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Shifting Cultivation among the Amahuaca of Eastern Peru[1])

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The Amahuaca are a widely-scattered group of Panoan-speaking Indians of the Peruvian Montaña. Their territory includes the remote upper reaches of the Inuya, Sepahua, Purús, and Yuruá rivers, and extends into adjacent areas of Brazil. Because of their geographic isolation the Amahuaca remain to this day very little influenced by Western civilization.

The culture of the Amahuaca is of the familiar Tropical Forest type, but in many respects it is a very primitive representative of this type. Settlements are small, averaging perhaps three single-family houses and 15 people, and are very widely dispersed. These communities are politically autonomous, and their location and composition are constantly changing. Amahuaca social and ceremonial organization is exceedingly simple: headmen and shamans are absent, and there are only two ceremonies. Subsistence is based almost equally on hunting and gardening, with the latter predominating by something like 50 per cent to 40 per cent. The remaining 10 per cent of the food supply is derived from fishing and gathering.

Environment. The territory inhabited by the Amahuaca, being the height of land between several river systems, is relatively high and quite hilly. The Amahuaca of the upper Inuya, among whom I worked, live at an elevation of about 1,250 feet in terrain consisting of a series of short, steep, heavily forested ridges. The tops of these ridges are often 200 or 300 feet above the adjacent stream bottoms. According to informants, all Amahuaca territory is much the same.

The plant cover of the entire region is dense and unbroken tropical rain forest. Savannas never occur.

The climate is one of alternating rainy and dry seasons. The heavy rains begin in October and last until April. However, there is no cessation of rain during the dry

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[1]) This account of Amahuaca shifting cultivation is based on field work carried out by Gertrude E. Dole and myself among the Amahuaca in 1960—61. Part of this field work was done in an Amahuaca community located on the upper Inuya River. This community has developed around a field station of the Summer Institute of Linguistics established here by Robert L. Russell in 1953. I would like to acknowledge Russell's generous help in filling in the gaps in my information about Amahuaca horticulture, and at the same time absolve him from responsibility for any misstatements I may have made.

season as there is, for example, in central Brazil. Even in August it may rain three or four days in a row. The total annual rainfall is probably around 75 inches.

Game is varied and abundant. Fishing however is not very productive; the headwater streams are too narrow and shallow for this.

Determining When to Clear. The onset of the dry season marks the beginning of the new year for the Amahuaca. It is also the time when new gardens are cleared. Two ways are used to determine when this time has arrived, one astronomical and the other botanical. When the Pleiades «fall», that is, when they are seen low on the western horizon in the morning before sunrise (around the end of April), the dry season is said to have arrived. This time of year is also identified by the reddening of the fruit of the guava tree *(Psidium guayava).* Women, who are not very familiar with the stars, prefer to use the fruiting and flowering of trees to reckon time.

Selecting a Site. When they clear a new plot or «chacra»[2]) the Amahuaca usually select an isolated spot, preferably in primary forest. Rarely do they clear a new garden adjacent to an old one. Furthermore even if there is plenty of primary forest in the neighborhood of their old plot, as there invariably is, they prefer to go some distance away. Indeed, clearing a new plot generally coincides with building a new house, and is done nearly every year.

Primary forest is preferred over secondary forest because of the smaller number of weeds that grow up in it. Another advantage of primary forest is that the soil under it is moister than that under secondary forest. This factor might make the difference between a good and a poor corn crop if the weeks immediately following planting should be unusually dry. Other than this, in selecting a chacra site little attention is paid to the soil. Some Amahuaca recognize that corn grows better on black soil than on sandy soil, but because of the wide variety of crop plants raised in a plot and their varying soil requirements, no one type of soil can be considered ideal.

One advantage of secondary growth is that it is easier to clear. If a man is in a hurry to make his garden, perhaps because he is late in starting, he might choose to clear a chacra in secondary forest.

The Amahuaca have a preference for the upper slopes and the tops of ridges for making their gardens. Being higher, ridge tops get more sunlight than valley bottoms, and the Amahuaca are aware of the importance of sunlight for plant growth, especially for corn. Another advantage of planting on ridges is that the riverine rodents, the paca and capybara, who prey on cultivated plants, avoid the hills. Even agoutis, whose habitat is not so limited, seem not to frequent the ridge tops either. The Amahuaca clear even the steepest ridges; some I saw under cultivation had slopes of as much as 35°.

No ritual is involved in the selection or clearing of a chacra site. In fact there is an almost total lack of supernaturalism connected with gardening. The following incident exemplifies this attitude. I once asked a man if the Amahuaca performed any ceremony to make crops grow, and after telling me they did not, he turned to another Amahuaca and asked, «How could such a ceremony make crops grow, I wonder?»[3]).

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[2]) This word is of Quechua origin and is used throughout Peru to refer to an Indian garden plot. It is equivalent to ‹roça› in Brazil, ‹conuco› in Venezuela, ‹milpa› in Mexico, etc.

[3]) There is, however, a great deal of magic connected with hunting. This difference may be attributable to the uncertainty of hunting as compared with the predictability of gardening.

Clearing a Chacra. If the site selected for a new plot is not on an existing trail, one is cleared to it as a first step. There is no preliminary marking of the perimeter of the plot to be cleared. One simply works out from a chosen spot until the clearing attains the desired size. There is no way to measure the size of a chacra except by eye; experience will enable a man to judge about how much land he needs to plant. The average size of the chacras I saw on the upper Inuya was roughly an acre and a half. Some informants say, however, that garden plots are often larger, perhaps 3 or 4 acres in size. The shape of plots varies from approximately circular to approximately rectangular.

The actual cutting of the vegetation is usually done individually. However if two men are clearing adjacent plots they may help each other to fell the large trees. A man who is ill at the time of clearing will get a close male relative to cut his chacra for him, and lets him draw food from it in compensation. Again, a young man may help clear a plot for his prospective father-in-law as part of bride service. When several men clear an entire ridge top together they may cooperate in felling the larger trees, but the composite plot is always divided up into separate fields, each owned and cultivated by a nuclear family.

The first step in clearing a plot is to cut away the undergrowth. This is done first to make it easier to get at the trees themselves. Nowadays the Amahuaca use machetes for cutting the undergrowth and smaller trees, but until very recently they made use of a large, heavy sword club made of palm wood. This sword club, which was double-edged and shaped something like a cricket bat, was wielded with both hands and directed against vegetation too thin or flexible to be cut with a stone axe. It was also used against bamboo, which was toppled with a few crushing blows.

Steel axes are now universally used by the Amahuaca. Probably as recently as 40 years ago though stone axes were still employed to fell the forest, and their use will be described below.

Trees growing at the lower end of a chacra are ordinarily cut first. In this way the felling can be better controlled. A tree is cut about three feet or so above the ground, unless it has plank buttress roots, in which case a scaffold is built to enable a man to stand high enough to cut above them. To assist in directing their fall, trees are sometimes notched.

Driving Tree Fall. To lessen the work of felling, the Amahuaca make use of the driving tree fall. A number of smaller trees located near an especially large one are notched in the direction it is desired to have them fall. The tree selected to key the fall is then cut, and in falling brings the others down with it, like so many dominoes. Ten or twelve smaller trees may be felled in this way. Vines and thorny bamboo, which entwine many of the tree crowns, help produce a better tree fall. In an area of secondary forest, where bamboo was especially common, I once saw some thirty small trees go down in one fall.

One reason for notching the smaller trees in the driving tree fall is to try to space their fall more or less evenly. An even distribution of trees on the ground permits the burn to proceed faster. However, once the trees have fallen the Amahuaca make no effort to rearrange them before burning.

There is some element of risk in cutting down any large tree. But there is one tree in particular whose felling calls for certain precautions. This is the catahua *(Hura crepitans)* which contains a latex so toxic that it is used by some Montaña tribes as a fish poison. The Amahuaca girdle a catahua to drain it of its sap, and may even build a fire around it to dry it out completely before undertaking to cut it. If the tree is cut without taking these precautions, its latex will spatter into the eyes, causing temporary blindness, and leaving one with a badly swollen head for three days.

Usually every tree in a garden site is felled. Certain wild fruit trees may be left standing, however, as may also a dead tree which casts little shadow. An outstanding tree, too thick or too hard to be felled except at great effort and perhaps at the cost of a broken axe blade, will be attacked by fire. The fire is not intended to fell the tree or even necessarily to kill it, but to scorch the bark badly enough to cause it to shed its leaves and thus not cast much shadow over the growing crops. Except for catahua no trees are girdled, and there is no topping or pollarding of standing trees.

Stone Axes. Although they are not always ready to admit it, some Amahuaca remember the days when stone axes were the principal cutting tool. Even those too young to remember have heard their elders tell many stories about the stone axe. The following account of the use of this implement is based on personal recollections and on such stories.

The Amahuaca stone axe was of the T-shaped type common in western Amazonia, rather than the cylindrical celt prevalent over the rest of the Amazon basin. It was lashed to a stout handle by means of cord made from *Cecropia* bast fiber[4]), and was cemented in place with beeswax. The handle was two to three feet long, and about three inches in diameter. The axe was wielded with both hands, and the stroke was short and apparently not delivered with full force. In cutting a tree the stroke seems to have been more downward than inward so that the trunk was scraped as much as it was cut. In this manner a tree was thinned all the way around until it fell. According to one account a pile of wood dust would have accumulated around the stump of a tree by the time it was finally toppled. As an aid in felling the larger and harder trees the Amahuaca sometimes built a fire around the base of a tree, then chopped away the charred parts, burned the tree again, chopped away more charred wood, and so on.

Some estimates were obtained of how much time was required to fell a tree with a stone axe. One informant said that to cut a tree a foot or so in diameter took about 6 hours. Another said that working all day, it took some three days to fell a tree $2^1/_2$ or 3 feet in diameter.

When in hard use, stone axes sometimes chipped or broke, and often became dulled. In fact, it was said that when chacras were being cleared stone axes had to be sharpened every day. This may not be an exaggeration. One stone axe head I obtained had been resharpened so many times that it was reduced to perhaps a third of its original size.

Although a few people had some around, more or less as mementoes, there is no nostalgia about the days of the stone axe. One Amahuaca summed up the prevailing attitude when, after describing the vicissitudes of using this implement, he added vehemently, «No vale esa hacha de piedra!» (That stone axe is no good!)

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[4]) Cord of this type is still used to make bowstrings and hammock ropes.

Time Required to Clear. It was difficult to obtain reliable estimates of the total time needed to clear a garden plot. For one thing, a man does not work at it every day. He may clear one day, go hunting the next, clear the third, and so on. In the old days, when only the sword club and the stone axe were used, it probably took a month or more to finish the work. Nowadays it takes much less time. One plot whose clearing I observed took a week of labor — five days to clear the undergrowth and two days to fell the trees.

Burning the Vegetation. After the slash has been allowed to dry, it is burned. To insure a good burn the drying period should be about one month for secondary forest and two months for primary forest. One chacra in secondary forest which was burned after only two weeks did not burn well at all.

Burning takes place before the end of the dry season. As in the case of clearing, the time of burning is determined by observing the position of the stars and the fruiting or flowering of certain trees. When the constellation *Wishirïkï* «falls», or when balsa wood trees bear their small yellow flowers, it is time to burn the chacras.

A long stem of bamboo, splintered at one end and ignited, is used to start the chacra fires. Bamboo makes an especially good brand since it can be made to blaze up by waving it in the air. A clearing with a lot of bamboo in it burns particularly well, and for this reason such sites are favored for making chacras.

Men frequently cooperate in burning a clearing, each one starting a number of little fires in his sector. The various small fires rapidly come together and coalesce into one big blaze. The fire subsides in an hour or two, but some trunks and stumps may continue to smolder for days or even a week or two. No firebreak is cleared around the edge of a chacra to keep the fire from spreading. If a fire escapes, an effort might be made to extinguish it with water brought from a nearby stream in bamboo section containers. However, chacra fires rarely get seriously out of control.

If a chacra does not burn well the first time, the unburned slash may be heaped up and burned again. But this practice of ‹encoivarar›, as it is called in Brazil, is not done very thoroughly by the Amahuaca. Even after a good burn a chacra has a rather messy appearance, with charred logs strewn here and there among the stumps. Chacras located near the dwellings get to look somewhat neater in time, as trunks and branches are cut up and carried away for firewood.

Planting of Gardens. Planting begins the day after burning[5]). By beginning to plant right away, the crop plants are given a head start on the weeds. Since a family makes only one plot, everything is planted together[6]). First to be planted is corn, which unlike any other crop is planted over the entire field. The rest of the crops are interplanted with corn, but each is restricted to a certain portion of the plot. While the women are planting corn, the men are planting manioc. There is a sharp division of labor in plant-

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[5]) In fact, some plants, such as squash, yams, and bananas are occasionally planted in a field before burning in order to have them yield earlier than usual. If burned slightly during the firing of the chacra, all will resprout.

[6]) Not all the planting takes place in the gardens. Bananas, plantains, and papayas are usually planted in small groves around the houses as well as in the chacras. Small patches of peanuts may be planted on the beaches during the dry season when the water is low. Occasionally a separate plot of arrow cane (Gynerium sagittatum) is planted.

ing: men plant manioc, bananas and plantains, and papaya, while women plant everything else, including corn, sweet potatoes, squash, yams, tuber beans, *Xanthosoma*, sugar cane, and beans, to name only the most important. Since corn and manioc are the two principal crops[7]), their planting will be described briefly.

Corn Planting. Seed corn is put aside when the previous harvest begins to run low. Generally, large ears, free of weevils, are kept for this purpose. The kernels to be planted are soaked in a bowl of water overnight in order to help them germinate and grow rapidly. Using a special planting stick made from an old bowstave a woman goes among the stumps and logs of her chacra jabbing holes into the ground to receive the kernels. Into each hole, which is 7 or 8 inches deep, she drops about 5 kernels. The holes are not covered.

Virtually all of the kernels seem to germinate and grow to maturity, and almost invariably each cornstalk produces two ears. Since the distance between holes is about 4 to 5 feet, this means that an average of 2,136 holes are drilled in each acre of land, and that from these, 10,680 cornstalks will grow. Counting two ears per stalk, this would mean 21,360 ears per acre. Since the Amahuaca plots I saw were about an acre and a half in size, the average yield per plot would be some 32,040 ears. (Later in this paper this estimate of ears produced per plot will be compared with the number of ears counted in corn storage houses.)

Manioc Planting. Only sweet varieties of manioc are known to the Amahuaca, and these are always planted from cuttings. After the tubers of a manioc plant have been harvested, its stem is cut and put away under leaves or in the corn house. When needed for planting, the stems are carried to the site of the new garden and cut into pieces 4 to 7 inches long. Using a spade made from a single piece of palm wood, shallow holes are dug and two or three cuttings are placed side by side into each. The cuttings are then completely covered with dirt.

It takes the manioc crop as a whole 8 or 9 months to ripen, but some good-sized tubers can be pulled out of the ground in 6 months. Manioc is dug only as needed, and keeps very well in the ground except that if left too long it begins to get fibrous and woody.

It was difficult to determine what proportion of a chacra was planted to manioc, but I would judge that it is between a quarter and a half.

Fertilizing. Like most swidden cultivators, the Amahuaca do not add any kind of fertilizer to their gardens, nor do they work wood ashes into the soil after burning[8]). They appear to be unaware of the beneficial effects of manure on plants. Asked what would happen if a man were to defecate in his garden, the informants I talked to agreed that it would neither help nor hurt the soil. (One informant did say, however, that the man himself would develop a skin disease!)

Weeding. At best, the Amahuaca are reluctant weeders. As often as not, a garden is not weeded at all. It is the men who do whatever weeding gets done, but after planting

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[7]) Bananas and plantains together are probably close to manioc in importance.

[8]) According to Robert L. Russell, ashes and sand are placed around Xanthosoma plants when they are quite large. However, it is not clear to me whether this is done for the protection of the roots or the nourishment of the plants.

time most men prefer to spend as little time in the chacras as possible. Weeding is done by hand and with a machete, and formerly with the sword club.

Crop plants seem to withstand weed competition fairly well. Corn grows faster than any weed and is harvested before weeds have become really rank. Manioc grows more slowly, but has relatively small nutrient and moisture requirements, and does well even though it has to face the full force of the weeds. Other crops probably do not fare quite so well.

Predation of Gardens. Plots are not very much subject to attack by predators. Of the animals that do prey on them, deer eat the leaves of the corn and manioc plants, and agoutis, pacas, and peccaries eat manioc and other tubers. Persons with gardens situated on the ridge tops experienced little or no difficulty with predators, but a man whose field was located a few hundred yards from a stream complained about their incursions. In any event the Amahuaca never fence their plots and never use scarecrows to frighten animals away. I was told that if predators became especially bothersome, a man might build a hunting blind near his field and attempt to shoot animals from it.

Harvesting. The first crop to ripen is maize, and it is harvested and stored in large quantities. If a family has planted only a moderate amount of corn, or if their house is located near the field, the upper part of the dwelling may be converted into a corn crib. Otherwise a special corn storage house is built in or near the field and the ears piled neatly inside. Women visit their corn houses every six days or so and return with a basketful of corn, which is about 175 ears. All other crops are harvested as needed, and none other is stored for very long or in any great amount.

Abandoning of Plots. After a family has moved to a new location and cleared a new plot there, the old plot is seldom visited, but it is not entirely abandoned for some time. Banana plants and papaya trees, which are late to bear fruit, keep on producing[9]), and trips to the old chacras are undertaken every now and then to gather their fruit. It may be necessary on occasion to clear the undergrowth from around these trees lest the encroachment of the jungle kill them. When younger banana and papaya trees planted nearby begin to yield, the old ones are no longer visited.

By the time a chacra is abandoned it is so overgrown with weeds that it is a veritable jungle. To reclear such a plot would be most arduous. It would be inaccurate, however, to say that it is because of the luxuriant weed growth that the Amahuaca refrain from clearing and planting the same plot a second year. It is more nearly true to say that they do not bother to weed a chacra because they know they are not going to plant it again. If the determining factor leading the Amahuaca to abandon a year-old, weed-infested plot were the difficulty of reclearing it, then we should expect them to clear their next year's garden in some nearby area of primary forest. The same would be true if a plot were abandoned because of the loss of soil fertility. But neither of these

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[9]) A banana plant produces only a single bunch of fruit before it dies, but it sends up shoots from its underground stems and these grow up into new plants. The new plants bear fruit and propagate themselves in the same manner, and so on indefinitely, or until the clone is choked to death by the invading forest. Papaya (according to an informant) bears fruit in six months and for 3 or 4 years thereafter, but then it rots.

is the case[10]). As we have noted, after a year's residence in one locale, the Amahuaca generally prefer to move their settlement to an entirely different part of the forest, often several hours' or even a day's walk away.

Now if Amahuaca semi-nomadism cannot be explained in terms of their system of cultivation, how is it to be accounted for?

First of all, it should be kept in mind that the Amahuaca are still hunters almost as much as they are gardeners. Consequently, considerations having to do with the availability of game are very important to them. Even though three of four families settled in one locale for a year do not hunt out the game animals within the usual hunting radius of the settlement, they nevertheless probably make a noticeable inroad in their numbers. By the end of a year it has become necessary to walk farther to find game, and this is a decided inconvenience. If this inconvenience were counterbalanced by an equal or greater inconvenience in building a new settlement each year, the Amahuaca might not move so frequently. But Amahuaca houses can be built in three days, and Amahuaca families are independent units perfectly free to pick up and move when and where they want to. Thus the Amahuaca, in deciding to move their settlements, do not have to overcome the inertia that would face a society which had a large village, substantial houses, and centralized political authority. In short, since the resistance to moving is small, the forces required to bring it about can likewise be small.

But the depletion of game is not the only factor involved. The known history of the Amahuaca, imperfect though it is, has been one of external attack by other more powerful Indian tribes and by rubber gatherers, and internal feuding on a considerable scale. Small community size and frequent movement of settlements would have the effect of making communities more difficult to locate. They would afford some measure of protection and provide the best chance for survival. Thus, while there is no conclusive evidence for it, the recurrent moving of the Amahuaca may be interpreted as an ecological adaptation to conditions of great insecurity.

Fallowing. Let us now examine the last stage of the agricultural cycle, namely, fallowing. With weeding so little practiced, a plot begins to revert to forest almost from

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[10]) Below are the results of the analyses made of soil samples taken from three different sites around the Amahuaca settlement on the upper Inuya. No. 1 is a section of primary forest. No. 2 is a vegetable plot which has been cultivated by Robert L. Russell for four consecutive years and is still producing well; it has been kept free of weeds, but never fertilized. No. 3 is a section of secondary forest which had been a chacra about 5 years before.

	%	%	parts per million				
	Nitrogen	Organic Matter	K	Na	Ca	Mg	P
No. 1	0.152	2.19	105.0	20.5	1495	555	6.51
No. 2	0.199	2.99	265.0	43.0	1170	410	32.06
No. 3	0.249	2.78	194.0	35.0	2120	940	10.50

In commenting on these figures Dr. Hugh Popenoe of the Department of Soils, University of Florida, Gainesville, who very kindly undertook these analyses said: «I think we can say that these are fairly good agricultural soils and with possible supplementary additions of nitrogen, that these soils could produce crops continuously as far as the fertility goes» (personal communication, August 8, 1962).

the time it is burned. Unlike some other areas of the Amazon basin, the cycle of forest regeneration in this region does not begin with an invasion of grasses. In fact, grass never appears in an Amahuaca plot. The first weeds are the seedlings of the secondary forest trees that will eventually cover it. These seedlings remain green and succulent for a long time, belying the fact that they are tree species. But they grow very rapidly, and in 6 months may attain a height of 8 or 10 feet, obscuring and engulfing the crop plants. In 5 years they may be 30 feet or more tall, and 8 or 9 inches thick, and thus form a fairly respectable secondary forest.

The most common trees of this secondary growth are balsa wood (*Ochroma* spp.) and cocona (*Ipharhenia* sp.). Other secondary forest trees for which I have found botanical names are setico (*Cecropia* sp.), ishanga (*Myriocarpa densiflora*), amasisa (*Erythrina glauca*), and ojé (*Ficus* sp.). In a special class is paca or thorny bamboo (*Guadua* sp.), which is often the most abundant plant of all in second growth.

A secondary forest is only a temporary plant association. Since the trees that comprise it cannot reproduce themselves under their own shade they survive only one generation. They are replaced by primary forest trees which grow up under them and eventually shade them out. In its earlier stages secondary forest is called *naï* by the Amahuaca, a term equivalent to the Peruvian ‹purma› and the Brazilian ‹capoeira›. More advanced secondary forest is termed *naï xïndi*, ‹old purma›.

Productivity of Horticulture. Despite the casual way in which Amahuaca gardens are cultivated, they produce very well indeed. The yield of corn alone is quite impressive. In one family's storage house I counted 17,328 ears. Since the count was made more than three months after the harvest, the number of ears originally put away must have been between 20,000 and 25,000. A nearby corn house whose contents I did not count but which seemed to be larger probably had held 25,000 to 30,000 ears. (These figures square fairly well with the estimate made earlier that an average-sized plot would produce 32,040 ears.)

Let us attempt to calculate how much food this amount of corn represents as measured in terms of calories. The average weight of the kernels shelled from one ear of Amahuaca corn was determined to be 104 grams. Pure, dry carbohydrate or protein yields 4 calories per gram, but since Amahuaca corn, although shelled dry, still retains a little moisture and consists partly of indigestible cellulose, it probably yields around 2.5 calories per gram. The caloric value of an ear of shelled corn would thus be $104 \times 2.5 = 260$ calories. The total number of calories available from the corn harvested by an average family would then be $25{,}000 \times 260 = 6{,}500{,}000$. If we take the average Amahuaca's energy requirements to be 3,000 calories per day, his annual caloric requirement is $3{,}000 \times 365 = 1{,}095{,}000$. We can conclude that the amount of food energy derivable from 25,000 ears of corn is sufficient to satisfy the entire yearly food needs of a family of 6 persons.

Actually, the Amahuaca do not consume anything like this amount of corn in their diet. On the basis of short-term records kept for two families, I was able to calculate that the amount of corn processed per person per day in an Amahuaca household is $8\,1/3$ ears. This would be equivalent to 2,600 calories per person per day if it all were consumed by members of the family. But it is not. A certain amount of it, of course,

is lost during various stages of preparation, and a good deal is fed to the dogs in the form of a thin gruel.

It is not necessary though to account for all of the differences between the corn consumed, lost, or fed to dogs and the total amount harvested. Informants said that sometimes a family's corn harvest is too large for its needs, and that the excess is simply left in the corn house to rot. The Amahuaca never seem to entertain the idea of trading away this ‹surplus›, but it may be shared with a closely related family which planted too little corn for its own needs.

It was not possible to make so close an estimate of the food yield obtained from any of the other crops raised by the Amahuaca. Yet it is probably safe to say that the number of calories derived from all of them together is at least as great as that derived from corn.

All in all, then, Amahuaca shifting cultivation is, in spite of its rudimentary form, thoroughly capable of producing food abundantly, reliably, and with relatively little expenditure of labor. It has not, therefore, been the limiting factor in Amahuaca cultural development. Indeed, as far as agricultural productivity goes, the Amahuaca have had the basis for developing much larger and more stable settlements, and for elaborating the social and ceremonial means by which such settlements are integrated and directed. Earlier I suggested some of the limiting factors that have kept this from occurring, but to explore them further lies outside the scope of this paper.