
ABACA.¹

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THE name "hemp" as applied to the fiber of *Musa textilis* is a misnomer. The chief cordage fiber of the world was formerly that obtained from the hemp plant *Cannabis sativa* which grows in Europe, the United States, and other temperate regions. Many other fibers have from time to time taken the place of hemp in rope making and have in a general way also been classed as "hemp." Often they have the name of their place of origin prefixed in order to distinguish them from other similar fibers. Such are Mauritius hemp, New Zealand hemp, Sisal hemp, and Manila hemp. The term "hemp" as applied to abaca fiber is not only a misnomer but it is an unfortunate one as far as the foreign viewpoint of our industrial articles is concerned. To those persons to whom the word "hemp" may convey some meaning it brings to mind a coarse gray material of no particular beauty, the chief quality of which is its strength. It will therefore be unfortunate if, in the markets of the world, the beautiful abaca hand bags, the delicate slippers, the fine laces, and such articles made from the fiber of *Musa textilis* are to be advertised and sold under the name "hemp" or "Manila hemp." There is much in a trade name. The word "hemp" has a definite meaning in the world at large and conjures up no impression of beauty and delicacy. The word "abaca" is not known in foreign markets but it is an unusual and catchy word, one for which many a manufacturer would pay a considerable sum. The title of this article has therefore been limited to "abaca" with the hope that the word will be employed by all when referring to articles made from fiber of *Musa textilis*. This will fix the word in foreign markets and associate it with our products and with the Philippine Islands.

The species of banana from which abaca fiber is obtained is indigenous to the Philippines and, commercially speaking, is confined to it. The fiber producing quality of this plant was well known to Filipinos long before the days of Spanish occupation. When Magellan arrived at Cebu the weaving industry was widespread in the Islands. The plant grew wild in much the

¹ Abaca—pronounced äbäcä'.



Plate I.

same places in which it is now cultivated. La Perouse (1493-1529) mentions weaving as an industry of the Islands, and Lavezaris (1569-1576) speaks of the great quantities of colored (abaca) cloths produced in the present Province of Albay. Don Francisco Tello especially mentions the abaca cloth of Mindanao. According to Dampier the cloth was used by the poorer people only. The better class used long (cotton) cloth. Abaca cloth did not receive the approval of Gregorio Belin (1629-1649) who calls it "wretched."

Owing to the general knowledge of this industry and the use of the cloth by the natives, the Spanish government made cloth a legal tender for the payment of taxes, each tax payer of the Visayas being required to give a piece of a certain length. In Mindanao this was said to be in payment for protection from the Moros. Although weaving was a common household industry, this peculiar form of money was not easily obtained in some sections. Long arguments concerning the hardships of this class of taxation appeared from time to time in letters to the Spanish king.

All the fiber of this period was obtained from the wild plant. The establishment of fields and the cultivation of hemp began in the early part of the 19th century. It was not until 1825 that any serious attempts were made to develop a foreign market. Methods were of the most primitive sort and in 1850 the exports did not exceed 187,000 kilos. Soon, however, the superiority of the fiber over real hemp caused an increased demand and during the last quarter of the century annual shipments exceeded 880,000 kilos and later statistics show a steady increase to 1901. After war times the industry steadily grew and in 1910 over 170,000,000 kilos of the fiber were exported. The percentage of the value of this export to the total exports from the Philippines has fluctuated from 40 per cent to over 60 per cent.

Abaca requires very fertile and well drained soil, damp atmosphere, and protection from the direct rays of the sun and high winds. Roughly speaking, the production of abaca is of greatest importance on the eastern and southeastern, or Pacific side, of the Philippines below Laguna de Bay. This condition results from the fact that these regions have rainfall practically throughout the year and that typhoons and other high winds are not of very frequent occurrence. In the other smaller isolated regions in which abaca is of commercial importance, certain very local conditions result in continued rainfall or moisture.

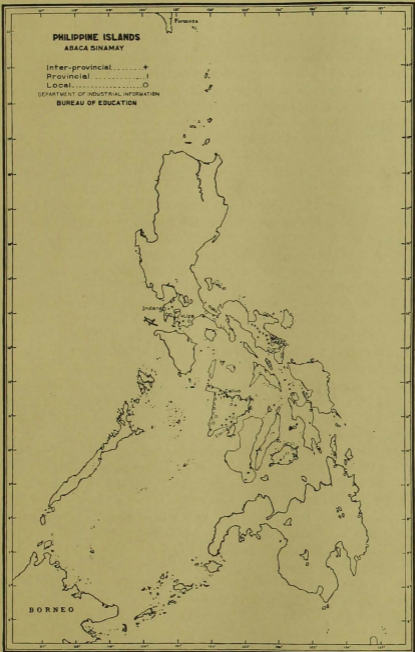


Plate II.

The fiber of abaca is contained in the outer portion of the petiole. This is removed in strips after the petiole has been separated from the stalk. These strips, which when dried produce abaca lupis, consist principally of fiber, pulp, and water. The stripping apparatus by which the fiber is separated is a simple one and consists essentially of a large knife (bolo) pressing down upon a block of wood. Under this knife the strip is drawn and the pulp and much of the water are removed. If a serrated knife is employed, stripping is much easier, but adhering pulp causes the resulting fiber to be dark in color. Abaca stripped under a smooth-edged knife is always better and the more times it is drawn under the knife the whiter is its color. From the outside sheath to the inner ones the fiber decreases in size and strength but increases in softness. The same relation holds true between the older and younger stalks.

For many years the chief use of abaca fiber exported from the Philippines has been in rope making, since it is long, durable, and pliable, resists the action of water, and has a high tensile strength, especially in comparison to its weight. Abaca is used to a certain extent in the production of rope in the Philippines. Fishing nets are also extensively woven from it. Its most important use in these Islands, however, is in the manufacture of sinamay. This is the material from which the pañuelo and camisa worn by native women are usually made. Sinamay may consist purely of abaca or may contain a pattern of colored cotton or mercerized cotton yarns.

The above have been almost the exclusive uses of abaca fiber. Both in foreign countries and in the Philippines the value of this material in the making of more beautiful objects is gradually being recognized, however. The uses to which it is put in the outside world will be discussed in this article and in subsequent issues the products which are made from it in the schools of the Islands will be taken up by various persons. Briefly, it may be stated that the qualities of abaca fiber which particularly make it such a good material for art objects are (1) the ease with which it dyes, (2) the fine tones and the fastness of the colors obtained, (3) its strength, and (4) its resistance to moisture.

KNOTTED ABACA AND TAGAL BRAIDS.

It has been stated that abaca fiber is used in France to mix with silk, that experiments are being made to reduce it to such a form that it can be spun, and that it is being woven into table mats, and the like. It is also known that in Japan considerable amounts of stiff cloths are produced and used for stiffening

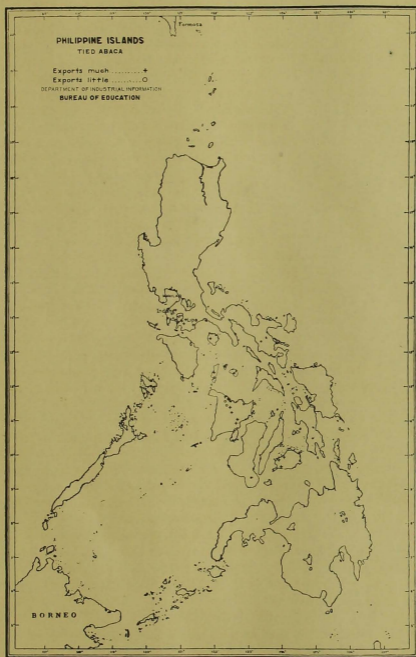


Plate III.

clothing. Much of the coarse abaca cloth exported from the Philippines is also employed for this purpose and for straining. However, by far the greatest portion of the abaca fiber sent out of the Philippines and used for purposes other than rope is woven into braids from which hats are made.

The export of knotted abaca from which these braids are produced depends upon a certain process in the weaving of sinamay. The production of this cloth takes place in a great many towns south of Laguna de Bay, the most important being Indang and neighboring towns in Cavite Province, Bauan in



Plate IV. Carrying abaca to market, Indang, Cavite.

Batangas Province, Albay and neighboring towns in Albay Province, Calivo and neighboring towns in Capiz Province, and Pototan and neighboring towns in Iloilo Province. The subject of sinamay is too large a one to be treated within the scope of this article. Hence it is limited only to that portion of the processes in its manufacture which bear upon the production of knotted abaca.

The fiber from which sinamay is woven is that which has been most carefully extracted under a straight-edged knife. It is usually sold in *manojos* (fist bundles) and may be bought either classified or unclassified. The bundles of mixed quality are separated into several grades according to their diameter, the classes varying in different localities.

In Albay at least 6 grades are recognized, in Cavite 5 classes, and in Lipa 5 classes. There are three ways in which abaca may be sorted. (1) The fibers in a bundle may be separated into the different classes between the fingers and each class tied separately. (2) The fibers may be separated according to quality into three bundles without tying. Then these bundles are separated and each is again classified into two grades. As this is done the coarser fibers are tied at one end in pairs, the finer being separated into another bundle between the fingers. The coarser pairs are then removed

and tied into a continuous yarn. The finer fibers are tied separately. (3) Many workers classify and knot the fibers at the same time. The last process gives the most uniform yarn. The portion of a fiber at the base is much coarser than the part taken from the tip of the stalk. In the most careful tying this is taken into consideration and the fibers are cut so as to classify them into finer and coarser. In tying, the coarse end is knotted to the end of the coarse yarn already completed. The worker then runs the fiber between her fingers until touch tells her that the finer portion of the fiber has been reached. Here another cut is made and this end is tied to the finer yarn.

Abaca intended for sinamay is often beaten before being tied. Where several grades are made as indicated above the fibers are usually tied separately into different baskets. From the finest class very closely woven textile may be made. The coarsest yarns produce mesh-like fabrics suitable for fish nets and the like.

The knot used in tying these fibers may be seen from the illustration. The ends protruding from the knot are cut by means of a sharp bamboo or steel knife. The weavers are so expert in this work that it is doubtful whether any machine could be used to advantage in supplementing the work done by hands. In cotton weaving a patent knotter is often employed for tying knots which break. It is a very cheap and simple instrument, but will probably not be a success with abaca. It was tried out in Batangas Province and the following report was received upon it:

"It seems to tie a knot all right and I am satisfied that one could learn in a few hours to tie faster than by the ordinary process. However, as a device for tying abaca it seems to be open to three objections. The knot is much more bulky than that tied by the ordinary process and the ends left by the knife are too long. The latter could be remedied in part by changing the shape of the knife, but the former seems fundamental.



Plate V. Sorting abaca fiber, Lipa, Batangas. The largest bundle will be knotted for export.

Furthermore, the knot tied by the patent knotter seems to double the fiber in such manner as to weaken it, as in a series of trials the patent knot broke at less tension than that required to break the knot tied by hand."

The name for knotted abaca differs in various localities. In Batangas it is called "dinoctong;" in Cavite "bakingking" when coarse and "labay" when fine. In parts of the Visayas the word "ginoctong" is applied; in Manila it is usually known as "sinagot."

The initial export of knotted abaca from the Philippines took place in the Province of Batangas four or five years ago, the late General Malvar being the first to engage in the industry. Shortly after, the center shifted to Lipa and several large buyers became interested in it. Batangas is still the largest exporter of tied abaca, though a very large amount is exported from Cavite and some from towns in the Visayas. In the trade the Cavite abaca is preferred, because it is the most brilliant and the whitest of all abaca which comes to the Manila market. This undoubtedly results from the composition of the soil in that province.

Batangas and Cavite being the chief centers of the knotted abaca industry, a description of the conditions which exist in these two places would seem appropriate. Lipa and Bauan are the centers of this industry in Batangas, the former being the more important. The abaca is grown around Lipa for the most part, though some of that tied is imported from Cavite.

Formerly there were five grades of abaca, the

- Finest, called "payeran;"
- Second, called "ikalua;"
- Third, called "dumalaga;"
- Fourth, called "batugan;"
- Fifth, called "malalaki."

Now the fourth and fifth classes are joined into one class called "malalaki" and it is this material which is knotted for export. The finer material is not tied except for use at home in weaving sinamay. Much of the "malalaki" is used for rope or exported in the raw state. About 80 per cent of the fiber obtained in Lipa falls under this combined malalaki class. Demand for the finer material does not offer a higher price, and as it is harder to tie and as there are more knots to a kilo, the workers make smaller wages at knotting it than with the larger fiber. Under former conditions, a considerable amount of abaca tied into a continuous yarn was sold to weavers who did not care to prepare their own

materials. This was made into skeins (labay) consisting generally of 960 fibers tied together and wound on a frame some two and one-half feet long. Even to-day the producer generally sells to the small local trader on this basis. Since the material is sold by the kilo and a skein of large fiber weighs much more than one of fine material, buyers continually urge the producers to get large fibers for knotting.

Usually the abaca is separated as explained before, but often fine and coarse fibers are tied together, very fine fibers being doubled to add bulk. The small buyers seem to connive at this practice, though the merchants who deal directly with the firms in Manila and who buy from the small traders on the basis of weight are opposed to it. For some time it was the practice of the Manila merchants to distribute cardboard bobbins and have the provincial buyers deliver the abaca already wound; but, owing to the ease with which deceit could be practiced, this method of buying is not now used. It is fairly easy to inspect a skein of abaca in order to determine whether there are any loose untied ends. It is more difficult, however, to inspect the bobbins so as to determine whether the weaver has placed a quantity of loose material in the inner part of the coil. It is customary for the small dealers to assign numbers to the workers from whom they procured the materials. These persons place their numbers on each bobbin. When a shipment of bobbins is received from a provincial dealer a number are broken open and in this way any loose material is disclosed. On account of the number, the worker who has attempted deceit can be determined. Formerly abaca was pounded before being tied to make it soft and pliable. Abaca knotted and sold for export is seldom treated in this manner.

With the increase in demand for knotted abaca, there has been a substantial rise in the price paid for it. Before American occupation a skein was sold for three or four centavos; later it was worth six centavos. Since it has been sold for export, the price rarely falls below ten centavos and often reaches fourteen or fifteen. With the long coarse fiber such as is ordinarily selected for tying, an expert tyer can easily earn fifty centavos per day. The only capital necessary for engaging in this occupation is a few kilos of abaca and a little piece of sharp steel. After a woman becomes expert she can almost tie in the dark. In fact much of the work is done by the light of the little kerosene lamps without chimneys, commonly used in the homes of the poorer Filipinos.

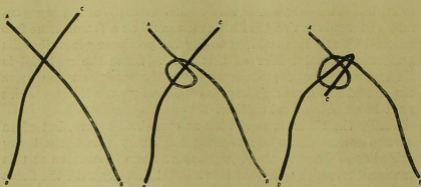


Plate VI. Weaver's knot.

It is impossible to give exact figures on the production of tied abaca in the provinces. When the price is high, or when the usual work of the community is slack, the production increases. During the harvest and planting times, when other work is pressing, the trade in tied abaca falls off. It is safe to say, however, that as long as the present demand for tied abaca continues, Batangas Province is in no danger of a famine. Moreover, the present fairly prosperous condition of the working class of the province is due almost entirely to this industry. Upland rice, the principal crop of a great portion of the province, has failed partially or entirely for three years in succession. Some income is derived from the sale of horses, chickens, and pigs, but the principal source of ready money of at least one-half of the families of the province is the abaca tying industry. During all this period of crop failure, taxes have been paid promptly, land has doubled and trebled in value, new houses have been constructed, new tiendas opened and the old ones enlarged. One feature of this new prosperity is its distribution. The wealth of the Philippines is generally concentrated in the hands of a few. Often a half dozen prominent families will own the greater part of the land of a municipality. Recently in Batangas Province a new tendency has been noted. The lower classes have become land hungry. The truth is they are saving money and are looking for investments near home. Hilly, sterile land underlaid with a volcanic formation that makes it necessary to dig it up with picks and break the lumps with clubs every time a heavy rain washes off the top soil—land that produces a minimum of crop with a maximum of effort—is bought and sold for from ₱150 to ₱200 per hectare. Occasionally a large landowner disposes



Plate VII. Knotting abaca fiber, Pototan, Iloilo.

of part of his land. It is bought, not by another large owner, but by a combination of small capitalists and by them is divided up into small holdings. The money to buy this land is rarely made from the soil. Most small farmers, even in a good year, produce less rice than is consumed by their families, and outside of a few pigs or chickens, no product of the soil is sold. The money for eking out the slender income from the soil and satisfying the land hunger is earned by the wife and children of the household, generally by tying abaca.

One of the chief sources of income in Cavite Province is also

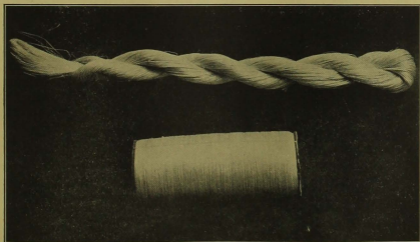


Plate VIII. Skein and spool of knotted abaca.

from the export of knotted abaca. As previously explained the fiber from the highland region is particularly white and lustrous, and is much more in demand than that from Batangas or any other part. For this reason the farming industry of the highland region of Cavite is small in comparison with those of tying abaca and weaving sinamay. It is probable that the latter industry is even of more importance than the knotting of abaca, the amount of sinamay woven depending upon the price of the tied abaca in the market. When the price goes up, more women devote themselves to knotting abaca fiber and

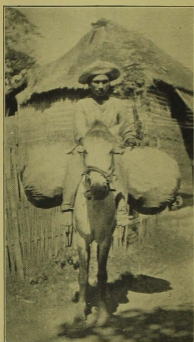


Plate IX. Pack horse carrying knotted abaca from barrios to Bauan, Batangas.

selling it directly to representatives of export houses. When the price of knotted abaca goes down, they find it more profitable to weave and sell the cloth, which is always in great demand.

The land of the highlands of Cavite is divided fairly well into small parcels and fully one-half the workers own plantations from which their raw material is obtained. The rest buy their material at the market. The husbands of some women go out into the country and strip hemp on shares, receiving one-half of the amount made for their work and taking it into their homes to be tied by the women. Women never strip abaca. It is estimated that about one-fiftieth of the total amount of abaca produced in the highlands of Cavite is exported in the form

of knotted abaca. Most of it comes from the towns of Indang, Alfonso, Silang, and Mendes, but it is all marketed at the town of Indang. It is usually taken, by "cargadores" (porters), in the wet season and "carretones" (carts), in the dry season, to Naic, and from there shipped by "banca" (dug-out) to Manila. There is also a large export of loose abaca fiber from Indang to Manila. This material is sent to Japan, where it is tied in the fishing villages.

From Lipa and Indang the tying industry has spread to the towns of Batangas and Cavite Provinces. Many of these do not

produce their own fiber but import it from the highlands. The industry has also been introduced into other places in which sinamay is produced, but the export from these is not nearly so great as from the above-mentioned places. By a comparison of the maps on the production of sinamay and tied abaca it will be seen that many places which produce sinamay still export no quantity of tied abaca. This is particularly true of the Bicol provinces. On the other hand, several exporting houses have introduced the industry into places in which no sinamay is made but in which the people are in need of income additional to agriculture and fishing. Several of these localities are known but are not included because the information is of a confidential character. From this statement it can be seen that the competition among exporters of knotted abaca is very keen.

From the small industry which began a few years ago, the export of knotted abaca from the Philippines has grown to very large proportions and exceeds in amount the money value of several other export products, such as hats, for instance. In 1911 the total value of knotted abaca exported was ₱1,144,026; in the year 1912 this had increased to ₱1,231,538 and was divided among the different countries as follows:

United States	₱18,282
England	6,480
Austria-Hungary	2,880
Belgium	57,126
France	278,952
Germany	26,726
Italy	588,054
Switzerland	151,096
China	1,872
Japan	100,070

By far the greater part of this large amount of money goes directly into the hands of the peasant workers of Batangas and Cavite. Thus it can be seen that the statement of the Division Superintendent of Schools for Batangas quoted above is not at all overdrawn. Close to a million pesos must be earned yearly by these people, who are thus becoming economically independent. In both Lipa and Indang the estimated average daily earnings of a woman from tying abaca is 50 centavos, and since this amount is usually earned in addition to the income from agricultural pursuits, it is almost entirely a surplus income.

The abaca suitable for export is usually called "quilat." In Lipa the average price of this material is about 25 centavos per kilo. The average price paid to the worker for knotted abaca

is ₱2.25, the appreciation in the price on account of the knotting being, therefore, about ₱2 per kilo.

The fluctuation in the price of abaca is due to cable requests from Europe and the consequent competition of local buyers. The supply of abaca being a continuous one it is not customary for local exporters to keep a stock on hand. Instead they sell "short," the terms being made by cable from Europe and Japan. European importers allow three months for delivery. All the local exporters receive cabled requests at the same time. Their quotations to provincial dealers and agents, therefore, go up or down simultaneously. The price has been as low as ₱1.80 and



Plate X. Women selling knotted abaca in the market at Indang, Cavite.

as high as ₱3.60 per kilo, depending upon the urgency and amount of foreign requests.

The Bureau of Education became actively interested in knotted abaca over two years ago. The export of this material had been known for some time and there was a vague understanding that it was being used in the manufacture of hats. The matter was taken up in Europe and America and it was found that the material was being woven by machinery into narrow braids intended for the manufacture of expensive hats for women. For a long time, however, it was impossible to determine the mechanism of the machines on which these braids were woven, in Switzerland, France, and Italy, the efforts of the correspondents being fruitless. The whole industry in Europe was most carefully guarded as a secret. Attention was then turned to the United States, with the result that the Bureau was put in

touch with the New England Butt Company, of Providence R. I., which agreed to send to the Philippines a sample braiding machine.¹

In the meantime the Japanese have devised cheap machines for braiding fiber and are exporting to the United States and Europe probably as much braid as is produced in all other localities in the world combined. The competition of Japan is being most keenly felt in Europe, with the result that several factories have closed down.

Abaca braids are known as "tagals" in the trade and are now almost entirely employed in the manufacture of hats. These have for some time been the finest and most expensive in the millinery trade. The illustration of a large hat is presented in this article. It is in two colors—black and blue. The hat, untrimmed, sells retail for ₱25 in the Manila market. Another illustration shows the manner in which these braids are sewed in the production of hats. The common width of braid is $4\frac{1}{2}$ mm. Others are as wide as 3 cm. Most of them are of a close weave, though some are of open and others of fancy weaves. The braids shown in the illustrations were selected from several samples received from Europe by the Bureau of Education and now on file in the Industrial Museum of the Bureau.

In view of the competition which is being felt from Japan, European manufacturers have considered the advisability of establishing braiding factories in the Philippine Islands. The product of these factories would have the advantage of free entry into the United States as against 15 per cent duty levied upon braids from other countries, and the United States is the largest importer of braids. In the first nine months of 1911 the braiding machines of Japan produced 1,200,000 pieces of braid of 80 yards each, valued at approximately ₱600,000. This production has gradually increased, however, as can be seen from the fact that in the month of May, 1912, alone, ₱300,000 of "tagals" were exported from Japan. Cheaper power, wages, and freight rates to the United States, and lower commissions and

¹ This machine has been received in the office of the Bureau of Education and a picture of it is presented in this article. It can be run either by a belt from a shafting or by hand. It weaves 13 strands. The list price quoted is \$16.90 (₱33.80); the gross weight is 102 pounds and net weight 68 pounds. This machine is found to work most satisfactorily. Catalogue and price lists of the New England Butt Company are on file in the Bureau of Education and can be consulted. The machine illustrated in this article is a standard one. The catalogue quotes prices on a number of different types producing a great variety of strands.

cost of packing are all in favor of Japan. The Philippines have in their favor on offset of 15 per cent duty and the raw material at hand. From all that can be understood there are several

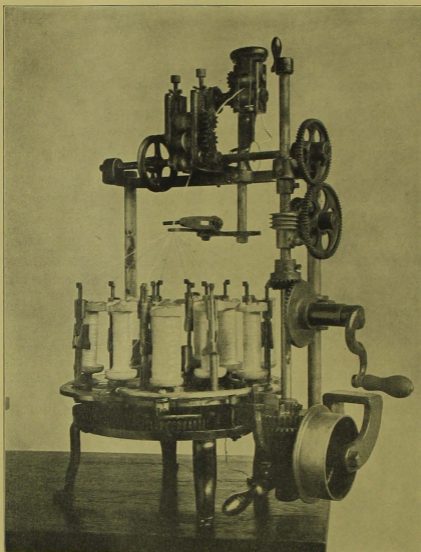


Plate XI. Thirteen-spool braiding machine of the New England Butt Company.

plans for large braiding establishments in the Philippines now under way.

There are now three small braiding factories in the Philippines, two within the limits of Manila and one at Malabon,

Rizal Province. These have a total of 180 machines, each capable of turning out $2\frac{1}{2}$ pieces of braid per day. Each piece contains 80 yards of braid $4\frac{1}{2}$ mm. wide. This is a total possible production, therefore, of 575 pieces or 46,000 yards a day. The amount seems very large indeed, but when one comes to consider that it takes one piece (80 yards) of braid to make a small hat for men's wear, it can be seen that this production is not very great. The present output of braids in the Philippines is made into men's hats which retail here for about ₱2. The cost of the raw material for such a hat is about 50 centavos; that is,

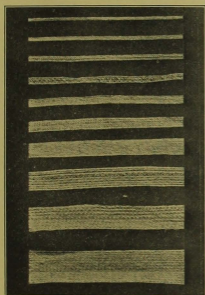


Fig. 1. Braids of various sizes. The top braid is 2 mm. wide, lower one 30 mm.

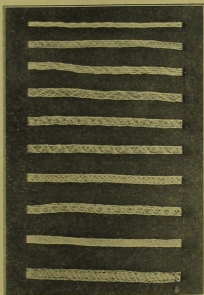


Fig. 2. Fancy braids.

Plate XII.

for a piece of 80 yards. This is a rather cheap hat in the Philippines and it is believed that the mode will last for some time to come. Braid is also exported to the United States from Manila.

The amount of material going into one piece of abaca braid averages 2.7 centavos and fluctuates from 2.5 to over 3 centavos.

While the present use of "tagal" braid is practically confined to the production of hats, other uses are gradually being found for it. There is presented in this article an illustration showing a white handbag made from bleached pandan raffia (which this

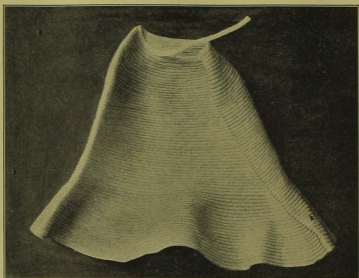


Plate XIII. A man's "tagal" hat, showing method of sewing braid.

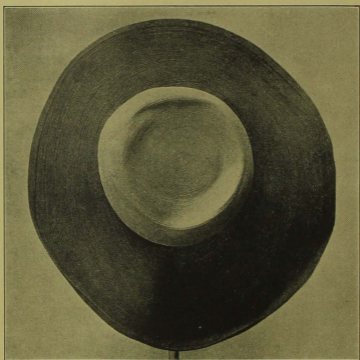


Plate XIV. Woman's "tagal" hat.

Bureau is now experimentally producing) and abaca braid. The idea is a good one and undoubtedly can be evolved into a very much better article than that illustrated, which was bought at a local Japanese store for a peso. The writer believes that any number of beautiful and salable articles will later be produced from the braid. The Bureau of Education is now turning out on the machine from the New England Butt Company some flat braids 2 mm. wide from which it may be possible to weave

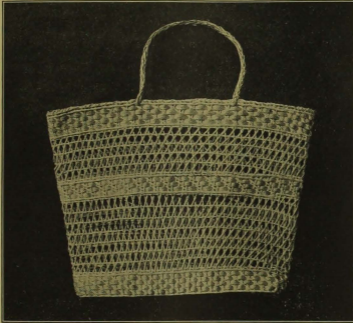


Plate XV. A bag of "tagal" braid and bleached pandan raffia from Japan.

coiled baskets. (This is the narrowest braid shown in the illustrations.)

A summary of the present situation in the knotted abaca and "tagal" braid industry is as follows: The export of knotted abaca from the Philippines is increasing year by year, the money value for the year 1912 being ₱1,231,538. Most of this sum is kept in the hands of the workers. A considerable amount of loose abaca suitable for tying is also being sent to Japan, where it is knotted in fishing villages. The European manufacturers are feeling keenly the competition of the Japanese braids and investigations have been made with the view of establishing large factories in the Philippines. There are now in and near Manila

three small factories, the product of which is consumed locally and is exported to the United States. The chief use of abaca braids at the present time is in the making of hats. As a material for the finest and most expensive women's hats the day of abaca braids is probably past, though it is equally probable that a fair grade hat will always be produced from them and that there will always be a large demand for "tagals." It is also probable that many other uses can be found for the braid itself and for the knotted abaca as exported from the Islands. It is very possible that braids produced in the Philippines can be utilized in the production of many beautiful articles of school work.

EDITOR'S NOTE.—This paper on abaca introduces the plant and its fiber, and contains the first of a series of discussions on its uses. These articles will be continued through the present volume under the main heading of Abaca. They will take up the various materials which are prepared from the plant and the articles which are made from them.

The educational board of the colony of Trinidad in South America has as yet given very little attention to special industrial training. However, the importance of manual training in the schools is now being urged by those who are most interested in these matters, and it is hoped that in the near future valuable work of this kind may be introduced into the schools, especially along agricultural lines.

Trinidad is and must always remain a country devoted to purely agricultural pursuits; so in the Philippines the economical condition of the people must continue to depend directly upon the products of the soil. The industrial work of the schools must follow along the lines on which the people of future decades must depend, and here the extreme importance of proper direction in gardening and farming is evident. The accomplishments which have already been made in the improvement of school gardens and the extension of home gardens are gratifying, and types of school farms which are in a way quite successful have been evolved in many parts.

At the same time a proper division of labor and the most practical development of the several industries that are also essential in a purely agricultural community will justify the rapid extension which is being given through the schools to the varied phases of industrial school work.

The fields will continue to be tilled, and improved methods and implements will provide increasing food supplies for a growing population; the many arts and crafts of an apt people will be applied toward the economic independence of the country.