

YALE UNIVERSITY PUBLICATIONS  
IN ANTHROPOLOGY

NUMBER 15

NOTES ON HOPI ECONOMIC LIFE  
ERNEST BEAGLEHOLE

NEW HAVEN

PUBLISHED FOR THE SECTION OF ANTHROPOLOGY  
DEPARTMENT OF THE SOCIAL SCIENCES, YALE UNIVERSITY

BY THE

YALE UNIVERSITY PRESS

London: Humphrey Milford, Oxford University Press

1937

## NOTES ON HOPI ECONOMIC LIFE

### HOUSEHOLD, KIN AND CLAN

**B**EFORE I take up in detail the study of Hopi economic processes and values, it is necessary to summarize the main facts about the organization of Hopi household, kin and clan units, and to characterize in a preliminary fashion the economic aspects of these basic social institutions.

The household consists essentially of the father, the mother, and one or more children. Since Hopi marriage is matrilineal, there will usually be included in the household group unmarried or widowed brothers and sisters of the wife, married daughters, their husbands and children, and also widowed or divorced sons.<sup>1</sup> This enlarged family group occupies one house block, consisting of one or more living rooms and storerooms. Occasionally married daughters occupy adjoining house blocks, or other houses owned by the maternal family elsewhere in the village.

Whatever its composition, however, the household group remains the fundamental unit in social and economic affairs. Dr. Parsons has coined the phrase "brittle monogamy" to characterize Hopi marital arrangements. Although divorce is a simple matter and monogamous relations are theoretically subject to a certain amount of change, it is not correct to conclude that short-lived monogamy is the rule among the Hopi, or that the household group is marked by neither stability nor permanence.<sup>2</sup> Various patterns help to even the balance in such a manner that the family group may be looked upon as a relatively stable social unit. Father and mother cooperate in the task of bringing up the children, and the children in return develop sentiments of affection and respect for both parents. The rôle of the maternal uncle will vary according to the set-up of the household. It is usually his duty to instruct his sister's son in ceremonial and ritual; he is called upon later to advise on marriage arrangements and to help provide the wedding outfit for the bride of his sister's son. He takes over the duties of the father in other spheres only if the mother is widowed and does not re-marry, or if the mother dies and the father returns to his own maternal household, leaving his children in the household of his dead wife.

The reciprocal ties of dependence and group unity which mark the household in the social sphere are carried over into economic activities. Here the household acts as the ultimate unit of production and consumption. In marriage both partners assume definite obligations to contribute to the economic welfare of the household; when the family is enlarged by the presence of maternal relatives all are brought within the economic partnership. The division of labor between members of the group and the tasks to which all apply themselves in order to produce the household wealth are analyzed in a later section. The household is also the unit of consumption for this wealth, and, apart from feasts or cere-

<sup>1</sup> This is substantially correct. For a detailed analysis of the composition of 51 households in the two Second Mesa villages of Mishongnovi and Shipaulovi see P. Beaglehole, *Census Data*, 42.

<sup>2</sup> *Idem*, 47.

monial occasions when the men are required to eat in the kiva, the household and its guests eat all meals in common in the maternal house.

That the economic obligations binding together members of the household are considered very real and definite by the Hopi is demonstrated by an analysis of the causes of some of the household quarrels that came to my attention. Temperamental or personality differences often seemed to be fundamental; but in some of them the immediate cause of the friction lay in the charge that one or another member of the household was not fulfilling the economic duties that his or her status in the household demanded. Where conflict had not become acute peace was usually restored to the harassed household only by the offender's mending his ways and cooperating more fully, or else by his moving to the house of another relative. The point to be emphasized is that membership in the household means the fulfilling of definite social and economic obligations which must be conscientiously observed if all are to participate in the economic goods of the community.

#### THE BILATERAL KIN GROUP

Marriage among the Hopi not only links together husband and wife in a more or less durable bond; it also serves to connect two groups of kindred belonging to different clan affiliations. In this new kin grouping brought about by marriage the paternal relatives unite with those of the maternal family in the education of the child, and both together act as a closely coordinated unit in many economic activities.

The Hopi kinship system is classificatory, of the Crow type, and bifurcates linked kindred according to their paternal or maternal connections. Thus the Hopi use the term *i'na''a'* to designate (my) father, father's brother, father's sister's son and father's clansmen generally; *i'da'ha'* for (my) mother's brother or other clansmen of her generation; *i'na''i'* for (my) mother, mother's sister or step-mother, and *i'k'a''a'* for (my) father's sister or father's sister's daughter (plural *ik'a''da*). The term *i'so''o'* is applied to both paternal and maternal grandmothers, usually also to the father's eldest sister; *i'kwa''a'* is used for both maternal and paternal grandfathers.<sup>3</sup>

A brief review, to be amplified later, of the personal life of the individual from birth to death will serve to bring into focus the obligations and duties of both groups of kindred towards the child, their cooperation at life crises, and the reverse obligations of the child in terms of his bilateral kinship affiliations.

It is the father's mother, or the father's eldest sister, or failing these, another female paternal relative who takes the child when it is born, attends it according to the customary requirement during the first twenty days of its life and thus comes to stand in the relationship of *so''o'* to the child. It is the *so''o'* again who plays the principal part in the naming ceremony on the twentieth day, though most of the female paternal relatives are present at this time, make presents to the child and give it a name. All the names thus

<sup>3</sup> Lowie, *Hopi Kinship*, 367 ff.

given refer in one way or another to the father's clan or to another clan linked or merged with his own. At this important ceremony the only members of the maternal clan present are the child's mother and maternal grandmother. The naming ceremony itself may be best regarded as a rite of adoption, or initiation of the child into its father's clan; the child is henceforward known as "member" of his mother's clan but "child" of his father's clan group. In this connection it is of interest to note that the Hopi "illegitimate" child, the child whose father is unknown, is sometimes spoken of as a "stolen child," in the sense that the mother has stolen the child away from his father's clan. The use of such an expression indicates the importance of the paternal kin group in this matrilineal society, and shows also that the rights and duties of the father's clan are well marked.

Mutual obligations of the boy or girl to his or her paternal kin, especially the paternal grandmother and aunts, are intensified as the child grows older. He enters into the gift exchange relations with these kin, works for them at initiation, or in general whenever they require assistance, provides wood and salt for their needs, and shares the spoils of the hunt with them. The father chooses the hunt godfather, the mother the ceremonial godfather, to sponsor the child into the ranks of skilled hunters, or into ceremonial societies, respectively. Both kin groups, however, unite to hold feasts celebrating the *rites de passage*, or to pay those who act as sponsors on set occasions. At marriage, for instance, the kin groups provide the food for feasting and gift exchange, but it is the paternal male relatives principally who spin the cotton and weave the bride's wedding costume, while the paternal female relatives stage a mock fight to express their disapproval both of the bride chosen by the child of this clan and of the breaking of older economic obligations which marriage inevitably entails. Finally, at death, it is the paternal kin who usually perform the last mortuary rites.

So far I have emphasized the influence of the paternal kin group. But the child is, of course, deeply influenced by his maternal kin. He is born a member of their clan and traces descent through his mother's lineage. His maternal uncle educates him in ceremonial and ritual, and from his uncle or other maternal relative he may inherit priestly status in the ritual associated with his lineage. He will help, and will be helped by, those relatives in all the everyday economic activities, and though he will be a welcome guest in his father's relations' house, yet it is to his mother's kin group that he is likely in the last analysis to feel most profoundly bound.

The individual, therefore, in Hopi society is a full member of the bilateral kinship group, linked to both by strong ties of affection, sentiment, economic duties and obligations. For Zuñi Dr. Parsons has suggested that it is the father's people who are charged with performing the requisite rites during the personal crises of the individual, whereas it is the mother's people who help him in his economic activities.<sup>4</sup> Among the Hopi, this dichotomy of function is not so important as it appears to be for Zuñi. In a wider, though intersecting sphere, the bilateral kinship group extends the economic and social ties first

<sup>4</sup> Parsons, *Notes on Zuñi*, 255-58.

manifest within the narrower household group, and in a more detailed discussion later I shall show that it is this kinship grouping which plays an important role in the functioning of the characteristic cooperative economic complex.

#### THE CLAN GROUP

The organization of the Hopi clan with all its social and ceremonial interconnections is so full of complex detail that there are problems yet to be solved in this connection. Since it is my purpose merely to indicate the relation of the clan to the economic life of the group, I may block in the essential outlines of clan organization, leaving aside any discussion of more debatable points. It appears that basically the normal content of a Hopi clan consists of an exogamic, named, maternal lineage; that is, a unilateral group of true blood relations tracing descent through the female line. In many cases multiple lineages are to be found within the one clan, but this condition may be due to the merging of originally distinct clan lineages into one because of dwindling numbers, to the incorporation into the clan of a family or families of a different lineage which has migrated from another village, or perhaps in addition, to a process of independent name multiplication acting by analogy within the one clan. In any case, whereas the maternal lineage is a relatively stable unit subject to extinction only through natural causes, the clan, of which the lineage may be the whole or a part, is relatively unstable and may change its composition in the course of time through the operation of the factors just mentioned.<sup>5</sup>

Each maternal lineage has a name referring to some animal, plant, or natural phenomenon, though there are only the fewest traces of totemistic patterns, and is associated with a particular house in the pueblo, the house where the senior family in the lineage resides. In this house the clan fetish is kept, together with the clan mask. Each lineage in charge of the performance of a particular ceremony keeps in the senior house the medicine bundle associated with this ceremony. The internal organization of the clan is relatively simple. There is a male head who is chief of the ceremony which the lineage performs and who represents the lineage in secular councils. There is also a senior woman in the lineage, the clan "mother," by whom intra-clan disputes over such matters as division and allocation of land are in theory adjudicated. Kinship terms are extended to all members of the clan.

As already indicated, certain maternal lineages are closely associated with curing and ritualistic societies and with the ceremonial for which these societies are responsible. The bonds of association are traditional and symbolic. In certain societies all clansmen are conceived as potential participants in the ritual, but in general, membership of a society is open to men and to women (in the case of women's societies) from all the clans in the pueblo. Membership is through voluntary initiation, through trespassing on the performance of a ritual, or through being cured of an ailment or disease in the treatment of which a particular society may specialize. The chief priest of the society, however, is always a

<sup>5</sup> Cushing, Fewkes and Parsons, *Contributions to Hopi History*, 284-85.

member of the closely associated maternal lineage. This is true also of the occupancy of the semi-priestly offices associated with the secular control of the pueblo, the town chief, crier chief, war chief, sun watcher, and the like. Succession to office is matrilineal and, failing maternal kin, is likely to go to members of linked lineages.

The Hopi clan has thus important ceremonial and judicial functions, but as Dr. Parsons has pointed out in some detail for Zuñi, the Pueblo clan has usually economic functions as well, and attempts to differentiate nicely between the ceremonial and the economic are apt to be merely attempts to read distinctions of our own culture into that of the Pueblo Indians.<sup>6</sup> The social, ceremonial and juridical unit which is the Hopi clan is also an institution with economic functions. It is the clan, for example, which controls land, one of the more important items of wealth in the community, and which sets up rules governing the control and use of this wealth. It is mainly from clanspeople that members of certain varieties of working party are drawn, and, since it is by means of the working party that much of the work of planting and harvesting, housebuilding, sheep shearing and the like is carried out, it is evident that the productive capacity of the small household group is increased many times by its ability to draw on the services of all the members of the clan group. In this way the clan acts as an extension of the kin group on the maternal side and in economic terms it is perhaps not incorrect to define the Hopi clan as a body of men, women and children of common blood periodically united for the cooperative production of food supplies and other major forms of wealth.

The clan may also be said to assume the duties and obligations incidental to a scheme of social insurance. In this respect, as in many others, it is hardly possible to draw any sharp line of demarcation between the functions of the bilateral kin groups and those of the maternal clan group. The clan simply reinforces and widens the activities of the kin groups. It is usually clan members who give hospitality to members of the same, related, or equated clan when they visit another village, address them in kinship terms, treat them to food and shelter and enter into the mutual exchange of food or other presents. Finally, in time of distress, personal misfortune, accident or sickness, it is the clan which assumes the main responsibility for the sufferers by gifts of food, or by taking over the cultivation and harvesting of fields and gardens. Clan solidarity, nurtured and strengthened by cooperative work, patterns of mutual aid, participation in ceremony and ritual, shows to greatest advantage when hospitality is required or help imperatively needed.

<sup>6</sup> Parsons, *Laguna Genealogies*, 226.

## OWNERSHIP AND CONTROL OF PROPERTY

The patterns of ownership in any community are essentially those which regulate the behavior of an individual or a group of individuals in relation to the objects of material culture, the natural resources, and sometimes, to the more immaterial goods which are at the command of the members of a social unit. With the psychological aspects of the bond between the individual and the property he owns I am not now concerned. All I wish to do in these notes is to give an inventory of the main types of Hopi wealth, examining in each case the rights of the individual or group of individuals and the reason, nature and extent of control exercised.

### PERSONAL PROPERTY

In Hopi society, as in every other, there are certain economic goods which are personal in their very nature, since they are usable only by a single person at a time, and through long continued use become of personal interest to this individual and no other. Patterns grow up therefore which assure to this individual fairly complete and lasting control over such objects as clothing, ceremonial attire, ornament, weapons and implements. With other objects such as the house, this personal equation cannot hold and the reason for regarding the house as private property must lie in some particular emphasis in social organization: for example, the strong sib emphasis of Hopi society. For other objects, such as livestock, the prevailing patterns are probably the outcome of the patterns regulating the division of labor within the group.

Among the Hopi the man owns his clothes, his ceremonial costume consisting of mask, kilt, belt, arm and leg bands, rattles and the rest, ornaments of silver, turquoise and shell, weapons, riding equipment, tools and implements, occasionally a horse or two, and usually a few sheep and cattle. Today the man keeps for himself any money that he earns, but when this is spent on household goods, food or clothes for wife or child, these objects become his wife's property. Occasionally a man owns land in his own right; even so, where a man cultivates land for his wife, whether his own or his wife's, the produce therefrom is his only until it is carried to his wife's house, when it automatically becomes hers to dispose of at will. If a man wishes to present some of this harvest to his sister or mother, he may do so freely only before it is received in his wife's house. Thereafter he must ask his wife's permission before disposing of field crops. The same pattern regulates the disposal by the man of other products of his labor, for example, woven blankets or katsina dolls.

The woman, if unmarried, owns her own clothes, ornaments, katsina dolls, household implements. If she is married and the head of her household, she will effectively own also her house and its contents, the bedding of sheepskin and rugs, the simple furniture and domestic utensils of pottery, basketry or wood, as well as the corn and other produce stored in the house, but produced by her husband or male relatives. The woman further controls that part of the clan lands assigned to her household, the garden plot by the spring, one or two peach orchards and the peach house.

A further note may be added regarding the house. If a married man builds a new house away from the house block of his wife's people, as occasionally he may to escape conflicts with his wife's parents, the house becomes the wife's property and descends to her daughters. If an unmarried man builds a house for himself on a vacant lot near the village it will remain his even after marriage and he can nominally do anything with it he wishes at any time, give it away during his lifetime, or bequeath it away at his death. This second case is largely theory at the present moment, but with the increasing tendency to build on the flat ledge below the village, it may become fairly common for a man to build for himself before marriage, in which case there may result finally an entirely new arrangement of patterns governing the ownership of houses. It is interesting in this respect to find that at Cochiti and other Rio Grande pueblos where female ownership of houses is the older pattern, a man who builds a house for himself on unoccupied land, becomes the owner of it and may will it at death as he pleases.<sup>1</sup> Some of the objects mentioned above, such as houses, stock, and today, wagon, plough, cultivator, harness and other large objects may be controlled by two or more men of the same family. They come to an agreement as to when each shall use the objects, decide whether or not to accede to requests for their loan; in acquiring a new wagon, for instance, they arrange to work together in order to pay off the debt.

The rules of inheritance for personal goods throw light on the nature of their control. On a woman's death all her property is customarily inherited by her daughters. If the latter are still young at her death, the property will be held in trust for them until they grow older by the husband or maternal relatives, usually the latter. The trustees may use this property, cultivate the land, use the peach crop, or live in the house, if they so desire, during their period of trusteeship. In regard to the man, his personal goods, stock and sheep are customarily inherited by his sisters, brothers, and clanspeople generally, the widow, sons and daughters ordinarily inheriting none at all. A conflicting or possibly a newer pattern allows the man, but not the woman, some testamentary choice, and it is clear that today children as well as the close clan connections inherit from the father; that is, there is a tendency to allow members of the bilateral kin group to share in the disposal of the goods. I was informed also that not unusually a man leaves his property to the child of the person who took care of him in his old age; in this case clan affiliation, seniority and sex of the beneficiary gives way before the principle that reward should go to the individual who looks after the aged. I do not know whether this custom applies also to women, but it may be noted that Dr. Parsons reports the same custom applying at Laguna for both parents and is inclined to think that "the principle of inheritance in return for service may be, if not applied to houses, then to other property, an underlying and ancient Pueblo principle."<sup>2</sup>

Still further light comes from a statement of patterns relating to borrowing and theft.

<sup>1</sup> Goldfrank, *The Social and Ceremonial Organization of Cochiti*, 27-28.

<sup>2</sup> Parsons, *Laguna Genealogies*, 249.

Borrowing occurs frequently. In preparing dance costumes, or in making presents for children, a man borrows paints and tools from another, but he rarely takes them without permission and is careful to return them to their owner immediately he has finished using them. Ceremonial ornament or costume may be borrowed from one who is not a participant, often from men of another village, but these goods are returned after use, often accompanied by a present of food. It is the same with agricultural implements, horses, bridles or wagons. Permission is asked to use these things and they are returned without delay. Should the rights of the individual be disregarded the resulting action is looked upon as theft and the strongest disapproval is expressed. This sanction of group reprobation would in theory, be automatically operative and thus secure the return of the goods to their rightful owner.

The sanction for honest conduct, in other words, is found in the power of public opinion. In the old days a man caught robbing house, field, or garden would probably be violently treated. Today the matter of the theft is talked about, the name of the suspect is freely mentioned, he may be pointedly alluded to by fun-makers during a katsina dance, and disapproval is expressed on all sides. The case of a man who stole a string of beads in order to exchange them for a load of firewood and used the latter to help forward the preparations for his marriage is brought up time and again in talk, even though the theft occurred some time ago. Only in rare cases of long-continued and provocative transgression will severe action be taken and the thief rendered an outcast by being driven from the village.

#### GROUP OWNERSHIP

Many Hopi wealth objects, whether real or intangible, are controlled by a group of individuals, usually an organization of clan members, though, as already stated, certain objects are more often jointly owned by two or more members of the same family. Land is a typical case of wealth controlled by the clan group. Before considering land ownership, however, brief notes are given on the type of group control exercised over such varied property as kiva, springs, eagles, ceremonies, masks and medicine bundles.

Ancient masks, corn medicine bundles, and animal figurines are considered clan property and are controlled by the senior man of the clan. The corn *dixbo'ni*, or medicine bundle, is a clan possession only if the chief priestly office in a society is associated with a particular maternal lineage. The senior man of the clan is considered "trustee" of the associated society and is responsible for the performance of the society ceremonial. Altar paraphernalia used in the ritual will be kept, as a rule, in the senior maternal house of the lineage. That the trusteeship exercised over society ceremonial is no dead letter is shown by the fact that though the Hopi have been heavy borrowers of Zuñi and Rio Grande pueblo ceremony, they have steadfastly refused to allow representatives of Zuñi to purchase the right to perform the Hopi snake ritual. There is no individual or group ownership of katsina songs; anyone may sing them who learns them for a katsina performance. Hough, however, records the fact that "less inventive" Indians have come to the Hopi to learn

songs giving "magic power over the gods and forces of nature" and have paid a fee to be so taught.<sup>3</sup> He does not specify the nature of the songs.

Eagles belong to the clan on whose buttes they are found nesting. Members of one clan are excluded from removing eagles from the buttes owned by another. Eagles are kept in the village tethered to beams on the roof of the senior house of the clan. Feathers obtained from the eagles are freely used as needed by all men of the clan, or are borrowed from another clan if the clan supply fails.

The springs scattered about the mesa near each village are said to be owned by particular clans or maternal lineages in the village. Garden land near the spring is also owned by the clan, but the ownership in each case is of a special nature, based on traditional association, and the assumption of special responsibilities by the clan in question towards the spring. The spring *do'ji'va'*, for example, at the foot of Second Mesa below Mishongnovi pueblo is "owned" by the Water lineage of this village, because traditionally, ancestors of this clan brought water to this place from the Salt River near Phoenix in pottery vessels, and "planting" the water, caused the spring to flow from hitherto dry sand. Each year members of the clan assume control of the work of cleaning away the mud and debris from the source of the spring, clan members delegating to themselves the hardest and dirtiest tasks. They also perform ritual to feed and strengthen the spring and thus assure ample water for the succeeding year. People of the village use the spring freely at all times except for four days preceding the public performance of the Flute ceremonial, when there is a blanket prohibition against any use of the spring for secular purposes. At this time water is obtained from another spring, *lemi'va'* associated with the Eagle (Hawk) clan.

Natural cavities or hollows in the rock surface of the mesa top as well as reservoirs formed by damming up depressions with earth and stones are used as thawing cavities for the collection of winter snows and for the collection of summer rain water. The water so stored is used for stock, for laundry purposes and for making the adobe mud used in house-building. Small holes may be owned by individual women, larger ones by a group of related women, especially if the holes are adjacent to house blocks, and these are inherited in the maternal line. In many cases, however, the holes are common property and are used by all the women of the village as long as the supply of water holds out.

The kiva is generally considered to be owned by the clan which has built it, although owing to ceremonial associations and complexities, the men who use a kiva often belong to many different clans and usually loiter or work in that kiva which is either associated with their clan or with which they have ceremonial associations. Clan owners of a kiva control it through the senior man of the clan, and clan members are responsible for keeping the kiva in repair.

At Mishongnovi pueblo the Corn and Eagle clans are planning to build a new kiva. They have already started work on the new site close to their old kiva. The reason given

<sup>3</sup> Hough, *Hopi Indians*, 102.

for wanting a new kiva is that the present one is dilapidated and not worth repairing. A new kiva also represents symbolically a special prayer on the part of clan members for rain and good crops. Other reasons for building a new kiva might be quarreling and dissension among owners of a kiva, or an increase of clan membership through population growth.<sup>4</sup> Work on the new kiva is directed by Corn clansmen. Members of both clans assist in excavation, transportation of rock, and building work. Timber for the rafters is obtained from the Navaho, all clansmen and women contributing food to carry out the trading operations and to pay members of participating working parties for their services. When the kiva is finished it will be "broken in like you break in a colt," by all-night dancing and a big feast prepared by clanswomen and served to all dancers and spectators. The head man of the senior clan will act as kiva chief of the new as of the old kiva. Mindeleff mentions two cases at First Mesa of individual kiva ownership, brought about by the dying out of a clan through a smallpox epidemic. One of the few survivors of the clan inherited the clan kiva, made his friends members of the kiva, and, retaining control in his own hands, passed the kiva on to his eldest sister's son at his death.<sup>5</sup>

#### LAND OWNERSHIP

A full study of Hopi land tenure could well start with a consideration of the manner in which ties of sentiment and association springing from residence and localization, ancestral connections, legend, myth and religious belief, form the basis for the development of a strong bond of union between the Hopi and the land and thus determine the reality of property ties and interests. Such consideration, however, would take one far afield. All that is in order here is a brief analysis of the system of regulation whereby the rights and privileges of the individual or group are established and validated.

Boundaries between village lands are marked by sight lines, making use of natural features such as buttes, mesa promontories and hilly projections. These lines are well known by all and disputes about them are rare, although an old dispute exists between Hopi and Tewa of First Mesa, and the residents of Shipaulovi pueblo on Second Mesa have a grievance over the alignment of their own sight lines. Boundaries between clan lands were marked by stone slabs, on the face of which are engraved clan signs and other marks, but few of these are seen in the fields today. No boundary marks are necessary to define the limits of family land within the clan areas. Individually owned land broken in from village waste land is similarly unmarked, but the location of such land is known to men of the village and individual rights well respected.

The following legend tells how land was first divided among the clans. It was related by an old man of the Cedarwood-Fire-Coyote clan and translated by his son.

Coyote clan was the first clan here (e.g., first to settle after the legendary migrations). Then other clans came. Land was not divided up, it was free for all to use and cultivate. Certain lands

<sup>4</sup> Cf. Mindeleff, *A Study of Pueblo Architecture*, 134.

<sup>5</sup> *Idem*, 133-34.

orth repairing. A  
clan members for  
quarreling and dis-  
rough population  
ers of both clans  
for the rafters is  
to carry out the  
for their services.  
all-night dancing  
spectators. The  
d kiva. Mínde'eff  
ht about by the  
ivors of the clan  
aining control in

on of the manner  
l localization, an-  
the development  
rmine the reality  
ne far afield. All  
ereby the rights

se of natural fea-  
re well known by  
tween Hopi and  
lesa have a griev-  
clan lands were  
other marks, but  
ary to define the  
n in from village  
n to men of the

is. It was related  
son.

migrations). Then  
ate. Certain lands

were better than others, they had better soil and were closer to water, so that trouble soon arose. Each began to cultivate near the best land. It grew crowded there. Quarrels arose and killings. It got so bad that the clans came to Coyote clan and asked that clan to make rules for the land to prevent further trouble. Coyote clan agreed and asked the swift little fox (coyote) to settle the trouble. This fox could talk, he was like a man only he had a furry skin and was small. The fox agreed. He made prayer feathers using the little neck feathers of the eagle, the feathers of the woodpecker and the feathers of the little bird *nīwī'zi*. To each prayer feather he tied a *hoho'yawa*, a small blind black beetle,<sup>6</sup> and a *divi'mokwa*, a spider with red striped legs and a poisonous fiery sting. Then he took these prayer feathers into the fields and dug a deep hole, an arm's length deep. He built a fire in the hole, put the prayer feathers on top and filled in the hole with sand.<sup>7</sup> He built another fire on top of this place and put on this fire a stone marked with clan signs on two opposite sides. He went around the land dividing it up thus for all the clans and all the villages. Between the fields of each clan and of each village, the fox marked off a space twenty feet wide saying that if a man cultivated this waste land he would go blind, he would be poisoned and die. The fox gave the same sized lands to each clan, and each clan and village was told to keep to its own fields. He reported what he had done to the people and there was no trouble after this.

My translator added: "There was no trouble until Christian Hopi tried to break everything up by taking no notice of boundaries and dividing up clan lands. My sister's husband helped in this work and because of this wrongdoing, my sister died in the way the fox had foretold." No reason could be given as to why the wife and not the husband was so stricken.

As to land tenure, it may be noted first that the village remains a passive agent in land control. Stock is grazed and hunting takes place over all land adjacent to the villages irrespective of village boundaries. The village council comes into the picture as a land owning unit only on the occasion of dispute regarding boundary alignments. The effective controlling agent is therefore the clan group. Clan lands vary in size from a few hundred square yards to a square mile, and today, because of the operation of such factors as clan merging and reshuffling, there is little correspondence between the area of clan land and the number of clan members. Clan lands are distributed over a number of sites in various parts of the washes surrounding the mesas.<sup>8</sup> This in turn enables the household to distribute its holding in like fashion and becomes an important factor in the success of Hopi agriculture in so far as the washing away of one area does not mean the destruction of the whole of a season's crop and each household shares equally in the good land and the bad. Clan lands are divided between the maternal lineages, if there is more than one lineage in the clan, and again among the households comprising the lineage. The senior woman in

<sup>6</sup> The beetle *hoho'yawa* is also used in the preparation of snake emetic medicine and medicine for war ceremony.

<sup>7</sup> Note the use here of a characteristic Hopi witch craft technique; cf. E. and P. Beaglehole, *Hopi of Second Mesa*, 5-10.

<sup>8</sup> Forde, *Hopi Agriculture and Land Ownership*, 360, 364, gives maps delimiting clan and village boundaries which agree substantially with the information I collected.

each case is the controlling agent for the land her lineage or household uses. Not all the clan land is allotted in this way. There is reserved enough clan waste land to enable a household freely to shift its cultivable areas elsewhere should the originally allotted household sections be denuded by flood or sand-covered by wind. As already mentioned, disputes between households are arbitrated by the senior woman of the senior lineage in the clan. In each clan field the household area is known as a *dī'gi*. The length of each clan field usually runs from east to west. The *dī'gi* is measured by stepping off some fifteen paces from the southern towards the northern boundary, more or less according to the width of the field and the number of households participating in the division. Each household, therefore, receives a *dī'gi* in each clan field, and is provided with roughly the same amount of land. Variations in the size of the household relative to the amount of land needed for cultivation work out in such a way that the larger household will cultivate *dī'gi* that a smaller household cannot use. No interest or payment is demanded. The arrangement is informal and by mutual agreement. Similar informal agreements regulate the use of land of one clan in return for services, by a member of another clan.

Sections of cultivable land are associated with political and ceremonial office, either parts of the land of the clan traditionally associated with the office in question or else fields distinct from clan lands. Fields attached to the office of society chief were sometimes cultivated by society members in conjunction with clansmen of the chief; those attached to political offices are cultivated by working parties drawing membership from all men in the village.<sup>9</sup> This practice of cultivating special fields is breaking down today in some villages. When functioning actively it enabled holders of responsible offices to devote all their time to the duties attached thereto, unburdened by the time-consuming labors of agricultural work.

Apart from 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. The rights and privileges of the cultivator to this land are respected by men of the village. With the death of the owner, the land relapses 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.

The general rule governing the inheritance of land is that it descends within the lineage in the female line. Fields are inherited, that is, by the family connection within the clan. If a man is working, in addition to his wife's clan lands, land belonging to his own clan, this land returns at death to his maternal family; his children may arrange to work this land in turn but it is clearly understood that the title to the land remains with the father's

<sup>9</sup> Cf. pp. 28, 29, 40.

d uses. Not all the  
te land to enable a  
ally allotted house-  
dy mentioned, dis-  
enior lineage in the  
length of each clan  
ing off some fifteen  
ording to the width  
n. Each household,  
ly the same amount  
land needed for cul-  
tivate *ni'gi* that a  
The arrangement is  
e the use of land of

nonial office, either  
restion or else fields  
ef were sometimes  
ief; those attached  
from all men in the  
ay in some villages.  
evote all their time  
bors of agricultural

of land by the male.  
with fruit trees or  
village land, rarely  
; land are respected  
to village waste, or  
goes out of cultiva-  
ake it over, usually  
y secure the return  
nership the land is,  
it over to cultivate.  
; within the lineage  
i within the clan. If  
g to his own clan,  
range to work this  
as with the father's

clan. The custom in regard to individually owned waste land is given above. The inheritance of this land by the deceased's own children probably represents a newer pattern and is not characteristic of older Hopi practice.<sup>10</sup>

With the extinction of a clan, the rule seems to be for a linked clan to take over the lands of the deceased clan and for originally separated lands to be merged together. One informant insisted, however, that the children of the clan and not a linked clan would inherit the land. At Mishongnovi the Katsina clan is represented by several surviving men. When they die the linked Parrot clan will take over Katsina land. Parrot clan is represented by four or five men and two women past child-bearing age, and will likewise soon die out. A Parrot woman remarked that since there is no pre-existing linkage to dictate which of the other Mishongnovi clans should absorb Parrot-Katsina land, this land will ultimately go out of cultivation. It would not be right for an unrelated clan to use the land, nor could an individual cultivate it in his own right. In this case, however, it is likely that children of Parrot clan will cultivate if they need land or else one of two patterns reported on First Mesa may be followed:<sup>11</sup> a survivor may choose an unrelated girl to live in the maternal house and inherit the clan fields or else the family which by chance ceremonial tie or by fictitious or remote relationship takes up residence in the house of the extinct clan, will inherit also the clan fields. A final method suggested by an informant was that the family which takes care of the clan survivor in his old age and in whose house he dies has the right to inherit house and land in return for services rendered.

It may be noted in conclusion, that in patterns regulating tenure of land, though not so much in those regulating control, there is room for deviation from established rule. The rule in fact, always seems to be fitted to the individual case. Thus with one family where the husband is temperamentally at odds with his wife's clan and where in consequence the wife's clan refuses to allow him to cultivate clan lands, the situation has been eased by an arrangement with the paternal clans whereby the husband and his father-in-law occupy and cultivate land of their respective clans. The family is supported on the crops produced therefrom. This is a fluid arrangement and might cease should the household in question come to terms again with the wife's clanspeople. When a man thus cultivates his mother's land it is usual for his wife to make in return regular presents of food to his mother's family. But there are deviations from this pattern also and much will depend on the personal relations between wife and mother-in-law. With the family just mentioned these personal relations did not run smoothly and no presents were expected or given.

<sup>10</sup> At Zuñi, one who breaks in waste land, "raises the sand" as the Zuñi express it, has the use of it for life, but at death the land is inherited by clansmen. Columnar piles of stone at each corner of the field mark individual pre-emption. Cushing, *Zuñi Breadstuff*, 131-32, 153.

<sup>11</sup> Parsons, *Pueblo Indian Journal*, 91, fn. 142.

## ECONOMIC ORGANIZATION

It is well to recall in connection with an analysis of Hopi economic organization both the classless nature of Hopi social life and the fact that each household is largely a self sufficient producing unit. This goes far to explain the relative absence of specialization in economic activity whether of individuals or classes, and means that each pursues the occupation of craftsman, farmer, hunter or shepherd as the need, time and occasion coincide.

### DIVISION OF LABOR

By division of labor is meant separation of employments and not separation of the processes making up one type of employment. Common wants and desires, fairly standardized, simple and easily satisfied, require no diverse specialization to satisfy them. As summarized in the accompanying table, it is evident that division of labor is primarily conventional, based on sex secondarily and more indefinitely on age. There is little intrusion of one sex into the specific activities set aside for the other. The men in general attend to the more energetic outdoor occupations involving hard physical labor and, formerly, danger of attack from raiding enemy groups. They perform agricultural tasks, herd, hunt, provide wood and water (the latter was formerly brought to the village by the women, however) and cooperate to carry out ritual that has direct economic value. Men also carry on sedentary activities such as weaving, moccasin making and the like, but this is generally done in time taken from other tasks or during the winter months.

TABLE 1. DIVISION OF LABOR

MEN	WOMEN	COMMON
Hunting	Preparation of meat and carcass of animals	Men slaughter and butcher; the women dress and prepare meat for cooking
Trapping		
Planting	Husking of corn for seed	Planting, harvesting, and gardening (occasionally today, frequently of old)
Cultivating	Husking and grinding corn for food	
Harvesting	Preparation of food	
Roasting of corn	Drying of peaches, melon, squash, chile	Girls usually assist at the roasting of sweet corn
Gardening	Storing of food	
	Cooking and baking	
	Collection of wild food products	
	Care of chickens	
Sheep herding, shearing		
Cattle ranching		
Tending to eagles		
Spinning of wool, cotton		
Weaving of blankets, belts, ceremonial costumes; knitting		
Manufacture and repair of tools and weapons		
Working of silver		

mic organization both  
d is largely a self suffi-  
e of specialization in  
ach pursues the occu-  
nd occasion coincide.

not separation of the  
esires, fairly standard-  
satisfy them. As sum-  
r is primarily conven-  
e is little intrusion of  
general attend to the  
d, formerly, danger of  
, herd, hunt, provide  
the women, however)  
n also carry on seden-  
is is generally done in

MEN (cont'd)	WOMEN (cont'd)	COMMON (cont'd)
Preparation of paints	Preparation and dyeing of materials for basketry	
Carving and painting of dolls	Basket making	
Manufacture of ceremonial objects	Preparation of clays and pottery making	
Dressing, tanning of skins		
Manufacture of moccasins		
Making and repair of clothes for both sexes		
Housebuilding	Housebuilding	Housebuilding
Assembling materials	Plastering of floors, walls	
Heavy labor	Making of outside ovens	
	Preparation of piki ovens	
	Care of house and children	
	Domestic duties	
Practice of medicinal arts	Practice of medicinal arts, specially midwifery	
Digging coal	Carrying water (formerly)	
Expeditions for firewood, salt and pigments		Expeditions to collect materials for basketry
Trade and barter	Trade and barter	Trade and barter

The women care for the house, grind all the corn, cook and provide meals at regular hours, prepare extra foods for gift exchange and ceremonial meals, make baskets and pottery and care for the children. Women and girls now help in planting and harvesting only on ceremonial occasions or when it is necessary for the work to be done with extra speed, but formerly they participated in this work more fully. Both men and women cooperate in house building, or in guarding the fields from human or animal marauders when the crop approaches maturity, or again in making expeditions in the fall, the purpose of which is to replenish the household supplies of yucca for basketry, herbs for medicinal purposes and to trade with the Navaho. The elderly and the young of both sexes carry out subsidiary tasks which are not beyond their strength and endurance to perform. The boy drives horses to water, assists with the herding of sheep and hoes weeds; the girl assists with lighter household tasks and tends younger children; the very old people similarly occupy themselves with such tasks commensurate with their strength as sewing, spinning of wool, manufacture of implements, preparation of pigments, dyeing of elements for baskets and the like. The menstruating woman is not debarred from work. It is fatal to success for a pregnant woman to have anything to do with, or to be present at, the tanning of skins or the dyeing of wools, cotton or basket material. She is accordingly rigorously prohibited from participating in such activities.

#### EDUCATION

The major part of the education of the child in economic activities is unformalized and is in terms of play-work. "Most things a boy just teaches himself" but such self-teaching is based on trial and error behavior or on imitation corrected by personal advice and help

#### COMMON

slaughter and butcher; the  
men dress and prepare  
it for cooking  
ng, harvesting, and gar-  
ing (occasionally today,  
quently of old)  
usually assist at the roast-  
of sweet corn

whenever necessary. The boy's father or his male paternal relatives assume the principal responsibility in this connection, the maternal uncle limiting himself to occasional help but assuming responsibility for instruction and advice in ceremonial and ritual patterns, and for economic and general education also, only in the case of the father's being deceased or divorced from the mother.

A boy accompanies his father to the fields from an early age onwards, learning by precept and practice all there is to know of agricultural lore, technique and ritual—how to judge soils and prepare them for crops, how to terrace and dam an arroyo wash, how to plant and tend garden and orchard, how to care for livestock, how to recognize the nature and extent of land boundaries. From his hunting godfather, from listening to winter hunting stories, and in accompanying hunters on expeditions he learns the skills and rituals of the experienced hunter. Then in the winter months, after the boy has become proficient in the more prosaic activities, he is taught how to spin, dye and weave wool and cotton, how to tan leathers, make moccasins, and how to carry out other crafts in which his paternal relatives may be specially skilled.

The girl learns, by similar methods and through constant association with women of the household and related clanswomen, all there is to know about domestic duties and care of the children, how to prepare foods, the qualities of different colored corns, the uses of herbs and wild plants, the arts of basketry and pottery. In the old days she would be taught basketry only after marriage for fear that otherwise she would not be sufficiently proficient at grinding, cooking and baking. For the girl, as for the boy, the process of acquiring sophistication is largely one of imitative absorption of the techniques required for the work which the elders expect the children to perform.

When the child is recalcitrant, a useful pattern of discipline is provided by appeal to *katsina*. Children are told by their elders that *katsina* bring gifts only to those whose footsteps *katsina* have observed about the mesa at dawn, to those who rise early and are industrious. At *biwa'mu* again *katsina* go from house to house and threaten to take away with them from the village bad, disobedient and lazy children. They stamp, growl, swing ropes and bang various implements on the floor and thus thoroughly frighten the children. The mother of the house eventually pacifies the *katsina* with gifts of food and they leave only after having given the children a lesson in the value of industriousness and other Hopi virtues. Other *katsina* are reputed to be ogres always on the lookout to snatch up the lazy or ill-tempered. The total effect of this precept and example is realistically to support the authority of the elders in their economic and general education of the young.

When the children become proficient their help is of great value in the support of the household group. Much of the opposition of the Hopi to compulsory western education in government schools is based on the fact that children at school not only cannot observe or participate in religious ceremonials but also are unable to assist in the economic activities of the household. When the household is small the loss of services caused through absence of children at boarding school often means much hardship for the parent.<sup>1</sup>

<sup>1</sup> Beaglehole, *Culture Contacts*, *passim*.

SPECIALIZATION

The classic type of Hopi education makes the economic specialist practically non-existent. Each child is thoroughly trained in all the conventional activities associated with its sex, though it is inevitable that some individuals for one reason or another stand out in the community as possessing greater skills than the average in such work as weaving, silver- or skin-working. These experts are called in when there is work to be done that requires an extra delicacy of treatment or perfection of finish. The employer usually provides the materials to be worked and feeds the expert while he is employed. When the job is finished compensation is paid in food, today occasionally in money. One sheep is considered suitable return to the expert called in to tan an especially fine buckskin.

Much of the curing of illness is done by the ceremonial societies, each of which appears to specialize in the cure of specific disease or illness, through the agency of the ranking chiefs or priests of the society in question. Payment for cures thus effected consists in joining the appropriate society or else providing a feast for the next society ritual performance. There are today, however, and probably were also in the past, medical specialists not, I think, affiliated with the curing societies. They make a practice of diagnosing and treating various ailments ranging, in typical cases, from over-due childbirth to persistent ulcers on the leg or acute stomach trouble. When such an expert is called, the practice at Second Mesa is for the patient, should he feel inclined, to repay the expert's attention by a gift of food at some indefinite future date, though should the illness be serious and the cure properly appreciated by the patient, a gift of food will immediately be made to the medicine man. Perhaps payment was not so indefinite in the past because one informant remarked that a cured person would always give a member of the *woawi'mpkya*<sup>2</sup> curing society a gift of cloth when the expert left the house. "The medicine man puts this cloth on the ground anywhere as a gift to his ceremonial animal father. Any person who later happens along and finds the cloth may keep it." In any case the pattern of payment seems to vary slightly at First Mesa where, according to Stephen, a preliminary gift of nominal value, usually a few yards of cloth, is always made before consultation takes place and is followed by more substantial gifts of food and materials after treatment is finished. At Second as at First Mesa, however, the pattern is to assume indifference as to the size of the gifts and to accept whatever is offered with no overt comment other than the conventional word of thanks. Though specialists called in from another mesa receive no special payments, it is not uncommon for a Hopi expert to travel long distances to treat a sick Navaho and to receive large fees for the extra trouble involved in such consultations. It may be noticed in this connection that a specialist in sorcery, *bowa'ka*, might be hired to cause illness or death in a third individual and would be paid with turquoise, beads or a woman's dress for his services. A love sorcerer, *di'sgiavu*, engaged by a man to turn the affections of a girl

<sup>2</sup> A curing society, now died out at Second Mesa, which held public kiva ceremonies to exorcise witchcraft, though individual society members practiced private curing. Initiates chose as their ceremonial godfather either the eagle or the field mouse.

in a definite direction, would be paid with similar goods, or in lieu of these, the man would give the sorcerer his own sister or other female relative to act as his mistress for as long as the sorcerer desired her.<sup>3</sup>

#### SEASONAL CALENDAR OF WORK

The accompanying table enables one to study the interrelation between economic activity and seasonal conditions, and so serves to illustrate the fact that the Hopi, like other agricultural peoples, follow a sequence of activities closely determined by seasonal change and the movement of plant and animal life. It will be noticed that Fewkes gives names for an eight month cycle, Forde for ten lunar months, and Parsons for twelve moons. My own informants were in close agreement on names for the six lunar months extending from November through to May, a period when major calendrical ceremonial and planting for a new season's crop provides sufficient stimulus to distinguish accurately between a succession of moons. For the names of the remaining moons in the lunar cycle however considerable disagreement appeared to exist: one informant insisted that the six lunar names would be repeated with the qualifying adjective "winter" or "summer" as the case might be, another gave names for an eight month cycle, while still others gave names that were either obviously personal names not generally known, accepted or used, or else were names taken from the ceremonial peculiar to the month in question. The reason why there is no generally accepted list of names for the summer and early autumn months may well lie in the fact that that period of the year devoted to cultivation and harvesting is looked upon as a unit and there is no felt need to break up this functional unit into shorter periods. The list of twelve names given in the table was obtained from Yusi'ima, ordinarily well-informed and accurate in his information. It may be compared with the list that Parsons gives for First Mesa, with which it agrees fairly closely (see Table 2, p. 23).

Each lunar month is divided by the naming of the new moon *naso'fbi'*; first quarter, *dza'ηai'naso'fbi'* ("seven after new moon"); full moon, *wogo'mi'ia'* ("big moon"); and last quarter, *dza'ηai silau'di* (in seven, all gone). The word for day is *dok*. Short periods are measured in terms of so many days before or after the present one. The seasons are named *damī'i* (winter), *damī'oŋova* (spring), *i'yis* or *da'lo'ŋova* (summer), and *hī'hī'g'a'* (autumn, though the word means also "windy").

The lunar calendar is not specifically important in the determination of dates for work or ritual and so no problem of intercalation can arise. These dates are, in general, fixed by means of a precise observation of the position of the rising sun on the eastern horizon. The irregularities of mesas and buttes marking the eastern horizon enable the position of the sun to be correlated through experience with seasonal changes.<sup>4</sup> By means of this observation, work and ceremony are anticipated, planned for and carried out, though for agricultural operations, seasonal and weather conditions are final determinants. The holder of the office of sun-watcher in most village hierarchies is responsible for the solstitial ob-

<sup>3</sup> Cf. E. and P. Beaglehole, *Hopi of Second Mesa*, 5-10.

<sup>4</sup> Forde, *Hopi Agriculture*, 386-87, gives diagrams of schematic horizon calendars.

of these, the man would  
mistress for as long as

tion between economic  
hat the Hopi, like other  
ned by seasonal change  
Fewkes gives names for  
welve moons. My own  
months extending from  
nonial and planting for  
ately between a succes-  
ycle however consider-  
six lunar names would  
as the case might be,  
names that were either  
else were names taken  
why there is no gen-  
ths may well lie in the  
ing is looked upon as a  
orter periods. The list  
dinarily well-informed  
that Parsons gives for  
)

naso'fni'; first quarter,  
("big moon"); and last  
dok. Short periods are  
The seasons are named  
nd hi'hi'g'a' (autumn,

ation of dates for work  
re, in general, fixed by  
n the eastern horizon.  
enable the position of  
.4 By means of this ob-  
arried out, though for  
eterminants. The holder  
le for the solstitial ob-

ervation. At Mishongnovi, however, there is no office of sun-watcher, and horizon observa-  
tion is carried out by town chief, crier chief or ceremonial chiefs according to the time of  
the year and the next ceremony on the calendar. The summer solstice is observed by crier  
chief from the shrine dawavi'nbi on the west edge of town. From this date such future  
ceremonies as niman katsina, Snake, Flute, mazγau', lako'n, are dated theoretically by a  
system of dead reckoning in such a manner that the smoke-meeting for one ceremony will  
be held four days after the conclusion of the preceding ceremony.<sup>5</sup> Wi'wizim, the winter  
solstice and biwa'mu, are again fixed by the horizon calendar, the observation in this case  
being carried out by the town chief or the chiefs of the ceremonies concerned from the  
roofs of their houses in the village. Differences of observation will be ironed out by private  
meetings of the various interested members of the village hierarchy. The Second Mesa  
system of determining planting dates will be mentioned later.

TABLE 2. SEASONAL CALENDAR OF WORK

	FEWKES*	FORDE†	PARSONS‡	BEAGLEHOLE
November:	keli-müiya-uh kel—novice (also, sparrow hawk)	kel moyauö	kele müye	ke'l mī'ia'

The initiation moon. The initiation of boys into the wi'wizim societies.

Late harvesting finished this month. Other activities include weaving, moccasin making, sheep  
herding, miscellaneous work.

December:	kya-müiya-uh or wikiya; wherein wikiya is the imple- ment used for clear- ing fields of weeds.	kya moyauö kya—beware	kya müye dangerous moon	g'a'mī'ia'
-----------	------------------------------------------------------------------------------------------------------------	--------------------------	----------------------------	------------

The danger moon; girls must not grind corn at night lest the dead harm them.

Soyal ceremony held about Dec. 21st, if late, in the following month.

Continuation of indoor activities and sheep herding.

January:	bamüiya-uh: when baho or pray- er sticks are made	pa-moyauö pa—play	pah müye: play moon	ba'mī'ia'
----------	---------------------------------------------------------	----------------------	------------------------	-----------

\* Fewkes, *A Few Summer Ceremonials*, 151-53. Fewkes, *Tuysayan Katsinas*, 257-58, states that it is  
obscure whether the Hopi recognize twelve, thirteen or fourteen lunar months but, in any case, the five summer  
moons have the same names as those of winter.

† Forde, *Hopi Agriculture*, 388. Forde remarks that there are traces of a Hopi six moon cycle in which the  
terms for January, February and March are also used for August, September and October and the term for De-  
cember is often applied to the June-July Moon.

‡ Parsons, *Hopi and Zuñi Ceremonialism*, 58-61.

<sup>5</sup> The dead reckoning may also be checked by the horizon calendar if the dates are doubtful. Note that the  
smoke meeting for the mazγau' was delayed in Mishongnovi this year (1934) owing to the absence in Gallup of  
the chief woman of the society, and there was some doubt as to whether the ceremonial date should be announced  
in her absence or whether the crier chief should wait for her return before calling out.

FEWKES (cont'd)

FORDE (cont'd)

PARSONS (cont'd)

BEAGLEHOLE (cont'd)

The root *ba'* may refer to play, moisture, or prayer stick making.

The moon which sees the making of prayer sticks to be used during summer for prescribed ceremonies.

Indoor work, sheep herding, hunting, games and dancing.

<i>February:</i>	powa müiya-uh Wizard moon refer- ring to feast held this month	puwa moyauö puwa—quiet	powa müye exorcising moon	bīwa'mī'ia''
------------------	-------------------------------------------------------------------------	---------------------------	------------------------------	--------------

The quiet moon. Little is done, but certain preparations made for spring planting.

Indoor work, weaving.

Lambing late this month.

<i>March:</i>	üshe müiya-uh prickly pear moon, celebrating period of scarcity when pear was valuable food	ösö moyauö ösö—sprouting	ösö müye cactus bloom moon	īsī mī'ia''
---------------	---------------------------------------------------------------------------------------------------------	-----------------------------	----------------------------------	-------------

The sprouting moon or the windy moon.

Fields are prepared

Winter activities finished off.

Housebuilding and repairing often done during this moon.

<i>April:</i>	kwiya müiya-uh windbreak moon— windbreaks set up to protect young corn	kwiya moyauö melon planting moon	kwiya müye greasewood fence moon	gwi'ia'mī'ia''
---------------	------------------------------------------------------------------------------------	----------------------------------------	----------------------------------------	----------------

The moon when fields are cleared and got ready. Brushwood cut-away, breaking up of soil. Windbreaks made. Terracing of washes and water courses. Early planting of irrigated gardens with onions and chile. Very early corn and melons planted. General return to outside activities on part of men.

<i>May:</i>	hakiton müiya uh waiting moon	pama'ö moyauö planting moon	akiton müye wait moon	gawai'i'yis mī'ia''
-------------	----------------------------------	--------------------------------	--------------------------	---------------------

The moon for planting watermelon fields.

If season favorable planting in full swing by end of this month—early melon, corn, bean, squash.

Sheep shearing begins also.

<i>June:</i>	—	hakiton moyauö waiting moon	öy müye plant moon	i'yisdi''
--------------	---	--------------------------------	-----------------------	-----------

Planting time.

Every man is busy this moon.

Planting is pushed forward at full speed specially if held up by previous frosts.

Sheep shearing finished.

Expeditions to obtain eagles are arranged and carried out.

BEAGLEHOLE (cont'd)	FEWKES (cont'd)	FORDE (cont'd)	PARSONS (cont'd)	BEAGLEHOLE (cont'd)
summer for prescribed		Regular rabbit hunts to provide eagles' meat. Turtle hunting at the end of June. Working parties are held every day and there is much activity in the village.		
bīwa'mī'ia'	July: —	tala'va moyauö nameless moon (three moon cycles)	niman müye go home (kat- sina) moon	nima'n didzo'o mī'ia'
g planting.		The time for the home dance of the katsina and the time when rain is wanted to give the shoots a good start.		
isī mī'ia'		Weeding, hoeing, cultivation of fields. Miscellaneous activities about village. Weaving in spare time. Picking of first apricots. Some sweet corn usually harvested for the niman katsina dance in middle of this month. Eagles killed and skinned.		
	August: —	tala'va moyauö	pah müye play moon	nasa'n mī'ia' or na'mī'ia'
gwi'ia'mī'ia'		Feasting, nasan, moon. The corn now begins to ripen. Feasting on new produce. First melons due at end of the month. Peaches picked and dried in the sun. Melon seeds set aside for next season's planting. Early sweet corn is roasted in the fields, dried in the sun, husked and hung up in the store house.		
y, breaking up of soil. irrigated gardens with tside activities on part		Women collect wild products for immediate or winter use. Sheep are dipped and cattle branded. Hunting of antelope, deer and mountain sheep in August, September and October.		
	September: —	nasa'n moyauö	nasang müye big feast moon	mazyau'mī'ia'
gawai'i'yis mī'ia'		The month for the maz'au' women's ceremony. Harvesting is in full activity. All corn and beans brought in from the fields, dried on roof tops and stored away. Other field products also harvested. Seed corn placed aside.		
ly melon, corn, bean,	October:	tuho-oe müiya-uh Harvest moon from tuhota, act of carry- ing bags of corn home from fields	tuho'oc-moyauö burden moon harvest moon	töhos müye harvest moon lago'n mī'ia' or dīho'is mī'ia'
ï'yisdi'		The month for the laco'n women's ceremony or the month for gathering corn into baskets. The moon when all harvesting is finished—late melons, beans, squash brought in. Seed from corn, beans, squash, set aside for next season's planting. Fruit trees pruned.		
frosts.		Activity in the fields closes down this month. Occasional expeditions to salt lake south of Zuñi for salt made in this or the previous month after field work finished. Other expeditions made for pigments, trading, visiting.		

## THE ECONOMIC CYCLE

Apart from certain non-seasonal activities like rabbit hunting, stock tending, basket making, and domestic work, there is a well defined succession of tasks making up the economic cycle, which, more particularly for men, falls into two fairly distinct seasonal and social rhythms. From November on to the spring months, there is a series of great ceremonials to be performed, all bearing reference to the fertility of the next season's crop. Much of the work of the men during these months is by nature sedentary and indoor. It comprises moccasin making, preparation of dance costumes, making dolls, rattles and other children's presents, saddle repairing and other work in skins, spinning and weaving wool and cotton, making wedding outfits and other clothes. Most of the day is spent in the kivas working, playing games, listening to stories told by the older men, singing, and practicing dance cycles. The women participate in many of the activities devoted to wedding preparations, grinding and cooking parties being held in the houses. The women take part in kiva games and kiva dances especially during the January moon. In the late winter and early summer, both sexes cooperate in necessary housebuilding, because at these times snow and rain, collecting in cavities and dams on the mesa top, render it possible to make mud plaster without the otherwise extremely arduous preliminary task of carrying up water from springs below the mesa.

The advent of spring brings with it a different tempo marking a transition from a sedentary to an outdoor active life. There is hard physical labor to be done, for the fields must be cleared and put in order for planting, tools must be refurbished, dams and terraces repaired; if winter snows have been heavy, hope and expectancy of a successful season mark the transition. The agricultural cycle leads to long days of cultivation, finally to harvesting. Periods of rest and refreshment have come from the performance of katsina dances, the Flute or Snake ceremonies and the dances of the women's societies. After harvesting there is a free period when salt expeditions are made or visits to the Navaho or Rio Grande Pueblos undertaken for sociability and trade, or formerly, hunts for antelope, deer, and mountain sheep were arranged. With the coming of November, regular outside work slackens away and the new ceremonial year begins.

The reality of these work rhythms will become more vivid if mention is made of the summer and winter organization of the working day. During the spring, summer, and autumn months, the families earliest awake are moving about the village by sunrise and even earlier. The men chop firewood or do odd jobs; they go to the springs to tend the gardens and fetch water; they go out to the fields to get heavy work done before the sun becomes hot. The women husk and grind corn and prepare the first meal of the day, usually eaten about nine o'clock. After breakfast the men go again to the fields to cultivate or hunt, while the women clean the house, nurse the young children, grind more corn, cook or spend the morning at basket or pottery making. The second meal is eaten in the early afternoon, by the women and children alone or in company with the men if they are well

sk tending, basket  
ks making up the  
r distinct seasonal  
s a series of great  
next season's crop.  
ary and indoor. It  
, rattles and other  
nd weaving wool  
ay is spent in the  
singing, and prac-  
voted to wedding  
The women take  
In the late winter  
use at these times  
t possible to make  
sk of carrying up

transition from a  
one, for the fields  
dams and terraces  
successful season  
ivation, finally to  
rmance of katsina  
ieties. After harv-  
he Navaho or Rio  
for antelope, deer,  
ular outside work

on is made of the  
ing, summer, and  
ge by sunrise and  
rings to tend the  
ne before the sun  
of the day, usually  
ls to cultivate or  
l more corn, cook  
eaten in the early  
n if they are well

ahead with their field work.<sup>6</sup> The afternoon is spent by those in the village at craft activity, sleeping and cooking. During the day the village is quiet under the blazing sun, a quietness broken only by the occasional shouting of children at play or the monotonous swish of a grinding stone on its metate.

In the early evening the men come back to the village. The women thank them for their day's work.<sup>7</sup> The livestock is watered and driven to the corrals for the night. The evening meal is eaten by twilight and afterwards all sit outside the house talking, resting in the cool air or paying neighborly visits. The village goes to sleep between nine and ten o'clock, though men practicing for a katsina dance remain awake in the kiva until a much later hour.

In winter there is a different routine. The rising hour is later. The men go for water to the spring, but unless there is need of wood, or coal, or a hunt is projected, or there is stock to be tended, no one leaves the village and the rest of the day is spent visiting or in the kiva working, playing games, singing. There are frequent dance practices, much ceremonial to be performed and occasionally a visit to see dances in another village. The women go to the kiva as well but their main activity is in the house, grinding corn and cooking. The village is asleep at its usual hour unless there are all-night kiva dances to watch or ceremonial performances break up the night. Then men, women and children may all see dawn flush the eastern sky and much of the day will be spent making up arrears of sleep.

The terms used for divisions of the day are as follows: the morning star rises (dala·so''·'a·'ma); the grey dawn (kwi' 'a'η'nu'); the dawn becomes yellow (si'k 'aη'nu'); the sun rises (da·'wa 'a·'ma); early morning (dala·vai''); the sun is well up, 8 to 9 A. M. (diηva''); noon time (da·'wa naso'fɔi); early afternoon (da·'wa naso'fzɔba); late afternoon (da'fki'kwu'); sunset (da·'wa ba·'gi); twilight (da·si'bi); and night time (mi·hi').

#### ORGANIZATION OF WORK

From the organization of work in its most general sense one may pass to the type of organization that results when a number of workers come together to complete a given task.

The institutional form that operates in the carrying out of relatively large scale tasks is the working party, a cooperative organization based on the necessity for mutual help. It may be one of two main types according to the obligation to work which is involved. In the first type the obligation of a man or woman to work is one of self interest. "Because anytime anyone may need help, therefore all help one another," is a succinct Hopi statement of this obligation.<sup>8</sup> The first type may also be subdivided into three varieties according to the organization of the party whether on a kinship or kinship-clan, a society, or an inter-village basis. The first variety is the working party proper, the ai'ya'ada, which is either

<sup>6</sup> Formerly two cooked meals only were eaten each day; the noon meal consisted of wafer bread and water.

<sup>7</sup> Thanks are called to the men by the women of the household whenever the former return to the house after work.

<sup>8</sup> Parsons, *A Pueblo Indian Journal*, 70.

small in numbers and made up of friends and immediate relatives or else includes also on a larger scale many clan and kin relatives from both the paternal and maternal sides of the household. According to the work to be done it is called *gi'ai'ya'ada*, house building party; *no'da ai'ya'ada*, basket making party; *i'yi ai'ya'ada*, field working party; *ni''man ai'ya'ada*, grinding party; *'azi'lan ai'ya'ada*, sheep shearing party; and so on. The members of the party will be of one sex exclusively or both sexes according to the work to be done. Formerly to arrange a large mixed party, the men of the household killed a sheep and hung the carcass up outside the house. Men passing by would notice the sign and enquire as to the work to be done and the meeting place. These would tell others and so the word would pass round the village. Today the senior woman of the household will go around to see her women friends and arrange with them for the women or their menfolk to work on an appointed day. Parties of this type are "paid for"<sup>9</sup> by the woman for whom the work is being done in the sense that she provides the food for the midday lunch and for the evening meal of the workers and makes gifts of food to the wives of the men. Wives and children of the men are always invited to the evening meal and eat after the men have finished.

A working party proper composed of society members and organized at the request of a member of the particular society to work for this member or for the society chief was a rare occurrence in the Second Mesa villages and apparently never occurs today. Most informants denied the idea. The nearest approach to such a working party comes about from the fact that members of the four *wi'wizim* societies are under an obligation to work for the woman who represents *soya'l ma'na* during the *biwa'ma* festival in February. Should this woman require extra help during the spring planting of her fields she will organize the customary working party and *wi'wizim* members are required to participate in this. As is customary she feeds the workers at noon and evening. Stephen has left us, however, with a good description of a First Mesa society working party. *Wi'wizim* and *Agave* society men join together to clear the fields of a *wi'wizim* member, the *Agaves* assisting in this activity because to them, according to native belief, attach the virtues of fertility and sweetness, excellent qualities to be passed on to the fields. The man for whom the work is done sends to the kivas of the two participating societies half a beef each which is cooked by women relatives of the society men. At the end of the day's work, all the men go to their respective kivas to eat the evening meal. Occasionally also at First Mesa, members of women's societies join together in a similar manner to work for a fellow society member or the wife of a member. The group is fed, as before, by the person for whom the work is done.

The second variety of working party is the women's bean-planting group called *moji''i inana'ho'a* (bean planting for each other). Several women join together in a group and plant each other's bean fields in rotation, A's field on one day, B's field on the next, and so on until all the fields are planted. This is done only for bean planting. There is none of the

<sup>9</sup> Note that the verb *si's'vi*, to pay for, is used in this connection, the same verb being also used in the sense of paying for goods bought at a store.

includes also on a  
ernal sides of the  
ise building party;  
gī''man ai'ya'ada,  
e members of the  
to be done. Form-  
leep and hung the  
. enquire as to the  
) the word would  
go around to see  
olk to work on an  
whom the work is  
nd for the evening  
'ives and children  
ave finished.

at the request of a  
ociety chief was a  
s today. Most in-  
comes about from  
gation to work for  
February. Should  
she will organize  
articipate in this.  
left us, however,  
īdzim and Agave  
: Agaves assisting  
virtues of fertility  
ian for whom the  
e beef each which  
ay's work, all the  
lso at First Mesa,  
or a fellow society  
son for whom the

oup called moji''i  
a group and plant  
e next, and so on  
ere is none of the

; also used in the sense

ritual nor racing that accompanies the ordinary working party. The woman whose field is being planted on a particular day provides a light lunch of wafer bread, but no evening feast for the workers or their families.

The third variety that may be distinguished is the inter-village working party termed so'hk'i'au'' (everybody has to go). Such a party would be arranged by one who had large fields to plant or harvest, after discussion with the village and crier chiefs. Announced four days ahead, the news of the event would be relayed to other villages and a large party would turn out for the work. There would be much food provided by the arranger for noon and evening meals; young and old would take the opportunity to indulge in much fun, gossip and racing during and after work.

A different type of obligation is involved I think, in the second main type of working party, the party organized on a village basis to work for the town or crier chief, to clean out village springs, to repair stock reservoirs or village trails or to help specific unfortunate families in the villages. The obligation in these cases is not so much one of self interest, as one based on traditional loyalty for the village officers, traditional pride in the village and its equipment, or on charitable feelings for the sick and unfortunate. Village working parties are organized by the crier chief or other responsible individual and announced by the crier chief four days ahead.<sup>10</sup> Sometimes katsina may initiate the actual work by going from house to house and gathering together the men. Most of the men make an effort to perform their share of the work and the household members are more than a little ashamed of themselves (villagers do not allow them to forget this easily) if one at least from their number is not present as a representative. When the work is for the village chief or for the village as a whole, the women are responsible for providing and cooking the food for the worker. At First Mesa according to Parsons, the evening meal for the workers laboring for the town chief "is highly ceremonial, for each tastes five times only: first of beans, then of peaches, then of meat, and then leaves the house."<sup>11</sup> Second Mesa informants were not familiar with this custom but said that at any working party meal it was polite and customary for the workers to taste each dish four times only, though not in any specific order, and then to finish eating. The food presented to their wives on leaving would help make up the deficiency in the case of a hungry man. At all times, guests and strangers who wish to be polite should not taste the dishes before them more than four times for each dish.

Students of primitive economics distinguish two ways in which labor may be organized to perform group tasks. The first involves simple combination of labor wherein all the workers work at the same task in roughly the same fashion. The second involves complex combination of labor wherein the workers perform different tasks, but integration of effort and the attainment of a common goal are secured by the activities of a nominal leader. The Hopi working party is organized in terms of one or other of these patterns according to the type of work to be done. In relatively simple, small scale activities the party is

<sup>10</sup> By the war chief at First Mesa; cf. Parsons, *Hopi and Zuñi Ceremonialism*, 56.

<sup>11</sup> *Loc. cit.*

usually one of simple combination; for example, girls spend a morning together grinding corn, women come together to gossip and make baskets, or a group of men join to do agricultural work, tend livestock, or spin cotton and wool. In other activities the combination of labor tends to be complex. A good example of this is the work connected with the annual cleaning out of the spring do'ji'va' by a working party based on village cooperation.

On the day arranged the crier chief calls at about seven o'clock in the morning urging the women and girls to begin preparing food. Another reminder is called out about two hours later and at eleven, a third call is made to tell the men that all should assemble at the spring and to tell the women to commence baking the special corn dish somi'viki. Beside the spring in the shade of the cottonwood trees the old men of the Water clan, "owner" of the spring, together with town chief, crier chief and society chiefs begin to smoke ritually over a number of prayer offerings lying on a plaque in the centre of the group. The smokers exchange relationship terms and for the most part carry out their duties in a serious fashion. At intervals, however, they exchange gossip and joke together. Occasionally one not too old or decrepit leaves the group and assists the workers among whom there is a division of labor according to age and strength. The able-bodied assume the heavier tasks of digging and carrying sand from the terraces of the spring to a nearby dump. The old men hoe weeds. Water clan members bail out water from the spring and then dig out with their hands the black noisome mud at the bottom. Older children form a chain gang and pass containers of mud from hand to hand until the last youth empties the contents some distance away. The work is coordinated by common sense and custom, the nominal leader occasionally directing the allotment of work. Besides the traditional expectancy that all should work according to ability in the interests of the common good of the village, the work is lightened by the pleasure of working in company and enlivened by the usual goodnatured banter, gossip and laughter at any little untoward incident.

As soon as the source of the spring is cleared of mud the head of the Water clan places two prayer sticks in the ground on the north wall of the spring. Meal is sprinkled over the offerings with prayers for rain and the continued fertility of the spring. He next places two prayer feathers on a bundle of waferbread, sprinkles them with crumbled tobacco, meal and food, and places the offering at the bottom of the spring. The offering is usually placed in pottery bowls before being fed to the spring but on one occasion the bowls were left in the village by mistake. Bowls used the previous year were salvaged intact but were returned to under-water ledges without being used a second time. The ritual is concluded by sprinkling meal in the spring with prayers for its strength. This is done by each of the ritual smokers. A prayer feather is placed on the north rim and a short trail of meal is laid down leading toward the east. All participants then join in the feast provided by the women and girls. Before entering a house on the return to the village each person purifies himself by holding his hands over a smoking sprig of juniper. Failure to do this will result in household members suffering from swellings and sores on the body. The spring is again

together grinding  
 in join to do agri-  
 s the combination  
 nected with the  
 llage cooperation.  
 ie morning urging  
 ed out about two  
 ould assemble at  
 lish somi'viki. Be-  
 ter clan, "owner"  
 s begin to smoke  
 tre of the group.  
 ut their duties in  
 e together. Occa-  
 sers among whom  
 odied assume the  
 ring to a nearby  
 m the spring and  
 der children form  
 youth empties the  
 e and custom, the  
 rditional expect-  
 nmon good of the  
 l enlivened by the  
 cident.

Water clan places  
 sprinkled over the  
 le next places two  
 led tobacco, meal  
 g is usually placed  
 e bowls were left  
 ntact but were re-  
 tual is concluded  
 s done by each of  
 ort trail of meal is  
 it provided by the  
 ch person purifies  
 do this will result  
 The spring is again

tended to and fed four days before the public performance of the Flute ritual and thereafter closed for use until the Flute ceremony is finished.

Parties working on a village basis and involving labor in complex combination are also sometimes organized for housebuilding and, today, for voluntary roadbuilding. The division and coordination of labor in housebuilding is given later. In roadbuilding, the work is initiated by a responsible member of the community usually acting on the suggestions of the local government superintendent. The latter, according to custom, provides the food for the midday or evening meal of the workers and their families, but needless to say, few members of the party are polite enough to taste the dishes four times only when canned tomatoes and fruits are placed before them!

#### WORK PSYCHOLOGY

A few notes may be added here on the motives and stimuli characteristic of Hopi economic psychology. The primary motive of much work is of course, the desire to satisfy such fundamental needs as the desire for food, clothes, shelter, implements and other instruments of production. These needs are not satisfied in a naïve or non-institutionalized fashion but in terms of a complex of cultural forms and overlaid with other motives deriving strength from their connection with tradition, religion, aesthetics and the power of group opinion. Tradition sets the mould for activity, teaches the technique and sets up standards regarding what is expected from each individual. The desire to participate in ritual observances sets up other norms of work which give cultural respectability to a varied set of activities. Art for art's sake is unknown to the Hopi crafts-worker, but within the limits set by traditional and stylistic factors the basket or pottery maker produces utilitarian articles of high artistic merit displaying subtlety, freshness, and vitality of design. Finally, the desire to win social approval is a strong motive in a group where bonds of social unity are tied remarkably tight and where merciless ridicule is reserved for the man or the household that prefers laziness to economic self-sufficiency.

Besides these rather generalized motives there are a number of factors to be mentioned which help to make work pleasant and take from it much of its customary monotony. In the working party, stimulus comes, as mentioned earlier, from the pleasure of working in company with all the joking, the laughter, and gossip that prevail when the Hopi work together. During the winter months when the men spin and weave together in the kivas, story telling and the rehearsing of katsina songs are valuable stimuli. As they work the songs are sung and discussed, or else an old man, specially in the month *g'a'mi'ia'*, narrates folktales, culture hero myths, or stories of clan migrations. As one finishes, another takes up the tale and so the time passes in an enjoyable and pleasant fashion.

Song and song rhythm are also used in connection with grinding parties to help along the work. Such grinding parties are held in the winter months specially during November and January, and are termed *ga-sai'le'*. Young people of both sexes meet together in the

house of a woman who provides corn to grind and food to eat.<sup>12</sup> The youths sit on the floor and sing songs to the rhythm of a drum, dance songs, special grinding songs and the like. Formerly also the flute was played to accompany the songs.<sup>13</sup> The maidens, their hair hanging down over their faces, grind to the time of the song; as one tires she is relieved by another, and so the work continues throughout the winter afternoon or evening. These grinding parties have now almost died out at Second Mesa but they were formerly also the scene and the occasion for courtship activity as well as much hard work. Today, however, the women frequently sing to themselves, accompanying their song by the monotonous rise and fall of the grinding stone. There is no clan ownership of grinding songs as noted for Laguna.<sup>14</sup> Men going backward and forward to work in the fields often sing out loud the katsina or dance songs being currently practiced in the kiva, but part from singing of this type, Hopi music is practically all connected with dance or ceremony and on this account does not function as an important economic stimulus.

<sup>12</sup> Stephen records these grinding parties for First Mesa also.

<sup>13</sup> Cf. Winship, *The Coronado Expedition*, 100, 101; Cushing, *Zuñi Breadstuff*, 384.

<sup>14</sup> Parsons, *Laguna Genealogies*, 215-16.

youths sit on the  
ng songs and the  
aidens, their hair  
she is relieved by  
r evening. These  
ere formerly also  
ork. Today, how-  
g by the monoto-  
grinding songs as  
lds often sing out  
part from singing  
ny and on this

## AGRICULTURE

Before I describe the cycle of agricultural operations with their accompanying ritual, a brief summary may be given of the climatological conditions with which the Hopi farmer has to contend and the manner in which these conditions affect the principles upon which successful agriculture must be based.

Precipitation over the southern spurs of the Black Mesa, on which the Hopi villages are located, and over the surrounding washes, results in a normal annual rainfall of 12.72 inches at Keam's Canon, an annual variation ranging from a mean of 0.40 inches in May to a mean of 2.49 inches in July, and a variation over a ten year period ranging from approximately 5 inches for the driest, to 15 inches for the wettest, year. There is a mean snow-fall each year of about 27 inches, a temperature variation from 98° F to -9° F, and an average growing season dating from the last killing frost in June to the earliest killing frost in September of 105 days (116 days in 1930).<sup>1</sup> The characteristic form of precipitation is the thunderstorm, often of extreme violence, but usually so localized that the total rainfall for a month may be the result of one such storm which falls on an area scarcely more than 300 acres in extent.

The significance of the figures just given may be subject to a little elaboration. The season of least rain is from April to June. Since this is the planting and early growing season for most crops, this seasonal distribution of rain is far from favorable for agriculture. Moreover since evaporation in the clear hot days of early summer is most pronounced, corn and other plants obtain only a small portion of the rainfall that does occur. Moisture in the ground due to the seepage of melted winter snows and scattered spring showers is sufficient to germinate seeds and send their stalks above ground but insufficient to bring crops to maturity. July rains thus become a critical climatic factor. Because of their extreme variability (over a ten year period, there were four years when they were less than one inch), non-irrigated corn probably fails fully to mature every third or fourth year. Corn requires to mature on an average of 90 to 150 days, stone fruits a much longer period. Taking into consideration the average growing season of 105 days, it is evident that only in exceptional years can the Hopi expect climatic conditions favorable enough to grow corn and fruits in anything like necessary abundance. The meagreness and variability of rainfall in this desert country increases the value of the springs, which, being largely independent of short-period fluctuations in rainfall, ephemeral stream flow and mesa drainage, mark points of escape of ground water from the mesa face and provide the only dependable supply of water for small garden irrigation, domestic and ceremonial purposes.<sup>2</sup>

There is little residual soil either on the mesa tops or on the washes owing to scanty vegetation, severe winds, heavy thunderstorms and rapid run-off of water. Transported soil predominates, light and sandy in composition, distributed by wind or stream action

<sup>1</sup> Statistics from Gregory, *The Navajo Country*, and Grant, *Arizona Section*.

<sup>2</sup> Gregory, *op. cit.*, 49-71. Forde, *Hopi Agriculture*, 358-66, treats these geographical factors in more detail.

over the broad alluvial washes. The soil is not lacking in fertility, but save in exceptional situations the fertility is potential only, and only where quickened by hand irrigation or the seepage of water through talus slopes does the natural fertility grow garden and fruit crops in abundance. Elsewhere only the intense patience, industry, and faith of the Hopi farmer make it possible to gain a favorable living from the land.

#### NATURAL PHENOMENA AND WEATHER LORE

Since weather conditions are of fundamental importance for the desert agriculturalist, I give here the few notes that I have on natural phenomena and the signs whereby seasonal conditions may be foretold.

The stars, so'de'a (singular, so'hu'), were made by Coyote to give light to the Hopi at night. The moving stars are really Hopi, the little fixed stars high in the sky are white people. One cluster of stars moving west to east each night is called *dāi dāi kām* and by its position the progress of the night towards dawn may be judged since morning is near when this cluster is in mid-sky. Ursa major is called so'eīya'bi "star cup or dipper." The morning star *da'la'so* is the signal for all people to rise from sleep. A red star to the south which rises quickly and later appears to drop suddenly "like falling from a horse" is called *bono dzo'na'*. This star owns all the mules, horses and cattle. Prayers and meal sacrifices are made to it for those animals. A shooting star *so'hī'lixki* "star-bride's grinding" is thought of as a girl hurrying to the bridegroom's house to grind corn for her wedding. A falling star *bosəwī* makes a noise like thunder.

The following story is told of how the sun and moon were first made.

The Hopi first gathered up all the flowers that grew and mixed these with water into dough. This they fashioned into a human being. From a strong oak stick they made a hoop which they covered with buckskin and painted as for the Buffalo Dance. They placed feathers around the hoop and placed the hoop on the man they had moulded from the dough. They made prayer sticks for him to get rain and promised to "support" him. This promise made, they sent him off to the east, as the sun. When it rose however, they found that it was no sun at all but the moon. (It had only been whitewashed and not painted, except for black eyes and mouth.) So they set about to make a real sun. Proceeding in the same way, they covered the hoop with the woman's 'o'va' (weddingblanket) instead of with buckskin. This time they painted it with blue and other colors and put red hair around it. They told him, the sun, that he would live for ever and furnish the people with whatever they want, rain and heat, and so on. Then they sent him off; it was indeed the real sun when it rose up in the east and everybody was glad.

The eclipse of the sun (*da'wa mo'ki'*, sun dead) means bad luck because people will die. If the eclipse occurs immediately after the sun rises, people to the east will die (Zuñi and Río Grande people); if it occurs in middle morning, Hopi will die; if it occurs at noon people who live to the southwest will die.

Once the sun rose like a half-moon; there followed an epidemic of measles fatal to many children. Once it rose quite black and small pox followed. Once it rose as if in many pieces which joined

together again by noontime, but many people died of measles and pneumonia. (Informant was vague as to whether the sun caused the disasters or was merely a warning of the imminent danger to come.)

A heavy rain storm accompanied by thunder is known as *dzeḡweyo'kava*; a sprinkling rain or light showers is called *sivivoyay*. One informant personified the former as male and the latter as being little children, but this does not seem to be common belief. A steady slow light rain (*dzaḡa'ksivivoyoki*) soaks into the ground better than a heavy one. Hail (*lemo'yokva'*) indicates thunder on the way. One who goes out in a hailstorm will be struck by the lightning when it comes. Thunder is *imiki'*; lightning is *da'lwibigi'*. Lightning seen towards the south forecasts rain. It is *na'dwa'ḡla'lo'a'* "getting ready to rain." The rainbow, (*ḡaḡa'*) is disliked because it makes people sick and, by getting in front of the rain, drives the rain back with its bad smell. A person who steps through a rainbow will die. One who points at it will get a sore finger from which the nail will afterwards drop off. At the end of the rainbow is found excrement dropped by the rainbow. This is medicine which if collected, ground to a powder, mixed with water and swallowed, will cure chest complaints or enable one to have extra strength to triumph over a rival.

Observation of sun, moon, animal and bird life is used to predict seasonal and weather change according to the following beliefs. A circle round the winter sun or moon is known as the house of the planet (*mi'ia'g'i'da'*, moon house around; *da'wa gi'ida'*, sun house around). If this circle is bright and clear, it signifies rain to come, if dull it means cold weather and snow. When the summer sun rises with a house round it and a line underneath (*da'wadi'dzgi'ida'*), this signifies a wind and sandstorm. A new or a quarter moon lying on its back in the sky (*siba da'ḡkaḡzi*) means wind and no rain. At this sign old men come together and smoke for rain. A similar moon standing in the sky on one of its horns with the arc to the left (*lo'ma'kaḡzi*) means rain. A person who first sees the new moon (*mi'ia'kaḡzi*) says, "I see the new moon first. I'm going to get rich and raise many muskmelons." The wish will then come true.

The return of birds and small winter hibernating game to the fields shows that summer is coming. If a yellow bird (*sisi'k'adzim*) or a small bird (*i'ize'hoyem*) comes back when peach trees are in blossom this forecasts a good summer. If the red-headed bird (*da'wa ma'nau'*) comes back early this means that sun flowers will blossom early too, and there will be much pasturage for the stock. When the black bird with red on its breast (*ḡo'ḡka'*) returns it is also time to plant corn. If the dove (*hi'wi'*) comes early this foretells a good summer. If this and other birds come late it will be a bad summer, there will be no rain and the frosts will come early. Again, should the water bird with white markings on its wings (*ba'dḡo*) be seen in spring this signifies a wet summer; should one hear these birds flying northwards at night sometime before the niman katsina dance one knows that it will rain hard before the katsinas leave the village. To hear many cicadas (*ma'hi*) singing in the trees means a hot summer and little rain. Finally, when the wild duck (*a'a'dok*) flies southward in flocks at peach drying time, cold weather and frosts will soon come and harvesting should be hastened.

## CHOICE AND PREPARATION OF LAND

In spite of the fairly extensive ritual that the Hopi uses to aid him in crop growing, he is careful first to employ his utmost skill and knowledge in the choice of cultivable land. His choice is likely to depend on two factors, the position of the field relative to flooding by summer rains and a soil differentiation according to the crop he wishes to plant.

The drainage of water from the mesa tops is accomplished by intermittent arroyo streams which fan out this water over the washes and form alluvial floors one to five miles wide in the valleys between each mesa and in the plain to the south. In course of time deeply cut arroyo channels are formed and carry flood waters from flat to flat through the washes. Where the channels are absent the flood waters form lakes which quickly disappear through percolation and evaporation. Hopi cultivation depends upon a knowledge of the position of those areas in the middle of the wash or along the foot of the mesa liable to be flooded by occasional showers or the annual heavy rains of mid-summer. In these areas the seeds are planted. They usually rise an inch or two above the surface before July rains wholly or partially flood the planted area. After the water recedes parts of the field are stripped completely bare of plants, other parts are completely buried under heavy quantities of silt. The portion of seeded ground remaining unspoiled constitutes the irrigated crop which will be ultimately harvested.

Soils are pragmatically divided into four classes. A white sand or friable yellow clay is of little value and rarely planted, a brownish sand is reserved for beans and melons, a heavy dark-brown sand verging to redness is considered to be of high quality, while a blackish clay is believed to be the best soil provided it does not get too dry through quick run-off or fast evaporation of flood waters. On these last two soils corn is always planted.

The Hopi farmer has no system of crop rotation nor does he use natural or artificial fertilizer. Sometimes he may leave a field fallow for a year, but in general he plants each year the same area of clan land. The prevailing wind, however, coming from the southwest tends to blow the soil away from the western side of the field; since it is necessary to have the subsoil covered with six to eight inches of top soil in order to retain adequate moisture in the ground, the tendency is for the western parts of the field to be so denuded of top soil by wind action that the ground dries up and is useless for cultivation. Hence the custom has arisen of removing the boundaries of cultivated fields five to ten yards farther east each year. After a field has been in continuous cultivation for some years, it is likely that most of the surface soil will have been removed and it will be impossible any longer to shift boundaries eastward. The soil will be too dry and hard to render cultivation profitable. This field is then allowed to go out of use. Weeds, sage and rabbit bush, greasewood and other desert plants are allowed to grow in order to collect and hold freely blowing surface soil. After two or more years sufficient surface soil will have been collected by this vegetation, the sub-soil will become relatively moist again and the land can be brought back into cultivation. A similar practice is reported for Zuñi.<sup>3</sup>

<sup>3</sup> Cushing, *Zuñi Breadstuff*, 165-66.

With regard to fields situated on sloping hillsides or on washes where an arroyo cutting a deep channel reduces the amount of water received by a field, the attempt is made to conserve and collect both wind and water borne sand, by the use of dams, terraces and low fences of brushwood designed to check the flow of water and allow alluvium to be deposited. These terraces and blocking dams have to be rebuilt each season.<sup>4</sup>

The agricultural season opens in late February or as soon thereafter as winter snows have melted. The first task is the clearing and preparation of fields for planting. The implements used in this work are the digging stick (so'ya) some two feet long without a footrest, and used with both hands either to lever up bushes or to make seed holes; the planting stick (pe've) of the same length as the digging stick but of less diameter; the hoe of aboriginal pusher type (wi'kya) or of modern design (yu'k'daka). The pusher hoe was shaped something like a canoe paddle cut down the median lines, about eighteen inches long and three or four inches wide across the blade, the curved edge bevelled and sharpened. It was used with a pushing motion away from the agent. This hoe type was later superseded by the modern type with the blade, first made of wood or stone and later of iron, set at right angles to the plane of the handle. According to informants the three-tined rake of juniper described and figured by Hough<sup>5</sup> was never known or used at Second Mesa. Each household prepares its own portion of land by chopping off the weeds with the hoe and removing the bushes by levering them out of the ground with the digging stick. Bushes and weeds are gathered together by hand, left to dry in the sun for a few days and then burnt. The ashes are not used but left to be dispersed by the wind. Brush fences and other windbreaks are rebuilt in localities where crops other than corn are to be planted. The surface soil is broken up and loosened with the hoe or digging stick. The corn stumps of the previous year's harvest are not removed but remain in the ground to serve as a guide to the planting. Land for beans and melon is prepared at this time and also in the same fashion save that old roots are removed. 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. Besides individually owned land a household of seven or eight persons will usually cultivate the equivalent of about seven acres of land, most of this with corn, a minor amount with beans, squash, melons and garden products. Informants comment on the fact that the size of the fields and the amount of land cultivated were both much smaller formerly than today because the labor involved in clearing fields with aboriginal implements was too arduous to permit other than the minimum sized cultivations.

#### PLANTING AND CULTIVATION

Towards the middle or end of April if the season is early, but later on in May if conditions are not propitious, the planting of melon, squash, beans, corn and other crops begins.

<sup>4</sup> Gregory, *The Navajo Country*, 104, estimates that loss of water through incomplete or inefficient dam control is as high as 99.5 per cent.

<sup>5</sup> Hough, *The Hopi Indian Collection*, 237.

At First Mesa there is a series of nine ceremonial planting dates fixed by solar observation, the first three for watermelon, the remaining dates for corn.<sup>6</sup> The use of these dates by First Mesa villages is known to my informants but all agree that there is no such system in operation at Second Mesa. For melons, pumpkin, beans and early katsina corn, each man observes the sun for himself from any place in the village where he can get an unobstructed view of the horizon, usually from his own house roof, and fixes his planting according to his own determination of seasonal conditions. Watermelon, the first crop planted, is usually put in the ground when the sun reaches the place *wɔ'łɔza'*. For the main corn crop the case is slightly different. Town chief, crier chief and other men watch the sun, again not from any shrine but from any convenient place. When the town chief decides that the sun is rising from the right place he tells the crier chief and the latter calls out, four days ahead, the day on which all plant for the town chief. The crier uses the words *naie'ŋem i'yiwisne* "plant for the father." It is only after this planting has been done for the chief, sometimes for the crier also on succeeding days, that each man may begin to plant his own corn. Planting continues up to the summer solstice and then finishes. There is no prohibition on planting after the solstice but each knows that corn planted after this date has not the slightest chance of maturing before the frosts come.

Sometimes omens are sought for the coming season by sending selected men to katsina spring, a legendary home of the katsina spirits, situated to the north near Piñon. The men plant prayer sticks close to the spring, sprinkle meal in the six directions, pray for rain and retire. They return later. If the ground about the prayer sticks is moist and the prayer sticks themselves damp, it is a good omen for abundant rain and crops. If the ground is dry and there are no other signs of moisture it is a bad omen, signifying that the katsina are not going to send rain because of evil in the hearts of the Hopi. It is specially serious if such trouble is traceable to members of the Bear clan, clan of the town chief, to members of the Corn clan, intimately associated with growing corn, or to members of the Water clan, associated with springs and rain, and it is imperative that evil ways be mended immediately else the season's crop will fail to mature.

Great care is exercised in the storage and preparation of the seed corn. There are nine varieties of corn named as follows: blue (*sa'kwav ɣa'i*); white (*k'wɪɪza' ɣa'i*); red (*bala' ɣa'i*); yellow (*da'gizi*); speckled (*hɔɪzu'kava'za*); sweet (*dawa'k'dzi*); pink (*bala'avadza ɣa'i*); black (*gogu'm ɣa'i*); gray-blue (*ma'si' ɣa'i*). The corn is a hardy drought resisting plant with two special adaptations that permit deep planting with relative surety that the roots will obtain moisture during the critical seedling stage. It maintains roots during flood, matures quickly after brief midsummer rains, resists severe wind and sandstorms and is unaffected either by intense heat during the day or sudden change of temperature at night.<sup>7</sup> The seed is kept in special sections of the store room and is occasionally taken outside, sunned and brushed clean of insects and dust. This is often done by a working

<sup>6</sup> Parsons, *A Pueblo Indian Journal*, 74-75, 87; *Hopi and Zuñi Ceremonialism*, 59-60.

<sup>7</sup> Collins, *A Drought-Resisting Adaptation*, 293-302.

party of older women. The seed is removed from the cob by fingernail pressure (for ordinary food corn, a stick or another cob may be used) after the cobs have first been sprinkled with rain water. The seeds are then mixed with a blue flower (nzu'dzis) and the flower of a bush (sala'vi). This is to make the corn go further in planting. The seed cobs may not be burned as fuel until they have been moistened by rain. Failure to observe this means rain will fail in July and August. In case of necessity and if other fuel is lacking, however, the cobs may be used if they are sprinkled with the first snow water of the previous winter preserved for this purpose in a small gourd. If more corn is prepared than is necessary for planting, such seed may not be used until all corn planting is completed, otherwise the fields may be ruined by an invasion of mice and other pests.

When the seed is prepared a working party is arranged to plant the fields. Each man takes with him his seed container and planting stick. Some now use a section of iron pipe as a substitute for the wooden planting stick but the more conservative deplore this departure on the theory that the iron becomes hot in the sun and tends to scorch the seeds when they are placed in the planting holes. The leader of the party places a prayer stick at one of the principal springs with prayers for rain. When the seed carrier sets out from the village he and his burden of corn are both liberally sprinkled with water by the women of his household. Sometimes water is sprinkled on everybody present and the man retaliates by pouring water over the women. This is mimetic magic to make rain.

After the working party has assembled on the edge of the field, the men come together under the shade of the field hut (ki'si) to smoke and breathe prayers for rain. A rude shrine is made in the field, if one is not already there, by heaping up a pile of stones. The leader of the party, usually the husband of the woman whose field is being planted, takes two or more prayer sticks that he has made the previous day and stands them in the ground before the shrine. He takes a handful of meal, prays over it for rain and good crops and sprinkles it about the shrine in the six directions. If katsina have recently visited the village the leader will place beside the prayer sticks sprigs of juniper secured from katsina at the end of a dance. The prayer said over the sacred meal is to the effect:

I hope, my father in the underworld (mai'yunwa), that rain will come soon. I hope I will have a good corn crop unspoiled by worms or rabbits. I hope, my father, that you are in all directions and will send rain clouds from everywhere. I know you and hope you will help me and my people.

The men then smoke together again. The ceremony is performed only once for each field, whether the planting is done by a party or by one man. No mention is made of weeds. "If you are lucky you get rain; if you get rain you get weeds," represents the general attitude and there is nothing for it but to eradicate them as fast as they grow.

The planters work with bare feet. The esoteric explanation of this is that it is to cause clouds to blow up and deposit their burden to cool the feet, the more practical explanation being that moccasins and shoes become so filled with sand as to be uncomfortable to wear. The planters are careful not to throw any object from one to another since throwing anything will cause a hailstorm later on with disastrous effect to the young corn shoots.

The men, and formerly the older women, line up in a row about five paces apart on the boundary of the field. Sometimes a boy or a woman, if the season is late, accompanies the planter to carry and plant the seed after the hole is dug. The planter clears away the surface sand with his foot, drops on to one knee and with a few vigorous strokes of his digging stick, makes a narrow trough-like hole twelve to sixteen inches deep. The damp sub-soil at the bottom is loosened up, ten to twenty seeds, the number varying with the moisture of the soil, are dropped in, the soil is replaced and the surface packed down with hands and feet. Five paces are measured off and the next seeds planted. When the further boundary of the field is reached, the first man walks down the line and starts again after the last worker, taking care not only to make the rows of seeds alternate with each other in the form of transverse rows, but also to place the rows of seeds between the rows of stubble marking the last season's crop. The alternation of transverse rows is secured whether one man or a group participates in the planting.

Deep planting ensures that the seeds receive the benefit of all the moisture in the soil and so develop a root system that protects the plants from being blown away or washed out of the ground. Planting a large number of seeds is protection against depredations of mice, worms and vermin and the cutting powers of sand-laden westerly winds. The plants send up a number of shoots in the form of a bush and the outside foliage protects the corn bearing shoots within; even so, at the end of a season, the foliage of surviving plants on an exposed field is usually cut into shreds.

The workers rest during the hot noontide hours. Before eating each man takes a piece of food, utters a simple prayer for rain and throws the food onto the field that the spirits of the field may eat and be satisfied. After resting, and again in the evening, the workers sometimes run horse or foot races. The race may be over a short distance and run quickly to make the corn grow quickly or it may be over a long distance, run at a slower speed with a view to making the summer sun move slowly in the sky and thus give the corn plenty of time to ripen before the first autumn frosts. Towards sunset, the work is finished and the party moves back to the village without further ceremony, receiving the evening meal at the house of the woman for whom the work was done.

The account just given describes the customary manner in which corn fields are planted. With respect to planting for the village chief, additional minor details may be noted. The crier chief announces the work four days ahead and again on the appointed day, calls out four times in the early morning that all may be ready. The chief's wife or sister prepares the seed corn for planting. Seed left over is kept by the workers for later planting in their own fields in the belief that it will produce specially fine corn. The chief puts the prayer stick by the spring and carries out the field ritual. The workers eat a light lunch of wafer bread provided by the chief's household. Foot races are held in the late afternoon. On return to the village, each worker eats in his own house, since there is no general feast provided by the wife of the chief.

Melons, pumpkins, squash, gourds, cotton and beans are all planted before corn and

in that order, corn planting coming after bean planting is finished. No ritual is used in the planting of any of these seeds save cotton. The Hopi have four varieties of melon named in terms of seed color: white (kwĩdzá ga'wai'o); black (kwĩ ma'h ga'wai'o); brown (das'i'g'ga'wai'o) and red (bala'ga'wai'o). The word for melon (ga'wai'o) is also the word for horse. Seeds are set aside from melons ripening early in the season since these are believed to produce the sweetest fruit. A man usually plants his own melon, squash and pumpkin field without extra aid, placing the seed in holes six inches deep, the holes in transverse rows, the distance between each hole and each row being some three paces.

There are six varieties of beans: white (go'dza'wĩwiyi'o); black (kwĩma'h'moji); yellow (sig'a'moji); speckled (bi'ndomoji); red (bala'moji) and lima (go'dza'xadigo). A pink variety, unnamed, has recently been introduced. All but the lima bean are commonly grown. Formerly beans were planted by women's parties; today the work is done by the men. The beans are sometimes planted between rows of corn, more often on other smaller sections of land in transverse rows about one pace apart. Brushwood windbreaks are erected to shelter both beans and melon plants. Irrigated gardens are planted with chile, onions and other vegetables in rows and afterwards thinned out. Vegetable colorings are grown sparingly here and early corn for niman katsina will find a place also. Fruit trees are propagated from seeds in October or from cuttings in spring and the young plants carefully sheltered from wind by rock piles or old cans. In connection with garden plots one informant noted that the gardens at some springs, notably at do'ji'va' below Mishongnovi, were formerly planted only by women. The Badger clan mother from Mishongnovi and the Sun's Forehead clan mother from Shipaulovi came together and planted at this garden. Afterwards other women from the villages might plant when these two had thus initiated the work.

Cotton is not cultivated today but formerly it was grown on sheltered sandy slopes below the mesa. The seeds were soaked in jars for several days and then planted in holes three inches deep, the holes about one pace apart and some eight to twelve seeds in each hole. Sand might be piled up over the seeds to form a hill nine inches high, but not always. A prayer stick was placed on the field shrine to secure rain or else a hole about eighteen inches deep was dug in the middle of the field, the prayer stick placed in this and covered up with sand. Circular rock piles were built to shelter the young shoots and the number later thinned out to three or four in each hill. If the field was near a spring the plants might be irrigated. Usually, however, the plants depended upon rain water.<sup>8</sup> Cotton is termed bi'si'vi or bi'hĩ.

Some ten days after planting, corn shoots should appear above ground. Where sprouting does not occur the hole is usually reseeded. The cycle of cultivation now starts. The soil about the shoots is kept loose and weeds eradicated by means of weeding hoes. If the corn appears to be in an unsheltered position the young shoots, specially on the windward side of the field, are protected by brush-wood fences or circles of stones. They may also

<sup>8</sup> Cf. Lewton, *Cotton of the Hopi Indians*, 1-10, for botanical details.

be surrounded by low banks of earth in order to keep in moisture from rain or flood. When the plants have reached a fair height, probably two feet or so, cultivation is gradually slackened, a little attention being paid to the hoeing of weeds mainly after a good rainfall.

Beans, squash and melon sprout in a few days. The shoots are protected by low brush fences or low earthen banks running between each row. The fields are visited frequently, usually every other day; holes are reseeded where necessary, plants kept clear from drifting sand, fences or banks repaired, and a sharp watch is kept for signs of cut worm. As the plants grow bigger, the weaker shoots are thinned out leaving four or five of the more vigorous plants to mature. Mice and prairie dogs are trapped. The more advanced farmer has learnt today the use of disinfectant washes and usually sprinkles the melon plants with soapsuds or tobacco water to destroy insect pests. Finally, if runner beans are planted, these must be staked up on long poles and given special attention at the right time. Once the irrigated gardens are planted their maintenance is not laborious, especially when it is possible to run water from the spring directly through the irrigation channels. As summer advances the level of water in the spring becomes low and then the water must be carried by hand. The gardens are tended three times each week, usually in the early morning or evening, the former being the preferred time since all the spring water may be exhausted during the day in supplying domestic needs.

The final stage in cultivation comes when the corn begins to ripen. A constant watch is kept over grazing stock that it may not get into the fields and trample down the plants. Occasionally watch dogs are trained to stay by the fields day and night to frighten away stock and vermin. Rude scarecrows may also be erected for this purpose or else members of the household build a rough shelter and take up permanent quarters beside the field until harvesting is finished. Today, a rough double strand wire fence may also be used to enclose the cultivated area.

The Hopi distinguish the following nine named stages in the growth of corn: Corn when it first sprouts above ground (sig'adzmiqio' ɖaŋwu''); corn about nine to twelve inches high (giwa'nkiliio ɖaŋwu''); corn when the leaves are bending over towards the ground (ma'ɖiau'iŋwuŋwa''); corn about two and a half or three feet high (ɖala'mogio ɖaŋwu''); corn about four feet high (ɖala' gi'ɖaŋwu''); corn with small ears of corn just forming (si'gi'ɖaŋwu''); corn with ears of corn about one inch in diameter (bo'si'yŋwa''); corn with ripe cobs on the stalk ready for picking (ni'vau'va'); corn with cobs drying off and hardening on the stalk (ni'kw'sioda'). Of the varieties of corn grown by the Hopi, blue, white and sweet corn are most favored because they are considered more hardy, ripen quickly and produce more kernels on the cob than do the other colored varieties.

Native squash was extensively grown in former times; now the tendency is to make greater use of pumpkin. A few gourds only are grown to provide materials for rattles and sounding bones. Native tobacco is collected from wild plants and sun dried. It is doubtful whether it was ever cultivated in any quantity.

## HARVESTING

Towards the end of September and throughout October the crops are harvested and brought back to the village. This is a time of much feasting and jollity both in field and village. The women and girls provide special corn dishes to supplement the melons, fruit and fresh corn that are eaten as the crops are harvested. The workers sing, dance and run foot races after the major part of the work is done "just for pleasure and to have a good time." According to the size of the field, harvesting is done by the men of the household or by small working parties of kinsfolk, and the crops transported to the village by burro or wagon. If harvesting is late the men may well be preparing for the *wi'winzim* festival and be very busy during the day, in which case it is not uncommon for the men to go to the fields at night and bring back the corn by moonlight. Formerly when burros and wagons were few or non-existent, corn was brought in from the fields in the wicker carrying basket (*hwa'bi*), in skin bags or blankets. By arrangement with the heads of households certain days were set aside for the harvesting of different fields which were closer to the village than they are now. Men and women would form a long line stretching from the house to the fields, each individual ten or more paces from the next. The baskets would be filled with corn and passed on from one worker to the next until they arrived at the field owner's house where they would be received by the women and prepared for storage. Empty baskets passed down the line in the opposite direction. Large amounts of the corn dough (*kwi'mi*) would be piled on the floor of the house and this too would be passed down the line from one to the next that each might eat as he desired. The usual working party feast was held in the evening. The need for complete village cooperation of this type has disappeared with the increasing use of the burro. Stephen himself last observed a working party of this kind at First Mesa about 1880.

Beans, squash, melons, pumpkins, cotton and fruits are harvested before the main corn crop. Beans are left in the fields until thoroughly sun-dried, then threshed out, either in field or village, by placing them on a spread of cloth and beating with sticks. The shells are used as fuel and the beans stored in sacks or, in the old days, in large clay pots or, again, in plastered holes dug in the floor of the store house.

Squash is cut into strips, sun-dried, and then hung from the rafters in long strings. Pumpkins and melons are stored whole and not otherwise preserved.

Cotton was harvested either by picking the bolls and carrying them to the village in skin sacks (*sowi'wa*), or else by rooting up the whole plant and stripping the bolls from the plant in the village. The bolls were dried on the roof top and stored in sacks. The cotton was not ginned until it was required for winter weaving. Then women picked out the seeds, preserving some for next season's planting but roasting the remainder to make cotton seed "pop corn" (*bisi'vi si'vos gidiki*, cotton seeds roasted).

Stone fruits are split in two, placed on flat rocks and baked in the sun for two weeks. When thoroughly dried, the fruit is bundled into sacks and transported from the outlying

peach houses, where the family has been living during this period, to the store houses in the village.

The main corn harvest is completed before the first snow falls. The women take the crop when it is brought to the house, strip the husks from the cobs and spread the latter on the flat house tops to dry in the sun. The cobs are then stored in orderly rows according to color, the products of the new season's harvest being kept apart from former harvests. Sweet corn is tied in bundles and suspended from the rafters of the store houses.

Part of each harvest is laid aside for next season's seed. Pumpkin, squash and melon seeds are sun-dried and stored in small clay jars or boxes. Selected cobs of corn are strung together on yucca fibre and then hung in a reserved section of the store room.

Sweet corn is harvested and roasted in the fields about the middle or latter part of August. The oven is a large, deep, bottle-necked cavity dug close to the corn field. A large fire is lighted in the oven and allowed to burn for five or six hours. Meanwhile the corn is stripped from the plants. When the oven is hot enough, the fire is allowed to die down and green corn plants are strewn over the bottom of the cavity. The cultivator has previously made two bundles each consisting of a perfect ear of sweet corn wrapped first in the yellow-flowered medicine plant (gī'ŋa) good for stomach trouble, and then in the brush (ma'vi). The bundles are tied with yucca fibre and called Father Corn and Mother Corn.<sup>9</sup> The cultivator takes the Mother Corn bundle, points it about the mouth of the oven in the six directions and then tosses it into the bottom of the oven. The collected sweet corn is then thrown in, the Father Corn bundle is placed on top and the oven closed with large stones packed down with earth.

Before sunrise next morning the oven is opened up, the Father Corn bundle placed aside and the roasted cobs thrown out. If a man is suffering from indigestion or allied stomach complaints it is good for him to stay as much as possible inside the roasting pit when it is time to throw out the cobs, the intense heat being considered a sovereign remedy. The husks are removed and the cobs are placed in containers. Before eating any of the corn each worker takes a mouthful from the Father Corn cob "to keep the belly fresh and in good health." The remains of this cob and the Mother Corn are taken back to the village that the household group may sample them in a similar manner and for the same reason. The roasting is usually done by a small working party made up of men, youths and maidens. The men and youths harvest the corn and on the second day throw it from the pit. The maidens collect the corn, carry it to the oven and later assist in the work of husking the cobs. Such working parties are usually marked by much gayety and fun and provide the occasion for informal courtships. After the work is done a field picnic is often held. The girls roast corn over hot ashes and the boys hunt for rabbits. The latter are quickly roasted also and the workers eat before the return to the village.

<sup>9</sup> At Oraibi, according to Second Mesa informants, prayer sticks are added to the bundles. If the prayer sticks are not burnt or scorched when the bundles are removed from the pit, all will be well; but if the sticks are damaged in any way by the heat then it is an omen that misfortune will soon overtake the maturing crops or sickness is likely to attack the owner of the field or her family.

Each worker sets aside six cobs of corn for his own use and is later given a small sack-full when the work is finished. As the corn is transported to the village, each person met is invited to take a few cobs of corn. The women of the household, assisted by friends, receive the corn, string the cobs together on fibre or else slice the kernels from the cobs with a sharp knife, and store them in jars or sacks. Each assistant receives a bundle of corn for her services. Friends, relatives and other visitors to the house are all invited to sample the new crop and often presented with small gifts of corn when they leave.

#### RITUAL IN AGRICULTURE

Hopi ritual has three main purposes, the production of rain, fertilization and promotion of growth in human beings and crops, and the curing of sickness and disease. In that the ritual is heavily weighted in terms of the first two purposes, it largely serves the purpose of an economic instrumentalism and as such, has a close linkage with agricultural technique. In this connection it may be briefly mentioned under two heads: first, direct ritual for the promotion of crop growth and second, indirect or generalized rain ritual. The distinction is largely theoretical but the ritual may be so classified according to which aspect is more prominent.

In the agricultural cycle, direct ritual begins with the winter solstice ceremonies when seed corn is left on the kiva altar overnight and then returned to the store house "to help the crops." Sand or adobe mud from the altar is sprinkled over the seed corn to protect it from damage. Prayer sticks and corn meal effigies of peaches, melons and other crops are buried in field and orchard to promote increase and secure the fertility of the crops.<sup>10</sup> Later on at planting time and especially if an individual has large fields to plant with corn, katsina or Masau will be invited to participate in a working party. Second Mesa practice in this context may be described in some detail for comparative village study of the custom.

Katsina planting is arranged by one man, or perhaps two men acting jointly. The arranger notifies the chiefs of his wish to have katsina plant for him in the preceding February when katsina dances for the coming season are arranged. The planting date is called out four days ahead, and on the set day, katsina, almost invariably Navaho katsina, *nasó'f* *kadzí'na*, though one informant thought that any katsina might be danced, go out in the morning with the working party, each katsina providing himself with a small handful of mixed seeds, seeds of various colored corns, cotton, melon, sunflower, gourd and beans all mixed together. While the leader of the working party plants the prayer stick in the field, katsina remain at the side and smoke for rain. After this is finished each katsina plants a few holes with mixed seeds, starting in the middle of the field "because this part belongs to the katsina." The katsina then retire again to smoke and the working party finishes planting the field. At lunch time and in the late afternoon men and katsina race together to help the corn grow. After all the work is finished the group of katsina dances on the edge of the field. All go back to the village and the katsina dance again in the village plaza. Next

<sup>10</sup> Cf. Stephen, *Hopi Journal*, *passim*, for First Mesa rituals in this connection.

day a regular all-day katsina dance is held in the village. The group of dancers is fed on both days by the household of the arrangers. One informant thought that katsina often danced in the fields without masks for the reason that "once they danced this way and they brought good luck to the fields and plenty of corn, but another time when katsina took masks with them, they brought bad luck to the field and a whirlwind cut all the young shoots so that hardly any corn grew." The katsina party is termed *kaḏzi' nam i'yis wisa*, "katsina field working."

Any man who has fields to plant or harvest may arrange for Masau to be present. The occasion is usually the holding of a *so'hk'iau'* working party and when the latter is discussed with the village chiefs, the chief of the *ma'swi'mpkyā*,<sup>11</sup> society of Masau, is asked to provide a man to act as Masau. The working party is called out four days ahead, and during these four days Masau goes into seclusion, sleeping by day in a darkened room,<sup>12</sup> eating no salt or meat but only the corn food *wi'daḓa*, "so as to become skinny and a fast runner." Each night he goes out after midnight running an anti-clockwise circuit which becomes smaller on succeeding occasions so that on the last night the circuit is round the villages on the mesa ledge. He places prayer sticks and meal on the various Masau shrines about the village and places prayer sticks also in the principal grave yards. The running is to help the corn to grow, the decreasing circuits to bring the rain clouds nearer.

This midnight running is considered hazardous in the extreme. One informant related:

A man who acted as Masau told me he was frightened all the time he ran. Once he went into a cave where children are buried to put prayer sticks on a shrine. It was very dark and he could not see. When he turned to leave he could not find the entrance and there was no light, not even star light. His nerve gave way, he wailed and screamed in his fear, and when he finally got out he fell on the ground bathed in sweat and almost unconscious.

Another informant said:

It is dangerous to go out at night like this. One man, just initiated, went out on the first night. He became so crazy with fear that he tried to kill himself by throwing himself over the mesa edge onto the rocks below. Masau, the spirit, saved him from certain death, however, and he lived to go out again. When a man runs at night and sees something moving in front of him, he must go up to the thing whether it turns out to be bush, tree, or stone, and rub some of the stuff of which the thing is made over his body. This will make him brave and strong and no longer afraid.

On the third day a rabbit hunt is held. The hunt chief is a member of the *ma'swi'mpkyā* and all men in the village participate. Each man presents the first rabbit he kills to the house where Masau is in seclusion, but keeps the rest of his kill for himself. The women in

<sup>11</sup> Maswimpkyā society died out at Second Mesa about twenty years ago "because no one wanted to join." Its chief came from Eagle clan and it specialized in curing swelling in the head, and head pains. Those cured or those caught by Masau as he runs his ceremonial circuit at night, join the society. No Red-Headed clansman might be a member of the society because if such a man "hit another with Masau's *ma'wi'ki* sack, the person hit would surely die."

<sup>12</sup> One who sleeps late in the morning is jokingly termed "Masau."

Masau's house skin the rabbits and save the skin, blood and meat. Next day, the working party goes out to the fields early. About noon Masau and another society man go to a cave in the rocks above le'mi'va spring and here Masau dresses. "No one else would come round at this time since he who trespassed would have to take Masau's place and dress like him." Masau's body is painted red with rabbit blood. He wears bead necklace, earrings, a loin cloth, a woman's dress, and different colored cobs of corn hang from his waist. His face is streaked with black pigment and a corn husk is put round each eye and over his mouth. He wears a rabbit skin mask, the fur inside and the outside skin soaked in rabbit blood.

About the middle of the afternoon Masau goes out to the fields. As the working party returns he hides in the washes, jumps out suddenly, and chases the people to frighten them. Alternately he may go straight to the field being planted, chase the workers and then plant a few holes with mixed colored seed corn. Masau carries with him a small cylinder-shaped sack filled with cotton or other soft substance; he strikes people with this sack (ma'wi'qi) and they fall down as if dead. "All this running about is good for the crops."

The party later returns to the village, Masau also. While the workers eat at the arranger's house, Masau makes an anti-clockwise circuit of the village four times. The people finish eating and come to the dance court to see Masau meet there some twelve "Hair" katsina, called for this occasion ma's kazzi'nam, "Masau katsina." The katsina dance and Masau goes off to eat. After the dancers have left, Masau returns to the dance court. Any men who wish dress up in costume, in katsina or cowboy clothes for instance, and come to the court one man at a time. As each appears, Masau chases him with clownish antics and finally hits him with his cylindrical sack. The man falls as if dead and Masau strips him of his clothes, putting them on himself but in the wrong manner, ties the sash on the left side instead of on the right, puts moccasins on the wrong feet and so on. This comedy is enacted with each man until no more come forward.

It may now be well after sunset. Men bring a bundle of juniper bark to the court. One lights a piece of this and advances with it towards Masau, who, being afraid of light and fire, falls as if dead. The men carry Masau to the mesa edge and roll him over, but he jumps up and chases the men back to the court. This is done four times but on the last time Masau walks back slowly and stands in the court while men and women give him prayer feathers and meal with prayers for long life, rain, good crops and many children. Masau takes these feathers to his shrine ma'sgi near Corn Rock and deposits them there. He leaves his special costume in a cave close to the shrine.

Masau may also appear at harvesting time when a so'hk'au' party is gathering corn. He comes down from his cave and crawls under a pile of corn, coming out suddenly from this hiding place to frighten and chase the workers. On return to the village, Masau katsina do not dance, but the clowning is as before.

Katsina cannot appear to participate in harvesting, but at Second Mesa, a man who has large quantities of corn may arrange with the la'gon chief for the women of this society to work and dance for his field on the day after the public la'gon dance. The regular

so'hk'au' party is held. The la'gon women help the men harvest the corn and when all is finished the women dance once in the fields. All go back to the village, eat at the house of the arranger and then the women dance again in the village plaza.

Besides the racing in connection with planting activities, semi-ritual movement of various kinds is also believed to have beneficial effect on the crops. This is one reason, the esoteric one, for the program of games and races that takes place in early spring, when kick-ball race games (na na' munwa) and shinny games (nahob'a'datci) are frequently played "just for fun." In shinny, kiva competes against kiva, clan against clan and occasionally katsina against men and boys. The First Mesa custom of playing a four day shinny game with a buckskin ball filled with seed is known but not practiced at Second Mesa. Further examples of movement with direct magical import, typical of many similar customs, occur after the spring kiva katsina dances when prayer feathers are taken to the principal springs by fast runner that rain will come, and corn will grow very quickly. At the summer solstice again, prayer feathers are taken before sunrise to a special shrine by a boy who awaits the sunrise and then slowly returns to the village picking flowers on his way, that the sun may advance slowly in the sky.<sup>13</sup> On the last day of the Snake ceremonies and for the four following days, it is the custom for the youths to race about the village with foodstuffs in their hands. They are pursued by women and maids who attempt to take away the goods that the youths are carrying. This custom of running and pursuit (wi'i'diwa'') is believed to have beneficial effects on crops and rain, the fields belonging to the household of the girl strong and fleet enough to secure many articles, being particularly favored with good crops. According to Stephen, a similar ritual-diversion occurs during the January moon when women and maids struggle with katsina in the kivas for the possession of food and other objects. Second Mesa informants however, saw no connection between the two patterns.

Many more examples of this direct ritual to aid crop production are to be found in all the winter ceremonials. There is probably no purpose in describing them here since the few already given establish the principle that agricultural technique is supported and helped by those magical procedures. In a similar manner the generalized rain magic found in all Hopi ceremonial provides further support to the agriculturalist. A convenient view of the fertilization motive in Hopi ritual is given by Haeberlin: to this monograph and to the studies of Fewkes, Dorsey, Voth, Stephen, and Parsons reference may be made for full description and discussion.<sup>14</sup>

<sup>13</sup> Parsons, *A Pueblo Indian Journal*, 95 and fn. 147, (First Mesa).

<sup>14</sup> Cf. the short bibliography given in Parsons, *Hopi and Zuñi Ceremonialism*.

## SECONDARY PRODUCTIVE ACTIVITIES

Although Hopi economic life is based fundamentally on the production of agricultural commodities, other types of production play considerable yet subsidiary rôles in the economy of this desert people. Some notes may be added therefore on various secondary enterprises and the economic ritual, if any, that accompanies such activities.

### HUNTING AND HERDING

Hunting and hunting ritual have been considered in detail elsewhere<sup>1</sup> but it may be recalled in this context that the values centering about the hunting complex contrast strongly with those implied in agricultural work. Whereas agriculture is marked by monotonous routine activity and involves long-continued and patient labor, the hunt gives to the Hopi all the pleasure and excitement of rapid movement. The element of chance bulks large and an occasional element of danger adds to the fascination of the activity. At all times the individual is given the opportunity to display both skill and daring and the satisfaction accruing from such display gains much from the presence of many companions. The rabbit, other small game, the eagle and the coyote are the only animals hunted today but formerly when white contact was slight and pasturage grass more plentiful, antelope, deer, mountain lion, mountain sheep and gray wolf were also frequently hunted for food and skins. From various parts of these animals were obtained skins for moccasins, leggings, bowguards, drums, clothing, pouches, shields, masks, riding gear, lariats, sinew for bowstrings and sewing, hooves for rattles, antlers for straightening wrenches, basket implements, and feathers for ceremonial and ritual costume. The flesh and organs provided a welcome addition to a diet otherwise almost exclusively composed of corn and vegetable foods.

The work of tending sheep and cattle is exclusively a masculine occupation though Fewkes noted in 1890 that Hopi sheep were herded by the women and children who sometimes carried bows and arrows.<sup>2</sup> Women do not participate in such activity at the present time and it is possible that there is something exceptional about Fewkes' observation. At First Mesa, herding appears to be the main support of some households, the men of the household dividing their time between their village home, where they cultivate small fields of corn, and herding camps close to their grazing sections in more distant parts of the reservation. At the other two mesas where herding is still a subordinate occupation, the usual practice is for cattle to graze wild, and for several men to pool their small flocks of sheep and goats. Each man then takes his turn for a two-day period at herding the combined flock. The flock is taken each morning from the corral by the herder, accompanied by a small boy as assistant, and slowly driven over the desert pasture to and from the nearest spring, or water supply, being returned to the corral at nightfall. A heavy winter snowfall may preclude the possibility of taking the flock in search of pasture and in this case, since no provision is made for storing winter fodder, often many animals die of exposure and starvation.

<sup>1</sup> Beaglehole, E., *Hopi Hunting and Hunting Ritual*.

<sup>2</sup> Cushing, Fewkes and Parsons, *Contributions to Hopi History*, 272.

In summer a small sheep camp is established some distance away from the village and the sheep are taken from the village corrals to the pastures adjoining the camp. The herding is carried on in rotation as before but the spell of duty is often for as much as ten days at a time. In both systems of herding, a man will often employ his young kinsmen to herd for him and pay for their services with gifts of sheep. In this manner younger men are enabled in time to gain flocks of their own. In general the flocks are small and are kept mainly for wool though, when fresh meat is needed for working party or feast and no Navaho has visited the village to trade meat for corn, an animal must of necessity be slaughtered. Shearing is carried out by small working parties of men and boys early in June. Dipping is a government innovation and involves village cooperation since all the sheep from each village are required to be dipped on days set by the Indian Agent. A representative from each sheep-owning household joins the party which is responsible for driving the sheep to and from the dipping station. Yearling cattle are branded in August, the work involving household or kin cooperative work according to the number of animals.

Ritual is absent in herding possibly because this is a sphere of activity in which the Hopi finds that reliance upon empirically founded rules is adequate for success. Fertility and prosperity of all livestock are secured by placing prayer sticks at the winter solstice ceremony in sheep, horse and burro corrals and by burying them also in land given over to livestock pasturage.

#### GATHERING OF NATURAL PRODUCTS

If the physical and geographical environment of the Hopi is such that only by virtue of skill, experience and patience can he gain basic subsistence through agriculture, the natural resources of his environment as regards its flora are nevertheless rich enough to provide him with material help in his struggle to live. Apart from a variety of indigenous cultivated plants, materially increased by those of Spanish introduction, the Hopi, according to Hough, is familiar with the existence and use of many of the one hundred and fifty indigenous wild plants in his environment.<sup>3</sup> A large portion of this number is used as edible food plants in search of which the Hopi extends his environment by long journeys in all directions. Every berry patch in the vicinity of each village is known and regularly visited. Many plants are used in early spring when other food may run low. Others probably provide sweet substance and formerly took the place of sugar in his diet.

The utilization of the plant environment for arts and crafts may also be mentioned to indicate the variety of ways its products enter into economic processes. Native cotton was formerly extensively used in loom products which in turn were dyed in vegetable dyes. Such dyes made from gathered wild, or semi-cultivated, plants are also used in basket-making, pottery decoration, and food coloring. Alder bark is used for the tanning of skins,

<sup>3</sup> Hough, *Environmental Interrelations*, 133-55. Relevant observations are also to be found in Fewkes, *A Contribution to Ethnobotany*, 14-21, and in Robbins, Harrington and Freire-Marreco, *Ethnobotany of the Tewan Indians*.

the pounded root of *Yucca angustifolia* takes the place of soap, and the leaves of the plant are used for basketry. Mesquite grass is used for floor broom or hair brush, while other wild plants provide an extensive pharmacopœia for the treatment of illness.

The gathering of wild plants is carried out by both sexes; by individual women or parties of women making short expeditions during the day to nearby locations, by the men when going backwards and forwards between village and fields or incidentally to other journeys and expeditions, by small household groups of husband, wife and children making picnic excursions by wagon to some distant but favorite desert location. Sometimes, however, a type of working party, really a gathering party, may be held. Such a gathering party is termed *neve'n we'he'*; to gather, in a group, is *neve'n wisa*. Any man may arrange such a party and become chief or leader (*mo'ŋwi*). He talks about it to the chiefs at the winter solstice, specially when the proposal is to hold a party in the spring at the time of watermelon planting. Crier chief calls out the party four days ahead. The girls make the special corn dish *somī'viḳi* for the occasion. Youths and maidens, sometimes also married men and women, meet at the appointed place. Men and women gather for themselves; boys and girls both gather the plants, but the boy gives each armful that he picks to the girl in return for several small packets of *somī'viḳi*. Sometimes only the boys collect the plants; the girls remain in a group and either race towards the boy when he holds up a handful of material, the winner receiving the greenstuff in return for food, or else the boy comes to the girls and trades his plants with a member of the group. For such parties the girls dress in their best and all enjoy a merry time with much singing and fun. Everyone would return home before sunset, the boys well provided with food, the girls with edible green foodstuffs.

In spring gathering parties to collect the wild mint grass (*mi'ŋ'ŋocavu'*) are held and many children are also present. A man or a youth impersonates the female *katsina* *gogo'bi'l mana'* and chases the children in the late afternoon while they are still in the fields. The children scatter in all directions but the first one to be caught by the *katsina* is considered specially fortunate and destined for much good luck. More *katsina* appear when the party arrives back in the village. The children are all shepherded to the dance court by *katsina* and the boys are given *somī'viḳi* secretly made for them by the boys' mothers. Then the *katsina* take the boys to a point on the mesa ledge and race them along the flat. When the children stop the *katsina* keep on running and disappear. It is likely that this sudden appearance of *katsina* for such a gathering party serves both to discipline the children and to assist the growth of wild and cultivated plants (chasing and racing patterns).

Stephen noted in his journal that wild potatoes (*di'mna'*) were collected in the autumn by gathering parties. This is still done today at Second Mesa but not so frequently as of old. Stephen also has a brief note on the manner in which young leaves of spruce, pine and aspen, used to mix with native tobacco for ceremonial smoking, were collected by small groups of young men sent out every four years by each First Mesa *kiva*. Second Mesa informants use the same term for ceremonial tobacco (*omau'bi'va*, cloud tobacco) but could

llage and  
the herd-  
ten days  
to herd  
n are en-  
t mainly  
vaho has  
d. Shear-  
is a gov-  
h village  
rom each  
p to and  
g house-

hich the  
Fertility  
r solstice  
ven over

oy virtue  
the natu-  
o provide  
ultivated  
rding to  
y indige-  
lible food  
all direc-  
d. Many  
r provide

tioned to  
re cotton  
vegetable  
n basket-  
of skins,

Fewkes, A  
the Tewan

not recall that leaves of spruce and pine were ever mixed with dried wild tobacco for ritual smoking. The tobacco itself is not a cultivated variety. It grows wild and a man collects leaves each year and dries them slowly inside the house preparatory to shredding or cutting them to form a coarse, strong, smoking tobacco.

SALT

One of the products of the more widely extended environment that the Hopi gathers at regular intervals is salt. Formerly this was obtained from deposits in Marble Canyon, close to Grand Canyon. Prayer sticks were deposited at the shrines of the Salt Woman and the Twin War Gods near the Canyon and the men either suspended themselves with ropes from the rim of the Canyon and broke off stalactites of salt from the sides of the cliff or else clambered down to the floor of the Canyon by means of ropes, trees and a step ladder and obtained salt from the Canyon bottom. This salt was brown in color, a soft rock salt, easily ground down but when added to food it turned the latter a yellowish color. The Canyon deposits later became too difficult of access and salt today is obtained almost exclusively from the salt lake forty-two miles south of Zuñi,<sup>4</sup> though Mishongnovi men on occasion used to obtain some salt from deposits on the wash southeast of the mesa.

Any responsible man in the community may arrange for an expedition to obtain salt and he then becomes the mo'ηwi or chief of the party. He talks to the chiefs at the winter solstice prayer stick making, notifies them of his intention to lead an expedition, and has prayer sticks made to ensure a successful trip. Before the mazγau' dance and usually some ten days before the departure, the crier chief announces the expedition, telling the men to get ready their moccasins, saddles, ropes, sacks, burros and other equipment, the women to prepare food for the men to take with them. After mazγau' and four days ahead of the leaving date, crier chief again calls out a general warning for all concerned to hurry on their preparations. A man goes to his so''o or his k'a'a, and tells her he is going to bring back salt for her; she, in return, gives him sufficient food for the trip, wafer bread and other corn foods. For these four days the men "don't have to go with the women," continence being necessary to secure success. Men from other villages may join the party. The first night's camp is always at the butte kavu'ηapi, close to Awatovi mesa. Here all meet together and sleep overnight, waiting for the laggards to come up and "asking each other for whom they are going for salt, and what food they were given." The war chief (ka'le'k'daqa) and his assistant (hoη'vi'ai'γad) must always be members of a salt party. Today men from the clan that formerly filled the office of war chief with one of its members act as substitutes for the war chief and his assistant.

As soon as the morning star rises, the men eat, smoke for rain and are quickly on the move. The leader of the party deposits prayer sticks at each spring that is passed on the outward journey with prayers that there will still be ample water flowing on the return journey. The party stops at sunset each day, eats, smokes and prays for a successful journey.

<sup>4</sup> Darton, *The Zuñi Salt Lake*, 185-93, gives the geology of these deposits.

Formerly when the trail led through hostile territory, the men would be well armed and travel by night, camping in sheltered situations by day. The party passes Gallup on the fourth day and camps beyond Zuñi on the fifth. In the old days the men would not stop at Zuñi village either going or coming from the lake. This was because the men might not have anything to do with women, they might not meet, touch or see them. If they did, the men or the burros carrying the salt would develop ulcerous sores where the salt touched their back and probably die as a result. Today, however, the men often stop at Zuñi to visit friends, to trade or to procure a supply of fresh food. The day after leaving Zuñi camp the party reaches the place called *ki'hso'wa* or *ki'h'sa* (sparrow hawk) a small hillock with a flat rock on top. This is about noontime. The leader mixes up some sweet corn dough (*kwi'mi*) and gives a piece to each man. He goes to the top of the hillock and kneels down on the flat stone. The men go off about a mile and when the leader stands up the men race on foot towards him. Coming near the leader each man throws his *kwi'mi*, in which he has embedded a prayer feather, at the standing figure and then circles round the hillock. This race is called "the sparrow hawk race."

On the next day the party again stops about a mile from the salt lake. The men have been serious-minded throughout the journey, but it is specially necessary to be serious at the lake and to indulge in no joking, laughing or idle talk. "It is dangerous at the lake and the men don't have to offend the Salt Lady. She is an enemy and you have to pray to her and to fight her too if necessary." The men race down to the lake on burro-back. He who arrives first is accounted a brave man and a good racer. As each man comes up to the lake he lets his burro taste the salt water, sometimes doing this with the Mother Corn cob that each man carries. Each man also tastes the water himself and then rubs his burro and his own body with salt, this to make both man and beast strong and courageous. Camp is made and the party eats. All strip to the breechcloth. The leader goes first and the men follow him in line as he moves to the west side of the lake and wades in until the water comes up to the knee. Following the actions of the leader again, each man sweeps forward his arm under the water and lets go a prayer stick that he carries in the palm of his hand. Each walks from the water and looks at his hand. If he sees there a small piece of corn husk it is a good sign; if he finds there a piece of hair it is a bad omen. After this the leader asks the war chief and his assistant to go to the shrine on the south side of the lake. This shrine is a deep hole with bubbling water at the bottom and the warriors deposit prayer sticks here for Spider Woman (*go'g'a'n wixdi*), and the Twin War Gods (*bi'ga'η ho'ya* and *ba'li'ηau ho'ya*), three deities who preside over the lake, and pray for long life and permission to remove salt.<sup>6</sup>

When the warriors return each man strips absolutely naked. Then "calling out aloud to each other the names of the women they have slept with, because this brings good luck"

<sup>6</sup> Stevenson, *The Zuñi Indians*, 357, notes that prior to 1902 the Hopi deposited prayer sticks in two circular-walled chambers built of blue clay similar to those used by the Zuñi, but in a different section of the lake. Apparently Mexican salt gatherers had destroyed these chamber-shrines by this date (1902).

all rush into the lake. Each hollows a small depression in the friable salt and places in this his Mother Corn cob with prayers for protection while removing the salt. The salt is taken out with the hands and placed on a rock. The sack is dipped in water to wash away impurities and the salt placed in a pile by the lake side. When enough salt is obtained each man begins to put salt into his sacks, filling first the sack reserved for his paternal relatives. When all have this first sack ready they carry it off a little way "telling each other that they are going back with this one sackful only and pretending it is really so." All return and fill the remaining sacks. In the old days no one would stay overnight at the lake because it was dangerous, so the men would take the Mother Corn, pack up the salt and break camp immediately, making an overnight camp again some distance away. If the water in the lake was too deep to remove salt, the men would camp away from the lake and come back each day. Meanwhile each man would try to rid himself of evil thoughts and many prayer sticks would be offered to the Salt Woman. Today the more courageous will stay overnight at the lake only if it is absolutely necessary. When the time comes to leave, formerly and today, each man deposits a handful of salt on the shrine of the Salt Woman, *ĩ'ŋi'wixdi*. A prayer stick is tied to the tail of each burro that it may not get sick on the return journey. None may turn round, or look back towards the lake as the men depart. Each must walk with eyes fixed on the ground. If one looks back his spirit will never leave the lake and he will soon be near to death.

The return journey is slow because of the heavy loads that the burros carry so that it is six or more days of travel before the home mesas are again in sight. As the party approaches, it lights fires on the wash to notify the women of the return. A final overnight camp is always made on the wash below the village and the party is then ready to re-enter the village at early morning, the only time when the naming ceremony may take place. The women meanwhile, have been busy making plaques, cooking and preparing special food dishes. On the morning of entry they rise early, dress up in manta and the white and red wedding blanket (*a'di:'i'*) and go with the chiefs to the point where the north-east trail strikes the mesa ledge. When the salt-gatherers appear about sunrise the women line up behind the chiefs. The men are carrying salt for their aunts on their shoulders, the remaining salt being still carried by burros. Men from the village come forward and lead away the burros. The chiefs sprinkle meal before the men. Each aunt steps forward, shakes hands with her man, thanks him and sprinkles him with meal. A procession is formed: first the chiefs, then Bear clan women, next Coyote clan women, finally women from other clans in any order. Behind each aunt walks her nephew, the salt still on his shoulder. When the procession arrives in the village all the people crowd round the men and thank them for their expedition.

The aunt takes her nephew to her house. Meal is sprinkled to the sun with prayers for the good fortune of the inhabitants. The salt is emptied on to a white wedding blanket (*'o'va'*) placed on the floor, the man's Mother Corn is placed on the heap and the salt covered by folds of the blanket. Besides the man there is present in the house his *so'o'*

and his  $\text{k}'\text{a}'\text{a}\text{da}$ . Each of the women has brought with her a quantity of blue corn meal on a plaque.

All eat. The  $\text{so}'\text{o}'$  makes yucca suds and washes the man's hair. She puts sand on the floor in front of the stored corn. Then, assisted by all the  $\text{k}'\text{a}'\text{a}\text{da}$ , she undresses and washes the man all over and each woman names the man according to full naming ceremony. The Hopi woman says, "We name him because we are glad to have him back out of danger," referring to such hazards of the journey as thirst, exposure, marauding enemies and a sometimes maleficent Salt Woman. The protective Mother Corn and the naming Mother Corn cobs are hung up in the house. The  $\text{so}'\text{o}'$  takes two or three specially large plaques which she has made for the occasion and places on them the blue meal brought by the  $\text{k}'\text{a}'\text{a}\text{da}$ , transferring to the latter's meal-plaques some of the salt from the heap on the floor. She adds more meal of her own grinding to the large plaques so as to make up a large amount of meal, places wafer bread on top and a big block of  $\text{k}\text{w}\text{i}'\text{mi}$  on top of this again. "This meal and food are to pay ( $\text{si}'\text{s}\text{i}\text{vi}$ ) for the salt that the man has brought back." Another procession is formed, this time to take the man to his own house. The  $\text{so}'\text{o}'$  goes first carrying the man's curved throwing stick or other pieces of equipment. Then comes the man carrying food and after him follow the  $\text{k}'\text{a}'\text{a}\text{da}$  each carrying a plaque of meal or other foods. Having taken the man home the women return to get their salt while the man divides the remainder of the salt he brought back between his wife, his mother and other maternal relatives. No further purification is involved for the man nor is there any period of continence after arrival in the village. The salt so obtained from Zuñi lake is highly valued and used sparingly. Store salt is considered strong and bitter. Too much of it in food renders the dish uneatable whereas the unfortunate addition of overmuch Zuñi salt to a dish still leaves the food relatively palatable.

Zuñi, Laguna and Acoma all obtain salt from Zuñi salt lake, Cochiti from a lake south-east of that pueblo. With all these villages the expedition is accompanied by much ritual with the same general phrasing as the Hopi ritual. The Zuñi expedition, made in July, is in charge of high priests, those of Laguna and Acoma are directed by the Parrot clan, which is said to own the lake, and are made in September. At Cochiti there is no clan affiliation and anyone may direct an expedition. In all expeditions the Salt Woman must be propitiated with prayer feathers, no one laughs or talks at the lake, the salt is obtained without the use of stick or hoe, the salt is received in the village with much ceremony, and at Zuñi and Laguna, the collectors are purified by head and body washing. Among the Pima and Papago, salt gathering involves purification on return to the village but the ritual patterns of gathering and purification differ from the Pueblo phrasing.<sup>6</sup>

#### PIGMENTS

Although many pigments and dyes are obtained from wild plants and clay deposits close to the mesas and are gathered when required, two, however, require expeditions to the

<sup>6</sup> See Goldfrank, *Social and Ceremonial Organization*, 9; Lumholtz, *New Trails in Mexico*, 269; Parsons, *Laguna Genealogies*, 225-26; Russell, *The Pima Indians*, 94; Stevenson, *The Zuñi Indians*, 354-61; White, *The Acoma Indians*, 139.

Colorado River to be obtained and were usually collected on journeys for salt. Today special expeditions are sometimes made to get these colors, yellow ochre and copper carbonate. At the point Grandview, some miles west of Grand Canyon township, there is an old trail leading down to an ancient copper mine situated about half way from the rim. From this mine, quantities of copper ore are dug which, when ground down and mixed with water, make a serviceable greenish-blue pigment. Since Grand Canyon and the San Francisco Peaks passed on the journey are intimately associated with legend and katsina mythology, it is inevitable that an expedition to the Colorado partakes of something in the nature of a religious pilgrimage. Prayer feathers are deposited at appropriate shrines close to the foot of the Peaks, feathers and sacred meal are also left at a shrine in the mine after the ore is extracted.

#### Wood

The supply of timber and firewood close to the Hopi villages is so very scant as to be almost valueless economically; to secure wood for craft activities and for cooking, expeditions are made at frequent intervals to the Black Mesa forests a day or more distant to the north. An individual makes the expedition alone or else two friends take a wagon and supplies and gather timber together for their households. As the wood closer to the villages is being rapidly used up such expeditions have to go further to the north each year to secure adequate supplies. The principal timbers used are cottonwood, piñon, juniper, mountain oak and mountain mahogany.<sup>7</sup> Cottonwood roots gathered from driftwood on the sides of the Little Colorado River are favorite material out of which to carve ceremonial objects, and an occasional expedition is made to this river to collect large supplies of roots. These roots were also formerly gathered on turtle hunting expeditions to the same river. Larger beams for housebuilding, as mentioned earlier, are obtained in trade from the Navaho. Wood gathering is an informal activity for the most part but occasionally formal expeditions are held. Fewkes has noted one of these about the time of the *wi'wizim* ceremony without, however, saying how or why it is formally organized.<sup>8</sup> The girls dressed in festive costume and the chiefs of the village go to meet the returning gatherers. The chiefs open a trail to the village with meal and prayer feathers and smoke ritually. When the men appear with the wood they are thanked by the chiefs. The girls then come forward, give presents of food to the youths of the party, and follow the group to the village. Fewkes gives no information on the point, but presumably the youths give some supplies of wood in return for the food, the rest being brought back for the household or for the paternal female relatives. Again, at the time of *niwa'mu*, formal expeditions are organized by ceremonial participants to secure the large supplies of wood necessary to keep the kivas hot enough to force the ritual bean seeds to sprout. Extra amounts are also collected during

<sup>7</sup> See Hough, *The Hopi Indian Collection*, 275-78, for the various uses to which these woods are put.

<sup>8</sup> Fewkes, *Hopi Shrines near East Mesa*, 353-54. I do not know whether such expeditions are customary at Second Mesa.

these expeditions to give to the women in return for their services in supplying food for the kiva feasts.

In winter a soft lignite coal, found in small deposits on the mesa ledge, is surface-mined by digging small trenches to tap the outcrops, and largely substituted for firewood. It is comparatively easy to obtain and since it burns slowly but produces great heat, it becomes doubly valuable when heavy snow and ice render wagon travel for firewood absolutely impossible. The deposits are common property and are used by all the surrounding villages.

The people of Mishongnovi are supposed to get their coal from the north side of the rim, back of and below Shipaulovi, while the people of Shipaulovi are supposed to get their coal from the south side of the rim. But some time ago, rocks fell on a Mishongnovi man while getting coal and killed him. Since then the Mishongnovi men refuse to go near the mine, and insist on getting coal from Shipaulovi side. The Shipaulovi men resent Mishongnovi men taking all their coal but cannot do anything about it because the Mishongnovi men are many more in number than the Shipaulovi men.

#### CRAFT ACTIVITIES

Fairly complete accounts of such typical Hopi crafts as basketry, pottery, moccasin-making, weaving, and clothes making are to be found in the literature.<sup>9</sup> Here it may be noted that, save in house and kiva building, the Hopi makes practically no use of ritual in craft work to propitiate supernaturals but relies almost exclusively upon his own skill and patience to produce satisfactory examples of his craftsmanship. One or two examples may be adduced, however, to show that magico-propitiatory customs are occasionally followed.

In weaving or basketry when it is planned to introduce a difficult or complicated design into the projected products, the worker prays to the supernaturals, "May the weaving (coiling) come even. May the pattern come quick." In basketry, a woman never completely finishes the last coil of her basket or plaque; about a quarter of an inch is left uncoiled, otherwise bad luck will overtake the worker. When dyeing yucca black, yellow or red, the dipped yucca is held in the smoke of burning wool. This makes the colors come true. The act is called *ni'fhe'ni*, the term also used for the process of dyeing. In pottery making, when large storage water jars are being made, the moulder keeps her eyes closed when the time comes to close the gap at the top of the jar. Failure to close the eyes would cause blindness. In painting designs on pottery for domestic use, it is important to leave open the top circle around the jar or bowl. Failure to do this will result in difficult childbirth and the death of the child. Finally in firing the large water jar a toy water jar of similar shape to the large one is cast into the fire to propitiate the spirits. By this act the potter ensures that her large jar will come from the fire uncracked and evenly burnt.

<sup>9</sup> See Mason, *Aboriginal American Basketry*; Hough, *The Hopi Indian Collection*, and Bunzel, *The Pueblo Potter*.

## HOUSE BUILDING

Mindeleff's excellent study<sup>10</sup> requires little emendation, but some notes may be added on the relation of ritual to building activities.

The occasion for building a new house or for making substantial additions to an old one usually occurs when, through the marriage of daughters, the maternal house is too small to accommodate growing families. Today a new impetus in house building comes from the desire of some to remove from the rather confined quarters of the village itself to the more open areas on the flat mesa-ledge below. Building and heavy repairing, as mentioned earlier, are usually, though not always, done during the March moon because of ready access during this month to thaw waters collected in mesa cavities. The work is done by parties of men and women, kin and clansfolk. The men perform the heavy tasks of transporting stone, timber, brush and water. The women place and fit the wall stones, make the adobe mud, plaster floor and walls, and tramp down the mud and earth roof. There is a tendency today to limit the work of the women to mixing and plastering. "Some men are too particular to allow women to build walls," one Hopi remarked, the reason, one suspects, being that the younger men receive training in industrial skills and habits of precision at government schools which suggests the use of tools that the women are incapable of handling.

The use of ritual appears to have two purposes, to give the house a firm foundation and strength to endure, to ensure that good fortune and many children will be the lot of the future inhabitants. Rituals employed are performed by a man closely connected with the prospective owner, her father, husband or brother. As soon as the foundation line of the house is traced on the ground and marked with stones, the man walks round the foundation in an anti-clockwise direction scattering crumbled wafer bread, tobacco and sacred meal on the line. This is to appease the spirits and guard against their possible evil. He next takes four pieces of cactus and four prayer sticks and places one of each at each corner of the building. The corner stones are then firmly placed in position over the cactus and prayer sticks. In an anti-clockwise direction the man starts from the door stones, sprinkles sacred meal and breathes a prayer at the first corner stone to the sun, at the second he prays for the fertility of corn crops, at the third for rain, at the fourth for the occupants of the house that they may have many strong children. The cactus is used "to give the house roots so that it will stand solid and strong." After the house is finished, prayer feathers and food are placed among the roof rafters with a further prayer that the house may be strong and its occupants happy. Each year at the winter solstice ceremony, new prayer sticks are placed in the rafters, again to ensure its continued strength and the fertility of the inhabitants. In all essentials the same ritual and construction method are employed in the building of all types of shelter, whether it be dwelling, kiva, or peach house. The only shelter built without the use of ritual is the small stone chicken house.

A note may be added on the construction of the piki oven used in the preparation of

<sup>10</sup> Mindeleff, *A Study of Pueblo Architecture*, 188 ff.

the indispensable wafer bread. The oven consists of a large rectangular flat stone, three feet long, two feet wide, and about three inches thick. The stone has a highly polished black surface and rests on side walls about eight inches above the floor. It is heated by a fire underneath; a large chimney hood over the oven serves as an escape for smoke. The oven is usually found in a small room, adjacent to the living room, and often reserved entirely for activities connected with piki baking.

Rough slabs of sandstone are obtained by the men from quarries several miles from the mesa. It is difficult to split plain, unmarked blocks of stone. Hence the worker must be careful not to take with him stone beads, turquoise or other ornaments with markings on them. If he does, his stones are likely to be scored or will split into pieces as he takes them from the quarry. The stones were formerly carried to the village on the shoulders. Now the services of burro or wagon are employed. The women take charge of the stones when they arrive at the house. With piki moistened in the mouth, four longitudinal marks are made on the surface of each stone. This is to feed the spirit of the stone that it may not crack the stone while work is in progress. Both surfaces of the block are smoothed by rubbing with coarse sandstone and later with smooth water-worn stones. The surfaces are cleaned finally by rubbing over them chewed melon seeds. The stone is placed by the fire and allowed to dry slowly. It is next set up as an oven. Non-crackling firewood is collected and a fire is lit under the stone. If ordinary wood were used for this first fire, the crackling might split the stone. When the stone becomes very hot, crumpled piki is sprinkled on it and allowed to char. Piñon gum is placed on the stone and as it melts, it is rubbed in vigorously with a piece of sheepskin. More piki is allowed to char and the stone again rubbed smooth with gum and given a high polish. A new fire is now lighted under the stone and the woman makes the first piki which must be immediately consumed by members of the household; the more quickly eaten, the better the stone will be. All this work may be done only by women and in seclusion. None of the workers may speak to each other, no noise of any sort may be made close to the work-room, no woman may work who has evil in her heart. Failure to observe these rules will result in the piki stone's cracking while the surface is being prepared.<sup>11</sup> It is obvious that this work is considered both delicate and difficult. By paying attention to definite rules, the worker gains a feeling of confidence which is the more valuable the less control she has over the ultimate successful outcome of her labor.

<sup>11</sup> Hopi practice is paralleled by Zuñi methods though the Zuñi observe more ritualistic procedures than do the Hopi. Their aim, however, is the same—to propitiate the spirits of the stone and so prevent cracking; see Cushing, *Zuñi Breadstuff*, 321-33, and Stevenson, *The Zuñi Indians*, 361-62.