

MODERN
TRANSFORMATIONS
OF MOENKOPÍ PUEBLO

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To my parents and my wife

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clear sky. Most rainfall does not seep into the ground but runs off in torrential streams into the lowlands. The destructive power of rainstorms is considerable not only to the crops (Forde, 1931:163) but to human lives as well.

If the rainstorms are not very conducive to farming, rapid evaporation of the surface water during the hot, dry months only aggravates the problem. One frequently observes shriveled young leaves turned yellow. Some farmers cover their corn shoots with tin cans to protect them from desiccation during the early months of their growth. Young shoots of the Japanese seedless melons I persuaded a Hopi to plant wilted shortly after they broke ground.

To conclude, agricultural problems implied in the above climatic factors of the Moenkopi area are the exact antithesis of those of Hopiland proper. In the latter, they derive from the "moist region [with] a very short growing season" (Hack, 1942:8), while in our area the problems are of the very dry region with a comparatively long growing season. Dry farming, one of the most predominant forms of farming in Hopiland, is, therefore, precluded from Moenkopi agriculture.

Third, the drainage system of the Moenkopi area eliminates the possibility of practicing the other type of Hopi traditional agriculture, flood-water farming (Forde, 1931:361; Hack, 1942:26ff.). In Hopiland proper, numerous washes, each relatively shallow and long, provide extensive flood plains on which to practice agriculture. In our area, the only wash comparable in its length to those of Hopiland is Moenkopi Wash, which begins at Black Mesa and courses a distance of about 75 miles to drain finally into the Little Colorado. However, erosion of the Wash floor has reached such a stage now that even at times of increase in the flow, the stream never spreads itself over the wide, alluvial floor.

Arroyo cutting of Moenkopi Wash appears to have been in progress since the last century (Gregory, 1915:115). Hack suspects changes in the course of the Wash for an unknown period of time (1942:80). While all this indicates the possibility of flood-water farming in the past, I was unable to obtain confirmation of the practice from the present residents of Moenkopi or from the available literature. Apart from the evidence of construction of a diversion dam on a point near *Tuwiktsyala* (see Map 4) during the Mormon settlement period in Tuba City, it appears certain that direct flood-water farming has never been practiced in this area. Utilization of the perennial stream in Moenkopi Wash around Moenkopi

has, on the other hand, been incorporated into the general framework of irrigation farming.

If the geography of the Moenkopi area precludes the possibility of traditional Hopi agriculture, its geology provides an excellent opportunity for irrigation, a minor form of farming in Hopiland proper. The geological structure of Kaibito Plateau, on which Tuba City and Moenkopi stand, is crucial here. The surface rock of the plateau consists of highly porous Navajo sandstone, which, due to intensive wind action, contains numerous depressions on top. Sand dunes exist in abundance on its northern slope. Consequently, the huge surface area of the plateau works as an effective intake of rainwater. Further, the shale, which lies beneath the surface sandstone and retains the ground water, slopes down south and southwestward to Moenkopi Wash, which, in turn, exposes the water-bearing level by cutting the fill and canyon bed (Gregory, 1916:145-60). Finally, the surface sandstone, worn through weathering and aeolian abrasion, brings the water level closer to the surface (Gregory, 1915:114). Thus the underground water becomes available either in the form of natural springs or of artificial wells. Tuba City, Moenkopi, Moenave, and Willow Spring are locations of the innumerable natural springs of various sizes, which enabled verdant growth of cottonwoods and induced Gregory to call them the oases of the Navajo country (see Map 1).

With the water supply secure in the geological structure of the area, wind loses the significance it has in sand dune farming in Hopiland proper (Hack, 1942:32ff.). However, severe sand storms are quite frequent in our area, especially during the spring. The direction of these storms, as well as the milder winds in other seasons, is uniformly southwest. To the north of Tuba City, one observes fresh sand dunes and outcrops of denuded rock, including Castle Butte. This area is mostly arid and unoccupied even by the Navajo. These dunes have been travelling farther to the northeast to cover the upper portion of Reservoir Canyon¹ (Gregory, 1916: Plate XXIV B) and have buried a few springs there (1915:101). On the wall of Moenkopi Wash, opposite the village, three such sand dunes formed and apparently stabilized two or three decades ago. Since dry farming is a remote possibility, no effort has been made by the villagers to retain aeolian sands on farms by laying

¹ It is now called Pasture Canyon. Throughout the present work, I use the older name, "Reservoir Canyon."

half of the last century] sent these people out here to live. It was the people who didn't own farming land in Oraibi, were the ones he sent out. . . . He told them to stay out here and take care of it for Oraibi. He said *Mongwi* [chief] of Oraibi holds on to it. . . . He said for them to take care of this place and look after it for him." Being a colony, Moenkopi did not have "clan houses." The Hopi residents spent a great amount of time in Oraibi for ceremonies, and the one *lava* in Moenkopi was utilized only for *kachina* and social dances. Initiations and other "religious" ceremonies were held in Oraibi, whence the residents of Moenkopi returned.

Though the Moenkopi Hopi resented their inclusion on a Navajo reservation, the mutual relationship between the Moenkopi and the government was tinged with indifference tending toward amiable tolerance. Even before the Oraibi split, the government regarded Moenkopi as a "friendly" village and the latter looked upon the former as a protector from the Navajo.

Primarily to lead the residents in dealings with this government, a woman from the Pi:kayas clan, Nashleowi, assumed the position of chief of Moenkopi.² There are two accounts regarding the choice of this woman as the chief. One states that in order to evade the Navajo attacks, a woman was selected by Tuba for the Navajo were thought not to kill women. Another insists that she was chosen through the people's consent. The latter account states that in the course of selection, some people suggested Lololoma's daughter but Lololoma declined the offer.³

Whatever the actual process of selection might have been, the chiefly position of Moenkopi was secular in nature. Its authority was derived mainly from the position of the Pi:kayas clan in the Oraibi Soyal ceremony, while its power was based on the virtual

² Nashleowi was known in several ways to the Mormons as well as other white people then resident in Tuba City. All the terms of reference to this woman chief are derived from *mô:wi* or female in-law (Voegelin and Voegelin, 1957:DL.7.3). Thus the Mormons called her "May Way," while the other whites "Mary" or "Queen Mary." In terms of the extension of kin terms to political positions among the Hopi, this produces the following chain of contrasts: chief/female chief/chief's sister; father/female in-law/mother (see Eggan, 1950:104; 1964:179-80; Connolly, 1955:19). I was not able to determine, however, if the term, *mô:wi*, was derived chiefly from the political position or from other circumstances. The Water Coyote clan of Moenkopi, to which Nashleowi was *mô:wi*, was known, on the other hand, as the supporting clan of the Pi:kayas.

³ His daughter's husband eventually obtained an allotment in Moenkopi, however.

monopoly of strategic resources in the traditional economy, i.e., farm land and irrigation water. However, the constitution of this power contained two serious flaws. First, it was limited to the traditional sector of the economy and hence susceptible to economic change. Second, the ultimate sanction of the power lay with the government that granted these resources for the Indians to use, while retaining the final right of control to itself. In addition to the structural ambiguity of Moenkopi as a colony, this separation of authority and power of the Moenkopi chieftanship between Oraibi and the Tuba City Agency provided Moenkopi with another source of ambiguity.

Basis of Village Economy

Immediately after the transfer of the location of the agency to Tuba City, the most important economic alternatives available to the residents of Moenkopi consisted of subsistence agriculture and wage labor for the government and other white establishments.

Moenkopi agriculture was based on irrigation of allotment lands from the reservoirs, originally constructed by the Mormons on Reservoir Canyon. Of the 16 tracts of land allotted to the Navajo and Hopi, the latter obtained 11, two of which contained the site of the Moenkopi village. In theory, each of the Hopi allotments was 20 acres, while four of five Navajo allotments were 40 acres each. In reality, however, the cultivable size of an allotment varied.

The clan affiliations of the original 11 allottees and their cultivable acreage are shown in Figure 1. The distribution of allotments shows the Pi:kayas clan as a majority among the allottees. Their advantage is further enhanced by the fact that four other allottees were affinally related to the Pi:kayas clan. For example, Allotment No. 45 was being used by a member of the Water Coyote clan on behalf of the Pi:kayas. Thus, as far as agricultural resources were concerned, the Pi:kayas retained a dominant position, which was further reinforced by the location of their allotments in regard to accessibility to irrigation water.

It appears that at the beginning of the BIA administration in Tuba City, most of the irrigation facilities left by the Mormons were applied to the school farms and orchards. Only the surplus water from the reservoirs, after joining the canyon, was utilized for irrigation of the Moenkopi allotment fields in its course to Moenkopi Wash. Significantly, the allotment located closest to the mouth of Reservoir Canyon and hence most advantageous, belonged to Nashleowi (see Map 4). Another Pi:kayas allotment was

much later. The subsequent political developments can better be characterized as a process of incorporation of each segment, or more specifically, of the upper one into an independent decision-making unit.

Ceremonial Division

The first incident of any significance in this process occurred in the ceremonial life of Moenkopi. Sometime during the 1930's and perhaps simultaneously with the question of establishing the Tribal Council (see below), the upper Moenkopi group decided to give its own initiation ceremony to the Kachina society. The implication of this action was serious. Until then, the upper group had been giving ceremonies in Moenkopi under the leadership of the lower group, but now it chose to defy the religious prerogatives of the latter. The participants in the ceremony included only the sympathizers of the upper segment, and no adherents of the lower group joined.

The ceremonial disturbance on this occasion first brought about the differentiation of kivas between the upper and lower segments. *Letatovi* of the Coyote clan, the oldest kiva in the village, and *Kāvankiva* of the Greasewood clan were eventually brought under the control of the upper group, while the lower group managed to retain only *Iskiva* belonging to the Water Coyote clan.⁸ In 1942 the lower group constructed another kiva, *Tāvankiva* ("West Kiva"), for themselves (see Map 3). Its first owner was Teddy Honyumplewa of the Coyote clan. Each group now had two kivas.

The second consequence was the establishment of a spatial boundary partially dividing the two groups. This incident was recounted by a present member of the upper segment. During the parade of kachinas, on the second day of the Kachina society initiation, members of the lower group attempted to drive the kachina dancers out of their site, telling them that the upper segment people no longer belonged to their village and that they should stay on their new site above the bluff. The upper group thus claims today that this boundary was forced upon them and they accepted it, but the lower group refuses to admit that such a boundary exists (see Map 3). However, it is taken as the boundary by some political actives of Hotevilla, even though they are sympathetic to the lower group.

⁸ *Letatovi* is Titev's *Kuwanovi*, and *Iskiva* is his *Istiya* (1944:95).

The boundary did not clarify rights to all geographical features. The sacred spring and the road going by it were regarded as common resources. The roads going through the upper segment had to be used by the lower people to leave the village, and these were regarded as open to both groups. The graveyard, located on the rim of the upper knoll, was also jointly held and used by both segments. While the upper group conceded these rights, it retained the rights to the two kivas and the village plaza on the lower group site.

Tribal Council

The impact of depression and subsequent advent of the Indian New Deal placed further pressure on the schisms of Moenkopi. John Collier, who visited Moenkopi while commissioner, introduced the Hopi to the idea of tribal self-government. Its general form and role were formulated into the present constitution of the council, which included Moenkopi as a unit community with two representatives allocated to it. The draft of the constitution and by-laws was voted on by the Hopi and subsequently adopted in 1936. A man from First Mesa was then "elected" as the first chairman of the council.

All through the process of the establishment of the council, Moenkopi manifested its factional split ever more clearly. Kenneth and others, who tried to be a unifying element in Moenkopi through the "Village Council," could not maintain the mediating position in this all-too-clear choice between the BIA-inspired tribal organization and the village, which admitted to no higher authority than Oraibi. With the entire tribe as a group of higher authority than Oraibi, the unique tie of Moenkopi with Oraibi was endangered. The "tribe," as represented in the tribal council, thus emerged as another divisive factor in Moenkopi. The "Village Council" could have continued to exist as long as its actives affected only their own village of Moenkopi. Now this condition disappeared.

The change brought about through the adoption of the tribal council constitution, however, served merely to formalize the division of the upper and lower segments into "Lower and Upper Districts of Moenkopi," from each of which one representative was to be selected. Otherwise the council was inactive because of the lack of cooperation of component villages. The stock reduction program was imposed by the BIA during this period of infancy of the council.

pathetic parties of each group, who, in general, do not have a particular stake in the village politics.

In 1960, when the application was accepted for the water-sewer project, the Upper Moenkopi Council was required to furnish a site for a community sewer lagoon within the village site. Through a consultation with the project engineer, one of the original allotments was chosen for the lagoon site. Apart from the technical considerations, the choice of this allotment land was based on the following circumstances. Because of its location at the mouth of an arroyo, the land had been gullied deeply in many spots and the vicinity of the land used as a dump area by some people of Upper Moenkopi. It had long been out of cultivation and its appraised value at the time of probation in 1962 was only \$1,410. Finally, one of the heirs was a long-time resident in Flagstaff. These factors obviously contributed to lessening the curiosity and antagonism of the people and left only a small number of them aware of the plan.

In order to secure the land for the project, all the heirs to the allotment were contacted by a project worker as well as by the officials of the Upper Moenkopi Council and their signatures were obtained. The circumstances under which the signatures were collected cast some doubt upon their validity. The people involved

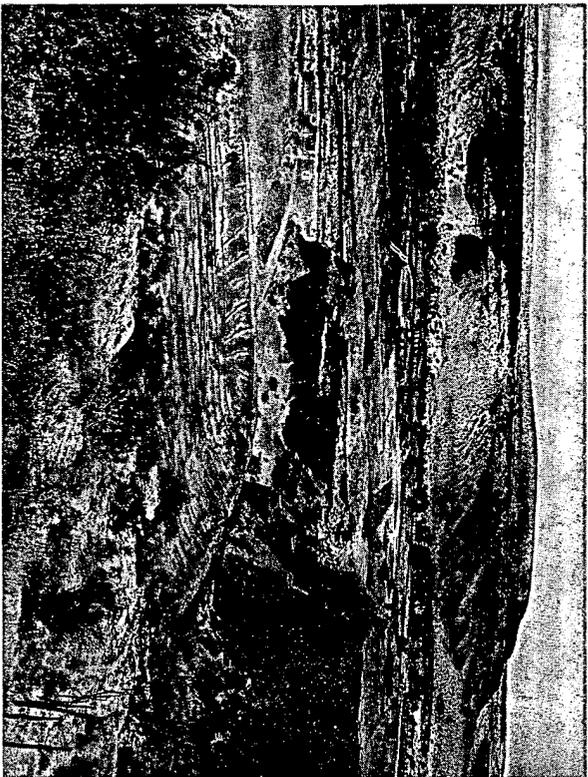


Plate 3. Newly constructed sewer lagoon for Upper Moenkopi.

appeared to have divergent views on the exact purpose of signature; some were willing to sign because of their political affiliations. The husband of one of the signers was the watermaster for Upper Moenkopi. Others were more or less talked into it without a full understanding of the implication of their action, or signed from disinterest in the already devalued allotment.

Theoretically, however, all the allotment lands are held in trust by the government and their final disposal needs to be approved by the BIA as in the case of inheritance. The Kearns Canyon PHS apparently did not duly appreciate this and, through a tacit understanding with the tribal lawyer that community interests take precedence over individual interests (principle of eminent domain), satisfied itself with receiving signatures from respective heirs.

Thus there was an irregularity beyond the framework of village politics. It was a matter to be taken up by the BIA and related legal agents and not by the village. In fact, the entire issue would have passed without incident had there not been agitation instigated by an active "traditional," Kenneth Loma. He had already taken it upon himself to inform the people of such conservative villages at Hotevilla and Shongopavi about the Moenkopi project. On the basis of his affiliation with Moenkopi through birth and his political convictions, he urged the Lower Moenkopi chief to take action against this allotment affair as well as against a plan to enlarge the capacity of the sacred spring by digging another well nearby. As for the latter, however, the project itself decided to do a minimum of work, leaving the entire access to the spring open to the villagers as it had been. Thus the opposition could only make an issue out of the allotment problem.

The manner in which this was handled by Lower Moenkopi was indicative of the way it generally operated. Apart from the limitations set to the opposition by the legal framework, it was also known to its leaders that the individuals approached for signature cared less about Lower Moenkopi. Thus, instead of marshalling their support to the opposition, they immediately contacted the probation officer from the Gallup area office who was responsible for the inheritance. Then, one night in the winter of 1962, a large meeting was held by the chief at his house. The officer expressed his "private" opinions regarding possible irregularities involved in the transfer of the allotment to the project. Nothing of any consequence, however, developed from this long-awaited meeting and, as mentioned, the project proceeded without much difficulty.

The case shows, if incompletely, that affairs in Moenkopi do not

sections. It is sufficient to mention here that even during the period of farm expansion in Moenkopi, the land around the village was frequently visited by the people of Third Mesa for hunting and gathering purposes. It was regarded as the territory of Oraibi, of which Moenkopi was a colony.

Even after the separation of Moenkopi from Oraibi by a reservation boundary, the Hopi from Third Mesa continued to visit *Shalako* spring and *Patu-pa* pool in Reservoir Canyon for the water used in the Shalako ceremonies and for reed and cattails for the Soyol ceremony in Oraibi. Third Mesa Hopi also went to Moenave for cottonwood fruit, *Pikyangkoku* (Wildcat Peak) for firewood and timber (TCL), *Pikino* in Reservoir Canyon for rocks, and *Oako* on Coal Mine Mesa for coal.

It was in this general milieu of the Oraibi "outland" that farms were opened by the colonists of Moenkopi. However, the agriculture in Moenkopi did not develop simply as another Hopi economic activity in unrestrained village "outland." The reservation system, which alienated the village from its parental community in the administrative superstructure, emerged as a constant factor to reckon with. In addition, this system was originally designed for the Navajo in the area, who were later integrated into their own tribal government. In the BIA theory the land on which Moenkopi developed its subsistence economy was no longer in Oraibi's territorial domain. It was the government on which Moenkopi had to depend for the ultimate sanction of the productive resources in the traditional economy.

Reservation Control of Land Resources

Perhaps the most critical element in the Indian reservation system is the status accorded to the reservation land. As Oliver La Farge so succinctly stated: "Indian special status consists mainly in the ownership of land—reservations and grants—and income therefrom held in trust for them and tax exempt" (1957:42). The land policies adopted so far naturally varied from one reservation to another and even their general tenets, as maintained by the federal government, did not remain constant. In the present section, I discuss only those features of the policies that have been relevant to Moenkopi.

Apart from the establishment of the reservation in this area, the first policy of great importance to Moenkopi is the General Allotment Act (Dawes Act) of 1887, through which land allotments of 400 acres were made on the alluvial floor of Moenkopi Wash (TCL). The spirit of this act was derived from the then current

policy of assimilation of the American Indian. The general mechanism of the act, on the other hand, was to divide up the reservation land into individual allotments, whose patents were held in trust by the Indian Service for 25 years, and the "surplus" from the allotment was to be opened for homesteading (Haas, 1957:13).

In Moenkopi, however, the allotment lands were surrounded by the reservation that was established almost simultaneously with the allotment. The existence of the reservation and allotment lands contributed to the repeated confusion of the earlier superintendents on both the Western Navajo and Hopi reservations (FDL, KCL). In any event, all categories of land were thus denied to public entry and remain so at the present time.

A serious modification, indeed, a reversal of this policy was brought about with John Collier's Indian New Deal and its cornerstone legislation, the Indian Reorganization Act of 1934, which formally repealed the Dawes Act (Haas, 1957:19-20). This act intended to restore the land basis of the Indian communities in the country and to promote Indian self-determination on the basis of restored land resources.

On the local level of Moenkopi and Tuba City, the new act later led to the transfer of managerial functions of land resources to the Navajo tribe from their BIA, which retained an ultimate veto power. Generally, this resulted in a more stringent control of the resources with the help of the tribal court and police. Thus the quarries the Hopi used to visit as a part of the Oraibi "outland" were closed. The Hopi were denied access to the rock quarry in Reservoir Canyon during the 1950's. Firewood and coal collection have been conducted since then only by evading the watchful eyes of the Navajo. Some Navajo took advantage of this situation and have been selling firewood and coal to the Hopi of Moenkopi. Hunting and fishing activities came under the tribal game regulations and permit system as well. Cutting piñon pines around Shonto for Christmas trees has to be carried out only in the absence of Navajo policemen in the vicinity.

More serious in its effects on the Moenkopi economy was the establishment of the Land Board and grazing committee as local land controlling organizations of the Navajo Tribal Council. Since they are the organs of the Navajo tribe, the Hopi community of Moenkopi is excluded from formal participation. I shall discuss the grazing committee and its relevance to Moenkopi later. The implications of the Land Board to Moenkopi are just as serious. While the allotment lands remained exempt from the supervision of the

board and continued to be held in direct trusteeship of the BIA, all the remainder of farm land in the area came under the authority and power of the board, which includes assignment of land, settlement of disputes over land and water distribution, and supervision of transfers of assigned land.

In the framework of Moenkopi agriculture, therefore, two kinds of land rights exist at the present time. First, the farm land in the allotment area is held by the allottees or their heirs irrespective of actual cultivation, and the transfer of farming right itself is arranged without intervention of either the Navajo tribe or the government. Mismanagement of the allotment lands is not sanctioned by either of the two groups. Apart from the governmental sanctions on sale, it is the category of land on the reservation for which the right comes closest to "ownership."

Assignment land, on the other hand, is subject to several additional restrictions imposed by the Land Board. The assignment "may be cancelled" in the case of two years' nonuse, failure to pay water use assessments (this clause is inapplicable to the Moenkopi area), or more generally, if "beneficiary use is not being made of" the land (Navajo Tribal Council, 1954). The land whose assignment is revoked or relinquished returns to the Land Board for future assignment. Thus the right derived from assignment is, in essence, usufruct. The tribal court probates inheritance of assignment at the death of an assignee. In this action the court is advised to keep the assignment as an intact "economic unit."

Both allotment and assignment lands are under the ultimate trusteeship of the U.S. government, whose representative on the Indian reservations, BIA, deals with, in the case of the Navajo, "the sale, exchange, partition, patenting and leasing" of land (Young, 1961:263) through the Branch of Realty and with probaton of inheritance of allotments by an examiner of inheritance (Young, 1961:264).

AGRICULTURE

Expansion and Contraction of Farm Acreage

The basis of Moenkopi agriculture was founded on a complex of 11 allotments. Soon, however, the reduction in arable land acreage in Third Mesa and general political unrest induced migration of the Third Mesa Hopi to fill the land vacancy left by the Mormon withdrawal (TCL). In 1907 the land under Hopi cultivation reached 385 acres for the population of 150, giving 2.5 acres per person

(TCL). Less than 10 years after the establishment of the reservation, the village population had doubled in size (Gregory, 1915: 119). The appropriation of land for farming by these immigrants first occurred along Moenkopi Wash, formerly in cultivation by the Mormons. In the early part of the 1910's, Moenave, another spot of Mormon irrigation farming, and an area around *Pa:laituika* (dry farming) came under Hopi use (see Map 4). Competition with the Navajo over the farm land resources was not serious in this early period. In fact, the transfer of the Moenave farms to the Hopi was made by the Navajo settlers, who were not interested in small, intensive irrigation farming then. Later, one of the Navajo allotments, 40 acres in size, was sold to a Hopi for an alleged sum of \$500 and "groceries to be delivered in [his] convenience."

The period between the 1920's and 1930's is characterized by further expansion of farm acreage in Moenkopi. It proceeded on the basis of individual reclamation. Two conditions for this process can be noted.

First, the appropriation proceeded to the area where irrigation was possible. The allotted tracts of about 70 acres, adjacent to allotments A 47, A 48, and A 49 (see Map 4), came under cultivation almost simultaneously with the original allotment lands (between 1904 and 1907). These farms depended on the same irrigation system as the allotment fields.¹ The fields in the *Má'sau* area (approximately 120 acres; 200 acres according to HyJ, Def. Ex. 196) were turned to Hopi use about 1920. They have been irrigated from the Wash.

The second type of reclaimed area depended on "flood-water farming" (Hack, 1942:26).² Another large Akchin field was constructed to the west of the *Má'sau* area. The second group of this type of field used the flood plains of Reservoir Canyon and another unnamed wash by an old bridge across Moenkopi Wash farther south.

The last type of field includes a small number of dry farms around *Pa:laituika*, which must have been in cultivation prior to 1912 (Gregory, 1916:144; see Map 4). The farms built around the cattle corrals in Red Lake and Coal Mine Mesa and those by

¹ Before merging with the allotment irrigation, these tracts may have been watered by an arroyo that drains to *Tuwiktigada* (see Map 4).

² Of these, the farms at *Wikipi* represent a typical Akchin field. They are located at the mouth of two small arroyos, which forms a comparatively wide, level plain.

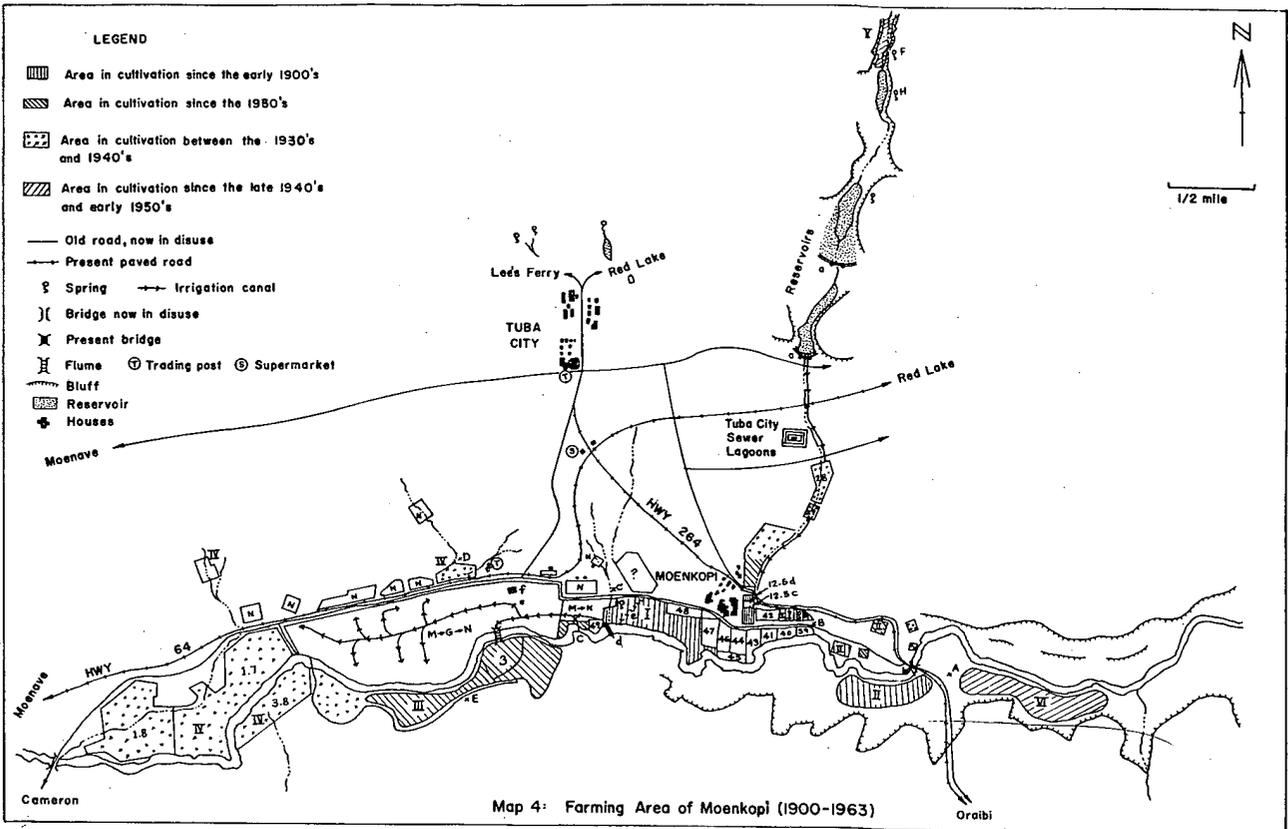


Plate 4. Moenkopi Wash near the fields in Ma'asau.

Dimnebito Wash that belong to one Upper Moenkopi household are all of this type.

By 1937 a major portion of the ecological niche of the area around Moenkopi was thus being exploited by the Hopi farmers. The total amount of acreage rose to about 860 acres, four times as large as

Additional Legend to Map 4

- 1) Numerals 39 to 48 are allotment numbers. Other numerals indicate the plot numbers in assignment lands.
 - 2) I = irrigated area from the reservoirs; II = dry farming area; III = irrigated area from the Wash through the diversion dam; IV = Akchin fields; V = individually irrigated area from the Wash; VI = area irrigated by springs.
 - 3) A = *Huyankikyo*; B = *Parlatuka*; C = *Tuokisyalu*; D = *Wikipost*; E = *Ma'asau*; F = *Shadko*; G = *Marisya*; H = *Pakupa*; I = *Pavankyaaki*.
 - 4) a = dam and headgate, originally constructed by the Mormons; b = dam first constructed by the Mormons but fallen into disuse after their withdrawal (it was proposed to rebuild it during the 1910's); c = dam constructed by the Mormons but fallen into disuse since the late 1900's; d = diversion dam, originally constructed by the Mormons; e = old diversion dam in the Mormon period; f = government dairy in use until around 1935.
 - 5) M = former Mormon farms; C = former government farms; N = Navajo farms.
- Sources: Blout, 1911; Gregory, 1915:118, 1916:Pl. XXVII; Page and Lavantu, 1937; U.S. Geological Survey, 1937; field work, 1962-63.

the initial allotments. The increase in acreage corresponded to the continuing growth of the population through immigration and natural growth. Per capita acreage in 1937 was about two acres.³

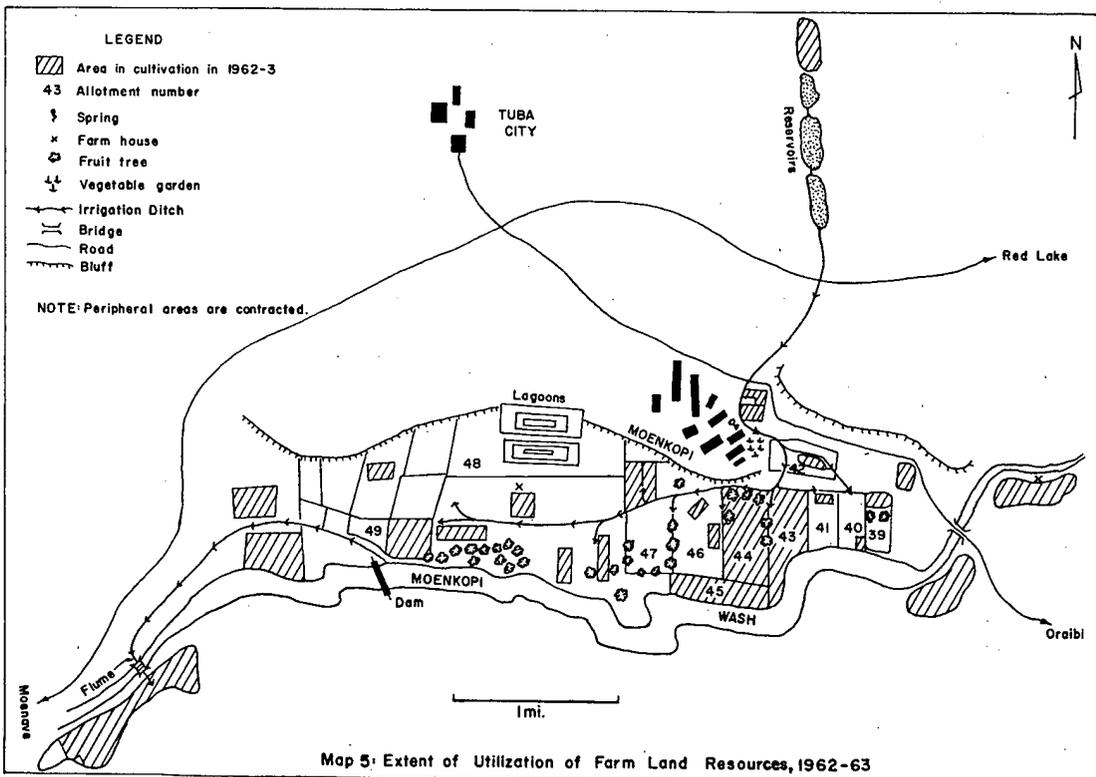
Several factors are involved in this process of farm land expansion. First, the political stability brought about by the BIA made possible the Hopi migration and agricultural exploitation of land resources. Second, rapid adoption of wagons and draft animals during this period facilitated transportation between the distant farms and the village (Forde, 1931:365; Watson, 1945:67-71). Finally, the villagers were yet only marginally involved in money economy through occasional wage work at the local agency and sale of farm and livestock produce. Since the village economy for this period was based chiefly on subsistence agriculture, the increase in farm acreage corresponded in the main to the growth of the village population.

A significant change in Moenkopi economy began with the advent of World War II. While the population continued to increase, the total farm acreage appeared to reach a peak by 1940, when the period of decline set in. Thus the fields at *Wikiposi* were abandoned to the Navajo. The fields in such outlying spots as Red Lake and Coal Mine Canyon were also given up to Navajo herders toward the end of the 1950's. Two areas of flood-water farming were abandoned because of deep arroyo cutting, which decreased the cultivable area of level land. The remainder of the flood-water farms were left out of operation because of a shortage of labor.

On the other hand, new fields were opened during the 1940's and '50's. In 1940 the Tuba City BIA, which had been operating farms for the Navajo Boarding School, released them for the use of the Hopi farmers. They are about two miles upstream from the reservoirs and well watered by a series of springs, including *Shalako* (see Map 4). The farms around *Hu:yanikiyo* were individually opened in the post-war period and have not been legally recognized by the government nor by the Navajo Land Board. These are located about two miles northeast of the village and irrigated from the Wash (see Map 4).

At present, about 550 acres constitute the farm acreage of Moenkopi (1962-63), with an average of 0.95 acres per person. However, many plots within this complex of farms have been out of operation for several years, though retained as Hopi farms (see Map 5).

³ This figure corresponds to the per capita "cultivated" acreage in the Hopi District in 1936 (Human Dependency Survey, 1939).



More recently, some farms were taken out of cultivation for non-agricultural purposes. Thus Allotment No. 48 was turned into two sewer lagoons for the sewage system of the upper segment in 1963. A portion of the farm by the Moenkopi Day School was used for a house site in the same year.

The decline in farm acreage, the movement of the farms closer to the village despite improvement in transportation by popular adoption of automobiles and construction of paved highways, and the conversion of farm land to nonfarming use all represent the dislocation of subsistence economy to the increasing pressure of money economy, which had not only attracted the Navajo to this area since the stock reduction program (Levy, 1962a:796), thus creating competition for land in the immediate environs of Tuba City, but also has extracted a great amount of labor for wage work, thus causing a shortage of farm labor in Moenkopi.

Tenure and Distribution of Farm Land

The discussion of tenure of agricultural land in Moenkopi is complicated by the fact that the native system of land tenure, which was in the process of radical change at the time of allotment in Moenkopi, was superimposed by the reservation system of land control. I shall first deal with the change in land tenure that spread in Third Mesa at the turn of this century.

EMERGENCE OF RIGHT OF INDIVIDUAL DISPOSAL ON THIRD MESA. It has already been pointed out that the Moenkopi area, in which the Hopi opened farms, was Orabi "outland." In regard to the cultivation right in this section of the village territory, the literature indicates "male individual ownership" as a prevalent form of customary right. For Second Mesa during the 1930's, Beaglehole mentions as follows: "Apart from the clan control of land there exists individual ownership of land by the male. This occurs when a man breaks in land from the waste and plants it with fruit trees or cultivates squash or beans on it. The waste land is usually part of the village land, rarely part of the clan lands" (1937:16). For Third Mesa, Eggen remarked that "there were probably always a certain number of fields owned by Hopi men outside clan areas" (Watson, 1945:67-68). Page made the following quote from Stephen's rather cryptic observation for Orabi: "... during the late 1880's . . . of the land properties there are still traces that it once was divided on a communal basis for use of families composing the clans and not as individual holdings" (1954:9). This appears to indicate that individual holdings were already prevalent in the last century.

On rights over farm land in this area, Beaglehole further states:

With the death of the owner, the land reverts to village waste, or is taken over by clan relatives or by the son of the deceased. If the land goes out of cultivation during the owner's lifetime, another interested in the field may take it over, usually by mutual agreement. Should the owner wish to renew his rights he may secure the return of the land without question. If no attempt is ever made to resume ownership the land is, by tacit understanding, considered the property of him who has taken it over to cultivate (1937:16).

This statement points out that the farming right in the "outland" is essentially usufruct and contingent on continued cultivation. Forde (1931:379) and Colton (1934:22) further believe that male control of reclaimed fields in the "outland" emerged under the influence of the reservation system, while Beaglehole (1937:17) suspects the same for the inheritance by a claimer's own children of this type of field. This, however, does not appear to be the case.

My arguments for aboriginality of usufruct by individual males in the outland and its inheritance by their children are based on the following considerations. First, as Colton mentions (1934:22), the outland was primarily used for grazing. From this, Watson suspects that individual "ownership" was partly derived from individual appropriation of grazing ranges (1945:68-71). However, as shall be mentioned, the appropriation of ranges in Hopiland proper is often made by a group of Hopi herders and not by individuals. It appears more reasonable to assume that the farming right in the form of usufruct by an individual was established through an act of reclamation and protected by the village as such for the duration of cultivation even by his descendants (see ter Haar, 1950:85). The fact that such a piece of land was invariably held by men appears to have derived from the traditional division of labor, which excluded women from farming activities. The ultimate sanction of the use right in this section of the village territory resided in the village and its representative, the village chief. Inheritance by the children and not by the matrilineal descendants appears to be due to the fact that the former, especially sons, start working on their parents' land before and stay there even after marriage and that subsequently they inherit at their fathers' deaths the usufruct of the fields the latter opened through continuous cultivation.

What is unique in the land tenure of Third Mesa is the absence of a clan land system as described by Forde (1931) and others. The relevance of the reservation system appears more direct in this respect than in the existence of the right of individual disposal

itself. During the survey in the 1930's by the Soil Conservation Service, Page discovered the absence of clan lands in Third Mesa. All the farms there were held in the form of "individual ownership" (Page, 1954:11).

The process through which the right of individual disposal of farm land was established in Third Mesa involves three factors: population, available farm land, and sanction structure. First, the population of Oraibi, the sole village on Third Mesa at the time, reached 900 in 1898 (Page, 1940), almost equal to the total of First and Second Mesa populations. At the same time, the land basis of Oraibi agriculture was in the process of rapid deterioration because of the erosion of the Oraibi Wash, on which most of the Oraibi farms were located (Hack, 1942:34; Titev, 1944:62). The pressure on the land, then, resulted in increased reclamation of the outland, including the Moenkopi and Dinnebito areas.⁴ The decrease in available farm land through population increase and erosion cycles must have been a common occurrence in the history of other Hopi communities. The uniqueness of the Oraibi experience is the very context in which the process went on.

Briefly stated, the imposition of the reservation system and consequent restriction of movement, along with the censure of religious practices, were undermining the village authority, which could not control developing factionalism (Eggan, 1964:182). As the clan lands were gradually abandoned, the individual control of farms in the outland became a predominant form of land use. In the face of weakened village authority, the same procedure must have been adopted in the use of the remaining farms in the clan blocks. Confinement on a reservation further made it difficult for Oraibi to shift the location of the community through migration or segmentation. The physical basis of clan solidarity was thus deteriorating long before factionalism precipitated the Oraibi split (Titev, 1944). The final result was a replacement of the clan land system with individual land right. As the latter became the sole form of right over farm land, its transmission was now executed without reference to clan organization. Since the land right ceased to be sanctioned by any particular village after the disorganization of Oraibi, the right over a piece of land did not revert to the latter as an ultimate possessor of domain but remained as the original claimer's. The disputes over the land that ensued were now resolved not by village

⁴ Since the Dinnebito fields mostly depend on sand dune farming (Hack, 1942:33), irrigation farming in Moenkopi is irrelevant to the development of right of individual disposal in Third Mesa.

authority but by the BIA, which held final control over the land. More often, however, individual negotiations took the place of formal adjudication by the BIA. Thus all the Third Mesa farms came to be individually held as they are at present.

As this reconstruction of the process (see Eggan, 1950:107) shows, the relevance of the reservation system was crucial, and yet the government, which instituted the system, did not dictate such a change. This is indicated by the fact that in contemporary First and Second Mesas clan lands still exist in juxtaposition to individually held lands (Page, 1954:11).

Through trusteeship of "individual land ownership," the government replaced a Hopi local community as a final sanctioning body of land resources. On the one hand, this provided protection from the encroachment of outside interests. Yet, on the other hand, it did away with the context for further development of the concept of "individual ownership" by choking the process that had been in progress in Third Mesa. The trusteeship was thus a legal fiat thrust into the indigenous movement of changes in land right, which, given market economy and commercial agriculture, could well have resulted in genuine "individual ownership." This did not materialize in Moenkopi, however.

What happened or has been happening in the village is a complicated pattern of adjustment in farm distribution among the kin whose subsistence needs for land are meted out on the basis of an amorphous concept of individual "control" within the framework of overriding supervision by the government.

FARM LAND TENURE AND INHERITANCE. The general process of breakdown of clan "ownership" of farm land also affected the land tenure pattern in Moenkopi. All information regarding land rights in the area prior to Mormon control of the Moenkopi valley indicates individual appropriation of farm land. The allotment subsequently froze this type of individual tenure into law. However, as already indicated, the distribution of the allotments clearly reveals a mode of farm land appropriation that must have been extensively employed in this early period. A tract of land was delimited by a group of matrilineally related men and their male in-laws. Within the land demarcated by this group, each member acquired a piece for his own cultivation, claimed it as his, and disposed of it as he saw fit. The group itself was formed for reclamation and probably for defense of the reclaimed territory.

Prevalence of this mode of land appropriation for farming pur-

usufruct to a farm within the theoretical framework of reservation land tenure. Each transfer of this usufruct requires approval from the local Land Board. In actuality, however, numerous transfers occur without awaiting such actions from the board. Inheritance of assignment lands has been made as frequently without probatation by the Navajo Tribal Court in Tuba City. In one of such inheritance cases, a man "gave" a piece of the land he obtained from his adoptive father to his brother. In another, a young man gave "permission" to his mother's brother for entry to the land he inherited from his father, the original reclaimer and assignee. This occurred when the young man was incapacitated by drunkenness. However, the mother's brother continued to work there even after he recovered and eventually brought one of his sons onto this land to work with him. As these cases show, the patrilineal transmission of land rights is not a result of imposition of government regulations, which do not, in fact, specify the mode of inheritance of assignment lands.

As already noted, frequent entries and withdrawals on the farm land and the process of establishment of the disposal right through continuous cultivation may lead to overlapping land rights of several individuals on a single piece of land and consequent confusion in regard to its ultimate possessor. Such is the case of a plot near the Moenkopi spring by the present Moenkopi Day School.

This land was originally utilized by the school as a small-scale demonstration farm. It appears that during the 1920's it was released for Hopi use and a man of the Patki clan from Orabhi became its holder. The farm land itself is a tiny two acres but direct irrigation from the spring and the proximity of the village site made the land comparatively more valuable than the outlying farms with greater acreage. The Patki man first gave a portion of the land to a friend in Moenkopi. When the Patki man died sometime before 1937, his son took it over. Through the son's wife, her male clan relative from Hotevilla obtained a portion in the land. Further, through the original Patki man's wife, her male clan relative obtained another piece there. When the Patki man's friend died, his portion went to his daughter and her husband. By 1948 the son had died. As a result three men have been working on this narrow strip of land up to the present time. The son's wife as well as his brother now claim "ownership" of the land but no actual attempt has been made to regain it. In fact, the present operators are political antagonists to the son's brother and it appears unlikely that he will dare to assert his claim, which would inevitably conflict with that of his sister-in-law.

The second feature of agricultural land use in Moenkopi is *frag-*

mentation and scattering of farm land holdings (see Brophy and Aberle, 1966:73-74, 76). The land holdings of many individual farmers were already diverse when a survey by the Soil Conservation Service was conducted in 1937. The original allottees and their immediate relatives, who held small plots in the allotment area, soon opened fields in other areas. The later arrivals, on the other hand, sought through kinship relationships the use of fields in areas already reclaimed and supplemented these with land they themselves reclaimed. At present, it is not unusual for one farmer to work on a piece in the allotment area dependent on reservoir irrigation, on another piece in the *Mátsau* area dependent on Wash irrigation, and on a last piece of land in the dry farming area.

Several factors are involved in this seemingly "uneconomic" combination of land and labor. First, the trust ownership of land by the government formed an effective barrier which protected the basis of Moenkopi subsistence economy from the national competitive market. Second, participation of the villagers in the money economy mainly through wage work *dislocated* the subsistence economy to a residual activity within the total economic complex.⁵ All through the period in question, no trend for accumulation of land in the hands of any individual has been observed. Third, individualization of economic activities through the above-described land tenure and participation in wage work eliminated the community and its component groups as possible production corporations oriented toward commercial economy. Finally, and perhaps most important of all, in spite of the general advocacy of land reform policies, the peculiar character of right of individual disposal inhibited movement of land capital along channels of demand and supply. This is most clearly seen in the *poorly developed contractual land relationship*.

I have already pointed out the significance of kinship in the disposal right over farm land. Conversely, it is rare to observe "renting" relationships between a possessor of the disposal right and his non-kin user. Such "renting" appears to be on the increase in recent years among families who migrate out of the village for off-reservation employment. However, all these relationships I observed are characterized, in addition to the absence of direct kinship between the parties concerned, by lack of specific terms of "rent" and its duration. The only term involved consists of maintenance of the

⁵ Incentives for economic employment of farm land capital, e.g., for commercial production, were thus no longer seriously considered in the allocation of productive labor. The surplus land that resulted from this process has been left idle.

some years already. In moving, one of the A 39 operators removed the fence wires and posts from this allotment, while leaving fruit trees planted by the original allottee. Of the original allottee's three children, to whom the allotment was probated, only one started working on a small portion of the land in 1963. Since her family lived in Flagstaff, they came back to the village only for planting.

Through diverse kinship relationships, some of the heirs obtained shares in more than one allotment. Frequently, however, they took the largest share and let those in other allotments rest as they had been. Some heirs with shares in a single allotment refrained from working the land because it was already overcrowded. The extent of each share also fluctuated extensively and in the case of heirs to A 48, some received only one-twentieth of the 10-acre tract, which had a total assessed valuation of only \$1,410! There were also heirs who had settled in other villages long ago and who, as a result, declared surrender of their shares to the other heirs who had been working on the probated allotments. Finally, some others who were unable to activate their rights because of their residence outside of the village arranged to have their village acquaintances work their shares on condition that they "keep their fields clean."

All in all, an immediate consequence of the probaton was to appreciably discourage actual operation in the allotment area, and in 1968, a year after the probaton, only four out of 11 allotments were cultivated to any significant degree (see Map 5).

The impact of this action on the concept of land rights was just as serious. Though the ultimate right of supervision still rested with the government, the villagers clearly perceived the changed status in land rights. Now the act of cultivation did not guarantee rights over the land. Conversely, "owners" no longer needed to be actual operators on the land. With this awareness, several political actions were initiated by the two groups of the village (see p. 80-81). It even involved the question of legitimacy of the residential area, and the young chief of the lower segment wondered about collecting rents from the residents upon it.

The brief process of these adjustments to the introduction of a new land right concept through the probaton clearly was possible because of greater reliance on wage work in recent years. If the change in the combination of land and labor had been carried out in the sole context of subsistence economy, its effect could have been disastrous, since it would presuppose a comparatively rigid correlation of the two factors of production (land and labor) on the basis of the subsistence needs of each household. In Moenkopi,

however, this change was brought about without many deleterious effects on economic activity as a whole, partly because the area affected was limited to the allotment lands, but more important because the economic structure of Moenkopi itself was dual and the number of wage work opportunities was, at the time, on the increase. It meant a further displacement of subsistence agriculture and greater commitment to money economy.

Farm Labor Organization and Supply

The changing conditions of the dual economy brought about a new pattern of labor recruitment and organization for farming purposes. In the olden days, when the labor was concentrated on the subsistence economy, the entire male population of the village took part in farming activities. Further, it appears to have been common during the early period of the 1910's and 1920's for relatives from Oraibi and other Third Mesa villages to come down to Moenkopi to help with the farming there (see Simmons, 1963:208). With a more rigid administrative separation of Moenkopi from Hopiland and with differing degrees of involvement of all the Hopi villages in wage economy, the labor recruitment from the other villages for farming ceased to exist.

In this early period the villagers cooperated in the harvest of the chief's fields to relieve the chief and his family of this labor (Simmons, 1963:150-52). At present, no labor contribution is made to the chief's family in its farming activity by the villagers.

At the present time, farm labor on a tract of land is mainly provided by the household to which that tract belongs. The only occasions for the traditional type of cooperation of kin in farming are limited to the first day of planting and harvesting phases, when the women of the household give feasts for the helpers. Usually, however, neither of the activities is finished in one day, and the male members of the household continue the work to completion without the help of nonhousehold kinsmen.

One of the characteristics of the dual economy is for an individual or a household to divide its labor force between subsistence agriculture and wage work. The division involves a decision-making process based on diverse factors, economic as well as noneconomic. The optimality question involved in the division in a particular household may be difficult to determine. Yet it appears certain that many households in Moenkopi are now short of farm labor, obviously because of the absorption of the labor into the wage work sector. A majority of the villagers do not have time to collect com-

pletely the ripened fruit of their trees during the fall season. Much fruit is left strewn on the ground and often rots there. Middle-aged men of the village attribute the cause of inefficient employment of farm land in Moenkopi at present to the growing laziness of the young people (see Rubin, 1961:126-27), although a majority of the latter are employed in wage work and hence have no great interest in farming. While the constraint on the transfer of land imposed by kinship and reservation regulations creates an impression of land shortage, the shortage in farm labor is responsible for another picture that the land in Moenkopi is, in fact, in surplus. The two impressions are shared by many village farmers, with some confusion.

The following modes of accommodation in the households also indicate the intensity of involvement in money economy in Moenkopi. First, many male wage earners return to their farms during after-work hours on weekdays or on weekends. Since the engagement in wage work is no longer seasonal (see Adams, 1963:141), they take days off from their regular wage work for farming during the busy planting and harvesting periods. Second, if old and "retired" males are available at home, the burden of farming often falls on their shoulders. Often a young household leaves the farming of its own fields to the old men of a parental household. The sharing of labor between brother households has also been frequently observed. These labor arrangements usually include such other reciprocations as feeding the old fathers at the home of their children and giving a portion of the field produce to them.

Another type of farm labor recruitment is from the unemployed young men, who return to farming for the period of unemployment. Since the engagement in wage work at present is mostly year-long, the context for seasonal adjustment of farming and wage work activities does not exist in Moenkopi. Although construction labor is now the only occupation that retains seasonality, its season overlaps with that of farming and hence no significant labor contribution to farming can be made by these people.

The shortage of farm labor has also resulted in relative relaxation of the sexual division of labor in farming. Traditionally, women seldom took part in the cultivation of fields. Though shelling of beans and corn from the stalks collected by men in the fields had been women's responsibility and though women had been gathering fruit, they had had no part in any phase of the cultivation of the main crops in the fields. Nowadays, however, a few young women do not hesitate to go out to the fields and help their menfolk harvest

corn or thin corn stalks. A young divorcee of the lower segment has frequently been seen driving a pickup truck to haul her father's corn from the fields; it was also her task at home to chop firewood every afternoon.

On the other hand, with the wide use of grinding machines, the village women have been released from the toilsome work of daily corn grinding and no longer does a tranquil atmosphere of grinding songs exist in Moenkopi. Further, men frequently take the place of women in grinding corn by machine. The release of women from heavy household chores, however, has only infrequently led to their increased contribution to the subsistence economy across the traditional division of labor, primarily because a goodly portion of their released labor time has been absorbed in wage work, in which women have occupied an important position since the very early days of the Tuba City Agency.

It is important to note at this juncture that all these modes of labor recruitment in farming are based on kinship relationship, bilateral or otherwise. The premium placed on kinship for farming has apparently prevented the development of "contractual" labor organizations (Fitchen, 1961:114-15). Although the Sun Chief men-tioned working for the Hopi in the fields for wages as early as the 1910's (Simmons, 1963:203), no significant attempt to introduce wage labor in farming has been made in the village so far. Though there are cases of hiring fellow villagers or Navajo farmers on the basis of cash wages, their number is yet extremely limited and has only slightly affected the position of Moenkopi agriculture as subsistence economy.

Commercial agricultural production is only slightly in evidence. Two old farmers from Moenkopi have been conducting full-time cultivation of the crops primarily directed to the local market for sale. Specialization of their agricultural production for sale purposes, however, is severely restricted by the kinds of crops, which consist entirely of traditional subsistence crops. What demarcates them from other village farmers is merely their relative emphasis on salability. They have made no attempt to expand the basis of their operation either by acquiring more land, or by hiring more laborers, or by raising nontraditional crops.

Technology of Farming

The technological aspects of Moenkopi agriculture represent the area of the greatest outside influence. It was the Mormon settlers and later the government that bequeathed a huge complex of irriga-

tion canals to the Moenkopi farmers. Nevertheless, a characteristic feature of agriculture in Moenkopi is a peculiar lack of integration between irrigation, on which farming has been dependent since the beginning of the village, and the traditional Hopi techniques of dry or flood farming.

IRRIGATION. Though the Hopi always practiced a small scale of irrigation from contact springs on the mesa walls in terraced vegetable gardens near the villages (Forde, 1931:365-66), it never reached the extent and intensity of Moenkopi irrigation. I have already mentioned the traditional type of irrigation adopted in Moenkopi prior to the withdrawal of the Mormons from the area. However, this was immediately replaced by the reservoir irrigation system that the Mormons originally developed. At the same time, a great number of local Indians were employed for labor on the government irrigation farms and must have been acquainted with the principal aspects of irrigation agriculture. At any rate, irrigation in Moenkopi remained highly dependent on government supervision. This still holds true in the irrigation from Moenkopi Wash.

Of the two major irrigation systems that the Mormons developed, the first consisted of three small reservoirs in Reservoir Canyon and a ditch leading to the fields on the alluvial floor of Moenkopi Wash. Gregory observed a dam built by the Mormons in this set of reservoirs in 1912: "The waters of the lower 'lake' or reservoir, with an area of about 15 acres, [are] retained by a dam 350 feet long and 5 feet high. About 75 acre-feet is drawn off during the growing season" (1916:109). Since the government took over the administration of the area in 1903, another dam was constructed for the middle "lake" in order to prevent seepage in the lower "lake," and in 1908 the two dams were raised to the capacity of 350 acre-feet (Long Range Program, 1944:19). Each of the two dams was equipped with an independent gate. During the 1930's "drifting sand threatened to choke the [irrigation] channel, and a stone culvert was built and later extended with corrugated pipe. A new feeder canal was built in 1937" (Long Range Program, 1944:19). Sometime later the culvert was rebuilt with cement. The feeder canal, though improved in spots later, runs its course without a major change since the time of its construction; the course is parallel to Reservoir Canyon and merges with it only by the village, again to prevent seepage. In 1962 a new canal was laid out to connect the "middle" and "lower" reservoirs with stone slabs and cement; it runs on higher ground than the older one.

Another item of the Mormon legacy is a diversion dam on Moenkopi Wash, about a mile west of the village, where a small arroyo joins the Wash through *Tuokitkyala* (see Map 4). The water was diverted from the dam through a canal to the fields north of the Wash, to which it was brought back after a mile's run. The dam and canal were first used for the government farms of about 250 acres. During the time of this school farm operation, a diverse system of canals was added to the main ditch. Between 1915 (Gregory, 1916: map facing p. 144) and 1937 a flume was constructed to lead the water across to the fields in the *Matasu* area. The main canal from the diversion dam was paved with cement in 1960. A trace of a long earthen dam still remains by the present diversion dam on Moenkopi Wash. This may have been built by the Mormons prior to the present one and used to inundate the adjoining fields. There is no evidence, however, that this dam was made use of by the government after the Mormon withdrawal.

Presumably first the Indians (FDL) and then the government attempted to build another diversion dam near *Palawitika*, but this project was not completed (Gregory, 1916: map facing p. 144). During the 1910's the government at Tuba City also constructed a series of small reservoirs to impound spring water for the cultivation of the 60-acre school orchards in Tuba City. They were never applied to Indian farming. Only one of these reservoirs still exists in Tuba City, while the others were desiccated.

(1) *Reservoir Irrigation.* Of the above two major irrigation systems, that of Reservoir Canyon was the first turned over to the use of the Hopi allotment fields. The Hopi farmers were entrusted further with its maintenance, which included clearing the ditch or canal and repairing the dam.

It is difficult to know how the Hopi performed these tasks in the early period. In addition to the two tasks of maintenance, it also included that of constantly keeping the water level of the reservoir below the danger of overflow. Whoever noticed this danger was to open the gate to drain the surplus water. These tasks required cooperation among the farmers, and the village chief was to direct the entire work. In theory, cooperative labor on the irrigation system was carried out in the spring and occasionally in the fall after the date announced the date for work. No rule was established, however, as to the amount of labor each household or any other unit group within the village was to contribute. The work itself continued only for two days.

This organization of cooperative labor, however, was unsuccessful

for the following reasons. First, the village contained households whose farming did not depend on this system of irrigation. Second, some of those whose farms were irrigated from the reservoir simply refused to contribute their labor because of personal differences with others. Instead, they went out to work on their own accord. On the other hand, some others who did not depend on the reservoir irrigation came out and helped the work to cull a favor from the chief. Still others sent out small boys, who went simply for the fun of it. Consequently, it appears the work that started out as a village undertaking soon ended up as a private enterprise of the chiefly lineage and its associate households, all of whom were dependent on this system of irrigation.

A similar difficulty became evident in the irrigation of individual farms. This was again a matter of unstated, unspecified understanding or agreement. Individual irrigators opened the gate and let the water to their fields whenever they were ready to do so. This started soon after the repair of the ditch from April to May. Before drawing water to the field, it was ploughed by a mule plough only once. Earthen ridges surrounding a plot were raised and repaired to prevent leakages. Then the plots were inundated "brim full" (Ave to 10 inches deep). Planting began only after the water seeped into the soil and the ground sufficiently dried up. Depending on the growth of the corn shoots, the second or third irrigation

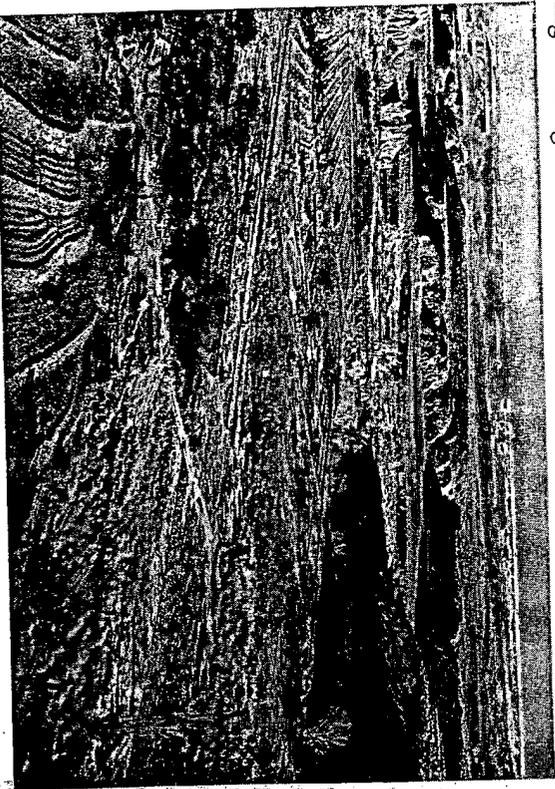


Plate 5. Irrigated fields of Moenkopi in winter.

was done in June or July. On the other hand, irrigation was entirely skipped for a year when the fields were considered to be sufficiently wet.

This mode of irrigation of individual fields continues at the present time without significant change. It should also be noted that the entire procedure is strongly reminiscent of flood-water farming as practiced in Hopiland proper (Hack, 1942:26ff.). Further, the technique prompts salinization of the soil by letting the alkaline-impregnated water stand on the fields until it seeps down into the ground. Although no field has so far been abandoned because of salinization, there are spots of land along Reservoir Canyon that show the surface bleached white with alkaline salt. In any event, irrigation in Moenkopi agriculture is no more than a superficial addition to the traditional farming technique of the Hopi.

Simple or crude as this may seem, the farmers could not avoid the cumbersome question of water distribution among themselves. Innumerable troubles soon developed in this respect.

First, there existed differences in the time at which individual farmers were ready for irrigation. While a general framework of farming calendar might, at this time, still have been given by the solar movements observed in Oraibi and transmitted through informal means of communication to Moenkopi, this was certainly not minute enough to coordinate the economic life of Moenkopi, already diversified because of its involvement in the reservation community of Tuba City. Finally, Moenkopi had a wider range of choice of planting seasons owing, to the shorter period of killing frost than in Hopiland proper.

Consequently, the order of individual irrigation did not always follow the most efficient route as might be imagined from the spatial distribution of farms and the course of the canal. Thus water was wasted by leakage into unprepared fields before it reached the field for which it was intended. Accusations of water theft were exchanged. Some were criticized for leaving the intake gates to their fields open while others were irrigating. The control of reservoir gates by individual irrigators was often neglected, leading to another cause of waste. Navajo and Hopi shepherders were blamed for allegedly watering their sheep in the canal and soiling the water.

In the face of these novel difficulties, the village chief was almost impotent. Though his position was recognized by the local agency, he was unable to bring about any sanction against the saboteurs of cooperative labor or the pilferers of irrigation water. In turn, the



Plate 9. Irrigated field in *Ma'asau*; note the intake gate.

from the last Navajo farmer. The subsequent order of irrigation in the *Ma'asau* area is also strict and one cannot obtain water if his fields are not ready by the time the water reaches there. The coordination of this work is done through mutual observations on the progress of the irrigation as well as daily, informal conversations in the village and fields.

Each plot is irrigated "brim full" or just enough to avoid overflow and only once. The water level in the Wash is not high enough for irrigation during the summer and fall. Depending on the number of plots in cultivation in a particular year, irrigation in the entire area of *Ma'asau* varies from one to two weeks. A field 10 acres in size takes about two days to draw water and irrigate after the water has reached the intake gate from the flume. While irrigating, the farmers vigilantly observe the fields night and day to prevent leakage as well as theft of water.

The second area that depends on the Wash water for irrigation lies to the northeast of the Moenkopi bridge. The farms in this area stand on an unassigned section of the land and are therefore illegal. No action, however, has been brought against the operators since the beginning of cultivation sometime after 1940.

Seven farmers in this area irrigate their fields with three gasoline pumps, each of which draws water for a distance of about 30 to 40

feet from the Wash through a flexible pipe, about half a foot in diameter. The seven farmers are divided into three pump-using groups on a kinship basis and each group chooses a time for irrigation at its own convenience. No coordination of the work is made among the three groups, however. Moreover, they often choose the fall season because the water seeps better into the soil by its frosting during the winter time. While this theory is only apparent, the farmers in this area are well aware of the complaints hurled against them by the other farmers downstream. This may be a more cogent reason to avoid the spring-time irrigation.

(3) *Spring Irrigation.* During the period of the Mormon settlement and shortly thereafter, irrigation from such springs as *Moenkopi*, *Ma'tsya*, *Ta'waki*, and *Tu'iktsiyala* was the only form practiced by the Moenkopi farmers. The technique of farming from these springs must have been similar to those described by Forde (1931:365-66) and others (Hack, 1942:36ff.). The fields by the present State Highway 264, near the upper segment site, still retain small plot demarcation and terracing, which are characteristic of the spring irrigation farms in Hopiland proper (see Map 2). At present, a few patches in the communal vegetable garden are still in use under this type of irrigation. The people often carry water in buckets from Moenkopi spring to irrigate some of these plots, while others obtain water from a tributary of Reservoir Canyon after it collects water from Moenkopi spring. The significance of these plots is presently nil and many are left unused.

More important of this type of irrigation are the fields in the *Shalako* area above the reservoirs along Reservoir Canyon. Five farmers have been operating on the land of about 40 to 50 acres since 1940. The farms are well irrigated by a series of rich springs that feed Reservoir Canyon.

To summarize the discussion of irrigation, it has been characterized by a disaggregative tendency throughout the history of Moenkopi. There is no coordination among the five distinct systems of irrigation presently used in Moenkopi. Though irrigation has been deemed indispensable for the success of farming in Moenkopi, its operation has been carried out without any community level organization. The Hopi farmers, in turn, exploited available alternatives of not only different sources of irrigation but also of non-irrigation farming. Thus one farmer expressed relief for the fact that he did not have to be dependent on one single system of irrigation.

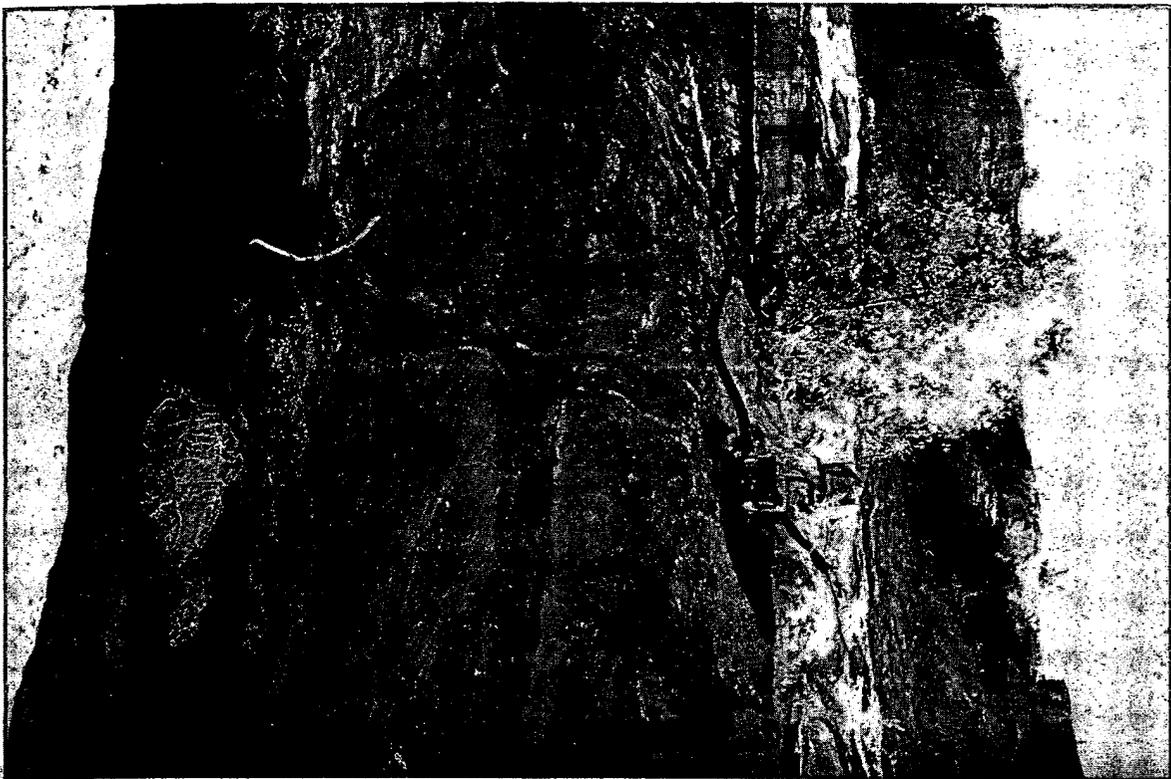


Plate 10. Irrigation pump and a flexible pipe in Hu:yanakkyo.

Dozier has argued that the absence of community-wide irrigation contributed to the persistence of the clan system among the Hopi (1960; cf. Kirchoff, 1955; Wittfogel and Goldfrank, 1943:27). The

case of Moenkopi irrigation, then, partially corroborates his argument, since economic cooperation among bilaterally related households is preserved at the expense of community integration for the maintenance of a unified system of irrigation. Disaggregation of the source of irrigation, while vitiating community solidarity, allows the villagers to form the network of interactions based on close kinship relationships and further to take part individually in the outside economy.

Second, the Moenkopi irrigation technique has not been tightly incorporated into the whole complex of Moenkopi agriculture. It is highly reminiscent of traditional flood-water farming. Irrigation in general may be regarded as a technological achievement to partly free farming from the exigencies of nature by controlling the supply of water. Thus, even in Moenkopi there exists the theoretical possibility of expanding agricultural production into double cropping. No such attempt has ever been made, however. In fact, the village farmers are not as aware of increased and stabilized yields from irrigated fields as they are of the additional toil expended in irrigation farming. The total contribution of irrigation to agriculture in Moenkopi is summed up in stability of annual production and lessened chances for abandonment of land due to erosion processes in flood-water farming. In short, irrigation in Moenkopi has remained as a mere adjunct to the traditional flood-water farming technique.

NONIRRIGATION FARMING. As previously mentioned, dry farming has been practiced in the fields near *Pa:latwika* since the 1910's (see Map 4). During the last war, one household in the upper segment took up dry farming fields by Dinnebito Wash and has continued their cultivation until the present time. The fields at Red Lake and Coal Mine Canyon, now abandoned, appear to have been dry farming fields as well.

The farming technique in these categories of fields is basically similar to that adopted in the irrigated fields minus irrigation. The following description of the technical aspects of farming, therefore, applies to irrigation farming as well.

Farming now consists of plowing, planting, weeding, thinning, harvesting, and plowing in that order. The irrigation phase is inserted between plowing and planting and, optionally, between planting and weeding. Plowing after harvests is practiced only in dry farms. All but the plowing operation by tractors composed the traditional pattern of farming as it is still practiced in Hopland

proper. Moenkopi farming techniques thus reveal a highly conservative character in general.

(1) *Plowing.* It was the government at Tuba City that introduced *en masse* wagons, plows, and plow harnesses to the Indians as "issues" in return for their labor on the school farms and road constructions during the 1900's and 1910's (TCL). Similar issues were apparently being made in Hopiland proper (Watson, 1945:66). In Moenkopi as well as in Hopiland the use of horse plows was still extensive during the 1940's (Watson, 1945:66-67). In the latter part of the 1950's, however, horses and horse wagons were rapidly being replaced by automobiles (see p. 167) and with this, horse plows disappeared and tractor-drawn plows were introduced. The tractors were purchased in Flagstaff and soon became fashionable in the village. The number of tractor owners, however, remained small and even at present, does not exceed 20. Consequently, the machines were often circulated among related households in the village. Further, those without horse or tractor now hire two village tractor owners for plowing and pay wages to them. The two have also been employed by the Navajo farmers in the vicinity.

The tractors do not appear to have helped alleviate the shortage of farm labor. Due to the fragmentation of farm holdings, there now exist numerous plots into which tractors cannot be brought

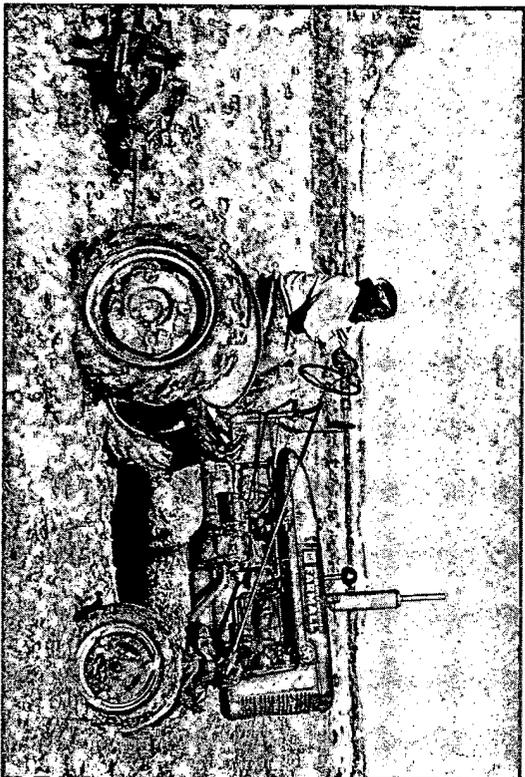


Plate 11. Old Moenkopi Hopi ploughing a dry field after harvest.

for plowing. Further, scattering of the holdings resulted among some farmers in a restriction of use of their tractors in a certain number of their fields, but not in others to which they could not be moved effectively. Partly because of this limitation of tractors for farming purposes, one owner applies his to such other non-agricultural services as removing weeds and drifted sands from the house lots, a service for which he receives payment in cash.

It is not clear what contribution the plowing phase made to Moenkopi agriculture. Traditional cultivation as it is currently practiced in some parts of Hopiland proper did not require intensive plowing. Clearing fields of weeds with a pusher hoe and wooden rake in First Mesa (Beaglehole, 1937:37; Forde, 1931:389) was the only preparation made prior to planting, and the top soil itself was left undisturbed. Beaglehole states, "Native tools are now being superseded by American tools. The plough is of no great value, however, since ploughing renders the soil too light and causes over-quick evaporation" (1937:37). It is generally maintained, on the other hand, that the plowing process, including disking and harrowing, is an essential ingredient of dry farming, since it breaks up earthen clumps in the fields and enhances the capillary action of pulverized top soil (Webb, 1931:360ff.).

The contemporary Moenkopi farmers seem to hold Webb's view on plowing, which would explain the pre-irrigation plowing. At the same time, however, they seem to regard the elimination of weeds and remains of corn roots from previous years as another important aim of plowing. On the other hand, some farmers occasionally skip plowing in their irrigated fields and when they do plow, the operation is for the purpose of rebuilding a new pattern of plot demarcation by destroying all the pre-existing ridges.

Unlike irrigated fields, sand dune fields for dry farming receive plowing treatments before planting as well as after harvest. The exact function of plowing in this type of field is not quite clear, for sands in these fields are already fine enough to need no further pulverization. Yet it appears the esthetic preference of the Hopi farmers for tidy corn fields somehow calls for plowing of dry fields if only to rid them of wind-driven weeds.

(2) *From Planting to Harvest.* Apart from the irrigation and plowing processes, Moenkopi farming has remained unchanged from the traditional pattern. The following, therefore, notes only the features characteristic of Moenkopi farming today.

Though digging sticks or "planters" (*so:ya*), traditionally made of greasewood branches, are no longer in use, the sticks fashioned

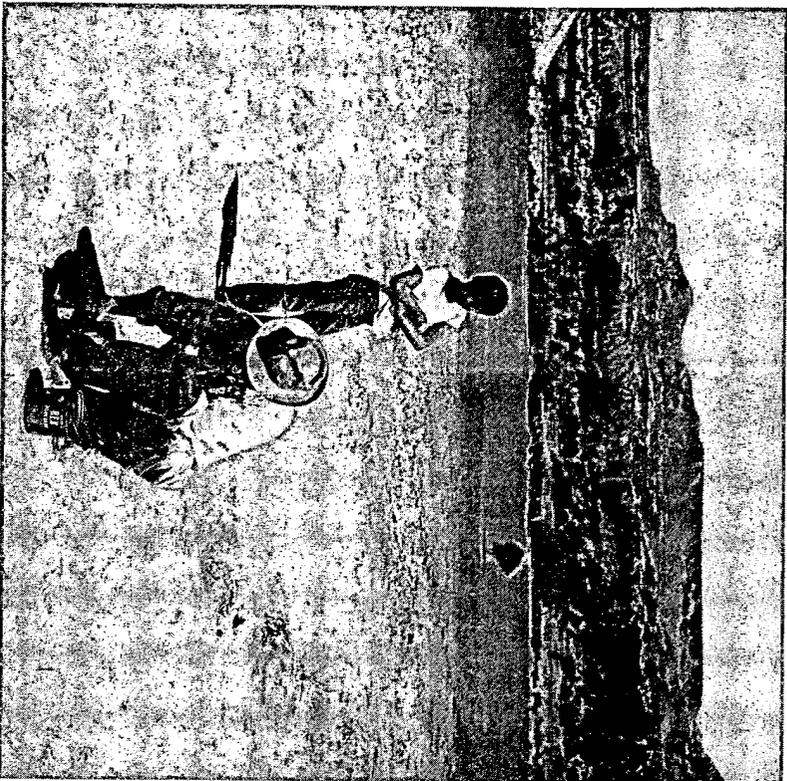


Plate 12. Moenkopi man planting in a dry field near Moenkopi Wash; note the use of a digging stick.

out of steel pipes have been extensively employed in exactly the same manner as the former. Some also have been using thin hoes. The steel implements are obviously more effective in digging in the irrigated fields, whose soil is often harder than the sandy soil of dry farms. One informant mentioned an experiment with an automatic planting machine but it ended in an evident failure. Otherwise no serious efforts for labor-saving have been made in planting. Alternation of planting rows of corn is still practiced in both irrigated and dry farms.

After harvest, corn stalks are left in dry fields for fertilization of the soil as in the customary procedure. In the irrigated fields, however, they are either taken out of the fields to feed horses or simply burned. Some farmers collect corn husks for wrapping of tamales. Use of fertilizers has not been very common. A few farmers



Plate 13. Young Moenkopi Hopi in a Ma'asanu field.

bought insect sprays for their vegetable crops. In general, the attitude of the farmers to fertilization of the soil remains little changed and they still abhor a danger of contaminating the fields by the use of chemicals.

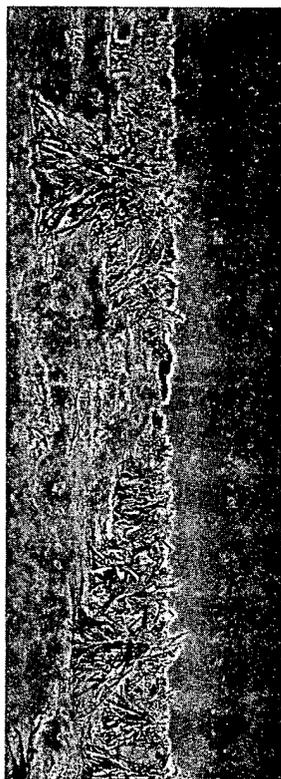


Plate 14. Dry field shortly after harvest.

PRODUCTIVITY OF IRRIGATED AND NONIRRIGATED FIELDS. The difficulties attendant to quantification of data have made it practically beyond my hope to make an accurate comparison of the productivity of the two types of fields. Yet it appears fairly certain that the labor input in a unit of irrigated fields is much greater than in the same unit of nonirrigated fields if only because of the irrigation itself. Further, given the same amount of capital outlay, a greater area can be brought under dry farming than irrigation. On the other hand, as previously indicated, the annual output in the irrigated fields is greatly stabilized due to independence of rainfall, and there is even a possibility of reaping double crops. Finally, the availability of land for the two types of farming may influence the relative rent and hence eventual cost of production. These factors, though isolable in theory, are so fractious in practical analysis that I give the following only as an indication of the village farmers' response to the two techniques of farming.

Irrigated fields in Moenkopi reflect higher relative productivity than the nonirrigated in the density of hills ($5' \times 5'$ to $3' \times 3'$ in the irrigated vs. $8' \times 8'$ in the nonirrigated). The farmers are aware of this difference. However, as mentioned earlier, they also assert that the irrigated fields demand greater care and labor than the nonirrigated. No specific preference for irrigated over nonirrigated fields has been expressed. I have already cited the instances of the Moenkopi farmers who left the village and their irrigated fields on marriage for other villages, where they have been engaged in dry farming. Though extremely scanty as evidence, these appear to indicate that the full potential of irrigation farming has not been exhausted in Moenkopi and corroborates once again the previously reached conclusion on the absence of integration between irrigation and the traditional pattern of farming.

To conclude, the absence of a lasting demand for subsistence



Plate 15. Man and young girl unloading the harvested corn from a dry field.

crops in the area and eventual participation in cash economy through wage work have left the technology of farming extremely conservative. Yet the farmers of Moenkopi are often proud of their farming activities and quote this heritage in comparison with the Navajo farmers in the same area. Though basic technological requirements are the same and the farmers of the two tribes are engaged in similar types of irrigation agriculture, the Hopi are wont to criticize Navajo farming techniques in terms of such relatively trivial points as the depth of planted corn seeds or the process of thinning the hills of corn. Apart from the economic significance, the present farming techniques are thus taken as a mark of tribal identity in this minority community on the Navajo Reservation.

Varieties of Cultivated Crops

Another striking index of the stability of subsistence agriculture in Moenkopi is the kinds of crops so far adopted by the village farmers. In the earlier period, the only crops in addition to the "Indian trinity" were cotton and wheat, which, however, remained marginal in the complex of Moenkopi agriculture.

The Navajo had long known of Moenkopi as "Where Cotton is Cultivated" (Van Valkenburgh, 1941:100). Mindelof (1891:33) and Christensen (1958:85) reported that cotton was typical of Moenkopi in the pre-allotment era. Indirect evidence of cotton in

the early period is also found in a rock hollow called *Pawaakynoki* east of the village, which had been used for weaving (see p. 195). In 1911, however, it was already noted that "at present very little cotton [was] grown by the [Moenkopi] Hopis" (TCL, November 23, 1911), although Gregory found it still in cultivation in 1912 (1915:114).

The subsequent fate of cotton growing is unknown. At the present time no farmer appears to cultivate it. I could find only one farmer with a comparatively recent experience of raising cotton from 1948 to 1951 but never since.

Reference to wheat is still more scarce. Christensen noted it again for the pre-allocation period (1958:85). The Sun Chief mentions it for the 1900's (Simmons, 1963:108). Gregory found it in 1912 (1915:119). Though the cultivation of wheat is still remembered by many residents of Moenkopi, I could not obtain any indication of approximately when it disappeared. I suspect, however, that wheat dropped out of the Moenkopi crop complex much earlier than cotton, primarily owing to the availability of flour through the local trading posts since the early period.

After the withdrawal of the Mormons, the Tuba City Agency succeeded to the operation of the orchards and irrigated fields that the Mormons had developed in the area and conducted a fairly profitable enterprise based mainly on apples and hay (see p. 176-78). With encouragement from the Mormons and government, the Indian farmers planted a number of fruit trees in their fields. These included apples, pears, peaches, and apricots. Many trees still stand in the fields of Moenkopi and fruit is harvested in great quantity. As shall be discussed, however, they have not effectively been directed for sale but are mostly consumed domestically or used in ceremonial exchanges. In particular, there is no indication that fruit growing ever constituted a profitable enterprise as it did on the government school farms. Therefore, I regard fruit in Moenkopi as a variety of subsistence crop that continues to exist along with the other major crops.

The documents for the earlier periods indicate the early presence of the corn-bean-squash complex. John D. Lee noted the Hopi planting corn and melons in their summer settlement of Moenkopi during the 1870's (Cleland and Brooks, 1955). Stephen mentions "corn, beans, squashes, pumpkins and melons" in his letter of 1892 (HvJ, Def. Ex. G-245). A group of surveyors noted "corn, beans and melons" in 1906 (HvJ, Def. Ex. 243).

Corn occupies the most stable position in this complex of sub-



Plate 16. Moenkopi woman taking roasted corn out of a stone oven.

sistence crops at present. Its varieties are blue, white, yellow (*takéji qa'ó*, Forde, 1931:392; Voegelin and Voegelin, 1957:A8.10), and sweet corn (*tawakchi*, Forde, 1931:392-93). Occasionally, *Wálapai* corn (*ko:niñ qa'ó*, Voegelin and Voegelin, 1957:A8.10) is planted as well.

How the sweet corn (*Zea mays saccharata* Sturt.) (Whiting, 1950:69) was introduced to the Hopi is not known (Forde, 1931:392-93). In Moenkopi at present it is the most popular corn, and households which lack labor to plant the other types of corn seldom neglect growing it. Apart from the suspected recency of its origin, the special position of sweet corn appears to be primarily because of the Hopi preference for roasted fresh sweet corn, a favorite item in the early summer menu.

The importance of white and blue corn is derived from its multiple uses not only in traditional foods but also as an object of ceremonial and kinship exchange. In addition, the blue corn is unobtainable in outside markets and it is widely believed that the yellow corn, though on sale in markets, is too hard to make corn meal. In many households white and blue corn often occupy the largest area of all the fields planted in corn.

Aside from these three varieties of corn, the others are optional and not infrequently omitted from cultivation. An informant who has been planting white corn for several years mentioned that its

main purpose was for sale. However, such a status was not accorded to it by the others who planted it as well.

It is difficult to determine the next most prevalent crop in Moenkopi today. While two varieties of beans (Hopi lima and string beans) are raised in considerable quantity by some households, others do not cultivate either variety. On the other hand, muskmelons and watermelons are almost invariably planted on every family farm irrespective of the size of the patch.

Hack mentioned adaptability of beans to sand dune farms in comparison to melons (1942:33-34) and gave this as a reason for the prevalence of bean growing in Hotevilla, "... where over 60 percent of the cultivated land is watered by rainfall only, and thus is farmed by the method of sand dune agriculture" (1942:33). Some farmers in Moenkopi are aware of this, although no attempt has been made to concentrate beans on sand dune farms. Further, the difficulty of sand dune agriculture in Moenkopi makes the ecological separation of beans and melons difficult and has led to competition in which all present indications are that the melons appear to be driving the beans out.

This is first seen in the allocation of crops to respective fields. The corn plots are relatively stable and seldom are rotated with either beans or melons. On the other hand, the melons and recently sweet potatoes are more often switched around from one plot to another. In this process they tend to invade the bean plots. Thus the rule that "A melon field always keeps the same" (Forde, 1931:391) does not apply in Moenkopi. Since no definite pattern of crop cycle is present in traditional Hopi agriculture (Baaglahole, 1937:36; Forde, 1931:391), crop rotation among the present Moenkopi farmers is largely a matter of individual adjustments based on considerations of such economic factors as available labor, domestic needs, amount of yield, and, marginally, salability.

Even in these terms, melons seem more advantageous than beans in contemporary Moenkopi. First, the processing of beans is slightly more cumbersome than melons, since the former require shelling, husking, and drying by women. Further, a tiny quantity of bean is almost meaningless for household consumption. Melons, on the other hand, can be appreciated as delicacies even if they are produced in small number. Finally, they can be sold more easily than beans. All relevant factors considered, melons are more advantageous than beans in the present economic context of Moenkopi. In melon patches, squashes, sweet potatoes, and pumpkins are often added as supplementary crops.

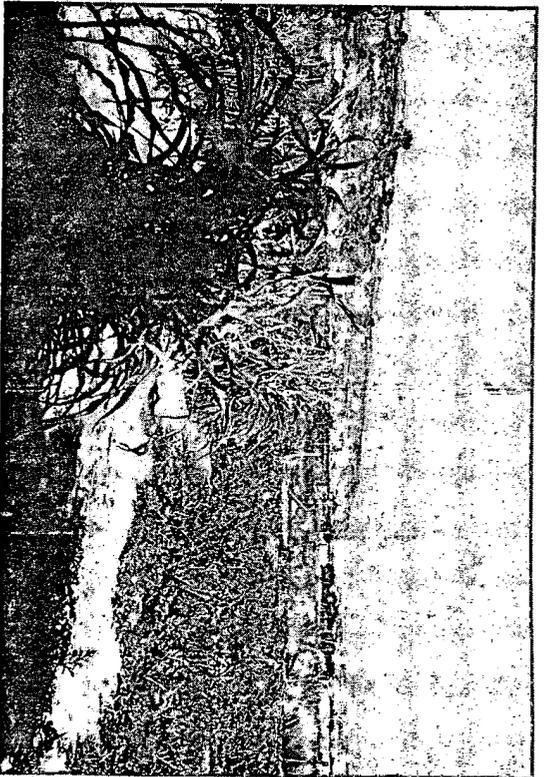


Plate 17. Communal vegetable garden in Lower Moenkopi; note the corn crop in the garden.

As with melons, a similar trend has been observed for vegetables, great varieties of which are now raised in the backyard gardens of Moenkopi homes. Occasionally, plots are prepared for vegetable crops in the corn fields outside the village. On the other hand, perhaps owing to the greater feasibility of home gardens and political antagonism in the village, many of the vegetable patches in the communal garden have been either abandoned or have lost their specialized use for vegetable growing. Some people have been planting corn in these plots. The vegetables now grown are chili, tomatoes, onions, carrots, cantaloupe, cabbages, and potatoes.

I could not decide which of these vegetables represent recent introductions from outside. Yet it seems the cultivation of vegetables in general has been increasing at the expense of wild vegetables, whose use had been limited in kinds as well as in quantity. The seeds of the vegetable plants, except for chili, are mostly purchased from outside and no attempt is made to preserve seed crops of the vegetables. The same applies to sweet corn seeds.⁷

⁷ The purchase of vegetable as well as flower seeds seems common in other villages as well. A trading store in Second Mesa has had a display shelf of commercial seed bags for sale.

To conclude, the kinds of Moenkopi crops have been remarkably stable and dominated by the subsistence plants all through the periods under consideration. No commercial crops have been added. As the contact conditions of the dual economy changed, certain crops became comparatively more prevalent than others, while certain others disappeared. Yet the core feature of the crop complex (corn-melon-beans) has been retained so far.

Disposal of Farm Produce

Native exploitation of the environmental differences between the Tuba oasis and the Hopi highland did not reach a stage of community differentiation of agricultural production, and no institution for the exchange of field produce emerged between Moenkopi and other Hopi villages, including Oraibi. Most of the agricultural produce thus flowed through the channels of kinship and ceremonial relationships as shown by the Sun Chief's visits to his relatives in Moenkopi "in order to conserve our food supplies [in Oraibi]" (Simmons, 1963:93, 108).

In the early periods of the village, the farmers took their early crops to the *Niman* ceremony at Oraibi to display them in the plaza during the dance and to be distributed among the contributors' kin in the audience. This practice is still observed by a small number of farmers in the village, who take the crops to Hotevilla and Bacabi, the only two villages that still give the *Niman* on Third Mesa. After the disruption of the Oraibi ceremonial cycle, however, the majority of the Moenkopi farmers ceased to offer contributions at the *Niman* ceremony and chose, instead, to distribute their field products to their kinfolk in other villages on informal occasions, on the occasions of kachina dances, or such individual kinship ceremonies as birth and marriage.

The general pattern of kinship exchange of agricultural produce remains well preserved in the traditional framework. Three levels of exchange appear differentiable here in terms of frequency and kinds of goods exchanged. First, the exchange is reciprocal, most frequent, and close to sharing between sister households and between those of parent and child. Between brother and sister households, on the other hand, it is usually the former that contributes field produce without reciprocation from the latter. Outside this range of kin, exchanges are formal and assume a ritual character. This is especially true in the exchange relationships between the households of father's sister and brother's son; a brother's son is expected to take meat obtained through hunting or, as has been

more frequently the case in recent years, purchased at outside stores, to his father's sister (*kiya'a*, Eggan, 1950:40-41; see p. 236). The latter reciprocates with cooked corn foods (e.g., *piki* or *pigami*). On the occasions of kinship ceremonies (first naming, Kachina initiation, or wedding ceremonies), a large number of clan relatives are involved in the exchange of various goods, including blue corn meal, *piki*, *tugu:viki*, *nokwivi*, or basket plaques and ceremonial bows and arrows. The Kachina ceremonies also provide contexts for exchange of corn, melons, and fruit among the kinsmen.

The amount of field produce expended for these exchanges is considerable. For example, about 50 pounds of blue corn meal is cited as "payment" for the gift of a basketry plaque by a paternal aunt on the occasion of a child's Kachina initiation ceremony (Eggan, 1950:51). The child usually obtains more than one plaque. In one case, a girl was given eight plaques, making the return of corn meal about 400 pounds. Taking 56 pounds for the weight of a bushel of shelled corn, the amount needed for the "payment" would be about seven bushels. Given 20 bushels as the average yield from an acre of irrigated land in Moenkopi and assuming that the size of a household holding is about 3.5 acres, two-thirds of which, about 2.4 acres, are planted in corn, we obtain 48 bushels as an annual yield of corn per household. Consequently, about one-seventh or 15 percent of the yield of corn is consumed for gift exchange. This type of large-scale exchange occurs only when a child is initiated to the Kachina society. However, the occasions for ceremonial exchanges of a smaller scale are far more numerous. Thus considered, the necessity to meet these obligations alone appears to be a sufficient cause for the continued cultivation of white and blue corn. The ceremonial need is thus a dominant motive for continuing farming at present. This illustrates again the fact that agriculture in Moenkopi carries an aspect of boundary maintenance today.

Some produce from the Moenkopi fields has been sold to the local traders and Navajo for cash since the early days of the village (TCL). No distinction was made in this practice between sale and nonsale crops. The traders even bought corn from the village farmers. It is not clear when they ceased to purchase agricultural products from the Moenkopi Hopi. During recent years the Hopi of Moenkopi and other villages have taken the place of the traders as buyers of the Moenkopi crops.

The sale of crops to other Hopi is much less frequent than to the Navajo. In sales to the Hopi, *piki*, made of blue corn, occupies

a dominant position. However, as the village came to contain households without farms or with an insufficient labor force for farming, cash transactions involving crops increased within the village as well. The Hopi from other villages, especially from Polacca, are said to have been frequent customers of the Moenkopi farmers. I was not witness to this during the field work, however.

Barter as well as cash sale of field produce have been conducted with the Navajo and continue at present. The Navajo bring mutton and jewelry to the homes of their Hopi acquaintances in Moenkopi and barter them for corn, melons, and fruit. I could not determine the current rate of exchange and a few Hopi women who dealt with the Navajo denied the existence of any fixed rate. The relationships between the Navajo and Hopi in barter are often characterized by the Hopi as "friendship" and appear stable enough to last for several years. However, the trans-generational continuity shown between the Navajo and Zuni (Vogt, 1955) does not exist in these relationships, nor is there a tendency to exclude other Hopi or Navajo from these "friendships."

Another apparently ancient form of transaction with the Navajo which involves field produce is entirely unilateral. It occurs on the occasion of the Navajo *Yebechi* dances during the fall and winter. When a dance is ready, a group of masked *Yebechi* dancers visits Moenkopi and collects contributions of melons and sweet



Plate 18. Melons displayed in a Moenkopi house yard for a gift to Navajo *Yebechi* dancers.

corn from the homes in the village. No reciprocity, even in the form of such ritual goods as blessing or prayers for the welfare of the Hopi donors, is made by the Navajo in return for these gifts. The *Yebechi* have visited other Hopi villages as well, and the Hopi frequently present caricatured *Yebechi* clowns in their lachina dances.

Most of the Moenkopi crops have at one time or another been sold for cash to the Navajo, who visit the village for that purpose. Melons appear to be the most popular item of purchase. The melons, in season, are displayed in the front yards of the Hopi homes and Navajo buyers visit one house after another, inquiring about prices and qualities of the melons, sometimes even haggling.

In barter as well as sale, it has been the Hopi women that have dealt with the Navajo visitors. All the harvested crops are controlled by women; one housewife once told me that "Corn, beans and everything belong to a man when they are in the fields but once they are harvested and brought into a house, they are women's" (cf. Titter, 1944:181). Transactions are conducted either in Navajo or in English but never in Hopi. Cash payments are made on the spot.

The above exchanges by the peoples of the two tribes have often been interpreted as symbiosis of the Navajo pastoralists and Hopi agriculturists. However, such an economic differentiation seems to be disappearing in the Moenkopi area for the following reasons. First, a process of mutual diffusion of the respective subsistence patterns has been going on through the interactions over a few centuries. Agriculture itself has become a well-established pattern among the Navajo in many areas (Brugge, 1964). This is especially true in the Moenkopi area, where a large number of Navajo families have been practicing a similar pattern of irrigation agriculture. As a result, the Navajo customers of Moenkopi are mostly from outlying camps where farming remains a minor activity. Navajo influence on Hopi economic life has been comparatively slight and yet it has left a distinct mark on the few Moenkopi shepherders (see p. 168). Second, participation in cash economy through wage work has assumed an increasing importance in the two tribes. This has tended not only to replace barter with cash transactions but also to direct the Navajo to outside markets and away from Moenkopi.

Thus, there has existed a modicum of competition between the Hopi farmers and outside merchants, including traders and super-markets on and off the reservation, for the Navajo consumer mar-

agriculture was primarily for subsistence, but some of the Mormon settlers kept livestock and maintained a close contact with the non-Mormon stock market in northern Arizona. Otherwise their commercial activities, based on a small number of farm products and Indian trade goods (Navajo wool and sheep hides), occupied a more important position as a link with the larger economy that had been developing along the Santa Fe Railway in the south and Salt Lake City in the north.

Unlike the federal government, whose main objective during this period was to maintain peace between different Indian groups and between Indians and white settlers, the Mormons in Tuba City and Moenkopi were confronted with the additional problem of their own survival in the arid environment. As a result, their interests were liable to conflict with those of the Indians over the limited resources in the area. These conflicts became manifest with the Navajo over the livestock range and with the Hopi over the farm land. To aggravate this, national resentment against the Mormons and continuing development of the regional economy drove the Mormon settlers into a still more difficult position, which eventually led to their withdrawal after the government compensated them for their improvements on the land.

EFFECTS ON MOENKOPÍ. The Mormon colonization of the area eliminated the Navajo menace to the tiny Hopi settlement of Moenkopi and allowed a comparatively stable occupation of the locality for more than a seasonal residence. All the Hopi settlers of Moenkopi were from Oraibi, and they consisted of those deprived of agricultural resources in their mother village. In Moenkopi most of them irrigated small tracts of farm land from the nearby springs. All the Hopi residents of Moenkopi frequently returned to Oraibi for religious practices; only social dances were given in the settlement.

A characteristic of the relationships between the Hopi and Mormon settlers during this period is complete lack of institutionalized modes of interaction. Although the Mormons occasionally recruited labor from the Hopi as well as from other Indians, they performed most labor themselves. They were thus extremely self-sufficient and exclusive. Lack of orderly interactive mechanisms between the two groups frequently resulted in violent encounters, especially during the last decade of the nineteenth century, when the competition for farm land became more stiff. The Hopi farming in the Moenkopi area, therefore, continued in the traditional

pattern of small-scale spring irrigation, and the Hopi adopted few crops from the Mormons. Nor did the Hopi profit from the elaborate irrigation works of the Mormons. As a result of competition for farm land, the Hopi were reduced to the position of sharecroppers for the Mormons on land they had formerly cultivated for their own subsistence.

Although there were informal, daily contacts between Mormons and Hopi, these interactions did not lead the Hopi to adopt any significant traits of the white man's culture. Mormon missionization among the Hopi was entirely a failure, and, since the settlers did not attempt to educate the Indians into the ways of the white man through schools or other means, the Hopi remained relatively insulated from the impact of factors of socio-cultural change. What was accomplished during this period was to prepare the Hopi for a more intensive and structured course of change through the Indian reservation system.

Western Navajo Reservation Period (1903-35)

CONTEXTS, FACTORS, AND MEDIATING AGENCIES. This is the first period when the federal government attempted consciously to bring about changes to Moenkopi in the framework of a newly established reservation, separating Moenkopi from the reservation of the Hopi. The general intent of the government during this period was to assimilate the Indians into the larger American society through individual land allotment and off-reservation boarding school education. The governmental agency at Tuba City encouraged agriculture among the Hopi of Moenkopi on the basis of allotment and assignment of land and through the issue of agricultural tools and wagons. The agency also took over the operation of farms, orchards, and the irrigation complex developed by the Mormons and marketed a portion of the farm products to other locations on and off the reservation. Unlike the Mormons, the agency conducted these operations not for the sake of areal development per se but for the economic welfare of the Indians in their charge, whom the agency enterprises provided irregular wage work. It also organized the work gangs of the Hopi youths in the Tuba City boarding school for summer wage labor in Flag-staff and elsewhere off the reservation.

The government also set out on an extensive and often rigid program of education of the local Indians through a day school in Moenkopi, a boarding school in Tuba City, and off-reservation boarding schools. In the last of these educational institutions, the