
ABACA.¹

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THE ROPE AND TWINE INDUSTRY, WITH A TENTATIVE OUTLINE OF OTHER ABACA INDUSTRIES.

Many fibers are used for rope by the agricultural communities of the Philippines. Rural people are never, in fact, at loss to find bark, twigs, or grass that may be extemporized into a fairly strong cordage quite suitable for tying bundles, repairing carabao yokes, or even rigging sail boats. Many such plants

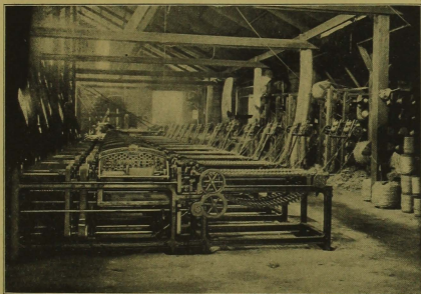


Plate I. Modern rope-making machinery, Manila.

are often utilized in the systematic preparation of ropes offered for sale at the barrio or municipal shops. Of the numerous grasses, sedges, and bast fibers employed in making rope, the most important are rattan, coconut (coir) fiber, malabago, cabon negro and balangot. However, more rope is made from abaca than from all these other fibers combined.

¹ This is the third paper of the series of articles on the subject of Abaca which was begun in the August CRAFTSMAN. The series will continue through Volumes I and II.

Most of the abaca exported from the Philippine Islands each year goes to the United States and Great Britain. The United States takes all the best grades, while England takes the inferior grades. In 1911, 165,649,626 kilos, valued at ₱32,282,680, were exported from the Philippines. During the next fiscal year, ending June 30, 1912, 154,046,928 kilos, valued at ₱32,577,120, and representing 32 per cent of the entire exports of the Philippines, have been shipped to foreign countries. Of this amount 69,573,526 kilos were exported to the United States, 66,137,911 kilos to the United Kingdom, and 18,335,491 kilos to other countries. Nearly all of the hemp exported is used mainly for making rope, cordage, and twine. However, a small amount of the waste in rope factories is used in making paper. Almost the entire output of this fiber has been exported to the different countries as follows:

Countries. ^a	Kilos.	Value.
United States	69,573,526	₱15,502,978
United Kingdom	66,137,911	12,677,346
Austria-Hungary	154,230	30,978
Belgium	1,581,844	367,910
France	586,359	115,442
Germany	1,024,291	204,672
Italy	664,155	120,796
Netherlands	1,338,194	269,000
Spain	184,147	34,710
Canada	480,700	113,680
China	63	30
British East Indies	1,629,874	308,934
Hongkong	3,023,552	579,334
Japan	4,636,287	1,668,592
Australasia	3,031,695	574,628
Total	154,046,928	32,567,020

^a See page 166 of the Annual Report of the Insular Collector of Customs for 1912.

It will be noted that during the past year the export of abaca is somewhat less than that of the previous year. However, at the same time the value of the product exported in 1912 is greater than that which was exported during the previous fiscal year. This is probably due to the advance in price of the fiber and a shortage of it in a number of abaca-producing localities that have been visited by typhoons. The increase in the price of this fiber is due primarily to the fact generally known among the American and European importers that there has been a tendency to decrease the acreage in recent years in the Philippines, owing to the previous low prices. The probable production during the next twelve months seems likely to be

further decreased as a result of the extreme drought and the severe typhoons that have passed over the abaca-producing regions.

The manufacture of rope from abaca is one of the important industries carried on in the city of Manila. Until recent years all rope produced in the Philippines was made by hand. Not many years ago a large rope factory with all modern machinery was established in Manila and has been turning out rope in large quantities. Abaca is the chief fiber used in this factory. Several different sizes ranging from small ropes 0.6 centimeters in circumference to the large cables 30 centimeters in circumference are turned out at this factory, and most of this rope is used by the shipping world.

The process of manufacturing this rope is very complicated and requires expensive machinery. The fibers are first run through a mangler to draw them out, after which they are passed over the machines as illustrated in Plate I and then wound on large spools. These spools are placed on racks and the ends of the cords inserted into a machine that twists and forms them into a rope. If a rope of greater size is desired the small ones are passed through one machine after another until the desired size has been obtained. In Plate II there is illustrated one of the biggest pieces of rope turned out by the Manila factory. This piece of rope is 30 centimeters in circumference, weighs nearly 2,000 kilograms and is valued at about ₱1,800.

Manila hemp (abaca fiber) as a cordage has no superior, its chief value for ship's rope being its relative lightness and strength. The strength of Manila hemp compared with that of English hemp is indicated by the following figures: A Manila rope 8 centimeters in circumference and 3.64 meters long stood a strain of 2,122 kilograms before giving way. The English rope of the same size broke with 1,765 kilograms. In a second test with a rope 4.5 centimeters in circumference, the Manila broke with 677 kilograms and the English with 508 kilograms.¹

Other kinds of ropes are made from the true hemp fibers, which were formerly the chief ones used for cordage. The best of these are produced in Italy; however, Russia produces the most. These ropes are manufactured principally in Europe and the United States. Aside from Manila hemp, the Agave fibers rank second and Mauritius hemp and New Zealand hemp next. Coir ropes are made from coconut-husk fiber and are used on fishing boats and in making nets. Jute is made into rope

¹ H. T. Edwards, Fiber Expert, Farmers' Bulletin No. 12, page 9.

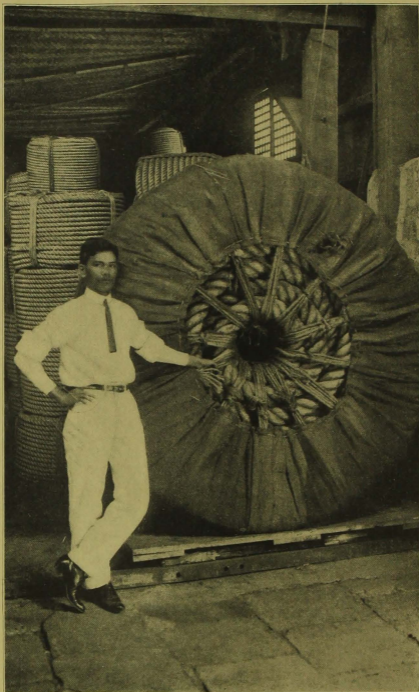


Plate II. A bale of tow-line made in Manila.

and twine of the lower grades, but has no great strength and soon rots after it has been in the water for a short time. Ramé cordage is probably the next best. It is strong and to a great extent resists action of water.¹

In almost all localities where abaca grows, enough rope to supply the local demands is made by hand. In a few places a small amount is exported but is of very little commercial importance outside of Manila. The greatest amount of hand-made rope comes from Malabon, Rizal. At this place the work is carried on to quite a large extent, and considerable rope is exported to the other provinces. The method of manufacture is the one that is common throughout the Philippines. Two



Plate III. Making rope by hand, Malabon.

or three strands are twisted first. This is done by fastening one end of the strand to a spool or wheel, which is made to revolve rapidly by the jerking motion of the operator, who holds the strand with his left hand and adds the fiber with his right. Usually a third man separates the fiber and hands it to the operator as it is needed. When the strands are of the required length they are twisted together by the use of a primitive rope warp.

At Tanauan, Batangas, and a number of its barrios, the rope industry gives employment to about 200 people during six

¹ Millers's Commercial Geography.

months of the year, and it is estimated that the revenue accruing to the people from this line of work is about ₱6,000 a year. Batangas also furnishes a quantity of small size rope, which is usually sent to Manila in the form of skeins and used in tying up packages.

Binder twine is used to tie into bundles nearly ninety million tons of wheat harvested annually in the United States. In addition to the wheat, barley, rye, rice, and flax which are cut by the grain binders, increasing areas of corn are being harvested by corn binders. The quantity of twine required varies widely for low and heavy crops and for different crops, also for different kinds of twine, but as an approximate average it may be estimated at 1 kilo per 40 ares for small grains and 1.5 kilos per 40 ares for corn. More than forty-five million kilos are used annually in the United States. The farmer pays for this more than thirty million pesos. This twine is used but once and in its use is destroyed. Hay rope may be used over and over again before being worn out and after that it may be converted into paper stock, but not so with binder twine. No attempt is made to recover it for any purpose and in one occupation it uses up completely more than ninety million metric tons of a new fiber each year. The demand for binder twine has been a most important factor in the development of hard-fiber production during the thirty-six years since self-binders came in general use for harvesting grain in the United States.

The fiber to be used for binder twine must be strong, stiff, averaging 76 centimeters long, clean, straight, not subject to injury by moisture, mildew, or insects, and must be comparatively inexpensive. These requirements are best fulfilled by the hard fibers—abaca, henequen, sisal, cantula, cabuya, phormiyum, and to a less extent by the soft fibers—flax, hemp, and jute. All of the hard fibers used in the manufacture of binder twine are imported into the United States. The principal kinds of binder twine quoted in the markets are the following:

1. Pure Manila (393 meters to a kilo), made of a good quality of abaca fiber.
2. Manila (404 meters to a kilo), made of abaca with a mixture of other fibers.
3. Standard Manila (393 meters to a kilo), made of mixed abaca and henequen fiber.
4. Standard (340 meters to a kilo), made of henequen colored to resemble abaca.
5. White sisal (340 to a kilo), made of henequen fiber sometimes with a mixture of other fibers.¹

¹ Year-Book, Department of Agriculture, 1911.

Abaca, commonly known as Manila hemp, and henequen, known commercially as sisal, are used for binder twine more than all other fibers combined. Other hard fibers used to a limited extent, chiefly for mixing with abaca or henequen, are phormium, Manila maguey, mescal maguey, cabuya, and Mauritius.

The best and the highest grades of binder twine are made from abaca. A description of the production of this fiber was taken up at length in the August issue of the CRAFTSMAN. Twelve different grades of this fiber are quoted on the market, the difference resulting chiefly from the greater or less care in cleaning and preparing the fiber. These grades range in price from about ₱0.25 per kilo for the lowest to about ₱0.44 for the highest. Most of the "pure Manila" binder twine is made of the "midway" or "medium" grade, ranging between the grades known as the spare current and good current.

To a great extent colored abaca is being used both in and outside of the schools throughout the Philippine Islands. In the making of sinamay, pinolpog, and other fabrics, as well as in the manufacture of slippers and handbags, a considerable amount of dyeing is necessary. In a few places the proper dyes are being used and the dyeing is well done. However, in most provinces, especially where sinamay and pinolpog are not manufactured, the teachers know very little about this line of work, and as a result their efforts to dye the fiber have been little more than failures. It is evident that some definite instruction in regard to this important part of industrial work should be sent out. For about two years the Bureau of Education has been in communication with a number of German dye manufacturers for the purposes of obtaining dyes suitable for this fiber. A number of good ones have been secured and are giving satisfactory results. However, investigations along the line of dyes are still being made and will probably continue until the best and most suitable kinds have been secured. An effort has been made to do away with the gaudy fugitive colors frequently used for dyeing this material, and to substitute more permanent, harmonious, and pleasing tones. As soon as sufficient data can be gathered on the subject an article will be written dealing with the different dyes adapted to this material, the methods of using them, the probable cost, and the place from which they may be obtained.

The commercial abaca fiber is contained in the outer portion of the petiole. To get this fiber the pulpy part is stripped away.

However, if it is not stripped it is cut into narrow strips, dried in the sun, and called lupis. If properly prepared it is of a silvery white appearance and very strong. A few years ago this fiber was used as a twine to tie bundles and to make fishing lines and small ropes. It was not until a little over two years ago that it came into use as an industrial material in the public schools. At that time it was used in making small trays. Since then its uses have spread and in the provinces where abaca grows it serves to a great extent as industrial material for pupils of Grades I and II. Even a number of European manufacturers have become interested in this material and have already ordered samples through their Manila offices. Information is being collected on this subject, and in due time an article in regard to it will appear in *THE PHILIPPINE CRAFTSMAN*.

Since time immemorial the native women in various parts of the Philippines have been weaving beautiful cloths from abaca fiber, the most important being sinamay and pinolpog. Some of these cloths are very fine and delicate and are beautifully dyed. Others are coarse and rough. The making of this cloth requires considerable skill and experience. The fiber is always tied by hand and woven on small hand-power looms, the process of weaving often being long and difficult. The greater part of these cloths is used locally and forms one of the principal dress materials of the Filipino women. However, during recent years an export trade has been built up and is on the increase. During 1911 more than 139,000 square meters of sinamay alone valued at ₱19,000, entered into the foreign exports. In 1912 this was increased to more than 207,000 square meters valued at nearly ₱26,000. The province of Albay exports more than ₱10,000 worth of sinamay annually, aside from a considerable amount of other abaca fibers, and the production is still on the increase. The history of this cloth, the preparation of materials, the process of dyeing and weaving, and the marketing of the finished product will be given consideration among other articles on abaca and its various uses.

A number of the non-Christian tribes, especially the Mandayas and the Bagobos, produce very beautifully dyed abaca cloths containing unique and intricate designs. The method of dyeing, designing, and weaving this cloth is so entirely different from that employed by the weavers elsewhere in the Philippines that the process is interesting and instructive, and should therefore be given to the public. Not a great amount of this cloth ever reaches the general market, as most of it is

made for home use. In many instances it requires several months to prepare the fiber and weave it into a finished piece of cloth.

During the past two years coiled baskets have been made from various materials in a number of schools. However, abaca has been the principal fiber used in making coiled baskets, especially the higher priced ones. Each year these baskets are greatly improved, and only time is needed when they will be works of art and demand high prices from the various basket collectors. The Bureau of Education is now working out some



Plate IV. Making a rope warp, Malabon.

excellent models in coiled baskets. At some future date the use of abaca fiber as it is employed in the manufacture of coiled as well as other forms of basketry will be taken up and discussed in considerable detail. A few years ago the Tagal braid industry was confined chiefly to Japan and Europe. Much of the tied abaca was shipped to Japan, made into braids, and then exported to Europe at a considerable profit. Two years ago very little braid of this kind was produced in the Philippines. However, from time to time the number of braiding machines in operation has increased. These machines were first put into

operation solely for the purpose of making braids for the European trade. The exportation of this braid still continues, yet to a great extent it is being employed in the manufacture of men's and ladies' hats. A number of workers in Baliuag are being supplied with this braid, and beautiful substantial hats are being turned out by the hat weavers in that locality. Aside from the use of these materials for hats, they are utilized in making lace, baskets, and other minor articles such as are manufactured in the public schools of the Philippines. At a later period this industry will be taken up and more fully discussed.

During recent years abaca slippers in one form or another have been manufactured in the schools of various localities throughout the Philippines. Many different types have been evolved and placed on the market. However, only a few have withstood the test and become marketable products. Every year the slipper work is greatly improved. During the industrial exposition new ideas in this line of work are always to be found and these ideas are usually better than those presented during the previous expositions. In a number of places the abaca slipper has entered the homes of the poor people and to a great extent has supplanted the use of the chinela. To the public schools is due the credit of developing and standardizing this work throughout the Philippines. An article will be prepared on the abaca slipper industry as it has been developed in the schools of the Philippine Islands. This will take up in detail not only the preparation of the material but the steps in their manufacture.

During the past eighteen months this fiber has entered the field as a substitute for a number of imported materials that were formerly used in the schools. Not only has it been used as a substitute but it is also being employed in the making of a number of useful and beautiful articles for which other materials are unsuitable. Many useful and substantial articles such as lace bags, embroidered cushions, and cushion covers are now being made from this material, and it is believed that within a short period of time it will be utilized for many purposes.

In a few localities attempts are being made to manufacture lace from tied abaca fibers and to a certain degree have been successful. However, only time will tell whether or not these laces will meet the approval of the general public.