

1930

Annual Report
Fifth Irrigation District

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Supervising Engineer



U. S.
INDIAN
IRRIGATION
SERVICE

DISTRICT
NO. 5.

ANNUAL
REPORT
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Engineer

ALBUQUERQUE
NEW MEXICO

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GANADO PROJECT

The principal work on the Ganado Project for the past year consisted of the regular operation and maintenance of the project. Funds appropriated for operation and maintenance of this project were in the sum of \$3,000 which would not permit any extensive repairs or replacements on the project.

The Indians farming on this project have shown an unusual interest in project affairs and regular monthly meetings were held with the Indians at which time project affairs and other matters of vital importance to the Indians were discussed.

The Indians have releveled a considerable acreage on the project and have in general improved their methods of cultivation and irrigation. In some cases where flood method of irrigation has been used the Indians have corrugated their fields and thereby conserved a considerable quantity of water which in turn increased crop production as in a number of instances where flood methods have been used for a number of years the alfalfa fields have been flooded to a point where the alfalfa has been killed and grass propagated in the fields. On the J. L. Hubbell ranch where flood methods have been practiced for the past

twenty years his entire alfalfa field consisting of some one hundred acres has been damaged beyond any possible chance of restoration and it will be necessary for him to plow up the entire field and plant to small grain crops for at least one year before reseeding alfalfa. It is believed that the Indians will profit by his experience and that better irrigation practices will prevail on the project.

Mr. Neil Campbell, who was sub foreman on the Pine River Project for a number of years, was transferred to the Ganado Project during the month of February 1930.

Mr. Campbell has made a good showing on this project, particularly in the Indians' affairs and in the building up of the irrigation plant, and because of his very great interest in the project he has been promoted from sub foreman to the position of foreman.

The Ganado Mission and J. L. Hubbell, the only two white users on the project, have performed their proportionate share of the cost of operation and maintenance in the cleaning of the canals. Reference is made to our annual report of 1929, page 33, for contract under which J. L. Hubbell and the Ganado

Mission receive irrigation water.

It is hoped that both the Mission and the Hubbell ranch will pay for operation and maintenance on a cash basis in the very near future.

MAP OF THE
NAVAJO COUNTRY
 IN
 SOUTHWESTERN NEW MEXICO, AND
 UTAH

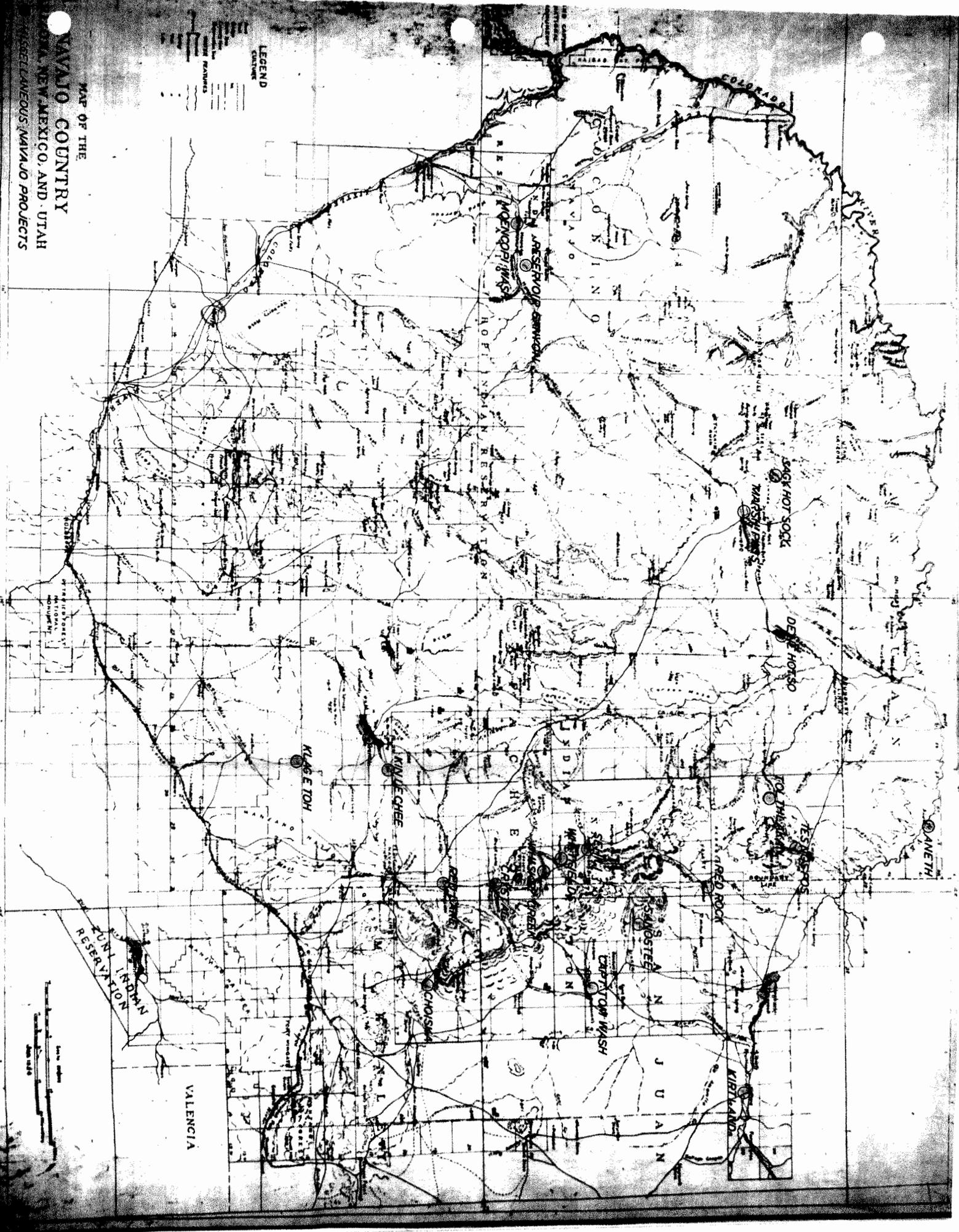
SHOWING
 SEVERAL LAYERS OF
 NAVAJO PROJECTS

LEGEND

LEGEND
 CENTER

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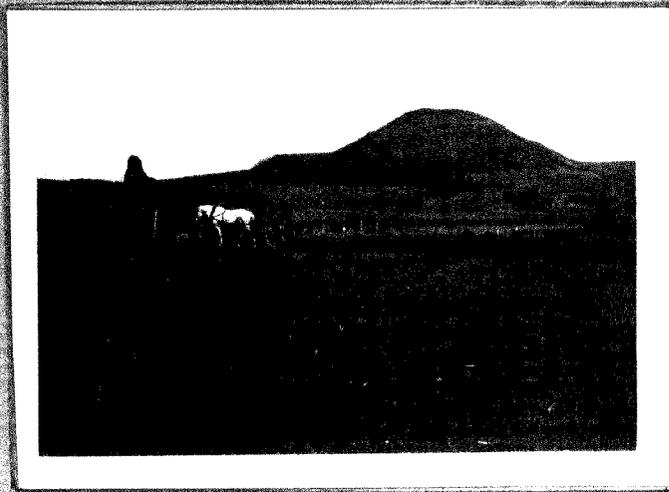
MOENCOPI PROJECT

This project is located three miles southeast of Tuba City, Arizona, on Moencopi Wash, and irrigates lands for the Navajo Indians and the school farm. In addition to this the agency has about 150 acres of land in pasture.

A sluiceway was installed in the canal just below the school farm to facilitate in sluicing out sand and other silt deposit which accumulates in the main irrigation canal. The Western Navajo Agency paid for the labor and this Service furnished the gates. This work was started October 15th and completed on October 23rd.



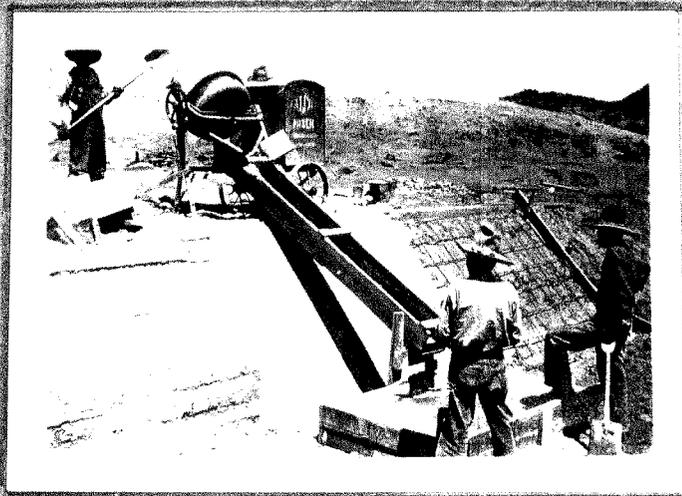
SHEARING SHEEP - RED LAKE



PLANTING ALFALFA - RED LAKE



EXCAVATION FOR CONCRETE LINING
RED LAKE FEEDER CANAL



LINING FEEDER CANAL ABOVE SLUICeway
RED LAKE

RED LAKE PROJECT

This is one of the oldest projects on the Navajo reservation, originally built prior to 1904. Very little use was made of the project up to 1928. During the time it was originally constructed and the time the Indians began to make use of it, it has been practically rebuilt twice. There are 700 acres of good agricultural land available for cultivation with a reservoir containing 4000 acre feet of water. The reservoir has been filled to capacity for the past eight months.

The Fort Defiance School has forty acres under cultivation and every effort is being made to have the Navajo Indians place all of the agricultural lands under cultivation during the present season.

The project consists of a diversion dam and feeder canal to the reservoir with a storage capacity of 4270 acre feet and about five miles of main canal.

The project is visited regularly by a representative of the Fifth Irrigation District, however, the management of the project is vested in the superintendent of the Southern Navajo jurisdiction and not in this Service.

RESERVOIR CANYON

This project is located three and one-half miles northwest of Tuba City, Arizona. Reservoir Canyon is about six miles long, is a stream of water which is fed by springs the year around and develops about one cubic foot of water per second. The upper three miles of the canyon is sheer wall from one to two hundred feet high of red sandstone formation, and averages about three hundred feet in width.

Some twenty years ago there was constructed a culvert of natural rock for the purpose of conveying irrigation water through a narrow canyon which is gradually being filled with blow sand.

During the year 1923 this culvert caved in from the weight of the sand and it was necessary to excavate a new channel for the waters to flow out of the canyon. This was accomplished partly by excavation and partly by the use of a siphon to wash the sand out, the sand having impounded considerable water in the canyon.

During the fiscal year 1930, 700 feet of ten inch slipjoint pipe were laid to replace the old rock culvert. This work was started on September

19th and completed October 14th.

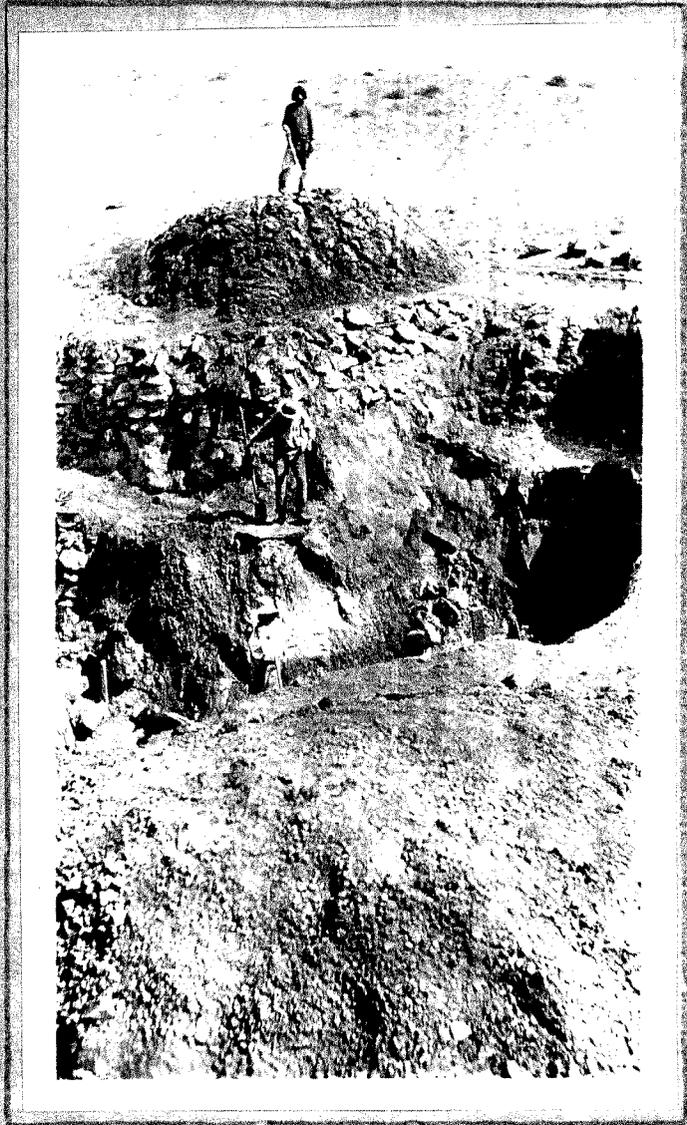
Reservoir Canyon is fairly inaccessible for trucks and it was necessary to carry the pipe by hand approximately 1000 feet as the sand in the neighborhood of the canyon is too heavy for trucks or small Indian teams. This work was done at the expense of the Government without any labor without pay from the Indians.

WATER DEVELOPMENT, NAVAJO AND HOPI RESERVATIONS

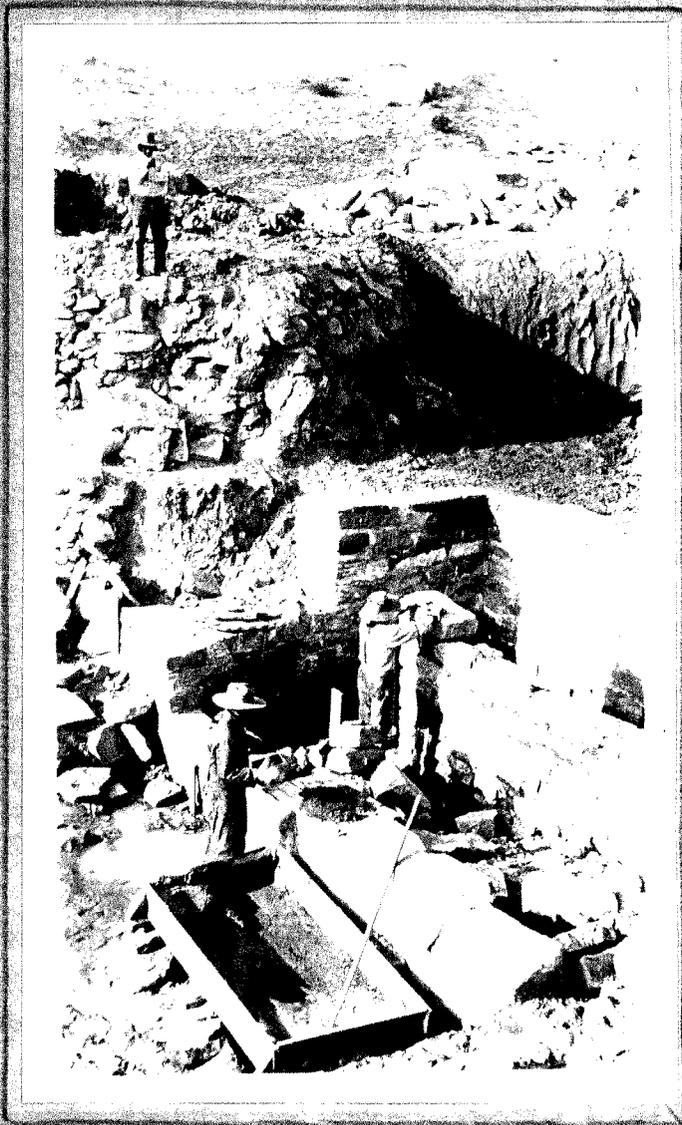
The Navajo reservation lies in one tract in northwestern New Mexico and northeastern Arizona and has an area of approximately 14,360,000 acres. The Hopi reservation lies in the heart of the Navajo country in Arizona and has an area of approximately 2,270,300 acres. The elevation varies from 4800 to 8000 feet with the higher elevations in the mountains. The rainfall varies from four to fourteen inches per annum.

Practically all of the area occupied by the Navajo and Hopi reservations is in an arid district and there is very little area that is fed by living waters. This area is confined to the west slope of the Choiska range and the area adjacent to the San Juan River. All of the other streams flowing through the Navajo country can be classed either as ephemeral or streams having an intermittent flow.

The work on the Navajo and Hopi reservations consists of the development of domestic and stock water for the entire reservations including Executive Order lands and lands acquired otherwise by the Indians. (Reference Office letter of March 7, 1930, Irrigation 6355-30).



SPRING DEVELOPMENT
HOPI RESERVATION



SPRING DEVELOPMENT
HOPI RESERVATION

The Navajo and Hopi reservations are divided into six jurisdictions: Eastern, Western, Northern, Southern, Leupp, and Hopi. Headquarters for the water development work are at Polacca, Arizona, on the Hopi reservation, and the organization is shown on the Organization Chart.

Water for domestic and stock purposes is developed by drilling wells and equipping them with windmills, storage tanks, and watering troughs; developing springs and piping the water from the springs into a concrete or less permanent water trough, depending upon the funds available, and the construction of earthen reservoirs to impound surface and flood waters. The dams forming the earthen reservoirs are riprapped on both slopes to prevent wind and water erosion and also to prevent wear and tear on the embankments where sheep and other livestock come to water. The work also includes the operation and maintenance of the existing wells, springs, and reservoirs.

Water development on the Navajo reservation has been in progress for some twenty years and it is now found necessary to replace the well casings which have rusted out in a number of wells which were drilled during



CONSTRUCTING SURFACE RESERVOIR
NAVAJO RESERVATION

the early period of the water development.

During the period that the development of stock water has been in progress, the Navajo Indians have increased their flocks to such an extent that the demand for stock water in the remote districts of the reservations has been very great. The increase in flocks has been so rapid that the range has been depleted adjacent to the water holes developed to such an extent that about 25% stand of natural grass remains and for many years the grass has not been allowed to reseed itself. The only good range on the Navajo reservation is in districts where stock water has not been developed and it is believed that most of this area should be retained as it is and used only during a period when natural conditions would permit of its use, otherwise the entire reservation will be overgrazed within a very short time.

Considerable attention is now being devoted to redistricting the range on the Navajo and Hopi reservations in order to provide winter and summer range and permit, if possible, the reseeding of the portions of the reservations that are now overgrazed.



ARTESIAN WELL
NAVAJO RESERVATION

The redistricting and developing of the range has recently been turned over to the Forest Department of the Indian Service.

The following summary shows the water development during the fiscal year 1930:

Springs Developed

<u>Northern</u>	<u>Southern</u>	<u>Western</u>	<u>Eastern</u>	<u>Hopi</u>	<u>Leupp</u>	
9	17	3	1	3		
						TOTAL 33

Reservoirs

<u>Western</u>	<u>Eastern</u>	<u>Hopi</u>	
12	4	2	
			TOTAL 18

Wells

<u>Northern</u>	<u>Southern</u>	<u>Western</u>	<u>Eastern</u>	<u>Hopi</u>	
16	16	7	4	1	
					TOTAL 44