

English. They were curious about us, surprised by our offer, and thoroughly friendly. They seemed miles from any habitation, yet in the gentle rise and fall of the desert, it is remarkable how a hogan can be hidden from view.

Another time, as we drove along in the Red Rock region, we came across a boy with a small flock of sheep. It was a wonderful day with great masses of clouds gathering for a possible storm. We pulled off the road to stop a while to enjoy the beauty of the scene. Soon the sheep came closer to us, the boy

watching from a distance. We were so absorbed with this scene in one direction that we did not see a young man approaching on foot from another. Then up out of a wash appeared a lone horseman who stopped to talk with the young man on foot. After a while each went his separate way as we watched them all disappear into the landscape. The sheep moved slowly on, the little boy with them. We spoke to no one, they paid no attention to us whatsoever, yet I doubt not that later in the day they knew who we were and a surprising lot about us.

Flocks of sheep are gathered prior to shipping to market.

Sheep Raising

Ever since the Navaho obtained their first sheep and horses from the Spaniards sometime in the seventeenth century, sheep and wool has become an ever increasing resource for the People. Between that time and the year 1846, when the United States took possession of the Southwest following the Mexican War, Navaho sheep had increased to 500,000 head. Later, when Kit Carson defeated the Navaho through his scorched-earth policy, much of this livestock was captured or killed. Only some 5,000 head were moved to Fort Sumner with the Navaho People; many of these died along the way, for they had not sufficient time to graze, and more died later.

When at last the Navaho were freed to return to their old land in 1868, they had nothing but the hope of the promised new start that the government would send them—seed, tools, and three sheep per family. It was more than a year, a time of near starvation, before this promise was fulfilled. Before the exile there had been some small groups who, with their flocks, had hidden in the remote wild canyons of northern Arizona, while Colonel Carson was rounding up the Tribe. There is a legend that one leader of the hidden groups urged the People to conserve their sheep so that they might help their fellow tribesmen when the day of liberation came. Doubtless some of the re-

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turning Navaho found their way to these remote regions, joining their relatives or friends. The rest struggled through that first year until the promised sheep and seed were finally delivered late in the fall of 1869.

By the year 1870 there could not have been many sheep on the reservation, yet between 1870 and 1894 sheep and other stock had increased to an estimated number of more than 1,500,000. During these first years following the exile, government agents were sent to certain areas on the reservation to maintain contact with the Navaho People. The first agent to realize the necessity for stock reduction was D. M. Riordan, agent at Fort Defiance, who sent a report to Washington requesting that the stock on the reservation be reduced, and also urging the introduction of better stock to improve the breed. This was in 1883. Again, in 1894, another agent, Edwin Plummer, realizing the great increase in stock, particularly of sheep, sent an urgent plea to Washington for more grazing land for the Navaho, but this plea also was turned aside. The next important effort to intercede in behalf of the Navaho was in 1914 by Father Anselm Weber from Saint Michael's Mission. Father Anselm became aroused when a group of non-Indian stockmen, with eyes on certain grazing areas, tried to bring political pressure to bear on the Indian Service to declare this large section of land, then beyond the western boundary of the reservation, as "surplus land," and, therefore, part of the public domain and subject to homesteads.

Father Anselm attacked this measure, sending reports to Washington showing the need for increased areas for the Navaho. Riordan, Plummer, and Father Anselm were the first who realized how the pasturage was being destroyed by over-grazing, who recognized the danger of the destruction of the natural grama grass so necessary for stock of all kinds. Father Anselm saw, too, how certain areas of land were being eroded where the sheep, who crop closely and often pull up the grass by the roots, were actually destroying the range. He urged Congress not only to preserve the Navaho range lands, but also to increase range areas. Father Anselm was successful in his mission, and new areas of land were added to the western section of the reservation. However, nothing was done about the overstocked range.

Following World War I, there was much discussion

about the land and the sheep, but no one seemed to have any plan. Finally, in 1930, an Indian Bureau forester, William H. Zeh, was appointed to make a general survey of range conditions on the whole reservation. Mr. Zeh's report showed that due to shortage of stock water the distribution of stock was very uneven. Consequently, there were great inroads of soil erosion in some areas, and stock of all kinds—sheep, horses, cattle, mules, burros, and goats—were far in excess of the available range. He urged a stock reduction program. Once more there were delays and the detailed grazing surveys were not commenced until 1933, to be completed in 1935. It was then apparent that the reservation range could support only about 500,000 head, and that the range at that time was overstocked by more than 200 percent. These were the depression years and the price of wool and lambs was at a low point. The Navaho were just not selling their lambs, thereby adding still more stock to the overgrazed land.

With the advent of the new administration in 1932, new agencies were created, the Soil Conservation Service, the Public Works Program, the Relief Administration, to name a few. These services, together with the reports from the Indian Service, brought to focus the necessity for the Navaho stock reduction program of the 1932-1942 decade. This program produced an economic and social revolution, for the Navaho at that time did not have the education or the understanding to comprehend the necessity for this long-range plan. To a people who had been shepherds for more than two centuries, to be told that they must reduce their flocks came as a shock.

Until this time the Navaho had had no centralized government of their own. In the early days before the exile they had been loosely governed by chiefs in various areas of the Navaho country. After the exile the Indian Service had divided the reservation into districts of administration. Now, in 1932, the tribal government was just being formulated, and still did not represent the people from all the areas of the reservation. The first steps taken by the new commissioner of Indian Affairs were in the field of land conservation, to be carried out by the Public Works Program, giving work to many Navaho men. Steps also were taken to develop greater water supply by drilling new wells and building small drainage reservoirs.

Then came the time when the whole land and sheep

The ever increasing use of trucks and cars is fast diminishing the use of the long-loved horse.

program was clearly stated and explained to the Tribal Council, showing them how too many sheep were destroying the grass and causing great areas of extreme erosion. To compensate for the reduction in sheep, a new educational program would be put into effect which would include the building of some fifty new day schools. The construction of these buildings would be done by Navaho labor. The Council understood the program and approved it. Work was commenced. The Relief Administration was to purchase

100,000 head of sheep immediately in the fall of 1933, this number to be divided among the several jurisdictions of the reservation.

But many of the large sheep owners refused to comply. A compromise was finally reached on a percentage basis, but this worked hardships on the small flock owners. Suspicion and resentment reached a high pitch, for the Navaho think of wealth in terms of livestock, not money, and they seemed unable to understand that money earned by wages would in any

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way compensate for loss of sheep. While the Council supported the program, enforcing it was something else, and the Council was placed in a difficult position with their fellow Navaho who disapproved the plan. There were several years of turmoil, climaxed when the Relief Administration purchased 150,000 head of goats, half of them females. At this point the Navaho women became very agitated and hostile to the entire program. These goats were to be delivered to small packing plants between September and December of 1934, with a purchase price of \$1.00 per head. Unusual weather conditions and long distances for hauling slowed the program, and a suggestion was made that the Navaho slaughter all the goats they could use for food, even though they had already been sold to the government.

Frustrated in getting some 3,500 of these goats to the railroad from one far distant point, and because the cost of hauling greatly exceeded the value of the animals, someone ordered that the goats be shot and left to rot. This action may have been a practical solution, but its effect on the Navaho was catastrophic and sent a shudder of apprehension throughout the Tribe, for, to the Navaho, animals are killed only for food. This was a tragedy which has left scars of mistrust, and even though the program was continued and the stock reduced to a better level, sheep control is still a matter of concern. In continuing the program, range management districts have been established, while the Bureau of Indian Affairs still issues the grazing permits.

The coming of World War II alleviated the tension to a considerable extent, for many Navaho men went into the army, many more, and women also, into war work of various kinds. Some went to California to work in defense plants. They all did a superlative job. These war experiences also taught the Navaho a great deal about the ways of other people, for they are quick to learn through observation, and to many this was a new experience, for they had never been away from the reservation. Following the war many more things have happened to help relieve the livestock situation. The discovery of extensive uranium deposits brought money into the Tribal Fund, as well as work for many young men. This discovery was followed by the development of new oil fields. The Tribal Council is doing much to produce new water

supplies, build new roads, and carry out other projects, all of which are helping to solve Navaho economic life. While there are still many sheep on the reservation, they are no longer the only means of livelihood.

Farming

The Navaho have been farmers since the beginning of their known history. Evidence of their produce was found in archaeological excavations in old Navaholand where corn, squash, and beans were found—seeds more than four hundred years old. As the Navaho moved westward down the San Juan Valley, they planted fields wherever they settled, but these were subsistence farms of small acreage. During the past seventy-five years, this picture has been changing, until today there are some Navaho who do practice commercial farming, and there are more who wish to do so.

As about 65 percent of land under irrigation on the reservation at the moment is concentrated in the San Juan Valley, a farm training program was established in this area by the government about ten or more years ago, to meet the need for new occupations to take the place of raising sheep. As this has developed, the Navaho have found that small subsistence acreage would not meet their needs, and as this need has increased, a consolidation of small areas has been developed, making productive farming as a livelihood more possible.

The new irrigation project, planned long ago but not put into effect until 1962, will bring water from the San Juan River, stored in the new Navajo Reservoir, to irrigate 110,000 acres of land. This area, now nearly destitute of growth, will extend along the south side of the river from near Farmington, south and west all the way to Newcomb. The first water will be turned into the new canals in a few years, creating about one thousand 120-acre farms for young Navaho People. This project is based on the premise that the land belongs to the Tribe and will be leased to individuals with a period of rent-free occupancy in which to become established. Farming on a commercial basis is a comparatively new occupation for the Navaho, and benefits from the farm training program will be needed as this development gets under way.

Although Indians in this part of the Southwest have

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under way for several more additions to the tribal park system.

Chaco Canyon Monument and Navajo National Monument contain great prehistoric ruins indicating the extensive population that existed here between the eleventh and fourteenth centuries, and there are other sites antedating these. The ruins of the great terraced structures of Pueblo Bonito and Chetro Kettle at Chaco Canyon reveal some of the finest prehistoric masonry. Here one sees the remains of two walled cities where perhaps a thousand people lived nine hundred years ago, and there are ruins of many other pueblos within this area. Navajo National Monument contains the cliff dwelling called Beta-ta-kin, perhaps the most beautiful in the Southwest, as well as other ruins. Canyon de Chelly and its tributary, Canyon del Muerto, comprise the most spectacular monument for scenic beauty. Here is an area of long-continued occupation, seventeen centuries, from A.D. 200 to the present. Not only do these Canyons contain evidences of ancient habitation, but through all these centuries the canyon floors have been farmed by successive tribes of Indians.

First came the so-called Basket Makers of A.D. 200 to approximately 700, followed by the Pueblos, who built the famous White House in Canyon de Chelly, the cliff dwellings in Mummy and Massacre Caves, and others in Canyon del Muerto. Then, according to some archaeologists, came some Hopi, who left behind quantities of pottery in the thirteenth and fourteenth centuries.

Lastly came the Navaho in the early part of the eighteenth century. This is still an inhabited region, for some three hundred Navaho live and raise their crops within the Canyons, sheltered by their high protective walls. As visitors travel up the Canyons today, they are conscious of small farms of corn and alfalfa, but it is only from the air that the full extent of the farming may be seen.

Throughout the summer, irrigating ditches bring water from higher regions as it flows down the Canyons following heavy thunderstorms. There are small peach orchards in Canyon del Muerto whose origins stem from trees brought to the Hopi villages by seventeenth-century Spanish padres. In September the Navaho dry large quantities of peaches to be stored for winter use.

There has long been misunderstanding regarding the names of these canyons, De Chelly, and its largest tributary, Del Muerto. *De Chelly* is a Spanish corruption of the Navaho word *Tseghe*, meaning "between the rocks," hence, canyon. Many have thought that the name *Del Muerto* came from the Spanish attack on Massacre Cave in 1804, but there is no evidence whatever that this branch canyon had any name until 1882 when Colonel James Stevenson entered the canyon on an archaeological expedition. Members of two earlier expeditions made no mention of any name other than De Chelly. In a cave, later called Mummy Cave, Colonel Stevenson found two mummies, and in recognition of this find, he called the canyon "Cañon de los Muertos," later condensed to Canyon del Muerto.⁵

The Canyons can be treacherous as well as beautiful. Few visitors realize how quickly water can accumulate following the great thunderstorms of this Western region. Sometimes a storm will be miles away, not even visible from the lower part of the Canyons; yet with incredible speed the runoff accumulates, rushing down the Canyon floors, sweeping everything in its path. There are areas of quicksand, too, where many an automobile has become bogged down and even submerged, to the dismay of unsuspecting travelers. The Canyons twist and wind, creating one beautiful vista after another when the lowering light of afternoon mystifies and enhances, and giant shafts of rock, sunlit against a shadowed wall, are silhouetted in majestic beauty.

There is a delightful legend of how the Canyons were made:

Coyote went to the People begging them to give him some fire. At first they refused, for he was well known as the mischief maker. After repeated entreaties, some one said, "Oh, give him some." So they gave him some flint stones. He tried and tried but could not make a spark. Finally he became angry and threw the stones on the ground, whereupon a great spark was lighted which quickly set fire to the dry brush. It burned and burned into a rushing fire and Coyote ran away. The earth split open from the great heat beneath the fire and finally Water Purer came to put it out. This started the washing

⁵David L. DeHarport, "Origin of the Name, Cañon del Muerto," *El Palacio*, 67, No. 3 (June, 1960), 95.

was hire the Jeep and its driver from the Thunderbird Ranch for a trip up Canyon del Muerto. As this was not possible for the following day, we made arrangements for the day after. We then rearranged our plans, driving up to Many Farms, some forty miles to the north, where Cornell University conducts a clinic. We spent a busy morning watching the school children as they came in for tests, making numerous pictures, and learning about the interesting work that is being carried out by this university.

At noon we started on our way back to camp. As we were passing a small trading post called the Valley Store, I realized suddenly that this was the old Frazier Trading Post, the end of my long walk in 1930 when Betsy and I ran out of gasoline. We stopped to buy something for lunch and to pass the time of day with the trader. As we started back to the car, a wagon drove up with a man and his wife coming to fill their water barrels. As this was an activity I had not yet photographed, I got out my hand camera, and, with Maria as interpreter, asked if I might make the picture I wanted. The man was willing, so I proceeded to make a number of exposures from different angles. After returning to the car, which was on the opposite side of the water tank, we drove for a short distance until we found a nice spot to stop for our lunch.

Then we returned to the Canyon and drove up on the rim to watch the sunset before going to our camp. After supper I got out my changing bag to reload my exposed film holders, and suddenly I could not find the case that contained all my small camera holders, as well as extra equipment. We hunted and hunted, ending by taking everything out of the car. It just wasn't there, so I assumed that I must have left it at the Many Farms Clinic. The next morning, having to postpone our trip up the Canyon, we drove all the way back to Many Farms. But the case wasn't there; we returned to the Valley Store, where I now knew I must have left it. Entering the store, we found only one man sitting there talking to the trader, who was busy behind his counter. I asked him if such a case had been found, thinking that I must have put it down somewhere and left it. He said he had not seen it or heard of it. Then the lone customer spoke in Navaho to Maria, telling her that he thought a certain young Navaho boy knew something about it. I realized then that it had been stolen, something that

down of the Canyon walls, making them deeper and deeper. Today, when you stand on the rim you can see how the Canyons would all fit back together.⁶

In September of 1957 I made a special trip to Canyon de Chelly, taking with me Maria Teba, a young Navaho woman who was then working in Santa Fe, and whom Betsy and I knew very well. She had never been to the Canyons and was most eager to go, and I thought it delightful to have a Navaho companion. On the way we stopped at Window Rock, where I found the Tribal Council in session. I obtained permission to make some interior photographs of the Council room with the members present. I also made a portrait of Paul Jones, who was chairman at that time.

Proceeding on to Chinle, we put up our tent in the National Monument camp grounds and settled down for a stay of several days. One thing I wanted to do

⁶ Adapted from Richard Van Valkenburgh, *Diné Bekéya*, p. 22.

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had happened to me only once before over the years. I posted a notice saying that it was lost and offering a reward. We returned to our camp to prepare for the trip up the Canyon the following day.

I was unhappy over the handicap I would have without the use of my hand camera, as all the extra film I had for it was in that case, including other accessories and a new exposure meter. But, of course, I had my large camera. We set forth early the following morning with the Jeep to ourselves and a nice Navaho driver. The floors of the Canyons are very treacherous with both dry sand and quicksand, and one must be accompanied by someone who knows the safe routes. Our driver, Art, lived up in Canyon del Muerto, and, as this was the Canyon we wanted to see, we proceeded on our way, stopping at Art's hogan, where he introduced us to his family and showed us a fine rug his mother was weaving.

It was a beautiful fall day and we took our time, stopping frequently to work or to look at whatever interested us. We passed numerous hogans, for this is the Canyon where many Navaho People live. We went all the way up to Mummy Cave, a cliff dwelling miles from the mouth of the Canyon. But just before we arrived at this spot we came to a group of hogans and, seeing several children running to meet us, Art stopped the car to give them candy we had brought along. In a few minutes two women appeared, one of them approaching Maria, saying to her in English, "Did you girls find the case you lost yesterday?" I was astonished at this, for we must have been about forty miles from the Valley Store. How could this news have reached these people in less than twenty-four hours, and how were we recognized? I did not have a camera visible and we were not in my own car. This was a striking instance of how news travels on the reservation and how carefully all strangers are observed.

We had our lunch in the shade of some beautiful pine trees across the Canyon from Mummy Cave, resting a while before starting on our return trip. About half way down the Canyon is a group of hogans, almost a community, called Standing Cow, so named for an early pictograph carved on the face of the Canyon wall above one of the hogans. Here we found a busy scene. When we had passed this point on our way up the Canyon in the morning, no one was

visible. Now we found a group of Navaho women and children busily spreading out the season's crop of peaches to dry. They had swept an area clean of loose earth and were placing the halved peaches open side up to dry in the sun. We watched this activity for some time, Maria in continual conversation with the women and thoroughly enjoying herself. Finally we left, driving down the rest of the way as the late afternoon sun threw long shadows across the Canyon floor.

The next morning was Friday, the opening of the Window Rock Fair, so we broke camp and prepared to leave. We stopped at the trading post, as I wanted to tell Mr. Nelson about the loss of my case, in the event that any of the items showed up at his post. I bought some food for lunch and when I joined Maria at the car she was talking to two older Navaho People. She told me that these people wanted to know if we would take them to Window Rock. I said that we would be glad to, but that I wanted to go back to the Valley Store first to see if my case had been found. We all got in the car, the man riding on our camp beds in the back of the station wagon, the woman in front with Maria and me. Maria was engrossed in conversation and I soon realized that she was telling the woman about my missing case and also about my book, for she got it out to show the pictures. As neither of these people spoke any English, I had to guess what all the talk was about. There was no one around the Valley Store when we got there. I went inside to speak to the trader, but no sign of the case.

Getting back into the car, I started to turn around to head for the fair, inwardly bemoaning the loss of much valuable equipment, as well as the exposed negatives of Chairman Paul Jones and the Tribal Council. The woman spoke to Maria, asking me "to go around that hill where it would be quiet." I couldn't imagine what she wanted, but I have never failed to follow such a lead. We drove three or four miles to a place out of view of the highway, with not even a hogan in sight. Then she asked me to stop. She got out of the car, asking us to join her. She told Maria to put a rug down on the ground and asked me to get out a case like the one I had lost. I still couldn't imagine what this was all about, but I said nothing and followed directions. Maria told me to kneel down beside the woman. Then, to my complete surprise, she began a

hand-trembling ceremony over me. Hand tremblers are diviners—diagnosticians—and they are sought out by the Navaho People to find lost articles.⁷ I could see Maria in wide-eyed wonder as the woman proceeded with the ritual. I watched the shadow of the trembling hand and arm in front of me and listened to the incantation. This lasted about fifteen minutes. Then the woman spoke to Maria, telling her that three boys had taken the case from my car. I was not to worry, as nothing would be hurt. I was to come back to the store in four days—two boys would bring the case back. I thanked the hand trembler for her services and made a small donation. Then we all decided that it was lunch time, made some sandwiches, and had our lunch right there.

We drove on to Window Rock and, as we approached, Maria told me that our new friends wanted to go on in to Gallup. Since there was something about the car that needed fixing, I decided that we might

⁷ Hand trembling, one of the lesser rituals, is used to recover lost or stolen property, or to diagnose illness. For the latter, the ceremony is more elaborate, involving the sprinkling of pollen on the patient, the singing of special songs (always four in number), and the presentation of gifts to Gila Monster, to whom the ceremony belongs. It is believed that Gila Monster sees everything that occurs, and keeps track of the actions of all people. In the case of lost or stolen property the trembler's hand leads to the location of the property, or else the trembler hears the far-away voice of Gila Monster.

The Navaho name for this ritual is "To Search for Something without Looking." (See W. W. Hill, "The Hand Tremblers," *El Palacio*, 38 [March-April, 1935], 65.)

just as well go into town and spend the night there. In Gallup we parted with these two, some 125 miles from the Valley Store. We never saw them again.

Saturday morning we returned to Window Rock and the fair, where we spent an interesting and busy day. Sunday, I took Maria back to Gallup to put her on the bus, for she had to return to her job the next morning. There was other work I had intended to do in the Shiprock area, but instead of taking the direct road north, I decided to go the long way around. I returned alone to Chinle, spending the night there. Monday morning, the fourth day, I went to the Valley Store. The trader said he did not have the case, but that two boys had just been there asking if the case had been found. I thought that they were probably seeing if the coast was clear, so I left the reward money and postage with the trader, and, knowing that they would recognize my car, I thought the best thing to do was to go on my way. A few days after I reached home, the case was returned, its contents complete and unharmed.

This was a most interesting experience, leaving many unanswered questions. I know that the hand trembler and her husband had spoken to no one but Maria and me from the time they got into the car at Chinle, until we left them in Gallup. There are many accounts of lost articles being found by hand tremblers. That there are Navaho People who have extra-sensory perception has been noted many times by a number of people. Was my experience one of these? I wish I knew the answer.

THE CRAFTS

The Weavers

THE RAISING OF SHEEP, the spinning of wool, and the weaving of textiles are age-old activities in most parts of the world where fabrics of great variety and use have been produced during many centuries. When the Spanish Conquistadores first came to the American Southwest in 1540, they brought with them the first sheep ever seen by the Indian inhabitants. To the surprise of the invaders they found cotton garments woven by Pueblo Indians, made on well-perfected looms of Indian origin. In later years archaeologists were to find scraps of woven cotton fabrics buried in prehistoric ruins whose dates go back to the fifth century A.D.

These first sheep brought by Coronado were used chiefly as food for his marching army, so that eventually they were all consumed. Later, when Don Juan de Oñate came up the Rio Grande Valley to colonize

New Mexico, he also brought sheep for domestic use. These animals were the common Spanish breed known as the *churro*. The Pueblo Indians soon learned the use of wool, and, as production of sheep spread, the western Pueblo Indians of the Zuñi and Hopi villages soon were weaving woolen garments.

At the time of the Great Rebellion of 1680, when all the Pueblo People united to drive the Spanish from their land, some groups, fearing the return of the Spanish soldiers, took refuge in Old Navaholand. In this region archaeologists, those intrepid investigators of ancient human habitation, have found remains of Pueblo dwellings in close proximity to those of Navaho origin, indicating an early association of the two Indian cultures. As the Navaho moved westward in the early 1700's, they encountered the Hopi in Canyon de Chelly and at the villages farther west. Possibly

because of this close proximity of the two distinctly different Indian groups, many students of Indian culture in the Southwest have believed that the Navaho learned the art of weaving from the Pueblo people. However, recent research is pointing more and more to the probability that the Navaho brought the knowledge of weaving with them when they migrated to the Southwest. During these travels and sojourns they came through country where other Indian tribes were already spinning and weaving, and it is quite possible that the Navaho learned to make and to use the spindle and the loom long before they entered the area where they now live.

Had the Navaho learned from the Pueblo weavers, they would probably have used the same techniques, but they do not. Pueblo looms are stationary, whereas Navaho looms are portable. The spindles are different, and the use of them most distinctively so. Among the Navaho it has always been the women who are the weavers (with a few rare exceptions), while among the Pueblo, the weavers are usually men. Pueblo weavers are dominated by traditional forms and designs with little variation, while Navaho weavers are emphatically creative. Although it is true that traders of many areas have in recent years influenced types and designs of rugs to some extent, within these bounds there is great creativity. Over the long years of production from Navaho looms, the infinite variety of design, color, and weaving patterns has stamped the Navaho as masters of their art.

Navaho weavers have never changed in their use of the upright loom, nor have they made any change in its construction. The Spanish settlers in the Rio Grande Valley brought with them from Europe the knowledge of the treadle loom, which they built here of native woods, but the Navaho have steadfastly continued to use the upright aboriginal invention.

While the earliest examples of Navaho weaving have long since disappeared, there are references to this craft contained in letters from a number of Spanish writers. These remarks, together with their dates, are interesting indeed. One early letter of 1780 says, "The Navahos, who although of Apache kinship, have a fixed home, sow, raise herds, and weave their blankets and clothes of wool . . ." ¹ The same Spaniard, Teodoro de Croix, fifteen years later refers to the Navaho: "The Navaho Nation has 700 families, more or

less, with 4 or 5 persons to each one, in its five divisions of San Mateo, Zebolleta, or Cañon, Chusca, Hozo, Chelli with its thousand men of arms; that their possessions consist of 500 tame horses; 600 mares with their corresponding stallions and young; about 700 black ewes; 40 cows along with their bulls and calves, all looked after with the greatest care and diligence for their increase." Another writer of the same year, 1795, states, ". . . they work their wool with more delicacy and taste than the Spaniards. Men as well as women go decently clothed, and their captains are rarely without silver jewelry." ² In 1799 an officer of the Spanish Royal Engineers wrote, "The Navahos have manufacture of serge blankets and other coarse cloths which more than suffice for the consumption of their own people, and they go to the Province of New Mexico with their surplus and there exchange their goods for such others as they have not, or for implements they need." In 1812 Pedro Pino, who went as a delegate to the Spanish Parliament, wrote of the Navaho: "Their woolen fabrics are the most valuable in our province and in Sonora and Chihuahua as well." ³

The picture evoked by these quotations indicates that within the thirty-two years between 1780 and 1812, Navaho weavers, through their imagination, versatility, and increasing skill, had gained widespread recognition throughout the Southwest.

A later picture is given by Charles Bent in 1846:

Navaho war and hunting parties might be found anywhere from the Coconini Plateau in Arizona to the buffalo plains of West Texas. They rarely ventured as far north as the Arkansas [river] and so were little seen at Bent's Fort. They did, however, go often to Taos to trade, many of their woven blankets finding their way into the Bent, St. Vrain and Company store, and ending up finally at the Fort as trade goods valued by the Plains Indians. ⁴

THE PROCESS

The Wool. The sheep that have been raised by the Navaho over a long period of time are small, are resistant to the desert heat and sudden changes of

¹ Charles Avery Amsden, *Navaho Weaving*, p. 130.

² *Ibid.*, p. 131.

³ *Ibid.*, p. 133.

⁴ Frank McNitt, *The Indian Traders*, p. 35.

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weather, can survive cold winters, and can exist on a minimum of food and water. Consequently, the fleeces of these sheep are light, and comparatively free of grease. The staple of the wool is long and wavy, and is particularly suited to Navaho methods of hand spinning.

Under the adverse conditions of raising sheep on most of the reservation, where flocks range over great distances in order to find enough to eat, heavier breeds, such as the Rambouillet, have difficulty in surviving. The crimped wool from the Rambouillet is very difficult to spin by hand, and when it is used it is apt to produce lumpy strands. The traders and the commercial wool buyers, however, have wanted heavier meat-producing animals and heavier fleeces. The difference in the character of the wool between the old-type sheep and new heavier breeds has been one of the major factors in the controversy over introducing the newer strains, for it is the Navaho women who usually control the sheep, and they want the old-type wool. While only 10 percent of the wool crop is used for spinning and 40 percent for sale to wool buyers, that 10 percent, by the time it has been transformed into fine rugs, brings a greater return than the wool that is sold.

Nevertheless, so much Rambouillet blood had been introduced into the Navaho flocks by 1936, in order to satisfy the demands of both traders and commercial wool buyers, that the type of wool needed by the weavers was in danger of extinction. The Rambouillet sheep, though heavier and better meat and fleece producers, did not thrive on reservation pasture. To meet this situation, the Department of Agriculture commenced a project at Fort Wingate, known as the Navajo Sheep Breeding Laboratory, under the direction of J. O. Grandstaff. Its purpose was to develop a breed of sheep that would have the conformation of the Rambouillet and the wool quality of the old Navaho sheep, as well as the ability to subsist on reservation pasture. During the more than twenty-five years since its inception, this Laboratory has succeeded in fulfilling its purpose. Not only has the mutton conformation been achieved while retaining the subsistence hardiness of the old sheep, but also the quality of the wool has actually been improved.

The Bureau of Indian Affairs was working with the Laboratory during part of this time, endeavoring to

interest the Navaho in improving their flocks. To accomplish this improvement it was necessary to keep the new sheep separated from other stock, and this proved to be very difficult. Whenever Navaho breeders would agree to this program, they were loaned three bucks of the new breed. The Bureau, however, did not have the personnel, nor did the Laboratory, to do the much needed field work. The Navaho themselves as yet have not shown sufficient interest in the project. Perhaps it followed too closely on the sheep reduction program for them to realize what the benefits really were. The Sheep Breeding Laboratory still exists, furnishing bucks to a few Navaho and Zuñi breeders, and at the present time there are some one thousand head of this new breed. What seems to be needed is an effort on the part of the Navaho themselves to profit from this long experiment. The Laboratory furnishes wool from these sheep to the Arts and Crafts Guild, already washed and carded and ready to be hand spun, but many of the weavers think it is too costly. It is hoped that where there are a number of weavers in a given area they will unite to improve the weaving wool for their own looms. The benefit they would receive would repay them many times over, but changes such as this take time to bring about.

Many goats are also raised by the Navaho, who like the meat to eat just as well as mutton, and goat hair (mohair) is also used in weaving. More difficult to spin, it nevertheless produces fine yarn, and rugs made of mohair bring a premium.

In Santa Fe, in 1860, there were a number of German merchants who imported from Germany the fine vegetal-dyed Saxony yarn with intent to sell it to the weavers of the Rio Grande Valley. It is believed by some authorities that some of this wool reached Navaho weavers, possibly while they were in exile at Fort Sumner. Having little or no wool of their own production, they may well have used this soft three-ply yarn if it became available to them at that time.

There are in existence, mostly in museums, a number of extremely handsome and rare blankets woven by Navaho women between the years 1860-1880, all made of this fine Saxony yarn. Following this period, American-made Germantown yarn made its appearance at some of the trading posts on the reservation. Heavier than the Saxony yarn, four-ply instead of

three, it was used to some extent during the decade that followed, and, with this yarn, cotton warp was first used. The cost of the Germantown yarn was a deterrent to the weavers, who, in general, preferred to continue spinning their own wool, and, in addition, the traders objected to the use of the cotton warp, which is neither strong nor elastic.

Shearing. In early times, sheep were shorn with the use of any piece of thin metal that could be honed to as sharp an edge as possible on a stone. But when metal shears were first brought to the trading posts, the Navaho were quick to use them. The shorn wool is sorted carefully, the weaver separating the longest

hairs to use as warp, removing the shortest to be sold as wool, and saving the remainder for spinning weft threads. Burrs and other matter sticking to the wool are carefully removed.

Washing. Usually only greasy wool is washed. Using the pounded roots of the yucca plant for soap (still preferred by most weavers), and making a rich lather with it in a pan or a tub, the weaver pours the mixture over the wool as it lies on a slanting board or rock, repeating until all the dirt, sand, and grease have been removed. The wool is then spread out in the sun to dry, and finally stored in sacks ready for use.

Carding. In early times cards consisted of burrs

held in place by strips of leather mounted on small boards with handles at one side. These were replaced when metal cards of American manufacture were procurable at the trading posts. When a weaver is ready to card her wool, she first loosens it by hand, then combs it between carding tools until the hairs lie all in one direction. Carded wool emerges in the form of soft pads called "rovings," ready to be twisted into continuous strands. If a weaver wants to produce good gray color, she mixes wool from black sheep with that of white as she cards the wool. This method makes the finest gray used in many rugs, particularly those from the Two Gray Hills area.

Spinning. The Navaho spindle differs from that of the Pueblo spinners, and its method of use also differs greatly. The spindle consists of a round stick about twenty-five to thirty inches long, pointed at both ends. The whorl is a flat disk, four or five inches in diameter, with a hole in the center into which the stick fits. The whorl, which acts as a balance, is securely fastened to the stick about five inches from the butt end.

The spinner first attaches a roving to the upper end of the spindle, and, with the butt end resting on the ground, she starts a roving onto the spindle with a spinning motion of the stick. Then, resting the upper part of the spindle on her thigh, she rolls the spindle with the palm of her right hand in a drawing motion toward her body. With the free end of the roving held in her left hand out from the top of the stick, she stretches the wool as it slips off the top of the twirling spindle (as shown in the picture of Old Lady Long Salt). The skill lies in the steady motion of the spindle as she twirls it with her right hand, while at the same time she uses just the right amount of pull to stretch the twisting strands. As a given length of roving is twisted and stretched into yarn, the spinner winds it onto the spindle just above the whorl, where it is stored until she has a sufficient amount to wind off into a ball. Each successive spinning makes the yarn finer and stronger. All Navaho yarn is spun at least twice until it is smooth and fine, and all yarn is one ply with the exception of the two-ply cords made for the selvages, so characteristic of Navaho weaving.

The quality of the wool, even more than the skill of the spinner, determines the character of the yarn. Coarse, short-fibered wool cannot be spun into smooth fine yarn, but wool from the old-type Navaho sheep

almost spins itself. This is why the weavers objected to the introduction of the Rambouillet sheep.

Since the American occupation of the Southwest, traders and others have tried to introduce the spinning wheel, but the Navaho women have always rejected it, probably because of the lack of room in the hogans, and the nonportability of the spinning wheel. Perhaps now that so many Navaho move less frequently and have sufficient space in their modern houses, they might be more interested in this less laborious method of hand spinning.

Dyeing. Using a wide variety of native plants, the Navaho produce dyes of many colors and shades. The wool from black sheep is never a true black, as it tends toward a brownish tinge. Good black dye is made from a mixture of twigs and leaves of sumac boiled four or five hours and then added to a mixture of powdered native yellow ochre and an equal amount of piñon gum; both mixtures are stirred together over a fire until a black liquid is formed which dries to a fine black powder. The tannic acid of the sumac acts as a mordant to produce a rich, permanent black.

Indigo, on the other hand, was imported in lumps by the early traders and was used extensively until the end of the 1890's. The indigo, tied in a cloth, was suspended in a large jar of urine which acted as a mordant. Occasionally, some of this dye is still made. The wool was placed in the jar and left until the desired depth of color was obtained. The mordant used with most native plants is an impure alum found in limited quantities in certain regions on the reservation, while some plants require moss or lichen as a mordant.

Aniline dyes, perfected in 1856-1857, came onto the market from the first factory in 1864, and were in general use by 1870. They reached the Navaho traders about 1880 when Mr. B. F. Hyatt, trader at Fort Defiance, taught the weavers how to use them. C. N. Cotton, originally a partner of Lorenzo Hubbell, succeeded in obtaining dyes packaged ready for use, including a mordant, and these, under the trade name of Diamond Dyes, were soon available at most trading posts, and were used to dye native hand-spun wool.

The Loom. The structure of the loom is both simple and practical. It consists of two parts: the weaving frame and the stationary upright poles and cross beams which hold the weaving frame while in use. Looms are made of native wood, poles of a desired

height being set into the ground with top and bottom cross beams. Usually the top cross beam is held in place by natural crotches at the top of the upright poles, while the lower beam is securely tied at the bottom of the loom frame. These cross beams support the weaving frame after the warp has been strung to it.

When a weaver has determined the size of the rug or blanket she will make, she first prepares the warp. A warping frame is made of four long poles, of which the two longer ones are cut some twelve to eighteen inches longer than the rug to be woven. On top of these poles she places two shorter cross pieces, sometimes broomsticks, tying each corner very securely, taking care that all sides are parallel and the measurements accurate. She then raises this frame a little above the ground on low supports, just high enough so that a wound ball of warp thread will pass beneath the cross sticks. After tying one end of the warp thread at the top (usually the upper left-hand corner), she passes the ball over and under the lower stick, and then up over and down under the top stick, thereby creating the cross of the threads, continuing until the sufficient number of threads have been wound. The winding of the warp is most carefully done, the weaver making certain that the threads are straight, that the tension is even, and that no threads are twisted or crossed. She ties the last thread at the diagonal of the first tie.

Next she adds the end cords. These consist of two- or three-ply twisted strands of weft threads which have been measured twice the width of the rug. These are twined with each other as the edging is woven in and out of alternate warp threads, the weaver keeping the spacing and tension even for both the top and bottom edges. Next comes the preserving of the cross formed at the center of the warp by the over and under winding of the warp threads. The weaver places a small reed (the length of the rug width) on each side of the cross, tying the reeds to hold this cross in place. The four poles of the warping frame are then removed, leaving a mass of warp threads, in which the cross is preserved by the reeds, and the top and bottom end cords hold the ends of the warp in place. The end cords are then tied to the weaving-frame cross bars by weft threads which wind around the bars holding the edges securely to it. The creation

of the firm top and bottom edges is one of the perfections of the Navaho technique. When the rug is finished it is removed from the loom simply by untying the edges from the loom cross bars. Sometimes this winding thread, which holds the edges in place on the loom, is placed between every two warp threads, sometimes every three or six, depending on the size and whether the rug will be woven of coarse or fine material. The bottom cross piece of the weaving frame is then tied to the bottom cross beam of the loom, and the top piece is laced to the top cross beam by a rope, using large loops by which the tension of the weaving frame can be adjusted. Again great care is used to see that all cross pieces are parallel.

The next procedure is the tying in of the heddles to form one or more of the sheds through which the weft is passed. The heddles are tied to every other warp thread for a plain weave, or to combinations of threads for any other weaving pattern the weaver chooses. Sometimes several heddles are used, as in the diamond-twill or herringbone weaves.

Yarn for the side edge cords is then tied to the lower beam, and loosely tied to the top beam. If the warp threads are light in color, the side edge cords are usually made of weft color threads, made in the same way as the top and bottom edge cords. The loom is now set for the weaver to commence weaving the rug. Everything about the loom has been made of simple native material and is completely functional.

Weaving. The simple tools used in weaving number only two—the comb and the batten—though every weaver will have several sizes of each. The comb is made of a hard wood into which tines have been cut, like a fork, perhaps three inches in length, with a handle carved out at the opposite end. The comb is used first to beat down the weft as it is passed through the shed. The batten, also made of hard wood, is a slightly curved piece about thirty inches long and three inches wide, though smaller sizes are also used. One shed is formed by the shed rod, the long upper stick just above the heddle; the other shed is formed by the heddles. The batten is inserted in the shed and then turned edgewise to make the opening wide enough for the insertion of the weft to be passed through. A true shuttle has never been used by the Navaho, for they insert the weft with their fingers, except when weaving plain long stripes; then a small stick is used,

around which weft thread has been wound. As so many of the designs require only a few inches of color at a time, the nimble fingers of the weavers seem adequate. As weaving is done in a sitting position, many weavers do not complete a whole line at a time when this would require moving, but weave several inches from one position before moving over to complete the line. After the weft has been passed through the shed, first the comb is used to press down the weft, then the batten; it is used also to press down over a longer area. The degree of firmness struck with both comb and batten determines the tightness of the weave.

The variety of weaves attained by the Navaho weavers is great: from the plain weave to the tapestry weave, the diagonal and the diamond twills, the rare two-faced weave which has a different design on each side, and the wedge weave, unique to Navaho weavers. Added to the variety of weaves are the variations of color and pattern, giving the weaver an extensive choice.

Most of the designs are carried in the weaver's mind. She does not use a diagram or drawing or counting of threads. The exceptions are some of the very intricate patterns of tapestry sand-painting rugs, or some of the classical designs—then the weaver makes a sketch in the sand. This carrying of a design mentally is a remarkable feat, for every weaver has many interruptions, and sometimes may be away from the loom for days at a time; yet when she returns to her loom she knows the exact place in her design where she had stopped and what is to come next.

Knitting. The Navaho also practice knitting, though interestingly enough it is usually the men who knit, making leggings or footless stockings. Originally sticks of hard wood were used for needles; later, wire or the ribs of old umbrellas served well. Regular knitting needles were of course carried by the traders when the demand for them became manifest.

As many as four or five needles are used at a time. The knitters create a raised rim at the top of the stocking with a purl stitch, giving a firm edge for longer wear. A knitted or plaited band is added at the bottom to pass under the foot to keep the stocking from working upward.

THE BLANKETS

From the beginning of Navaho weaving, blankets

and mantas were made for clothing. Beyond personal needs, as the chroniclers have told us, surplus blankets were made for trade. The great period, known as the classic period, was from approximately 1840 to the end of the nineteenth century. During the earliest part of this period, possibly even before, Spanish traders brought a fabric known as bayeta cloth to trade to the Indians. This was imported from England to Spain, thence to New Mexico, and, while it was called by the Spanish name, it was in reality English Manchester cloth. Red color predominated, a special shade of red which took the fancy of the Navaho weavers, who unraveled it, and, after careful scrutiny to test its strength and evenness, sometimes respun it, and then wove it into the intricate patterns of these early blankets. Many of the finest examples of Navaho weaving contain the beautiful bayeta, merged into the textiles along with the native hand-spun wool. Many serapes and blankets of this period were so firmly woven that they were waterproof. They were in great demand and were highly prized.

From about 1890 until the early years of this century, Navaho weaving deteriorated. The weavers commenced making coarser fabrics, largely for sale to the tourist trade as floor rugs. To a considerable extent the traders were responsible for this change. With the making of rugs rather than blankets, borders were introduced with patterns of very different character from the fine, vigorous designs of the classic period. Mr. J. B. Moore, of Crystal, seems to have been the first to suggest the idea of borders to the weavers of his area. This suggestion carried across the mountains to Two Gray Hills, where it was developed and has been used extensively ever since. In the early 1880's, Mr. C. N. Cotton left Ganado, where he had been a partner of Lorenzo Hubbell, to establish a wholesale business in Gallup, for he was intent on developing an eastern market for both blankets and rugs. With the coming of the railroad in 1882-1883, the outlook for such a business increased. As the Fred Harvey Company of the Santa Fe Railroad built its Harvey Houses along the length of the line, it not only used Navaho rugs in the buildings, but developed shops where the travelers might purchase rugs and other Indian-made handicrafts. Rugmaking grew to be a great business, the entire output being sold to the American public.

In 1920 Miss Mary C. Wheelwright of Boston, who at that time owned a shop carrying Indian-made articles for sale, had a talk with trader L. H. (Cozy) McSparron at Chinle. One of the questions Miss Wheelwright asked was did he know if the Navaho weavers still knew how to use their old vegetable dyes? Both Miss Wheelwright and Mr. McSparron deplored the trend of commercial dyes and loss of the fine old designs. McSparron agreed to see what he could do to persuade the weavers of his region to return to the old dyes. After some experimenting, some of the weavers produced borderless simple designs with the wool dyed by their old native methods. Mr. McSparron was able to sell these at a higher price than those made of commercial dyes, and to sell them as fast as the weavers could produce them.⁵ This was the beginning of another great change in the production of rugs, for other traders soon followed McSparron's lead, and, today, thousands of these beautiful rugs are on the market.

The Two Gray Hills region, however, has continued the border-patterned rugs which are woven with natural white, gray, brown, and black wool. The gray is a mixture produced by carding natural white with some black. The black is dyed to produce a true color, while a rich brown is obtained with dye made from a native walnut.

Occasionally, very large rugs have been made on special order, measuring twenty or more feet wide by nearly forty feet long. Special looms had to be built to accommodate such size, but they were, or are, built to the traditional specifications. Rugs of extremely fine texture have appeared in recent years from the Two Gray Hills area. One weaver, Daisie Tauglechee, spins strands so fine that her woven fabric counts 110 weft threads to the inch. Others are now following her lead, but, so far, these are still bordered rugs and of the undyed wool, except for the black and the brown.

Throughout the nearly 175 years that the Navaho women have been weavers, they have produced an extraordinary variety of products; moving quickly from the first simple striped blankets to the superb classic period, through a time of decadence, until in very recent years a new surge of fine quality has ap-

peared. The variety of design seems endless in its use of geometric shapes, the spacing of line and color, and the harmony of the whole, for there are never two exactly alike.

The variety of weaving is also great, for, following the old original clothes that were woven, there are shoulder blankets, ponchos, serapes, saddle blankets of both single and double weave, rugs, Yei blankets (sand-painting blankets), saddle girths, sashes, garters, hair-cords, stockings, and leggings. Weaving is unquestionably the great craft of the Navaho. The finest examples are to be found in leading museums of the world, as well as in many private collections. The new building of the Arts and Crafts Guild at Window Rock, with its contents of weaving, silver jewelry, and other crafts, is evidence of the vigorous production of the craftsmen of today. If the yearly volume of Navaho handicrafts which are sold by the many traders and shops all over the Southwest and elsewhere were added together, the aggregate would be impressive.

The Silversmiths

The art of silversmithing commenced in earnest among the Navaho soon after the return from Fort Sumner, though there may well have been earlier efforts. That a few individuals knew the craft of blacksmithing before the exile is recorded in Richard Van Valkenburgh's *Brief History of the Navaho People*. He attributes this knowledge to Captain Henry L. Dodge, the first civil agent to live in the Navaho country, though there may well have been previous knowledge of the craft. Captain Dodge was a veteran of the Washington Expedition of 1849, and he both understood and sympathized with the Navaho. Following his appointment in 1853, Captain Dodge built a house on the eastern slope of the Chuska Mountains not far from Sheep Springs, commencing his work with a Congressional appropriation of \$5,000. One of the first things he did was to bring a blacksmith, George Carter, an ex-soldier, to teach smithing to the Navaho in his area. He also brought a Mexican silversmith. But Captain Dodge's career was of short duration, for he was killed from ambush by the Chiricahua Apaches south of Zuñi in 1856 while on a hunting trip with a group of Navaho chiefs.

It is probable that the Navaho had worked in metal

⁵ Amsden, *Navaho Weaving*, p. 224.

even in the eighteenth century, and that inability to obtain silver may well have been the reason why they did not work in this medium at an earlier date. While there are a number of references to Navaho people wearing silver jewelry prior to the exile, it was doubtless obtained through trade or capture from the Spaniards, Mexicans, or even Plains Indian tribes, such as the Utes or Kiowa, who sometimes came in contact with the Navaho. Many of the designs later adopted by the Navaho were of Spanish origin, such as the so-called Squash Blossom, which in reality is the pomegranate blossom long used by the Spanish in Europe, fashioned of brass or silver for buttons, and of iron for ornaments on spurs.

One of the early Navaho to ply the blacksmith's trade was Atsidi Sani, who became known as a maker of bridle bits and knife blades. In his authoritative

book, *The Navaho and Pueblo Silversmiths*, John Adair tells of Atsidi Sani's learning the silversmith's art from Nakai Tsosi, a Mexican craftsman who lived near Mount Taylor (Tsoodzil).

As there seems to be no record of any silver work by the Navaho prior to the exile to Fort Sumner, it must have been after their return in 1868 that practice of the art commenced. That it spread rapidly is evident from all the early records of the period between 1870 and 1880, for by the time that Dr. Washington Matthews was stationed at Fort Wingate at the latter date, there were a good many proficient craftsmen. Dr. Matthews employed two Navaho silversmiths, whom he established near his residence where he might observe them at their work, and he left for posterity a detailed account of the art as practiced by these two men. Some fifty years later, Father Berard Haile also left a similar

record of his findings over a wider area, for he had been making a study of silversmiths as well as of many other subjects during his long years on the reservation.

The fine work of the early Navaho smiths was produced with the simplest of equipment, and though during the following decades new tools were added to the smith's work bench, the technique is basically the same.

✓ THE METHOD

The Forge. The forge was a square structure of stones and adobe mud, built to a convenient height with the rear slightly elevated. Air tubes were made of two pieces of wood, grooved and fitted together and lined both inside and out with adobe. The smith sat crosslegged on the floor of his hogan or wherever he had his forge. In later years benches or chairs were used to give a more comfortable sitting position for long hours of work.

The Bellows. The bellows was made of sheepskin in the form of a sack about eighteen inches in diameter, held distended by three or more hoops of willow twigs. One end of the bellows was firmly secured to a

nozzle and fitted into one of the tubes leading to the forge. The other end was closed by tacking the sheepskin to a round disk of wood containing a leather valve in the center. The bellows had two handles of different lengths; the longer projected downward, resting on the ground, the upper worked the bellows. As the number of silversmiths increased, traders stocked commercial bellows in their posts.

The Anvil. The very earliest anvils were simply hard stones. Later, pieces of iron, such as parts of plows or wagons, were used. After the coming of the railroad, pieces of rails were used and still are by many smiths. An anvil was fastened to the top of a large log cut to the right height for comfortable work. ✓

The Crucible. The early crucibles for melting silver were made of clay, and baked hard in a fire. They were about three or four inches in diameter and had an outward-curved rim and one or more spouts. These melting pots were not very durable and were replaced by commercial crucibles when they became available. Some smiths have found that cup-shaped pieces of prehistoric pottery from a ruin served the purpose and were more durable than any other container.

The Mold. Some molds are made of ingots for cast-

ing a bar of silver to be worked into a bracelet or other ornament. Molds for making casts are incised in a soft stone, preferably pieces of volcanic tuff, a very light pumicelike stone which is found in several places on the reservation.

The incised pieces of tuff for casts are cut to approximately the right size and shape and the surface is perfectly smoothed. A cover piece is then fitted to each mold, making as tight a fit as possible. Grooves are cut at one end of the incised piece to permit the entry of the molten silver, while two or more grooves are cut for air passages.

All molds for casting are greased with mutton tallow. Molds for beads are cut into iron or hard wood, smooth surfaced, so that the silver coin or sheet can be pounded into the depression, making a rounded half of a bead. Later two of these are soldered together to make the spherical bead.

The Smelting Fuel. Charcoal has always been used for smelting fuel. It is prepared during the summer months from large fires of piñon or juniper branches. After the flames have died down and only glowing embers remain, the coals are smothered with earth and allowed to cool, forming the charcoal.

The Blowpipe. Originally the blowpipe was ham-

mered out of a piece of brass or copper wire, bent into a tube with a curved, tapering end. It was used in soldering with a lamp or wick of twisted cotton soaked in tallow. The modern blowtorch is a highly prized tool used today by most smiths. Some ingenious individuals have fashioned torches from cans by fastening a spout on one side and forming an opening on the opposite side into which a rubber tube is fastened. Blowing through the tube produces enough pressure to blow the flame out the spout.

The Solder. Silver solder is used with borax as flux to make it flow smoothly.

The Materials. Some of the very early smiths worked in copper and brass, making rings and bracelets. The first silver to be used was American coin silver, melted and fashioned to the desire of the craftsman. When the United States government put a stop to the use of coins for this purpose, some time in the 1880's, the traders soon procured Mexican pesos in their place. The Navaho smiths preferred the peso silver, for it had less alloy and was somewhat softer. As the traders began to buy jewelry to sell, they provided silver in one-ounce slugs in a quality approximately that of the coins.

The Stones. Turquoise first was used by the Navaho

in the 1880 period. The traders procured stones from mines near Santa Fe, and later from mines in Colorado and in Utah. The traders supplied stones that sometimes were already cut, and sometimes were in chunks that had to be shaped and polished. Early stones were set in deep bezels, with the edges coming slightly over the top of the stones, holding them securely in place. As craftsmen acquired greater skills they were able to set stones in a lower setting. Other kinds of stones also were used—malachite, garnets, cannel coal.

Cleaning. The Navaho liked their silver well polished. Silver used to be cleaned with native alum, and then polished with buckskin, but today it is cleaned by being dipped in a diluted solution of nitric acid, then put in a bowl of water and brushed with a wire brush. It is buffed either by hand or with a buffing pad attached to a grindstone, with the pad well covered with jeweler's rouge.

The skill of the Navaho craftsman lies in his ability and judgment in all phases of his work—sprinkling a little borax on the silver as it melts, to reduce the melting point; heating the silver to just the right degree of even moltenness; pouring the molten silver quickly and evenly, to avoid the formation of a slight crust causing brittleness and, later, cracks. There is great skill in using the hammer correctly, striking

blows with the edge of the hammer and producing blows of even strength. Coins are hammered by hand, the smith singing as he works, obtaining a rhythm of song and stroke. The most beautiful of the silver ornaments are the hand-hammered pieces. The smith must learn to use his dies correctly, placing them exactly and striking them with just the right amount of force. These techniques of course require much time to achieve.

The Navaho made jewelry primarily for his own adornment and that of his family. It was not long, however, until there was a ready market and a growing demand for his products. Just prior to 1900, the Fred Harvey Company realized this potential market and began to place orders with traders who had silversmiths in their regions. Soon came a demand for lighter (in weight) pieces at lower cost, so that silversmiths were producing two types of jewelry, the old heavy pieces for their fellow Navaho, and light-weight cheaper jewelry to sell to the white man.

The traders began to stock better tools for the smiths—dividers, files of many sizes and degrees of fineness, metal worker's saws, and gasoline blow torches. The smith usually made his dies, with which he stamped designs on bracelets and other pieces, from all sorts of worn tools, old railroad spikes, old cold chisels, bolts, and other pieces of scrap. The Nav-

aho never wastes anything; he always seems to find a way to put worn-out scraps to use. And seldom does he ever make two pieces alike; there is always a difference, giving his work that unmistakable quality of hand work, and the uniqueness of Navaho design.

The Navaho learns the techniques and methods of his craft from watching another smith, usually a relative. The apprentice pays for his instruction by helping his teacher as soon as he is able. In rare cases when a man is learning from a nonrelative, he pays for his apprenticeship in sheep, or cash, or some other material way. The Navaho, when he does not have the money to buy the tools he needs, shows great ingenuity and resourcefulness in his ability to fashion such tools from old material.

ARTICLES OF JEWELRY

Conchas. The round or oval disks called *conchas* are made for ornamenting belts and bridles. Sometimes these are very simple, sometimes ornate with design or turquoise studding.

Buckles. Silver buckles are made for belts and bridles; other metals are used for girth buckles.

Bridles. Headstalls are mounted with silver bars with various degrees of ornamentation. *Conchas* are used sometimes at joints with larger bars, sometimes on a pendant from the cross piece over the head of the horse.

Ketohs. Long ago the Navaho adopted the use of a

leather wrist guard as a protection from the snap of the bow string. Later, silver ornaments were added to the guard, or *ketoh*. Some are of hammered silver, many are beautiful casts, and some are set with turquoise. Today they are worn as ornaments and are always worn on dress occasions. As these have never been made for commercial use, they are the finest of the silversmith's art.

Bracelets. The Navaho silversmiths make many types of bracelets: Some are bands of silver one or two, even three, inches wide with simple or ornate decoration. Some are heavy and mounted with turquoise; some are narrow with or without stones; some are narrow with stamped designs. There are also cast bracelets with open design, with or without turquoise.

Necklaces. Necklaces are made of hollow beads of many sizes and shapes, constructed in two pieces and soldered together. Sometimes the so-called squash blossom ornaments are strung at intervals between the beads. Many necklaces have pendant Najah, a design similar to the Arabian hand of Fatima (probably brought to New Mexico by the Spanish). Some early Najah had two little chiselled hands at the ends to ward off the evil eye; this is doubtless a Navaho adaptation. One also finds small circles with inset turquoise at the ends. Sometimes this nearly circular design is double. There are many other types of necklaces—strings of turquoise, of shell ground into very fine beads, and of coral.

✓ *Rings.* The earliest rings were plain silver bands; soon some were made with simple incised designs. The use of turquoise with silver appeared in the early 1880's. Some cast rings were made. Most rings now have insets, usually turquoise, but also malachite and garnets or cannel coal, and occasionally polished petrified wood.

Pins. There are pins of many shapes and designs, both with and without turquoise.

Earrings. Both Navaho men and women have worn

earrings since the early days. Before the advent of turquoise on the reservation, Navaho men wore silver earrings of several types: round circular loops on which dangling silver beads had been strung; flat slightly decorated rings; and pendants, narrow and cone shaped with spreading flowerlike petals at the ends. Since turquoise became abundant, about 1900, the silver earrings for men have all but disappeared. Instead the men wear large pieces of turquoise in several forms—some edged with silver, others plain

with holes drilled in one end for the insertion of string, which in turn is passed through the pierced ear. Women too, have long worn earrings, usually turquoise beads strung in loops two to four inches long with the addition of a few bits of red shell at the bottom of the loop. These are worn on string passed through pierced ears.

Sometime in the 1920's, the Fred Harvey Company introduced the screwtype fasteners, urging silver-smiths to produce women's earrings to be sold through the Company to the non-Indian market. In recent times Navaho women also wear the screwtype earrings with both silver and turquoise ornamentation of great variety.

Buttons. The variety of buttons is great, hammered silver as well as cast. There are many sizes and many shapes, such as buttons with small turquoise insets, plain silver disks, and some with incised designs. Coins which have loops soldered on one side are often used. Buttons are used as ornaments on collars, cuffs, blouses, leggings, moccasins, pouches, and narrow leather straps.

✓ **Unusual Pieces.** *The Mother-in-Law Bells* are made from twenty-five-cent pieces, hammered into thin bell shapes. The coins are pounded between a round-headed bar into a corresponding receptacle of hard

wood or iron. Small clappers are fastened to the inside, and the bell is then fastened to the end of a short string of beads. These are made for older women who wear them on their belts to notify their sons-in-law of their approach.

The Powder Horn was a gracefully designed receptacle to hold a charge of powder. It had a handle on one end, the whole object being shaped like an elongated letter S. A small chain was fastened to the center for attachment to a belt. When bullets were available, powder horns were no longer made, and, as many were probably melted down to make other articles, they soon became very rare.

Tobacco Canteens were beautiful small containers, seldom made any more. Only a few are in existence, mostly in museums and private collections.

A variety of other pieces are being made today for sale to the non-Indian public, such as spoons, silver boxes, and a number of other articles.

When the Arts and Crafts Guild was founded in 1940, under the direction of René D'Harnoncourt of the National Indian Arts and Crafts Board, John Adair was appointed as the Guild's first manager. Mr. Adair's extensive knowledge of Indian crafts made him the ideal person to commence this Guild. Ambrose Roanhorse, one of the most skilled Navaho

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Ned Hatathli, first Navaho manager of the Arts and Craft Guild.

craftsmen, was his assistant, and together they made a solid beginning for the Guild, setting the highest standard for materials and workmanship. Following World War II, when the Guild was re-activated, other managers took Mr. Adair's place, one of whom trained a young Navaho, Ned Hatathli, to follow in his footsteps.

In 1951 the Guild was made a Tribal enterprise, with Ned appointed as the first Navaho manager. The Guild grew rapidly under Ned's management as more

and more craftsmen brought in their products for sale. Housed at first in the old log building at the Fair Grounds, the Guild has recently moved to a beautiful new building erected by the tribe on the highway approaching Window Rock. Here fine facilities display great quantities of rugs, jewelry, and other items coming from the skilled hands of the Navaho. The total output from the looms and forges on the reservation is great, for in addition to all the many traders both on and off the reservation who handle

Ambrose Roanhorse with his class at Fort Wingate school.

these products in quantity, the total amount of sales by the guild alone came to a quarter of a million dollars in 1963.

Ned Hatathli went on to become a member of the Tribal Council in 1955, serving in this capacity until 1960, when he was made director of Tribal resources, the position he now so ably holds.

Away from the reservation, there is a quantity of imitation Navaho jewelry on the market. Any purchaser will do well to go to reliable shops or directly to the Guild at Window Rock, where all items bear

the seal of the Arts and Crafts Guild, and all are of unique Navaho design.

Ambrose Roanhorse, whose superb work as a master silversmith has won him many awards, including a decoration from France, is now teaching at the Vocational School at Fort Wingate, near Gallup, where boys and girls are given the opportunity to learn not only all the Navaho Crafts, but also other occupations, such as carpentry, shoe making, leather work, and dressmaking—trades that will equip these students for their future lives.

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The Potters

Following the Spanish reoccupation of New Mexico, 1692, some Pueblo Indians fled into Old Navaholand. During recent archaeological excavations in this area, evidence came to light of the close proximity of these Pueblo groups to those of the Navaho. In the ensuing century, pottery fragments from Navaho sites indicate, there was a definite Pueblo influence, such as sherds decorated with red, black, and occasionally white designs which had been fired to the high temperature used by the Pueblo people.

Later came utilitarian pieces, some of good size, with thin walls made of crumbly clay with sand for temper. Shaped with the use of corncob scrapers, many pieces had exceptionally beautiful form. These storage jars had pointed bottoms, being held upright by the use of basket rings or by being set in depressions in the floor. Water bottles were also made of pottery in early times. Shaped somewhat like a pitcher without a spout, such a pot had a loop, a finger handle, near the narrow neck to facilitate pouring. A horsehair rope could also have been inserted in the loop for easier carrying. These bottles were flattened on one side for ease in carrying, and some had designs. Legend tells of water bottles being made of the four sacred colors—white, blue, yellow, and black—and used in ceremonies to carry water gathered from the four sacred mountains. These water bottles are very rare now, for they were replaced by other types of containers as soon as they became available. Bowls of various shapes and sizes, spoons and dippers and dolls, many with finely executed designs, were the products of years gone by.

Today, only cooking jars, a few bowls, and drums are made, and there seem to be but few potters left. These jars, somewhat similar in shape, rounded on the bottom with a slight flare at the top, and some with scalloped edges, are all that can be found of recent manufacture. These jars or pots are made for cooking or for preparing dyes for wool, while some are made specially for remedial and ceremonial use. A few of the latter are used as drums with pieces of sheepskin or goatskin stretched over the tops. A new pot is always preferred for a drum and once it has been used for this purpose it must never be used for cooking.

In some areas firing of the pottery is accomplished

by the potter's first digging a pit and then building in it a large fire of piñon wood. When this has burned down, the coals are raked to one side, the pots put in, usually upside down, covered with the hot coals, and, then left for from four to seven hours. In other areas, pots are placed on flat stones, then covered with enough juniper (preferably) to insure the fire's burning for six hours without replenishing. A few areas have used Spanish-type outdoor ovens. After a good fire has burned down, the pots are placed in the oven and left for twelve hours. Pottery making among the Navaho has never approached the superlative quality of that of the Pueblo craftsmen. Because the Navaho often moved from place to place, pottery was replaced by more durable containers as they became available, with the exception of the jar-type vessel, which is used also for ceremonial purposes.

One of the few remaining potters.

Following many inquiries in numerous regions, I finally heard of one potter still at work in the Shonto area. With an English-speaking interpreter, Betsy and I set off to find her. After looking at my pictures and learning what I wanted to do, she asked us to return in two days, when she would be ready. As there are a number of taboos connected with pottery making, I was not at all sure what I would be able to accomplish. For instance, no one must watch the gathering and grinding of potsherds (from ancient pueblo sites) which the Navaho potters use for temper to

mix with their clay. This had been prepared and mixed with the clay before we arrived, but our potter did leave the metate (grinding stone) and a few sherds for us to see. May Adson, our potter, was sitting beneath a shelter as we drove up, and greeted us with the usual Navaho courtesy. We watched her make four pots, employing much the same technique as that of the Pueblo potters, using a waterworn stone for smoothing the inside and a piece of corncob as a scraper on the outside.

Before May fired these pots, we had lunch. We had

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also been watching one of May's daughters prepare the meal, which consisted of roasted corn on the cob, boiled mutton, coffee, and fry bread, a dough patted into a round flat cake and fried in deep fat. We produced some fresh fruit from our larder, and as we ate we listened to much Navaho conversation. Finally after a few silent moments our interpreter turned to me and said, "You two look kind of old, but you sure got good teeth!"

Lunch over and everything put away, our hostess built up the fire and placed the pots near it. This was in no sense true firing. She turned the pots occasionally to heat them evenly all around; these were baked rather than fired. Two of the pots we purchased to bring home, but we were sure that, because we had witnessed as well as photographed their making, the others would never be used, and would be destroyed after we had gone. However, we had had a nice day and had witnessed at least part of the Navaho pottery-making process.

When we were packed and ready to leave, May shyly said to us, "We have a new baby in the hogan." I had noticed another woman going in and out of the hogan several times during the day, but she did not join us nor speak to us. We were taken into the hogan where we found a tiny baby less than twenty-four hours old. It was on a small cradleboard, sound asleep. Soon, the father would make a permanent cradleboard for the addition to the family. We parted good friends and went on our way, for we had located a basketmaker not too many miles away, whom we were to visit the following day.

The Basketmakers

While the art of basketmaking is a minor craft among the Navaho, it is practiced with great skill by the few women who still make baskets. From the time of the return from exile, three types of baskets have been made, but in recent years two of these are no longer found, the water bottle and the carrying basket. The water bottle had a long neck and a round base, measuring from twelve to sixteen inches in diameter. It was coated both inside and out with pitch or resin to make it watertight. The carrying basket was a wicker, loosely woven basket with an unfinished edge, used for gathering yucca or cactus fruit or other edible plants. As other types of containers came into the trading posts, these two types quickly disappeared.

From 1868 to the early years of the twentieth century, shallow baskets were made for ceremonial use, for utilitarian purposes, and for holding small objects. Archaeological evidence indicates that graves did contain baskets, though in recent times they are never buried with the dead.

During the past fifty years or more, baskets have been made exclusively for ceremonial use. These are shallow, perhaps three to four inches deep and twelve to sixteen or eighteen inches wide. The material used is chiefly sumac, sewn with split strips of sumac leaves. A bone awl is used to insert the yucca binding strips. The sumac twigs, or small branches, are scraped clean and sorted as to size; pieces to be dyed are laid to one side, others will remain the natural color. The same dyes as are used for wool are prepared for the dying of the sumac. Usually only red, indigo, and black are used, occasionally yellow.

DYES

Red is made from the roots of juniper and mountain mahogany boiled together, and then ground, with alder bark added to the mixture.

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Blue is made from the same indigo dye as is prepared for dying wool. Also used is a native blue, which is made from a blueish clay and ochre mixed together, pulverized, and moistened with water.

Black is obtained from coal added to boiling sumac leaves, or from a sulphurous rock, slightly roasted with piñon gum or resin. Added to boiling sumac, this gives a rich, lustrous black.

The basketmaker begins by winding a sumac twig around a small stick called the "bottom of the basket." In order to assure that it will be pliable, all material is soaked before being used. Sewing is done counter-clockwise, with the exception of one rare ceremonial basket which is made clockwise and which must be completed in one day. So deft and strong is the sewing that a basket will require only a few minutes of soaking to make it watertight.

DESIGNS

Designs are limited to geometrical shapes and tiered block patterns, sometimes used in a single row, sometimes in double rows with the second inverted. Sometimes a single open unit is used, sometimes bands with no geometric forms are used. Always there is the "trail" or "path of exit," the "spirit path," a narrow strip where the design does not quite meet, for the Navaho believe that to complete the circle would imprison the spirit of the maker. This is also true of some Pueblo potters, for a similar trail will be found on much decorated pottery. When a basket is nearly complete, the rim is finished in a herringbone, or false braid, technique. The final end of the rim is always directly above the spirit path. In ceremonies where a basket is full, the medicine man knows where the spirit path is by finding the end of the rim, and the basket is placed so that the spirit path always faces the east.

Baskets have numerous ritual uses: as drums by turning them upside down and beating on them with small drumsticks; as containers of ritual paraphernalia, such as prayer sticks, medicine bags, and fetishes; as containers for use in ritual baths; and as food containers in certain ceremonies, for example, corn-meal porridge in wedding ceremonies, this use having given them the name of wedding baskets. Occasionally baskets are used as portions of masks in certain nine-night ceremonies and in certain minor rituals in the hogan.

Strict taboos exist in connection with basketmaking, as with all the other crafts. While a woman is making a basket she must not be touched by anyone. No one may step over the materials being used to make a basket, otherwise the material will break. Should a man make a basket, he will become impotent. Blood must never touch a ceremonial basket. Should this taboo be broken, harm will come not only to the maker, but also to the singer who used it. In silver-smithing, too, the craftsman must not make certain pieces of jewelry while his wife is pregnant or some disaster will occur.

Other crafts pursued by the Navaho are many kinds of leather work, both decorated and plain—saddles, shoes and moccasins, pouches, straps and belts, hobbles, quirts and ropes. In early times the Navaho became good tanners, for they made shields, quivers for their arrows, and leather caplike helmets. To whatever craft the Navaho turns his talents, he will execute it with skill and dexterity.

The Painters

Aside from the ancient rock paintings, the art of painting is a comparatively new venture for the Navaho. However, as early as 1901, Dr. Kenneth Chapman, while working at Chaco Canyon, discovered a Navaho boy making drawings with colored pencils. But it was not until much later that any serious work was done. In 1932 the Santa Fe Indian School commenced a class in painting under the direction of Dorothy Dunn, in which several of the now-famous Navaho painters had their start. In that same year three Navaho boys made a series of murals in the school dining room under the supervision of Olive Rush, the well-known Santa Fe artist, who had great interest in developing the painters' art among both Navaho and Pueblo Indian students.

Such famous painters as Gerald Nailor, who painted the murals in the Tribal Council room at Window Rock, and murals in the Department of Interior in Washington, had his start in Miss Dunn's class. And there were many more: Andrew Tsihnajinnie, Ha-So-De, Quincy Tahoma, and Harrison Begay, whose portrait is here. Later artists were Beatie Yazz, Wade Hadley, and others. Today many more young Navaho are doing excellent work at the new Institute of American Indian Art in Santa Fe.

One interesting aspect of painting by Indian artists,

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not only Navaho but many others as well, is their method of work, which is instinctively Oriental. Pictures are painted from knowledge and inner vision rather than from a direct approach. Instead of an easel, a Navaho painter works on a flat surface. There is always an extraordinary sense of design, a skilled sure draftsmanship, and the Indian's subtle use of

color. Museums all over this country and in Europe own examples of Indian painting, many of them by Navaho artists. One can truly say that all American Indians have artistic potential. The amazing amount of talent that is coming to light at the new Institute, now in its third year, is ample proof of this latent ability.