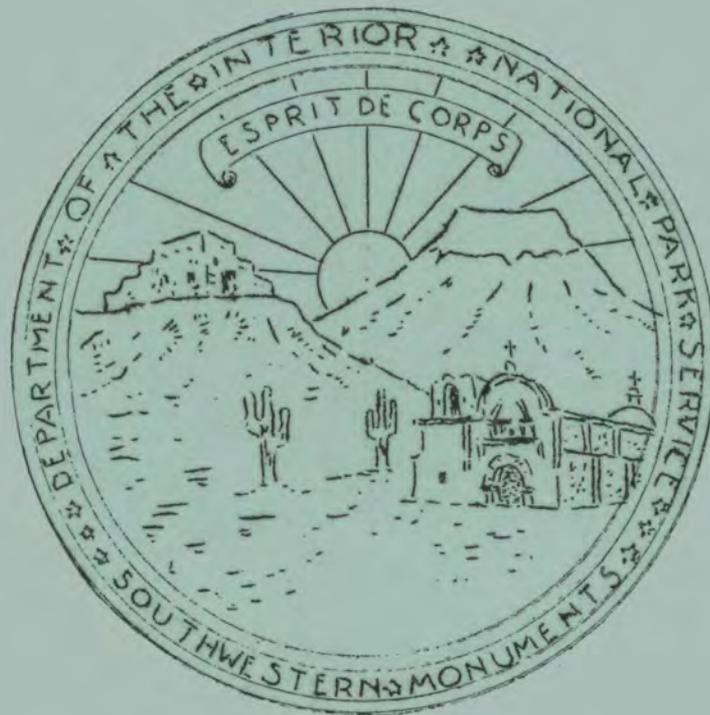


SOUTHWESTERN MONUMENTS MONTHLY REPORT

FEBRUARY 1937



DEPARTMENT OF THE INTERIOR
NATIONAL PARK
SERVICE

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SOUTHWESTERN MONUMENTS

PERSONNEL

HEADQUARTERS, Southwestern Monuments, Coolidge, Arizona: Frank Pinkley, Superintendent; Hugh M. Miller, Assistant Superintendent; James Luther, Chief Clerk; J. H. Tovrea, Assistant Engineer; Dale S. King and Charlie R. Steen, Junior Park Naturalists; Millard Singerman, Clerk-Stenographer; Luis Castellum and W. H. Sharpe, ECW Clerks.

FIELD STATIONS:

1. Arches - Moab, Utah. J. M. Turnbow, Custodian.
 2. Aztec Ruins - Aztec, New Mexico. Thomas C. Miller, Custodian.
 3. Bandelier - Santa Fe, New Mexico. Clinton G. Harkins, Custodian.
Jerome W. Hendron, Guide.
 4. Canyon de Chelly - Chin Lee, Arizona. Johnwill Faris, Custodian.
 5. Capulin Mountain - Capulin, New Mexico. Homer J. Farr, Custodian.
 6. Casa Grande - Coolidge, Arizona. Albert T. Bicknell, Custodian;
J. Donald Erskine, Ranger
J. W. Brewer, Jr., Guide
 7. Chaco Canyon - Crownpoint, New Mexico. Lewis T. McKinney, Custodian.
 8. Chiricahua - Willcox, Arizona. Frank L. Fish, Custodian,
Homer Bennett and Bronson Harris, CCC guides.
 9. El Morro - Ramah, New Mexico. Robert R. Budlong, Custodian.
 10. Gila Cliff Dwellings - Cliff, New Mexico. No Custodian.
 11. Gran Quivira - Gran Quivira, New Mexico. Geo. L. Boundey, Custodian.
 12. Hovenweep - Cortez, Colorado. No Custodian.
 13. Montezuma Castle - Camp Verde, Arizona. Earl Jackson, Custodian;
Russell Farmer, Ranger.
 14. Natural Bridges - Blanding, Utah. Zeke Johnson, Custodian.
 15. Navajo - Kayenta, Arizona. John Wetherill, Custodian.
 16. Pipe Spring - Moccasin, Arizona. Leonard Heaton, Acting Custodian.
 17. Rainbow Bridge - Rainbow Lodge, Arizona. No Custodian.
 18. Saguaro - Tucson, Arizona. Paul Beaubien, Park Ranger.
 19. Sunset Crater - Flagstaff, Arizona. No Custodian.
 20. Tonto - Roosevelt, Arizona. Thomas Onstott, Park Ranger.
 21. Tumacacori - Box 2225, Tucson, Arizona. Louis R. Caywood, Custodian.
James Felton, Park Ranger.
 22. Walnut Canyon - Flagstaff, Arizona. Winston Carrington, Ranger.
 23. White Sands - Alamogordo, New Mexico. Tom Charles, Custodian.
 24. Wupatki - Flagstaff, Arizona. Milton Wetherill, In Charge.
 25. Yucca House - Cortez, Colorado. No Custodian.
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CONDENSED REPORT

Coolidge, Arizona
March 1, 1937

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

Dear Mr. Director:

The Condensed Report on Southwestern Monuments activities for February:

TRAVEL

	<u>February, 1937</u>	<u>February, 1936</u>	<u>February, 1935</u>
Aztec Ruins	214	278	374
Bandelier	260	252	294
Capulin Mountain	700	500	350
Casa Grande	3,845	3,043	2,923
Chaco Canyon	91	379	207
Canyon de Chelly	---	5	---
Chiricahua	205	300	---
El Morro	---	---	---
Gran Quivira	109	129	216
Montezuma Castle	313	436	1,167
Pipe Spring	5	137	27
Saguaro	1,891	2,000	---
Sunset Crater	--	74	---
Tonto	700	724	599
Tumacacori	2,864	1,512	2,116
Walnut Canyon	---	187	---
White Sands	4,460	3,794	---
Wupatki	---	70	50
Actual Reported			
Registration	15,657	13,859	8,228

Although severe winter weather continued through the month of February, travel to the Southwestern Monuments showed a gain of nearly two thousand over the corresponding month of 1936. Several monuments, Walnut Canyon, Sunset Crater, Canyon de Chelly, and El Morro were completely isolated because of storms, snow drifts and bad roads, others were very difficult of access due to the same factors. In contradiction to that on the plateau, weather in the desert has been just what the doctor ordered. All hotels in the tourist districts have been full for nearly two months and with balmy days on tap, hordes of visitors, ranging from the humblest of cottage campers to the dudiest of dudes, have been traveling the roads to the southern monuments. The big increases shown in the travel figures at

CONDENSED REPORT (CONT.)

Casa Grande, Tumacacori and White Sands more than erase the losses shown at those stations which snowed under by the Navajo weather man.

010 MATTERS OF UNUSUAL IMPORTANCE

Montezuma Castle - On February 23 the President signed a proclamation which added 360 acres to the area of Montezuma Castle National Monument.

100 ADMINISTRATIVE

123 - PARK SERVICE OFFICERS

Aztec Ruins - C. D. Carter; Johnwill Faris; J. B. Hamilton
Bandelier - A. E. Borell; J. B. Hamilton; Charles A. Richey
Casa Grande - Dr. C. P. Russell; Ward Yeager; Adrey Borell; Walter Attwell; Johnwill Faris; Norman Dole; A. E. Underhill
Ghiricahua - Dr. C. P. Russell; Ward Yeager; Erik Reed; Vincent Vandiver.
El Morro - Charles D. Carter, Jr.
Montezuma Castle - Clinto F. Rose
Saguaro - Dr. C. P. Russell; Ward Yeager; Adrey Borell; Louis Caywood; J. H. Tovrea; Vincent Vandiver; Erik Reed.
Tonto - James Luther.
Tumacacori - C. P. Russell; Ward Yeager; Hugh Miller, Charlie Steen; Luis Gastellum; Paul Wilkerson; Lorenzo Moffett; Paul Rockwood; Erik Reed; Donald Page.

170 PLANS, MAPS, SURVEYS

Capulin Mountain - Engineer Clark's survey crew arrived during the latter part of the month and expects to be busy here for several weeks.

200 MAINTENANCE, IMPROVEMENTS, NEW CONSTRUCTION

Bandelier ECW

Excavation of road bed material to sub-grade has been completed in the parking area. Entire project is now ready for the contractor, who has his equipment set already.

Work on museum cases has progressed so that cases are ready to be installed as soon as building has dried.

Sixty feet of rubble masonry retaining wall around Hotel Development completed.

Footings and three feet of wall around the dining room of the hotel development completed.

Landscape crew has completed all projected planting for this season. One crew occupied during the month in hewing and shaping timbers for the dining room and kitchen.

Rock quarry crew augmented and working full strength.

CONDENSED REPORT (CONT.)

200 MAINTENANCE, IMPROVEMENTS, NEW CONSTRUCTION (CONT.)

Casa Grande -

Leveling coat and paint finish was applied to the residence area parking space.

Work on the new sewage disposal system was brought to a halt due to slow delivery of necessary parts.

Chiricahua ECW -

Rock slides on the Bonita Park-Massai Point Road have resulted in closing the road to all traffic. About 1500 yards of earth will have to be removed.

Maintenance continued on road between Bonita Park and public camp ground.

Nine hundred square yards of cut banks were sloped.

Sara Deming-Balanced Rock trail connection advanced 700 feet.

Tree planting job opened. Fifty-seven trees planted in the camping area.

Crushed rock and sand have been hauled for the construction of the equipment shed floor and incinerator.

300 ACTIVITIES OF OTHER AGENCIES IN THE MONUMENTS

320 COOPERATING GOVERNMENT AGENCIES

Bandelier - The United States Geological Survey is continuing the topographic mapping which was started last month.

Chaco Canyon - The Soil Conservation Service has had two men employed in rodent control in the Monument during the entire month.

330 NON-GOVERNMENT AGENCIES

Chaco Canyon - The University of New Mexico has finished the sixth hogan and plans to finish the main building of their camp in the near future.

600 PROTECTION

630 ACCIDENTS

Tumacacori - During a high wind on the morning of February 7 the water tank which supplies water to the Monument fell over into the pump house. In repairing the damage, the custodian suffered a broken index finger and lost a portion of the thumb, both injuries to the left hand.



CONDENSED REPORT (CONT.)

700 ACTIVITIES IN ARCHAEOLOGY AND HISTORY

Aztec Ruins - Some ruins stabilization was carried on during February at the roofed kiva. The work was made necessary because of ground water which drained into the structure. More stabilization is urgently needed at Aztec; some of which will probably be carried on during March.

Chaco Canyon - A crew is removing the plug of debris which is wedged behind Threatening Rock in an effort to check movement on the part of the rock.

The University of New Mexico Field School plans to spend four months in the Chaco this summer instead of the customary six weeks.

Tumacacori - An old Indian ceremony which was held at Easter each year until 1928 was carried out during the month so that a Department of the Interior photographer could record the ritual on a movie film. It is hoped that this ceremony will be renewed and celebrated each year in the future.

700 MISCELLANEOUS

MAIL COUNT

Incoming:		
Personal	856	
Government	<u>1,364</u>	
Total incoming		2,220
Outgoing:		
Government Only		1,886
Telegrams:		
Incoming	37	
Outgoing	<u>26</u>	
Total telegrams		<u>63</u>
Grand Total Mail Handled		4,169

Very truly yours,

Hugh M. Miller,
Acting Superintendent.

FIELD REPORTS

FROM THE MEN ON THE JOB

CHIRICAHUA

By Frank L. Fish, Custodian

Weather

Snow covered the monument during the end of January and up to the 15th of February when a warm rain melted practically all of it except for a few spots in higher elevations.

On the 7th a six-inch heavy wet snow fell that started melting fast on the eighth, causing all the streams to run a good head of water. The night of the eighth a cold spell set in freezing a good many pipes. This cold snap lasted until the middle of the month. Since then we have had fine weather.

Roads

A slide on the Massai Point Road above Bonita Park occurred the evening of the 6th blocking that road to travel the rest of the month and at the present writing the road is not open to travel yet. Two smaller slides have fallen into the road since then above the big one. There has been a general sloughing of the banks all along the Massai Point Road due to the large amount of moisture, freezing and thawing conditions prevailing for the past two months. For the safety of the visitors, and after talking it over with Mr. Stevenson, we have closed the road to travel above Bonita Park until such time as all dangerous spots can be removed.

Approach roads to the monument have been kept in excellent condition with the exception of the road from Rodeo, New Mexico, by way of Onion Saddle which is still blocked by snow at elevations around seven to eight thousand feet. However, it is not the fault of Ward Yaeger, Carl Russell, Erik Reed and Vincent W. Vandiver that the road remained blocked - all tried to open it up during the month. The honors should go to the team of Reed and Vandiver as they penetrated the farthest with the greatest effort. In fact Erik stated something about so many feet in nine miles of walking.

Visitors

There is a decline in the number of visitors this month as against the number shown for last year. For this February we had 205 in 59 cars as against 300 in 65 cars for February, 1936. Seventeen states, District of Columbia, Canada and China were the homes of the 205 visitors.

CHIRICAHUA (CONT.)

Park Service Officials

Carl Russell and W. Ward Yeager were in the 28th of January for a short stay.

Erik Reed and Vincent W. Vandiver stayed with us the 4th, 5th, and 6th of February.

General

Probably the outstanding event of the month was the celebration at the Faraway Ranch in honor of Mr. and Mrs. Neil Erickson on their Golden Wedding Anniversary January 25. Between 200 and 300 friends, some from long distances, joined this lovable couple in an afternoon and evening of good fellowship and visiting. Songs and Tunes reminiscent of earlier and what some of us like to consider the better days of America brought back memories to many of the happy faces at the gathering.

Boss, we have been very sorry to hear your ticker caused you to go to bed for a rest period and personally knowing your failing to delve into the insides of things like intricate mechanisms I have been a bit worried about you taking the darn thing apart and not getting the right pieces together again. Well anyway we are glad to hear you are pulling out in good condition.

During the month in spare time I have operated the power saw with the help of a crew of enrollees. That is what Dr. Kuer refers to in a welcome letter a while back as practical forestry.

*****oo*****

CHIRICAHUA ECW

By Wm. Stevenson, Project Superintendent.

Several slides have occurred on Bonita Highway this month due to melting snows followed by intermittent freezing and thawing. As the unstable cut banks between Bonita Park and Massai Point presented too great a hazard of safety for men to be permitted to work within these limits, it was imperative to close the road from February 6 to date. It will be necessary to move approximately 1500 cubic yards of rock before this section of the highway will be reasonably safe for travel.

It was noted that there was no sloughing of the banks on the sections which had previously been backsloped.

Maintenance has continued throughout the month on that section of Bonita Highway between Bonita Park and the public camp ground.

Ditches and culverts were opened and one-fourth mile of road surfaced. A gravel pit was opened near the present stone quarry to furnish the surfacing.

CHIRICAHUA ECW (CONT.)

Additional drainage is being provided also as the present drainage has proven entirely inadequate for a heavy winter.

Nine hundred square yards of cut banks were sloped this month on Bonita Highway between the public camp ground and the National Forest boundary.

Excess material from the backsloping project was utilized in the obliteration of borrow pits.

The Sara Deming-Balanced Rock trail connection advanced 700 feet -- several large walls were constructed and the crew is now working on the last switchback before reaching the rim under the Balanced Rock.

The tree planting project was opened February 9. Five trees out of the group planted in the camp ground last spring failed to survive and were replaced. The remainder of the planting was accomplished in the areas adjacent to the camp ground where old roads had been obliterated. A total of 57 trees was planted.

The crushed rock and sand has been hauled for the equipment shed floor and construction of an incinerator.

*****OO*****

WHITE SANDS

By Tom Charles, Custodian

Looks like I'm to enjoy the pleasures of flu annually. Last year it came on with the calm of the May lamb, swung into a whizzing sinus infection which had to be punctured twice daily for weeks. This year it blustered in with the fury of the March lion, bowled me over with a temperature of 103° and hung there for three days. "Lit up" I guess tells it, corns that I had forgotten burned like fire crackers, football scars, made before they knew what shinguards were, flared forth anew. Then, three days of stupor when you count your bones by the number of aches and find that the old books accounted for about half enough bones. Six days, and through it all that ethereal journey -- hunting the origin of the Great White Sands.

Boss, I wish you could have had that trip with me; the indescribable grandeur of the crystal craters; the long, rippled arches; the bearded stems of the yucca, swept loose except for a tiny thread still fighting; groups of young folk, unconscious of the seriousness of the occasion; others, older, picking their paths, playing in the velvet dunes; up to the very portals of the Pearly Gates. I shrink from the sub-head Charlie Steen puts on this, it will probably be "Seeing Things". Admitted. But if a fellow can get any pleasure out of six days with the flu, isn't he entitled to it? I'd hate to be Tom Boles and have the flu six days; his explorations are headed in

WHITE SANDS (CONT.)

the wrong direction.

Bertha Bell Entrikin, professional Chalk-talk artist of Cameron, Missouri, writes that she is preparing a full evening's entertainment on the Great White Sands. Her recent book, "Canyons Grand and Desert Sand", in which she features the Sands, is now on sale in the local drug store.

Joe Bursey, Director of the New Mexico Tourist Bureau, writes for 8 x 10 pictures of the Sands for use in a reel which is being prepared for Governor Tingley for use in state advertising.

Local ministers will meet in a few days to prepare a program for the sunrise service in the Crystal Bowl on Easter morning. Last year we had nearly 400 people there for the early service.

The electric eyes just south of town caught 2,768 cars last Saturday, Sunday and Monday, an average of 923 a day with 1,332 on Sunday. Our percentages show that on week day travel the White Sands road draws 54% of that traffic. That would give us 500 cars a day for three days, with four people to the car it would mean 2,000 people a day through the Sands. According to our count 36% of this traffic stops some place in the sands or approximately 720 people a day last Saturday, Sunday and Monday.

We had registrations from 40 states and five foreign countries. 624 registered; on the basis of 14% registration it gives us 4,460 visitors for the month.

*****oo*****

GRAN QUIVIRA

By George L. Boundey, Custodian.

Visitors for January, 109.

Owing to lack of gravel for surfacing highways, all the roads in this vicinity have been surfaced with caliche at a cost of about \$2000 a mile. These roads are practically impassable in wet weather. We had three inches of snow last Sunday night. I gave the roads three days to dry off and yesterday drove to Mountainair. I spent over an hour in a mud hole with chains on and this road is considered the best in these parts. I do not blame tourists for not venturing into this country in the winter time.

On Sunday, the 7th, we had a sandstorm which left the roads in such condition that only the mailman got thru and he was delayed several hours.

A few days ago we were visited by a party of shotgun enthusiasts. One of the party had visited the monument some time ago and had seen so much wildlife here that he had organized this party and they had driven

GRAN QUIVIRA (CONT.)

a long way to put in the day hunting on the Monument. They were disappointed.

We offered the storekeeper down at the village \$5 a month for enough electricity to run our projector in the community building. He is putting in a Delco system.

We have many requests to show Park Service films, also those pertaining to archeology and nature studies. Will be willing to rent and will take all responsibility in caring for same. So far several friends have been loaning me educational films, but have almost exhausted their supply. No admission fee and no collection is ever taken.

Our teacher and the two boys are making great preparations to help with the collecting and pressing of plant specimens from the Monument just as soon as spring opens up. We are going to try and make as complete a collection as possible.

A 92 year old Mexican sends word that when he was a boy he helped his father water several hundred head of cattle, daily and months at a time, from a spring and small artificial pool 400 yards from the northwest corner of the larger mission building. There is a pool evidently dug and a few feet higher a depression which might have been a well. If the old man lives until spring he says he will come over and show me, if I will go after him. I'm skeptical; are you?

*****00*****

CASA GRANDE

By Albert T. Bicknell, Custodian.

The following is a report on the activities at Casa Grande National Monument covering the period from January 25 to February 25.

Use of Monument Facilities by the Public

Total travel: 1937, 3,845; 1936, 3,043; 1935, 2,923

Of the 3,845 visitors to the Casa Grande 3,646 were contacted as follows: 13,092 minutes were spent guiding 483 parties thru the ruins and 6,367 minutes were spent guiding 384 parties in the museum.

States and Foreign Countries were represented as follows: All states except South Carolina, Mississippi, Nevada and Delaware, also from England, Canada and Hawaii.

Newsworthy Visitors

National Park Service: Dr. Carl Russell and Adrey Borell on the 31st; Walt Attwell stayed overnight on the first; Johnwill Faris on the

CASA GRANDE (CONT.)

6th and 7th; Norman E. Dole and wife, Junior Forester, were interested visitors on the 25th.

On the 10th an unidentified visitor asked "Where are their (pre-historic) bathrooms?"

Mayor Udall of Phoenix rushed in and out on the 20th.

A party of 34 deaf and dumb visitors were guided thru the ruin on the 21st. The compound looked like a "handy" convention.

Weather

Days clear: 20
Days cloudy: 4
Days partly cloudy: 7
Maximum temperature: 81 on the 24th of February.
Minimum temperature: 14 on the 25th of January.
Precipitation: .32 with a trace on the 12th and 15th.
Strong winds on the 7th and 15th.
On 17 nights the mercury slipped to 32 degrees or lower.

Improvements

Engineer Underhill arrived February 3 from the San Francisco Office of the Chief Engineer to supervise the work of finishing the parking area for the residential group. The leveling coat has been completed and the paint coat is being applied.

Work was continued on the sewer system during the month but has been delayed some due to slow delivery of materials and equipment purchased on contract. However, with the exception of making the electrical connection, the job is complete.

Flora and Fauna

A bat specimen taken on January 18 by Ranger Erskine in the Casa Grande was returned from the Museum of Vertebrate Zoology. It was identified as Mastiff Bat (*Lumops perotis californicus* (Merriam)) by Dr. E. Raymond Hall. The specimen is on display in the museum.

The Western Horned Owl act in the superstructure over the Casa Grande has been reduced to a "single". On the 21st Mrs. W. H. Owl started house-keeping on the walls of the Big House and has not been seen since.

One Mrs. Say Phoebe is building a nest in one of the beam sockets in the west wall of the East room.

CASA GRANDE (CONT.)

General

Traffic into this monument has been good. Two rainy Sundays kept the visitors away and the rodeos in Florence, Tucson and Phoenix put a dent in the total travel but still 802 more visitors came this month than in 1936.

Ranger service reached a new peak this month; I overheard one of the hired hands tell a party "The Casa Grande is the best preserved ruin in Pennsylvania" and another 90-day wonder was showing a visitor how to flake a projectile point and stuck it in his own thumb to prove it would work.

Ranger Erskine took annual leave on the 8th. We've all missed Don and Marie and will be glad to see them back on (or before) the 28th.

*****OO*****

MONTEZUMA CASTLE

By Earl Jackson, Custodian

Visitors

There were 313 visitors, as compared with 436 for the same period last year. 59.7% of the visitors climbed into the Castle. 159 people, or 50.8% of the total, were from Arizona, or had Arizona cars. There were cars from 14 states. Visitor registrations were from 24 states and one foreign country, Quebec.

There were 49 guided trips, which were taken by 199 people. The average time per trip was 37.37 minutes. There were 51 museum lectures given, heard by 205 people. The average time per lecture was 22.7 minutes.

As is customary with the approach of warmer weather, the percentage of interested visitors is dropping. There are some picnickers, and quite a few locals who bring cousin Jabez and his wife in to see the ruins, and stay down themselves, for they have seen it six times before, and "don't need to register this time, 'cause we did it last time."

I am confident the drop in travel from the corresponding month of last year has been due to adverse weather conditions and bad roads.

Weather and Roads

During the month we had four rains, 6 cloudy days, 7 partly cloudy, and 18 clear. On February 7 and 14 Beaver Creek was in high flood, because of the warm rains on heavy snowbanks in the mountains. The flood of the 7th was the largest I have ever seen in 19 years' residence in this district.

MONTEZUMA CASTLE (CONT.)

During the first half of the month, incoming roads, with the exception of the Jerome-Prescott highway, were in poor shape. Deep snow on the highway to Flagstaff through Oak Creek Canyon held back much travel, and for several days after the road was well cleared people in Flagstaff told tourists the road was impassable. We haven't had a visitor this year over the other Flagstaff road, via Mormon and Stoneman Lakes. Only two or three parties have braved the Apache Trail from Roosevelt Dam, for that road had some sloughs and was snowy and slippery. The Black Canyon road to Phoenix has brought one party here that I know of.

So, with only one highway approach really open all month, the travel here has been really better than would have been expected.

Special Visitors

February 11 - Clinton F. Rose, Resident Landscape Architect, was in for a few hours, going over locations and checking on a possible right-of-way for a power line. There is possibility the Arizona Power Company may run a power line past the monument and on up Beaver Creek to the various ranches.

February 16 - Mr. and Mrs. W. W. Van Akin, of Birmingham, Alabama, were in, in company with their friend J. B. Houghton, of Weld, Maine. The Van Akins are frequent visitors each winter, and are great boosters for the place. Mr. Houghton is one of the best water color artists in the country, and is doing some studies of Montezuma Castle and vicinity.

February 17 - Mr. and Mrs. J. M. Gibeau and family, of Noranda, Quebec, were interested visitors. Mr. Gibeau was here 30 years ago, and expresses himself as pleased at the activities the government has carried on here.

February 18 - A party of 26 people, most of them on horseback, guests of the Rimrock Ranch, were in for a picnic and to see the ruins.

February 21 - Edgar L. Schnadig, Executive Vice President of the Chicago Mail Order House, was an exceedingly interested visitor.

February 22 - Mr. and Mrs. Barry Goldwater were in for a short while. Mr. Goldwater is owner of Goldwater's Clothing Store in Phoenix.

A group of 47 CCC boys, of Camp F-51-A, Flagstaff, were in. They were in the charge of Lt. Donald K. Ratliff, a traveling dentist for the camps of this region. They were a very well disciplined bunch of boys, and appeared interested.

Nature Notes

For complete notes on our feathered associates and friends, see Bird Report by my wife, appended to this report.

MONTEZUMA CASTLE (CONT.)

The big flood caused excitement in the gopher colony in front of the Castle. We saw one half drowned fellow come out of his hole, scurry desperately away for a few yards, dig a new hole and completely disappear from our sight within five minutes!

On the 12th Ranger Farmer picked up a small bull snake from a limestone ledge at the Castle. We set it in a warm room, thinking it would come to life, but the vital spark had departed. We can think of no reason for the fellow to have given up the struggle, as there was no sign of injury on him.

Mr. Farmer also reports that a few nights ago a raccoon walked along the mud flat below his tent, but hasn't been out since the last rain, at least not in that direction.

The squirrels and chipmunks have not come out of winter quarters yet. We have seen only one rabbit, and it is a pet which has been around here for two or three years. It has a goiter on its neck, and we have wondered if some member of your educational staff might prescribe the proper iodine diet.

General

The floods did some damage to the lower end of the long revetment wall, undermining it for about 35 feet so that the rock mass sunk several feet. Because of this sinking, the revetment did not catch much of the mud from the highwater, and consequently the inland area, instead of building up, has cut down a little.

The waters also cut away a good bit of the fill in front of the museum building, but the only harm was the uncovering of the tile leading to the septic tank. The tile was cracked some, but I think a cement box around it will prevent complete breakage.

Have done quite a bit of re-arranging in the museum this month, changing it from just a collection to some sort of order. A lot of material was considered surplus, and inducive only to visual fatigue, and so it was stowed away out of sight in the basement.

I constructed, out of wood and plaster of paris, a miniature of a cyst grave, showing, on scale of one inch to the foot, the skeleton in the grave after the dirt had been shovelled away and the bones had been brushed and ready for picture taking, with the pottery in position as found. Bettery painted it, that is, the pottery, and we now have it in the museum.

Up until six years ago I used to work at the Castle as a temporary ranger, and had hundreds of contacts in this little museum. Then I was away from the museum for six years, and am now back again. That six years

MONTEZUMA CASTLE (CONT.)

of separation from the place has enabled me to have a clearer picture of changing visitor reactions over that period of time than would have been the case had I been continuously employed here.

I notice now that it is definitely much harder to hold the interest of visitors with a museum exhibit than it formerly was. People are becoming jaded and weary of museums. In six years museums have popped up all over the country like mushrooms after a summer rain, and they are so thick that when people come into a museum now they are prepared to be bored before they enter it. I notice the greatest difficulty in holding interest is with the people who come in here from the guest ranches. They represent a class of people who have been everywhere, and have seen nearly everything. They have seen finer museums in other places, and nine out of ten of them don't care whether they see this museum or not. They are just as interested in seeing the Castle as they ever were, however.

The lack of museum interest is not only in the wealthy people, though. Middle class visitors, comprising the greatest percentage, seem more restless in the museum than they did in the old days. It seems peculiar to me. Here I am, fresh on the job, filled with the characteristic pep and enthusiasm of a beginner on any job, and still can't hold them as interestedly as I could six years ago.

All of this means to me that we can't interest people very much any more with just a good collection of artifacts. We probably have here the finest collection of artifacts of any national monument, and have shown the material as a collection and as an ordered whole. So, to appease a fed-up populace, we've got to put on a bigger show. And a bigger show means more pictures, miniature models, life groups, and trick panoram scenes. And that all takes money.

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BIRDS AT MONTEZUMA CASTLE

By Betty Jackson

There have been 34 birds banded here this month, in 12 days of banding. The traps arrived on the 12th. Follows a list:

Oregon Junco	15
Pink-sided Junco	9
Gambel Sparrow	6
Western Chipping Sparrow	2
Road-runner	1
Arizona Cardinal	1

Shortly after the Cardinal was banded, he was seen with the female

MONTEZUMA CASTLE (CONT.)

near the trap, but he has been too smart to go in again.

When the Road-runner was banded there were two Gambel Sparrows and one Chipping Sparrow in the trap. They had gone into the second compartment in terror while the Road-runner desperately flung himself about the other. His beak was so long and thin that he would get it in one of the holes of the wire, and then change his angle and try to pull it out a gain. That way he had torn a huge chunk of cartilage off the bridge of his nose, and was bleeding profusely. He was worn out when we got him out of the trap, and submitted to the band willingly, and was very glad to rest in my lap for a while.

When we took out the sparrows it appeared that the Road-runner had been pretty vicious. They were badly torn up, and scared to distraction. One of them had a gash on his throat which looked serious, so I carried him to the house and administered an antiseptic. That apparently was not enough, because he died about five minutes later.

It would seem that that Road-runner is a tough customer. Yesterday I went out to the trap, and there he was, as fresh and chipper as ever, apparently with his nose healed up, stalking around the trap. There was a Gambel Sparrow inside, and the Road-runner had been pacing back and forth around the end of the trap till he had worn a path about a half inch deep. I was very glad the trap was large, so the sparrow was safe from that long beak.

The Red-backed Juncos left about the first of this month, though the others seem to be sticking here for the present.

I am not positive about that White-winged Junco I mentioned last month. Norman talked to Hargrave about it, and I have examined him in the hand. He is listed above as Oregon, but I doubt if he is. Next month I'll report what Mr. Hargrave thinks, though I may have to take the specimen.

A Black Phoebe, and what I think is a Say Phoebe, have arrived, and so have some Bluebirds which I have not yet seen close enough to identify exactly. They are probably the Mountain Bluebirds, which I have seen for a week or so between here and Camp Verde.

Norman saw a Rocky Mountain Creeper, which he says he never saw here before.

There have been a pair of ducks up and down the creek. They are popularly known as "fish ducks", but I think their real name is American Merganser.

The Terganza Blue Heron is still around, for there are some huge tracks, which I am sure are his, on the fresh sand below the Castle.

MONTEZUMA CASTLE (CONT.)

I must mention that I saw a Snowy Heron, or Snowy Egret, standing in the flood water where Beaver Creek and the Verde run together. I don't know of any other bird it could have been, with that heron shape and pure white color.

Is there a trap made that will not injure the head plume of the Quail? I want to start banding them, with colored bands, but I don't dare trap them in these wide mesh traps.

*****oo*****

SAGUARO

By Paul Beaubien, Park Ranger

The CCC boys who check visitors through the north gate, just part of the time, report 1,891 to enter this month. 612 visitors were contacted at the ranger station some four miles farther in monument.

Park Service visitors were Dr. Carl P. Russell, Adrey Borell, Louis Caywood, J. H. Tovrea, Vincent Vandiver and Erik Reed. The engineering crew of Andy Clark, Carl Schmidt and Ed Leavitt packed their belongings about a week ago, and departed for Capulin Mountain National Monument.

Dr. Russell was rather surprised to see so many cattle ranging on the monument - a situation which I have no means to control. With only a little grass left, there is a marked difference between our property and some of the fenced estates on the way to Tucson.

The weather has been very warm the last few days, and many of the winter annuals are well on their way. Expect to have flowers, young birds, etc., to report soon.

Deer are seen more frequently this year than last when no one guarded the gates to keep guns off of the monument during the hunting season. The day before leaving, the engineers saw seven in one bunch. If all hunting could be stopped for a year or two, many more visitors would have the thrill of seeing deer, quail, and other wild animals.

*****oo*****

EL MORRO

By Robert R. Budlong, Custodian

February, 1937, at this national monument, has been a month to delight the hearts of polar bears and Esquimaux, and one to frighten the wary visitor from the roads in this part of the State. We have but little to report for the month, but will do our best.

Weather

The less we say about this, the better. During the early part of

EL MORRO (CONT.)

the travel month we had snow, then more snow, and somewhat low temperatures. The lowest official temperature observed was 32 degrees below zero, January 26, at 4:00 a.m., at the Department of Commerce emergency landing field some five miles distant. The latter part of the month, however, brought clearing skies, snow flurries, and warmer days, with consequent melting of much of the snow. At present we are having a thaw, and the roads, so recently deep in snow, are now bottomless mud-holes.

Visitors

There was but one visitor during the month, and since he was a Park Service official, on official business, he can hardly be classed as a bona fide visitor, though his visit was his first to this Monument: Charles D. Carter, Jr., Resident Landscape Architect, Mesa Verde National Park, arrived here the afternoon of February 12, and departed the afternoon of February 13. He was our first visitor since the 26th of December.

About 4:30 p.m., February 12, I noticed someone stumbling through the snow toward the cabin, dragging an apparently heavy Gladstone bag. He came up and introduced himself as Carter, of the Branch of Plans and Design, and had a most interesting tale of adventure to relate: He had been warned not to attempt the trip, but had done so anyhow; had taken the wrong roads numerous times after reaching the airport, due to all signs being buried under snow; and had finally glanced back to recognize the Rock nearly two miles back of him. He could see the cabin, and, in his own words, "figured it must be a garage, and that the Custodian's Residence must be nearby" so turned back, got his car as far as the entrance gate, could go no further, so left it there and hiked to the cabin. I was overjoyed to see him, and nearly talked him to death until after midnight. The following morning we arose early, and spent the entire morning hiking over the rock, over the trails, and the entire Monument, returning to the cabin about two o'clock, where further discussions were in order until time for his departure. We were mighty sorry to have him leave. A great many matters were discussed, and we profited greatly by his visit.

Transportation

Don't mention it. But if I must, it was something like this: Many moons ago I received what appeared to be notice of shipment of the new Chevrolet truck, with the proper inspection blanks. Said truck was due, under contract, to reach Gallup not later than December 29. Since we had received no word that delivery would not be made, we figured the truck must be waiting in Gallup, and at the first opportunity I went in to get it. This opportunity was somewhat long in arriving. Roads had been solidly blocked with snow for a long time, and when I wrote my last monthly report we had been living on beans and nothing but beans for some days. Late in January word was sent by radio from the

emergency landing field five miles distant that ten people had been stranded there for 12 days, with food left for but two more days, so, on January 24, a tractor and scraper managed to break a road through to the field from Ramah. We heard of it several days later, and on the 29th I snowshoed over to the field, carrying a set of truck chains draped around my neck to use when I got the truck, getting a lift to town with a radio mechanician the following morning. It was necessary, since we had been entirely out of food for nearly two weeks, unless you call beans food. I don't, any more. Inquiry at the Chevrolet dealer's in Gallup revealed the fact that the new truck had never arrived, so there I was in Gallup, with no transportation. Words fail me at this point, but suffice it to say that I bought provisions until my last salary check jumped over to the wrong side of the ledger, made arrangements with a transfer company to drive me and the supplies to the flying field next day, and, upon arriving there, snowshoed to a nearby farmer's house, and arranged to have him transport the supplies from the flying field to the cabin via a team of tough mules and a sled. The mules had a bad time of it, breaking through the crust into deep snow all the way, but managed to get the supplies to the cabin. We propped the mules up against the side of the cabin to rest, and ate a square meal. I may state, quite unnecessarily, that beans were not included in the purchases of provisions.

General

In general, this has been a very quiet month, with nothing of note having occurred to warrant comment that can be put into print. However, several inspections of the stone steps on the trail have shown definitely that we must plan upon early replacement of most of them, if we can get the necessary funds for the work. The soft sandstone has disintegrated badly. Freezing and thawing have done their work well, and in places the steps are almost entirely gone. I hope we can get funds for this most necessary work in the near future.

Rapid run-off of melting snows is also cutting gullies in the soft earth of the fill where the arroyo used to be, below the water cove. I have ordered wood posts, and when they arrive will start construction of minor dams to prevent further erosion. There have been numerous minor falls of rock from the cliff, but no damage to inscriptions to date. Several new inscriptions were found during the month, and much work done along lines of research. Some transplanting of small shrubs and young trees has been done, but we are greatly hampered in this work by lack of transportation facilities.

We are glad to report that the injured junco we mentioned in last month's report finally recovered, and was able to fly. We liberated him, and have since frequently identified him among the other birds feeding at the cabin. Though we fed the birds all during the winter, large numbers of them, mostly juncos, were found dead in the snow

EL MORRO (CONT.)

during the month.

And so we bring another report to a close. We expect minor snow-falls for the next several weeks, and our first visitors of the season during the month of March. We hope they hold off long enough, however, to permit us to finish much work we have yet to do. You know, Boss, El Morro is destined to occupy a place high in importance in the Monuments system, and there is a tremendous amount of work yet to be done. Summer months bring many visitors, and there will be little time then for much necessary work -- it will have to be done over the winter. Next year, with (we hope) good living quarters, adequate working space, proper storage space for provisions, and means of transportation, one man will have more than enough to keep him busy during the period of relative isolation, just as we have had our hands more than full this winter. We have been greatly hampered by lack of space, proper facilities, and what not, though we believe we have accomplished much during the winter. However, the 1940 Coronado Cuarto-centennial is not far off, we look forward to a decided increase in visitor attendance, with better roads, and must be prepared to take care of these visitors, and to give them the most we can in education. This is going to involve much study and much preparation of necessary material. We have done what we could during the winter. But we hope that next winter will find better living quarters here, and the custodian, whoever he may be, well prepared with a great amount of material on which he can work during the winter months. El Morro is "going places," Boss, and it is going to take every minute of one man's spare time during the winter months to keep facilities for educating and taking care of the public up-to-the-minute.

*****OO*****

TUMACACORI

By Louis R. Caywood, Custodian

This month brings an all time high in visitor travel with a total of 2,864 visitors. Two thousand six hundred and forty-eight visited the Mission ruins while 216 looked from the parking area and used the facilities. This total of 2,864 is a 90 percent increase over the 1,512 visitors reported for February, 1936.

The peak of visitor travel here has, no doubt, been reached this month, as many of the winter visitors to Southern Arizona will soon be leaving for eastern points. La Fiesta de los Vaqueros, the annual mid-winter rodeo, held in Tucson for four days each year and ending on February 22 is usually considered the climax to the visitor season.

The weather has been bright and clear most of the month. There have been several very windy days which have made visits through the Mission very disagreeable.

On the morning of Sunday, February 7, there were very heavy winds

TUMACACORI (CONT.)

sweeping down the valley which completely destroyed the surface units of our water system. The 1000-gallon tank atop a 30-foot wooden tower was blown over onto the windmill, demolishing it. After clearing away the debris it was found that the gasoline auxiliary engine was untouched although it was directly in the path of both the falling tank and windmill. However, after the pump rod was straightened out enough to work, no water could be pumped. The pump rod and cylinder had broken off the 2-inch well casing. The pump rod had to be replaced and new leather washers were placed on the piston and cylinder. Mr. J. H. Tovrea from Headquarters inspected the wreckage on February 8 and made recommendation for immediate replacement.

On February 12, a 250-gallon tank was brought from Headquarters at Coolidge by Mr. Underhill and placed on top one corner of the tool shed. The tool shed walls are of adobe only one foot in thickness. These have been braced and by good fortune this temporary water system will probably stay in place until a new system is installed. A heavy, soaking rain-storm may weaken the walls and allow the tank to crash, but we hope not. Under the present setup it is not advisable to keep the tank full of water because of the weakness of the walls. However, in order to have pressure for the restrooms the tank has to be kept full or the restroom facilities will not operate.

While working with Ranger Felton on the pump February 10 the Custodian was so unfortunate as to have his left hand caught beneath a falling pump flange to which 22 feet of casing and the pump cylinder were attached. The result was a broken index finger and the loss of part of the thumb, both injuries on the left hand.

The following item taken from the December 7, 1899, issue of "The Arizona Silver Belt" (Globe) should be of interest to the Custodian at Casa Grande Ruins:

"The United States Government has at last set aside the Casa Grande Ruins in Southern Arizona as a national park."

Captain Donald W. Page, W.P.A. research historian for the proposed Tumacacori Museum and his son, Guy, spent four days, February 3, 4, 5, and 6, in the vicinity making their headquarters at Nogales. From Capt. Page the Custodian learned of the important research work being done at the Bancroft Library in the translation of early Spanish correspondence and reports. These translations will shed much light on the history of Tumacacori.

The first Kino Church according to records (Bolton, Rim of Christendom, p. 423) must have been on the east side of the Santa Cruz River. A very probable site was located by the Custodian about six months ago directly east of the present church one half mile, on a

TUMACACORI (CONT.)

prominence or jutting river terrace. It consists of the adobe foundations of a small building, about 17.8 feet in width and 39 feet in length, situated on the site of a historic Indian village. The pottery sherds found there are identical with those found around the present location of Tumacacori. Therefore, IF, the early Kino church was NOT in the river bottom land where it since has been plowed under and obliterated, then this is the most likely possibility for the site. A number of local people place the early Kino church where the Bailey ranch house is now located. Their reason being, no doubt, that a large red-on-buff (pre-historic) village site is located there. The pottery sherds here are prehistoric and having no similarity to the historic sherds found at Tumacacori would place the occupation of this site contemporaneous with Casa Grande Ruins or hundreds of years earlier than Kino's first visit to the region. Persons not cognizant with the value of sherd analysis might make this mistake.

Capt. Page was fortunate in locating a site known as El Torreón which is east of the Santa Ruz River and about a mile north of Tumacacori. From surface appearances it shows that a building about 40 feet or more square had been there at one time. It was no doubt Spanish because much brick and lime plaster are visible. On the northwest corner of the building is a larger mound showing that el torreón or the tower was located there. The site was also visited by Mr. Rockwood, Mr. Moffett and myself on February 22.

Mr. Lorenzo Moffett and Mr. Paul Rockwood, Museum Preparators from the Educational Office at Berkeley, spent four entire days at Tumacacori making drawings, taking photographs, color notes, paintings, etc. They arrived Saturday, February 20, and left at dark on February 23 and were here each day from early morning until the sun had set. Their notes, photographs and sketches contain a world of detail so that they will be able to faithfully reproduce the Mission and its setting in the dioramas and painting being prepared in Berkeley for the proposed Tumacacori Museum. I am more than glad that these boys were able to come here and I hope they have all the information they need to complete the exhibits.

Other Park Service visitors during the month were Mr. and Mrs. Hugh M. Miller, Charlie Steen, Dr. and Mrs. Gipe, Mrs. Albert Bicknell, and Luis Gastellum, all of Headquarters, and Mr. Paul Wilkerson, Cinema Photographer from the Washington Office. They were all here on January 31 to see Mr. Wilkerson take movies of parts of the Easter ceremonies given at Tumacacori. On that day more than 400 people were here, some participating in the ceremonies and others watching them. The Mexicans in this community gave this Holy Week ceremony last in 1928. It is hoped there will be a revival of it this year and that it will be held each succeeding year at Easter time. Luis Gastellum, a native of Tubac, deserves the credit in contacting the Mexicans and getting their cooperation in putting on the scenes for the movies taken by Mr. Wilkerson. He also acted as interpreter and helped direct the Mexicans in their under-

TUMACACORI (CONT.)

taking. Unless one spent the preceding four days here they cannot imagine the amount of work entailed in the preparation for this ceremony. Our hats go off to Luis.

Mr. Eric Reed from the Oklahoma Regional Office as a visitor on February 7. Mr. and Mrs. Carl Schmidt and son, who are at the present time stationed at Saguaro, spent February 14 with us. Other visitors of importance during the month were: Mrs. Joe Conway, wife of the Attorney General of Arizona, and Mrs. Vandenberg, wife of the U. S. Senator from Michigan. The All States Club of Tucson visited here on January 20. Miss Nora Gladwin of the Gila Pueblo, Globe, Arizona, was an interested visitor on February 10.

During the month all of the fruit trees growing on the Monument were pruned and some were replanted. Mr. Tate and Mr. Thompson, both of the Department of Agriculture, pruned some of the trees and made recommendations as to replanting. Three large mesquite trees were moved and it is hoped they will grow in their new locations. A number of Palo Verdes have been started from seeds.

Fifty Gambel Quail were banded this month. Also twenty Gambel Quail were given to the Monument by the Arizona Fish and Game Commission. These Quail came from Welton, Arizona, where they are being trapped because they are so numerous. For the present those given the Monument will be kept in a pen until they become a little tamer.

Thus ends the largest month so far in the history of Tumacacori.

*****oo*****

CHACO CANYON

By Lewis T. McKinney, Custodian

General

February has been pretty good to us up here in God's country, a little rain, a little snow, a little wind and quite a bit of much welcomed sunshine.

The roads have been pretty bad in both directions due mostly to thawing; of course, the rain and snow helped out. Consequently, we didn't have many visitors through the Monument this month.

I have been doing quite a lot of excavating this month. Dug up all of my sewer line, pipe lines for water, and dug new cesspool; also dug my truck, pickup and personal car out several times.

University of New Mexico

Have finished their sixth hogan and are preparing to finish the

CHACO CANYON (CONT.)

main building which was started last spring. I hope that the roof doesn't fall in like one of their hogan roofs did, with Mr. Hastings right in the middle of it all, for I would most likely have to look for someone else for Ranger this summer.

This research group plans to enter the Canyon May 1 and spend four months this summer instead of the usual six weeks as in the past.

Soil Conservation Service

The Soil Conservation Service has had two men working here in the Monument this month on rodent control, and as far as we can tell have made pretty good headway in getting a lot of the rodents along the earth dikes and other structures. They will also keep two men here next month to make small repairs on some of the structures that were damaged through the winter months.

Visitors

91 people entered the Monument in 46 automobiles, from the following seven states: New Mexico, Utah, Colorado, Arizona, California, Texas and Wyoming.

Weather

The temperature for the month has been as follows:

Maximum 52° on the 13th of February.

Minimum -2° on the first of February.

.74 of an inch of precipitation was recorded during the month.

*****OO*****

CAPULIN MOUNTAIN

By Homer J. Farr, Custodian

Only about seven hundred visitors this month, altho the weather has been mostly fair, it has been fairly cold and windy, the minimum temperature being about three below and the maximum about 50 for the month.

All roads have been open in this vicinity in all directions and very little snow during the month. This Monument has just barely missed four days of terrific dust storms that have been raging just east of here across the plains while we here were enjoying a delightful calm.

Our Engineer Clark and his assistants, Schmidt and Leavitt, arrived here on the 21st from Saguaro. They will do some work on this monument for a few weeks, and we will be able to report more of the results later.

CAPULIN (CONT.)

Last month this Custodian enjoyed a wonderful trip to headquarters, visiting Mr. Pinkley, Mr. Miller, Steen, Brewer and some more of the gang. My wife and I were certainly royally treated. We hope to get back down there again. Gee, but that's a fine place in winter but I guess just a wee bit warm in summer for snowbirds like us. We have lived here at Capulin, 7000 feet in the air, for 30 years and shoveled too much snow to know anything else. It is not so good to hear that my Boss is ill and I surely do hope the next word I receive from him will be that he is all O.K.

I have recently inspected a large portion of our boundary fence and find most of it in splendid condition, altho in a few places I will repair it this spring. Of course, all corners were set in heavy blocks of cement, as well as all stretch posts, but I find one corner has been uplifted and is in bad condition so that outside livestock may enter. This, I presume, was caused by having the wire a little too tight.

General weather conditions still insist upon retaining us in the drought stricken belt but we have ordered good rains for the spring and expect them.

*****OC*****

TONTO

By Tom Onstott, Ranger in Charge

This month showed a great improvement over January in both visitors and weather. Although there were eight days on which rain fell - one day of which there were no visitors - the weather remained warm, and the daily average increased steadily.

The following are the figures for the month:

Total visitors at the Monument	700
Daily average	22.58
Total visitors to ruins - guided	544
Number of parties guided to ruins	143
Average number in parties to ruins	3.8
Total visitors through museum - guided	457
Number of parties guided through museum	117
Average number in parties guided through museum	3.9
Total time guiding to ruins (minutes)	7100
Average time for party to ruins (minutes)	49.7
Total time guiding in museum (minutes)	1650
Average time for party in museum (minutes)	14.96
Total time spent in guiding (minutes)	8750
Precipitation	3"
Temperature, maximum (degrees)	73
" , minimum (degrees)	31

The figure for the rainfall was obtained from the Water Users

TONTO (CONT.)

Association and is for the precipitation at the Roosevelt Dam. It is, however, the nearest figure obtainable.

Mr. Luther of Casa Grande National Monument stopped in for a short visit on the morning of Sunday, February 21. It is too bad he did not stay to see that day hit a new high for this year with a visitor tally of 91, 76 of which went up to the ruins.

During the month there were two visitors of outstanding importance. They were Mr. Lohr, President of the National Broadcasting Company, who came in the company of Mr. Lewis of Station KTAR, Phoenix, and Mr. Vander Veer, photographer for the Byrd Expedition to Little America. Mr. Vander Veer was quite impressed by the Upper Ruin, and as his camera was broken, asked me to take some pictures for him later. He showed me, of course, where, how, and when to take them.

Mr. Alexander of the Forest Service informed me that if the Silver Cholla got too numerous he would gladly furnish poison and needle for inoculation, which they have found to be the best means of extermination.

The way people have been coming in recently, next month promises to be a big one.

*****OO*****

CANYON DE CHELLY

By Johnwill Faris, Custodian

It is rather hard to enumerate the number of visitors for the month, in that not one put in his or her appearance. Your Custodian was eight days getting from Gallup to Chin Lee, so it is no wonder we are a little short on visitors. Fortunately my delay was made very comfortable due to the graciousness of the Ganado Indian Mission. They very kindly gave me food and shelter and then when I burned out the clutch in the car their mechanic was kind enough to do the work of installation, thus saving me considerable expense had it been necessary to call a mechanic from Gallup, especially with the roads as they were. It was possible to come home yesterday on the frozen ruts. I was only stuck once, and then because of bouncing over into deep ruts and breaking through the crust. It was necessary to unload most of my load and come in almost empty even at that.

My trip to headquarters was most pleasant and profitable in many ways. I had the opportunity of visiting one of the Monuments never before visited and then it seems that we always come away all pepped up and I think this trip did more in that line than any for some time. With a new place to start the season and all the opportunities I can see here, I am confident that 1937 will end in one of the most enjoyable years of my employment in the Service.

CANYON DE CHELLY (CONT.)

As a contrast to my past reports, Boss, I want to inject a little more optimism, and mention that I think the season of frozen pipes, pumps, cars, etc., is over and we are experiencing some of the most beautiful weather one might encounter any where. I have every hope that much of it will continue and give me a chance to put the Monument in tip top shape for the summer season. I want to get on the rim road just as soon as it is possible in order that I might get in some water passages before any great amount might do us any damage.

This morning I am planning to get out the grader and get at some of the roads around close and get some definite routes established in and about headquarters.

Adding my little job to the printers along with those of Heaton from Pipe Spring, I want to correct a slight error. My visitors were Batching not Hatching, while they were here; any way such is life in the Monuments and we all know that it can not be beat anywhere and realize how many would like to trade jobs with us and experience some of the joys of living.

With a hope that this will find you all well and happy at headquarters and issuing a challenge to each of the custodians to try and get their Monument in nicer shape than mine will be for the season, I am.

*****OO*****

AZTEC

By Thomas C. Miller, Custodian

General

The past 60 days Northwestern New Mexico has experienced the most severe winter on record. Deep snows, extreme temperatures and cold winds were the rule all over this part of the state. Only a part of the time the passes were open in Colorado and many of them are still closed according to all road reports. The approach road to this monument has been all but impassable the entire month. Several cars have skidded off of the road and into the ditches. However, as this report is being made the roads in the Animas valley are drying up and showing much improvement. The temperatures are rising and many birds are coming in and have begun their singing, which would suggest that spring is just around the corner.

Weather Statistics

Maximum temperature for the month 52 on February 18

Minimum temperature for the month -17 on January 23.

Precipitation 1.52 inches rain and melted snow was recorded for the month. The greatest amount recorded in 24 hours was .85 inch on the 14th.

AZTEC (CONT.)

Clear days 15
Cloudy days 9
Partly cloudy 6
Number of days precipitation was recorded, 12.

Travel

214 people entered the monument in 63 cars coming from the following states and foreign countries: Arizona, California, Colorado, Florida, Idaho, Illinois, Iowa, Kansas, Missouri, Minnesota, New Mexico, New York, Nebraska, Oklahoma, Utah, Texas, Wyoming and France. Museum service was rendered to the 214 people mentioned above, while due to inclement weather conditions only 183 people were guided through the ruins. It is believed that if 214 visitors from 17 states and one foreign country would visit this monument during the month of February and drive through snow, mud and ice to get here, then we can expect to be plenty busy handling visitors when weather conditions are normal again.

Roofed Kiva

On Monday, February 15, flood water from melting snow covered the floor of the roofed kiva in the court to a depth of four inches. The water was dipped out and carried up the stairway in buckets. On the 16th we had 25 inches of water on the floor of the kiva. A force pump was borrowed from the city along with 100' of fire hose. With this pump installed we soon pumped the water out. The next question was how did the water get into the kiva? From studying the map of the tile drainage and reading the reports made by different ones, it was believed that the drain was plugged. However, after examining the entire court we discovered a small hole in a depression in the ground 30 feet south of the ventilator shaft, there we started our excavation. four and a half feet below the surface the hole got larger and turned toward the kiva. The hole then followed almost a straight line to the ventilator shaft, went through a hole in the masonry 4' 10" below the present ground level, then followed the ventilator shaft to the floor of the kiva. In addition to the water, four inches of mud covered the floor of the kiva which was carried out in buckets. After cleaning the kiva of water and mud, we found that the ventilator shaft was plugged with mud and fallen masonry which had to be removed. The lintels that lead from the shaft to the firebox in the kiva were rotted out causing the masonry in the wall to sag and fall. After the old timber had been removed along with several feet of mud and rocks, concrete and 60' $\frac{1}{2}$ " reinforcing steel were used for lintels for a distance of 5' 5" which was the thickness of the kiva wall. A new lintel of juniper and an outer core of masonry was used to fill in the break in the wall above the concrete and to cover up the concrete and steel. The Kiva and ventilator shaft have the appearance of prehistoric work but at the same time it is a good strong job. I believe we have solved the problem of a

AZTEC (CONT.)

better ventilation system for the kiva and cut off the flood water that has long been covering the floor of the kiva causing the walls to sweat. If and when we get more money for ruins repair it is planned to excavate and repair the ventilator shaft on the outside of the kiva wall. In that way we will have it whipped permanently. The ditch or trench that it was necessary to dig has been filled and tamped with wet clay. The ten-inch tile drain is not plugged up, I mean the one that drains the roof of the kiva. After two days of fairly warm weather clear water ran out of the drain at the lower end of the pipe. The court has been ditched and drained to the east of the ruins. We feel that we have accomplished a lot on a very small amount of money on this job. However, this winter has been a hard one on the Ruins. I have counted 42 recent falls, where a part of the walls or sections of the walls have collapsed. In places the foundations of the ruins are giving away. Boss, It is strongly believed that when we can get some money that we should excavate down underneath the walls of the Ruins in the most critical places and put that part of the Ruin on a good concrete foundation; then all the repair work that we do in those places will be something permanent and money well spent. I believe that the foundation should get the first treatment then it will be soon enough to start work on the second and third story structures as has been the practice in the past.

National Park Service Officers

Mr. C. D. Carter, Landscape Architect ECW, spent most of the day on the 11th going over the master plans with me and discussing our problems in general. The Cliff Dweller from Canyon de Chelly was here for a few minutes the same day. District Engineer and Mrs. Hamilton were here on the 19th. We were surely glad to see Jim because about that time things were somewhat complicated in and around the roofed kiva in the Ruins. Jim gave us some good suggestions on using concrete and steel in repairing the ventilator shaft. We had planned to use timber, but when Jim explained how the concrete could be used and covered up to where it would not be seen by any party visiting or inspecting the Ruins, that was what we decided to use. We think that we have some fine field men in our Service here in the Southwestern Monuments and it certainly is a pleasure to have one of them drop in when he is most needed.

Mr. Hamilton also outlined the stabilization work to be done on the Threatening Rock in the Chaco Canyon. We had planned to drive into Chaco on that date but the weather Gods were not with us this time; it rained and snowed all day and Jim thinks he knows something about those roads in wet weather.

It is believed that the visit of Mr. Carter is also going to do us much good because I bogged him down in the Court on the same trail that we take visitors over. I am sure that he can convince the Landscape Department that we must have some kind of a trail, or at least stepping stones placed along the trails so that the mud won't pull the ladies

AZTEC (CONT.)

shoes off in wet weather. Come again, Mr. Carter, the next time it rains or snows. We like you and your Department too and by visiting us in such inclement weather you will understand our problems better.

Threatening Rock, Chaco Canyon

On the 22nd I made a trip into the Chaco Canyon to get the stabilization work started on the Threatening Rock as outlined by District Engineer Hamilton. This work started on the morning of the 23rd with Custodian McKinney in charge and two laborers to help. Boss, the more I look at that job the bigger it gets. However, it is believed that when all that loose material is removed from between the rock and the cliff it will make a big difference in how long the rock will stand. I found the roads were mighty wet and slippery, spent one hour getting out of a mud hole on my return trip, but with good weather as we are having now the roads will be good again soon.

*****OO*****

WALNUT CANYON

By Milton A. Wetherill, In Charge

Not much to report this month. There is still plenty of snow with lots of mud. We have not had the February thaw so there has been little runoff, most of the water now soaking into the ground.

On the morning of February 7 about 3:00 a.m., we had a gentle wind in this part of the country. There are 43 trees down between U. S. Highway 66 and Walnut Canyon. Mr. J. C. Kester removed a 12-foot section from a tree that fell across the road near his ranch, and I cut the top 16 feet out of a tree which was across the road about a mile southeast of the Fisher Ranch. Telephone line is down in several places, about three quarters of a mile in all. Spent five days repairing the telephone line and cutting trees which had fallen across it.

From what I can learn there have been no visitors to Wupatki or Sunset Crater National Monuments. The road to Sunset Crater has been closed all winter. The road to Wupatki from U. S. 89 has been open part of the time. Ranchers going into that part of the country are going in on the Leupp Road.

Birds seen at Walnut Canyon National Monument

Long-tailed Chickadee	Western Robin
Western Horned Owl	Red-tailed Hawk
Red-shafted Flicker	Western Crow
Long-crested Jay	White-breasted Woodpecker
Gray-headed Junco (1 banded)	Red-backed Junco (1 return)
Shufeldt Junco (1 banded)	Townsend Solitaire
Western Bluebird	Chestnut-backed Bluebird
Rocky Mountain Nuthatch	Pygmy Nuthatch (70 repeats, 2 banded)
Mountain Chickadee	

BANDELIER

By Clinton G. Harkins, Custodian

Visitors

The total travel for this month numbered 260, 29 ahead of last month's total of 231, and eight ahead of the total travel for February, 1936.

Visitors arrived in 91 cars from 19 states and five foreign countries, South America, England, Canada, Scotland, and Austria. There were 36 returns.

The six highest states in order by car check:

New Mexico -----	102
Illinois -----	18
Colorado -----	18
New York -----	16
California -----	12
Texas -----	11

Weather and roads

Days partly cloudy -----	11	
Days cloudy -----	6	
Days clear -----	14	
Maximum temperature -----	58	February 7
Minimum temperature -----	04	January 26
Mean maximum -----	49	
Mean minimum -----	20	
Range -----	29	
Precipitation -----	72	against 85 for February, 1936
Rain and sleet -----	None	
Dust storms -----	1	February 6

Only one dust storm visited the canyon this month. The weather as a whole has been quite mild especially last week. Our coldest weather was in January. Snowfalls for the month occurred on January 25, 26, and February 16, 19, totaling .62 inch for the month.

Roads have been fairly good though rough and sloppy at times, especially through Pajaque Wash, and in the Ramon Vigil Grant:

Visitor trip chart

Forty-two parties made guided trips through the ruins, making a total of 114 people with an average of 18 people per party. One short lecture was given at the Community House.

BANDELIER (CONT.)

Most of the visitors escorted around the ruins showed a great deal of interest. We also had 30 returns, due mostly to the good weather over the week-end, and Washington's Birthday.

Special Visitors

February 18 Mr. A. E. Borell; February 20, Mr. J. B. Hamilton, Associate Engineer; and Chuck Richey, Landscape Architect.

General

The writer assumed the duties of Custodian at this Monument on the 17th, having transferred from the Petrified Forest National Monument. I wish to extend my thanks to Mr. Hendron at this time for his cooperation in acquainting me with the details involved in paper work, pertaining to the office; also to the very fine assistance shown by the enrollees detailed here. They are very competent.

We are still living out of a cracker box waiting for our household effects, having been one week, to date, since they were shipped. Two trips have been made to the Detached Section, one to Otowi and the other to Tsankawi Ruins. Both trips were made by Mr. Hendron and myself, on research work for the museum.

The U.S.G.S. party is doing a mighty fine piece of work on the topographical map they are preparing along with the location of the ruins in this area. The approximate number of houses in each ruin will be shown on the map. Also, St. Peter's Dome, where a lookout is maintained by the Forest Service, is included. Notes on the development of the museum by Mr. Hendron are included in this report as follows:

"Within a short time ECW will have finished with installation of museum cases and then we will be ready to install a few of the exhibits, and since Mr. Harkins has taken over the duties of Custodian I will be able to devote all of my time to this preparation.

Helmut Naumer, WPA pastel artist, informs me that he thinks it will be possible for him to gain entrance to a few more of our modern Rio Grande Pueblos and with the completion of these scenes we will have a good representative collection of the native villages to hang in the office. John Raymond Terken, our sculptor, is still working on heads of the Bandelier types, and I expect these to be completed in a few days, and then shipped to Berkeley for final touches. Terken will then work on Kiva Models, and house models of the Frijoles inhabitants.

*****00*****

BANDELIER ECW

By H. B. Chase, Project Superintendent

Excavation of road bed material to sub-grade has been completed within the parking area this month and now the entire proposed road surfacing project is complete and ready for work to be performed by the contractor. It has been noted the contractor is setting up his equipment today.

Additional work has gone forward with the construction of museum cases in the museum. All framework is now complete in place and plastering work in connection with this project completed to the sand finish in all rooms. Final bench work in connection with the cases has been completed in the woodworking shop ready for installation as soon as the building is properly dried.

Sixty feet of heavy rubble masonry of the retaining wall around the Hotel Development Area has been completed this month, with approximately 50 additional feet of footings in place.

Footings and three feet of wall have been completed around the dining room of unit one in the Hotel Development. Occasional cold weather during the past month has retarded the stone construction work to some extent, but has given the opportunity of construction small details that the work can progress rapidly at such a time we have continuous favorable weather.

The landscape crew completed all work contemplated for this planting season about the 15th of this month. Their activities this month being confined to planting within the vacant area adjacent to the camp headquarters and the baseball diamond.

One crew has been occupied most of the month hueing and shaping timbers for the dining room and kitchen unit of the Hotel Development.

Additional crews have been added to the rock quarry project and now the quarry project is in operation at full strength to insure ample building material within the Hotel Area.

*****OO*****

BANDELIER FORESTRY

By James Fulton, Forestry Foreman

On February 1, I completed the painting of Quarters No. 3. This was a particularly long siege of painting because of the fact that the woodwork and walls were very slow in drying.

The first two weeks of this month I was on leave.

The rest of the month I have had a crew engaged in cutting lintels, posts and vigas for the hotel dining room. This building is requiring quite a bit more timber than any building we have constructed so far.

PIPE SPRING

By Leonard Heaton, Acting Custodian

I let yesterday slip by without thinking that the monthly report was due to be sent in - too interested in the birds, irrigation, and things of the Monument, I guess, or it might have been that we are having some real spring weather that makes one want to be outside all the time.

We have had two good rains this month, one starting in the evening of February 5, lasting until February 7; this storm took most of the snow off and settled what was left down to about five inches. On the evening of February 13 another storm came and lasted till noon of Feb. 14, which finished most of the snow, causing floods in the washes and making the roads so soft cars couldn't travel. Since then the days and nights have been getting warmer until we have very little snow left, except on the north slopes and in drifts.

Some very unusual things have happened this winter; we had to get snowplows in to open the roads; ice froze on the east pond at the Fort nine and a half inches thick and while the thermometer was down to 15, 20, 22 below zero in the meadow under the snow the dandelions were growing and on February 2 I saw two that were in full bloom.

There ought to be good picking for the naturalist on the monument this summer. I intend to make a better collection of plants and flowers, some that will be of some use as reference and study.

Travel has not gotten back to normal yet, due to the softness of the roads and the many mud holes. February 19 was the first day on which the mail truck made a complete trip on scheduled time since December 26, 1936.

The ECW started their boys to work today after eight weeks of rest and most of the boys were glad of the change so that they could work off some of their energy. They will be leaving in about four weeks.

A crew of six men started to work on the monument cleaning up and leveling off ground which I hope to plant in grass soon.

I have had five visitors this month in spite of the bad roads. These people had other business in the country but took time to visit the Fort.

The most interesting of my activities has been bird banding. I have banded the following birds:

Redwing Black Bird	1
Junco	57
Shrikes, Northern	2
Song Sparrow	2
Gambel Sparrow	2
Total	64

PIPE SPRING (CONT.)

The Gambel Sparrows arrived back from the south February 21 and I caught one on the 22nd. The Song Sparrows also came about the same time. The first Shrike that I caught and banded killed several birds in the traps before I could catch him again, and removed him to Moccasin.

As there has been no educational advisor for this camp since last September, I concluded that the camp had no more use for the west cabin as a school house, so I called on the camp commander and asked him if it could be cleaned up. He agreed to do this work this week.

I received Mr. Vandiver's report on the geology of Pipe Spring. I can say that he surely has made things so plain that anyone can tell what they are reading. By means of the illustrations, the different formations can readily be distinguished. I have enjoyed reading this report very much.

*****OO*****

NATURAL BRIDGES

By Zeke Johnson, Custodian

I discover that it's report time again, so here it goes. I have enjoyed best of health all this month and have been out somewhere every day, always looking for an opportunity to talk about rock bridges to some one. I have been invited to speak twice, once at the University of Utah and once in a Mormon Chapple. I have talked San Juan scenic wonders on the street, in stores, and other places of business. Through these talks I have contacted 297 people and spent, as near as I can tell, 269 minutes in doing so. I have no work, so all I have to do is eat, sleep, read and visit around among my many friends. It looks and feels as though spring is just around the corner so I begin to feel like I will soon be back on the job, the sooner the better for Zeke!

*****OO*****



HEADQUARTERS STUFF

By Charlie R. Steen, Jr. Park Naturalist

With the exception of one day trips to the Organ Pipe Cactus area south of Ajo and to Phoenix, I spent the entire month at Headquarters. The day in the Organ Pipe area was spent in company with Walter Wilcox, Department of the Interior photographer, who took a number of fine photos of the flora of the region. The principal tasks which occupied my time during the month were, preparation of a tentative schedule for the proposed ECW mobile unit for ruins stabilization and rewriting the descriptive material for the master plans for the various monuments. Two talks were given to school assemblies during February.

Bird Banding

Birds were banded at all stations in the Monuments during February; a chart indicating the number and species trapped is appended to this report.

An interesting feature which is showing up at the headquarters banding station this winter is a large percentage of hybrids among the Gambel Sparrows; the crossing is with English Sparrows. In each of the several cases which have been noted the English Sparrow strain seems to be dominant, that is, instead of having the rather meek temperament of a Gambel, all are very cocky and show a good deal of fight while being handled.

Museums

We should have a flock of new museums and exhibits ready by the time the summer travel season gets under way. The Bandelier exhibit cases are ready to be installed; we hope that the Tumacacori Museum will be ready in a few months and plans are now being made for new exhibits at Casa Grande and Aztec. This month more formal plans will be made for the new unit at White Sands than the outline which was run in last month's report.

SPECIE	Casa Grande		Pipe Spring		Tumacacori		Walnut Canyon		Montezuma Castle	
	Pre	Feb.	Pre	Feb.	Pre	Feb.	Pre	Feb.	Pre	Feb.
Blackbird, redwing			14	1						
Bluebird, Chestnut backed							294			
Bluebird, Mountain							1			
Bunting, Lazuli					1					
Cardinal, Arizona					9					1
Chickadee, Mountain							1			
Cowbird					1					
Crossbill							57			
Dove, Inca	2				1					
Dove, Western Mourning							1			
Flicker, Red shafted							5			
Flycatcher, Arizona crested			5							
Goldfinch, Green backed							2			
Grosbeak, R. M. Blackheaded							1			
Grosbeak, R. M. Evening							5			
House Finch	37		3		8					
Hawk, Sparrow					1					
Juncos			47	57			45	2		24
Mockingbird					2					
Nuthatch, Pigmy							49	2		
Nuthatch, Rocky Mountain							6			
Pyrhuloxia					15					
Quail, Gambel	4				6	50				
Robin, Western							17			
Sapsucker, red naped							10			
Shrike, Northern				2						
Siskin, Pine							79			
Solitaire, Townsend							2			
Sparrow, Gambel	2	7	123	2	48		2			6
Sparrow, Rocky Mt. Song			12	2						
Tanager, Western							5			
Sparrow, West, Chipping							19			
Thrasher, Palmer					2					
Towhee, Canyon					11					
Woodpecker, Mearns							1			
Woodpecker, Whitebreasts							1			
Wren, Cactus	1									
Wren, Canyon			2							
Wren, Rock					1					
Road Runner										1
Sub-total	46	7	206	64	108	50	603	4		34
TOTAL	53		270		158		607		34	

STATISTICAL SUMMARY OF EDUCATIONAL CONTACTS FOR FEBRUARY, 1937

SOUTHWESTERN NATIONAL MONUMENTS

MONUMENT	No. Employees		GUIDED TRIPS				MUSEUM TRIPS				Unatt'd.		Outside Lectures	Total Edu'cl Contact	Total Travel	
	Pet.	Temp	No.	Att'd	Time	Av. Att Time	No.	Att'd	Time	Av. Att. Time	No.	Att'd				No.
Arches																
Aztec	1	1	44	183	17174.1	39	56	188	1105	3	20			371	214	
Bandelier	1	3	42	114	32802.7	78								114	260	
De Chelly	1		0											0		
Capulín															700	
Casa Grande	2	2	506	3646	130927.9	26	408	3013	6567	7.3	16			6,659	3,845	
Chaco Canyon															91	
Chiricahua	1	2	11	30	17352.7	157								36	205	
El Morro	1		1	1	360	1	360							1	1	
Gila Cliff																
Gran Quivira	1		25	109	1005	4	40							109	109	
Hovenweep																
Montezuma	2		49	119	17962.4		51	205	1158	4	23			324	313	
Natural Bridge												11	297	297	---	
Navajo																
Pipe Spring	1		3	5	851.3	28								5	5	
Rainbow																
Saguaro	1		109	612	47455.6	43								612	1891	
Sunset Crater																
Tonto			145	544	7100	5.8	117	451	1650	3.9	14.9			1,001	700	
Tumacacori	2		248	2648	132910.7	54								2,648	2,864	
Walnut Canyon	1		0											0	0	
White Sands	1														4,460	
Wupatki																
Yucca House																
Headquarters												2	180			
TOTAL			1181	8011			632	3863				13	477	12,351	15,661	

CLOSING

Luis claims that cutting stencil for the Headquarters Stuff and the Closing is no fun for we say the same thing each month. Well, this month will be no different and we might as well get it over - the boys in the field have been keeping pretty busy. "By gosh, that's true", comes the chorus. This has been another of those outstanding months, but if you were to ask why it has been so you would get two or three dozen assorted answers. The reasons that Budlong and Faris and Wetherill would give would not jibe with those of Bicknell and Caywood; Tom Charles has a field all to himself; we certainly sympathize with him but we fervently hope these dreams aren't contagious.

We finally have a ruins stabilization crew at work. The plug of debris behind Threatening Rock is being removed, and the roofed kiva at Aztec has been drained. Several other jobs of stabilization are on the slate for this spring and it is hoped that a few of the prehistoric walls which have threatened to collapse for several years will be saved. Stabilization of ruins should be one of the most important phases of our work but heretofore the monuments have been handicapped by lack of funds. The proverbial silver lined cloud seems to be overhead now and we are going ahead making plans for repairing walls and roofs that have needed such work for lo, these many years.

Another big problem, one which has been mentioned a number of times in this report, is what to do with the visitors which are showing up at Casa Grande and Tumacacori. Caywood's problem will be even more acute next year when there is a new museum through which visitors will have to be guided, in addition to the mission. Wurra, wurra, as our old friend the Irishman would say, there are busy days ahead.



THE Supplement



S.M. MONTHLY REPORT

PIPE SPRING NATIONAL MONUMENT

By Vincent W. Vandiver, Associate Regional Geologist

Introduction

Pipe Springs as a National Monument owes its existence to important historical factors in connection with the early Mormon pioneers and their struggles with the Indians of Southern Utah and Northern Arizona. It will be my endeavor in the following pages to relate something as to the geologic history of the general area of the Monument. In the immediate vicinity of Pipe Springs the geology is not particularly exciting; however, one of the prize stratigraphic sections of America, if not in the world, extends from the Colorado River on the south, through the general area of the Monument, and on northward into Utah to the Markagunt Plateau. Rocks from the Archean to the Eocene may be observed in this space of around one hundred miles and very few periods fail to be represented. This great columnar section, comprising some 12,000 feet of sediments, has been made visible to us through the regional uplift of the area, the raising of beds which were at one time below sea level to a height of almost two miles above sea level, with consequent carving of great canyons and the formation of the step-like higher plateaus proceeding northward into Utah, thereby unfolding the geologic history in open-book fashion.

I first visited Pipe Springs in October, 1935, and have since made official visits to the area in company with Dr. Charles N. Gould, Regional Geologist, and in the latter part of 1936 several trips with Dr. Herbert E. Gregory of the United States Geological Survey. Many of the observations discussed in this report have been reviewed with these geologists. The maps included in this report are from published data of the United States with minor alterations of the fault lines between Pipe Springs and Moccasin Springs, the latter in accordance with our interpretation. The area is one which grows in interest with successive visits and after one has seen all there is to be seen he returns and finds that there is "plenty new under the sun".

Location

Pipe Springs National Monument is situated in northeastern Mohave County, northwestern Arizona, in the famous Arizona "strip", bounded by the Utah state line on the north and the Grand Canyon of the Colorado on the south. The Monument contains only 40 acres in the SW $\frac{1}{4}$ of Section 17; Township 40 North; and Range 4 West. It is about 10 miles south of the Utah line. President Warren G. Harding established the area as a National Monument by Presidential proclamation on May 31, 1923, placing same under the administration of the National Park Service. Reservation was made primarily to protect an old stone fort and springs which have had an important bearing on the history of the early Mormon settlers in this desert region and their troubles with the Indians.

PIPE SPRING GEOLOGY (CONT.)

The sketch map on the following page shows the general geographic relationships. Travel from the main U. S. Highway No. 66 through northern Arizona and New Mexico is made to Pipe Springs via U. S. Highway No. 89 by way of Cameron, Lee's Ferry, Jacob's Lake and Fredonia. At the latter point one leaves the gravel road and travels southwest, on a graded road, a distance of 15 miles to the Monument. If proceeding into Utah one may travel northwest from Pipe Springs and enter Zion Canyon National Park from the south or return to Fredonia and U. S. Highway 89 for those travelling south. For those driving south from Fredonia there is a sign which calls attention to the fact that the next town (Flagstaff) is 200 miles distant. This is no doubt somewhat disconcerting to motorists during the summer months, especially those with slick casings on their cars.

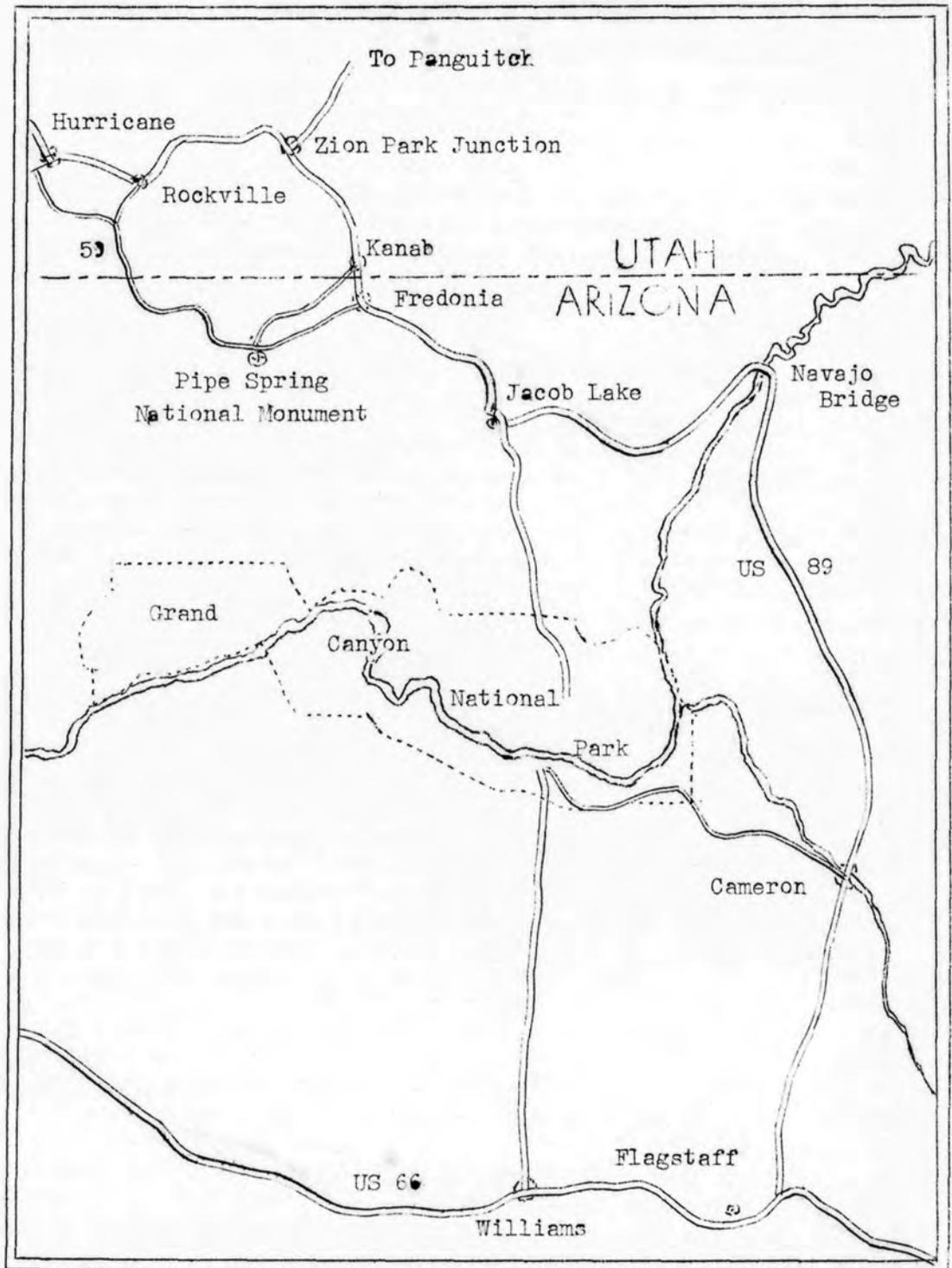
Mr. Leonard Heaton is acting custodian for the Monument. He makes his headquarters at Pipe Springs and resides with his family at Moccasin Springs a few miles north. The Heaton family have lived in this section for about half a century. The acting custodian, from his contacts with members of a large family and from his extensive travels in the section, is ideally situated as the Park Service representative.

HISTORY

Pipe Springs

This region is indeed rich in historical interest. Much of the following data has been obtained from Dr. Herbert E. Gregory (1) and Mr. Leonard Heaton (2-3). The Pueblo Indians attained their peak of culture in the Southwest around 1100 A.D. Cardenas, the Spanish explorer, discovered the Grand Canyon in 1540 and at this time found roving bands of Indians (Navajos?) on the Coconino Plateau. There were several expeditions into the region during the next three hundred years when efforts were made to establish satisfactory business relations with the Indians. Hunting bands of Navajos, Utes, and Piutes seemed to be in evidence everywhere. "Zion" or Salt Lake City, as it is now known, was founded in 1847 by Brigham Young, President of the Mormon Church. Soon thereafter parties were dispatched southward across the High Plateaus to select sites where water and suitable agricultural lands favored the establishment of settlements.

It was in 1856 that the first white man visited Pipe Springs. This party was sent out by the Mormon Church with instructions to explore the country lying in and around the Colorado River and to endeavor to make peace with the Indians living in the vicinity. The group was headed by Jacob Hamblin. The Monument received its name through a wager made by William Hamblin (Gunlock Bill) and another member of the party who challenged him to shoot through a silk handkerchief at a distance of fifty steps. The handkerchief was hung by its upper edge only and of course remained unpunctured. Accordingly Hamblin, vexed by the joke, dared



VICINITY MAP
PIPE SPRING NATIONAL MONUMENT, ARIZ.

PIPE SPRING GEOLOGIC REPORT (CONT.)

Amon Tenney to place his pipe on a rock near the spring which was at some distance, so that the mouth of the bowl faced the party. Hamblin wagered that he could shoot the bottom out of the bowl without touching the rim, which he promptly did, and thus the name Pipe Springs.

According to available records Dr. James M. Whitmore and his brother-in-law, Robert McIntire, made the first settlement at Pipe Springs in 1863. They were mainly interested in the cattle business and lived in a dugout near the present fort. The Navajo Indians were raiding the settlements in this section during 1866-1867 with the result that many of the weaker establishments had to be abandoned. In January, 1866, the Indians stole the livestock that the Whitmores had near the spring. As the rightful owners followed the trail they were killed by the Indians at a point about four miles away. The eight-year old son of Whitmore was left at the springs and he later caused the report of the slaying to reach Captain James Andrews of the State Militia. Six Indians, later found to be innocent, were killed for the crime.

The springs and adjoining lands were purchased from the Whitmore Estate by the Morman Church. Bishop Anson P. Winsor was sent out in 1868 to build a fort and to care for the tithing cattle in the interest of the Church. He constructed temporary two room quarters northeast of the spring which were restored in 1925. A second two-room house was constructed west of the spring, facing south, which commanded a broad view of Antelope valley. These structures were to be used as living quarters during the process of construction of the fort. The latter building was restored in 1929.

In the fall of 1869 a crew of thirty to forty men started to work on the fort. The plans called for two two-room buildings facing each other across a court. The buildings were to have two stores. The court was to be closed off at each end with massive swinging gates. Red sandstones (of the Chinle formation) was obtained from nearby quarries and used in construction. Some of the doors and windows were shipped from Salt Lake City. Most of the lime used for mortar was hauled in wagons from Pocketville or Virgin City, Utah. Much of the lumber had to be cut and hauled for a distance of from forty to fifty miles. The construction of the fort was completed in 1870. The buildings were so located that the spring flowed up into the courtyard and in this way they were always supplied with water.

Soon after completion two of the rooms in the fort were utilized as a cheese factory. The Winsors shipped most of the dairy products to St. George, Utah, where a Morman temple was under construction. Beef steers were driven at frequent intervals to this point and in the spring and fall to Salt Lake City.

In 1871 the Deseret Telegraph Company's line was extended to Pipe Springs with Miss Luella Stewart as operator. This was the first telegraph

PIPE SPRING GEOLOGICAL REPORT (CONT.)

line into Arizona. As the Indians were giving no trouble at the time Miss Stewart was transferred in a few months to Kanab, Utah, where she handled much of the business of Major Powell's party, who were conducting exploration work in the surrounding country. Bishop Winsor moved to St. George in 1875 and sold his interests to private parties for a cattle ranch.

The Arizona "strip" country was noted at this time for its excellent grazing lands. Cattle fattened with little effort on the part of the ranchmen. Thousands of head were rounded up each year and driven to market with the result that many comparatively wealthy families became established in the vicinity. Drives were started periodically from Pipe Springs and nearby points to the railroad. Profits proved too much for the settlers, however, and now the whole of the Arizona "strip" country has been overgrazed until little vegetation remains. The Soil Conservation Service are now making every effort to return these lands to their original state.

Moccasin Springs

This series of springs, situated about five miles north of Pipe Springs, was first claimed by white man in 1865. The name Moccasin was derived, it is said, from an Indian moccasin which was found near the spring by early settlers. In the spring of this year a man appeared at Cannon ranch and informed William Maxwell that he was going to take up a ranch at Moccasin, whereupon Maxwell sent his eldest son over to Moccasin to claim the place, and later sold it to the stranger for \$200. This man built the first cabin and lived at the springs for eight years. The property then changed hands several times until purchased by Allen and Webb, who later became members of the Mormon United Order, of Orderville, Utah, at which time their holdings were turned over to the Order. The five Heaton brothers were working the ranch at the time of the abandonment of the Order and received same when the lands were split up. Johnathan Heaton purchased his brothers' interests and Moccasin Springs has been the property of his sons since about 1893 up to the present time. Today there are several nice homes, orchards, etc., making it a beauty spot in the desert.

Kaibab Indian Reservation

When the United Order, of the Mormon Church, was in operation throughout this area many Piute Indians were brought in to assist in farming the lands. Each Indian was given ten acres of land and the group received their portion of the water from the springs. They likewise had foremen to teach them the art of farming. In 1908 the Government established the Kaibab Indian Reservation which consisted of a tract of land about 18 miles in length and 12 miles in width and extending to the Utah State line. At this time there were about 120 Indians belonging on the reservation, whereas today there are only half this

PIPE SPRING GEOLOGIC REPORT (CONT.)

number. Their headquarters are located about midway between Pipe Springs and Moccasin Springs. This is where they have their homes, schools, etc. Although the Indians now receive one-third of the water from Moccasin Springs their principal interest seems to be in the raising of livestock rather than farming.

GEOGRAPHY

Topography

Pipe Springs is located in the southwestern sector of the Colorado Plateau, which is characterized by high block plateaus being bisected by the mighty canyon of the Colorado River. These uplifted plateaus are outlined by prominent fault scarps trending generally in a north-south direction. The escarpments in this region trend east and west in the main, while the canyons, with the exception of that of the Colorado River, are carved in a north-south direction through the High Plateaus. Dr. H. E. Gregory states the following (1) - "The highlands are plateaus, tables, benches or steps rather than mountains, hills or domes, and the streamways are canyons -- narrow or wide, deep or shallow -- rather than river flats, bottoms, swales, or meadow lands. The canyons and plateaus alike are developed on a stupendous scale, and for the region as a whole 'the canyon lands' and 'the plateau country' are equally appropriate terms". Drainage in this area is southward to the Colorado River. Pipe Springs is approximately 5,000 feet above sea level. The Kaibab Plateau to the south and the Markagunt Plateau to the north reach elevations of over 9,000 feet.

CLIMATE

The climate of the plateau country ranges according to altitude from semitropical to temperate. For areas with the general altitude of Pipe Springs (5000 feet) the summers are hot and the winters somewhat severe. The average annual rainfall for Kanab, Utah, about twenty miles northeast and with practically the same elevation, is 12.68 inches. At this point for over a period of years the highest temperature recorded was 105° and a low of -15°. The highest and lowest monthly mean temperature being 67.2° and 33.4° respectively.

Vegetation

The collection of the following list of plants from the Monument was collected by Leonard Heaton, Acting Custodian, and they were named and identified by Jack Whitehead, Boyce Thompson Aboretum, Superior, Arizona. They are included in this report not because of any special connection but as a matter of record only.

Salmon Globe Mallw Malvaceae - *sphaeralecta anibigua*, A. Gray
Mariposa tulip Liliaceae - *Calochortus flexuosus*, S. Wats.

PIPE SPRING GEOLOGIC REPORT (CONT)

Minute California Poppy...	Papacraceae- Escholita Minutifolia, Sluats.
Buffalo Guard.....	Cucurbita foctxi dissima, H. B. K.
Russian Thistle.....	Chenopodiaceae- Salsola Pestifer, A. Nels.
Broomrape.....	Crobanchiiaceae- Orobanche ludouiciana, Nut.
Arizona Four O'clock.....	Nyctaginiaceae- Quenioclidion multiflorum, Torr.
Tansy Mustard.....	Brassicaceae Sophia pinnata, Walt. Howell.
Bee Weed-Yellow Cleome....	Capparidaceae- Cleome lutea, Kuoker.
Desert Trumpet.....	Polygonaceae- Eriogonum niflatum, Tarrey.
Plantain.....	Plantaginimaceae- Plantago Major L.
Narrow Leaved Goosfoot....	Chenopodiaceae- Chenopodium leptophyllum, Nutt.
Fluff Grass.....	Gramineae- Triodia pluchella, H. B. K.
Six Weeks Grama Grass.....	Gramineae- Buteloua Barbata, Leg.
Ivy leaved Ground Cherry..	Solanaceae- Phycalis hederaeplin, Noes.
Scrub Oak.....	Fragacae- Quercus ?
Bird Beak.....	Scrophulariaceae- Cordylantus neuinii, Grey.
Saltbrush.....	Chenopediaceae- Artiplex cuneata, A. Nels.
Jimson Weed.....	Solanaceae- Datura Metaloides, D. C.
Knotweed.....	Polygonaceae- Polygonuni Mulhenbergii, Wats.
Common Horhound.....	Labintae- Marrubium uulcare L.
Crownbeard.....	Compositae- Verbesina encelioides-exuuriculata Rod and Green
Sunflowers.....	Compositae- Helianthus aridus, Rydb.
Cocklebur.....	Compositae- Xanthium Commune, Britton.
Annual Bur-sage.....	Compositae- Franseria Acanthicarpa, Hook, Cav.
Horseweed.....	Compositae- Ergeron Canadensis, L.
Wild Lettuce.....	Compositae- Lactuca Scariola Integrata, Grant
Snakeweed.....	Compositae- Gutierrezia Lucida, Greene.
Creak Se necio.....	Compositae- Se necio douglasi, L.
Aster.....	Compositae- ?

In addition to the above Mr. Heaton states that there are about 100 more plants which have not been named or classified. Some of the most important are greasewood, rabbitbush, sagebrush, cactus, and a lot of grasses. Some of the more common trees are cedar, piñon pine, American elm, locust, ailanthus, silverleaf cottonwood, lombardy poplar, and willow.

Fauna

Mr. Heaton has likewise supplied the following list of birds, animals, and reptiles for the Monument:

<u>Birds</u>		<u>Animals</u>	<u>Reptiles</u>
Quail	Hawks	Jack Rabbits	Desert Rattle Snake
Robin	Eagles	Cottontail Rabbits	Bull, Blow or Gopher Snake.
Crows	Ducks	Coyote	King Snake
Killdeer	Cranes	Civit Cat	Red Racer
Blackbirds	Gamble Sparrow	Ringtail Cat	at least five kinds of lizards.
Song Sparrow	Herons	Grey Squirrel	

PIPE SPRING GEOLOGIC REPORT (CONT.)

Birds (Cont.)

English Sparrow
Pinon Jays
Woodpeckers
Oriole
Goldfinch
Humming Birds
Flycatchers
Wrens
Sandpipers

Animals (cont.)

Striped Chipmunk
Brown Chipmunk
Longtail Rat
Wood or Pack Rats
Mice
Porcupines
Badger

GEOLOGY

Stratigraphy

The sedimentary rocks of this area, which outcrop over broad portions of the Colorado Plateaus, are composed of the Moenkopi formation, the Shinarump conglomerate, and Chinle shales of the Triassic; the Wingate sandstone, Kayenta formation and the Navajo sandstone all of the Glen Canyon Group, Jurassic (?) in age; and northward into Utah the Carmel and Morrison formations of the Marine Jurassic, underlying a thick series of Cretaceous and Tertiary rocks. Looking southeast from Pipe Springs across the broad valley one may see the north flank of the Kaibab monocline, the surface being made up of Kaibab limestone, Permian in age. The Kaibab limestone forms the rim on both sides of the Grand Canyon.

Looking southwest from Pipe Springs the Mount Trumbull volcanic field is visible. These lavas were erupted during Tertiary times and comprise one of the major volcanic fields of the region. The view northward from the Kaibab Plateau, just before going down into the valley after leaving Jacob's Lake is one of the most impressive panoramas of the region. From this point the Vermilion Cliffs, the White Cliffs, and even the Pink Cliffs, which form the steplike High Plateaus of southern Utah, are visible on clear days.

The sequence of geologic formations is indicated in the stratigraphic table on the following page; however, each will be described briefly here.

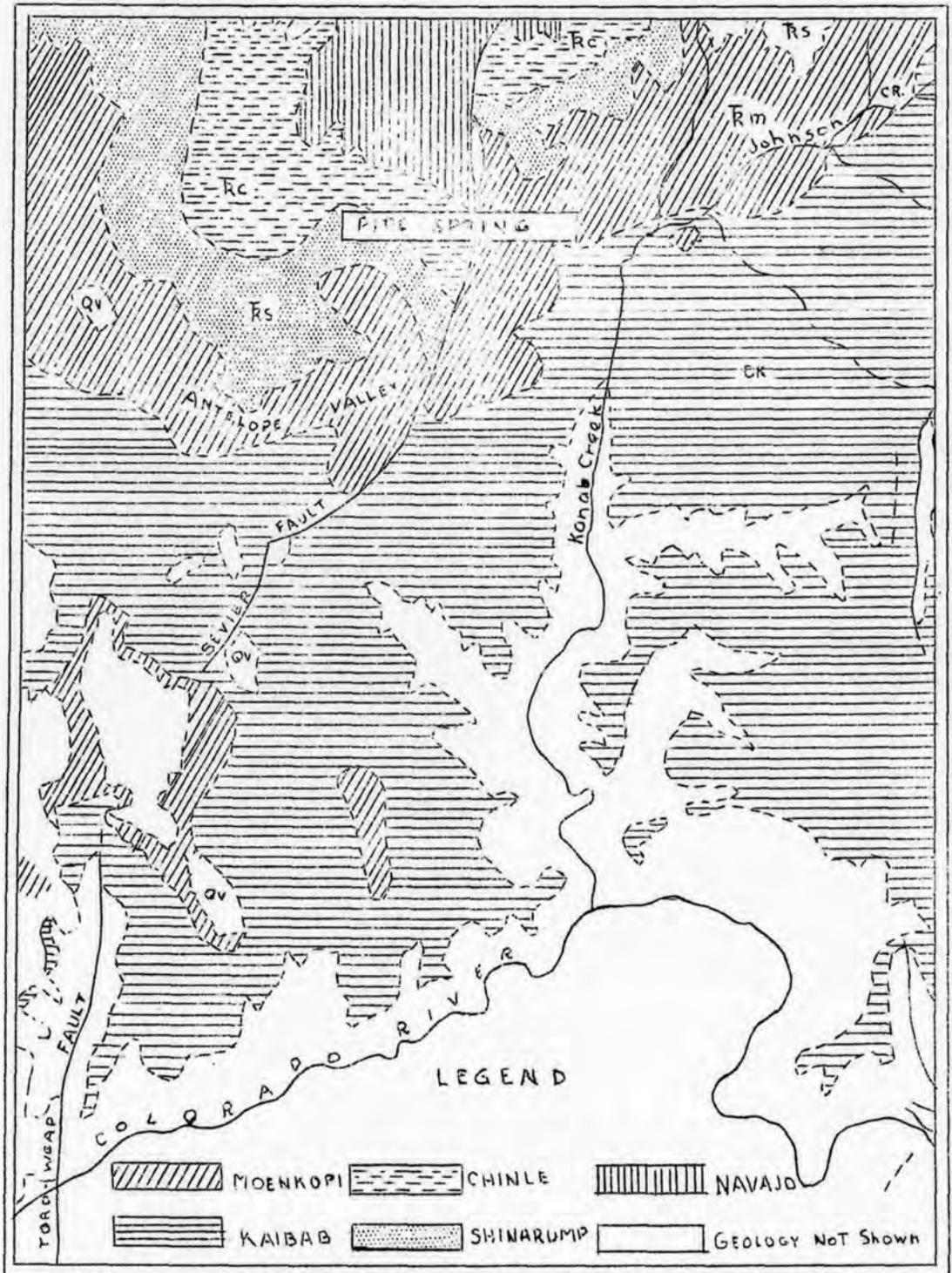
Kaibab Limestone

This gray to buff limestone comprises the basal formation of the plateaus to the north and south of Pipe Springs and forms the uppermost cliffs on both sides of the Grand Canyon. It is a sandy limestone with considerable chert and gypsum in some localities near the base. The formation is quite fossiliferous with some 80 species of sponges, corals, shells and sharks teeth having been described to attest to its marine character. The Kaibab limestone may be observed south and west of Pipe Springs.

GENERALIZED STRATIGRAPHIC SECTION FOR THE REGION AROUND
PIPE SPRINGS NATIONAL MONUMENT

ERA	PERIOD	FORMATION	THICKNESS (FEET)	CHARACTER
TERTIARY	EOCENE	Wasatch	400-1500	Highly colored beds of limestone, shale and sandstone with basal conglomerate. "Pink Cliffs" of Bryce Canyon National Park and Cedar Breaks National Monument.
		Unconformity		
MESOZOIC	CRETACEOUS	Kaiparowits		Bluish drab sandstone and sandy shale.
		Wahweap		Yellowish-grey massive sandstone with sandy shale.
		Straight Cliffs	3000 plus	Yellow to brown, irregularly bedded sandstone with some coal.
		Tropic		Bluish drab argillaceous to sandy shale.
		Dakota		Yellow to white sandstone conglomeratic in part. Thin coal beds and petrified wood in places.
	JURASSIC	Undifferentiated and Carmel Limestone	500 / -	Pinkish gypsiferous sands overlain by massive gypsum, thin limestone and sandy shales. Hard gray fossiliferous limestone.
		Navajo		Huge piles of sandstone with cross-bedding on an enormous scale.
	JURASSIC(?)	Kayenta	2000 / -	At Kanab Canyon this group is divisible into three formations however at Pipe Springs the Navajo rests on the Chinle.
	UPPER TRIASSIC	Wingate		
		Unconformity		
Chinle		400-1000	Variegated marls, sandstones and thin cherty limestone conglomerates. Shales included with Bentonite in places. Petrified wood and reptilian remains are abundant.	
UPPER (?) TRIASSIC	Shinarump	100 / -	Unconformity Conglomerate and coarse sandstone with fragments of fossil wood.	
LOWER TRIASSIC	Moenkopi	400-1775	Red-brown, grey, white and yellow gypsiferous sandy shales with interbedded layers of yellow limestone in lower part and conglomerate at the base. Thickens westward accompanied by change from arid terrestrial deposits to marine beds.	
	Unconformity			
PALEOZOIC	PERMIAN	Kaibab	200-1000	Grey to buff cherty sandy limestone with interbedded sandstone and gypsum in places. Contains a marine fauna consisting of some eighty species.

Note: Mainly from USGS Publications.



GEOLOGIC SKETCH MAP

PIPE SPRING NATIONAL MONUMENT, ARIZ.

Moenkopi Formation

Unconformably overlying the series of marine limestones is the chocolate brown, grey, white and yellow sandy shales with interbedded layers of limestones in the lower part and a conglomerate member at the base. This group comprising the Moenkopi formation thickens towards the west and the arid terrestrial deposits merge in this direction into marine sediments containing fossils. One of the best sections for the Moenkopi formation may be had at Virgin City, Utah, about forty miles northwest of Pipe Springs, where 1775 feet of section have been measured. The escarpment to the east of Pipe Springs, on the upthrown side of the Sevier fault, is made up of beds belonging to the Moenkopi formation.

Shinarump Conglomerate

The Shinarump is more resistant than the overlying and underlying shales and sandstones and it therefore forms a cap rock, being persistently a cliff-maker, throughout large sections of this region. It is made up of conglomerates and coarse sandstones and is unconformable with the Moenkopi formation below. It rarely exceeds 100 feet in thickness and usually contains fragments of petrified wood in abundance. In some localities the chert pebbles in the conglomerate have been found to contain "Kaibab" fossils.

Chinle Formation

A thick series of shales, sandstones, and thin conglomerates conformably overlies the Shinarump conglomerate and have been designated as the Chinle formation. This series of sandy marls forms one of the most picturesque series of rocks in the region. Because of the great variation of color in brief vertical and horizontal distances together with the vividness of same in various shades of light they are usually referred to as the "Painted Desert". Strictly speaking, however, the "Painted Desert" is generally understood to extend from the vicinity of the Petrified Forest National Monument in a northwest direction to the vicinity of Cameron, Arizona. From the character of rocks now making up the Chinle and the fossil remains thus far discovered we know that the material was deposited by shifting streams and in great shallow bodies of water. At intervals there were great outbursts of volcanic ash from areas of intense activity. This ash was carried to great distances by the wind and is now found intermingled with the beds making up the Chinle. The ash, which is known as bentonite, contributes much to the colors of the formation. A distinctive feature of these rocks is the almost universal presence of petrified wood. The wood is so plentiful in places that they have been termed "forests". Important remains of fossil reptiles and amphibians have been found in these beds.

The old fort at Pipe Springs is constructed from sandstone beds of the Chinle and the fort rests on beds belonging to this formation.

Wingate and Kayenta Formations

The Wingate and Kayenta formations are not exposed at Pipe Springs. They are included in the stratigraphic section since they occur just north of the Utah line. The Wingate is a highly cross-bedded wind-blown sand deposit which cannot be distinguished from the Navajo sandstone unless the intervening Kayenta formation is present. The Kayenta formation is a uniformly bedded calcareous shale deposit with some sandy shales and thin limestone beds.

Navajo Sandstone

The Navajo sandstone like the Chinle formations is most interesting from the point of view of color but it is mainly known to geologists due to its extreme thickness and the variety of architectural features. Zion Canyon is carved in the Navajo sandstone. At Pipe Springs it may be observed just above the slope of Chinle shales. The Navajo is composed of quartz grains, imperfectly rounded, and held together by a weak cement of calcite and iron oxide. Its various shades of color is due in the main to type and amount of cement. Its principal characteristic is the presence of cross-bedding on a huge scale. Curved vertical laminae have in many places resulted in the formation of great recesses, caves, and alcoves wherein the Pueblo cliff-dweller found shelter. No distinctive fossils have been found in the Navajo and as the result its age may only be conjectured on a lithologic basis as Jurassic (?). At Zion Park the formation is over 2000 feet in thickness.

The formations for the general area are all indicated on the stratigraphic table. Those above the Navajo do not occur at Pipe Springs or the immediate vicinity and it is not considered important to discuss them at this time.

Structure

The important structural features of this section of the Colorado Plateau in east-west profile are the Hurricane and Sevier faults which have a general north-south trend and cut the plateaus into great blocks. A section of the wall of the famous Hurricane fault remains and is crossed by the Zion Park and Toquerville highway at the Hurricane Cliffs. Although there is some folding present in the area between the faults the strata is generally undisturbed with dips in the main of less than 2°. Regional uplift and differential erosion have contributed mainly to the present land features.

Sevier Fault

The Sevier Fault has been traced from the High Plateaus in Central Utah in a southwestward direction for a distance of over 200 miles to Mt. Trumbull and it probably continues across the Grand Canyon of the

PIPE SPRING REPORT, GEOLOGY (CONT.)

Colorado as the Toroweap fault. The fault cuts south through the broad valley which extends northward from Pipe Springs where a displacement of 800 to 1000 feet may be noted with the upthrown side to the east. The uplift along the Sevier fault at Mt. Carmel in Utah has brought the Cretaceous rocks in contact with Navajo sandstones of the Jurassic (?) indicating a vertical displacement of about 2000 feet. The Sevier fault may best be seen at Pipe Springs by travelling northward on the road to Moccasin to a point in the vicinity of where the above mentioned photo was taken.

Pipe Springs

Pipe Springs, Moccasin Springs and the other springs and seeps in the zone to the west of the fault owe their existence to the presence of the Sevier fault. The beds are dipping a few degrees in a northeast direction into the fault. While the rainfall is slight, amounting to less than 13 inches annually, the Navajo sandstone forms a tremendous catchment area and a considerable portion of this water percolates downward as ground water until the Chinle shales are reached. At this horizon it follows the dip until the fault zone is reached where another barrier is formed by the Moenkopi shales and sandstones. As the water is piled up along this zone it is forced to the surface under hydrostatic head. Pipe Springs has a capacity of some 65,000 gallons per day and the Moccasin Spring is some three or four times its size.

Geologic Signs

No signs are recommended for Pipe Springs since the area within the Monument is so small and the prime geological features are more regional in character, making it difficult to develop them from this point. We have in mind the construction of a wayside shrine for Lee's Ferry Bridge to take in the area from the Grand Canyon to Bryce Canyon in Utah in a geologic section. Pipe Springs and its relative position will be shown on this panorama. It is also considered by the writer that a similar shrine should be erected on the Kaibab Plateau, on the road north from Jacob's Lake, and immediately before one starts dropping down into the valley. Most visitors stop and stare at this marvelous landscape and the features should be pointed out to them as practically all of the tourists are plying between the parks. Pipe Springs could well be brought into this picture. A generalized cross-section from the north rim of the Grand Canyon to Zion National Park through the Pipe Springs area on a large scale is to be drawn and placed on the wall of the old fort at Pipe Springs for the benefit of the visitors who are interested.

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TUMACACORI HISTORY

By Louis R. Caywood

Recently while in Tucson Father Victor Stoner loaned me a paper bound copy of "The Resources and Natural Wealth of Arizona" a Handbook to its history, towns, mines, ruins, and scenery, by R. J. Hinton, editor of the "Evening Post". It is a book for prospectors, emigrants, tourists and travellers printed by Payot, Upham & Company, Publishers, Booksellers, and Stationers, 204 Sansome Street, San Francisco.

In reading through it I found several references made to Tumacacori Mission and thought it of interest to include the following part of the book in the Supplement of the Southwestern Monuments Monthly Report.

The following copy is made as it appears in the book and several misspelled words, one typographical error, misinformation, etc., is included. For example in one place Pimeria is spelled Primeria, sancti is spelled santi, etc. Again, reference is made to the Jesuit priests as though they were the builders of the present edifice, which statement is erroneous. The Jesuits were expelled from all Spanish colonies in 1767 and the Franciscans took over the mission chain a year later. The present church building at Tumacacori probably was being built between 1800 and 1820.

However, I feel that there is much of value in the descriptions of the buildings and surrounding country as told by these early American explorers. Because of these we may better imagine the Pueblo of Tumacacori during the days of its existence when, according to the Rudo Ensayo, at one time there were more than 1100 Spaniards living there.

Extract - The Resources and Natural Wealth of Arizona
by R. J. Hinton

CHAP. VII - THE UPPER SANTA CRUZ VALLEY

The upper valley of the Santa Cruz debouches southeasterly from its north-by-west course, leaving the remarkable evidence of catholic power and devotion manifested in the mission church of San Xavier del Bac, at the Papago Reservation. Crossing the eastern edge of the Prima Mining District, the traveler enters on a region of well grassed land, broad and rolling, in which the mountain ranges east and west are still misty in the distance. A shallow stream, fringed with heavy cottonwood and sycamore trees, meanders through a wide intervale which rises almost unnoted into a rugged mesa. To the west the outlines of the Picacho del Alama Muerto rise boldly. To the south and east a score of miles away may be traced the serrated lines of the Santa Rita, a mountain range of

TUMACACORI HISTORY (CONT.)

singular beauty, which grows grandly on one's approaching the ancient town of Tubac. The landscape is a bold one; the gray and hazy outlines of rugged ranges becoming distinct, as they are approached. The effect of atmospheric foreshortening is very peculiar. The valley offers advantageous places for camping. Starting early from Tucson, the first day's noon will generally find a traveler at one of the sinks of the Santa Cruz, where the water disappears in a shallow bed of gravel and quicksand. The stream has here a fall of 75 feet to the mile, and there is abundance of grass for feed. Near by is a Mexican cattle ranch. The great peaks of the Sierra Santa Rita now loom grandly before one through the trees. The mist is flushed with gold, and the warm purple tints are enchanting. Deep fissures can be traced, while the heavy cumuli, sun-flushed and crimson-barred, drift slowly athwart the blue sky. The course of the stream is nearly due south until the old mission ruins of Tumacacori are passed, and one would hardly imagine the lonely beauty everywhere visible, that it had been not only the scene of busy life, but of death also, resounding with the harrowing yells of the bloody-minded Apache. But so it is; almost every foot of the road and valley is replete with tragic interest. Abundant proofs are seen on every hand of former settlement. The presence of the prospector and miner, come to stay, is already giving proofs of reassuring ability, in the shape of new ranches located and old ones reoccupied.

The bold sweep of the Santa Rita mountain range, with its massive and serrated peaks, is the one commanding object on which the observing eye rests, in whichever direction the traveler approaches. The outlines of the great peaks rise hazy but bold in the distance, against the wondrously clear sky, while growing more majestic and imposing as the day's declining journey brings the traveler almost under the sweeping shadows of Mount Wrightson. It was in sight of this superb range that the old Aztecs and Toltecs journeyed, and along its base, in the beautiful valley of the Santa Cruz, passed the Spanish explorer and conqueror, priest or soldier, it mattered but little to the primitive people living in the Primeria Alta. From its once secure and savage fastness, old Cochise and his warrior Apaches have swept down on the settler, miner and traveler, until the region was desolated by his forays.

The mastering Spaniard - soldier or priest - never seems to have lifted those they mastered, but on the contrary were in their turn mastered by the Apache. The Santa Cruz river rises in Arizona, on the east side of the Patagonia Mountains, flowing southward a short distance into Sonora, where it makes a considerable bend and sweeps northward through the Potrero, and flowing along the eastern base of the Sierras Pajarito and Atascoso, till above Tubac the valley broadens into a great plain in which the little river meanders until it strikes again the Sierra Tucson, near the town of that name, and along beyond the base of which it flows northward for miles, when it sinks and is lost sight of permanently. It is supposed to enter the Gila by some subterranean channel, about 130 miles from the Potrero or gateway by which it enters Arizona.

SOME TUMACACORI HISTORY (CONT.)

The Valley of the Santa Cruz, south from Tucson, comprises that portion of Arizona of which the most is known, and in which the Spaniards and Anglo-Saxon have struggled the hardest to maintain themselves against the sullen and desperate onslaughts of the destroying savage, until at last the latter has dashed himself to fragments. Tucson marks the northern termination of the Spanish effort. Below it may be found the evidences of its most steadfast endeavor in the section under consideration. The best Spanish map handed down to us is that of El. P. F. Pedro (a copy of which is found elsewhere) bearing the date 1775. This shows quite a number of missions, pueblos, as well as two presidios, between the present frontier line of Mexico and the town of Tucson. Among these is the Mission of Tumacacori, the Presidio of Tubac, and the Mission of San Xavier del Bac, the church and building of which latter are still standing. According to the Bishop Sapiencia of Tucson, the first church of San Xavier was erected in 1690; the one now in existence, nearly a century later. The Mission of San Dominick, at Tuqueson, or Tucson, was located in 1650, about a century after Coronado's expedition for the conquest of the seven cities of Cibola passed up the Rio Grande Valley, and Father Niza wandered by this route to the ruins now known as the Casa Grande. A military post had, however, existed there for three-quarters of a century. The Mission of St. Gertrude was established at Tubac as early as 1751, a quarter of a century preceding the date of the Pedro map referred to. At that time, and for a considerable while thereafter a Spanish garrison, with a military commandant of considerable rank, was maintained. A local outbreak, in the year names, drove out the troops and set the region back for several years. For a period of forty-eight years thereafter the Spanish adventurers, soldiers, priests, miners and rancheros were left undisturbed. The Indians rose again in 1802, and since that then there was little business done or activity displayed until after annexation to the United States.

Tubac, at the present time (1878), is a collection of adobe ruins, with a few such houses, rudely put into a semi-habitable condition. Its situation is good, located as it is along the high road to Sonora, and at a point where diverging west and south roads to such points as Sopori, the Baboquiveri, Fresnall, in the old Papago country, the Arivaca Valley and the Cerro Colorado mines, necessarily enter the main line of travel. Tubac has a history. Mr. Bartlett found it occupied by Mexican troops when, in 1850-51, he was engaged in fixing the new boundary line between Mexico and the United States. At that time it was the principal place in the Pimeria Alta, as the territory south of the Gila River, below the 33d parallel from the line of New Mexico to the Colorado River, was then known. Tucson, which has grown a great deal since that date, was described by Bartlett as a wrecked place, with about four hundred Mexican and half breed inhabitants. In 1853, Colonel Charles D. Poston and Herman Ehrenburg arrived in Tubac, coming from San Francisco via the Gulf of California and Guaymas, across the north-west portion of Sonora and the Papago country, following on the heels of the ratification of the Gadsden Purchase Treaty. Their purpose was to spy out the fatness of the land which had

SOME TUMACACORI HISTORY (CONT.)

been acquired for the United States at a cost of \$10,000,000. No transaction has been the subject of more adverse and diverse comment than this treaty; and when it was afterwards found that the Mexicans had astutely managed to cut this country off from the Gulf of California, one general cry of disgust was raised. The charge was made, and generally believed, too, that the Mexicans had purchased our commissioner. The feeling among the few intelligent Americans who were cognizant of the surroundings was, that the General signed the treaty under the influence of a habit to which he sometimes yielded. The Mexicans gave, however, much more than they withheld, in surrendering the finest mineral region on the continent - one whose richness had been known to them for nearly three centuries. Messrs. Poston and Ehrenberg was a German by birth, long resident in the South; a topographical engineer and metallurgist of high repute and a man of most decided ability. Colonel Poston, in a personal narrative, embodied by Ross Browne in his attractive book, "The Apache Country," says of this town and locality, under date of 1853:

"Arriving in the Vally of the Santa Cruz, we found the old town of Tubac abandoned by its Mexican garrison and the population, which had been dependent upon them for protection against the Apache Indians, the most fierce and barbarous tribe of which we have any account. As the houses in Tubac were in a good state of preservation, we occupied them for headquarters during the ensuing winter, and passed the time in exploring the surrounding country for silver mines. The winter season here proved very mild, and our animals were subsisted upon the nutritious grasses which abounded upon the hillsides.

* * * * The valley of the Santa Cruz is a very rich body of land, and with irrigation produces two crops annually - corn in the spring and wheat in the autumn. Wild game could be procured in abundance in the immediate vicinity, and by Christmas we had such a store of bear meat, deer antelope and fat wild turkeys, that no apprehensions of short rations disturbed our enjoyment. * * * In the course of a few months several hundred people had gathered around Tubac, and engaged in planting; the mines developed a wonderful richness; and traders from Sonora, New Mexico and California came to supply all our wants with the productions of foreign lands in exchange for the silver bars which we made 'current with the merchant.'" The same gentleman, in a report made to the Sonora Exploring and Mining Company, published in 1856, says: "The old town of Tubac was formerly occupied by a numerous and thrifty population, engaged in agriculture and mining. It is the very center of the mineral region in our territory, and has probably 150 silver mines within sixteen miles. Many of them were worked by the Spaniards and Mexicans in a primitive manner, but not opened to any extent, because they had no sufficient machinery or mining tools. * * * Under the Mexican rule a garrison was kept at Tubac for the protection of the inhabitants, but only of sufficient force to enable them to work their fields; the mines have not been work for (1855) fifty years."

SOME TUMACACORI HISTORY (CONT.)

A weekly paper, called The Arizonian, was started there in 1858 or '59.

The ruins of St. Joseph Mission, Tumacacori, are located on the west side of the Santa Cruz, about a quarter of a mile from the dwelling of Mr. King. There is abundant evidence of long continued cultivation in the vicinity; and still, with the rather shiftless farming of the present, rancherias in the vicinity bring good returns. The first church building was constructed in 1752; and the one whose ruins are shown in the accompanying engraving was built in 1802. It was destroyed by the Apaches in 1820. The mission buildings, of which sufficient remain to show their character, were of large extent, and yet cover a considerable area. The church itself is partially unroofed, the chancel with its dome still remaining in fair preservation, while the nave is open to the sky and the weather. It is a rather plain structure, built of brick and concrete, or cojin, as the Mexicans term it. Apparently it was both smaller and ruder than the Church of San Xavier del Bac, which is quite lavishly ornamented inside and out. The main structure is about one hundred feet long by forty or fifty wide. The form was that of a plain Greek cross with a basilica. The cross, emblem of the devout hope and sacrificial service which animated the Jesuit Padres, still crowns the latter, and outlines against the marvellous skies and under the shadow of the gray sear hills, the symbolized passion and power of Christian zeal and endeavor. Two towers remain in fair preservation. On the west side an unroofed chapel remains otherwise almost intact, while on the other the sacristy is quite dilapidated. It has evidently been used as both a stable and granary; and the interior of the nave shows the vandal hand of prospectors and travelers. Professor Thomas Davis, Superintendent of the Aztec Syndicate Mines, who has spent the last thirty years in the mineral fields of Mexico and the United States, states that when he first passed down the Santa Cruz Valley in 1849, the church roof was nearly intact, and much of the interior was in good preservation. There were many fruit trees, pomegranates, peaches, etc., bearing profusely; and the walls that once enclosed the home orchard and garden were still to be traced by the eye. They are now almost obliterated.

The church ruins stand square with the compass, the principal front facing the south. At the rear end there is a high wall in good preservation, enclosing a circular mortuary, still perfect. Within this enclosure, formerly the ground for meditation, the wall contains niches,* still perfectly defined and evidently once used for shrines.* It is notable that the place of sepulchre should be the one best preserved. To the west of the church is a large enclosure, the walls of which are readily traced. It is evident that this was the workyard of the mission, as there are the remains of arrastras, rude smelting vassos or furnaces, a few heaps of debris, etc., to show that the good Jesuits were actively engaged in the

* There originally must have been fourteen of these shrines which were stations of the cross. At the present writing there are only twelve as part of the enclosing wall has since fallen. LRC.

SOME TUMACACORI HISTORY (CONT.)

mining and working of ores. On the east of the church can be traced some buildings which appear to have been the mission residence. Part of the front wall, the gateway, still remains. Beyond this can be followed the lines of a small orchard and field, once enclosed; while in front of the church itself are the remains of another enclosure, in the southwest corner of which are crumbling adobe walls that marked some of the large buildings, which, on a hasty examination, suggest our offices, stables, etc. Judging by the examination made, the church and mission buildings proper, with their immediate appurtenances, would appear to have been enclosed and walled in the form of a cross, of which the east and west, especially the first, were the largest, while the north and south wings formed the transverse portion.

In the last report made to the mining organization of which he was general agent, dated 1930, Professor W. Wrightson thus describes this important point: "Tumacacori is an old mining mission, established here many years ago by the Jesuit priests. * * The church is an adobe building plastered with cement and coped with burnt brick. The front is of the Moorish style, and had on the southeast corner a tower, the top of which was burnt brick. The roof of the church was flat and covered with cement and tiles. The timbers have now fallen and decayed. The chancel was surmounted with a dome, which is still in good preservation. Adjacent to the church in the form of a hollow square were the residences of the priests, containing spacious and airy rooms, with every evidence of comfort and refinement, while surrounding those in the interior was an arched colonade, forming a shady walk around the whole enclosure. To the east of this square of sumptuous residences was an oblong of building, where the metallurgical operations were carried on. Here are still the remains of furnaces and quantities of slag, attesting the purpose for which this was formerly used; and still to the east was the garden enclosing about five acres, and surrounded by a cahone wall. The acequia passes through this, and here is the remains of a washing vat and bathing place. There are also fruit trees and vines still growing; while in the rear of the church is the campus santi, a burial ground surrounded by a strong adobe wall well covered with cement, and forming even now the best enclosure in Arizona. To the south of the mission building and fronting the church, was laid out a large square or plaza, which was surrounded by peon houses, thus forming a respectable village. * * It is not beyond the range of probability that here again, in the course of a few years, will be a thrifty settlement."

It will be seen that the general appearance of the ruins has not materially changed in the last eighteen years. The former residences of the priests and the peon's houses are now almost destroyed, but the campus sancti and the church remain very nearly the same. This property has been claimed as belonging to a Spanish land grant, floated over the region. The old Santa Rita company purchased such rights as it gave, and at the time of the foregoing writing held and improved it somewhat.

SOME TUMACACORI HISTORY (CONT.)

But there is reason to believe that the Spanish grant will not hold. The church had the usual mission rights, which are recognized as a rule by the United States, when used for the original purposes of such grant, but not otherwise. It is understood at Tucson, the episcopal seat, that there is no intention of reviving the mission of St. Joseph, and therefore the mission lands would of necessity lapse to the public domain. The ranch or farm, of which the mission ruin forms a part, is quite a desirable acquisition. The Santa Cruz affords considerable water power at this point. There is close by a dense body of mesquite trees, the largest in Southern Arizona.

This Mission has an eventful history. At the time of our war of independence it was in the full tide of its activity. The sagacious padres looked after not only the salvation of their Indian peons and converts, but even more strenuously sought the temporal results to be obtained for their church and the Society of Jesus, by working the wonderful mineral lodes located in the mountains that overshadow these ruins, or are outlined in front of them at a few miles distance.

The earlier and more positive information of settlements in the Santa Cruz valley, from the Sonora line to Tucson, show that the missions of San Xavier del Bac, St. Gertrude at Tubac, St. Joseph at Tumacacori, San Miguel of Sonita, those of Guevavi, Calabasas, Arivaca, and Santa Anna, existed in 1751. In that year, one Luis, from the town of Saric, who* passed himself off as a sorcerer, instigated the Indians of Pimeria Alta to a rebellion against the Spanish Government and its missions, and these Indians, together with the Serics, caused the priests great suffering and loss, killing three of their number and hindering all the missionaries in their religious duties until 1754, when peace came. They were undisturbed again at Tumacacori until an Indian rising in 1802, by which the first church was destroyed. It was replaced by the structure whose ruins are now seen. Then came the revolution in Mexico. The republic was established, the Jesuits banished, and their church property confiscated. The Tumacacori Mission was abandoned, and naught remains of their history and doings, as known to the world, but tales handed down from generation to generation, and one or two books, which speak of the Salero Tumacacori and Plancha de la Plata mines. The Salero is in the Tyndall district, the Tumacacori has never been found, and the Plancha de la Plata, or placers of silver, are located some twenty miles south-west of here, stretching across the boundary line.

* Whe (typographical error in original manuscript)

HISTORIC SITE SURVEY

By Erik K. Reed, Ass't. Archeologist

(Editor's Note: - The Historic Site Survey has prepared a number of fine reports during the past few months. Three weeks ago the following paper arrived at this office and, because it should be of interest to custodians and rangers in the Southwest, we decided to run it in this report.)

Introduction

An excellent report was submitted recently on this subject with respect to Region One by Mr. Day of the Richmond office. This memorandum is intended as a supplement thereto, covering the Southwest in the same manner, and as an extension of my section of the memorandum transmitted to Washington, from this office, on October 14, 1936, commenting on the "Preliminary Outline of The Main Periods of American History."

In the Southwest, a smaller area than that covered in Mr. Day's report (the entire area east of the Mississippi), we have a hardly less complex and varied series of tribes and cultures, but a better known one in general; and we have more striking and spectacular pre-historic sites, and in District B many historic sites still occupied by the aborigines. The early historic sites and scenes of early contacts between Indians and Europeans are in many cases not well known, however. Mr. Day's system of presentation and classification can be extended to Region Three with very little change.

SECTION A THE HISTORIC INDIAN CULTURES

1. Village Indians of the Southern Plains

From the panhandle of Texas east there were in the 16th to 18th centuries, decreasing and diminishing as the acquisition of horses swung the balance of power in the plains to the nomad buffalo hunters discussed in the next section, sedentary agricultural pottery-making tribes of the Caddoan linguistic stock. These peoples did not extend south of Red River until the 18th century except in the northeastern part of Texas where the Hasinai confederacy occupied the region of Nacogdoches; they extended north into Kansas and east into southern Arkansas. It was their villages of grasslodges that the "Turk" described to Coronado as Quivira. And the Pawnee and Arikara of Nebraska constituted a northern division of Caddoan-speaking agricultural village Indians (becoming nomads only during the historic period).

The introduction of the horse led the Western Caddoans (the Wichita confederacy - Taovayas and Tawakonis or Wacoos, notably)

also to forsake, to an extent, their sedentary life, and the Wichita were allies of the Comanches in the destruction of San Saba in 1758 and the subsequent defeat of Colonel Parrilla. The Hasinai of east Texas and the Caddo confederacy on Red River continued as sedentary and friendly ("the Tejas") peoples throughout.

Both eastern and western Caddoans should be represented in the historic site survey: Either a site in the vicinity of Nacogdoches identifiable with a specific Hasinai village, or one of the several Caddoan sites of late prehistoric date excavated by the University of Texas further north in east Texas, and a Wichita village-site in north Texas (so far as I know, no such sites have been specifically identified, unless by E. B. Sayles and unpublished, but it should be easy to do so, perhaps even to locate the Taovaya villages that Parrilla attacked unsuccessfully in 1759).

2. Nomad Buffalo Hunters of the Southern Plains

The typical Plains Indian of the historic period is the Blackfoot or Cheyenne or Sioux, armed and mounted, wearing a war-bonnet of eagle feathers and taking scalps, following the bison herds and raiding the white settlements and village Indians, although previous to about 1600 the main pattern of Plains life was sedentary and agricultural. The rapid acquisition of horses from the Spaniards changed the whole picture with startling speed and many village tribes became wholly or partly nomadic. The following tribes of the Southern Plains are wholly or primarily nomad bison-hunters throughout the period in which we know them: Comanche, Kiowa, Jumano, Tonkawa, Lipan, Apache. As mentioned above, the Wichita tribes were considerably affected by the change in Plains life, and the Yscani and Tawakoni especially became roaming hunters while retaining some agriculture. It is probable that the Jumano - a Caddoan-speaking people closely related to the Wichita - similarly were originally agricultural; they are very poorly - and rather confusingly - known. Apparently the true Jumano were, during the 16th-18th centuries, a nomadic bison-hunting people ranging over west Texas and eastern New Mexico; in the early 17th century they are associated with the village Indians living at the confluence of the Conchos and the Rio Grande (the present Presidio, Texas), and in the 18th century they join the Wichita and disappear as a people.

The Tonkawa tribes of central Texas, a separate linguistic family, were semi-agricultural, and were not typical Plains Indians in cultural details - lacking (so far as is known) the sun dance, graded military societies, and other sociological features of the warrior tribes further north, less belligerent and less historically important. However, they were of nomadic type, ranging from the Red River to the vicinity of San Antonio, and depended largely upon the buffalo in their economy.

The Lipan Apache can best be considered under Section 4 with the

other Apache peoples; they appear in the plains proper only incidentally and spasmodically, raiding as far as the vicinity of San Antonio but living primarily in the mountains of west Texas. The Mescalero Apaches similarly belong in the arid southwest rather than the Plains.

The only true Plains tribes in the Southwest, in the sense of pure nomad raiders, living on horseback and dependent on the buffalo (and on less warlike neighbors), then, were the Comanche and Kiowa. The Kiowa were pure Plains, with feathers and everything (the feather-ornamented dances of Taos today are derived from the Kiowa), ranging fairly widely over Oklahoma and the northern Texas panhandle, appearing rather late from somewhere further north - but the Kiowa language has been bracketed with Tanoan, the language of most of the pueblos on the Rio Grande. The early history of the Kiowa is not at all clear; their location prior to 1650 or even 1700 is uncertain. It is quite possible that the Kiowa were originally sedentary and agricultural.

The Comanche, late comers into the southern Plains, were typical Plains people with no taint of peace or agriculture. Originally in Montana with their congeners the Northern Shoshoni, during the early historic period, they gradually drifted south through the Western Plains, and round about 1700 were established in the region of the Texas panhandle and southwesternmost Kansas. The panhandle was their home range until their subjugation in the 19th century; they raided as far as the gulf coast of Texas and as far as Durango in central Mexico.

The nomadic Plains tribes, with their impermanent dwellings and roaming life, left few noteworthy sites; the direct connection of the importance of these peoples in the historic period with the innovations of that period, and their range and mode of life, cannot well be memorialized at any one camp-site. More suitable would be the development of a Plains Indian indoor and outdoor museum in an area such as the Palo Duro Canyon in the Texas Panhandle (a state park at which there is now an ECW outfit), where the Kiowa, the Cheyennes from eastern Colorado, and other tribes, often camped in winter, and where Colonel MacKenzie administered decisive defeat to the Comanches in 1874-5. Also historical markers could be installed at points where main highways cross the Comanche war trail that extended through the West Texas into Mexico and on this trail in the Big Bend Park area; at points of notable Comanche raids and battles (for example the notable Comanche raid on Victoria, Texas, and Port Lavaca, Texas, in 1841, could be commemorated by a marker at Plum Creek where General Felix Huston defeated the returning raiders).

3. Tribes of the Gulf Coast

From Bayou Teche, Louisiana, to Galveston Bay, the coast of the Gulf of Mexico was occupied by the scantily known Tunican-speaking

Atakapa and Arkokisa, apparently intermediate in cultural level, with definite villages and with agriculture, but seemingly less advanced than the Caddoans. The location of the Arkokisa villages in the vicinity of the mouth of Trinity River and the Spanish post of El Orcoquizac (Mission N. S. de la Luz and the presidio of S. Agustin de Ahumada, 1756-1771) could be determined; less study would be required for this than for finding out enough about the Atakapans to be able to tell anything definite and specific to visitors.

From Galveston Bay to beyond Corpus Christi bay, the littoral islands and the immediate vicinity of the coast were occupied by the Karankawa, generally considered to have been of very low cultural status and reported to have been true cannibals. The Karankawa lived on sea-food and small game, were transhumant (seasonal migration) rather than nomadic, had very impermanent brush dwellings of a type intermediate between a true lodge and a mere windbreak -- but made pottery with asphalt decoration. Karankawa campsites are known around Rockport, Oso Bay, Corpus Christi Bay; one of these might be more satisfactory than an Arkokisa village as a site representing the gulf coast peoples.

In southwest Texas (between Brownsville, Laredo, and San Antonio, approximately) existed numerous small unimportant Coahuiltecan-speaking tribes, from which were drawn most of the mission Indians of San Antonio, and a few Tamaulipecan peoples. These groups may be neglected in the Historic Sites Survey; the only way in which they connect up with any Park Service program is in relation to the Mission of Espiritu Santo at Goliad (SP-43-T), whose neophytes may have been mainly Coahuiltecan.

4. Sedentary Peoples of the Arid Southwest

There are today a number of Tanoan - and Keresan - speaking pueblos along the Rio Grande from Taos to Isleta (12 miles south of Albuquerque), and two Tano pueblos (Acoma and Laguna) west of Albuquerque; also the Zuni (a separate linguistic group, possibly related to Tanoan) south of Gallup, New Mexico, and the Hopi in northeastern Arizona, who speak a Shoshonean language related to Ute, Paiute, and Comanche, and distantly related (as are the latter three) to Nahuatl, the language of the Aztecs. All these peoples live in largish adobe villages, practice agriculture, and make painted pottery - as did their ancestors eight hundred years ago.

If any present pueblo is selected as a National Historic Site, it should remain under its present administration, the Park Service interfering no more than is necessary from the standpoints of conservation and education. Taos might be the most suitable in some ways - already well-known, visited by tourists and by artists; for centuries the point of contact between the southwest and the Plains - trading post during the historic period for Kiowa and Comanche and for French and Anglo-American fur-traders; and presumably serving a like function, though

HISTORIC SITE SURVEY & THE AMERICAN INDIAN (CONT.)

perhaps in less degree, before the historic period; one of the leaders in the great Pueblo rebellion of 1680; most picturesque - though consequently most commercialized - of the Rio Grande Pueblos. Or, again bringing in specific history, San Juan de los Caballeros at Chamita where Onate halted in 1598. If a pueblo as purely Indian as possible is desired, typical of the less acculturated historic Pueblo, either Acoma on its high mesa or conservative Santo Domingo (both close to U. S. Highway 66) would do.

In the 16th century, from Coronado to Onate, there were many more pueblos than now, especially southward on down the Rio Grande. Most notable of these now deserted pueblos is Pecos, finally abandoned in 1838, excavated a few years ago by Dr. A. V. Kidder. There is no question but that Pecos should be included. When the location of the important Piro village of Tiguax visited by Coronado is definitely established, it will be another good representative of the early historic pueblos. Also some comparable 16th century pueblo further south might be considered as an additional or alternative site. Furthermore, the villages of Patarabueyes at the mouth of the Conchos constitute a particularly important point on the route of the conquistadores between Mexico City and the southwest (Rodriguez, Espejo, Onate, all passed through here, coming down the Conchos from Santa Barbara to the Rio Grande), and constitute also an interesting archaeological problem; also the La Junta missions were established here in 1683. Consideration should be accorded the Patarabueye sites on the American side of the river in the vicinity of Presidio, Texas. Then, one of the early-historic Zuni pueblos would be of interest in this general connection. The several pueblos of Zuni, of which only one is still occupied, were the Seven Cities of Cibola of which Cabeza de Vaca was told, and at which the negro Estevanico was killed. Hawikuh, a late prehistoric and early historic Zuni town (one of the "Seven Cities of Cibola") excavated some years back by F. W. Hodge, might well deserve designation. In Arizona the site of this period of most importance is Awatobi in the Jeddito Valley (near Hopi), destroyed by the other Hopi towns in 1700, now being excavated by J. O. Brew of the Peabody Museum of Harvard University.

Both historically and archaeologically there is a division of the southwestern agricultural peoples into two groups - the Pueblos of the plateau of the Rio Grande, with their compact towns, the Pima and Papago (and in prehistory their ancestors, the Hohokam) of the desert country of southern Arizona. Early historic sites of the Pima and Papago are not known; their recent and present villages are not very suitable for our purposes, as the Pima have been greatly acculturated; but in one case, at least, a present day Pima village is beside a prehistoric site of outstanding importance, discussed below.

The semi-agricultural Yuman-speaking tribes (Havasupai), Walapai, Yavapai, Cocopa, Maricopa) of western Arizona likewise may be neglected

herein as of no especial significance and as having left no suitable sites.

5. The Apache Nations

The only truly nomadic hunting groups to be dealt with in the arid Southwest are the various Apache peoples, including the Navajo and the Lipanes. The Utes may be omitted as belonging for the most part in Region II and as having, in any case, left no archaeological or historical sites of consequence. The entire subject of the Apaches will be discussed here and they will be omitted from the section on Prehistoric Cultures.

Probably in the thirteenth century A.D., bands of Athapascan-speaking people entered the southwest, from the central western plains (or possibly through the Great Basin), having come originally from western Canada where the main body of Athapascans occupies the Mackenzie drainage. These bands spread in various directions over the southwest; one into northeastern Arizona where, having received many accretions from the pueblo peoples and the Utes, it becomes the Navajo, another into the mountains of west Texas whence, as the Lipans (Llaneros, or Canneci), they make alternate peace and war with the Spanish in the 18th century, others into the mountains of southern Arizona - the Gila Apaches, the Chiricahua Apaches, etc. Others stay in New Mexico - the Jicarilla and Mescalero. Only occasionally do any of these groups trifle with agriculture and pottery-making; they are for the most part hunters and fighters, and continue so to the time of Geronimo. Accordingly, they have left very sparse archaeological remains. The outstanding spot in Navajo life and history is the Canyon de Chelly, already a National Monument; probably there is no Apache site suitable for reservation.

SECTION B
THE PREHISTORIC INDIAN CULTURES

1. Early Man

A number of finds of human remains or artifacts in association with extinct fauna have been made in the southwest. Best-known of these is Folsom, New Mexico, original type site of the "Folsom Culture" that occurs, mainly as surface finds, over most of the United States east of the Continental Divide, and of which a large campsite is being studied by Dr. F. H. H. Robert of the Smithsonian Institution near Fort Collins, Colorado. Another especially important site is Conkling Cavern, at Bishops Cap in the Organ Mountains, New Mexico, which has been reported on in the bulletin of the West Texas Historic and Scientific Society. The work of Dr. E. B. Howard in eastern New Mexico - in the Guadalupe Mountains and in the sandhills in the Clovis region - has produced a number of similar instances, notably in Last

Chance Canyon and Dark Canyon in the Guadalupe. At Frederick, Oklahoma, a somewhat dubious association occurs. The finding in one cave in Culberson County in West Texas of bones of *Tetrameryx* (extinct antelope) apparently associable with Big Bend cave-dweller materials, raises interesting questions.

Discoveries of artifacts considered to be of great antiquity for other reasons than direct association with Pleistocene fauna are for the most part questionable; especially, cases when the supposition of vast age is based on typology are unsatisfactory, and when on patination they can be accepted only with considerable reservations. However, for at least one group of such finds the indications of antiquity are supported by excellent geological evidence; these are the covered sites in the vicinity of Abilene, Texas, discovered by Cyrus Ray of that city and studied by Sayles of Gila Pueblo, Leighton of the Illinois Geological Survey, and Ernst Antevs. These sites are of palaeolithic typology and occur in pluvial deposits equated to the glacial deposits further north.

Folsom, New Mexico, and Bishop's Cap, New Mexico, are the most suitable sites in Region III for designation; it might be well to mention here that there are a number of important early sites in Region IV - in Nevada and southern California.

2. Basketmakers and Cave Dwellers

In dry caves in southern Utah, northern Arizona, and northwestern New Mexico, similar caves in west Texas from the Pecos to El Paso and in Coahuila, and in the Bluff-shelters of the Ozarks of southern Missouri and northwestern Arkansas, are often found cultural remains of perishable materials (basketry, matting, sandals, wooden implements, cloth, etc.), of the same general type in all three areas but differing in many details. For all three the same general cultural level is indicated and many traits are identical. The Arkansas bluff-dwellers cannot be dated; the west Texas cave-dweller culture seems to extend from very early times to the 14th century A.D.; the Basketmakers of the southwest acquired (or developed) the beginning of the arts of ceramics and masonry in the middle of the first millennium A.D., thereby initiating the developments of Pueblo civilization, and were overrun and submerged by a new people in the eighth and ninth centuries.

Connection between these three peoples is probable theoretically and is further indicated by extension eastward into the panhandle area and southeastward into central New Mexico of Basketmaker finds. A daring and unorthodox theoretician might suggest that a general culture-type, of which these groups are the only representatives whose remains have survived, extended over a large area (from St. Louis to Chihuahua City and to St. George, at least) for a long period of time, with varying terminal dates in different sections.

These groups are characterized by: Excellent coiled and twined basketry, matting, sandals of various types, and, at least in the Southwest, cotton cloth; the atl-atl, or spear thrower; a little agriculture (in some districts none); stone artifacts rather crudely chipped; use of nets and light ropes; flexed burial wrapped in robes and mats; shell and stone ornaments; lack of the following essential traits of developed American cultures - pottery, permanent dwellings, advanced agriculture, the bow and arrow, (apparently occurs among the west Texas cave-dwellers but presumably is a late acquisition).

Each of these three groups should be represented in the final selection of Historic Sites. Emphatically outstanding is the lower Pecos between the U. S. Highway bridge and the Rio Grande. The west Texas cave-dweller culture will also be represented within the Big Bend National Park, but the lower Pecos is a richer and more concentrated archaeological area. There are Basketmaker remains within certain of the Southwestern Monuments, notably de Chelly. Suitable Arkansas or Missouri site could be selected after consultation and study.

3. Villages, Mounds, and Campsites of the Southern Plains

The archaeology of this area has not been thoroughly worked out; the majority of the sites are unimpressive camps or villages. In Arkansas and eastern Oklahoma, numerous earthmounds, funerary and domiciliary, along the watercourses; these are probably to be connected with the Caddoan peoples, and tie in in a very general way with the rest of the Mississippi Valley and the southeast. Certain very interesting points arise in any consideration of the Arkansas mounds - occurrence of pottery traits of the so-called Q-complex of Middle America, general correspondence on the St. Francis River in northeastern Arkansas to pottery forms of the Chihuahua culture in northern Mexico - but they need not detain us here. Two mound-groups in this area have already been brought to the attention of the National Park Service - the Knapp mounds at Toltec, Arkansas, and the Spiro Mounds at Spiro, Oklahoma. Designation should also be considered for the mounds at Wagoner, Oklahoma, and for suitable mounds on the Ouachita and St. Francis rivers, and for the mound site near Hope, Arkansas, where two mounds of Caddoan remains have been found.

The village-sites in Oklahoma, Arkansas and East Texas, for the most part, tie in with either historic tribes or with mound sites; designation of Hasinai, Wichita, and Arkokisa villages has already been suggested, and the only purely prehistoric villages that need be considered are the slab-house "Pueblos" of the Canadian Valley in the Texas panhandle region. These represent a late (14th-15th century A.D., as shown by intrusive sherds) extension eastward of puebloan influence, but probably not of puebloan peoples; it has been suggested that the panhandle "Pueblo" culture is to be ascribed to the Kiowa. Whatever the ethnic affiliation of this culture it is of considerable

interest, and some site thereof, such as Landergin Mesa, Texas, or Optima, Oklahoma, should be included in the survey.

There is another archaeological group of uncertain affiliation which deserves attention - the burnt-rock mounds of central Texas. The upper level in these is very possibly to be linked with the Tonkawa tribes; the cruder implements of the lower levels may or may not represent ancestors of the Tonkawa. Burnt-rock mounds such as those near Round Rock, Texas, or those in the upper Frio Canyon in and near Garner State Park, or those between Austin and Georgetown, Texas, should be considered.

The campsites in the sandhills southwest of Lubbock in western Texas and eastern New Mexico are an interesting group but hardly of the caliber of National Historic Sites.

4. Hohokam and Anesazi

There are two main divisions of southwestern archaeology aside from very early remains - the adobe villages of the Hohokam (Pima word for 'ancient people') in southern Arizona and the masonry pueblos of the Anesazi (Navajo word for 'ancient peoples'), or Pueblos and late Basketmakers, in New Mexico and northern Arizona and southwestern Colorado and southern Utah). A third cultural focus is perhaps represented by the Mogollon-Mimbres-Chihuahua group; its disparateness is not universally admitted and it ties in closely with the Anesazi or Pueblo culture.

The Hohokam are clearly ancestors of the Pima and Papago culturally, and presumably ancestors ethnically. Their history from the early centuries of the Christian era to the present is known primarily from the excavations at Snaketown (on the Gila River south of Phoenix, Arizona), which certainly must be included in the survey. Snaketown is the only site at which the earliest known phase, the Hohokam manufactured excellent pottery, plainware and redware, and lived in great semisubterranean square lodges; during succeeding horizons (about 200-800 A.D.) the characteristic pottery is red-on-gray with geometric designs, notably hatched spirals, carving of hard stone becomes highly developed, and houses become smaller and oblong; contemporary with early and classic Pueblo culture the Hohokam pottery acquires a buff slip and zoomorphic decoration, the houses become oval; in the early 14th century a branch of the Pueblo people from the upper Little Colorado spread down into the Gila Drainage and submerge but do not obliterate the Hohokam, who apparently absorbed these people, becoming the historic Pimas and Papagos. The Casa Grande was built by the invaders; the other ruins on the monument are mostly Hohokam proper of slightly earlier date. The ruins of the Tucson basin vary somewhat from those of the Gila basin, and one of them might be considered - Martinez Hill, Tanque Verde, or the University ruin. Also the large

HISTORIC SITE SURVEY & THE AMERICAN INDIAN (CONT.)

site at Phoenix known as Pueblo Grande is an outstanding one.

In the 8th and 9th centuries A.D., the Pueblos proper come into the northern southwest, submerging and absorbing the Basketmakers, and carry forward Basketmaker culture, practicing agriculture, making black-on-white and black-on-red and "corrugated" pottery, living in small masonry settlements. In the 11th and 12th centuries they draw together in large urban communities such as those in Chaco Canyon, in the Kayenta-Marsh Pass-Chinle area, and on the Mesa Verde; later they spread south from the Zuni country into southern Arizona and east from the Chaco and the Mesa Verde into the upper Rio Grande. Meanwhile, the people of southwestern New Mexico, a poorly known group with many Hohokam cultural elements, come under Pueblo influence and develop the distinctive Mimbres culture; a comparable process in Chihuahua brings about the Casas Grandes culture; the Mimbres people disappear in the early 13th century, perhaps going to Chihuahua; and in late prehistoric times southern New Mexico is occupied by a group of uncertain affiliation using pottery traded from the lower Gila, from the El Paso area, from Chihuahua, and from Central New Mexico.

The Pueblo culture proper, especially its urban period, is well represented in the southwestern National Monuments - Aztec, Chaco Canyon, Canyon de Chelly, Navajo, Wupatki, Yucca House, Hovenweep, Bandelier, Gila Cliff Dwellings, Montezuma's Castle, Tonto Cliff Dwellings, Walnut Canyon, El Morro, Gran Quivira, as well as at Mesa Verde National Park. However, the Mimbres area should be included in the Historic Sites Survey by designation of one of the "classic period" Mimbres ruins such as Swarts or Galaz.

SUMMARY OF SUGGESTED SITES

A. Historic

1.

- a) A Hasinai Village-site in the region of Nacogdoches.
- b) A Wichita Village-site in north central Texas.

2. The Palo Duro Canyon

3.

- a) An Arkokisa village on the lower Trinity.
- b) A Karankawa site near Rockport, or Corpus Christi.

4.

- a) A contemporary pueblo: Taos, San Juan, Acoma or Domingo.
- b) Early historic pueblos; Pecos, Tiguex, Hawikuh, vicinity of Presidio (Texas), Awatobi.

HISTORIC SITE SURVEY & THE AMERICAN INDIAN (CONT.)

5. Canyon de Chelly National Monument.

B. Prehistoric

1.

- a) Folsom, New Mexico.
- b) Bishop's Cap, New Mexico.
- c) Last Chance and Dark Canyons, New Mexico.
- d) Covered sites near Abilene, Texas.

2.

- a) Basketmaker sites: Canyon del Muerto (de Chelly National Monument), Chaco Canyon National Monument.
- b) The lower Pecos.
- c) The Hueco Tanks.
- d) An Arkansas bluff-shelter.

3.

- a) Mound Sites: Spiro, Oklahoma; Wagoner, Oklahoma; Hope, Arkansas, Toltec, Arkansas (Knapp Mounds).
- b) A Panhandle Pueblo: In the Canadian Valley, in Texas, or Optima, Oklahoma.
- c) A burnt-rock mound site in central Texas.

4.

- a) Hohokam sites: Snaketown, Pueblo Grande, Casa Grande National Monument, a Tucson basin site.
- b) A Mimbres site: Swarts or Galaz.
- c) Puebloan sites: Fourteen National Monuments and Mesa Verde National Park; also suitable are Heshota and Nutria on the Zuni reservation, Kinishba on the San Carlos Apache reservation, Elden Pueblo near Flagstaff, Johnson Canyon south of the Mesa Verde, the Barker arroyo ruin north of Farmington, the Lowry ruin near Ackmen, Colorado (just within Region IV, I judge), the Sierra Ancha cliff-dwellings.

RUMINATIONS

Well, Chief, I don't feel like running any foot races yet but I'm getting almost to the point where I'm afraid I will have to go to work before long.

Something went wrong with my pump and the Doc promptly ran me into drydock and told me I would lie on my back until it healed up. Of course, the first thing you discover in such a case, is that the outfit gears up just a little, takes your duties along with its own, and goes right on turning out the usual mass of work. At first this makes you feel pretty useless but you finally come to the conclusion that it would be a lot worse if things went to pot every time you went off the job; that would prove you couldn't delegate work and were not much of a Boss.

From my own standpoint I have been having a grand vacation - no aches, no pains, a good appetite with enough to eat and all the time to catch up on a lot of back reading I've been wanting to do these past twenty years; high brow stuff - Don Quixote, nine hundred pages of him with a laugh on every page - The Iliad in a prose translation which brings out the sense much better than the rhyming or blank verse editions which I had heretofore read - the Oddeasy in the Lawrence translation - four or five plays of Aristophanes - oh, we had a grand high brow review.

Then there was Seven Pillars, which I have not yet found time to read and Gladys Reichards' books on the Navajo, and Will Robinson's Thirsty Earth and an endless procession of magazines, papers and so on. It has been a busy time.

Everyone, in and out of the Service, has written and I'll have to stay in dry dock a month or two more if I work the puzzles and brain teasers that have showered out of the mail sack. Especially are we having trouble with nine little pieces of wood in a little box which you are supposed to move this way and that until you transfer the big piece from one corner to another. It looks so simple on the face of it and proves so complicated that I hardly need explain it comes directly from the Legal Department of the Washington Office.

And now Charlie Steen comes in to say that Luis is waiting to cut stencil on this copy and so the last page of another monthly report starts on its way. These fellows sure turn out a good report when I let them alone, don't they?

THE BOSS