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PHILIPPINE MATS.

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THE production of mats in the Philippines is large because of the extensive domestic demand for them. The sleeping mat¹ is used throughout the Christian provinces, and is also found among the Moros. Such mats are of the finer class and are usually more or less highly decorated with colored straws in various designs. For this purpose the buri petates are more widely produced than those made from any other material. Pandan mats are considered stronger and cooler but their use is not so extensive, probably because they are more expensive than the buri mats. In the Visayas, tikug mats are important.

Another use of mats is in the baling of two of the staple products of the Philippines, tobacco and abaca. In the Cagayan valley mats of dried banana petioles are employed. A great many of these are made in Batac, Ilocos Norte, from which place they are shipped to Cagayan. In most cases the tobacco of the Visayas is packed in such mats also. At Argao, Cebu, banana petiole mats are woven as a by-product of the sabá cloth industry. In obtaining the fiber, the outer skin of the petiole is pulled off for stripping, and the remaining portion, which is called "upag," is dried and woven into very coarse mats by children. These are called "bastos"² or "liplip," and are disposed of to the tobacco balers in the town, or are shipped to Cebu and other towns for baling purposes. While sabá sinamay is produced in several of the districts in the Visayas, notably in Bohol, it is not known that the upag is used for mat weaving there.

Coarse buri mats are almost exclusively used in wrapping abaca for the export trade. Since baling is carried on only in large seaports, particularly in Manila and Cebu, the weaving of these mats in certain localities where the buri palm is abundant

¹ Banig, petate, ikamen, dase.

² Meaning coarse stuff.



Plate I. Boy carrying a bastos mat,
Argao, Cebu.

and their transportation to the hemp producing towns are important industries.

While they are not, strictly speaking, mats, plaited sacks³ are woven in the same weave and bear the same relation to sugar and rice as do mats to tobacco and abaca. Most of the domestic rice crop entering into commerce is packed in buri sacks and practically all the export sugar is sent away in them. A few bayones are made of pandan. The production of bayones is an important industry in certain districts.

Mats are also employed throughout the provinces for drying paddy and copra in the sun, in the same manner in which trays are used for sun-curing fruit in temperate regions.

The use of the finer grades of petates for floor mats and for wall decoration is confined to the foreign population in the Philippines. Nevertheless, a considerable number is so utilized. For this trade only mats of the better grades are demanded, and the number sold for the purpose is probably considerably restricted by the fact that few mats are of suitable color combination and of proper design to satisfy foreign taste. As yet there is no known commercial export of Philippine mats. There is a considerable demand for floor mats and mats for wall decoration in Europe and in the United States, but it is improbable that the Philippines can hope to supply any part of it unless designs and color com-

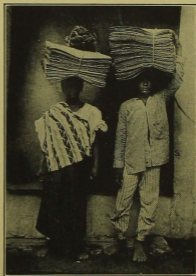


Plate II. Vendors of sleeping mats.

³ Bayones, bayong, canastro, banyot.

binations are vastly improved. Floor mats are used as rugs in the same manner as are the strips of Japanese matting which are so popular all over the world. Round floor mats, somewhat larger in diameter than the round table tops, are also in demand. Small mats can be used as doilies on the table or under the stands of flower pots and the like.

Sleeping mats and mats intended for floors, walls, stands, and mat doilies are the ones which are suitable for domestic and foreign commerce, and industrial education must interest itself in them. The Philippine materials available for weaving these mats are varied and well distributed. With improvement in color combination and design, there should be a large increase in the industry.

BLEACHING AGENTS.

Sunshine is used to bleach all mat straws, but more often they are also treated with boiling water to which certain bleaching agents have been added. Only the most important of these are explained.

Tamarind.—This tree (*Tamarindus indica*) is known in Tagalog, Bicol and Pampanga as sampalok, in Visayan as sambag, in Ilocano as salamagui, and in Palawan as kalampisao. It is a large tree with dense foliage. The leaves are employed as a bleaching agent in boiling water. It is said that the young green fruit can be used for this purpose.

Pandakaki.—The leaves of the plant (*Tabernaemontana pandacaqui*) are used as a bleaching agent. This is the name under which it is known, particularly in Pampanga and Cavite. In Palawan it is called alibetbet. It is also known as kampoipot in Tagalog and as alibubut and toar in parts of the Visayas. In Ilocano the name is kurribuetbuet.

Lemons.—The juice of the various species and varieties of *Citrus* is employed to some extent for bleaching. It is usually added to boiling water in which the straw is immersed.

Vinegar.—Of Philippine vinegars, those made from palm juices are considered about half as strong as lemon juice. Vinegar from sugar cane juice has probably the same strength. That made from cooked rice is considered about one-fourth as strong as lemon juice.

Alum.—In some towns alum is added to the boiling water in which straw is treated. It is usually employed in combination with other bleaching agents.

DYES USED ON MAT STRAWS.

MORDANTS.

A mordant is a substance employed to fix the dye to the material. In general, different ones are needed for different dyes and various materials. In some cases the mordant is added to the dye liquid; in others the material is previously treated with it before being colored. The most important are the mineral mordants, such as the alumina, the iron, the tin, and the chrome. These are not used in the Philippines with local vegetable dyes. Tannin is also important and is employed to some extent in the Philippines, being generally obtained from the mangrove tan barks. Wood ashes are little used but vinegar and lemon juice are important.

Kolis.—The leaves of this plant (*Memecylon edule*) are commonly used in mordanting buri straw before dyeing it with sappan wood. In Tanay, Rizal, it is employed on sabutan straw with all of the vegetable dyes. It is known as guisian (Laguna), duigim (Ilocos, Pangasinan), kulis (Rizal, Nueva Ecija, Bataan), tagobachi (Leyte), kasigay (Ilocos Norte), agam (Negrito, Cagayan), guisoc-guisoc (Sorsogon), macaasin (Tayabas), baiian (Zambales), diyatdiyatan (Tayabas), candong (Pangasinan), dioc (Pangasinan).

NATURAL VEGETABLE DYES.

Numerous natural vegetable dyes are employed in the Philippines. Those used on the mat straws are limited in number. The important ones only are here noted. The whole question of dyes is a most difficult one and hardly warrants the time which has been spent upon investigating the various dye materials, nor the effort which would be necessary to determine definitely the methods by which they can be used on mat straws. The artificial dyes have driven the natural vegetable dyes out of use because they are cheaper and are more easily applied, and because in most cases they produce more pleasing and lasting colors.

Sappan.—This plant (*Caesalpinia sappan*) is known as sapang in Tagalog and Ilocano and as sibucao in Visayan and Bicol. A beautiful dye varying from red to red-orange (see Plate III) is obtained from chips of the wood. This is employed on most Philippine fibers. Lime is sometimes used as a mordant but the straws are usually first treated with kolis leaves.

Turmeric.—This plant (*Curcuma longa*) is known as dilao

throughout the Islands. In Ilocano it is called kunig. Kalaoag is its name in Negros and Sorsogon, ange in Pampanga and duao in parts of the Visayas. The yellow dye obtained from the roots is fugitive in the sunlight.

Annatto.—This plant (*Bixa orellana*) is generally known here as achuete. It is sometimes called achiote. The plant bears burs containing many small reddish seeds from the pulp of which the dye is obtained. It is often employed in combination with turmeric. The result is a yellow orange. The dye fades easily.

Deora.—The use of this plant (*Peristrophe tinctoria*) is confined to the Visayas and Mindanao where it is known by this name and also as dauda and daura. In Samar the name is dala-uda. It is a small bush and is usually grown in the gardens for its leaves and tender stems. A mordant is not used. The color ranges from yellow orange to a deep red orange.

The methods of using these dye materials are explained for each straw.

MATERIALS USED WITH MUD TO OBTAIN DARK GRAYS.

Red or green straws are turned dark gray by burying them in mud to which certain substances (usually containing tannin) are added.

Talisay.—This large tree (*Terminalia catappa*) is common in the Philippines. The leaves are added to the mud in dyeing straw black. From the bark a brown dye may be obtained. It is, however, seldom used. It is universally known as talisay. Spanish speaking people call it almendras.

Indigo.—Two species of *Indigoferae* are grown in the Philippines and are known as tagum. Except with mud they are not used to dye straws.

Tiagkot.—The leaves of this plant (*Pithecolobium subacutum*) are employed on Romblon Island in dyeing buri gray. Other names are tagayong, narandael, saplit (Cagayan); carisquis, ayamguitan (Zambales); tugurare (Pangasinan); inep (Bulacan); malasaga, malaganip, tekin (Laguna); bahay (Sorsogon); tagomtagom (Samar); tique (Rizal).

Kabling.—This plant (*Pogostemon cablin*) is generally cultivated, though it grows where its cultivation has been abandoned. A volatile oil used to keep away insects from textiles is obtained from the leaves. The leaves are used in Tanay, Rizal, in obtaining gray sabutan straw.

Mabolo.—The heart wood of this tree (*Diospyros discolor*) is known as kamagon. The leaves are employed in Tanay, Rizal.

Castor.—This plant (*Ricinus communis*) is seldom cultivated in the Philippines but is found wild in all localities. The "beans" yield the oil. The leaves are added to mud in obtaining gray sabutan straw.

ARTIFICIAL DYES.

It is commonly believed that artificial dyes are less permanent than natural ones. This is seldom the case; as a matter of fact some of the fastest and most valuable dyes are now made artificially and many are not procurable from vegetable coloring matters. Most of the cheaper dyes made from coal tar are fugitive; that is, they fade in sunlight or water or in both. They are often still further cheapened by being adulterated with salt, dextrine and the like. Such are the colors which are usually sold by the Chinese tienda keepers and which have caused artificial dyes in general to come into such ill-repute in the Philippines. Many of these "Chino dyes" contain 95 per cent salt. It is the belief, however, that artificial dyes of a good class, so packed and marketed that they will come cheaply to the hands of the dyers and weavers will drive out of use practically all of the vegetable dyes now employed in the Philippines. The disuse of the natural dyes would not be regretted here, for, with the possible exception of those obtained on sabutan straw in Tanay, much finer colors can be produced with artificial dyes, as to both beauty and fastness. If the time of the workers is considered, the vegetable dyes now employed in the Philippines are more expensive than the artificial dyes, even though the latter are now sold in wastefully small packages and bear the burden of several large profits before they come to the hands of the persons using them.⁴

DYEING.

The process of dyeing is simple. The fluid is prepared in water (usually boiling), and the material is immersed in it. The shade of color obtained depends on the length of time the material is allowed to remain in the fluid or the number of times it is treated, and the strength of the dye. The combination of two different dyes to obtain a third is understood to some extent. In particular, red and yellow are mixed to obtain orange.

⁴ The Bureau of Education has taken steps to procure series of dyes suited to each one of the mat straws and other important fibers used in household industries and industrial instruction in the Philippines. It is believed that these will at once solve the local problem.

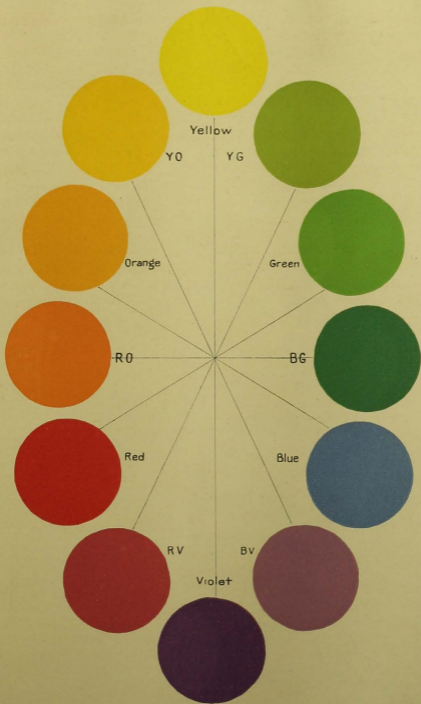


Plate III. Color Chart.

SUGGESTIONS ON THE USE OF COLORS IN MATS.

STANDARD COLORS.

The three primary colors are red, blue and yellow. The three secondary colors are obtained by combination of the three primary colors, and are orange, green and violet. Orange is made by a combination of yellow and red, green is a combination of blue and yellow, and violet is the combination red and blue. Most of the dye materials explained in the preceding pages do not produce standard colors and so, when combined, do not result in the expected secondary color. Often those called red are, in point of fact, red-violet (see Plate III). In the same way dyes called yellow are yellow-orange. A mixture of yellow-orange and red-violet would produce a muddy color. Dye called green may be really blue-green or yellow-green, and combined with red, will make a muddy color.

The above remarks on standard complementary colors are only valid for pure colors and it is only by much experimentation that pleasing tones can be obtained by a combination of the dyes used on straws in the Philippines.

HOW TO TONE DOWN BRILLIANT COLORS.

Many of the colors used in Philippine mats are very brilliant. A little brilliantly colored straw, properly combined with subdued colors such as gray or one of the natural colors of Philippine straws, is pleasing, but the abundant use of brilliant straws, such as is sometimes seen in mats of solid color, is to be discouraged.

All brilliant colors may be subdued by adding to them their complementary color. Thus a brilliant red may be subdued by adding to it a small amount of green and in the same way brilliant green may be toned down by mixing with it a small portion of red. If too much of the complementary color is added the result will be gray. In the same way all complementary colors will subdue one another. In Plate III the principal colors have been so arranged that the complementary colors are directly opposite each other and are connected by lines. Any two colors connected by lines on this chart will tone down each other and, if mixed in proper proportions, will result in gray.

It is probable that any straw which has been dyed too brilliant, can be closely matched to one of the colors given on Plate III. Consequently its complement can be determined and, by experimentation, the brilliant color toned down. Usually only an exceedingly small amount of its complement is needed to tone down a given color.

COLOR COMBINATION.

In general too many different colors appear in the Philippine mats, and most of these are brilliant. It is often true that a large amount of a given brilliant color is offensive to the eye, and yet the addition of a little of it greatly enhances the beauty of the mat. Often color combinations are not harmonious. Particularly bad effects are obtained with red-violet and yellow or yellow-orange. Red-violet with blue-green is another unfortunate combination.

Certain rules have been set down for combination of colors. (1) A given color with its tints and shades⁵ may always be safely combined; (2) complementary colors may always be safely combined; (3) the tints and shades of complementary color may always be safely combined. (4) Any three colors occurring in sequence on the color chart may be combined in that sequence.

The following notes on the use and combination of the colored straws from Tanay, Rizal, and from Romblon, and those shown on the charts accompanying the dyes of Leopold Cassela & Co., are given. The figures refer to the numbers given the colored straws on these charts. These dyes were evolved for the Bureau of Education especially for Philippine mat straws and will soon be available in the market. The notes have been prepared in accordance with the rules above outlined, and, if they are followed closely, no unfortunate color combination can result.

COLORS OBTAINED FROM THE NEW DYES.

The sample straws on these cards are made with the following dyestuffs:

Colors.	Numbers on chart.	Dyestuffs.
Yellow Yellow-Orange	No. 1	Paraphosphine G.
Violet	No. 2	Methylviolet BB 72 No. 1.
Brown	No. 3	Rush Brown B.
Orange Red-Red	No. 4	Rush Red S A.
Yellow-Green	No. 5	Rush Green T B.
Blue-Violet	No. 6	New Methylene Blue R.
Red-Violet	No. 7	Magenta Prima.
Black	No. 8	Rush Black M.
Chocolate	No. 9	Rush Brown X.
Red	No. 10	Rush Red J S.
Yellow Orange-Yellow	No. 11	Auramine II.
Blue-Green	No. 12	Japan Green.
Red Violet-Violet	No. 13	Methylviolet R No. 1.
Red-Orange	No. 14	Chrysoidine A G.
Blue Blue-Green	No. 15	New Methylene Blue N. *
Violet Red-Red	No. 16	Safranine S 150.

⁵ A tint is a paler or less intense tone than the standard color. A shade is a darker, more intense tone of the standard color.

Complementary or opposite colors on the color chart are said to be harmonious. Their relation is made more pleasing, however, if one color, usually the more brilliant, is used in very small amount. In many cases in the above combinations colors not exactly opposite have been united. They usually contain a mixture of a primary color common to both. Brown, Black, Chocolate and Dark Red are complicated mixtures and may be analyzed with a chart which will appear later. Many of these dark colors would harmonize with one another, but would be so dark that they would not be pleasing. In every one of these combinations, the natural straw background figures as another color, and that is why the especially good combinations, as will be noticed, contain browns, yellows and reds, colors which blend particularly well with the background. Red-Violet No. 7 can be used with only a very few colors, and never with Yellow-Yellow-Orange No. 1. Yellow Yellow-Orange should be used cautiously.

In Sabutan straw, No. 1, Yellow, must be used sparingly. When used in combinations in place of No. 1, Yellow Yellow-Orange, the design should be an open one, rather than solid. Violet Red-Red, No. 16, when being used in place of Red No. 10, must be used in the same way, and only in places where very, very little is called for. No. 11 is a color that clashes with even a natural straw, so is not advisable in any combination or alone. No. 13 is not a necessary color when No. 2 and No. 6 are available.

In placing the color upon the space to be decorated, the heavier colors should usually appear on the outside and near the edge of the space, although a border may sometimes be outlined with darker color on both inside and outside edges.

The following combinations of these colored straws will prove harmonious. The numbers correspond to those used on the chart and the different kinds of type indicate the proportions of the color to be used—*little*, MEDIUM AMOUNT, MUCH. The relative positions of the colors must also be observed and the given order followed when more than two colors are combined.

BROWN (3) *Yellow-Yellow Orange* (1). Especially good.

Black (8) YELLOW-YELLOW ORANGE (1).

Chocolate (9) YELLOW-YELLOW ORANGE (1).

RED-ORANGE (14) CHOCOLATE (9) *Yellow-Yellow Orange* (1). In this case, the heavy color, 9, comes in the center of the design, but is necessary to separate Nos. 14 and 1.

VIOLET (2) BLUE-GREEN (12) *Red-Orange* (14).

Violet (2) RED-ORANGE (14) BLUE-BLUE GREEN (15).

Brown (3) alone on natural background.

BROWN (3) *Yellow-Green* (5). Especially good.

Brown (3) BLUE-GREEN (12).

BROWN (3) RED-ORANGE (14) *Red* (16).

Brown (3) *Red-Orange* (14). Especially good.

Brown (3) BLUE-BLUE GREEN (15) *Red-Orange* (14). Especially good.

Brown (3) RED (16). In sabutan straw, use No. 4 or 10 in place of No. 16.

Black (8) BROWN (3) RED-ORANGE (14). Especially good.

ORANGE-RED RED (4) *Blue-Green* (12). Use No. 15 instead of 12 with sabutan.

BLUE-BLUE GREEN (15) BLUE-GREEN (12) *Orange-Red Red* (4). Especially good.

Black (8) ORANGE-RED RED (4). Especially good.

YELLOW-GREEN (5) BLUE-BLUE GREEN (15) *Red-Orange* (14).

RED-VIOLET (7) BLUE-BLUE GREEN (15) *Yellow-Green* (5). Especially good.

BLACK (8) YELLOW-GREEN (5). Use this combination with an open design—not solid—, and do not use much of each.

BLUE-GREEN (12) *Yellow-Green* (5).

BLUE-BLUE GREEN (15) *Yellow Green* (5).

Blue-Violet (6). On a natural ground.

BLUE-VIOLET (6) *Red-Orange* (14).

CHOCOLATE (9) BLUE-GREEN (12) *Red-Orange* (14). Especially good.

Chocolate (9) BLUE-GREEN (12) *Red-Orange* (14). Especially good.

BLUE-BLUE GREEN (15) RED-ORANGE (14). Especially good.

BLUE-BLUE GREEN (15) *Red* (16).

ROMBLON BURI VEGETABLE COLORS.

1—Black.

2—Gray-green.

3—Natural.

4—Orange.

5—Dark red.

In Romblon buri straw the following combinations will be harmonious:

Nos. 1, 2 and 3 in accordance with Rule 4.

Nos. 2, 3 and 4 in accordance with Rule 4.

Exception to Rule 2: No. 5 is inharmonious with No. 4.

It will be noticed that these colors depend for their harmony on their order or sequence and their quantity (in this case equal parts of all three). No. 3 being a neutral color, great quantities of it may be used with any other colors. There is danger, however, in getting too much of one of the other two colors. No. 4 is a very strong color and a little will be pleasing while much will be offensive. It is not well to use it alone on a ground of No. 3. No. 5 may be used alone with a ground of No. 3; No. 1 with a ground of No. 3; No. 2 with a ground of No. 3; No. 3 with a ground of No. 2; Nos. 1 and 3 on a ground of No. 2, with a very small quantity of No. 1; equal proportions of 1 and 4 may be combined on a ground of No. 3; Nos. 2 and 4 on a ground of No. 3, a *very* small quantity of No. 4 being used.

TANAY SABUTAN COLORS (MOSTLY VEGETABLE).

- 1—Black.
- 2—Blue-green.
- 3—Natural.
- 4—Yellow.
- 5—Red-orange.
- 6—Red-orange red.

It will be necessary to use No. 3 on a ground work. Mats made entirely of any of the other colors would hardly be harmonious on a floor or wall, if there were any other furnishings. Nos. 1, 2, 5 and 6 may be used separately upon a ground of No. 3; No. 2 in large quantity; No. 1 in small ground of No. 3; No. 2 in equal quantity with No. 5 upon a ground of No. 3; No. 5 in equal quantity with No. 6 upon a ground of No. 3; No. 6 in large quantity, with No. 2 in small quantity, upon a ground of No. 3; No. 5 in large quantity, with No. 1 small, on a ground of No. 3.

STRIPPING MAT STRAWS.

Philippine mat straws can be divided into three classes—palm straws, pandan straws and straws obtained from sedges. The first two are obtained by stripping the leaves of the plants into narrow lengths. For this purpose there is used in most localities a small gauge held between the thumb and index fingers. A knife blade fitting in the notches serves as the cutting edge. The leaf is held in one hand and the gauge and knife in the other, the edge of the leaf being drawn through the gauge. This is generally made out of the stiff part of the leaf, though,

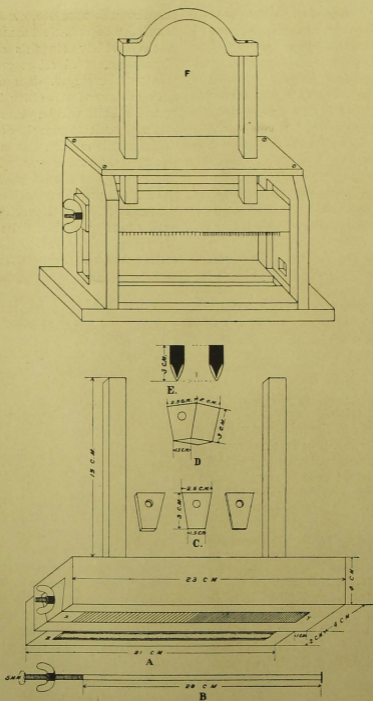


Plate IV.

occasionally, of a piece of rattan, bamboo or leather. At best it serves for only a few hours of use, when it is thrown away and another made.

When the notch becomes worn, the blade moves about in the gauge causing the width of the straws to vary, and when a new gauge is made there is always more or less variance in the position of the new notches. This method is very slow, as but one strip can be cut at a time; and, until the operator becomes expert in the use of the gauge, many of the strips are worthless. When used in the school room, each pupil has to prepare his own material. This causes waste of materials and a constant littering of the floor.

For stripping sabutan leaves, the mat weavers of Tanay, Rizal, use a kind of comb which is discussed under the heading

"Sabutan." The leaves are pulled over this comb before being dried. As sabutan is parallel veined it is very easy to strip it thus, the teeth of the comb following the leaf fibers. The comb produces several uniform straws with one stroke.

The object of contriving the stripping machine illustrated and described here was to furnish a quick means of preparing palm and pandan straws with uniform widths and clean cut edges. Forms of it have been in use for some time and the model noted here has been tried out for a year. By its use one pupil can prepare materials for the whole class, or else the



Plate V. Stripping with a gauge.

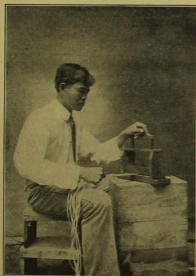


Plate VI. Stripping buri straw with the Andes stripper.

teacher can have all the materials prepared beforehand if it is so desired. This is half the problem of teaching the weaving of hats or mats.

This stripper is made wide enough for inserting teeth three widths apart, so that without adjusting these teeth three widths of straw may be cut. By changing the teeth in the adjustable gums, any width desired may be obtained.

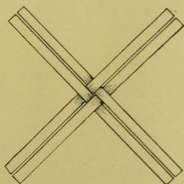
It is best to make this apparatus of hard wood, especially the piece represented by Fig. A. A is a block of wood 23 cm. by 4 cm. by 4 cm., containing the groove XY. This groove is the size and shape of C, being 2.5 cm. wide at the top, 1.5 cm. at the bottom, and 3 cm. high. C is one of the blocks which slides in the groove XY. These blocks are made of different thicknesses, about 2, 3, and 4 mm., and are of hard wood or metal. The rod B passes through these blocks and tightens on the block D, or X by means of a thumb screw. Z is a wooden roller 19 cm. long and 1.5 cm. in diameter. This should extend 2 mm. below the level of the main surface. It is placed in a groove made in a separate piece of wood from the principal block and is fastened into the principal block by means of screws.

The teeth (see C) are made of clock springs or other thin sharp metal. They are 3 cm. long and 1 cm. to $1\frac{1}{2}$ cm. wide. The two upright pieces at both ends contain grooves on the inside in which the block-head slides up and down.

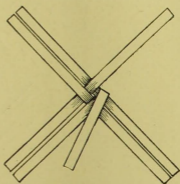
To operate this device, the block-head containing the teeth is raised by the handle; the leaf is placed under the teeth, and the block-head is dropped. The teeth pass through the leaf into a groove underneath. The leaf is now pulled through by the hand as illustrated in Plate VI.

KINDS OF WEAVES.

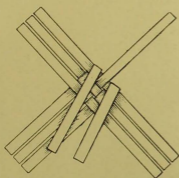
With respect to their weaving, Philippine mats divide themselves into five groups and are here arranged according to their difficulty. They are (1) the over and under weave found in most simple mats, such as those made of buri straws, pandan straws, and sedges; (2) the sawali weaves, which employ the floating straws for making "woven in" designs and panels for figured sabutan and tikug mats; (3) the open work weaves of the Romblon buri mats; (4) the circular mats which employ the hat weaves, either with or without "woven in" designs; (5) the hexagonal weave; and (6) the embroidered mats in which the designs are later added. In difficulty, and in place in a course of instruction, embroidered mats follow the simple over and under weave.



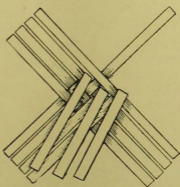
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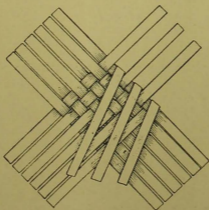
Step 2.



Step 3.

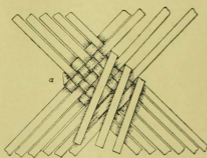


Step 4.

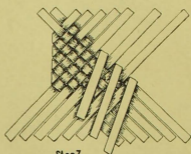


Step 5.

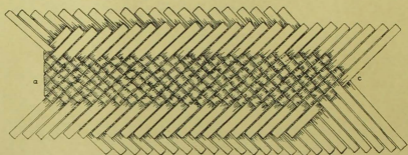
Plate VII.



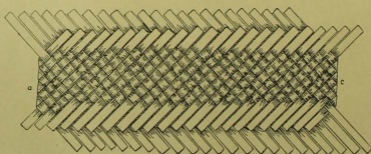
Step 6.



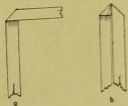
Step 7.



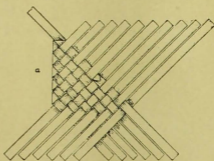
Step 8.



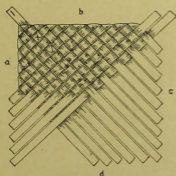
Step 9.



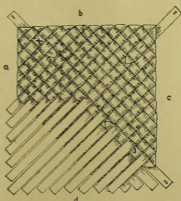
Step 10.



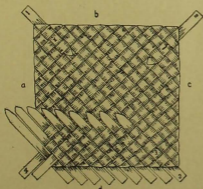
Step 11.



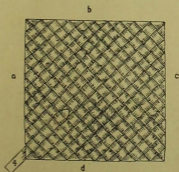
Step 12.



Step 13.



Step 14.



Step 15.

OVER-AND-UNDER WEAVE.

This weave is the simplest and is the one which beginners should first take up. It is made by weaving over one and under one continuously. Until this is thoroughly mastered children should not be allowed to begin the more difficult weaves.

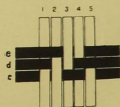
The steps have been diagrammed in figures sufficiently large and clear in Plates VII, VIII, and IX that a detailed explanation is not necessary. Step 1 shows the position of the first four straws as they are placed upon the table or desk; steps 2, 3, 4, and 5, continued additions and weaving; steps 6, 7, and 8, turning the edge *a* on the end of the mat; step 9, turning the opposite edge *c*; step 10, the double turn of the corner straw; step 11, the corner turn woven in the mat at corner No. 1, lapping over the straw already woven; step 12, the continuation of the second edge *b*; step 13, the turning of the second and third corners; and steps 14 and 15, finishing the mat.

In weaving large mats, it is customary to begin at one end of the mat, preferably, near the left hand corner, as the mat lies before the weaver. The weaving continues along the end until half of the desired width of the mat is reached, when the first corner is turned. Now the weaving continues down the side and in, as far as the middle of the mat. When the desired length is woven, the second corner is turned and the first half of the mat completed.

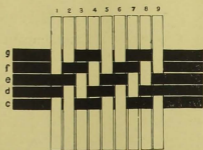
As the straws are not generally long enough without splicing, new straws are now added by lapping them from two to three inches upon the projecting ends of the straws already woven. This makes a narrow strip of double thickness down the center running the length of the mat. The weaving now continues as before until the desired width of the mat is attained, when the third corner is turned. The remainder is woven and finished at the fourth corner as shown by steps 14 and 15.

Some weavers begin at the sides, and some few, even at the corners; but this should not be encouraged since it results in making two or more seams, where the straws lap.

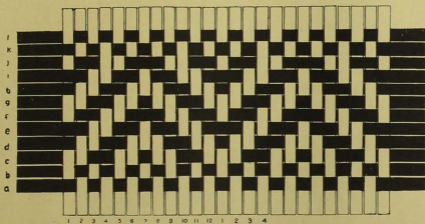
Care must be taken to weave all parts of the mat equally close and keep the edges perfectly straight; otherwise the mat when finished will be lop-sided, and consequently of no value. In weaving tapering grasses like tikug, which have ends of slightly different sizes, the opposite ends of the straws should be alternated. This prevents one edge of a mat from building faster than the other.



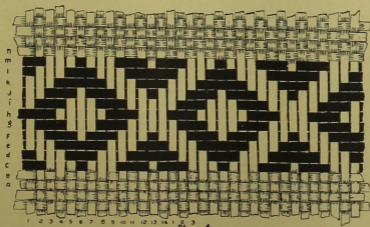
Step 1.



Step 2.

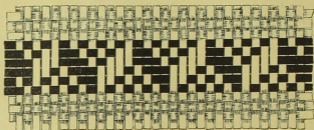


Step 3.

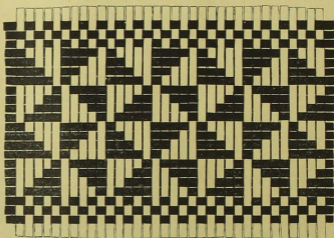


Step 4.

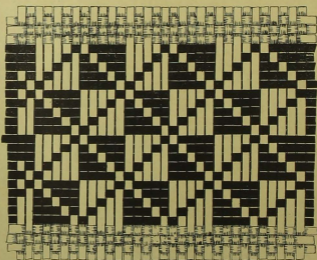
Plate X.



Step 5.



Step 6.



Step 7.

Plate XI.

SAWALI WEAVES.

SIMPLE SAWALI.

By sawali weave is meant all "woven in" designs that are not woven by *ones* as in the over and under weave. They may be woven regularly by *twos*, *threes*, etc.; or they may "switch" the floating straws so as to form a variety of artistic figure designs. In fact there is no limit to the number of designs that may be thus made.

Steps 1 and 2 illustrate the beginning of a sawali weave by *twos*. First 1, 2, 3, 4, 5 are laid down; then *c* is put under 1-2, over 3-4, and under 5; *d* over 1, under 2-3 and over 4-5; *e* over 1-2, under 3-4, and over 5. This process is continued, advancing one straw each time until the desired amount is woven. If the weaving is by *threes* or *fours*, the same principle is followed; that is, the straw goes over three and under three advancing one straw each time.

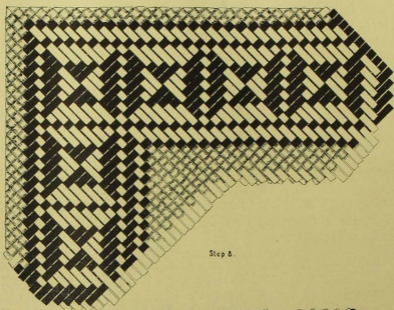
PANELS.

Most "woven in" mat designs are arranged in panels, with a ground between, as this gives a more pleasing effect than a continuous figure weaving. Panels may be woven either lengthwise, step 8, crosswise, step 8, diagonally across the mat, step 4, or in zigzags, step 3. They are most easily woven when arranged diagonally, for then the colors may be carried from border to border without mixing with the ground outside of the panel. Checks are made by weaving cross panels at regular intervals.

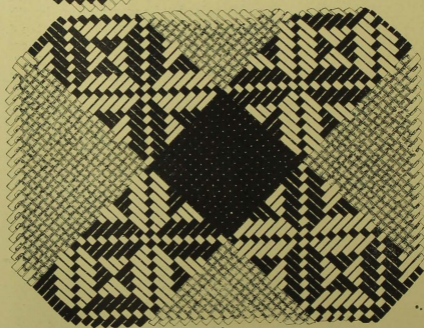
In making parallel panels (panels parallel either to the sides or ends), more than two colors can rarely be used to advantage.

Step 3 illustrates the weaving of a zigzag sawali panel. The straws, *a*, *b*, *k*, and *l* are woven by *ones*. It takes twelve straws one way and nine the other to make this panel. If a wider panel is desired, the same weaving is repeated as often as necessary.

The straws *a*, *b*, *k*, and *l* are woven by *ones*. Put *l* over *b* and *c*, under *de*, over *fg*, under *hi* and over *j*. Put 2 under *b*, over *cd*, under *ef*, over *gh*, under *ij* and over *k*. Put 3 over *b*, under *c*, over *de*, under *fg*, over *hi* and under *jk*. Put 4 under *bcd*, over *ef*, under *gh*, and over *ijk*. Put 5 over *bc*, under *de*, over *fg*, under *hi*, and over *j*. Put 6 under *b*, over *cd*, under *ef*, over *gh*, under *ij*, and over *k*. Put 7 over *b*, under *c*, over *de*, under *fg*, over *hi*, under *jk*. Put 8 under *b*, over *cd*, under *ef*, over *gh*, under *ij* and over *k*. Put 9 over *bc*, under *de*, over



Step 8.



Step 9.

fg, under *hi* and over *j*. Put 10 under *bed*, over *ef*, under *gh*, and over *ijk*. Put 11 over *b* under *c*, over *de*, under *fg*, over *hi*, and under *jk*. Put 12 under *b*, over *cd*, under *ef*, over *gh*, under *ij*, and over *k*. Then the whole operation is again repeated. It will be seen that the manner of weaving of 2 and 12, 3 and 11, 4 and 10 and 5 and 9 is the same.

Step 4 illustrates the diamond figure design, woven by threes, with 11 straws in width.

Put 1 under *cd*, over *efg*, under *h*, over *ijk* and under *lm*. Put 2 under *c*, over *def*, under *ghi*, over *jkl*, and under *m*. Put 3 over *cde*, under *fghij*, and over *klm*. Put 4 over *cd*,

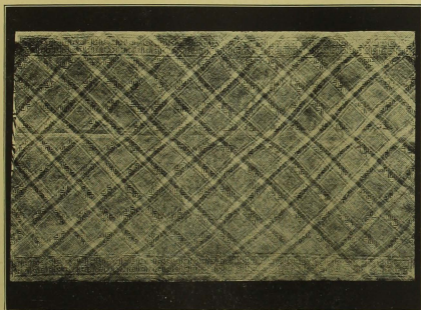


Plate XIII, fig. 1. Mat with woven-in border showing confusion in design.

under *efg*, over *h*, under *ijk*, and over *lm*. Put 5 over *c*, under *def*, over *ghi*, under *jkl* and over *m*. Put 6 under *cde*, over *fghij*, and under *klm*. Now the order reverses, 7 being the same as 5, 8 as 4, etc., until the other half of the figure is completed at 11. Now put 12 under *cde*, over *fghij*, and under *klm*. Put 13 over *c*, under *def*, over *ghi*, under *jkl* and over *m*. Put 14 under *cde*, over *fghij* and under *klm*. Now 1 repeats itself, and the second figure is woven as the first. It is believed that with the aid of the large illustrations here presented the teacher or pupil can now follow for himself the other designs given, without a detailed explanation of each step.

"WOVEN-IN" BORDERS.

Woven-in border designs may be made in three different ways, viz: *First*, by weaving the design around the mat, using the same straws that run through the body. (See Plate XIII, Fig. 1.) In this case the color effect is one of confusion, since the dyed straws used in the designs of the body of the mat have no relation to the design of the border when they enter it. *Second*, by weaving the border and the body of the mat of different straws, uniting them at the inner edge of the border by a loop as described in the Romblon mat. (See Plate XVI.) *Third*, by lapping the colored straws desired in the border, upon the projecting ends of the straws of the body of the mat. (See

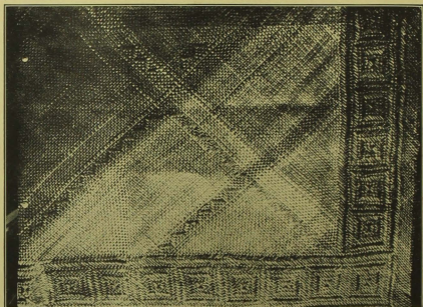


Plate XIII, fig. 2. Mat with woven-in design made by lapping straws.

step 8, Plate XII.) These latter two methods are much more artistic, as a uniform color effect appears throughout the border. (See Plate XIII, Fig. 2.)

THE ROMBLON MAT.

MAKING OPEN WORK.

Simple open work is illustrated in Plate XIV.

Weave corner Z using straws *a, b, c, d, e* and *f*, letting *f* float at both ends. Weave *g* turning upward and over *f*, then making a double corner at *y*, passing under *f*, to the left and over *f*, and

let float. Weave *h*, *i*, *j*, *k*, *l* and *m* in solid weave. Turn *h* under *i* and over *j*. Turn *j* upward and over *i*, to the left under *f*, upward over *g*, double corner at *W*, passing down under *g*, over *g*, and floating. Turn *m* upward over *l* to the left, under *i*, upward over *f*, to the left under *g*, upward over *j* making a double corner at *X*, passing under *j*. The straws *j* and *m* alternately cross each other to corner *V*.

The other half of this open design is an exact duplicate of this weaving, and the remaining designs have the same turns as the one explained, except that in opposite designs the straws

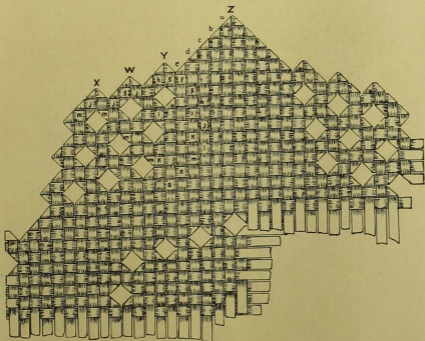


Plate XIV.

are turned in opposite directions. By following this plate it is easy to finish the weaves. If one straw is woven over another, it folds down before passing over, and, vice versa, if it passes under, it folds upward in turning.

As is seen, the holes are made simply by turning the straws in the weave. The different shaped holes in other designs (See plates) are made by turning a different number of straws according to the shape desired. Varied border edges may be made by switching the straws in any direction desired.

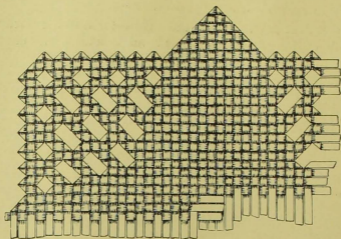


Fig 1.

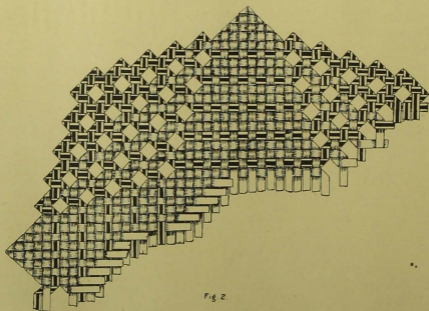


Fig 2

Plate XV.

INTRODUCING COLOR PANEL.

Step 1 of Plate XVI shows the first colored panel, straw *ab* placed between *cd*, the space between *x* and *y* having been already woven, as shown in step 11.

Step 2. Folding *a* to the right.

Step 3. Folding *a* under and down.

Step 4. Folding *c* over *a* and to left.

Step. 5. Folding *a* over *c* and upward.

Step 6. Folding *b* under *d* to left.

Step 7. Folding *b* upward, with right twist downward.

Step 8. Folding *d* downward, with right twist to right.

Step 9. Folding *b* under *d* upward.

Step 10. Shows addition of second straw *ef* woven to the right, where the same process of turning is gone through as illustrated in steps 6 to 9 inclusive. If weaving is to the left, steps 1 to 5 inclusive are repeated.

Step 11. Shows continued additions and weaving both to the right and left.

Step 12. Shows both edges of panel woven, the inside turnings being the same as those of the outer edge.

CIRCULAR MATS.

The circular mat is woven like the crown of a hat, with either the radiating center or a square center radiating at the four corners. In either case the weaver must be careful to add the proper number of straws so that the mat will be flat, and not cupped, or fluted. The cupping is caused by not adding a sufficient number and the fluting by adding too many.

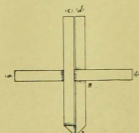
In tightening the weaving, do not pull the added straws (Plate XIX, step 6, straw *x-x*) or holes will be made at the elbow. Instead, pull the longer straws that run through the center, thus making the entire weaving tight.

RADIATING CENTER.

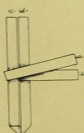
Step 1. Begin by laying down, in pairs, *ab* and *cd* perpendicular to the body. Put *kl* under *ab* and over *cd*. Put *ij* over *ab* and under *cd*.

Step 2. Now put *ef* under *cd* and *ij*, and over *ab* and *kl*; then put *gh* over *cd* and *ij*, and under *kl* and *ab*. See that the two ends of all the straws are equidistant from the center crossing.

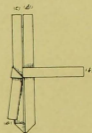
In step 3 the straws are changed from pairs to singles as follows: Bring *a* over *i*; *e* over *d*; *i* over *h*; *d* over *l*; *h* over *a*, and *l* over *e*.



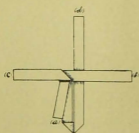
Step. 1



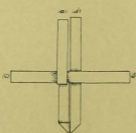
Step. 2



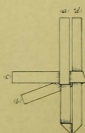
Step. 3



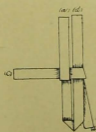
Step. 4



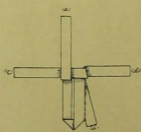
Step. 5



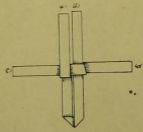
Step. 6



Step. 7

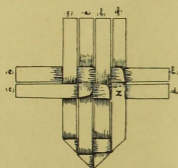


Step. 8

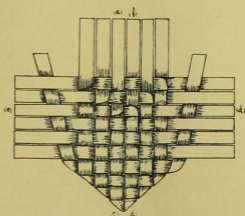


Step. 9

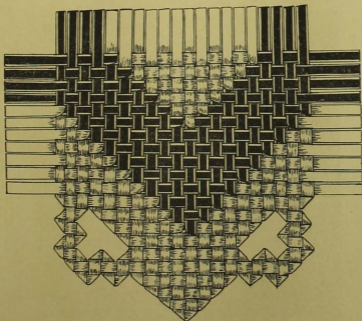
Plate XVI.



Step 10



Step 11



Step 12.

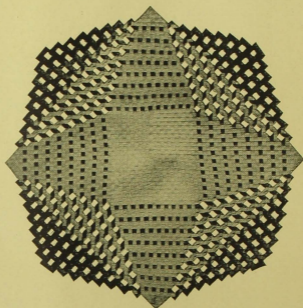


Fig. 1.

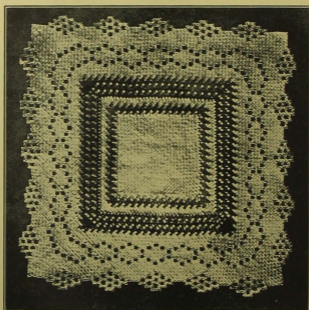


Fig. 2.

Plate XVIII. Romblon mat designs showing simple open weaves.

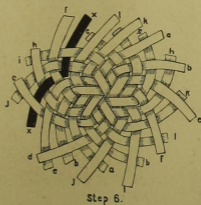
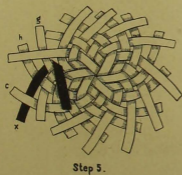
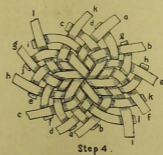
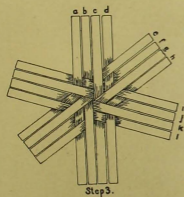
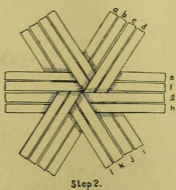
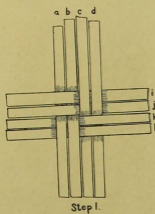
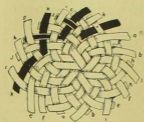
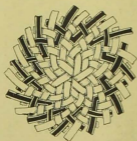


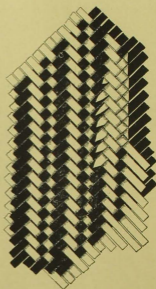
Plate XIX.



Step 7.



Step 8.



Step 9.

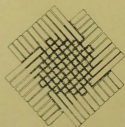
Plate XX.



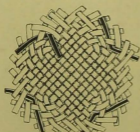
Step 1.



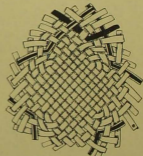
Step 2.



Step 3.



Step 4.



Step 5.

Plate XXI.

Step 4. The most convenient way to perform the next process is to take all the bottom straws in the left hand and allow the top straws to float over the closed first. Then the weaving is done with the right hand. However, for beginners the weaving may also be done on the table.

In weaving, place *c* under *b*, over *a* and under *k*; *d* over *b* and under *a*; *g* under *f*, over *e* and under *b*; *h* over *f* and under *e*; *k* under *j*, over *i* and under *f*; *l* over *j* and under *i*; *b* under *c*, over *d* and under *a*; *a* over *c* and under *d*; *f* under *g*, over *h* and under *c*; *e* over *g* and under *h*; *j* under *k*, over *l* and under *g*; *i* over *k* and under *l*; the round is then finished.

Step 5. This illustrates the manner of adding straws. Straw X is placed under *c*, over *h*, under *g* and then bent back. The bend should be in the middle of the straw.

Step 6. In this the right end of the added straw *x* is brought down over *j* and under *i*.

Step 7 shows how to continue the additions by weaving one straw and then adding one.

Step 8 shows the mat after the first round of additions has been completed. The weaving is now easy. Weave entirely around again without any additions, turning five straws each time. Then go around again weaving two and adding one, in the same manner as before, turning seven straws each time. As the diameter of the mat increases, the less often is it necessary to add. But be sure to add enough to keep the weaving close and the mat perfectly flat.

Step 9 shows how to close the edge of the mat by turning back the straws on each other. It also gives a very pretty "woven in" design for a border, which can easily be followed from the plate.

SQUARE CENTER.

Steps for commencing a circular mat with a square beginning are illustrated in Plate XXI. The additions at the corner are made in the same manner as explained in the radiating center, except that each is for a fourth of a circle instead of a complete circle.

DECORATIONS FOR ROUND MATS.

Decorations are often employed in round mats. (See Plates XXII and XXIII.) The most usual are concentric or radiating colored bands of either simple or sawali weaves.

HEXAGONAL WEAVE.

Step 1. In Plate XXII, place straws 1 and 2 parallel; then put 3 under 2 and over 1; put 4 under 1 and over 2.

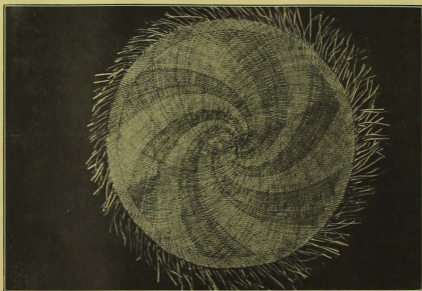


Plate XXII. Circular mat with radiating design.

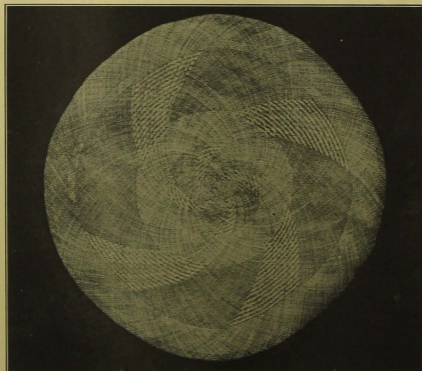
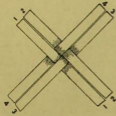
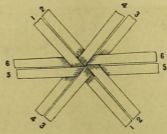


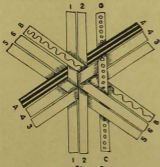
Plate XXIII. Circular mat with concentric and radiating design.



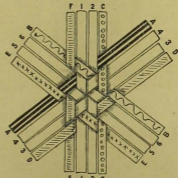
Step 1.



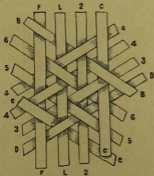
Step 2.



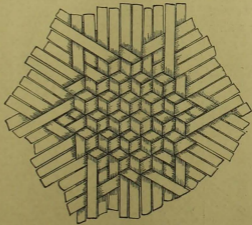
Step 3.



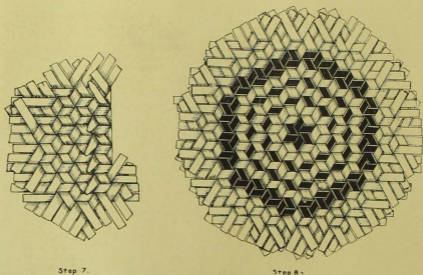
Step 4.



Step 5.



Step 6.



Step 7.

Step 8.

Plate XXV.

Step 2. Put 5 over 1 and 4 and under *a* and 3; put 6 under 1 and 4 and over 2 and 3.

Step 3. Put *a* over 5 and 6 and under 1 and 2. Put *b* over 1, 2 and *a* and under 3 and 4. Put *c* under *a*, over 4, 3, *b* and under 6, 5.

Step 4. Put *d* under *b* over 6, 5, *c*, and under 2, 1, *e*. Put *e* under *c* over 2, 1, *d*, under 3, 4 and over *a*. Put *f* under *d*, over 3, 4, *e*, under 5, 6, *a* and over *b*.

Step 5 is made open so as to show the triple over and under weave. Further weaving is merely a repetition of this process as shown in step 6.

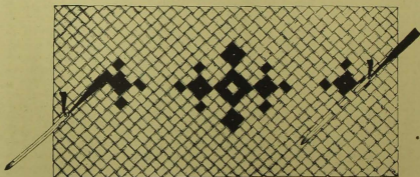


Plate XXVI.

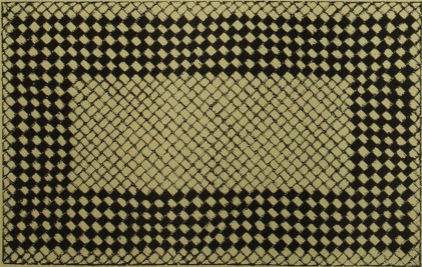
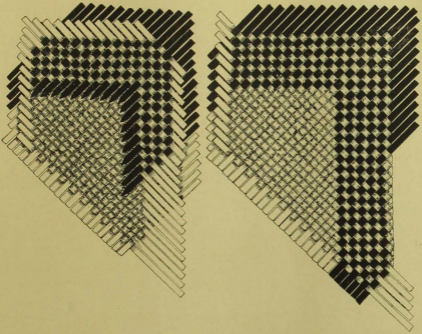


Plate XXVII.

Step 7 shows the turning of the straws on finishing the edge of the mat.

Step 8. Many designs can be made by inserting colored straws into the natural weave. Step 8 illustrates three of these embroidered designs—the star, the bar, and the diamond.

EMBROIDERED MATS.

The embroidering of mats is easily done and the method is shown in Plate XXVI. Mats in over and under weave, of solid color (either natural or dyed), are used, and the embroidery is done with colored straws. Plate XXVII illustrates an embroidered color panel. Floral, geometrical and conventionalized designs are discussed under the headings "Samar mats" and "Special designs."

MAT MATERIALS.

Many Philippine mat materials have been described in a former publication on hats.⁶ Only additional and new information is written here and such data from Bulletin 33 as are necessary to make a connected article.⁷

BURI STRAW.

THE BURI PALM.

There are about six species of the genus *Corypha* in tropical Asia, but only one of these is found in the Philippines; this is *Corypha elata*, the buri palm.⁸ It is widely distributed throughout the Philippines but is most abundant in the central part of the Pampanga valley and in southern Tayabas.

Mr. C. W. Franks, formerly Division Superintendent of Schools for Mindoro Province, had a careful estimate made by his teaching force of the stands of buri palms on the Island of Mindoro. It was found that 5,000 hectares of land on this

⁶ Bulletin No. 33 of the Bureau of Education, entitled "Philippine Hats."

⁷ This office is indebted to Mr. E. D. Merrill, Botanist, Bureau of Science, Manila, P. I., for placing at its disposal an unpublished manuscript on the Flora of Manila. Information from the following sources is also acknowledged:

Engler and Prantl: Das Pflanzenreich.

Hooker's Flora of British India, 1894.

Blanco's Flora de Filipinas, 1877.

The sugar and alcohol produced by the palms are discussed by Dr. H. D. Gibbs in the Journal of Science, Manila, Vol. VI, Sec. A, No. 3. Hats are also discussed by Mr. C. B. Robinson in the same Journal, Vol. VI, Sec. C, No. 2.

⁸ Buri (in most localities), buli or búle, silag, ebus.

island are covered by 2,000,000 buri palms, of which 225,000 or about 12 per cent are mature trees.

The Island of Burias, the Isla Verde, and other small islands are fairly covered with the palm. The Province of Sorsogon, including the Island of Masbate, is also well supplied. In the Visayas there are districts in Panay, Negros, Cebu, and Bohol, where many buri trees are found.

The buri is the largest palm that grows in the Philippines, attaining a height of 20 meters. Its trunk is very erect, spirally ridged and up to 0.7 meter in diameter. Its wood is of no commercial value.

The full grown leaves may be three meters long. They are spherical in outline and the lower one-third or one-half is entire, like the palm of the hand. The upper part is divided into from 80 to 100 segments each from 1.5 to 6 cm. wide and appearing like fingers spread apart. The petioles supporting the leaves are about 3 meters long and 20 cm. thick, and are provided with long, stout, curved spines. Both margins and spines are black in color. At flowering



Plate XXVIII. Foliage of the buri palm.

time all the leaves are shed. The young leaf grows out from the top of the palm with the segments pressed together in the form of a lance.

The buri flowers and fruits but once and then dies. This is said to occur when the plant is from 25 to 40 years old. The individual flowers are greenish-white in color and only from 5 to 6 mm. in diameter. They are nevertheless perfect flowers, with calyx, corolla and ovary showing plainly a division into threes, and stamens six in number. Thousands of these flowers occur on the large, terminal, much branched, pyramidal inflores-

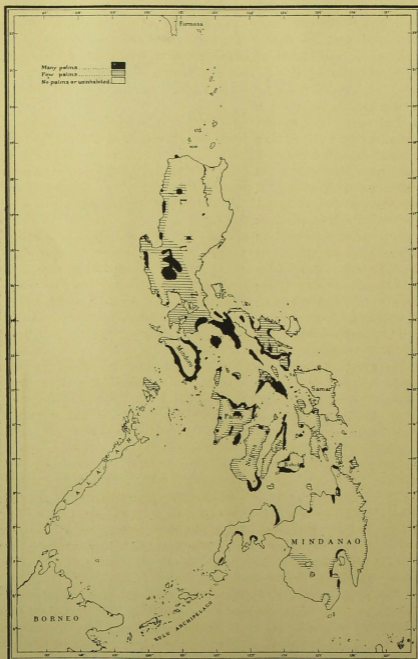


Plate XXIX. Distribution of the Buri Palm.

cence which may grow to be 7 meters in height. The lower branches of this inflorescence may be as much as 3.5 meters long, the upper shorter, the highest about one meter in length.

From 10 to 12 months after flowering the fruits are mature. They are from 2 to 2.5 cm. in diameter and each contains an extremely hard seed 1.5 cm. in diameter.

PREPARATION.

Buri straw is prepared from the young, unopened leaf of the buri palm. The coarsest straw is made by separating the leaflets from the midribs and drying them in the sun. A higher grade straw results from boiling them in water. Such straws are suitable only for bayon manufacture and to be woven into coarse mats for baling purposes.

Several methods of bleaching buri straw obtain in various localities. Any exact description of the processes is somewhat difficult, since the persons who produce the straw have no very definite idea of the proportions and quantities of various materials which they use, and often do not care to divulge what they consider trade secrets. In several cases, nevertheless, supervising teachers have succeeded in obtaining fairly exact data on the preparation of buri straw.

However, the same method carried out in different towns seems to result in different qualities of straw. These differences probably result from slight variations in the method of preparation. It has also been found that the age of the leaf, as determined by the length of the stem (petiole), influences the color of the straw produced. In some districts the unopened leaf is not taken if the stem is over two inches in length. In other places, leaves with stems about one foot high are considered ready to cut. It is probable, too, that the composition of the water in which the straw is boiled influences its color. Mauban, in Tayabas province, has the reputation of producing the whitest buri straw. Mr. John H. Finnigan, supervising teacher, attempted to introduce buri straw into the schools of Gumaca, Tayabas, where the buri palm is very plentiful. The work was in charge of expert weavers from Mauban, but only a poor quality of straw was produced. It was claimed that the water in which the segments were boiled, according to the process which is explained later, did not whiten them. It is a fact that in Mauban the water of the town fountain is used to produce the fine white straw. In the several years of his experience, Mr. Finnigan found no place outside of Mauban which produces straw equal in color to the Mauban straw, but he has noted that

the second best straw comes from San Fernando, Gumaca, where there is an especially clear stream of water.

In fact, all reports would seem to indicate that clear, pure water is essential to the production of the finest white buri straw, and only such should be used in all processes of the various methods outlined here.



Plate XXX. Unopened buri leaves.

The Arayat Process.—Mr. Robert Clauson, supervising teacher, has determined the process of whitening buri straw in Arayat, Pampanga, as follows: The segments are separated from the midrib and rolled rather loosely, so that the water may pass between them, in bundles as large around as a plate. These are placed in a large can or vat containing tamarind leaves and alum (see bleaching agents) in water, and the whole is boiled until about one-half of the water has evaporated. During the boiling the buri must be tightly covered with tamarind leaves and not be allowed to project from the water. After this process the rolls are placed in a jar full of clear water and left to

soak for three days. The strips are then washed several times in the river during a period of three days, and they are then laid on the grass or along fences to dry after each washing. The oftener they are alternately washed and dried the whiter and tougher will the material be. After the final drying, which should be thorough, the strips are rolled very tightly into bundles.

The San Luis Method.—The method of whitening buri straw followed in San Luis, Pampanga, is described by Mr. James H.

Bass, supervising teacher. The unopened leaves are brought down the Chico River in rafts. The segments are torn from the midrib and boiled for four hours in five gallons of water to which one liter of nipa vinegar, a lump of alum the size of an egg, a handful of tamarind leaves and a handful of pandakaki leaves (see bleaching agents) have been added. Other steps follow as in the previous process.

The Mauban Process.—The following description is taken from Circular No. 27, series 1911, of the Division of Tayabas. Let the unopened leaves, cut from the stalk, stand in a cool shady place several days, until the sap has well run. Open the leaves and separate the segments from the midrib with a sharp knife. Put these carefully into a petroleum can or other suitable receptacle filled with a boiling solution of two-thirds water and one-third white nipa or coconut tubá vinegar (see bleaching agents). Keep the solution boiling until the segments are cooked, so soft that folding them leaves no crease.

Spread the cooked leaves on clean grass in the sun to dry. The drying process may require one or two days. When the segments are quite dry, prepare a jar with clear soft water, and put them in this to soak over night. In the morning remove them from the jar, wash them thoroughly in clear running soft water and place them in the sun. At noon repeat the washing process until the segments open, then dry thoroughly in the sun.

It is customary to roll the buri into coils in order to make it more convenient to store. The dry leaflets may be made flexible for this purpose by laying them on the grass in the night air. After a few minutes they will be flexible enough to roll. Care must be taken to have the segments smoothly rolled. When used, they should be smoothed carefully and then split into the widths required.

The process can also be followed with rice vinegar (see bleaching agents) substituted for the tubá vinegar.

Wash two chupas of rice and cook it in water until it becomes very soft and starchy. Put this in a clean petroleum can and add cold water until the can is two-thirds full, then cover the can and let it stand five or six days. This mixture will become very sour. Strain it through a piece of sinamay or other cloth. Cook the segments in this mixture instead of in the solution described in the first process, and then carry out all the other steps.

The Romblon Process.—In Romblon, great care is exercised

as to the age of the unopened leaf taken for the production of straw. If it is intended to produce bleached straw, stalks having stems about two inches long are selected. In the following description, which was submitted by Mr. R. L. Barron, head teacher, one unopened leaf is taken as a unit. The midribs are removed and the segments are rolled into round bundles, say by fives. These are boiled in clear water for about three hours. The leaves are then placed in a mixture of half a liter of tuba vinegar (or three liters of vinegar made from cooked rice, or one-fourth liter of lemon juice) to which enough water has been added to cover the rolls of buri, and boiled for about five hours. The material is then spread in the sun for three days to dry, care being taken that it is not exposed to rain or dew. The segments are then placed in cool clear water for twelve hours and again placed out in the sun for two days to dry.

THE DYEING OF BURI STRAW.

Buri straw intended for mats is usually colored with the cheap imported coal tar dyes previously noted. It is expected that the new dyes for which the Bureau of Education has arranged will take the place of these. Romblon buri mats, which are the finest in point of workmanship and design made in the Philippines, are colored entirely by local vegetable dyes.

The methods used in the island of Romblon in dyeing buri straw have been carefully investigated by Mr. Barron, and are presented herewith. In each case the unit of material is one stalk of buri for each color. The process of whitening Romblon buri straw has already been described.

For red, unopened leaves having stems three feet long should be selected. The midribs are removed while green, and the leaves are rolled into bundles of convenient size, say by fives. These are boiled in clear water for about three hours, after which the segments are spread in the sun for three days to dry. Care should be taken that they are not exposed to rain or dew. They are then placed in a fluid made by boiling two gantas of kolis leaves (see mordants) in plain water for one hour. The buri leaves remain in the water and soak thus for three days and three nights. The buri leaflets are then placed in a vessel containing two gantas of sappan wood (see dyes), one-half liter of lime water and one chupa of tobacco leaves. To this a sufficient quantity of plain water is added to thoroughly submerge the buri, and the whole is boiled for eight hours, being mixed at short intervals to obtain a uniform shade of red. The seg-

ments are then removed and hung in the wind for about six hours to dry after which they are smoothed and rolled.

For yellow-orange, unopened leaves having stems about two inches long are selected and the segments are removed from the midribs and rolled into bundles. These are boiled in clear water for about three hours and spread in the sun for three days to dry, care being taken that the buri is not exposed to rain or dew. The material is then placed in a vessel containing one ganta of powdered turmeric (see dyes), one chupa of powdered annatto seeds (see dyes), one liter of lime water, and sufficient clear water to cover the buri, and is boiled in this mixture for five hours, with frequent stirring. It is then removed and hung in the wind for one-half day to dry, and is smoothed and rolled.

For green, an unopened leaf having a stem about two inches in length is selected. The segments are removed from the midribs, rolled into bundles and boiled in clear water for about three hours. After this, they are boiled in lye (consisting of ashes) for about two hours, the mixture of ashes and water covering the buri during the process. The bundles are then removed from the vessel, wrapped in a bayon, and put in a dark place for 48 hours. The segments are then taken out and hung in the wind for about three hours to dry, and are smoothed and rolled.

The preliminary steps in the production of "black straw" (a cold dark gray) are the same in the making of the green material. The segments taken from the bayon, as described above, are buried three days in black mud, in a rice paddy, for instance. The material is then washed in plain water until clean, and is then boiled for two hours in a mixture of one-half ganta each of the leaves of talisay, indigo, and tiagkot (see dyes), with a sufficient quantity of water to cover the mixture. The whole should be stirred at frequent intervals. After two hours the strips are removed and hung in the wind for five hours to dry. Then they are smoothed and rolled.

TYPES OF BURi MATS.

The Bontoc Peninsula of Tayabas produces great quantities of baling mats and bayons. Bayons are also produced in large quantities in Capiz province. Other localities are of less importance.

Buri sleeping mats are made from the northernmost part of Luzon, in the Bangui Peninsula, to the Sulu Archipelago. For the most part they are woven in small numbers here and there,

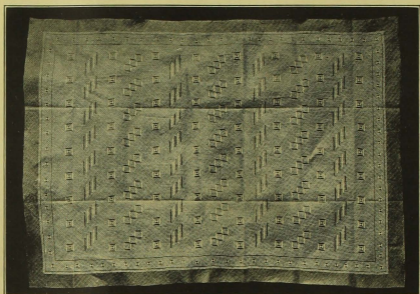


Plate XXXI. Fair grade Romblon mat.

in the different towns, sometimes for use in the household in which they are made, often for local trade in the barrios or municipalities. In nearly every province there is at least one town in which the production of buri mats reaches provincial commercial importance. A number of municipalities produce

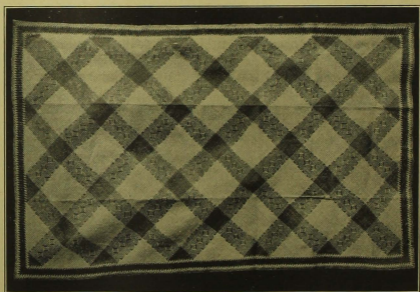


Plate XXXII. Medium Romblon mat.

them for a fairly extensive trade with neighboring provinces. In most cases these are ordinary products, usually decorated with a few colors in lines or checks of dyed straws, either woven in or embroidered on the mat.

In one region, however, buri mats have reached such a degree of perfection in their weaving and decoration as to have become a distinctive product known throughout the Islands. These are the Romblon buri mats, and they are produced throughout the islands of Romblon. Their central market is the town of the same name. They are distinctive because of the fine white and colored materials used, and of the designs which are woven in



Plate XXXIII. High grade Romblon mat.

them. In the designing not only checks and line borders but also plaids appear, and many of the effects produced by floating straws are employed. The Romblon mat, moreover, is most noticeable because of the fancy weave, making a sort of open work along the border, for which these mats are unique. Romblon exports great quantities of mats varying in price from ₱0.25, to over ₱10, and in size from small mats for stands to large decorative mats which cover the sides of rooms.⁹

NOTE.—This paper on mats will be continued in the October and November numbers of the CRAFTSMAN.

⁹It is probable that some of the double Moro mats which will be described under the heading "Pandán Straws" are woven from buri straw.