

CHAPTER X

MAGUEY FIBER AND ITS USES

The export of fiber from the leaves of *Furcraea guatemalensis* Trelease (locally called *maguey* but distinct from the *Agave* spp. of that name) is a major economic activity of Indians in Alta Verapaz; Ladinos appear to be involved only as buyers. There is reason to believe that this region has for centuries supplied ready fiber and articles made from fiber (rope, net bags, hammocks, etc.) to southeastern Guatemala much as the area around San Pedro La Laguna has served the southwestern part of the country.¹

A seemingly endless stream of man-loads of raw fiber can be seen passing through San Juan Chamelco on men's backs and on the busses, and the continuing importance of this commodity is confirmed all the more by the knowledge that less obvious routes are preferred because of taxation sporadically enforced by Ladinos of the Municipal Government. Few other economic plants besides this type of *maguey* are as well adapted to the cold, damp, sloping land that makes up most of the highland surface of Alta Verapaz - and especially those parts which remain in Indian ownership. *Maguey* is an apt commercial crop not least because it may be harvested and processed whenever slack time appears in the rather rigid schedule for cultivation of maize and beans, the food staples.

¹ MacBryde, 1947: 404-5; Bunzel, 1959: 70-73; cf. Wisdom, 1940: 152-158.

Cultivation and Varieties

Maguey (*ik?e*) comes in several deceptively similar variants, only one of which yields long, strong and abundant fibers. Propagation is by bulbils which appear among the flowers on the "century plant" type of giant stalked inflorescence. These are so similar in all three varieties that it is no novelty to see rows of worthless plants set out by someone who had erred or had been swindled.

Saq (white) *ik?e* is the desired form and is identified by its slick leaf surface, pale thorns, and retention of curl as leaves bend away from the plant axis. *Kaq* (red) *ik?e* is larger, with reddish thorns and a profuse inflorescence which is unique in that fully developed (but sterile?) pods of seed appear; its fiber is weak and thin. *Raš* (green) *ik?e* has very narrow, dark-green and strongly rolled leaves which tend to be heavily damaged by spots (*šoš*: pustules) which make the fiber hard to extract on any variety, though in this case it is as worthless as the 'red' sort. It is also earmarked by a gap of 5 to 10 cm. between the tip and the first serration of the leaf margin, and it flowers at 20 to 25 years in contrast to 10 years for *kaq ik?e*.

Saq ik?e is believed to flower according to the phase of the moon in which it is transplanted: in the full or waning moon it lasts only a few years, but if planted up to two or three days ahead of full moon it is said to grow for 15 to 20 years and until the stem is so tall one can cut leaves from it while standing up. Also, maguey so planted is said to produce usable leaves more rapidly than

otherwise, i.e. in three rather than ten or twelve months (the above according to an informant in Saqwi?l, an *aldea* specializing in maguey).

The bulbils of the inflorescence (in contrast to the rhizomes of cultivated *Agave* spp.) are ordinarily set out in a 'nursery' at a spacing of one *k?utub* (handspan) and transplanted to a field spacing of one *moqox* (armspan) after a year or so when plantlets begin to crowd each other. Nursery plants are salable, too, at one *centavo* apiece. Provided that weed competition is kept down the transplants will be ready to begin commercial production at five years and should give 25 to 30 leaves per plant per year if twelve or more leaves are left on the plant at each harvest. Cutting rights may be leased out, the going rate being four or five *centavos* per plant per year.

Harvest and Processing

Traditional "good practice" demands that the knife used to cut maguey leaves be used for no other task, a tabu probably based on practical consequences (infection?) though these were not made clear. Cutting off each plant's basal leaves is a straightforward job except for the hazard from thorns; the first order of business after cutting is to trim these away. Trimmed leaves are stacked with tips up on a hillslope of 200 to 300 and the stack braced as shown in Figure 14(1). A shallow fire pit is dug downslope from the stack and a low fire kept going for an hour or so, fueled with whatever brush is handy. The slope, the placement of leaves, and a top cover

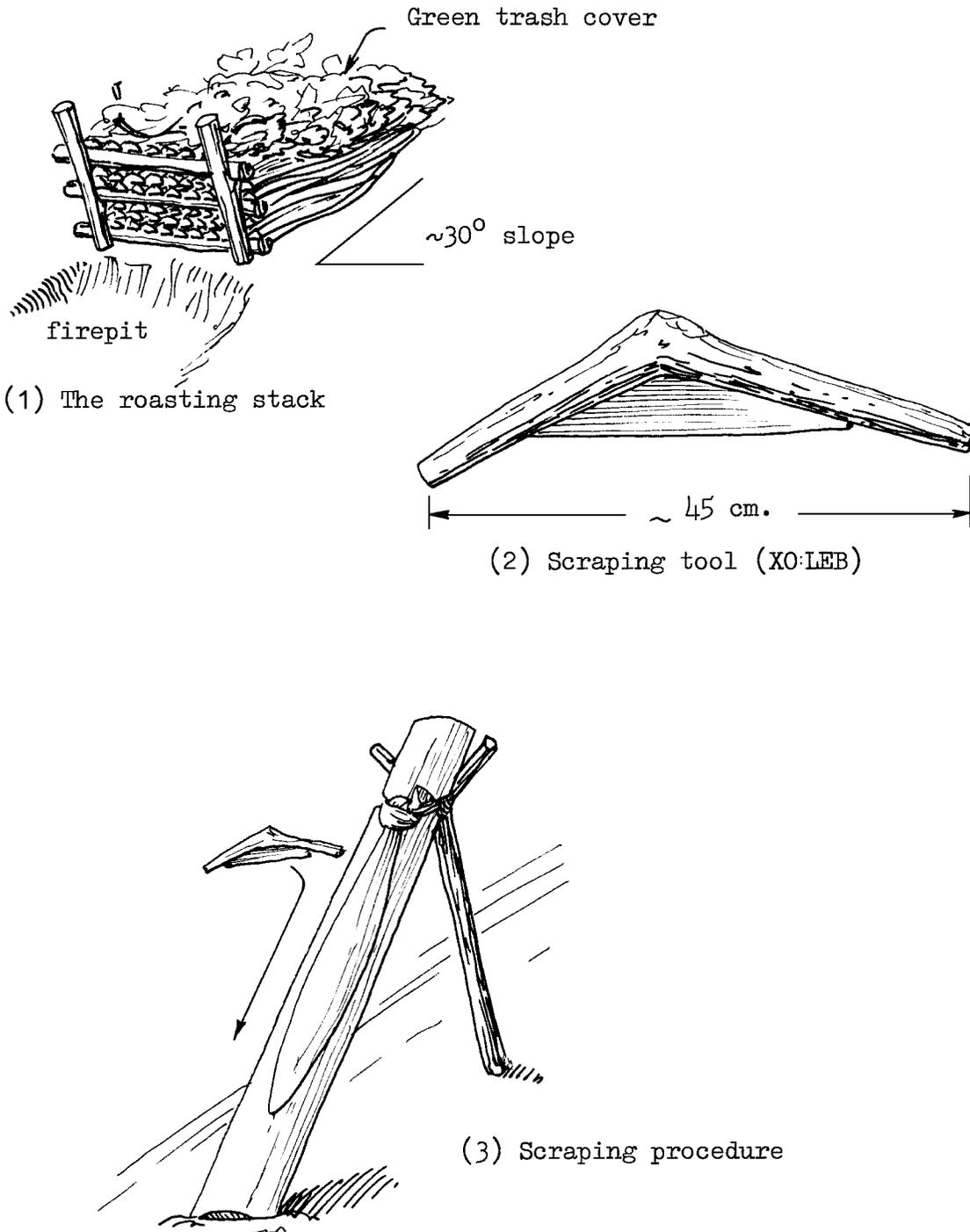
of green trash all help to funnel heated air through the stack with the result (presumably) that leaf pulp constituents are converted to forms more digestible by bacteria and insect larvae. Most workers let the leaves lie and rot in the roasting pile, but those of *aldeas* Kambat and Čilaš club each leaf as soon as it is cool (to pulp the interior) then re-stack with tips down-slope and re-cover with trash. This configuration conserves the moisture in the leaves and speeds retting from the usual month or more to half that or less. After decomposition of the pulp the fibers can be extracted. At this point the stack smells much like a cesspool, an odor which the Qʼeqčiči tolerate but find no more agreeable than anyone else. However, they have noticed that maize tends to grow better in old maguey pulp - just as it profits from the odorous deposits in the environs of every house.

The tools used for fiber extraction are simple and cheap. First, a pine trunk trimming (*r-iš čeʼ*, tree's skin) available from any sawyer for five centavos; this is barked and smoothed to give an even, convex working surface. Thus prepared it is a durable *xo:leb*, "instrument for scraping". The scraping tool itself (*r-uqʼ xo:leb*, scraper's arm) is made from a branch of tough wood such as *caʼax* with a scrap of machete blade driven edge-first into the shallow bend, as Shown in Figure 14(2).

In Qʼeqčiči the processing of maguey is termed *xocok ikʼe* (Sp. *raspár maguey*). Work begins by pulling a leaf from the retting stack and tying the butt end to a loop of rope or raw fiber which

FIGURE 14

MAGUEY PROCESSING DEVICES



itself is tied around the *riš če?* and kept at working height by notches in the board's edges (see Figure 14(3)). The blunt metal edge of the tool is scraped down the leaf to break up the waxy epidermis; on subsequent passes one bears down with force to strip out the pulp and leave only fibers behind. However, to get all the pulp out one must flip this end of the leaf over and scrape from the other side as well. The freed fibers are then tied around the working loop so that the leaf hangs in reverse and the butt half can be scraped on each side. After the resulting hank of fiber is taken from the board it is held at one end, supported in the middle, and twirled a few times to keep the fibers together. At all stages in maguery processing considerable care is taken to keep track of the number of leaves which are handled and to keep a reckoning of how many leaves' fibers go into each one-pound bundle of the finished product.

The rate of production depends very much on the workman's competence and enthusiasm and on the quality of the raw material. As a beginner I managed only four leaves an hour and twenty-five in a day, but one informant produced twelve per hour and sixty-three per day while the owner of the maguery plot did seventeen per hour and eighty-seven in a day. These leaves were moderately damaged by *šoš* attributed to the weeds in my informant's neglected *ik?e* patch, so they took longer for each of us to strip than would healthy leaves from a "professional" patch and they yielded less fiber due to breakage at the *šoš*. One hundred per day is the level of production

mentioned as maximal by yet another informant.

Complete loads of fiber hanks are tied in tens and taken to be washed in a stream convenient to the worker's house. In this way soluble and odorous (though biodegradable!) residues are removed; then the hanks can be wrung out and hung to dry over horizontal poles erected in the house yard. The hanks' dangling ends are individually stripped by hand both to remove excess water and to keep the hanks distinct. After a week or so of drying, which is the one step in processing that tends to make maguey production peak during the dry season, the hanks are placed in a pan balance to see how many will make up one pound. This number may be from ten to thirty; for our test batch it was twenty. For more data on weights and numbers, see Table 33.

An alternative procedure is to strip out the pulp immediately after roasting, bypassing the retting stage. The result is a very soft fiber quality termed *raś xo* ("green scraped"), which lacks the tensile strength of the regular product.

Marketing of Crude Fiber

Ordinarily the one-pound bundles will be accumulated until one or more 45-kg. *iq* (Sp. *cargas*, *quintales*) are ready, then these will be carried by tumpline for wholesaling to buyers in Chamelco, Cobán or Carchá. Some of the fiber is worked into twine and rope by residents of the latter towns, including people in jail, while the remainder goes to factories in Guatemala City. The wholesale value of

TABLE 33

ACCOUNTING SUMMARY FOR MAGUEY FIBER
(Data from participation study)

Raw materials: green leaves less thorns, mean of 10

length:	1.49 m
weight:	0.92 Kg
number:	325
total cost:	2 man-days
total weight:	300 Kg (comp.)

Processing: (in man-days for 300 kg. leaves)

roasting:	~ ½
smash, etc.:	1½
tools:	~ ½ to prepare, once only!
scraping:	~3¾ for 321 leaves
washing:	~ ¾ for 313 leaves (hanks)
loss or discard:	8 leaves
total labor:	6½ man-days, or ~2 per 100 leaves

Finished product:

hanks fiber:	313
bundles:	15 at 20 hanks + 1 at 13
total weight:	8.30 Kg (18:04.7 lbs.)
wt./bundle:	0.53 Kg (18.7 oz.) in sample of 10
weight loss:	97.2%
wt./hank:	26.5 g
labor/100 kg. (computed):	78 man-days
net return:	Q0.23 per man-day (at Q8/45.4 Kg)

a *quintál* has held steady at nearly Q10.00² for the last several years, and from the accounting summary one can see that at this rate of re-turn maguey is a less rewarding activity than lime-making: roughly Q0.23 per man-day.

Maguey Twine and Products

A relatively small part of the total production of maguey fiber remains in the *aldeas* and is there fabricated into twine, rope, net bags, hammocks, and a few other handcraft products. Both men and women work in these crafts, although the least remunerative--twining--usually occupies women and children whose slack time has no more rewarding use. A few *aldeas* are more noted producers of fiber than the rest, and of these some specialize more in one fiber article than in others. For example, Čaxaneb is noted for hammocks while Saqwi?l and Čamisun are known for net bags (*čampa*) and bulk twine. The demand for twine and bags has reached such a level that travelling merchants commission the whole year's output of entire families in *aldea* Saqwi?l.

Twine

To make any of the articles described below one must begin by buying or making twine (*baqok kok? k?a:m*, to twist little rope). To start, one hank is picked out of a bundle and given a few blows with a smooth stick, whipping the fiber around the stick to soften it. Twining begins by doubling some fibers - from three to several tens, depending on the desired gauge - then pinching the fold with one hand and rolling the two free ends with a forward motion of the

² As of 1972 it is at Q8 per *quintál* in Chamelco and Q9 in Cobán.

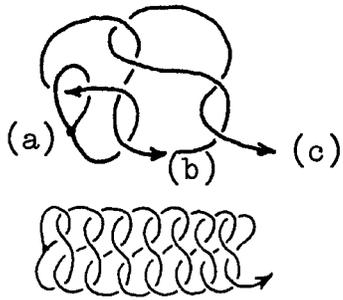
other hand's palm. The surface used for rolling may be a block of wood (preferably *bač* or *aq?l*), or one's own thigh, or the palm of the pinching hand, or a piece of bald tire carcass. Whatever the surface it is dusted with *q?an č?oč?* to reduce slippage between surface, fiber, and palm. Informants over 50 years old say that wood ash from *ca?ax* was formerly used, and in such quantities as to be a regular article of commerce. As the single strands tighten the pinch hold is relaxed and in the last half of forward travel under the palm they wrap around each other. The excess twist thus imparted is relaxed by a quick back stroke with the heel and thumb of the rolling hand.

New lengths of fiber are worked in by folding these at one third of their length with the long half added to the thinner of the two existing strands, first removing all twist from both strands and then pre-twisting to work in the new fiber. Figures on the amount of fine twine produced per hank and per work day are given in Table 34, as well as the lengths, weights and prices of some twine purchase in *Saqwi?l*.

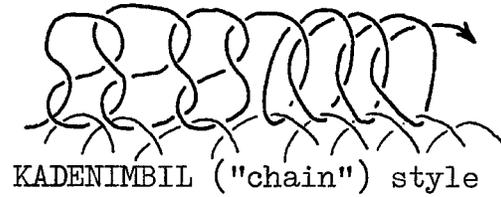
Rope

A few men or families specialize in producing rope, often from purchased twine, but nearly every household has the necessary tools and knowledge. The process involves clamping a number of strands of twine at one end and fixing the other to an eccentrically weighted and rotating paddle termed *xuyuč*, then twirling the paddle for hours on end. The directions of original twist and subsequent "twirl" are

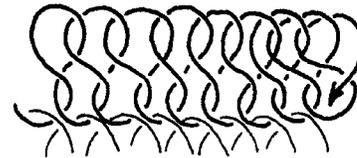
FIGURE 15
ELEMENTS OF CAMPA LACING



(1) Body fabric lacing

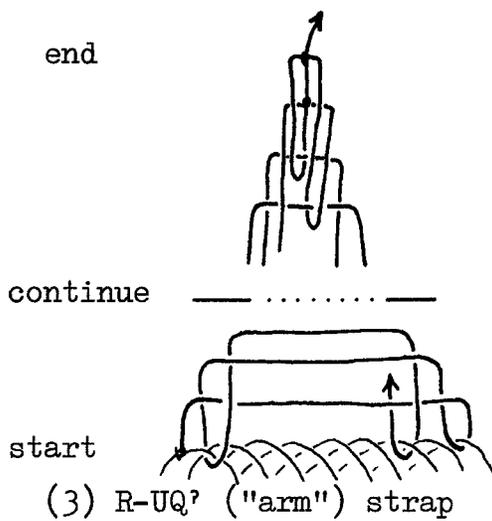


KADENIMBIL ("chain") style

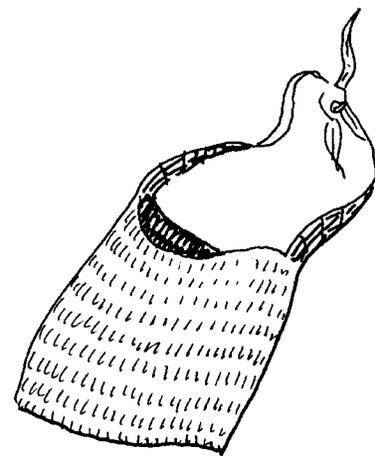


BAQ KAR ("fishbone") style

(2) Bag edging techniques



(3) R-UQ' ("arm") strap



(4) Completed bag

TABLE 34

COST ANALYSIS FOR MAGUEY TWINE

Labor costs:

3-mm twine from one leaf:	56
	38 mean of 44.3 meters
	39
meters 3-mm twine / man-day:	43
	28
	48 mean of 43.3 meters
	54

Purchased fine twine:

price (centavos)	weight (g (oz.))	length (meters)	dia. (mm)
25	454 (16)	236.5 (9.46 m./centavo)	2.0
20	482 (17)		
15	454 (16)	154.5	3.0
12.5*	383 (13 1/2)	116.0	3.5
12.5*	425 (15)	112.9	2.7-3.7
12.5*	383 (13 1/2)	165.9	2.0-3.8
12.5*	411 (14 1/2)	104.4	2.9-4.3

* from pairs of hanks sold at 25¢

Calculated returns:

mean length / wt. at nominal 3 mm dia.:	350 m./kg. (Sample of 6 1-lb. bundles)
mean price / length at nominal 3 mm dia.:	Q 1.03 /100 m
output /45.4 Kg raw materials:	15,900 (~16,000) meters
income /45.4 Kg raw materials:	Q 165.00 (less 10.00 costs)
man-days/ 45.4 Kg raw materials:	370 (16,000 m./43.3 m/m-d.)
net income / man-day:	Q 0.45

Informant description:

length/weight:	20 cda./lb. (970 m/kg.)
output/time	6 lb./week (2.72 kg/wk.)

opposite, but free-floating attachment to the paddle prevents cancellation of the two rotations. Ropes of about 5 mm. diameter and one *kʔa:m* (Sp. *cuerda*, ~20 m.) length are in steady demand for farm plot measurement, while heavier ropes up to 3 cm. diameter (Sp. *lazos*) are required by Ladinos and Indians who keep cattle. Traders come from as far as Chichicastenango to buy ropes.³

Net Bags

A number of lacing or netting techniques are illustrated in L.M. O'Neal's study of Guatemalan textiles.⁴ *Qʔeqčičiʔ* bags use the 'figure 8' pattern with a 'loop chain' (*baq kar*, fish-bone) only for edging, while the 'hands' or 'arms' (*r-uq čampa*) use the ubiquitous 'ladder' weave. All of these are illustrated in Figure 15.

The main output is of freight nets with open lacing of coarse twine, suited for hauling bulky commodities by tumpline. Often the leather or fiber tump (*ta:b*, Sp. *mecapál*) is tied directly to the 'arms' of the bag, though for full loads these are tied to close the top of the bag and a separate 5-mm. rope used with the tump.

Very finely laced bags are also made, but these take more time to produce yet fetch only half again to twice what the coarse bags sell for, about 40¢ vs. 20¢. The finest bags tend to be used by those who make them, and sold only to traveling merchants who can pay a fair price because they know where to sell at a 100% mark-up. A trial piece with "8's" about 2 cm. deep and 30 cm. square took 50 man-hours to complete; at this pace the return is on the order of Q0.08

³ Bunzel, 1959: 70-73.

⁴ O'Neal, 1937: figs. 58, 59, 60.

per man-day. Normally this fine a bag would be used as a seed pouch at planting time, and as storage for valuables the rest of the year. Lacing of any bag begins with a few meters of twine; the end is left unfinished because as this length is used up a few more meters are added; the style of lacing is such that no great length or bulk of twine is workable. Partly-finished bags may be carried around carefully rolled up, and worked towards completion whenever time and inclination permit with no equipment but hands, legs and a hank of *ik?e* fiber. Both men and women make *čampa*, though women probably do most of this work just as they do many of the other tedious and ill-paid crafts.

Macramé Bags

A different and reputedly recent bag-making style is connected with the prison and the tuberculosis sanatorium in Cobán. The work is standard macrame and one can only wonder by what path this technique and the overall bag design came to the TB patient who is said to have "invented" the patterns some twenty years ago. The whole bag is square-knotted out of uniform lengths of twine hung over the crosspiece of a simple frame and tensioned with a wooden tool tied at the waist (*š-čapbal k?a:m*), illustrated in Figure 16.

Bags from the prison are heavy, closely knotted, and made of garishly dyed twine. Those from the sanatorium are more elegantly open and of plain twine. One old ex-patient supposedly lives near Cobán and produces the magnificent bags occasionally available through one Ladino storekeeper. These clues from style may tend to confirm the time and place of introduction mentioned above.

FIGURE 16
MACRAMÉ BAG KNOTTING

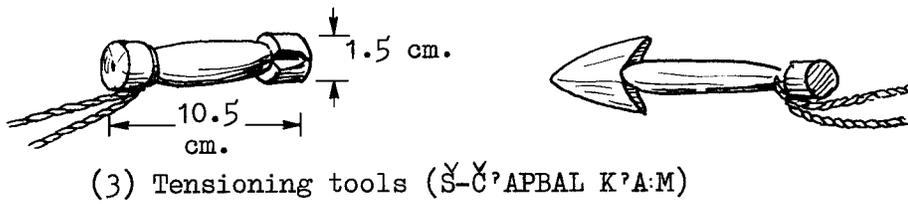
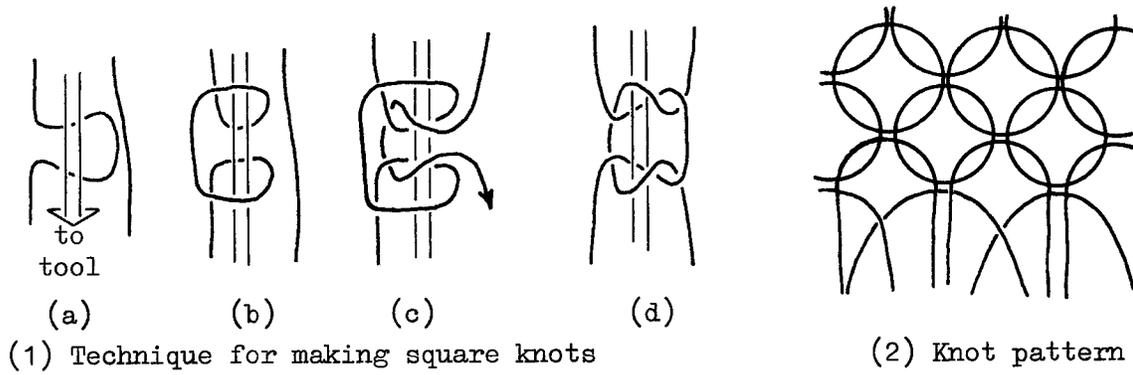
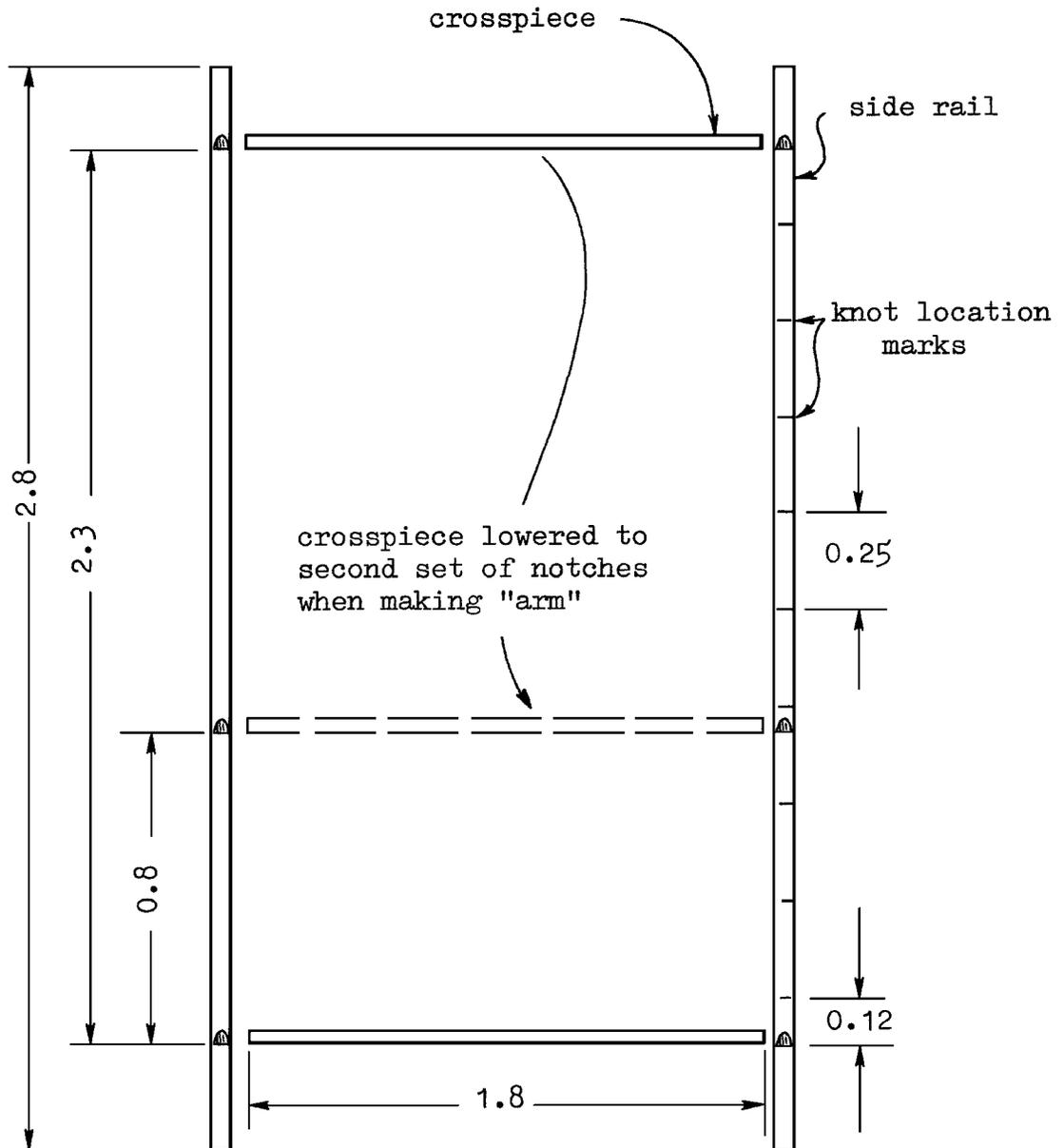


FIGURE 17
HAMMOCK-MAKING FRAME



Note: all dimensions in meters

Hammocks

Hammocks (*ab*) are the principal twine product which the highlands of Alta Verapaz supply to a large part of the neighboring drylands and wet lowlands.⁵ These are not nearly so comfortable as the fine cotton hammocks made in Yucatan nor so durable as the hammocks of synthetic cord made in Livingston, Depto. of Izabál, but they are comparatively cheap and readily available.

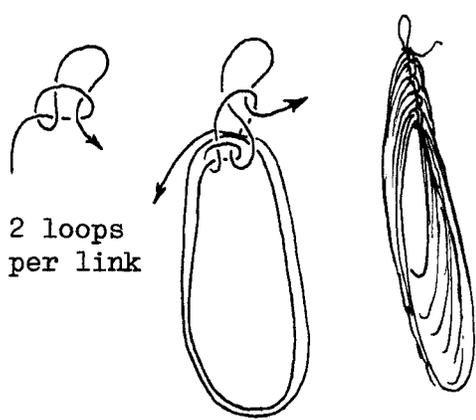
A simple frame of four poles tied together is needed for hammock making. The side rails have pairs of notches placed so that the crosspieces can be lashed at the proper spacing for the body and 'arms' (*r-uq? li ab, š-mayh ab*), as illustrated in Figure 17, and marks where the edging twine is to be knotted. Further preparatory work involves making up a supply of working hanks of twine (*q?inbal*, bundling; *š-yibankil či če:t*, its making into handfuls; *xun may*, twenty). Two loops of twine are made around one's foot and up to mid-chest; these are locked in with a knot in the 'tail' of twine left for the purpose (see Figure 18(1)). A dozen or so loops are accumulated in a chain of similar knots, then the twine is cut. Similar units (*š-wa li ab*, hammock's food) are prepared until the chosen weight for the hammock is reached, usually from 1.13 to 2.26 kg. (2½ to 5 lbs.) for a 'full-length' *ab*. Purchasers over five feet tall can expect trouble with the standard product.

Lacing begins with a loop tied around the left side of the frame's bottom crosspiece, knotted at the lowest mark on the side

⁵ Including: Salamá, Morazán, El Rancho, Zacapa, Guatemala City, Quiriguá, Puerto Bárrrios, Seból, and the Polochíc Valley.

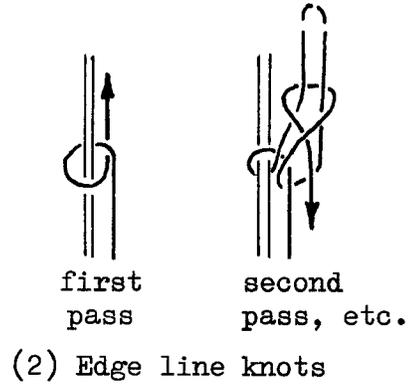
FIGURE 18

HAMMOCK DETAILS

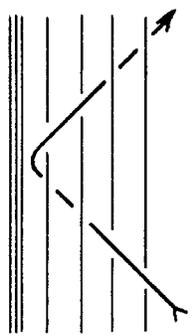


2 loops per link

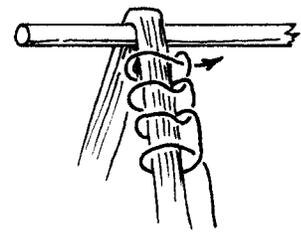
(1) S-WA 'AB ("hammock's food")



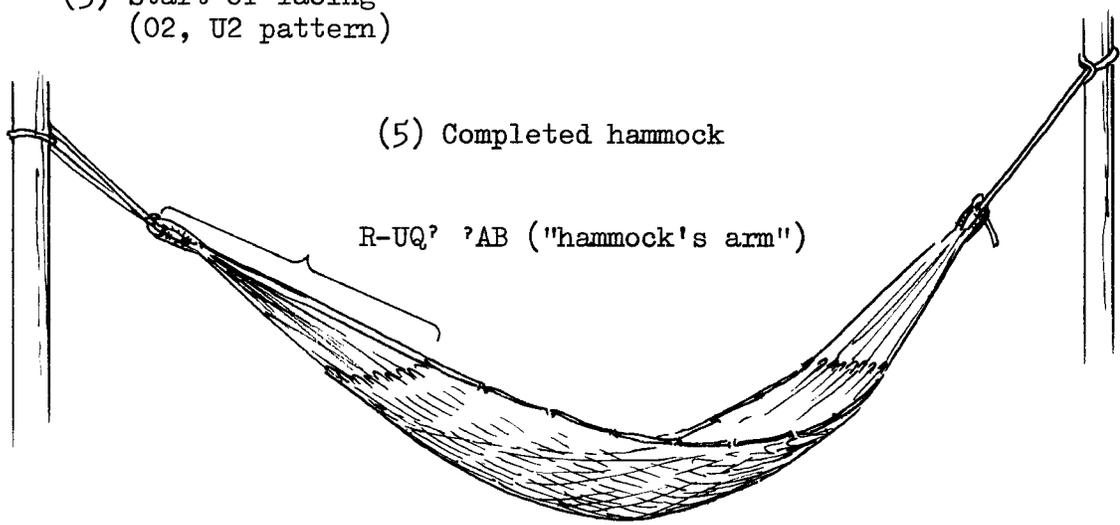
(2) Edge line knots



(3) Start of lacing (02, U2 pattern)



(4) Serving for "arm"



(5) Completed hammock

R-UQ' 'AB ("hammock's arm")

rail. The line runs from there over and around top and bottom cross-pieces until arriving back at the first knot. Ten knots follow, more or less, spaced symmetrically about the ab center and made as illustrated in Figure 18(2). In each subsequent pass the line is knotted over the lines before it until around six passes have been added to the initial two.

From this point two choices are open: one may wrap the frame with half the weight of twine and lace this with the other half (termed *č?ol c?ul*, part-weave), or else wrap on the down-pass and lace on the up-pass (*ti:kil c?ul*, straight weave). In either case one has the further choice of lacing pattern and density. The working strand may pass over (O) and under (U) previous strands in weaves of O2,U2; O4,U4; O3,U2; or O2,U3. In every case the pattern repeats to left and right in a zig-zag; the latter two weaves are used mainly in *ti:kil c?ul*, where lacing is done only on the up-pass. Note that straight passes usually go over the crosspieces while laced lines are taken under these, though for no compelling reason. Pattern density or 'tightness' of weave is determined by the number of zig-zags made between each pair of edge knots; cheap, loose hammocks have few knots and only one pattern while our 'no-expense-spared' model had the following pattern between knots (X):

1X3X2X2X2X3X2X2X2X3X1.

The terminal edge begins by grouping one more line than in the starting edge and locking these together with a series of knots in the working line as it comes up from the bottom crosspiece, much as

the first string of knots was put in (Figure 18(2)). Further passes continue until the full complement of knotted edge lines has accumulated - in our case, ten. The rather extravagant hammock we produced had 120 lines in the body; half that number laced with half as many lacing zig-zags would be about right for an *ab* as sold in the markets.

Once the body of the hammock is complete the top crosspiece is moved halfway or more down the side rails and a third crosspiece put in its place so that the 'hands' or 'arms' can be made. This phase begins with a loop in the end of a new *š-wa ab* so that it passes around the old top crosspiece and through the first few loops from the hammock body; then the line goes over the new crosspiece, down and over and through five loops of the body, more or less. That procedure repeats until the final group of loops is picked up, then the line goes up and is tied around the far end of the 'arm' to hold its loops in place and together. To make the other 'arm', the finished arm loops are shoved to one side and the lower body crosspiece replaces the old upper one so that repetition of all the above is simplified. The exact number of body loops gathered per arm loop is not critically important and, except for the sake of tidiness, need not be uniform or symmetrical. Completion of the arms can be done off of the frame, and involves serving their ends with a chain of half hitches so that a tidy 'U' curve is made in the end of the arm (Figure 18(4)).

The most time-consuming part of making a hammock is the lacing; all the other tasks together occupy about four hours at most. Our

test hammock took three days to complete at a rate of 75 lines in a full day of lacing; with half the number of body lines in total and only half as many zig-zag passes, a professional can turn out at least one hammock in a day of work. However, this does not count the additional time or cost invested in the twine itself.

Precise details of the labor costs, materials costs, and prices received for hammocks would take quite some time to compile. A calculated approximation can be made, however, from the fact that suitable twine sells for about Q0.20 a pound and some two to three pounds of twine go into the sort of hammock that can be laced in one long day's work. The going wholesale price for that grade of article is Q1.00, so the hammock-maker's income is on the order of Q0.40 per working day - unless he can buy or his family can make the necessary twine at a lesser cost.

The majority of hammocks are made of dyed twine nowadays so the hammock-maker is perforce a dyer too. The dyes are imported anilines but they are used as though they were harmless vegetable products; one wonders how long it will be before *ab*-makers are as notorious for eccentricities and ill-health as 18th-Century European hatters.

Backstraps, Tumplines and Saddle Girths

One pair of techniques has been adapted to several belt-like articles: backstraps for stick-loom weavers (*i:qa:l*), tumps (*t:b*), and saddle girths (Sp. *cinturón*). The simple technique is used mainly for cheap *ta:b* and involves an even-numbered set of lengths of *ik?e* fiber which are woven as in Figure 19(1) and served at the ends with fine twine. Our specimens were made by, and purchased

from, a boy in the Chamelco market at Q0.04 each. The superior technique involves three-part braiding of ten to twelve lengths out of fibers, laying these side-by-side, and sewing through with horizontal stitches of fine twine one finger-width apart. My informant used a needle made from the rib of a defunct umbrella. The unbraided ends are then knotted together strand by strand in a loop or side-by-side to make a loop or slit which is served with fine twine in a half hitch knot chain, as with *r-ug?ab* (see Figure 19(2)). Such an article, whatever its use, takes about a man-day to complete and sells for less than Q0.50.

Miscellaneous Articles

Weavers require a second twine product besides a belt, a special rope (termed *t?uy*) to hold the stick at the far end of the warp. This is made by twining two 'eyes' for the ends of the stick and joining the light twine from these into a heavier length to be tied to a tree or house post (see Figure 20(1)). This device is ingenious, quickly made, and therefore very cheap; however, demand is very low as the number of women weavers is small and getting smaller.

The same 'eye' technique is used for one end of the ancient sort of slingshot (*xok?, rant?in*). Two lengths are twined at their centers and the free ends brought around to be merged into a single, double-weight twine which is continued to one armspan (*moqox*) long and finished in a knot. At the cord's center a pouch (*š-ta:b li xok?*, slingshot's tump) is sewed as in Figure 20(2). In use, the slingshot is held with the loop over one's head and the knotted end

FIGURE 19
 TYPES OF TUMP WEAVE

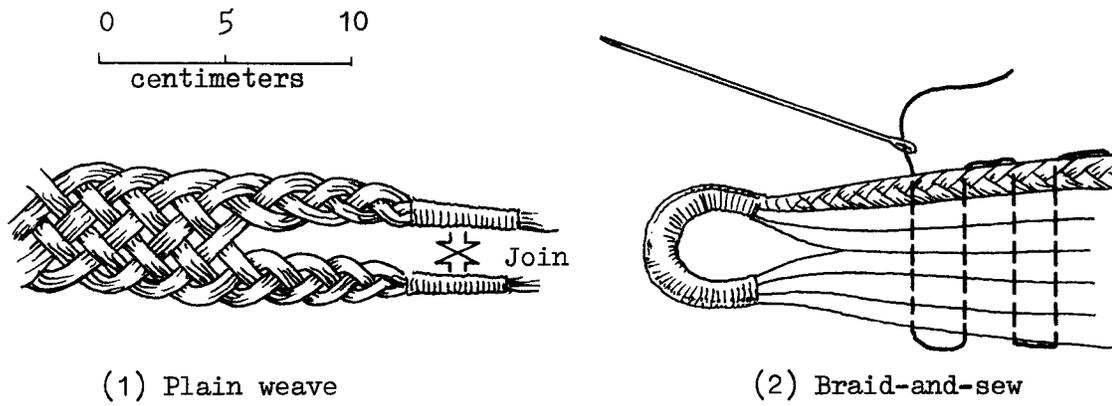
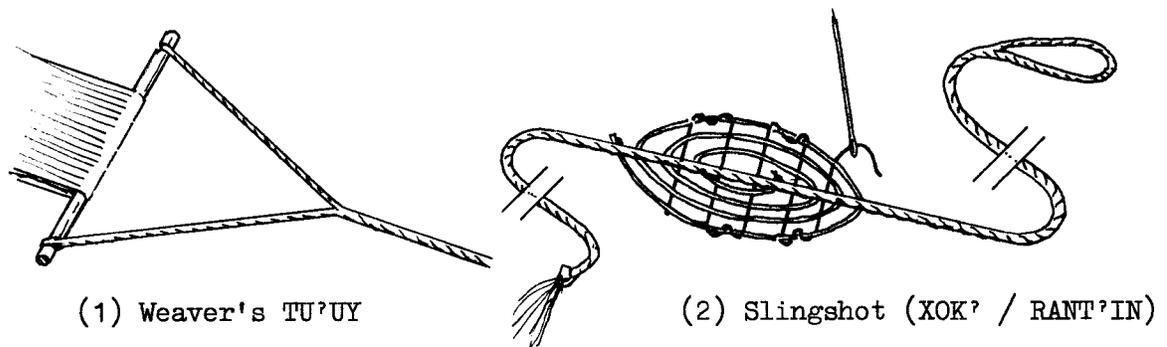


FIGURE 20
 MISCELLANEOUS MAGUEY-FIBER ARTICLES



gripped between thumb and first finger. The tab is then loaded and the sling pulled taut over one's head with the freehand, then popped into a circle behind and around. Circling is continued only to delay: once a target is chosen, full impetus is developed in one swing and the shot is made just as though the whole slingshot was being thrown away. Droll phrases associated with this ancient weapon are *xok?ho š-sa?* (gaspings with hunger) and *xok?ho na-iloc* (ill or hung over and bag-eyed).