But it seems to me that it is going to work out to the advantage of the monument and every one connected with it to have Jim and Margaret there at the headquarters.

In looking over Jim's report, I find that he has stolen most of my usual "thunder", but I am glad to cut my report in proportion to the amount of increase by his. I am especially glad to shift this visitor count to him 'though it is evident now that he is going to "knock my ears down" a bit.

Jim's estimate for the month was 1,830 visitors. The registration is 664. On the percentage established by Barry Mohun, 14 percent registration, the 664 registered would give us 4,742 visitors. So you can see there is some difference in calculation. Just to get the figures before you again, I want to call to mind that Barry counted 59 days, 8 hours a day, a total of 472 hours. He used a powerful field glass and counted from the hill east of the road that commanded a perfect view from Ridinger's station to the entrance into the sands. His records are meticulous and I have no doubt they are correct. On the 59 days counted, only 14 percent of the visitors registered.

Mohun's count is by far the most extensive one ever made at White Sands. There are many things yet which tend to support it. For instance, last Sunday there were 22 cars at the turn-around between 11 a. m. and about 4:15 p. m., practically 110 people; yet the book shows that only 21 registered all day. At least half of those who registered were personally requested to put their names on the book.

So, as a sort of farewell in this counting business, permit me to suggest that until the traveling public is routed in front of the new buildings and the visitors are actually tallied in, with at least an 18-hour a day count, there is going to be more or less guesswork with the influence of the inspiration, indigestion, and the various things that contribute.

WHITE SANDS (CONT.)

Our public relations department seems to have been a little slow this month. We had a letter from Fred Healey, state administrator for the W. P. A., in which he says, "I want to compliment you and the men working on the White Sands Project for the splendid work they have done. The adobes in the buildings are some of the best I have ever seen; the architectural designs and the entire layout is a splendid exhibition of what can be done with a little thought and effort."

Governor Tingley got two large truck-loads of white sand for the sand tables at the Hospital for Crippled Children at Hot Springs this month and the editors of DESERT, the new magazine published at El Centro, California, asked for pictures to illustrate a forthcoming article on White Sands in their popular magazine. The Magnolia Oil Company has definitely selected a picture of the Sands to use as one of their 12 National Attractions for the 1939 calendar, and the State Tourist Bureau and Highway Department have erected the White Sands marker at the fork of the roads, Federal 54 and Federal 70. It is a beautiful marker. The White Sands is one of about 18 or 19 state attractions selected by the Tourist Bureau. Frances Green, stenographer for Johnie Stevens at White Sands, was elected queen of Alamogordo for the coming El Paso Sun Carnival.

So, despite real winter weather for our section and the rain and the snow at the other ends of our roads, we have nothing to complain of. We have an over-abundance of Christmas cheer and good will for every one and especially for the home office and the co-workers in the Southwestern Monuments.

WHITE SANDS RANGER PROBLEMS

By James B. Felton, ranger,
Alamogordo, New Mexico.

TRAVEL

As you may guess, my first ten days on the job were rather hectic. Visitors didn't see very much of the new ranger, nor he of the visitors. After the loose ends were gathered, study began on the problem of contacting and counting visitors at the Sands. Please do not think, Boss, that I am satisfied with my figures or methods. They are not very accurate. Six hundred sixty four visitors registered. Seventy percent of these came over week ends. On Sunday, November 28, my first full-day count was made. A total of 202 cars travelled Highway 70. Sixty-seven of these cars drove into the monument bringing 268 people. In addition, nine cars stopped along the road where it skirts the Sands. There were 27 visitors in this group, making a total of 295 persons for the day. My records for the remainder of the month show 1,535 visitors in 383 automobiles: a grand total of 1,830 visitors.

This represents a considerable decrease from the estimated number. The reason, I am quite certain, lies in the 14 percent registration

WHITE SANDS (CONT.)

estimate. For the time being, I find, by checking the register with the cars coming into the monument, that at least 50 percent of our out-of-state visitors are leaving their names on the registration book. Weather conditions have caused some drop in the number of dudes.

After the heavy snow in the mountains, we had no visitors for a day. Only two cars appeared on the following day. In giving a travel figure for this period, we estimated the number for six days when there was no count. Mr. Charles' record for Sunday the 23rd and Thanksgiving added to mine, I feel, come very close to the correct totals.

GENERAL

We arrived in Alamogordo November 18 and fell into the hands of Mr. and Mrs. Charles. It certainly was fine to have a place just like home opened to us. We enjoyed four days of gracious hospitality with them before we were able to make camp in our new house. Even so, it seemed necessary that I go into the plumbing and electrical business if we were to use the kitchen and bath. With the conduit in place, stove operating, and with running water, we were somewhat settled by the 28th.

While I am writing this, the W. P. A. boys are giving our home some of the finishing touches--floor polishing and waxing being the order of the day.

When the cold north wind raises the sand and dust in the air, I find this New Mexico winter a true bone-cooler for a native Arizona desert dweller. The sunny Santa Cruz valley with its balmy air is not forgotten; however, the White Sands have a beauty all their own and, in the bright sunlight of today, they are a match for the snow-topped mountains to the east.

ROADS AND WEATHER

Most of the month ideal weather prevailed; however, in the past ten days rain, snow in the mountain districts, and cold north winds brought winter down upon us.

The State of New Mexico maintains highway 70 through the monument. In spite of constant attention, this road is rough and corrugated. Little or no surface materials remain, and no amount of grading seems to improve this unpaved 29 mile section. As the present location of 70 is a temporary route, we expect visitors will have to grin and bear with us until the new highway is constructed.

Mr. Shepperd worked full time on our five miles of clay surface road. Several sandy turns and a few narrow places caused by drifting sand were given needed attention. Clay surfacing was added to the

WHITE SANDS (CONT.)

soft spots and on the loose turns. Two old garbage dumps have been obliterated in conjunction with highway maintenance.

IMPROVEMENTS

Nine (Beaubien type) signs were made to be placed along the monument highway. Visitors are now informed that the paved road that springs up out of the wastes is a "Loop drive to the White Sands". With one of these informational markers on each side of the junction of 70 and the "black top", our travelers now either drive into the monument or plunge on their way to Alamogordo or Las Cruces. These cross-roads caused a great deal of confusion before the signs were erected. Our other seven signs replace the unsightly old markers on the clay surfaced road.

NATIONAL PARK SERVICE VISITORS

Dr. Charles N. Gould and Dr. W. B. MacDougal were here for a day to look over White Sands geological and wildlife problems.

Lyle Bennett was practically a resident architect during most of the month.

Charles A. Richey and Cecil Doty were other architects visiting the monument.

Regional Officers J. E. Kell and E. A. Pesonen were here on business with the RD.

Mr. George L. Boundey (our nearest Park Service "compadre") with Mrs. Boundey and children visited the Sands.

*****SWM*****

We want to say right here, Chief, that we are not going to hold this first month's count against Tom and his estimator. He was doing the very best he could and that Berry Mohun count, upon which his estimates were based, was made as carefully as was possible. That count was probably made at the height of the visitor season, while Jim's count last month might have been in the off season. At any rate, we will find out something about it in the next few months. One thing seems certain to us at this distance and that is Jim's count is too low as rendered, but we will let it go in without correction. What we feel like doing is striking an average between the two methods of figuring; like that Franchman who was making a 50 percent hash by mixing one horse with one rabbit.

We had a right good treasure hunting story break at White Sands lately and for a time we had strong hopes for some publicity, but the

WHITE SANDS (CONT.)

hunter proved to be much more loco than the average so we couldn't build anything that would hold together. We are going to play up the next case of mild treasure hunting that comes our way at Tumacacori, Gran Quivira, or White Sands; we have let several of them get by in the past without much comment.

Jim and Margaret Felton were in at Headquarters the other day and to hear them talk, you would think they had the finest monument in the whole Southwest. Jim wasn't any too pleased with the Park Service Bulletin description of the wall around his parking area wherein it was mentioned as a 'dobe corral. It is really just another of those walls the architects like so well; they generally start our administration group plans by building a wall and then putting some buildings behind it.--F. P.

*****SWM*****

AZTEC RUINS

By T. C. Miller, custodian,
Aztec, New Mexico.

GENERAL

Approach roads to this monument have been in better shape during the month of December than ever before in history. Highway U. S. 550 from Aztec to Farmington has been completed and the gravel is setting up nicely. We have had enough moisture to help pack the road. The new graveled road from U. S. 550 to the monument headquarters has packed almost as hard as pavement. However, with all the good roads and excellent weather, we show a small decrease in travel comparing it with the corresponding period of last year. This I am unable to explain.

TRAVEL STATISTICS

Total Travel- - - - -	-503	Foreign Countries- - - - -	1
Cars- - - - -	-170	Number of field trips- - - - -	97
Number of States- - - - -	21	Number of museum talks - - - - -	-102
Total guide time in field -2675		Total guide time in museum - -	2090
minutes.		minutes.	
Total conducted tours - -	-4765	minutes.	

WEATHER STATISTICS

Max. temp.- - - - (Nov. 24)	59°	Min. Temp.- - - - (Dec. 21)	8°
Total precip. - - - - -	.33	Greatest precip. in 24 hrs..	.15 in.
Clear days- - - - -	16	Cloudy days - - - - -	7
Partly cloudy days- - - - -	7		

AZTEC RUINS (CONT.)

NATIONAL PARK SERVICE OFFICERS

Mr. and Mrs. Homer F. Hastings, seasonal ranger, Chaco Canyon, and Custodian Faris, Canyon de Chelly, were here November 25. W. Ward Yeager from the regional office in Santa Fe was here to initiate seasonal insect control December 4.

PERSONNEL

H. Summerfield Day, ranger archeologist, resigned effective December 15. Mr. and Mrs. Day are now spending their accumulated annual leave in Chicago.

MONUMENT INSPECTIONS

Two trips were made to Chaco Canyon under dates of December 7 and 19. The inspection trip to Hovenweep and Yucca House had to be postponed this month due to the vacancy in personnel mentioned above in this report.

*****SWM*****

It is too bad about the resignation of Mr. Day. It takes us so long to get a man and break him in that we hate to see him quit. Likewise on the man's side: he is at considerable expense in both time and money to try out in the position and it is too bad to lose it all by drawing out. We try to put our needs in the coldest terms we can in taking on new men but despite that men come to us expecting to do research work in archaeology whereas what we are really seeking is an archaeological salesman, if there were such a profession.--F. P.

*****SWM*****

NAVAJO

By Milton Wetherill, park ranger,
Kayenta, Arizona.

December has been quiet with the usual work-around the monument, such as working the trail and patching up the roads. I have worked the road in several places in order to make the trip without tearing up equipment.

December weather for northern Arizona has been mild with about half the days partly cloudy or cloudy. There was one light snow of about two inches which followed six hours of light rain.

A Navajo ceremony, "Ho-zha-nie Ha-ta-lie", was held near Kayenta starting December 7 and ending the 15th. This ceremony is not held very often, as very few Navajos know it. Therefore it has nearly died out. It is a nine day ceremony with sandpaintings the last four days. The sandpaintings are made after sunrise and destroyed before sunset.

NAVAJO (CONT.)

BIRDS AT BE-TA-TA-KIN

Birds at Be-ta-ta-kin, Navajo National Monument, Navajo County, Arizona, are winter residents and year-around residents.

Rocky Mountain Nuthatch	Shufeldt Junco
Rocky Mountain Chickadee	Montana Junco
Gray Titmouse	Pink-sided Junco
Long-crested Jay	Gray-headed Junco
Woodhouse Jay	Red-backed Junco

Birds Banded:

Junco oregonus montanus	- - - - -	-14
Junco oregonus shufeldti	- - - - -	-19
Junco mearnsi	- - - - -	6
Junco caniceps caniceps	- - - - -	3
Junco caniceps dorsalis	- - - - -	1
Poocetes gamineus confines	- - - - -	2
Sitta pygmaea melanotis	- - - - -	2
Juncos, repeats	- - - - -	-70

*****SWM*****

CHIRICAHUA

By Frank Fish, custodian,
Douglas, Arizona.

WEATHER

Winter was ushered in on December 13 with rain in the lower elevations and two or three inches of snow in areas above the six thousand foot mark. December 20, starting around 2:00 p. m. and continuing well into the night, a storm accompanied by high winds left the monument and the country to the east blanketed with snow at variable depths of a few inches to drifts of two and three feet. The monument road was blocked for four miles of the six, but was opened to travel on the 24th. Sixteen inches of snow was reported at Portal and traffic around Lordsburg, New Mexico, was delayed.

ROADS

Construction and improvements have been continued on the Bisbee-El Freida and the monument roads. Improvements have reached a lull on the road to Willcox. Maintenance of all roads - entrance and monument - has been excellent during the month.

The road over Onion Saddle to Rodeo, New Mexico, at the present writing is blocked by snow and under normal conditions will be closed until around April.

CHIRICAHUA (CONT.)

Surfacing should start soon on the Steins Pass Highway as I understand the bids have been let on the first section. This route runs from Lordsburg Junction (18 miles west of Lordsburg) through Willcox and Benson to Tucson. Considering that it will be a shorter route from the east to west, it appears only natural that much of the future travel will go that way - passing north of the monument instead of east.

This route will have a greater attraction to many tourists that are accustomed to level country, as there are no grades or deep canyons. I find that a large percentage of eastern visitors are frightened by even our short Bonita Canyon Highway.

VISITORS

	<u>Cars</u>	<u>Number</u>	<u>Out of State</u>	<u>Number of States</u>	<u>Foreign</u>
1937- - - -	67	231	89	21-D.C. and C.Z.	Canada
1936- - - -	59	273*	73	22	None

*61 CCC from 64-A, Nogales, Arizona.

VISITOR STATISTICS

	<u>Trips</u>	<u>Att'd.</u>	<u>Time</u>	<u>Total Stay</u>
1937- - - -	19	83	1147 Min.	7386 Min.
1936- - - -	7	13	995 Min.	Not Available.

NATIONAL PARK SERVICE OFFICIALS

Charles A. Richey and J. H. Tovrea were here the 10th. dealing with problems concerning CCC work.

Hugh M. Miller and Ted Strieby arrived the 17th, and left on the 18th. for Bandelier National Monument.

OTHER GOVERNMENT AGENCIES

Fred Winn, Gilbert Sykes, and Mr. Miller of the U.S.F.S. Albuquerque office investigated the proposed addition to the monument on the 7th. and left the idea that they felt that the addition was justified.

ADDITIONS: (EQUIPMENT)

An Electrolux refrigerator was received during the month for the new residence under construction.

The Annual Report of the Secretary of the Interior has been received.

GENERAL

Elijah Alton was replaced by William Stone as CCC guide during the

CHIRICAHUA (CONT.)

month.

During the slack periods, a little Practical Forestry was carried out; i. e., operating the wood saw. This will always aid one in understanding the hardness of different species of trees. However, Ed Riggs convinced me by a bet we made that I do not know all about wood.

Wishing all the "Big Family" a Merry Christmas and a Happy prosperous New 1938.

*****SWM*****

We are interested in the fact that the State is finally starting that straight road across from Lordsburg to Tucson. This takes quite a lot of mileage out of the present distance between these two points and settles a road fight which has been running for many years. From our standpoint, it will throw traffic to the north of Chiricahuas instead of to the south as at present; it will take traffic away from Tombstone, where we are considering the possibility of a future monument, and will throw it up closer to old Fort Bowie, where we are considering the possibility of another monument. If the local people are wise, they will come in with us on these possible monuments and thus build up an interior circle of traffic which will draw visitors from both the old and new highways and benefit the country as a whole by holding people over one more day to the great benefit of the visitor himself and the incidental benefit of the community in which he stops.

We want to take this opportunity to thank Elijah Alton on behalf of the Service for his many months of work, to welcome William Stone to our personnel roll, and hope he will get as much fun out of his work as the rest of us do.--F. P.

*****SWM*****

RAINBOW BRIDGE

By Frank Pinkley,
Coolidge, Arizona.

We lift the following from the Navajo Service News, a corking good little house organ put out at Window Rock, Arizona, for the benefit of the Soil Conservation Service and the Indian Service.

"Most exuberant person at the table was the cook, an old timer from Kayenta who scoffed at tales of the day's discovery and told of the time an eastern millionaire came to Kayenta desiring to discover something.

"Old John Wetherill saddled up the horses and rode out into the wilderness with the millionaire until they neared the place that John had decided to let his companion 'discover'. Then John dismounted and the visitor went forward and made the discovery which was shortly im-

RAINBOW BRIDGE (CONT.)

mortalized on a bronze plaque laboriously toted to the site some weeks later by pack mule. Things didn't go off quite as smoothly on the second trip, which nearly proved disastrously embarrassing, as John had seemingly forgotten the way and the 'discoverer', who had brought friends along to witness his triumph, was in great travail until he and his bronze burro-load of self commemoration were tactfully steered into the anticipated destination a second time."

After getting a good laugh at the story as told we would like to set the record straight by explaining what really happened. When Hosteen John Wetherill acted as outfitter, guide, counsellor, and friend to the expedition which discovered the Rainbow Bridge, he took along a young Indian by the name of Nasja Begay who knew where the Bridge was and had offered to guide his white friend, Hosteen John, to it. When they got pretty well down what we now call Bridge Canyon, the Indian told John he thought the Bridge would be visible around the next bend in the canyon. John then dropped back and told Dr. Byron Cummings to take the lead and Dr. Cummings thus became the first white man so far as we know to see the Rainbow Bridge.

Many years later Hosteen John took a visitor in to the Bridge by way of the north side of Navajo Mountain, a most interesting trail which is not used as often as it should be, and incidentally told him the whole story of the discovery. This visitor thought the part of the Indian lad taking his white friend and his friend's friends, to the bridge had not had its fair share of publicity and proposed, at his own expense, to bring in and set up a plaque commemorating the Indian's part in the discovery. This matter being taken up through regular channels and permission to do so being obtained, the gentleman had Jo Mora design the plaque, had it cast in bronze, shipped to Flagstaff, and hauled thence to Ben Wetherill's place on the east side of Navajo Mountain. He had invited several of his friends, a representative of the Park Service, and a representative of the press to go in with the party.

Technically, the job of taking the plaque in was a hard one because it was so heavy and large it could not be packed on the side of a pack mule and could not be balanced on the top of a pack. John solved the problem by making an old fashioned travois such as was used on the plains and on this well-known mule, Phoebe, dragged the plaque over some of the roughest country in the southwestern United States to the place near the Bridge where it is now mounted in the cliff. Workmen, taken along for the purpose, mounted the plaque and appropriate ceremonies were then held in which the United States through the representative of the National Park Service, accepted the plaque from the donor, after which the party came out by way of the south side of the Mountain past the Rainbow Lodge.

I suppose this gentleman expended something like a thousand dollars of his own money in commemorating the act of the Indian boy; his

RAINBOW BRIDGE (CONT.)

own name not appearing in the matter except in the correspondence and local press items the few days the expedition was in the field; if he wanted the spotlight for himself, it was a terribly expensive way to get it; if he wanted to perpetuate the act of, until then, an unknown Indian boy, he took precisely the right steps for doing so at a considerable cost to himself. At any rate, it will be seen that the garbled story of the cook which is quoted above shoots far and wide of the truth.

I happen to be the Park Service representative who went along.

*****SWM*****

ARCHES

By Harry Reed, custodian,
Moab, Utah.

VISITORS

About 50 persons (estimated) have visited the Arches this month. Parties were made up of residents from Price and Greenriver, Utah, and Grand Junction, Colorado. There have been no special visitors nor park officials.

WEATHER AND ROADS

For the first 18 days of December, we have had beautiful sunshine. The weather has been ideal for hiking. Rains last week end broke the mild weather. Snow in the high country has brought the temperature down well below the freezing point. So far, no snow has fallen in the monument and the roads have been in very good shape. One party who visited the Arches last summer was a December visitor. He insists that the winter months are the best time to visit the monument. While I cannot agree with him one hundred percent, I do believe the monument could be kept open all year.

*****SWM*****

PIPE SPRING

By Leonard Heaton, acting custodian, Moccasin, Arizona.

My report for the month of December will be mostly about the work connected with the different jobs done by the CCC boy and myself on the CCC and monument projects. There was very little time spent with the visitors about the fort.

VISITOR REPORT

Among the visitors to the monument this month were Al. Kuehl on November 24 on inspection of garage and gas house, and Cliff. Presnall, naturalist from Zion park, with his family, on the 29th. He

PIPE SPRING (CONT.)

was very taken up with the idea that I keep on with the bird banding.

The balance of the visitors or contacts that I made were with local people and CCC boys that had a few minutes to kill. There were a lot of unguided visitors, some of which I wish that I might have guided to keep them from molesting bird traps and monument property. No serious damage was done but their actions were annoying.

My record shows I contacted 30 as against 14 for November and 114 were unguided as against 40 for November. There were no campers nor picnickers this month.

BIRD BANDING NOTES

I have carried on the banding of the birds throughout the month, having fairly good success catching them. I have not done so well the last week on account of the storms that have driven the birds on into the south country. My catch for the month of December, as compared with that of November, is as follows:

	<u>New</u>		<u>Returns</u>		<u>Repeats</u>		<u>Totals</u>		
	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	New	Ret.	Rep.
Gambel Sp. - - - -	57	77	1	2	87	70	134	3	157
Song Sp. - - - - -	2	6			15	13	8		29
House Finch - - -	1						1		
Spurred towhee ---	1						1		
Totals (333, all told) - - - - -							144	3	186

WEATHER

The weather has been rather cool throughout the month with a few stormy days. On the tenth we received about 20 hours of fine steady rain, just a soaker without making water run; and on the 19th a blizzard struck for six hours, covering the ground here and putting some ten inches of snow in the mountains. The east pond has had ice on it the last four days and there has been very little thawing weather.

Records show that there have been 11 cloudy and stormy days, five partly cloudy, and 14 clear days this month.

CCC AND MONUMENT PROJECTS

Work was continued on the garage this month putting down the rock floor (rock were hauled from Bullrush Wash, eight miles south of the monument). Building paper was tacked on the inside of the garage in the walls, gravel was hauled onto the driveway going into the garage, and all the tools and the tool cabinet, as well as the other equipment, were moved into the garage on the sixteenth.

There is plenty of workroom left with the truck, tool cabinet, _____

PIPE SPRING (CONT.)

and work bench in place, and also room to store things such as lumber and what-nots overhead.

Gas House. The CCC blacksmith made me some hinges for the gas house door which were put on with the lock the fifteenth. On the 16th, the gas, oil, and grease with cans were stored in the house. There is plenty of room for such materials for the needs of the monument.

East Cabin. With the moving of the tools and gas to the garage and gas house, we cleaned up the trash and gave the south room a good cleaning and opened it to the public as part of the fort. It had been used as a tool house and work room for about four years and very few got to see inside of it.

Camp Grounds. All the camp tables have been planed and painted with linseed oil, the last two being completed last week.

Also we have split and stacked the wood, that accumulated from the making of the tables, into four ricks near the fire places (or where the fire places will be built) and a general cleanup of the whole camp area has been made.

Three truck loads of clay were hauled in and used to line irrigation ditches for some 40 feet. Also several loads of gravel and shale were put on the road in the low places.

Roads. The road from the west pond to the west monument entrance, that I reported needed new gravel and for which I have tried to get a truck from the CCC to do the job, has been gravelled about half way.

For some reason or other that I do not know, the Army had some extra duty for the entire company December 18 and sent out three trucks with men. All day long they were busy hauling gravel till the road was gravelled from the west pond to the camp entrance. We now have about 120 yards to gravel onto the entrance.

Planting. We set out five silver-leaf cottonwood trees on the pond banks, to replace the trees that have died and when taken out. I want to get some more set out as soon as I get two stumps out of the bank. I have been wondering just how I will set them out without tearing down the rock wall too much.

I have cleaned some more grass seed which I want to plant along with some more brush seed this week or next.

Fort. The first step in front of the fort washing out when we were planning to put a walk to the east cabin but never did, and it left a rather high step. So this month we got two big rocks and put them in for the step. The more I look at it, the more I think we

PIPE SPRING (CONT.)

should reconstruct the remainder of the step with the larger rock. I have been waiting for Al. to come in and give his opinion and suggestions.

NATURE NOTES

Our storms of warm rain have brought out some plants on the sunny side of the buildings and rocks. The other day I noticed some dandelions in bloom at the lower side of the meadow.

Mr. P. H. Peebles of the U. S. Bureau of Plant Industry wrote asking for all the information that I could give him on the "Utahia silerias" cactus that I reported last spring. There have been several requests for seeds or plants of this cactus, but as yet I have not filled these requests. This last season I only gathered some 20 or 25 seeds from the cactus. It seemed that the mice or rats always beat me to the seeds when they were ripe.

GENERAL OUTLOOK

I have things in fairly good condition for the winter and have plans and work outlined that will keep me busy most of the winter, if the storms do not get too bad.

With the new set-up with the CCC, we ought to be able to complete some of the CCC projects by April of next year.

IN CLOSING

As another year approaches, I have stopped to reflect on the past year's work, noting the failures and successes that I have had, and making new resolutions with greater determination to fill my obligations to the people that I am called upon to serve, resolving that 1938 will be a better year than the one just passed.

So, bringing the 1937 monthly reports to a close, the Acting Custodian and Family wishes all who read these reports a Merry Christmas and a Happy and Prosperous New Year, and hoping that some day we may take your hand and say, "Tu Caubin Noonie", Piute for "We are always friends".

*****SWM*****

It looks like Leonard had a pretty busy month and a number of things to report despite the lack of visitors.

During the month Messrs. Keuhl and Richey were in at Headquarters and, among other plans, we went over the master plan for Pipe Spring. On our present information as to the location of the proposed highway

PIPE SPRING (CONT.)

outside and some distance to the south of the monument, we relocated our prospective residential area a little further south and west and this will be shown in the new master plans which will be coming out soon. I was relieved to find that the new highway will not come through or very near the monument.--F. P.

*****SWM*****

CAPULIN MOUNTAIN

By Homer J. Farr, custodian,
Capulin, New Mexico.

Visitors have been very few this month, I estimate not over three hundred. I noted a sharp decline from November, beginning about the first of this month. We had about twelve hundred in November and three hundred this month. I believe we had more than one hundred last Thanksgiving Day alone.

Our weather has been fairly good all this month but has been a little colder than common. We have had some four or five small snows this month and they have done considerable good. We are learning that our winter moisture does us more good than we had before thought, for the reason that evaporation does not get hold of snows in the winter.

Porcupines are now beginning to take hold of the trees as the winter gets colder. I have killed several and am looking for more.

The roads on the monument are in perfect condition and our only trouble right now is that the deer are rolling many rocks in the road from above. I believe we have a new influx of deer this month but I have not been definitely able to count them, altho I think we now have about fifteen.

I wish the Boss and all the rest a fine Christmas season and more work and pleasure for 1938.

*****SWM*****

WALNUT CANYON

By Paul Beaubien, custodian,
Flagstaff, Arizona.

There were 270 visitors at Walnut Canyon this month. A little snow on December 2 slowed traffic a bit, and more snow December 20 and 23 just about finished the visitor business for the winter. The county ran a snow plow over the entrance roads, but wood haulers are about the only ones to use them.

David Jones stopped by on his way south. Coming home that night, we ran into a deer and damaged the new car about \$20 worth.

The only other Park Service visitor was Milton Wetherill who came

WALNUT CANYON (CONT.)

by to help unload the newly acquired Electrolux (weight 510 pounds). Said ice box is being used to hold winter supplies. If it is insulated against thawing in summer, maybe it will keep things from freezing this winter.

Erik Reed was at the Museum of Northern Arizona the past week, working on the pot sherds from Room 7 at Wupatki.

I should mention that the Park Service was honored by Dr. Harold S. Colton when he invited David and me to Thanksgiving dinner.

I had one visitor repeat several times this month - Dr. Elbert L. Little, Forest Ecologist of the National Forest Service. From him I learned that the Department of Agriculture has a project under way to make a thorough study of the plants of the Pinyon-Juniper zone, hoping the information gained will make possible a greater utilization of those plants. Dr. Little is principally concerned with the Pinyon Pine. A group of these trees, just north of our boundary, have been tagged and will serve as his outdoor laboratory. I spent some time with him and increased my knowledge of Pinyons several hundred percent.

While speaking of Pinyons: Five Hopis recently visited Walnut Canyon. When discussing the numerous small ruins back from the canyon rim, I was informed that many which I thought were dwelling sites, were in reality the remains of stone-sided pits for roasting pinyon cones. According to my informers, the cones were gathered when slightly green and baked overnight in said pits. One, Edmund Nequawewa, called it steam baking because of the moisture present. Next morning the cones would be transferred from the pit to a blanket where they would be beaten with sticks. Supposedly, the shell pops open, the kernel falls out, and the shell remains with the cone.

I checked this information with Jimmy Kewanwytewa, Assistant at the Museum of Northern Arizona, and he said he could remember when this practice was common.

Perhaps this method of shelling the seeds has been published many times, but it was news to me. (Botanically speaking, I believe that pinyon seeds, and not pinyon nuts, is correct.)

I have worked at making a new set of direction signs for Walnut Canyon, but right now I'm in the midst of another project. I am trying to give the cistern its second cleansing since 1930. Anticipating this cleansing before I went to Saguaro last fall, I removed the troughs which carry the water from the eaves to the filter. But when I returned in the spring, I found the cistern about 1/3 full of water. After using from it all summer there were still more than 42 tons of water to be removed.

WALNUT CANYON (CONT.)

That is a lot of water for arid Arizona, and is still more for a poor ranger to drag from a deep hole. If the cistern was just ten feet shallower, I might remain a Christian. When I reach bottom, there may be a few rodent skeletons for the study collection. Would you call that looking on the dark side or the bright side?

I banded birds only one day, November 30. Thirty three birds were handled:

	New	Repeats	Returns	Total
Chestnut-backed Bluebird	7		1	8
Crossbill	1	1		2
Red-backed Junco	2			2
Pygmy Nuthatch	9	6	1	16
Rocky Mountain Nuthatch	1			1
Western Robin	2			2
Lewis Woodpecker	1			1
Mearns Woodpecker		1		1
Totals	<u>23</u>	<u>8</u>	<u>2</u>	<u>33</u>

I made four trips to Wupatki. On the last trip, December 23, I was accompanied by Jimmy Kewanwytewa who distributed Dr. Colton's Christmas gifts to the Navajos of Wupatki Basin. Snow drifts stopped us three times between Highway 89 and Sunset Crater. By shoveling a few more drifts, we could have reached the register, but would have been unable to continue to Wupatki via Heiser Spring. This is one time I can report that there were no visitors wandering around Sunset and wondering what it was all about.

There was little snow at Citadel, and only 49 names on the register. We saw one party of visitors leave, and another car arrived before we left. There is a "remark" column on the register at Citadel and almost every party had left an uncomplimentary expression about Park Service roads, lack of explanation, etc.

Most visitors to Citadel stop their car in the valley north of the ruin, and then walk some distance to arrive at the top of the mesa. Because of this, they frequently do not visit Nalakihi Ruin, east of Citadel, where the register is kept.

At Wupatki there were 29 names on the register below where David had written, "17 visitors between November 21 and 23". He alone knows whether these 17 should be counted this month.

The caretaker, Clyde Peshlakai, had finished roofing the old C. W. A. cook shack; had whitewashed the living quarters in the main ruin; and has done some work on the roads. He was straightening up the inside of the cook shack or store room when I arrived.

His father (see Sally Brewer's article "The Long Walk to Bosque

WALNUT CANYON (CONT.)

Redondo" as told by Peshlakai Etsedi (Museum Notes, Museum of Northern Arizona, Volume 9, No. 11) is very ill.

Clyde is living in the large hogan which Jimmy Brewer built to partly house his proposed Annual Navajo Arts and Crafts Exhibition.

*****SWM*****

We are very glad to get the interesting observations about the baking of pinyon cones. It makes us wonder if a little research work isn't indicated, possibly some of those pits remains which have been passing for early sites, as Paul suggests, will turn out to be this type of roasting pit.

We are sorry to hear of the illness of Peshlakai Etsedi and hope the sing which was held for him brought him back to his usual health. He is a very fine old man and has many friends throughout the country.--F. F.

*****SWM*****

CANYON DE CHELLY

By Johnwill Faris, custodian,
Chin Lee, Arizona.

The first part of the month found me trying to catch up on the loose ends after being away on annual leave. An agreeable surprise was finding the equipment shed so well along. Gipe and his men did some splendid work against many odds and I am certainly proud of the boys and the work they did.

Two official trips were made so far this month. The first to Holbrook and Gallup, the second to Gallup only. Both trips had to do with materials and supplies both for the special construction and regular monument activities.

Several minor jobs were accomplished, mostly in connection with protection against the colder weather we can expect now at any time. Pipe lines protected, pipes provided with stops, lowering of several points. Cementing our gasoline storage with a temporary cover. Minor drainage features and many other of the usual duties connected with the season.

Only three actual visitors for the month. This I think was due largely to the fact that several days during the month were somewhat threatening and last year's blockade can readily be recalled. As you can see by the SWM 16, one of these, a geologist of the Department of Agriculture, was in for a couple of days. He was very interested and gave many interesting points. It is his desire to get back and spend a longer time with us. It was impossible to get into the canyons and he would like very much to do that again. He has been up but only on

CANYON DE CHELLY (CONT.)

hurried trips and wished to spend some time in each canyon. While not counted as a visitor, Budlong and a friend was in the early part of the month. He took out some of the things he had stored here. It seemed quite natural to have Bud in the setting and the next time I do not want him to pick a day I am in Gallup to come out, and too, the next time he is to bring Betty. This is his second or third trip and not once did he bring Betty. He likely is scared that he would never get her back to El Morro after getting a drink of good water and putting foot inside a real house.

During my absence on vacation, de Chelly was visited by Engineers Diehl and Tovrea, and Architect Richey. I regret very much missing these gentlemen and invite them back whenever it is possible for them to get out this way.

December first, Boss, marked my first year as Custodian at de Chelly, and I want to thank you and any others concerned for the assignment. It has been a year filled with interest and pleasure. Other Government agencies, the McSparrons, one after another of our visitors, and the Indians themselves have all contributed and I am duly grateful. My closing wish is that each of the other monuments and headquarters can face the New Year as eager and with as much promise as de Chelly holds for me. To each and every one of the boys, de Chelly wishes the season's best and trusts that 1938 will be a banner year. To all, our sincere wish for success.

*****SWM*****

TONTO

By Tom Onstott, ranger in charge,
Roosevelt, Arizona.

Thus passes a warm but rather untraveled December. The weather has been ideal for travel, but it seems that people haven't been going places as much as last year.

The new SWM 16 caused me a bit of worry for a time. Everything went along fine until one busy day when, within three hours, there were three breakoffs and two joiners out of three parties. This would not have been anything to worry about only all three parties were here at the same time. This in conjunction with keeping total time of visitors on the monument, tossed me for about 15 yards loss. That night, I went into a huddle and next day, after wearing my finger nails to the quick on my thick skull, I came out with a system that should keep me at the line of scrimmage, at least.

As official guiding started on the first, the exact number of visitors cannot be given. A close estimate, however, would be 360; 247 of whom registered from 23 states, Alaska, Hawaii, and Washington, D. C. Twenty percent of the registered guests were from Arizona.

TONTO (CONT.)

SWM 16 goes as follows:

Number of guided field trips- - - - -	42
Persons on guided field trips - - - - -	-125
Average size of party - - - - -	2.8 persons.
Total time on field trips - - - - -	2105 minutes.
Average time on field trips - - - - -	48.9 minutes.
No. guided museum parties - - - - -	38
No. of persons in museum parties- - - - -	-129
Average size of party - - - - -	3.4
Total time in museum (guided) - - - - -	-522 minutes.
Average time of museum party- - - - -	13.7 minutes.
Total guided time - - - - -	2627 minutes.
Total stay of visitors- - - - -	3965 minutes.
Average stay of party - - - - -	85.3 minutes.

On November 27 Mr. Peters of the Fresno Ranch School and 30 of his students camped over night.

J. H. Tovrea and Chuck Richey paid a short visit on December 14. Come again, gentlemen, when the trail is guttered. Chuck kindly left plans for the work.

The road was bladed on November 28. Three trips were made with the grader that helped the road a lot. If I can get the remaining rocks off the road and keep them off, we'll have something.

The cattle up here have been getting their drinking water by breaking the pipe line. It so happened that there was a union over a low place which was easy to break loose. By changing around, I think that the union is now in a safe place.

Nine pieces of pottery, which were very kindly donated to the monument by Mr. Gladwin of Gila Pueblo in Globe, have been cataloged and are now quite an item for the visitors' attention.

Weather: days clear, 17; days partly cloudy, 2; days cloudy, 11; precipitation on 6 days, total 1.29 inches. Maximum temperature, 70; minimum temperature 38. The weather records are from the Salt River Valley Water Users Association at Roosevelt.

Next month I hope to have better luck and consequent better figures on SWM 16.

*****SWM*****

We are sorry Tom had trouble with SWM 16. It is a little more intricate than the old form but is yielding some interesting facts. On busy days it will break down under the rush; it does here at Casa

TONTO (CONT.)

Grande where they have about all the complications that can happen in the field and one or two more, but I don't think it will seriously hurt the results of, say, five thousand trips to drop a few busy days out of the calculations.

Tom was at headquarters for a few hours the other day and told me an interesting thing: he can average a longer time in the museum after his parties have been through the ruins than before they have visited the ruins. We wonder if this is because they can see the ruins from the parking area and museum and are impatient and anxious to make the trip and for this reason cut down the time in the museum if you attempt to show it to them before they go up to the ruins. You might say in that case they would again visit the museum when they returned to the parking area, but our experience tells us certainly that if you let a visitor into your museum for five minutes and then take him to your ruins he will not afterward go back into your museum. He figures he has seen your museum and so why go in there again?--F. P.

*****SWM*****

TUMACACORI

By Charlie R. Steen, junior park
archeologist, Box 2225,
Tucson, Arizona.

During the period November 24 to December 23, 846 persons visited this monument. Of the total recorded, 227 had no guide service, 619 were guided through the mission, and 51 were shown the small collection housed in the old office.

Custodian Louis Caywood returned from Berkeley, California, on the evening of December 23. Caywood has been working, on official business, at the western Museum Laboratories for the past two months.

The most important single happening of the month was the completion of the new museum and administration building. Except for a few minor jobs which cannot be done until the exhibit cases arrive, the building is complete and has been accepted and the custodian's office has been moved into the new quarters in the lobby. Caywood and I intend to set up an altar and offer daily sacrifices to Jupiter to insure prompt arrival of the exhibits from Berkeley.

Park Service visitors for the month included Frank Pinkley, Hugh Miller, J. H. Tovrea, Charles Richey, Charles Macquire, David Jones, Parke Soule, Luis Castellum, Natt Dodge, and William Butler.

Father Bonaventure of the Franciscan Missions to the Papago was here for about fifteen minutes one morning. With Father Bonaventure was a missionary from Santa Barbara, California.

TUMACACORI (CONT.)

On the morning of December 11, an automobile driven by a Mr. Campbell of Tucson turned into the monument parking area. There would be no need to report this occurrence if Mr. Campbell hadn't cut in front of a car which was being driven at a high rate of speed from Nogales. Of five persons in the two cars, two were slightly injured and were given rudimentary first aid treatment before being sent into Nogales. Both cars were badly wrecked. As the accident occurred on the highway right-of-way, the investigations were made by a highway patrolman.

A slight rain fell on the first day of the month and occasional heavy showers on the 12th and 13th.

*****SWM*****

Padre Bonaventure and his friend dropped in at headquarters and we had a pleasant hour together. I think the Padre first came to the Casa Grande about 1907 and our friendship has remained firm through the years. At that time his superior officers had placed him in charge of a territory about 250 miles east and west and 150 miles north and south containing about 5,000 Papago Indians scattered hither and yon through the country. He had a team and spring wagon with a camping outfit and all he had to do was to doctor and preach to and marry and bury all the Indians he could reach. The remainder of the time could be used to learn the language and keep abreast with his studies.

The Padre and his friend had just been making a study of the route of Fray Marcos de Niza through the country from Sonora to the Zuni country in 1539, trying to establish the day-by-day journey, camping places, etc. and they have a flock of mighty interesting facts and theories which they promise to put into print so we can all share them. For instance, it looks as if they may be able to check the Fray Marcos inscription, over south of Phoenix, as having a high probability of being authentic. Their report will be well worth your study.--F. P.

*****SWM*****

EL MORRO

By Robert R. Budlong, custodian,
Ramah, New Mexico..

Ah, I have sighed to rest me. The other day, during my absence from the monument, some brilliant water-hauler arrived, filled the syphon, and drove away without draining the line. I have this day dug out of the frozen ground over 300 feet of pipe, and have succeeded in thawing out the pipe by pouring gasoline in the trench and igniting it. But the pipe has burst in four places, and I see where I have quite a little work yet ahead of me, getting it so it will hold water. That ground was frozen solid, and it was just like digging in rock. The pick just bounced back.

EL MORRO (CONT.)

The month really can't have gone already, but the calendar tells us it has. Seems such a short time since I sent in the last report, and I imagine that since the days have been growing shorter all the time, that would account for it. Anyhow, there is little to report this month, but we'll do our best.

TRAVEL

A total of 66 persons visited this monument during the travel month. Eight of these arrived while we were in town buying supplies, and were not contacted. Eight more drove up about midnight, December 7, on their way to the Shalako. They parked their car some distance away, and we didn't hear them until they returned to the car. They were contacted, but had gone around the inscriptions by themselves.

The remaining 50 persons were taken on 14 trips around the inscriptions; total time, 965 minutes. These trips averaged 68.9 minutes each. We also had seven "office" or "educational" visits from those who also took field trips. These office visits are rather hard to define. We have no museum, but after returning from a trip around the inscriptions, the more interested visitors who have spare time are brought into the cabin where various and sundry matters are discussed. This is educational work, and includes the showing of natural-color slides dealing with points of interest nearby, or connected with the inscriptions; the showing of photographs of other monuments, of Navajo life, etc; discussion of various matters of historical interest. We feel that these office visits contribute much of value to the educational set-up.

These extra "educational visits" totaled 7; total time, 680 minutes; average time, 97.1 minutes.

We were most pleased to have Erik Reed, of the Santa Fe office, as a visitor on December 9. We hiked over the rock and looked over the ruins, and spent some time in the cabin discussing various matters.

WEATHER

Cold days, a few snow flurries. The snow still lingers on the ground, being about six inches in depth on the north side of the rock. Minimum observed during the month, seven degrees above zero. We have written in about having maximum and minimum thermometers installed here, and if we get them, we'll be in a position to give more data relative to weather.

MOISTURE

Boss, I was slightly timid about putting this paragraph under the heading of "Water", since I have more or less spoken my mind about it

in the past. So I hid the topic under the foregoing heading. But the stuff is - well, the last remark I heard, from a visitor, was the single word "Lousy!" Since you called my labors of the past month, in my last report, by the revised phrase "we are working like everything" when I had properly described it, I feel I must refrain from using appropriate language pertaining to this water.

From now on, we'll have to thaw out snow. The water in the pool is so miserable we wouldn't even use it for poor fertilizer, so we contemplate thawing out snow from this time on until roads become open again in the spring. Ever try melting snow? You take a shovel and dig tons of snow, and pile it in a washtub on the stove. By the time the snow has melted, you have a few drops of flat-tasting liquid that some people are pleased to call water.

QUARTERS

The cabin has had a few more loads of dirt piled around it. The roof has been re-covered where necessary, and the entire roof given a coating of roofing compound to stop leaks. The metal door on the cellar has been painted a light brown to blend in with the surrounding earth, and to render the door less conspicuous.

INSCRIPTIONS

More pencilling is being done on the inscriptions, and they are nearly ready for winter. Our experiments with hardening the sandstone have not been completed, due to constant below-freezing weather.

OFFICIAL TRIPS

Remarkable how quickly a perfectly good monument can go to seed. I understand that at de Chelly they are making plans to hold special examinations for future de Chelly rangers. It seems that after some years experience at Aztec, they feel that they should specify that would-be-rangers for de Chelly should be able to do tap-dancing, give song-and-dance performances, and do sleight-of-hand tricks. By which I mean to suggest that during the month I paid a visit to that gully in the sandstone to get the remainder of my belongings. We were received most cordially by Johnwill, Mrs. Johnwill, and the Springoff, and spent a most enjoyable evening. I understand that up there they are finding out how to stick a once-perfectly-good car in quicksand. Of course, there are three classes of people in the world: those who learn by the experiences of others; those who learn by their own experiences, and those who never learn. I'll mention no names, but will guarantee that I can stick a car in the quicksands of de Chelly second only to the present personnel of that once renowned national monument.

EL MORRO (CONT.)

SUPPLIES

We are fairly well fixed for our winter's supply of food. The cellar contains enormous quantities of vegetables and staples, and is one of the most valued of our few structures at this monument. At the foot of the bed in the blue room reposes the left hind leg of a graveyard steer--seventy pounds of beef. It is parked at the foot of the bed beside the refrigerator, the snowshoes and skis, and the blacksmith shop, for I can't decide where else to put it. There is no other room inside. It should be hung in a tree, of course, but I still haven't recovered from a most sad occurrence of only a week ago. Blame it on this program for the conservation of our wild life. I had hung a side of pig in a tall tree, some twenty feet from the ground, where I had thought it would be safe. But during one dark night something that must have been a giraffe wandered by and stole it. So we keep the meat in the bedroom. Do you have any other suggestions? How about getting a house built here?

GENERAL

Rumor reaches me (now, I may be mistaken) that McKinney, formerly of the Chaco, after listing the number of possible jobs he could undertake at his monument during the winter, was so appalled at the amount of labor involved that he has transferred to Arizona, where one may sit around and bask in the sun, rather than freeze in the New Mexico shade. Alas, poor Yorick, I knew him well. (Ed. note: Yeah, you are mistaken.)

But I told you there was no news. Christmas is just a few days away, and we extend a most sincere wish to you all for a very pleasant Yuletide season and a successful New Year.

*****SWM*****

I never melted much snow myself, Bud, being from a part of the country which didn't get very cold, though we did get it thirty below once I remember, but I will turn your question over to Al. Sicknell who checked the lowest temperature ever reported out of Yellowstone, sixty below I believe he said; anyway it was low enough that they didn't believe him and had to check the thermometer quite awhile for accuracy before they would take its word. And they have some snow up there too. I always like to tell that story about the fellows on game patrol snowshoeing over and sitting down on the cross arm of a telephone pole to eat lunch. Of course that was in the later days when they were sissy and had telephone poles to sit on; I think Al's time in the Yellowstone runs back before such luxuries.--F. P.

*****SWM*****

BANDELIER

By C. G. Harkins, custodian,
Santa Fe, New Mexico.

TRAVEL

Total travel- - - - -	263
Total contacts- - - - -	383
Number of field trips - - - - -	29
Number of museum trips- - - - -	28
Number of special groups- - - - -	53
Total guide time in field - - - - -	2175 minutes
Total guide time in museum- - - - -	475 minutes
Total guide time special- - - - -	14225 minutes
Total visitor time at monument- - - - -	17525 minutes
Average length of field trip- - - - -	75 minutes
Average length of museum contact- - - - -	16.9 minutes
Total guide minutes - - - - -	2465 minutes

Visitor travel shows an increase for the month of December over a like month last year, a total of 263 visitors arrived at this monument, being 35 more than during the month of December, 1936. Seven foreign countries and the District of Columbia were included in this group.

Twenty-nine parties made guided trips through the ruins, making a total of 95 people, with an average of 3.2 per party. Five parties among this group were given short lectures at the office in addition to the trip through the museum, which shows a representation of 95 people, with 28 trips averaging 16 minutes per group.

The cold weather has a tendency to discourage a great many from a trip through the ruins.

WEATHER AND ROADS

We have experienced clear days and cold nights with cold north-east winds and no precipitation during November, and up until December 12. Rain began falling the afternoon of the twelfth and continued through the night, turning to snow at 10:30 a. m. on the thirteenth. Snow continued to fall the remainder of that day, and until 6:00 a. m. the fourteenth. At that time, there was six inches of heavy wet snow on the ground and with this much needed precipitation we were able to place our roads in good condition again. A chart of the weather follows:

Days cloudy- - - - -	10	Mean Maximum- - - - -	33.35
Days partly cloudy - - - - -	4	Mean Minimum- - - - -	17.74
Days clear - - - - -	16	Mean- - - - -	25.54
Maximum Temperature- - - - -	52	Range - - - - -	18.45
Minimum Temperature- - - - -	10	Precipitation - - - - -	.53

BANDELIER (CONT.)

The State Highway Department has material on the ground and a crew working on the two bridges in the Detached Section. They are replacing the stringers and installing new decking, also putting on guard rails, a much needed precaution, as these bridges were very dangerous with no guard rails and the decking full of holes.

The recent heavy fall of snow has closed the highway over the Jemez Mountains.

GENERAL

Considerable work has been accomplished on the Detached Section the past month. Repairs have been made to all the fences where they cross the washes, also repairs to the shoulders of the highway where they were washed away earlier in the year. Cattle are being turned loose on the Ramon Vigil Grant, and as this land joins the Detached Section of Bandelier National Monument, we will have more or less trouble with stock on the monument, due to the gates being left open. Wood hauling is in full swing from the Ramon Vigil Grant. Up to the present time, no violations have been committed on the Detached Section, mainly due to the fact that all available wood had been taken from the area several years before the Park Service came into possession of it. Heavy traffic contingent with wood hauling is causing the road to become extremely rough and dusty, and with no precipitation the past two months, we had not been able to remedy the condition previous to the snow-fall of December 12.

Work has continued very satisfactorily on the stabilization project on the Community House which in all probability will be completed in January.

At odd times we have been hauling wood against the time when there will be other work to do and no wood for the residences.

The comfort stations have been drained in preparation for cold weather of the winter months, also the floors of both stations have been painted for next seasons travel.

NEWSWORTHY VISITORS

November 30. Mr. and Mrs. Dick Lovald, Gallup, New Mexico.

December 3. Major General Holmes of the British Army, London, England; Captain Staiger, sub-district commander, CCC, Santa Fe.

December 6. Mr. and Mrs. Theodore Wirth, Minneapolis, Minnesota. (Jonrad L. Wirth, assistant director, is their son.)

Sir Walter and Lady Moberly of London, England.

BANDELIER (CONT.)

December 11. Frank E. Andrews, supervisor, Santa Fe National Forest.

Lieutenant Garritson, SP-1-N, Santa Fe, New Mexico.

December 21. Dr. and Mrs. H. Gowpers, Vienna, Austria.

NATIONAL PARK SERVICE VISITORS

November 25. Erik K. Reed, assistant regional archeologist.

December 1. Frank Russell, Richard Ferris, L. C. Fuller, and Arthur Merkle, recreation study supervisors.

December 6. Harvey H. Cornell, landscape architect, and Milo F. Christianson, recreational planner. Milton J. McCole, assistant regional director, Santa Fe.

December 17. Mr. John H. Diehl, regional engineer, Santa Fe. Mr. H. E. Rothrock, Washington, D. C.

December 19. Mr. W. H. Wirt, regional forester. Mr. W. W. Yeager, assistant forester. Mr. Fred H. Strieby, fiscal supervisor. Mr. F. L. Cook, forester, San Francisco, California. Mr. Hugh M. Miller, assistant superintendent, Southwestern Monuments. Mr. H. L. Bill, Grand Canyon National Park.

THE MERRIAM TURKEY

The Merriam Turkey, or Wild Turkey as it is generally called in all localities, is prevalent in the area surrounding Bandelier National Monument and is exceptionally numerous within the confines of the monument itself, especially on the South Mesa. The general area is protected by the state game regulations of New Mexico which allow a two week hunting period in the fall of the year. Hunting of any kind at any time is, of course, prohibited in the national monument. The Merriam Turkey, which today frequents this area, is the same bird which was domesticated, or at least held in captivity, by the Aztecs, and which is believed to have been domesticated by the Indians who made their home in Frijoles Canyon, now embraced in the monument. The following is a brief summary of the known facts concerning this turkey:

Although the best breeders among domestic turkeys are yearlings of both sexes, such is not the case with the wild species. In all probability, wild turkeys actually breed at two years. Wild gobblers in confinement first breed at this age, although yearling hens have been known to breed and raise young. Such observations lead to the belief that domestication has evidently advanced the minimum breeding age of the hen both as to capacity and inclination. However, authoritative sources concur that wild turkeys actually breed at two years.

It is of interest to note that gallinaceous birds and cottontail rabbits are the fastest breeders, followed by river ducks, squirrels, and wild turkey, in the order named. The swan and the turkey are

BANDELIER (CONT.)

unique in their deferred maturity.

Wild turkey flocks are probably family units, at least in the early fall. The gobblers form packs from nesting time in the spring until the young are two-thirds grown. Turkeys practice polygamy of the true harem type, four to five hens being appropriated and herded about by one male until nesting time, when the hens nest nearby. In captivity, if there is only one gobbler present, the male rejoins the hen as soon as the brood hatches; but if there is more than one gobbler, they all flock together until the broods are two-thirds grown. Their clutch consists of nine to twelve, and the incubation period is 26-28 days. The hen has only one brood a year.

Staple winter foods of the Merriam Turkey are acorns, pinyon nuts, and corn if available, but they can subsist on other things. Although the wild turkey of the eastern United States requires considerable drinking water, it is said by many that the Merriam Turkey of New Mexico can survive for extended periods without drinking water. At any rate, it is tentatively agreed that the Merriam Turkey's minimum water requirements are nothing more than succulence of plants and dew. The ideal turkey range should, however, offer frequent water places.

Wild Turkeys thrive best on forest land with partial interspersions of grassland, brushland, or cultivated areas. Turkeys do not have a long cruising radius, and seldom leave the land on which they were raised; the extremes of their range under normal conditions reaching not more than five miles from the breeding grounds.

A complete, accurate census of wild turkey is almost impossible. As an example of possible error inherent in all census work where small areas are relied upon to sample population density, it is on record that an observer reported 15 turkeys within a radius of half a mile. Taken literally, this means 500 acres, or one nest per 33 acres. This count was shown to be extremely high when a later census was extended to cover a much more representative area. A rough census of wild turkey can be obtained by a direct count of nests over a large area, but the result is merely an index to turkey abundance or vice-versa.

In so far as game diseases go, the turkey is generally susceptible only to blackhead, an infection carried by a caecum worm of quail. Transmission of this infection is accomplished by blackhead gaining entrance through an injury made to the membrane by the worm. The infection is spread to other hosts by the worm's egg. So far as is known, turkey in and around Bandelier National Monument are not, and have not, been generally subject to blackhead.

It is interesting to note that Bandelier National Monument is somewhat near the center of New Mexico, a state, together with Pennsylvania, which has a most advanced game refuge system in so far that turkey

BANDELIER (CONT.)

are closely protected in the same areas set aside for deer refuge.

The basic function of a refuge is to produce an outflow of game to stock surrounding range, hence the area surrounding Bandelier National Monument should be afforded the Merriam Turkey for many years to come.

*****SWM*****

This is a good report and especially are we glad to have the nature notes on the Merriam Turkey.

I might say here that the good report Mr. Miller brought back from Bandelier included the general operation of the monument under Mr. Harkins; he said things were in fine shape and Cy was doing a good job.

We are glad to hear those highway bridges are at last getting proper repairs; we have been trying to get that done for these two or three years and have a large pile built up on it.--F. P.

*****SWM*****

BANDELIER CCC

By James M. Eden, acting project
superintendent, Box 669,
Santa Fe, New Mexico.

The inside forms of the 20,000 gallon concrete reservoir have been removed and a small crew has been at work making the necessary pipe connections during the latter part of the month.

Wall construction of Unit No. 2, lobby and sales room of the Hotel Development, has now been completed to the height of approximately four feet on all elevations.

The wall construction of five rooms in the employee's dormitory (Hotel Development) are complete to lintel height; footings of the remainder of this project have been laid.

The ruins stabilization crew has been working on the Community House during the entire month. Approximately 110 rooms have been completed this month.

The plans for the proposed telephone line project have been completed this month.

There has been a crew quarrying and shaping building stones in the rock quarry during the entire month.

Eight pieces of furniture were completed by the carpenter crew

BANDELIER CCC (CONT.)

Eight pieces of furniture were completed by the carpenter crew during the past month, and these will be turned over to the custodian for permanent monument use in the near future.

*****SWM*****

I might add incidentally that Hugh Miller came in from a field trip to Bandelier with a glowing account of the CCC work which was going on at that monument. Mr. Hendron sent in during the month a completion report on the stabilization of the kiva in the Ceremonial Cave. We hope to use this report in a forthcoming Supplement and thus make the repair work of this year a matter of permanent record.--F. P.

*****SWM*****

BANDELIER RUINS STABILIZATION

By J. W. Hendron, foreman, Box 669, Santa Fe, New Mexico.

Tyuonyi, the great community apartment house, is the largest structure in Frijoles Canyon and one of the largest in the entire monument. It was excavated in part by the School of American Archaeology a number of years ago, some 240 rooms being cleaned out. The excavations revealed that the building was more or less circular in form and that it was primarily used for protective purposes in as much as the rooms completely enclose the patio or inner court, which is more than 150 feet in diameter, and the only entrance was fortified by a half circle stone wall through which was a narrow doorway. In this manner the inhabitants entered the big house and then, it is thought, entered their homes through hatchways in the roofs of the rooms.

There has always been some discussion as to the height of the structure, whether or not it consisted of second, third, or fourth story of rooms. Of course a stabilization project is not concerned with the formation of the structure as it was when occupied, but on the other hand it does reveal the strength of the walls. After making a study of these walls, I am satisfied that for the most part it was made up of one story rooms, and in many cases the floors are at different levels. I estimated that the walls of the rooms with the highest floor levels must have stood ten or twelve feet above the ground level around the outside of the structure. In all probability there may have been some second story rooms, that is, when they were so located as to have the protection of the walls of the rooms with the higher walls. The height gained here would have given the inhabitants adequate protection against marauders.

In the inner court of Tyuonyi on the northeast side, are three small kivas, one of which has been excavated. These chambers probably were clan kivas which seem to have been vogue in prehistoric times,

BANDELIER RUINS STABILIZATION (CONT.)

but apparently have ceased to exist in most of our modern pueblos.

We have completed the stabilization of 147 of the 240-some excavated rooms. This stabilization consists of forcing mortar into the joints between the loose building stones of the standing walls, forcing wedges between the uneven stones, and then plastering over the outside. In many cases it was impossible to stabilize the walls without first laying new footings, the old ones being inadequate to hold the low walls for a great length of time. It was found that footings consisted of small chunks of tuff bedded in a mud mortar upon which were set the building stones. One can readily see how inadequate this type of building is. It is known that the Indian mixed ashes and charcoal into the mortar and this same technique is being employed in the stabilization. Spanish reports tell us that it forms a sort of a lime and that the method was practiced up and down the Rio Grande Valley proper during the first entrada in 1540. I have found that the valley soil alone will not hold up, and so it is being mixed with a clay that is being hauled 15 miles. After several rains the new effect will be removed from the walls, reproducing one that is similar to the original but much stronger.

*****SWM*****

BANDELIER FORESTRY

By James T. Fulton, foreman,
Box 669, Santa Fe, N. Mex.

During the past month I have been supervising a crew of men on Unit No. 2, lobby and sales rooms of the Hotel Development, laying the masonry wall construction.

*****SWM*****

NATURAL BRIDGES

By Zeke Johnson,
Moab, Utah.

I haven't much to report but thought I would extend to you and all the bunch New Year's greetings and tell you that we are well and still glad to be alive. We have spent thus far a very happy and pleasant Christmas, and everything looks lovely for the New Year.

I have been asked to speak only once since coming up here (to Salt Lake City) and then I had one full hour talking to about 200 very interesting people. I have contacted 200 in other places on many different occasions on the street, at home in hotel lobbies, and I always enjoy talking about the bridges and the San Juan country, and of course I am asked many questions about other parks and monuments which is all very interesting to me. I get many letters similar to the one enclosed and it takes a lot of pictures to fill all the bills so I will be obliged to have some printed as I sent this man the last ones I had.

NATURAL BRIDGES (CONT.)

I am very glad that after so long a time we will have no Augusta, no Edwin, and no Caroline, for I love the official names and have tried for a long time to get away from those old local names that meant nothing to me nor, I suppose, to anyone else. So now after this they will be a thing of the past.

Today Mrs. Johnson and I attended the rendition of the Messiah in the great Mormon Tabernacle. Over 12,000 people crowded in and it was a great treat. There were 300 in the choir. Two soloists were Utah people, one from New York, and one from Hollywood. I am sending you a copy of the program.

Yesterday we ate Christmas dinner with our baby daughter and her husband at Midvale and we expect to eat New Year dinner with relatives in Ogden. Enough for now! Best wishes to all.

*****SWM*****

Zeke is now drawing his winter salary of one dollar a month and seems to be getting the full worth of it. He sent us a program of the "Messiah" and made us envious of course; our radio being out of whack, we couldn't even listen in over the air.

There is still a lot of talk going the rounds about that road going west from Mesa Verde down past the bridges and over into the Bryce country. I look on it with fear and trembling but the more I think of it the less danger there appears to be in it.--F. P.

*****SWM*****

GRAN QUIVIRA

By George Boundey, custodian,
Gran Quivira, New Mexico.

VISITORS FOR DECEMBER

We arrived home from vacation on December 6. I think we must have brought the winter with us for everybody reported wonderful weather up to the time of our return. We have had four light snows during December with high winds and some blustery weather.

Our visitors have been mostly local people with visiting relatives here for the holidays.

Considerable work has been done on the highway between Corona and Gran Quivira. I understand the Corona end has been graded and made into a pretty good all-weather road, but at this end a new road has been scraped, but not graded for thirteen miles. It hasn't a single curve in it and is, at present, an excellent road for dry weather.

GRAN QUIVIRA (CONT.)

We haul our wood from the Lincoln National Forest to the east of us and I find by using the new Corona road it saves nine miles each way so it will prove quite a saving to the monument.

In spite of the snow, the birds still come in to water by the hundreds. The linnits and titmice which nested here last summer are still with us, and I have noticed several small flocks of birds much resembling the Ruby Crowned Kinglet only without the ruby crown.

Heavy snows in the higher peaks have forced many deer and quite a number of wolves down into the Cibola Forest. Local trappers report unusually good catches of coyote, bob cat, and foxes. There was a good crop of pinyon nuts this fall and that probably accounts for game being more plentiful.

The bean crop here, which is our principal crop, was late. The market opened at \$4.35 a hundred but few were able to make delivery at that time and the market dropped to around three dollars. Everybody held on to theirs and the market is now back to three seventy-five with every indication of going higher, so farmers are feeling quite cheerful again.

The rabbits on the monument are so tame and have increased to a point where I was a bit worried as to the outcome, but during the past month the Great Horned Owls have been especially busy and at least a dozen rabbits have contributed food. Twice I have surprised the owl while feeding and both times the owl was not able to quite clear the ground with the rabbit. It would fly but a few feet and then rest.

*****SWM*****

CHACO CANYON

By Lewis T. McKinney, custodian,
Chaco Canyon, New Mexico.

Here is the last report for Chaco this year of 1937, and here is wishing for a better New Year for yourself and all of the Park Service personnel. I also wish, Boss, that old Santa is a visitor to each and every monument and park and that he fills your old sock clear up to where the supporter hooks on. My youngsters each have written about a dozen pages to Santa, but from the looks of my pocket-book I doubt if I can bribe him out this far from town with as many things as they want. But anyway I have them a Christmas tree and the old rock house all dolled up for him when he arrives.

I have been out to all the different ruins this month and find them in the following condition:

Pueblo Pintado has been holding its own pretty well except some

CHACO CANYON (CONT.)

pot-hunting has been done within the past six weeks. No damage done to the walls by the pot-hunters, however. The fence is in pretty good condition except where visitors and pot-hunters have been climbing over it, the wires are a bit loose, or were a bit loose, but have been tightened. "IF WE EVER GET ANY MONEY", we can build a step over these fences around the ruins that have no gate. I would certainly like to see it done. It would cost only about \$10.00 per fence and there are only four of these, which would cost about \$40.00 for all of them. But \$40.00 is a lot of money for us in the Southwestern Monuments this day and time.

Kinya-a shows a few new falls and cracks and no doubt will be damaged quite a lot by the thaws and freezes next spring. Pot-hunters have also paid us a few visits there. Visitors have done some damage to the fence by climbing over it several times in the same place.

Kinklizin hasn't been bothered any by pot-hunters, but several visitors have climbed over the fence on the east side and have caused the wire to become loose.

Kinbiniola shows some damage from weather the last few months. I have noticed where rocks have fallen from the walls in several places within the last few weeks. There are not many of the so-called pot-hunters smart enough to find this ruin, so there has not been any pot-hunting for some time. There are too many roads leading from the road that leads to Kinbiniola that the pot-hunter generally winds up some other place, rather than Kinbiniola. No damage to the fence so far, except where stock has rubbed against a post or two and bent them some.

Penasco Blanco, where we get a tree-ring date of 898 A. D., and sit on the point of the mesa about $1\frac{1}{2}$ miles west of Bonito, seems like it is watching and waiting for the time to come when the old Chaco Wash and the Escavado will tear its solid rock foundation from underneath it. So far, Penasco Blanco hasn't suffered from pot-hunters, for it is within reach of my field glasses and it is almost impossible to reach it with a motor vehicle. It has suffered quite a lot due to weather the last few months, and will no doubt suffer plenty when the spring thaws begin. It seems that in the spring when the ice and snow melt during the day, water runs into the cracks within the walls, then freezes at night. That is the time that our damage is done. Of course we lose some walls from hard freezes, also from our hard summer rains.

Tsinklitsin is showing some damage from wind erosion on the west side. Of course it sits away up there on the mesa south of Bonito about a mile and gets the west winds square against its side. The wind has taken out a lot of the mortar and small rock on the west side like it has on the west curved wall of Pueblo Bonito. There have been several rocks fallen from the walls the last months but it

CHACO CANYON (CONT.)

isn't suffering very badly. No pot-hunting has been done as it is much harder to get to than Penasco Blanco.

Hungo Pavi is certainly falling away rapidly. There is one wall about 14 feet high that will surely go before summer if there is not something done to prevent it. There are several other places that are in very bad shape. It is sure tough to sit and watch such things as the wall at Hungo Pavi go, but what can we do about it?

Ona Vida, a fine big ruin from which we get a date of 861, is also in bad shape, and will be damaged a lot more in the near future if there is not something done to prevent moisture from entering the cracks in the walls. But I am afraid there is nothing we can do about this at present.

Wejiji is suffering quite a bit also. The back wall is leaning north at the top about a foot in several places. However, this has been leaning for quite a while. I believe Caywood, Dale King, and also Reed have some pictures of the conditions at Wejiji. I have noticed some new falls from the walls and several new cracks within the last few weeks.

Chetro Ketl is the ruin that must be repaired before there is any more digging done if we expect to have anything left of it beside a lot of reconstructed walls. The big Kiva, that the school excavated a few summers back, was almost completely demolished during the big rains last summer. I don't mean the Great Kiva, but the large Kiva in the west court. Great Kiva was also damaged quite a lot on the south and east sides because there was not any way for the water to drain away from the Kiva and it had to go through the wall. All the water from the west court drains into the Kiva that is in about the center of the court. After one of our Chaco rains last July, Ranger Hastings measured three feet and two inches of water in this Kiva. The fire place was almost completely wrecked, a lot of the bench just melted away and slid to the floor of the Kiva.

Talus Unit #1 was repaired some by the School of American Research last summer on the north side where the flood water had damaged the walls from pouring over the canyon walls onto the ruin walls, but water can still pour over the walls just as it did before they repaired them. How can we save the wonderful plaster on the wall of the Talus Unit that was uncovered last summer? It has already begun to crumble away, and no doubt our next summer rains will take a lot of it.

Pueblo del Arroyo, the big old ruin that sits on the very banks of the Chaco Wash and is slowly being taken away by the flood waters is also suffering from the weather as well as being washed away by the flood waters. The Soil Conservation Service has done a lot to

CHACO CANYON (CONT.)

save this wonderful old apartment house, but some one must do a lot more before it is out of danger.

Casa Renconada, across the canyon from Pueblo Bonito, is in good condition, as the School of American Research started reconstructing it more than a year ago.

Kinkletsoi could stand some repair work as it has begun to show wear and tear from the old man weather. The Soil Conservation Service has also done a lot to help save this old yellow house, but it is still in immediate danger and something more should be done to prevent this ruin from going down the Chaco during some of our floods, like some of our smaller ruins have in the past.

Pueblo Bonito still stands at the base of Threatening Rock with her old five-story head still sticking away up there in the air, as it has been for more than a thousand years. She seems to think that her 800 rooms are just as safe from Threatening Rock as they were the day they were built. But it has moved, so why can't it move again, and just how much will it have to move before Bonito will be in danger? Or is it in danger at present? Gosh, what a mess we will have if it does fall. And then what will it cost us to clean up the mess? Along with the mess we will lose all the wonderful work that those old fellows put at the base of Threatening Rock to keep it from falling.

Threatening Rock now measures 2 5/8 inches at the east end, 2 11/16 inches in the center and 2 9/16 inches at the west end. (See September report for more information)

The Soil Conservation Service plans quite a lot of work here in the canyon, if they can find the money to do it with. They are still doing some maintenance work on the large water-drop structure up near the Hungo Pavi Ruins. The nights are getting so cold that it is almost impossible for them to do any work with concrete.

The School of American Research Station now has ten hogans completed and have started on the eleventh one. Their main building is complete.

A. P. Springstead has sold out his trading post here in the monument to Arthur B. Tanner from Kirkland, New Mexico. We all surely hate to see the Springsteads leave the Canyon, for they have worked more than 100 per cent with the Park Service since they have been in business here at Chaco. Thelma (Mrs. Springstead) has certainly been a "Godsend" for our visitors. She could and would with a big smile, find something more to eat and another bed for some tired visitor that had arrived late. And no wonder "old man" (Colonel) Springstead always has a big smile, from the kind of cooking Thelma feeds him.

CHACO CANYON (CONT.)

But a finer couple will never be found to fill their place here in this great old land called Chaco. It certainly grieves all concerned to see them leave us. The Tanners seem to be our kind of folks and are swell people, and no doubt will do everything within their power to fill the place that the Springsteads left. We welcome the Tanners with all of our hearts and hope they see things as we do, and help us all make this a worthwhile and comfortable place for our visitors.

We have had .16 of an inch of precipitation this month, four cloudy days including today, seven partly cloudy ones, and the balance clear. The maximum has only been up to 57° on the 2th., and minimum down to 6 degrees on the 21st. It's sure been sharp around the edges this month, Boss, but it causes these slow, lazy guys like myself to pep up a bit (going from one fire to the other).

It looks like our visitors are side-stepping us for a spell, but I guess they are floating down in your part of the country for a while, Boss. Well, this is a pretty good place to be from, for the next month or so. Eighty-seven people have visited the monument from the following states: Montana, New Jersey, Minnesota, Colorado, Arizona, New Mexico, Texas, Missouri, and Utah. We have had this month as visitors on official business from the Soil Conservation Service, O. E. Gianni, Leo Carden, Bert Lucas, Bert Cottingham, Guy Murphy, Buster Charles, and Merrill Strong. Park Service visitors this month consisted of Custodian Miller and Mrs. Custodian from Aztec National Monument.

Guess I will end this report and go out and throw a few shovels of dirt out of the new cesspool we are digging. I want to get it all finished before the ground freezes. Again a MERRY CHRISTMAS and a happy New Year.

*****SWM*****

MONTEZUMA CASTLE

By Earl Jackson, custodian,
Camp Verde, Arizona.

STATISTICAL

Visitors- - - - -	-403.	Last year: 512.
Arizona by cars - - - - -	-232.	57.56% of total.
California by cars- - - - -	92.	22.82% of total.
Total states- - - - -	23.	
Foreign countries - - - - -	3.	Finland, Alberta, England.
Conveyance:		
Cars- - - - -	-118.	
Horseback - - - - -	3.	
Contacts:		
Guided field trips- - - - -	-106.	
Attendance- - - - -	-318.	
Trips through Castle- - - - -	88.	

MONTEZUMA CASTLE (CONT.)

Those who climbed ladders- - - -251. 62.28% of total on trips.
Average persons per trip party*- - 3.92
Average persons per trip group** - 3.
Average trip time per party- - - 51.53
Average trip time per group- - - 39. minutes
Museum talks - - - - - 90.
Attendance - - - - - -278.
Average persons per talk party - - 4.1
Average persons per talk group - - 3.
Average talk time per party- - - 21. minutes
Average talk time per group- - - 16 minutes
Special guide trips- - - - - 4.
Attendance - - - - - - 11.
Average party and group time - - - 18. minutes.
Unguided trips - - - - - 62.
Persons- - - - - -213.
Average unguided trip time - - - - 16. minutes.
Average actual guide and lecture time - 56 minutes.
Average group minutes in monument - - - 77 minutes.

* Party means total persons on part or all of a trip.

**Groups are natural arrival units of a party.

WEATHER AND ROADS

Weather has been mild for this season. There were eight cloudy days, and six partly cloudy. Precipitation was .59 inch, occurring on December 2, 12, and 13. Very heavy mist occurred on December 3 and 11. Picture this if you can: on the evening of December 12, after drizzling winter rain all day, we were sitting in a semicircle in front of the fireplace with a big log burning to keep us warm. Of a sudden a vigorous summer shower struck, and a regular summer thunder storm broke loose, with more lightning than we had seen in many months. After 30 minutes of this interlude, winter took the stage again.

Roads are in fair condition through the valley. The first part of the month saw them very rough from corrugations; the latter half of the month saw timely bladework after rains, and much improvement.

SPECIAL VISITORS

Park Service: December 15 - Chuck Richey, regional landscape architect, and J. H. Tovrea, assistant engineer, paid the monument an inspection trip together.

Other Visitors: November 27 - Charles W. Lincoln and family were very interested visitors. He is a doctor of dental surgery, from Pasadena, California, and was intrigued by the dental equipment of our skulls (historic).

MONTEZUMA CASTLE (CONT.)

November 28 - Bill Eaton, son of the "Big Bill" Eaton of Wyoming dude-ranch fame, paid his first visit of the season.

C. O. N. Gibson, a nephew of Charles Dana Gibson, was a visitor.

December 6 - Walter R. Steyer, sales engineer for the H. H. Robertson Company, of Los Angeles, was a very interested visitor.

December 14- Wesley Knorp, general manager of the Arizona Republic and Gazette, was a visitor. With him were Jack Forbes, Earl Seuch, and Jack Kimball, advertising men for the Republic.

PUBLICITY

Dr. Charles W. Lincoln took photographs of all the skulls in our collection. These photographs and data obtained from them are to be used in a scientific paper to be read before a dental convention.

In the Fond du Lac Commonwealth Reporter, Fond du Lac, Wisconsin, for December 6, occurred a two column feature article entitled "Fred G. Steenberg Writes of Explorations Made in Montezuma Castle, Arizona."

CONSTRUCTION

Ranger Jennings and the custodian constructed a standard thermometer shelter out of scrap lumber.

ACCESSIONS

From Headquarters we obtained two used flat-top museum cases, which will soon be installed in the museum.

NATURE NOTES

On December 3, at about 3:30 p. m., we saw the last lizard of the season. He escaped before we could even tentatively identify him.

On December 8, Jane Jennings smelled the presence of a skunk in the vicinity.

On December 10, Jesse Jennings' mother reported a theft from the ranger tent-house. It appears that a pack rat or trade rat had a hole in the bank near the creek. One opening of the hole is exposed by the cut-bank of the creek. She found where Mr. Rat had deposited a great number of shiny six-penny nails in his nest, and about fifty of them had fallen through the creek-side opening onto the bank below.

MONTEZUMA CASTLE (CONT.)

On December 11, we saw the first sprouts of alfilaria, coming up in our back yard.

On this same day we made our last notation of the season on ants. The big black ants (Crazy Ants) still had the door to their den open, and were very active.

On December 15, we saw the last snake of the season. It was a brown garter snake about 16 inches long.

On December 20, we saw a porcupine on a cottonwood tree near the upper end of the monument. There was no indication that he had been eating any of the bark. He simply sat in the crotch of a limb about 12 feet above the ground and watched us.

(For bird notes, see Betty Jackson's report).

GENERAL

Can't feel at all bad about affairs around here. Visitors have been more interested than usual, or we have been doing our stuff better, or both. There is an encouraging increase in museum time and in trip time. The stuffed rattlesnake and the mounted insects in life-like postures are doing their bit toward increasing museum time.

The custodian made a trip to headquarters, spending the first and second of the month there. This was a very worthwhile trip, in which some rough edges were shaved off his personality by the headquarters staff, and in which he got some good ideas for the improvement of the educational features of the monument. Wish there could be a more frequent get-together between the field men and headquarters.

Ranger Jennings went to headquarters on December 8 to pick up museum cases, and was retained there on special detail until his return on December 13.

Will sign off for this month and wish everybody a Merry Christmas and Happy New Year.

*****SWM*****

BIRDS AT MONTEZUMA CASTLE

By Betty Jackson.

We have a longer list of birds seen this month than in any previous month, for besides the 31 species definitely or tentatively identified, Jane has seen three others which we can't track down as yet. Here is the list:

Chestnut-backed Bluebird - - - - - All month.

BIRDS AT MONTEZUMA (CONT.)

Arizona Cardinal - - - - -	-All month.
Coot - - - - -	-December 20.
Mourning Dove- - - - -	-All month.
House Finch- - - - -	-All month.
Red-shafted Flicker- - - - -	-All month, four now.
Cooper Hawk- - - - -	-All month.
Desert Sparrow Hawk- - - - -	-All month.
Red-tailed Hawk- - - - -	-All month.
Green-backed Goldfinches - - - - -	-December 20, 40 plus.
Treganza Blue Heron- - - - -	-December 20.
Arizona Jay- - - - -	-December 5 in scrub oak, December 16 in Mesquite.
Oregon Junco - - - - -	-All month.
Pink-sided Junco - - - - -	-All month.
Belted Kingfisher- - - - -	-All month.
Ashy Ruby Crowned Kinglet- - - - -	-All month.
Merganser (?) - - - - -	-December 20.
Gambel Quail - - - - -	-All month. Counted 36 the morning of December 24.
American Raven - - - - -	-November 30 and December 8 and 23.
Road-Runner- - - - -	-November 27.
Western Robin- - - - -	-All month.
Red-naped Sapsucker- - - - -	-All month.
Townsend Solitaire - - - - -	-December 1.
Gambel Sparrow - - - - -	-All month.
Western Chipping Sparrow - - - - -	-All month.
Sparrow sp.- - - - -	-All month.
Crissal Thrasher (pair)- - - - -	-All month. Lately in hack- berry instead of feeding on the ground.
Cactus Woodpecker (pair) - - - - -	-All month.
Cedar Waxwing- - - - -	-Arrived December 1. Now 20 of them.
Gila Woodpecker- - - - -	-All month.
Baird-Bewick Wren- - - - -	-All month. He's the one I called Western Warbling Vireo last month.

On December second at about 7:00 a. m., a big dead ash tree, which has overhung the creek and formed a perch for kingfishers, hawks, and Black Phoebes for years, gave up and fell across the creek. The phoebes won't mind, but the kingfishers and hawks will probably abandon it for a loftier look-out.

On December third, Jess called me out, and we watched a Desert Sparrow Hawk chase a big Red-tail for several minutes. Finally the Red-tail went off over the cliff, and the Sparrow Hawk lost interest. Jane was watching the procedure too, and apparently had more patience

BIRDS AT MONTEZUMA CASTLE (CONT.)

than I, because she says the Red-tail came back twice afterwards, each time being driven off by the Sparrow Hawk. It was more of an argument than a fight, because no feathers flew, and apparently the Sparrow Hawk never came in contact with, but only swooped close to and annoyed the Red-tail.

Jane and Mrs. Jennings were raking leaves on December 11 when a Western Robin dropped down close to them. When they stopped raking and talking, he acted rather nervous but, as soon as soon as they went back to work, he started picking around for grubs, not at all disturbed. He often got within 12 feet of them. When a flock of robins flew overhead, he was terrified. The first time he flew off. Later he cringed under a mesquite 'till they had gone.

He was back again on the 13th and 14th, and by the 15th had acquired enough courage so he drove other birds away.

The kingfishers are a scrappy lot. On November 25, one of them was chased by a bird who had a longer wingspread and a narrower body. On December 16 Mrs. Jennings heard a racket and looked out to see two kingfishers, each sitting on a rock in the creek, having a loud argument. As she watched, one of them flew toward the other, and was coming so fast that he knocked him off his stone into the creek.--Yes, he got out.

The next day another fight was staged, and after that there has been only one on the creek here. It must be his private feeding area. He is seen before seven in the morning, and between four and dark at night.

On December 20, Earl assisted me in getting a Christmas census of Birds for Bird-Lore Magazine. We saw 22 species, and over 172 individuals. It was a long, cold job, with a northeast wind blowing and not a speck of sunshine all day, but we got some interesting records. They included two flights of ducks, one of ten and one of six, flying in a wedge -- I think they were Mergansers --, and a group of at least forty Green-backed Goldfinches.

*****SWM*****

This is another good report from the Jacksons and from that array of visitor figures it looks like Earl and Jess sat up nights working up the SWM 16 figures.

Incidentally, we want to thank Earl for loaning Jess to us for a few days for a special field job; we knew it meant doubling up his work while Jess was away, but we were in a jam and that was the only way out.

Everybody at headquarters congratulates the Jacksons on the

BIRDS AT MONTEZUMA CASTLE (CONT.)

arrival of the new son and heir and we all wish the best luck in the world to the new Park Service member.

*****SWM*****

CASA GRANDE

By A. T. Bicknell, custodian,
Coolidge, Arizona.

WEATHER

Days clear- - - - -	-20	Mean Max. Temperature- - -	-68.5
Days partly cloudy- - - - -	7	Min. Temperature - - - - -	-28°
Days cloudy - - - - -	4	Mean Min. Temperature- - -	-35.4
Max. Temperature- - - - -	-79°	Precipitation- - - - -	.87

The weather for the past month has been somewhat warmer than in the preceding years in that the night temperatures are above normal. In addition, we received our first good rain since September. It is interesting to see how quickly the desert plants respond to the rains.

GENERAL

The total travel for the month is somewhat below normal with only 2,931 visitors. Of these, 2,584 were guided through the ruins, the museum, or both.

Visitors represented 43 states, Washington, D. C., Alaska, the Canal Zone, and four foreign countries, namely: England, Germany, Denmark, and Switzerland. Approximately 75 percent of our visitors came from the following states: Arizona, 40%; California, 16%; Texas, 6%; Oklahoma, 6%; Colorado, 3%; Illinois, 3%. Other states represented by more than 20 visitors were in this order: New York, Wisconsin, Washington, Iowa, Ohio, and Kansas.

Ranger Erskine left for Boulder Dam Recreational Area on November 29, his position being filled temporarily by transferring Ranger Jones from Wupatki National Monument. All of us feel the loss of Don and Marie in both our work and social life.

The three CCC guides are proving themselves invaluable in handling the visitors. Not only are they interested in their work, but they are eager to acquire that background which is so necessary to a guide in an archeological monument. If the time spent with a party is any criterion of the guide, the boys will soon be on a par with veteran guides.

"Teddy" Baehr was on sick leave several days during the month, his position being filled temporarily by Dan Havens.

Ominous rumblings can be heard around the monument after hours.

CASA GRANDE (CONT.)

Someone suggested that the museum ought to be rearranged. Everyone agreed to that extent, but no further. The participants are classified as being on the side of the naturalists, the Boss, or on the fence. If these winter nights last long enough, there is a possibility that something might come of it.

On December 9 it was possible, through the courtesy of Julian Hayden and Elizabeth Harte, for Rangers Jones and Jennings to watch an old Pima woman make pottery. From this we hope to work up an interesting exhibit for the museum.

Al Kuehl (Grand Canyon) and Ranger Bill Butler (Mount Rainier) came down to visit and brought along some movies of their respective parks. The movies were fine, but it is still hard to convince some of us "desert rats" that there is ten feet of snow at Rainier in the summer.

USE OF MONUMENT FACILITIES BY THE PUBLIC

Total travel: 1937---2931; 1936---3052; 1935---2135.

Of the 2,931 visitors to the monument, 2,584 were guided through the ruins, the museum, or both. It required 16,669 minutes to guide 537 parties through the ruins for an average time of 31 minutes. In the museum, 9,500 minutes were spent guiding 154 parties for an average time of 21 minutes.

Numerous groups used the picnic grounds during the days, but there were no overnight campers, possibly due to the cool nights. Among the groups visiting the monument were: 30 boys from the Fresno Ranch School on November 26, 15 members of the Phoenix Motorcycle Club on December 5, and 33 Pima students from the Salt River Indian School at Scottsdale on December 8.

On December 23, we were pleasantly surprised with Christmas carols sung by the Coolidge Grammar School Glee Club.

VISITORS

National Park Service visitors to the monument included: Mr. and Mrs. W. J. Lippincott, Western Museum Laboratories; Chuck Richey, district landscape architect; Al Kuehl, assistant landscape architect; Paul Franke, assistant superintendent at Mesa Verde National Park; Ranger Bill Leicht (Grand Canyon); Ranger Bill Butler and wife (Mount Rainier); Custodian Jackson and Ranger Jennings from Montezuma Castle; Custodian Boundey and family from Gran Quivira; Ranger Felton and wife, White Sands; and Custodian Caywood and wife, Tumacacori.

Among the other visitors to the monument were: Project Superin-

CASA GRANDE (CONT.)

tendent Bill Stevenson from Chiricahua National Monument; State CCC Inspector Jack Haile; CCC Engineer Cliff London at Chaco; Dr. and Mrs. Harold S. Colton, and Katherine Bartlett of the Museum of Northern Arizona; Harry Hommon, Bureau of Public Health; Dr. Verne Ray, University of Washington, anthropologist; Julian Hayden, Pueblo Grande, Phoenix.

IMPROVEMENTS AND EQUIPMENT

Work accomplished by our General Mechanic Eugene Stonehocker during the month is as follows: overhauling of Chevrolet USDI 8114, started last month, has been completed; installation of a reconditioned motor in USDI 13781; repairing and replacing driveshaft housing, universal joint, radius, and brake rods on USDI 8076; and general repairing on the automotive equipment at headquarters.

Considerable improvements were made in the quarters this month. In Park Naturalist King's quarters two coats of calcimine were applied to the walls of the living room, bath room, and the enclosed porch. A new "Hot Stream" water heater was installed, also a Super-Fex oil heater. The service porch was calcimined in Assistant Superintendent Miller's quarters. To provide additional room in the bachelors' quarters, the screen porch was enclosed and two windows were framed in for light and ventilation. Oil heaters were installed in Junior Naturalist Dodge's quarters, and in the naturalists' office. With the installation of the heaters this winter, the personnel on the monument seems to keep pretty well thawed out. A meter exchange was made in the Chief Clerk's quarters to care for the electric stove.

Included in the new equipment is a new Chevrolet Coach for the "Boss". It will be known as USDI 13916. From the Federal Housing Administration, nine Duo Therm Heaters, three Electrolux refrigerators, two washing machines and ironers.

CASA GRANDE CCC

After getting the camp buildings well toward completion, Mr. Dale's carpenter crew was transferred back to the main camp at Chiricahua on December 4. On this date Foreman Joe R. Hobbs and his crew arrived, and under his supervision, the work has progressed nicely throughout the month.

With the exception of a few minor details, our camp is well established. Modern conveniences furnished are electricity from the U. S. Indian Service, refrigeration, and a modern bath house.

Guide and Contact: Seventy-six man days were spent conducting visitors through the Casa Grande and the museum. Another activity of our guides is helping with mimeograph work.

CASA GRANDE CCC (CONT.)

On the 13th, a small crew was started on Job 54, cleanup, and 33 man-days have been used pulling nails from old lumber and cleaning up some of the materials left from the pageant which, in former years, was held annually at the monument.

On the 14th, the boys started work on the caliche pit in preparation for making adobes to be used in the construction of the workshop, Job 55. The boys began manufacturing adobes the 20th, and 125 man-days have been used. Barring any hard luck in the drying process, we have enough made for the first building.

Safety instruction meetings have been held each week, as well as a class in construction.

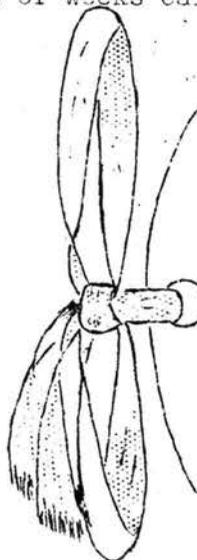
At Christmas the boys in camp enjoyed a nice turkey dinner and we appreciate the cooperation of Junior Park Naturalist Dodge for helping to make the fine menus.

*****SWM*****

The Boss is not so sure about taking over No. 13916. It is a nice new car all right but needs working in for twenty or thirty thousand miles whereas old 1803, with 80,000 miles on her clock, is loosened up and clicks and chuckles just about right when you get into a rough piece of road. 'Gene nearly ruined us by washing and waxing 1803 this month; the only way we can tell her now as we come down a block of parked cars is by the two spare wheels on the running boards.

Al comes in to add as a postscript to his report that he and I found a squaw berry bush in bloom on December 13 which seemed to us a couple of weeks early.

*****SWM*****



NOTICE OF ARRIVAL

VIA: Santa Claus - Stork Express
TO: Mr. and Mrs. Earl Jackson
ADDRESS: Montezuma Castle Nat. Mon.
ARTICLES: ONE SON
CONDITION ON ARRIVAL: Excellent

MARTIN ARVIN

TERMS: Plenty down; lifetime to pay

HEADQUARTERS

BRANCH OF EDUCATION

The educational staff for the month of December consisted of Park Naturalist King and Junior Park Naturalist Dodge. Junior Archeologist Steen continued on his assignment to Tumacacori National Monument and was unable to perform any educational duties except visitor contact work.

King took a total of 15 days sick leave to recuperate from a nasal operation and his work during the rest of the month was limited to routine desk matters. Dodge was in charge most of the month and his report incorporates practically all of the educational activities during December.. It follows:

Museum planning	
Casa Grande, 1 hr.; Bandelier, 10 hrs.; general, 1 hr.	--1 $\frac{1}{2}$ days
Work in Southwestern Monuments Loan Library	-----1 day
Annual leave	-----1 day
Monthly Report	-----10 days
Correspondence (Includes opening the mail)	
Thirty-two letters written or dictated	-----1 day
Maintenance (Cleaning office and putting up oil stove)	---1 day
Filing Photographs	-----1 day
Special Reports for Washington Office	-----1 $\frac{1}{2}$ days
Conferences: with Superintendent, visiting custodians and rangers, and with interested visitors	-----1 day
Talks; preparation and delivery	-----1 day
Packing, wrapping, and shipping publicity material, in- formational folders, supplies and equipment, specimens for identification, and binding monthly reports	-----2 days
Banding Birds	-----1 day
Relief Guiding at Casa Grande	-----1 $\frac{1}{2}$ day
Taking photographs of personnel, specimens, etc.	-----1 $\frac{1}{2}$ day

With the assignment of CCC enrollee Marvin Hale to the educational office on December 17, it is hoped that much of the mimeographing and shipping henceforth will be handled by him. During the month, he put in two and one half days mimeographing and one half day wrapping and shipping supplies and equipment.

The following pieces were mimeographed during the month:

- 35 copies of Steenberg's Montezuma Castle article.
- 200 Herbarium record cards.
- 2,000 Casa Grande Information leaflets.

BRANCH OF EDUCATION (CONT.)

Mimeographed last month but not reported:

1,000 Aztec Ruins Information leaflets.

100 Copies of Special Report #22 (Bird Banding, 1937).

SOUTHWESTERN MONUMENTS LOAN LIBRARY

Loan and return records were kept current, but cataloguing of new books has fallen far behind. The library received the following accessions during the month: twelve books, three pamphlets, eight reprints, and 19 periodicals.

HEADQUARTERS BIRD BANDING

There follows a brief report of bird-banding operations at headquarters since activities were started late in October:

Species	October			November			December		
	New	Rep.	Ret.	New	Rep.	Ret.	New	Rep.	Ret.
Cactus Wren-----	0	1	3	0	8	2	0	2	0
Crissal Thrasher--	1	0	0	2	1	0	0	0	0
Gambel Quail-----	0	0	0	17	9	5	0	0	0
Gambel Sparrow----	0	0	1	10	7	6	4	16	1
Gila Woodpecker---	0	0	0	0	0	0	1	0	1
House Finch-----	1	0	0	5	0	0	0	0	0
Rock Wren-----	0	0	0	0	0	0	1	0	0
Say Phoebe-----	0	0	0	0	0	1	0	0	0
W. Horned Owl-----	1	0	0	0	0	0	0	0	0
Total-----	3	1	4	34	25	14	6	18	2

Total birds handled in this period: 107.

TALKS OUTSIDE OF MONUMENT

December 1: fifteen minute talk over radio station KOY in Phoenix.

December 1: illustrated evening talk at the Arizona Museum in Phoenix. Attended by approximately 50 people.

December 16: fifteen minute illustrated talk to the Coolidge Masonic Lodge attended by approximately 35 people.

*****SWM*****

VISITOR INFORMATION

By the Boss

As nearly as we could check our visitors for the month of December, we had 11,503 of them as against 13,021 for the same month last year. The drop shown is more apparent than real, due in part to a sharp change in the figures at White Sands where we now have a permanent man working with the visitors. I think the figures at White Sands are too low for this month, but we will be able to get a closer check in the next month or two as we fall into the routine of the work over there.

VISITOR STATISTICS FOR DECEMBER, 1937

SOUTHWESTERN MONUMENTS

MONUMENT	EMPLOYEES		FIELD TRIPS				MUSEUM TALKS				Unattended	Total Informational Contact	Total Travel	Per cent Contact		
	Per.	Temp.	No.	Att'd	Time	Av.	No.	Att'd	Time	Av.						
															Time	Time
Arches	1	P.	---	---	---	---	---	---	---	---	---	50	---	50	---	
Aztec Ruins	1.5	---	97	410	2675	4.2	27.5	102	399	2090	3.9	20.4	110	809	503	160
Bandelier	1	3 CCC	29	95	2175	3.2	75.0	28	95	475	3.3	16.9	408	283	263	107
Canyon de Chelly	1	---	3	4	450	1.25	150.0	---	---	---	---	---	---	4	4	---
Capulin Mountain	1	P.	---	---	---	---	---	---	---	---	---	---	300	---	300	---
Casa Grande	2	3 CCC	537	2584	16669	4.8	31.0	451	2118	9500	4.6	21.0	142	4702	2931	160
Chaco Canyon	1	---	---	---	---	---	---	---	---	---	---	---	87	---	87	---
Chiricahua	1	2 CCC	19	63	1147	4.3	60.3	---	---	---	---	---	182	83	265	---
El Morro	1	---	14	50	965	3.5	68.9	---	---	---	---	---	16	57	73	---
Gila Cliff	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Gran Quivira	1	---	36	173	1764	4.8	49.0	---	---	---	---	---	26	173	199	---
Hovenweep	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Montezuma Castle	2	---	106	318	4173	3.0	39.37	90	278	1485	3.97	16.5	213	596	403	147
Natural Bridges	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Navajo	1	---	1	2	120	2.0	120.0	---	---	---	---	---	---	2	2	---
Organ Pipe	---	---	---	---	---	---	---	---	---	---	---	---	700	---	700	---
Pipe Spring	1	---	11	30	325	2.7	29.5	---	---	---	---	---	114	28	142	---
Rainbow	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Saguaro	---	---	---	---	---	---	---	---	---	---	---	---	2000	---	2000	---
Sunset Crater	---	---	---	---	---	---	---	---	---	---	---	---	200	---	200	---
Tonto	1	---	42	125	2105	2.8	48.9	38	129	522	3.4	13.7	231	254	360	---
Tumacacori	1	---	144	619	4029	4.2	27.9	13	51	190	3.9	14.6	227	670	846	79
Walnut	1	---	15	48	415	3.2	27.6	53	157	1175	3.0	22.1	101	207	270	76
White Sands	1	---	---	---	---	---	---	---	---	---	---	---	1830	---	1830	---
Wupatki	---	---	---	---	---	---	---	---	---	---	---	---	75	---	75	---
Yucca House	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	22	8	1054	4539	37012	4.3	35.1	775	3227	15437	4.1	19.9	7012	7868	11503	68
Last Month	22	8	1097	5643	44374	5.1	40.4	722	3478	13227	4.8	18.3	11546	9033	17795	50.7
December, 1936	---	---	1019	6061	41106	5.9	40.3	464	2902	8856	6.2	19.0	---	3963	13021	68

VISITOR STATISTICS (CONT.)

A check of these statistics with the same month last year convinces me that we are not having quite so many visitors as we did last year; that we handled them in smaller parties; and, we reached the same percentage, 68, of our visitors with our informational contacts. In the 11,503 visitors we made 7,868 contacts, and that means we missed reaching a lot of visitors.

We gave 1,054 guided field trips to 4,539 visitors, the average field party consisting of 4.3 persons and the time of the field trip being 35.1 minutes. This is an increase in number of trips over last year to a considerable decrease in number of visitors.

We gave 775 museum talks to 3,227 visitors; an increase over the 464 talks last year to 2,902 visitors. The sharp increase here comes at Casa Grande, where we spent nearly three times as much time in museum talks as we did last year, and is partly due to the fact that Bandelier, Tumacacori, and Walnut Canyon were not reporting last year.

I have been pointing out for the last couple of years that the size of the museum doesn't seem to affect the time the visitor interest can be maintained. This past month we have been doing a little experimenting at Casa Grande, where we are having to use some new guides. The following figures were compiled concerning guide No. 1.

Guide 1 ran 87 field trips for a total of 2,437 minutes, or an average time per party of 28 minutes. We then had a check-up and talked things over with the guides and Guide 1 then went out and ran 56 field parties for a total of 1,906 minutes, or an average per party of 34 minutes. He lengthened his party time six minutes by having his interest aroused. As a check on field time for this same month, a man who has been with us for some time ran 33 parties for a total of 1,206 minutes, or an average of 36.5 minutes. Another man who had been with us some time ran 32 field parties for a total of 1,042 minutes, an average of 32.5 minutes. Guide 1, a green youngster, with a little less than a high school education and less than a month of training, plumps his field party time, after having his interest aroused, right in between two old hands: what is the answer? Coincidence?

Guide 1 also ran a series of 76 museum talks for a total of 1276 minutes, or an average of 16.7 minutes per party. We then had the check-up and talked things over and he went out and ran 39 museum talks for a total of 860 minutes, or 22 minutes per party; 4.3 minutes added by arousing his interest. As a check against this, Old Hand No. 1 ran 19 talks to a total of 445 minutes, or an average of 23.4 minutes, and Old Hand No. 2 ran 22 museum talks to a total of 349 minutes, or an average of 15.8 minutes. Here again the green man, with his interest aroused, plumped his museum talk time between that of the two Old

VISITOR STATISTICS (CONT.)

Hands and just a little below the higher man. Again, what is the answer? Coincidence?

*****SWM*****

MOBILE UNIT

By Gordon Vivian, foreman,
Chaco Canyon, New Mexico.

Once when Dale was here he said that he'd sometime like to know exactly what has happened on the wall repair; amounts, man days, etc. The following figures were taken from the individual job reports and measurements on the work:

	<u>Repair</u> (Sq. yards.)	<u>Repointed</u> (Sq. yards)	<u>Man Days</u>
Kiva J - - - - -	14 - - - - -	6 - - - - -	37
Kiva E - - - - -	4 - - - - -	6 - - - - -	13
Kiva I - - - - -	7 - - - - -	- - - - -	4
Kiva H - - - - -	10 - - - - -	2 - - - - -	12
Kiva C - - - - -	49 - - - - -	- - - - -	69
Kiva K - - - - -	5 - - - - -	4 - - - - -	15
Kiva D (exterior) - - - - -	21 - - - - -	- - - - -	40
Room 263 (N) - - - - -	24 (cubic yards) - - - - -	- - - - -	85
Room 163 (S) - - - - -	4 - - - - -	5 - - - - -	15
Room 268 (N) - - - - -	3 - - - - -	2 - - - - -	9
Kiva D (interior) - - - - -	38 - - - - -	- - - - -	52
Kiva D (exterior) - - - - -	1 - - - - -	- - - - -	3
Kiva E (exterior) - - - - -	14 (cubic yards) - - - - -	- - - - -	50
Kiva I (exterior) - - - - -	3 - - - - -	- - - - -	12

All this adds up to 431 man days and 41 cubic yards of masonry, 160 square yards of veneer replaced, and 15 yards repointed. In getting a square yard of surface finished, we find that benches and bench tops are the quickest, repointing is next, replacement of veneer third, and building up the entire wall last. Now, by averaging these speeds and the amount of surface finished, I come somehow to the conclusion that it takes an average of one and eight-tenths man days to finish a square yard of wall whatever kind of work is done on it.

This includes all repair labor overhead, hunting up the rock and hauling it to the job, sorting and carrying the rock, hauling, and adobe, mixing mortar, and erecting scaffolds. It does not include any camp overhead.

The figures on the capping done so far are as follows:

	<u>Square yards</u>	<u>Man Days</u>
Kiva K - - - - -	16 - - - - -	19
Kiva D* - - - - -	33 - - - - -	26

MOBILE UNIT (CONT.)

	<u>square yards</u>	<u>man days</u>
Kiva C* - - - - -	31	21
Area 235 - - - - -	7	13
Area 239 - - - - -	6	12
Rooms 163-164- - - - -	13	17
Room 289 (N) - - - - -	2	5
Kiva I (W) - - - - -	14	21
Kiva I (outside) - - - - -	3	7
Area 166-167 - - - - -	7	11
Area 282-283 - - - - -	41	44
Rooms 157-158- - - - -	3**	12

* Base laid in single course but capping not yet completed.

**Unfinished.

This 176 yards of capping in 206 man days or one and seventeen hundredths man days per yard. It's not much faster than the wall repair but here we had to back up several times and do walls over again. I might add here that it takes between three quarters of a gallon and a gallon of Bitudobe to do a yard of capping.

It is still difficult to get the idea of this capping across to the boys. I explain and point and build up a section of the wall (not a very big one) to illustrate what I want. After I've built up a piece they say, sure, they understand now what it is all about and go ahead. And it all comes out like the small section, all the walls in the room higher on the outer edge than on the inside, and every fourth rock cocked off a little to one side and the fifth rock a great big one and the seventh and eighth rocks held back from the edge three quarters of an inch, and so on around the room in series a couple of feet long. Doing this suits them all right and they'd just as soon do it this way as any other once they've learned the formula, but after it's gone on for a few feet and I want to change it, they naturally think that I don't know what I do want and the best thing to do is to just lay it all flat like a pavement.

From time to time we take a sample of the mix and, after drying, test it for water absorption. The only way we can test it here is visually. To all appearances, the water absorption is less than the laboratory tests on the mix indicate that they would be with our soil.

Wishing to test some mortar that had been exposed to weathering and freezing, I took two samples from Kiva K which has now been completed about a month. Sample #1 was a small sliver of mortar about one quarter inch thick from between two surface stones. Sample #2 came from the center of the wall; it was irregularly shaped and the size of a large potato. Both were placed in a pan containing water. Number one, the small sliver, became entirely damp in eight to ten hours but remained firm to the touch.

MOBILE UNIT (CONT.)

After 48 hours in the water, the larger piece had absorbed moisture to a level of half an inch above the water but no disintegration had taken place below the water line. All above the moisture line remained dry and with its original strength.

A piece of original, or aboriginal, mortar of the same size taken from a wall being repaired melted down completely within 20 minutes.

Freezing weather is retarding the laying of the capping somewhat. For three days in which there were freezing temperatures most of the working day, we laid no stabilized mortar at all. The rest of the time the mix is kept as dry as possible and work on the capping is stopped at three o'clock and all work done that day covered with a heavy layer of earth.

Dale will probably not like to hear this, but we have not laid any of his concrete walk yet. As Mac said, "If you lay it now it will freeze, and if it freezes, it's no good." Two other jobs in the canyon have been laying concrete in this weather. On one job it entirely disintegrated when the forms were taken off, and on the other, the boss stands out there all day keeping burning gasoline on the surface of all new work. When it's laid on top of a wall, as all ours will be, the top can be covered with straw or what have you, but not the sides. To cover a second story wall with enough canvas so that charcoal burners could be safely used under it would require a couple of circus tents.

We've cleaned out several inches of wind-blown fill in Kivas D, J, and I, and exposed the floor features there. In addition to the usual shaft and circular fire pits, J and I were built over other structures whose wall tops now show at the floor level of these kivas. In D, the top of a slightly smaller kiva almost concentric with D appears.

Since I didn't get a copy of the October report in which Mac told a joke on me, I went right ahead and told the same joke in my November report. Perhaps I should always start my reports with, "Stop reading if you've heard this one before." Anyway, I'll take another chance and hope that no one has told this illustration of how well my boys can follow any routine. It goes like this.

When starting out to take some "Before" pictures of some broken concrete capping, I had one of the Navajos sweep all the loose dirt off it before taking the picture. The picture was then taken and the same Navajo told to take the broken capping off the wall. Then yesterday this selfsame Navajo was told to take the capping off another section of wall that had been photographed some weeks before. He started off and no more attention was paid to him. Then in about a half an hour he was seen to be vigorously sweeping the capping to be removed. This looked like something new, so I watched him. In a couple of

MOBILE UNIT (CONT.)

minutes the sweeping was finished. He looked proudly at the clean concrete surface, flected off a speck of dust or two, then reached for a pick and began to pry up the broken slabs.

*****SWM*****

Gordon has a good report here and the figures on his repairs are most interesting. I was particularly interested in his report on the quality of the mortar he is using because, being a sort of conservative die-hard, I haven't taken much stock in this bitudobe which is coming into use in this country. Strange as it may seem, I am happy to say it looks like I am going to get caught on the wrong side of another argument.--F. P.

*****SWM*****

INDEX JULY - DECEMBER, 1937, INCLUSIVE

A Method of Preserving Habitat Mounts of Insects, by Donald De Leon, (November Supplement) 405.
Archeological Report on the Stabilization of Reconstructed Talus House, by J. W. Hendron (December Supplement) 478.
Arches National Monument:
Monthly Reports: Sept., 194; Oct., 290; Nov., 362; Dec., 433.
Aztec Ruins National Monument:
Monthly Reports: July, 5; Aug., 103; Sept., 184; Oct., 267; Nov., 355; Dec., 427.

- B -

Bandelier National Monument:
Bandelier GCG:
Monthly Report: July, 12; Aug., 111; Sept., 204; Oct., 273; Nov., 279; Dec., 452.
Bandelier Forestry:
Monthly Report: July, 15; Aug., 112; Sept., 205; Nov., 380; Dec., 454.
Bandelier Monthly Report:
July, 9; Aug., 108; Sept., 201; Oct., 270; Nov., 376; Dec., 448.
Bandelier Ruins Stabilization:
Monthly Report: July, 14; Aug., 134; Sept., 206; Oct., 298; Nov., 379; Dec., 453.
Beaubien, Paul L.:
Monthly Reports from Walnut Canyon: July, 34; Aug., 112; Sept., 175; Oct., 302; Nov., 348; Dec., 437.
Bicknell, A. T.:
Monthly Reports from Casa Grande: July, 17; Aug., 96; Nov., 370; Dec., 466.
Bird Banding in Southwestern Monuments, by Dale S. King. (November Supplement). 391.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

Bird Notes:

Montezuma Castle Monthly Reports: July, 72; Aug., 155; Sept.-Oct., 324; Nov., 361; Dec., 463.

Navajo National Monument. (See Navajo Nature Notes)

Borell, A. E.:

Rodent Problems at Chaco Canyon (September Supplement) 233.

Boss, The (See Frank Pinkley).

Boundey, George L.:

Gran Quivira Monthly Reports: July, 41; Aug., 117; Sept., 177; Oct., 277; Dec., 455.

Branch of Education:

Monthly Reports: July, 44a; Aug., 120; Sept., 216; Oct., 304; Nov., 385; Dec., 470.

Brewer, James W., jr.:

Roving Ranger Monthly Report: July, 41; Sept., 197 and 173; Oct., 306.

Budlong, Robert R.

El Morro **Monthly** Report: July, 25; Aug., 86; Oct., 263; Nov., 349; Dec., 444.

- C -

Casa de Steenc: 303.

Casa Grande National Monument:

Monthly Report: July, 17; Aug., 96; Sept., 178; Oct., 283; Nov., 370; Dec., 466.

Visitors, 1937: (By the Boss) 390a.

Weather at, By J. Donald Erskine (Oct. Sup.) 327.

Canyon de Chelly National Monument:

Geological Report, by Vincent W. Vandiver, (July Sup.) 55.

Monthly Reports: July, 7; Aug., 100; Sept., 213; Oct., 286; Dec., 440.

Capulin Mountain National Monument:

Monthly Report: July, 16; Aug., 113; Sept., 197; Oct., 297; Nov., 375; Dec., 437.

Caywood, Louis R.:

Random Notes From Tumacacori (Aug. Sup.) 157.

Tumacacori Monthly Reports: July, 32; Aug., 105; Sept., 171; Dec., 443.

Chaco Canyon National Monument:

Monthly Report: July, 20; Aug., 114; Sept., 167; Oct., 292; Nov., 373; Dec., 456.

Rodent Problems at, by A. E. Borrell, (Sept. Sup.) 233.

Talus Unit Number 1 at, By Margaret S. Woods, (Oct. Sup.) 321.

Threatening Rock Movement Measuring Device, 168.

Charles, Tom:

White Sands Monthly Reports: July, 39; Aug., 89; Sept., 190; Oct., 274; Nov., 342; Dec., 423.

Chase, H. B.:

Bandelier CCC Monthly Report: July, 12; Aug., 111; Sept., 204; Oct., 273; Nov., 379.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

Chiricahua National Monument:

Chiricahua CCC Monthly Report: July, 24; Aug., 95; Sept., 180;
Oct., 263; Nov., 347.

Monthly Reports: July, 22; Aug., 93; Sept., 181; Oct., 261; Nov.,
345; Dec., 429.

Closing, By The Boss:

July, 44m; Aug., 131; Sept., 221e; Oct., 308h. For remaining months,
see Opening.

Condensed Monthly Report:

July, 1; Aug., 75; Sept., 161; Oct., 249; Nov., 337; Dec., 417.

Cover, The (Art work by Tovrea) 309.

- D -

De Leon, Donald:

A Method of Preserving Habitat Mounts of Insects (Nov. Sup.) 405.

Duffen, William A.:

Tonto Ruins Stabilization May 27 to June 30, 1937 (July Sup.) 23.

- E -

Eden, James M.

Bandelier CCC Monthly Report, December, 452.

Erskine, J. Donald:

Casa Grande Monthly Reports: Sept., 178; Oct., 283.

Weather at Casa Grande, (Oct. Sup.) 327.

El Morro National Monument:

Monthly Report: July, 25; Aug., 86; Sept., 173; Oct., 263; Nov.,
349; Dec., 444.

- F -

Faris, Johnwill:

Canyon de Chelly Monthly Reports: July, 7; Aug., 100; Sept., 213;
Oct., 286; Dec., 440.

Farr, Homer J.:

Capulin Mountain Monthly Reports: July, 16; Aug., 113; Sept., 197;
Oct., 297; Nov., 375; Dec., 437.

Felton, James B.:

Tumacacori Monthly Reports: October, 255.

White Sands Monthly Report: December, 424.

Field Trip by Assistant Superintendent Miller, 44e.

Fish, Frank:

Chiricahua Monthly Reports: July, 22; Aug., 93; Sept., 181; Oct.,
261; Nov., 345; Dec., 429.

Fulton, J. T.:

Bandelier Forestry Monthly Report: July, 15; Aug., 112; Sept., 205;
Nov., 380; Dec., 454.

- G -

Geological Report on Canyon de Chelly, by V. W. Vandiver (July Sup.),
55.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

- Geological Report on Natural Bridges National Monument, by Chas. N. Gould, (December Sup.) 473.
Gila Cliff Dwelling:
Monthly Report, Nov., 372.
Gould, Chas N.:
Geological Report on Natural Bridges National Monument (Dec. Sup.) 473.
Guan Quivira National Monument
Monthly Reports: July, 27; Aug., 117; Sept., 177; Oct., 277; Dec., 455.

- H -

- Harkins, C. G.:
Bandelier Monthly Reports: July, 9; Aug., 108; Sept., 201; Oct., 270; Nov., 376; Dec., 448; Merriam Turkey, 450.
Harris, Robert S.:
Mobile Unit Report: July, 44; Aug., 126.
Heaton, Leonard:
Pipe Spring Monthly Report: July, 38; Aug., 118; Sept., 209; Oct., 288; Nov., 263; Dec., 433.
Headquarters Library:
Monthly Report: July, 44b; Aug., 125.
Southwestern Monuments Loan Library, by Gertrude F. Hill (Sept. Sup.) 223.
Hendron, J. W.:
Archeological Report on Stabilization of the Reconstructed Talus House, (Dec. Sup.) 478.
Bandelier Ruins Stabilization Monthly Reports: July, 14; Aug., 134; Sept., 206; Oct., 298; Nov., 379; Dec., 453.
Herbarium at Navajo, by Milton Wetherill (Oct. Sup.) 310.
Hill, Gertrude F.:
Headquarters Library Reports: July, 44b; Aug., 125.
Southwestern Monuments Loan Library, (Sept. Sup.) 223.
Hovenweep National Monument:
Monthly Reports: July, 41; Sept., 197; Oct., 306.

- J -

- Jackson, Betty:
Montezuma Bird Notes: July, 72; Aug., 155; Sept.-Oct., 324; Nov., 361; Dec., 463.
Jackson, Earl:
Montezuma Castle Monthly Reports: July, 28; Aug., 81; Sept., 187; Oct., 277; Nov., 357; Dec., 460.
Johnson, Zeke:
Natural Bridges Monthly Reports: July, 31; Sept., 211; Oct., 297; Nov., 353; Dec., 454.
Jones, David:
Sunset Crater Monthly Reports: Aug., 92; Sept., 201; Nov., 369.
Wupatki Monthly Reports: Aug., 91; Sept., 198; Oct., 295; Nov., 367.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

- K -

King, Dale S.:

Bird Banding in Southwestern Monuments (Nov. Sup.) 391.
Branch of Education, Monthly Reports: July, 44a; Aug., 120; Sept.,
216; Oct., 304; Dec., 470.

- L -

Library List, Continued; 235, 485.
Loan Library, Southwestern Monuments: by Gertrude F. Hill, (Sept.
Sup.) 223.
Library Report, Headquarters; by Gertrude F. Hill; July, 44b; Aug., 125.

- M -

McKinney, L. T.:

Chaco Canyon Monthly Reports: July, 20; Aug., 114; Sept., 167;
Oct., 292; Nov., 373; Dec., 456.

McNeil, Irving J.:

Tonto Monthly Report: July, 36; Aug., 101.

Merriam Turkey: By C. G. Harkins, 450.

Meteor Crater, Arizona; By V. W. Vandiver (Aug. Sup.) 135.

Method of Preserving Habitat Mounts of Insects, A; By Donald De Leon,
(Nov. Sup.) 405.

Miller, Hugh M.:

Field Trip by the Assistant Superintendent, 44e.

Miller, T. C.:

Aztec Ruins Monthly Reports: July, 5; Aug., 103; Sept., 184; Oct.,
267; Nov., 355; Dec., 427.

Mobile Unit Monthly Reports: July, 44; Aug., 126; Sept., 217; Oct.,
307; Nov., 387; Dec., 472b.

Montezuma Bird Notes, by Betty Jackson: July, 72; Aug., 155; Sept.-
Oct., 324; Nov., 361; Dec., 463.

Montezuma Castle in 1894: By F. G. Steenberg (Nov. Sup.) 397.

Montezuma Castle National Monument:

Montezuma Castle in 1894, by F. G. Steenberg (Nov. Sup.) 397.

Monthly Reports: July, 28; Aug., 81; Sept., 187; Oct., 277; Nov.,
357; Dec., 460.

Monthly Reports (See under name of the individual monuments).

Monthly Reports, Condensed: July 1; Aug., 75; Sept., 161; Oct., 249;
Nov., 337; Dec., 417.

- N -

Natural Bridges National Monument:

Geological Report on, by Chas. N. Gould, (Dec. Sup.) 473.

Monthly Reports: July, 31; Sept., 211; Oct., 297; Nov., 353; Dec.,
454.

Navajo National Monument:

Herbarium, by Milton Wetherill (Oct. Sup.) 310.

Nature Notes, by Milton Wetherill; July, 69; Oct., 326; Dec., 429.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

Monthly Reports; July, 35; Aug., 116; Sept., 194; Oct., 281; Nov., 344; Dec., 428.

Nichols, Fred D.:

Tumacacori Museum Reports: Aug., 133; Oct., 257; Nov., 381.

Notice of Geographical Name Changes, 396.

- O -

One Square Mile, by Donald Culross Peattie (Nov. Sup.), 408.

Onstott, Tom:

Tonto Monthly Reports: Sept., 196; Oct., 294; Nov., 361; Dec., 441.

Openings, by The Boss; Nov., 335; Dec., 415.

- P -

Peattie, Donald Culross:

One Square Mile (Nov. Sup.), 408.

Pinkley, Frank:

Casa Grande Visitors in 1937: 390a.

Closings: July, 44m; Aug., 131; Sept., 221e; Oct., 308h.

Gila Cliff Dwelling Report: Oct., 372.

Openings: Nov., 335; Dec., 415.

Ruminations: July, 73; Aug., 159; Sept., 277; Oct., 333; Nov., 413; Dec., 495.

Travel Year Comments, 1937: 221d.

Visitor Information, 1937, on Six Museum Monuments: 390c.

Visitor Statistics:

Monthly Reports: July, 44c; August, 127; Sept., 221b; Oct., 308a; Nov., 389; Dec., 471.

Pipe Spring National Monument:

Monthly Reports: July, 38; Aug., 118; Sept., 203; Oct., 288; Nov., 363; Dec., 433.

Pottery:

Rio Grande Glazes, by Earl Jackson (Aug. Sup.) 156.

- R -

Random Notes from Tumacacori: By Louis Caywood (Aug. Sup.), 157.

Reed, Harry:

Arches Monthly Reports: Sept., 194; Oct., 290; Nov., 362; Dec., 433.

Rio Grande Glazes, by Earl Jackson (Aug. Sup.) 156.

Rodent Problems at Chaco Canyon, by A. E. Borell, (Sept. Sup.), 233.

Roving Ranger:

Monthly Reports: July, 41; Sept., 197; Oct., 306.

Ruins Stabilization at Tonto, by W. A. Duffen (July Sup.) 43.

Ruminations, by The Boss: July, 73; Aug., 149; Sept., 247; Oct., 333; Nov., 413; Dec., 495.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

- S -

Saguaro National Monument:

Monthly Report for October, 307.

Southwestern Monuments Loan Library, By Gertrude F. Hill (Sept. Sup.) 223.

Steenberg, F. C.

Montezuma Castle in 1894 (Nov. Sup.) 397.

Steen, Charlie R.

Tumacacori Monthly Report: Nov., 381.

Stevenson, William:

Chiricahua CCC Monthly Reports: July, 24; Aug., 95; Sept., 180; Oct., 263; Nov., 347.

Sunset Crater National Monument:

Monthly Report: July, 35; Aug., 92; Sept., 201; Nov., 369.

- T -

Talus Unit #1 at Chaco, by Margaret S. Woods, (Oct. Sup) 321.

Threatening Rock (Sept. Chaco Report) 168.

Tonto National Monument:

Monthly Reports: July, 33; Aug., 101; Sept., 196; Oct., 294; Nov., 361; Dec., 441.

Tonto Ruins Stabilization, May 27-June 30, 1937: By Wm. A. Duffen (July Sup.) 43.

Tovrea, J.:

Drawing of Cover for Oct., Nov., and Dec. Monthly Reports.

Tumacacori Museum:

Monthly Reports: July, 38; Aug., 105; Sept., 171; Oct., 255; Nov., 381; Dec., 443.

Random Notes, by Louis Jaywood (Aug. Sup.) 157.

Travel Year Comments 1937, by The Boss, 221-i.

- U -

Underhill, A. E.

White Sands Construction Reports: Aug., 132; Sept., 133.

- V -

Vandiver, Vincent W.

Geological Report of Canyon de Shelly (July Sup.) 55.

Meteor Crater, Arizona (Aug. Sup.), 135.

Visitor Statistics, By The Boss:

(All monuments) Monthly Statistics: July, 44c; Aug., 127; Sept., 220; Oct., 308a; Nov., 389c; Dec., 471.

Museum Monuments: Oct., 308e.

For 1937, 390c.

Vivian, Gordon:

Mobile Unit Monthly Reports: Sept., 217; Oct., 307; Nov., 387; Dec., 472-b.

INDEX FOR JULY-DECEMBER, 1937 (CONT.)

- W -

Walnut Canyon National Monument:

Monthly Reports: July, 34; Aug., 112; Sept., 175; Oct., 302; Nov., 348; Dec., 437.

Weather at Casa Grande, by J. Donald Erskine (Oct. Sup.) 327.

Wetherill, Milton:

Herbarium at Navajo: (Oct. Sup.) 310.

Navajo Monthly Reports: July, 35; Aug., 116; Sept., 194; Oct., 281; Nov., 344; Dec., 428.

Navajo Nature Notes: July 69; Oct., 326.

White Sands Construction:

Monthly Reports: Aug., 132; Sept., 193.

White Sands National Monument:

Monthly Reports: July, 39; Aug., 89; Sept., 190; Oct., 274; Nov., 342; Dec., 423.

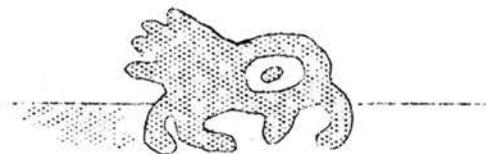
Woods, Margaret S.:

Talus Unit #1 at Chaco (Oct. Sup.) 321.

Wupatki National Monument:

Monthly Reports: July, 35; Aug., 91; Sept., 198; Oct., 295; Nov., 367.

*****SWM*****



THE Supplement

S.M. MONTHLY REPORT

GEOLOGICAL REPORT ON NATURAL BRIDGES NATIONAL MONUMENT

By Charles N. Gould

Natural Bridges National Monument is located in San Juan County, Utah, about 50 miles west of the State of Colorado, and nearly the same distance north of Arizona. The location of the monument and its relation to other National Parks and National Monuments in the Southwest is shown on the map of the Indian Country.

The monument is situated about 50 miles west of Blanding, Utah, from which place it is reached by a graded road. The trip may be made by automobile in two hours. Blanding can best be reached from the north over U. S. Highway 450 (marked 160 on the Indian Country map) from Moab to Monticello. From the Mesa Verde country and Durango, Colorado, the same road, U. S. Highway 450, is followed. From Monticello to Blanding, State Highway 47 is used. South from Blanding, State Highway 47 leads south to Bluff, Utah, and thence into Arizona, crossing Monument Valley via Kayenta, to Grand Canyon and Flagstaff.

On June 11 and 12, 1937, accompanied by Chief, Naturalist Division, Trager, and Associate Geologist Vandiver, I made an inspection of Natural Bridges. We were met at Blanding and conducted to the Monument by Custodian Zeke Johnson who has been connected with the monument for the past 23 years.

The first white man to see Natural Bridges was probably W. C. McLoyd who explored White Canyon in 1892. Later, James A. Scorup brought them to the attention of the public.

In the spring of 1905, Mr. H. A. Culver, artist of the Salt Lake Commercial Club and member of the Board of the Utah Art Institute, accompanied by Scorup, S. T. Whitaker, and Carlton Holmes, made a pack-train trip into southeastern Utah, visiting the bridges. The pack train which included 8 men with 20 horses, outfitted at Bluff, Utah, on April 9. The party reached Little Bridge, now called Owachomo Bridge, April 13 and remained in the vicinity of these bridges until April 18, then returned to Bluff on April 23.

Mr. Culver's diary was published as a supplement to Southwestern Monuments monthly report for June, 1937.

In 1908, three years after the Culver expedition, Natural Bridges National Monument was set aside by proclamation of President Theodore

GEOLOGICAL REPORT ON NATURAL BRIDGES NATIONAL MONUMENT, UTAH (CONT.)

Roosevelt to preserve the three natural bridges formed by water and wind erosion from heavy beds of sandstone.

I have not been able to secure an accurate map showing the boundaries of the monument. So far as I can learn, no accurate survey of the monument area has been made. The official blue print map was supplied by the Chief Engineer's Office at San Francisco.

The area of the monument also seems to be a matter of doubt. Zeke Johnson, the Custodian, told us that the monument contained approximately 4700 acres, but in the pamphlet entitled "Information Tables of Areas Administered by the National Park Service", edition of July 31, 1935, the area (estimated) is given as 2700 acres.

The Natural Bridges, as will be narrated later, officially named Kachina, Owachomo, and Sipapu, are arranged in a triangle, with three miles on each side. The road from Blanding ends at Johnson's camp, which is near the Owachomo Bridge. The other two bridges must be reached on foot, entailing a nine-mile walk along rough trails over rock and through sand.

Natural Bridges National Monument is located in one of the roughest and most picturesque parts of the state of Utah. This part of the State abounds in steep cliffs, lofty mesas, high mountains, and deep canyons. The drainage of the Monument is into Colorado River, through White Canyon, which is spanned by Kachina and Sipapu bridges. Owachomo Bridge is situated on Edwin Canyon, a small branch of Armstrong Canyon, three miles above the junction of Armstrong and White Canyons, at which place Kachina is located.

These canyons have been carved by erosion to a depth of 600 feet into massive sandstone which forms a flat plateau covering many hundreds of square miles. Above this plateau several mesas and peaks rise, sometimes to a height of 1500 feet. The total relief on or near Natural Bridges National Monument is approximately 2500 feet. The highest points in this part of Utah are Mossback Mesa to the west, and The Bears Ears, two peaks northeast of the monument on the Blanding Road.

The canyon walls are usually precipitous with many overhanging cliffs and long, narrow shelves (as may be seen in figures 2 and 3)*. The streams have cut a winding, tortuous, meandering course across the heavy sandstone plateau, and these meanders have become entrenched to a depth of several hundred feet. The few trails leading into these canyons are difficult of descent. The traveler must follow switchbacks, descent ladders, find his way along rock shelves, and following red arrows painted on the rocks by Custodian Johnson.

The geology in this part of Utah is all on a massive scale. The
*Original report

GEOLOGICAL REPORT ON NATURAL BRIDGES NATIONAL MONUMENT, UTAH (CONT.)

heavy, gray sandstone into which the canyons have been cut by stream erosion was described in some of the early reports as the Navajo sandstone, of Jurassic age, which it resembles in many ways. But, according to our latest and best information, this sandstone is of Permian age, not Jurassic, and is classified as the Cedar Mesa sandstone, a member of the Cutler formation. The thickness of the Cedar Mesa in this area is probably more than 600 feet. For description of the sandstone, reference is made to Bulletin 841, U. S. Geological Survey, by A. A. Baker, entitled "Oil Possibilities of the Moab District, Utah", Pages 32, 33. Also to Bulletin 865, U. S. Geological Survey, also by Baker, "Geology of the Monument Valley - Navajo Mountain Region, etc.", pages 31, 32.

The Cedar Mesa sandstone as exposed in the vicinity of Natural Bridges National Monument consists of many layers or beds, of heavy, crossbedded, gray sandstone, separated by thin beds of red or maroon clay. The thickness of the sandstone beds varies from 10 feet to 50 feet, while the red clays are from a few inches up to two or three feet thick. The weathering of these alternating beds of sandstone and clay gives rise to a series of long, narrow shelves with overhanging walls. In many places this unequal erosion has produced a stair-step effect along the canyon walls. These characteristics may be noted in practically all photographs used in illustrating this report.

Lying above the gray Cedar Mesa sandstone is a series of red or maroon-colored shales and sandstones, 1000 feet or more in thickness, which form the slopes of the higher mesas. Further north in the Moab region this is known as the Bogus tongue of the Cutler formation. It may be the equivalent of the Organ Rock, member of the Cutler formation, as exposed in the Monument Valley, farther south. The age is Permian. Next in ascending order is a gray sandstone which was formerly correlated with the Kaibab limestone, but which is now thought to be the equivalent of the de Chelly sandstone. Next follows another maroon-colored formation, several hundred feet thick, exposed on the slopes of Mossback Mesa and the Bears Ears, the two highest peaks in the region. This may be correlated with the Moenkopi formation of Triassic Age.

The names and dimensions of the three natural bridges, as given us by Custodian Johnson, at the time when he conducted us to these bridges, are as follows:

Owachomo Bridge (Formerly called the Edwin Bridge in honor of Edwin F. Holmes. This name was given by the Culver party in 1905.)

From the Indian name O-wa-co-ma, meaning "Mound on Top", from the cone-shaped mound of sandstone standing on top of the bridge. The dimensions of Owachomo Bridge are:

GEOLOGICAL REPORT ON NATURAL BRIDGES NATIONAL MONUMENT, UTAH (CONT.)

Span	200 feet	Height	108 feet
Width	35 feet	Thickness	10 feet

Sipapu Bridge (Formerly called the Augusta Bridge, probably for the mother of H. A. Culver.)

Called by the Indians "Si-pa-pu" meaning "Portal of Life" or "Place from which the Spirit Comes". According to their legend, this was the entrance into the underground world from which the spirit emerges at birth to enter the human body, and to which it returns after death. The dimensions of the Sipapu Bridge are:

Span	261 feet	Height	222 feet
Width	40 feet	Thickness	50 feet

In many ways Sipapu is the most impressive of the three bridges. The gigantic span of gray sandstone archway over the deep canyon forms a sight never to be forgotten. Figures 10, 11, and 12 show different views of this arch.*

Kachina Bridge (Formerly called the Caroline Bridge, for the mother of James A. Scorup.)

It spans White Canyon at the mouth of Armstrong Canyon. The Indian name is "Ka-Chi-na", meaning dancing girls, so named from a series of petroglyphs carved on the face of the cliff just above the bridge. The dimensions are:

Span	186 feet	Height	208 feet
Width	50 feet	Thickness	108 feet

Kachina is the most massive of the three bridges. *Figures 13 and 14 show views of the bridge. Unfortunately, it was not possible in the limited time at our disposal to secure good pictures of either Sipapu or Kachina Bridges.

Natural Bridges Monument has considerable archeological interest. There are scores of cliff dwellings, usually tucked away out of view along one of the shelves in the walls of the various canyons. These belong to the Mesa Verde type of structure, being built of flat blocks of gray sandstone laid in adobe mortar. Much broken pottery may be found. A description of these ruins is included in an article by C. R. Steen, Junior Park Archeologist, entitled, "Archeological Investigations at Natural Bridges National Monument", published as the supplement to Southwestern Monuments Monthly Report for May, 1937.

The most abundant trees on the monument are pinon and juniper, sparse
*See original report.

GEOLOGICAL REPORT ON NATURAL BRIDGES NATIONAL MONUMENT, UTAH (CONT.)

growths of which cover the slopes and mesas. Cottonwood and a few other deciduous trees occur in the bottom of White and Armstrong Canyons. Typical tree growth may be noted in any of the illustrations.*

Each year, Natural Bridges Monument is becoming more popular. Formerly a three-day pack train trip from Blanding was necessary, but since the completion of the graded road to Johnson's camp, the monument is much more easy of access. During 1936 there were, according to Johnson, about 1000 visitors.

At the present time, two most pressing problems at Natural Bridges National Monument are adequate quarters for the custodian, and a permanent water supply. Mr. Johnson lives in a tent, personally owned. Recently the Government has supplied a second tent for visitors. These two tents are shown in figure 1.* Plans are under way for the erection of a permanent residence.

All the water for camp use must either be hauled from a spring 12 miles distant, or carried in buckets up a steep winding trail for nearly a quarter of a mile from water holes in the bottom of Armstrong Canyon.

My brief studies would lead me to believe that there are four possible sources for a permanent water supply for the headquarters:

1. Water pumped from water holes in the bottom of Armstrong Canyon. This will entail a lift of plus or minus 300 feet. This on the assumption that the permanent headquarters is located at Johnson's present camp.
2. Water carried by gravity in a pipe line from a spring 12 miles distant.
3. Water from collected roofs of buildings, not yet constructed, and conserved in a cistern blasted in the sandstone.
4. Flood water from a ravine conserved in rock cisterns.

Numbers 3 and 4 might be combined. Custodian Johnson favors Plan No. 4. He suggests the building of a small dam across a ravine to divert water into a cistern blasted in sandstone and lined with concrete.

As a supplement to this Report, I am appending a memorandum, submitted to Regional Officer Maier, dealing with the Arch Valley area near Blanding, Utah.

*See original report

*****SWM*****

STABILIZATION OF TALUS HOUSE

By J. W. Hendron

During the year 1920, while Bandelier National Monument was under the administration of the United States Forest Service, the School of American Research resumed field work in the Rito de los Frijoles in cooperation with the Forest Service. This piece of field work was the restoration in part of the Talus Village, called the House of the Sun People, which was excavated by the School in 1909.*

Even in those days a large number of tourists visited the ruins at Bandelier, and it was thought that even with the aid of pamphlets that had been published with restorations on paper of typical ruin groups, it had not been possible to convey a satisfactory picture of these ancient settlements to people of average information on such subjects. It was therefore decided to select a typical village and rebuild enough of it to make a convincing example of the ancient Pajaritan cliff village.

Mr. Kenneth M. Chapman, who at that time was a member of the Museum staff, and who had for twenty years been a student of the architecture and art of the region, was selected for the job. He was assisted by a number of Tewa Indians from the village of San Ildefonso in the Rio Grande Valley, who had for years past been in the employ of the School in the excavation and study of ancient ruins of Pajarito Plateau. These men had been not only students of the ancient architecture of their race, but they had experience in building important structures along the ancient lines under the auspices of the School. They assisted in the construction of the "Painted Desert" at the Panama-California Exposition, and in the building of the Art Museum in Santa Fe. Not a feature of the restoration was carried out until every remaining ruin in the canyon had been carefully studied for historic authority. The result has been a most interesting addition to the attractions of this famous region. (Hewett, Edgar L.: Official Act and Administrative Reports of the School of American Research, Archaeological Institute of America, Santa Fe, New Mexico, U. S. A., ns. paper No. 22, 1918-1927, p. 53-55.)

I have been fortunate enough, through the kindness of Mr. Chapman, to obtain a detailed account of the restoration and also the names of most of the Indians employed by the School at that time.

Seemingly Mr. Chapman was unable to leave Santa Fe until about two weeks after the project was agreed upon and so Wesley Bradfield was sent out ahead and employed San Ildefonso men to cut vigas and small beams and poles for roofing. He was advised not to use pine cut at that season (May) for vigas, so he selected and cut oak, and alders

* Hewett, Edgar L.: Organic Acts and Administrative Reports of the School of American Archaeology, Archaeological Institute of America, Santa Fe, New Mexico, U. S. A., ns. paper No. 6, 1907-17, p. 63.

ARCHEOLOGICAL REPORT ON STABILIZATION OF RECONSTRUCTED TALUS HOUSE (CONT.)

for the other material from the floor of the canyon. Four to six men were used for several weeks gathering building stone from the talus slopes, and from the excavation of Tyuonyi. The old footing of the walls was located, partly by excavation, and partly by study of Mr. Chapman's plan published in the report of the 1909 excavations. (The Excavations at El Rito de los Frijoles in 1909, Papers of the School of American Archaeology, Archaeological Institute of America, No. 10, p. 656.) In some instances, it was necessary to cut back several inches into the weathered tuff to get satisfactory footing for the walls.

The valley soil was found to be too sandy for mud mortar, so it was mixed with clay obtained at the top of the trail, where it was exposed on a slope among the junipers, pinons and pines. The Indians packed it down in sacks on buros. This same clay was also used for interior plastering of the rooms. To get rid of leaves, sticks, roots, and coarse gravel, the clay was stirred to a consistency of cream, in buckets. The floating vegetal material was skimmed off and then the clean clay was poured off, leaving the gravel and sand. After settling, the water was poured off and the clay then used with the valley soil. For the plastering, sifted sand was used with the clay.

This reconstruction consists of five small rooms, and to enable the reader to view the situation clearly, a detailed description of the features of each room will be given. I shall number these rooms from 1 to 5.

Room 1 is to the front of the structure and forms the southeast corner. It measures 8.3 feet across the back wall on the inside, 9 feet across the front, the west wall, 5.6 feet, and the east wall, 7.1 feet. The 8 main vigas of oak were laid the width of the room. They were approximately 5 inches in diameter. Poles or vigitas of alder approximately 2 inches in diameter were laid across the main vigas and nailed. It was found that these poles in some cases were flattened with an ax so that they would lay an inch or so into the end walls. Apparently strong branches were used to fill in the gaps between the poles. Over the poles was laid a thin layer of brush, pine needles, and grass. On this, 2 x 4's were spiked down edgewise at intervals to provide nailing surfaces for a 3-ply roofing material. In the space between the 2 x 4's was placed crushed tuff, 1 to 2 inches in diameter and bedded in a clay mortar and finished to the level of the 2 x 4's. Over this, when dry, the 3-ply roofing was cemented and nailed down to the 2 x 4's, and brought up as a flashing at the sides, and flashed into the rain troughs of oak. Over the flashing, the final course of building stone or parapet wall was laid in cement mortar colored to imitate the mud mortar used between the rest of the building stone. After testing the pitch of the roof to make sure that water poured on every part reached the drain troughs, the Indians laid an earth roof over the 3-ply roofing, using 2 inches of mud, and when that cracked,

threw dirt on and worked it into the cracks. This layer was carefully sifted to keep sharp objects from puncturing the sheet roofing. Afterwards, another inch or so of ordinary dry earth was thrown on.

This room has in its front wall a low doorway, enabling a person to view the inside. In the southeast corner is a grinding bin 37 inches long and 32 inches wide, its sides being of slabs of black basalt. One slab divides the bin into two parts and in each compartment is a metate of basalt set in mud, and still in the correct position for grinding. This was, of course, a reconstruction by Mr. Chapman at the time the lodge was built, and was put back in place as near as the original position could be determined. In the southwest corner is the firebox. It is approximately 19 inches square and rather indefinite, some of the stones being missing. Its construction is very simple and it seems that slabs of basalt were set edgewise so that another slab could be placed flat over them.

Above the firebox, and in the roof 68.5 inches from the floor, is a chimney or smoke hole approximately 10 inches square with a small parapet wall around it. Back of the smoke hole and not more than 15 inches towards the cliff, midway between the front and back walls is the hatchway. Four lengths of oak notched at the ends and nailed to the main vigas were used for its construction. It is a little longer than wide, and just large enough for a human being to pass through.

The walls on the inside of the room were plastered with a coating of natural colored mud, a light brown to be specific, which was followed by a fine coating of plaster 35 inches up from the floor, apparently a clay of a light burnt red color. It is not known why rooms were given a final touching-up to this height, but it was probably a measure of cleanliness; plastering the walls whenever the smoke had sufficiently blackened them.

In the northeast corner of the room is a small doorway leading through the back wall into another chamber which I shall refer to as room No. 2. Two slabs of basalt set in a low protrusion of the cliff were used as steps leading up to the doorway 40 inches above the floor of room No. 1. In the bottom of the entrance was set a slab of polished black basalt. The entrance is barely large enough to crawl through.

Room 2 lies directly in back of room 1, and is a good example of a terraced room. It seems that in some instances rooms nearer the cliff were built on rising levels. The chamber is almost square, the inside measurement of the front wall being 7.7 feet, the same for the back wall; the east wall, 6.8 feet; and the west wall, 6.1 feet. The roof consists of 6 main vigas of approximately the same diameter as the vigas of the room previously mentioned, and the roof construction is the same as room No. 1. There was no smoke hole in the roof, but there was a central opening which was nearly in the center of the room near

ARCHEOLOGICAL REPORT ON STABILIZATION OF RECONSTRUCTED TALUS HOUSE (CONT.)

the northwest wall and constructed almost identical to that of room No. 1, and very little larger. From the floor to the ceiling, the room measures 72 inches and its walls are plastered in the same manner as the room in front of it.

In the center of the back wall is a small doorway with a slab of basalt set in the bottom 13 inches above the floor of room No. 2, leading into a shaft partly cut out of the cliff. The shaft measures 24 inches from the wall to the cliff, and 39 inches from the floor to its roof consisting of small poles of alder approximately 2 inches in diameter. The roof of room No. 2 extends over this covering and 15 inches above it. Four of the main vigas of room No. 2 were mudded into post holes cut in the cliff, and extended over the sides of the shaft, while two other vigas extended just through the wall which separated the shaft from the room in front. Along side these two main vigas were laid short lengths of pine about 55 inches long, extending over the shaft to post holes in the cliff. The shaft is barely large enough for an individual to sit in. Its use is unknown, but it is thought to have been a receptacle of some sort. Parts of its sides are laid up with chunks of tuff almost to the main vigas of room No. 2. I discussed the matter of the shaft with Mr. Chapman and learned that roofing material would soon rot, probably because of the lack of air.

Room No. 3 is the northwest room of the lodge and joins room No. 1 on the west. A low entrance way is in the front wall on the southwest side opening into the small chamber. Its inside measurements are as follows: southwest wall, 10.3 feet; northeast wall, 10 feet; northwest wall, 3.9 feet; and the southeast wall, 6.2 feet. The back wall curves toward the inside of the room and is laid upon a large flat protrusion of tuff, a natural formation which seems to serve as sort of a bench extending 7.5 inches above the floor of the room. Near the southeast wall there is a carved out portion which is just large enough for a person to sit down in.

The height of the room is 5.9 feet from the floor to the ceiling which was constructed in the same manner as the other two rooms mentioned. There were six main vigas in all. No central opening was found in this roof and there was no doorway leading into the room in back of it. In the middle of the back wall and almost down to the ridge of tuff was a small opening, which appeared to be for cleaning out the adjoining room or for handing objects from one room to the other.

Room No. 4 lies directly in back of room No. 3 and is built next to the cliff. The inside measurement of the back wall is 7.6 feet; the front wall, 8.3 feet; the northwest wall, 7 feet; and the southeast wall, 6.8 feet. From the floor to the ceiling it measures 6.5 feet. The roof is constructed almost identical to the others except that split pieces of timber, apparently pine, were used in some places instead of poles of alder. There were four large vigas of oak. The entrance is through the

ARCHEOLOGICAL REPORT ON STABILIZATION OF RECONSTRUCTED TALUS HOUSE (CONT.)

top almost in the center of the room between the second and third vigas and its size varies little from the hatchways of the other two rooms.

Directly in back of room No. 4 is room No. 5. It is entirely separated from the other rooms of the lodge and has to be entered by first ascending to the roof of room No. 4, and going through a low doorway in the front wall. The front or southwest wall and a small part of the northwest wall are the only ones built in this particular case, the other walls being formed by the cliff. The front wall measures 8.9 feet on the inside. The distance from the doorway in the front wall to the back of the room is 9 feet. From its floor to the roof it is 6.4 feet, and the construction is the same as the other four rooms, with the exception that the vigas or poles were placed about three inches apart, and covered by small branches, which appeared to be willows, placed very close together. There were 5 main vigas of oak, the floor is on about the same level as the roof of room No. 4, which is directly in front of it, and its walls plastered in the same manner. In the southeast corner were found slabs of black basalt which apparently form the fire box, the smoke hole being in the corner of the front wall just below the roof.

In each one of the rooms was a small rain trough placed in some portion of the roof. Three of the original troughs were still in place, the others had disappeared.

According to Mr. Chapman, except for the interior plastering, done by Tonita Roybal and Ara Montoya, no attempt was made to finish the interiors of the rooms, the main item in this regard probably being the plastering of the floors and blackened with soot. As near as can be determined, Indians employed other than those previously mentioned were Julian Martinez, Sotero Montoya, Juan Cruz Roybal, and Dionicio Sanchez.

The crew worked until August when the little house was finished.

THE STABILIZATION

Upon examination, this reconstruction was found to be in a deplorable condition. Most of the mud had been washed from the tar paper roofing which had rotted in the case of each room, and the thick coating of mud underneath the paper had washed away in places, laying the wood structure bare. The only parts stable at all were the large vigas cut from oaks and they too had begun to rot where the alder poles came in contact with them. In each of the five little rooms, a good portion of the plaster on the inside walls had been washed down and the mortar from between some of the building blocks was completely out, in fact, so badly that the cracks were large enough to be seen through.

The southeast corner of room No. 1 had evidently sunk, leaving a gap in the side wall where it is joined on to room No. 2, the wall being so loose that it could be moved back and forth with one hand. The cause

ARCHEOLOGICAL REPORT ON STABILIZATION OF RECONSTRUCTED TALUS HOUSE (CONT.)

of this cracking is not known, but it is thought to be the result of the wall being built on a slope and giving a little with each year's moisture or because of constant pressure on the roof. Excess weight on such frail structures would undoubtedly weaken them and lessen the length of their standing. I dare not attempt to estimate how long this room might have remained intact.

Before stabilization of the other four rooms could begin, it was necessary to cement or to repair this gap in the wall of room No. 1. The joints which had come loose were scraped free of all old mortar that could be reached, and cement was run down through the crack and forced in from the sides. Had the reconstruction of this section of dwellings continued, another room would have been joined on to the southeast side. The old viga holes are still present in the cliff wall for the first story and the outline of the room can still be seen, and even some of the original plaster remains on the cliff. A low wall not more than 5 feet high was built out from the lodge in a place where another wall might have been built by the original inhabitants. It so happened that the break occurred in line with this reconstructed wall. It was somewhat different from the building of an ordinary wall of a room, being that it was sunk into the ground about 15 inches and set in cement. It has rough edges resembling a portion of a wall of another room that had remained standing. This is the only way I know of that room No. 1 could be made stable without reconstructing the entire side.

As the old roofs of the rooms were being removed, the front walls had to be torn down to the level of the main vigas to facilitate their removal since they were mudded fast in the back walls. Most of the building stones in the upper portion of the rooms were loose and had to be reset regardless.

The new vigas, which were of pine, were set in the exact position of the old ones and were cemented in both the front and back walls. In setting the ends in the back walls, they had to be forced in small holes from which the old vigas were removed. Cement mortar was forced around the outside and small chunks or wedges of tuff were driven in to hold them tight. The building stones were then laid in to hold the ends of the vigas in the front walls.

Vigatas or poles of pine approximately two inches in diameter were laid side by side across the vigas, the ends being flattened on the under side so that they could rest or lap over the side walls thus giving more strength to the roofs at the ends of the rooms. The poles were nailed to each main viga. Although small branches were found laid over the cross poles only in one room it was thought better to use this method clear through, since a much stronger and tighter roof is produced. Willows were nailed across the vigas with the ends as close to the walls as possible.

ARCHEOLOGICAL REPORT ON STABILIZATION OF RECONSTRUCTED TALUS HOUSE (CONT.)

Another layer of building blocks was then put around the wall, building it up in order to lay the balance of the roofing material consisting of grass and some brush laid to a depth of approximately three inches. Dimension lumber, 2 x 4's were nailed down edgewise, the long way of the rooms, into the main vigas, and just far enough apart so that a width of tar paper would reach from one 2 x 4 to the other. They were cut so that drainage would be to the middle of the rooms. Small chunks of volcanic ash were laid in the grass and a thick coating of mud was poured over the top even with the 2 x 4's.

After the mud had dried, it was mopped over with hot tar, and before it had completely cooled, the tar paper was laid so that its edges would rest upon the walls. The paper was forced into the back walls about two inches, that is, forced back into the even joints between the building stones of the back walls where the mortar had been scraped out. The edges of the paper where they overlap were sealed with hot tar and when it had cooled, another coating was mopped over.

• The next step was the laying of the parapet wall. In the preceding paragraph, I mentioned that the tar paper was laid so that its edges would extend into the walls. In laying the building stones over it, they were set in cement over the paper and a flashing of cement was brought down from the wall to the paper on the inside.

While cleaning the five rooms on the inside, and removing the old roofing material, a great amount of tuff, small pieces of wood, twigs, and small pieces of volcanic ash had accumulated around the sides of the building. This material was used for mud which was poured over the final coating of tar to a depth of about 2 inches.

New drain troughs were cut for every room and placed in the lowest point in the roof. They were put down on top of the coating of grass and nailed to the vigas. Flashings of tin were put over the ends which rested on the roofs, the balance of the roofing materials being laid over this flashing.

In the case of the hatchways through the roofs of which there were three, the tar paper was cut and tacked to the frames, the edges of the paper then being sealed with hot tar. Each was made invisible when the job was completed.

The inside walls were plastered first with a coating of natural colored mud, and then the lower 35 inches was gone over with an orange colored clay, a deposit of this material being found in a small recess in the cliff. The exact reason why the walls were plastered with a coating of clay 35 inches up from the floor is unknown, but this same condition can be seen in most of the cave rooms. It may have been a measure of cleanliness, that is, as soon as the smoke from the fire moved down and blackened the lower part of the walls, they were

replastered. How often this replastering took place is not known and it was probably different in the case of each room, dependent upon the amount of smoke formed in each room. The walls of one room may have been smoked in a very short time while in another room fires may not have been built so often.

This completes the stabilization of the reconstructed talus house and although it is in excellent shape at the present time, a few years of weathering will leave its mark. Three entrances in the front walls of the rooms and three hatchways in the roofs leave the little house subject to climatic effects on the inside. I noticed in the case of room No. 1 that the hatchway was on the extreme end almost even with the side wall, and the rain dripping from the framework of the entrance had to run down the wall and washed away a wide strip of the plastering, and at the same time much of the mortar from between the building blocks had also washed down. This not only suggests but proves that some attention should be given the structure at least once a year. In this way, it will hold up for some years to come and with very little expense other than material, most of which can be obtained locally.

*****SWM*****

LIBRARY LIST

There follows the continued accession list of the Southwestern Monuments Loan Library, printed here so that the field men may obtain a rough idea of the library's contents. The October, 1936, Supplement carried the list through number 586; the September, 1937, Supplement brought it up to number 855 from which it is here continued.

- 856 - Hopi Katchinas Drawn by Native Artists. Extract from the 21st. Annual Report of the BAE of the Smithsonian Institution.
- 857 - Designs of Prehistoric Hopi Pottery, Extract from the 33rd. Annual Report of the BAE of the Smithsonian Institution.
- 858-859 - Outline of the Geology and Paleontology of Scotts Bluff National Monument and the Adjacent Region. By W. L. Effinger.
- 860-862 - Historical Background for the Rocky Mountain National Park, Colorado. By H. E. Rensch.
- 863-865 - Ethnology of Rocky Mountain National Park: the Ute and Arapaho. R. L. Beals.
- 866 - Mount Rainier: Its Human History Associations. By H. E. Rensch.
- 867 - Indian Tribes of Sequoia National Park Region. By J. H. Steward.
- 868 - Standards of Pottery Description. Occasional Contributions from

LIBRARY LIST (CONT.)

the Museum of Anthropology of the University of Michigan, No. 3.

- 869 - Report of the Charles L. Bernheimer Expeditions, 1922 - 1930.
By C. L. Bernheimer.
- 870 - Discovery of the Seven Cities of Cibola. By Marcos de Niza, Fray.
- 871 - A Method for Designation of Cultures and Their Variations. By
Mrs. Winifred Gladwin and H. S. Gladwin.
- 872 - The Sources and Authenticity of the History of the Ancient Mex-
icans. By Paul Radin.
- 873 - The Preservation of Antiquities. By H. J. Plenderleith.
- 874 - Historic House Museums. By L. V. Coleman.
- 875 - Problems of Installation in Museums of Art. By A. W. Melton.
- 876 - Birds of New Mexico. By Mrs. F. A. M. Bailey.
- 877 - The Ethnobotanical Laboratory at the University of Michigan. By
M. R. Gilmore.
- 878 - The Art and Technique of Ceramics. Brooklyn Museum, Brooklyn, New
York.
- 879 - Tribal Distribution in Oregon. By J. V. Berreman.
- 880 - Guide to materials for the History of the United States in the
Principal Archives of Mexico. By H. E. Bolton.
- 881 - 887 - Birds of the Papago Saguaro National Monument and the
Neighboring Region, Arizona. By H. S. Swarth.
- 888 - The Hawks of North America. By J. B. May.
- 889 - Life History of the Gambel quail in Arizona. By D. M. Corsuch.
- 890 - The Condor, Vo. XII, No. 1, Jan-Feb., 1910.
- 891 - The Condor, Vol. XVI, No. 6, Nov.-Dec., 1914.
- 892 - The Condor, Vol. XVII, No. 2, Mar.-Apr., 1915.
- 893 - The Condor, Vol. XXV, No. 1, Jan.-Feb., 1923.
- 894 - The Condor, Vol. XXIV, No. 5, Sept., Oct., 1922.
- 895 - The Condor, Vol. XXXVII.

LIBRARY LIST (CONT.)

- 896 - The Condor, Vol. XXXVIII.
- 897 - The Condor, Vol. XXXIX.
- 898 - The Old San Gabriel Mission. By Eugene Suñeres.
- 899 - History of Hawikuh, New Mexico. By F. W. Hodge.
- 900 - Broadcast, 1935. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 901 - Broadcast, 1936. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 902 - Monthly Report, January-June, 1937. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 903 - Monthly Report, January-December, 1934. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 904 - Monthly Report, January-December, 1933. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 905 - Monthly Report, July-December, 1932. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 906 - Concealing Coloration among some Desert Rodents of the Southwestern United States. By S. B. Benson.
- 907 - A Statistical Survey of the Snakes of the Southern Border of California. Bulletin No. 8 of the Zoological Society of San Diego.
- 908 - Forest Trees of the Pacific Slope. By G. B. Sudworth.
- 909 - The Plant Life of the Sonoran Desert. By Forrest Shreve.
- 910 - Plants of Rocky Mountain National Park. By R. E. Ashton.
- 911 - Plants of Yellowstone National Park. By W. B. McDougall and H. A. Baggley.
- 912 - Plants of Yellowstone National Park. By W. B. McDougall and H. A. Baggley.
- 913 - 914 - Arizona Cacti. By W. P. Stockwell and Lucretia Breazeale.
- 915 - Special Reports, 1936. U. S. Department of the Interior, National Park Service, Southwestern Monuments.

LIBRARY LIST (CONT.)

- 916 - Special Reports, 1937. U. S. Department of the Interior, National Park Service, Southwestern Monuments.
- 917 - National Geographic Magazine, Volume 22.
- 918 - National Geographic Magazine, Volume 30.
- 919 - National Geographic Magazine, Volume 31.
- 920 - National Geographic Magazine, Volume 32.
- 921 - National Geographic Magazine, Volume 33.
- 922 - National Geographic Magazine, Volume 34.
- 923 - National Geographic Magazine, Volume 35.
- 924 - National Geographic Magazine, Volume 36.
- 925 - National Geographic Magazine, Volume 37.
- 926 - National Geographic Magazine, Volume 38.
- 927 - National Geographic Magazine, Volume 39.
- 928 - National Geographic Magazine, Volume 40.
- 929 - National Geographic Magazine, Volume 41.
- 930 - National Geographic Magazine, Volume 42.
- 931 - National Geographic Magazine, Volume 43.
- 932 - National Geographic Magazine, Volume 44.
- 933 - National Geographic Magazine, Volume 45.
- 934 - National Geographic Magazine, Volume 46.
- 935 - National Geographic Magazine, Volume 47.
- 936 - 959 -- National Geographic Magazine, Volume 48 to Volume 59, inclusive.
- 960 - Annual Report, 1904. Smithsonian Institution.
- 961 - Annual Report, 1916. Smithsonian Institution.
- 962 - 966 - The Geographical Review. Volumes 18 to 22, inclusive.

LIBRARY LIST (CONT.)

- 967 - 972 - The American Anthropologist. Volumes 22, 23, 24, 37, 38, and 39.
- 973 - Fifty-third Annual Report, U. S. Bureau of American Ethnology, 1935-1936.
- 974 - Bird Banding. Volume 7.
- 975 - Bird Banding. Volume 8.
- 976 - 977 - History and present status of the breeding colonies of the white pelican. By B. H. Thompson.
- 978 - Manual for Bird Banders. By F. C. Lincoln and S. P. Baldwin.
- 979 - The Preparation of Birds for Study. By J. P. Chapin.
- 980 - 981 - A Systematic Synopsis of the Muskrats. By N. Hollister.
- 982 - 983 - Revision of the American Marmots. A. H. Howell.
- 984 - 985 - A Review of the American Moles. By H. H. T. Jackson.
- 986 - Monographic Revision of the Pocket Gophers. By C. H. Merriam.
- 987 - 988 - Biological Investigations in Alaska and Yukon Territory. By W. H. Osgood.
- 989 - Revision of the American Pikas. By Arthur H. Howell.
- 990 - Revision of the American Pikas. By Arthur H. Howell.
- 991 - Life Zone Investigations in Wyoming. By Merritt Cary.
- 992 - 993 - Alaska-Yukon Caribou. By Olaus J. Murie.
- 994 - Life Zone Investigations in Wyoming. By Merritt Cary.
- 995 - 996 - A Systematic Account of the Prairie Dogs. By N. Hollister.
- 997 - Revision of the North American Bats of the Family Vespertilionidae. By G. S. Miller, Jr.
- 998 - Revision of the Skunks of the Genus Chinchilla. By A. H. Howell.
- 999 - 1003 - Birds of the Southwest. By C. E. H. Aiken.
- 1004 - 1007 - New Mexico Historical Review.

LIBRARY LIST (CONT.)

- 1008 - 1009 - American Antiquity. Volumes 2 and 3.
- 1010 - The Archeology of Pleistocene Lake Mohave.
- 1011 - Nature Trails. An Experiment in Outdoor Education. Miscellaneous Publication No. 21 of the American Museum of Natural History. By Frank E. Lutz, New York.
- 1012 - Blazing Nature's Trail. The Nature Trails and Trailside Museum at Bear Mountain, New York. School Service Series No. 3. By William H. Carr.
- 1013 - Tumacacori National Monument. By Frank Pinkley.
- 1014 - Trailside Actions and Reactions. The Nature Trails and Trailside Museum at Bear Mountain, New York. School Service Series No. 5, The American Museum of Natural History. By William H. Carr.
- 1015 - Trailside Interdependence. The Nature Trails and Trailside Museum at Bear Mountain, New York. School Service Series No. 8. The American Museum of Natural History. By William H. Carr.
- 1016 - Trailside Transformation. The Nature Trails and Trailside Museum at Bear Mountain, New York. School Service Series No. 10. American Museum of Natural History. By William H. Carr.
- 1017 - 1018 - Fauna of the National Parks of the United States. By G. M. Wright and B. H. Thompson.
- 1019 - How to Collect and Preserve Insects. By F. E. Lutz.
- 1020 - Signs Along the Trail. The Museum and Nature Trails at Bear Mountain, New York. New School Service Series No. 2. American Museum of Natural History. By William H. Carr.
- 1021 - Trailside Conversations. Parts One and Two. The Nature Trails and Trailside Museum at Bear Mountain, New York. New School Series No. 4. American Museum of Natural History. By W. H. Carr.
- 1022 - 1023 - Trailside Family. The Nature Trails and Trailside Museum at Bear Mountain, New York. School Service Series No. 7. American Museum of Natural History. By William H. Carr.
- 1024 - 1025 - Ten Years of Nature Trailing. By W. H. Carr.
- 1026 - Trailside Family. By W. H. Carr.
- 1027 - Wildlife Restoration and Conservation.
- 1028 - 1029 - Museum Notes. Museum of Northern Arizona. Vol. 1 and 6.

LIBRARY LIST (CONT.)

- 1141 - Glimpses of our National Parks. Isabelle F. Story, Editor.
- 1142 - 1143 - Exhibit Plan, Historical Museum, Morristown National Historical Park, Morristown, New Jersey. By V. G. Setser.
- 1144 - 1145 - Stock-poisoning Plants of California. By A. W. Sampson and H. E. Malmsten.
- 1146 - 1151 - Lessons from Southwestern Indian Agriculture. By S. P. Clark.
- 1152 - 1153 - Chickamauga-Chattanooga National Military Park. By K. B. Disher.
- 1154 - Forest Conditions in the Black Mesa Forest Reserve, Arizona. By F. G. Plummer.
- 1155 - Picturesque Southwest. Volume 1.
- 1156 - The Kiva. Volume 1. By Arizona Archaeological and Historical Society.
- 1157 - The Kiva. Volume 2. By Arizona Archaeological and Historical Society.
- 1158 - 1159 - Southwestern Lore. Volumes 2 and 3. Colorado Archaeological Society.
- 1160 - 1167 - Museum Notes. Volumes 2, 3, 4, 5, 7, 8, 9, 10. Museum of Northern Arizona.
- 1168 - 1170 - Grand Canyon Nature Notes. Volumes 7, 8, and 9.
- 1171 - Historical Research for Devils Tower National Monument. By H. E. Rensch.
- 1172 - Report on the Possibilities for Ethnological Exhibits at Devil's Tower National Monument in Wyoming. By R. L. Beals.
- 1173 - 1179 - Trees of the National Forests of Colorado and Wyoming. U. S. Department of Agriculture. Forest Service.
- 1180 - 1181 - Annual Report, Colorado Museum of Natural History. 1935 and 1936.
- 1182 - 1183 - Bird Banding Notes. Nos. 1, 5, 9, 24, 27, and 28 and Volume 2. U. S. Department of Agriculture. Bureau of Biological Survey.

LIBRARY LIST (CONT.)

- 1184 - The Archaeological Survey of the High Western Plains: Seventh Report. By E. B. Renaud.
- 1185 - 1186 - Nebraska History Magazine. Volumes 16 and 17.
- 1187 - Third Contribution to Nomenclature of Cambrian Trilobites. By C. E. Resser.
- 1188 - 1190 - Tree Ring Bulletin. Volumes 1, 2, and 3.
- 1191 - The Troyville Mounds, Catahoula Parish, Louisiana. By W. M. Walker.
- 1192 - An Introduction to Pawnee Archeology. By W. R. Wedel.
- 1193 - Fox Miscellany. By Truman Michelson.
- 1194 - 1195 - National Geographic Magazine. Volume 72, and The National Geographic Society - U. S. Army Air Corps Stratosphere Flight of 1935 in the Balloon "Explorer II".
- 1196 - El Palacio. Volume 43. School of American Research and others.
- 1197 - Discovery of the Seven Cities of Cibola. By Fray Marcos de Niza.
- 1198 - Annual Report, U. S. Bureau of American Ethnology. Forty-ninth to Annual Report, 1931-1932; Fiftieth Annual Report, 1932-1933;
1201 Fifty-first Annual Report, 1933-1934; Fifty-second Annual Report, 1934-1935.
- 1202 - 1203 - History of Hawikuh, New Mexico. By F. W. Hodge.
- 1204 - 1205 - Northeastern and Western Yavapai Myths. By E. W. Gifford.
- 1206 - Indians at Work. U. S. Department of the Interior. Office of Indian Affairs.
- 1207 - Annual Report, Colorado Museum of Natural History. 1936.
- 1208 - Geology of Big Horn County and the Crow Indian Reservation, Montana. By W. T. Thom, Jr. and others.
- 1209 - History and Exploration of the Grand Canyon Region.
- 1210 - Trees of Grand Canyon National Park. By N. N. Dodge.
- 1211 - Contributions to Grand Canyon Ornithology.
- 1212 - Check-list of Birds of Grand Canyon National Park. By R. K. Grater.

RUMINATIONS

The Boss has what he thinks is a new idea and thus far hasn't made first base with it.

We around headquarters are knee deep in museum arguments again. It looks like museums and changes in the uniform are always good for an argument around this place, no two persons being able to agree on either.

In reading the current report of the Secretary of the Interior, which came in the other day, I was impressed with the following statement concerning museums: "Planned to illustrate ideas rather than exhibit collections of specimens, they tell a running story of the parks through pictures, charts, maps, models, and dioramas arranged in narrative sequence."

That same day we had been talking over some re-arrangement of museums and I had been studying about some lantern slides which we were proposing to make. The whole thing sort of jelled in my mind that night while I was waiting for the next tide of sleep to come in.

It works out somewhat this way in my mind: If a museum is to tell a running story with pictures, maps, charts, models, and dioramas, with a very light accent on specimens, why can't we determine ahead of time the best arrangement of a proposed museum by making up a series of lantern slides of each exhibit we have in mind and testing the proposed arrangement on enough persons to give us its definite reaction?

Suppose we decide the present arrangement of the Casa Grande museum is not very satisfactory and something ought to be done about it. Lack of ideas is the least of our troubles so almost at once we will have two or three competing plans proposed. Suppose one theory claims we have the cart before the horse two or three times and all the museum needs is a re-arrangement of the present material. Let us make up 125 lantern slides, or more if necessary, and we have our museum in our two hands with its exhibits as fluid as a deck of cards. We arrange the carts after the horses and try the talk that way until we are sure of our reaction. In some cases we find it works better and in some not so well. We cut and try, shift and change until we have the best possible arrangement of those particular exhibits which will hold visitor interest for the maximum time and at the maximum intensity. We find that we can leave out half a dozen slides without hurting the talk. We promptly remove them. Next we discover that a certain place in the development of our story needs bracing with half a dozen exhibits. We make up the slides and put them into the talk and watch our audiences for their reactions. Probably it takes three or four attempts before we get the wrinkle ironed out. Thus we cut and try, shuffle our cards, and watch the visitor reaction until we get a final run of slides which give the maximum visitor interest and tells our story the best we know how.

All of this experimenting takes months and will cost some money but that will be as nothing compared to the time and money we would

RUMINATIONS (CONT.)

expend in making the same experiments by shifting and changing and building and discarding in the actual museum rooms.

Having found by actual test of sustained visitor interest the best exhibits to show and the best sequence in which to show them, we next start turning our collection of slides back into actual three dimensional exhibits along the walls of our museum; we run some of our old exhibits back into storage, we shift others to their proper places in the museum as determined by our tests and then we fill in the blank spots with exhibits which we have already tested and know before hand will succeed.

I still think that is a blamed good idea but when I took it out and put it under the fire of criticism, I began to think, before the shouting and the tumult died, they would prove I was a chicken thief along with the other mistakes they were trying to prove on me.

The argument hinges around a bloody angle in which they maintain that "telling a running story of the parks through pictures, charts, maps, models, and dioramas arranged in narrative sequence" is a thousand miles, exhibitionistically speaking, from telling a running story of the parks through pictures on lantern slides. Maybe they are right but I am not yet convinced they are. Please note that I propose to first turn the present museum into lantern slides. We will then try that museum, as it stands translated into lantern slides, for intensity of visitor interest. We will then compare our proposed shifts and changes, not against the original museum but against the translated museum for intensity of visitor interest. What I hold is that if we can increase the interest, say 20% over that translated intensity, then we can turn this new arrangement on the slides back into a like arrangement in the museum and the new museum will have approximately 20% more interest-sustaining power. You should remember, in reading the above statement, that we guide our visitor in both cases; through the real museum or through the lantern slide museum. Take the guide away in one case or both and you change the equation, but I hope we never have to take the guides out of our museums; there are enough headaches about guided museums and I don't want to make it any worse by having to build un-guided ones.

As this Supplement goes to press, the war is still raging, so we must leave the final report for some future issue; this is a tough gang I have to contend with when I spring a new idea down here at headquarters.

Cordially,

The Boss