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The Philippine Craftsman

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MANILA, DECEMBER, 1916

No. 6

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A tool is but the extension of a man's hand,
and a machine is but a complex tool. And he
that invents a machine augments the power of
a man and the well-being of mankind.

Henry Ward Beecher.

The Philippine Craftsman

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LOOM WEAVING AMONG THE IGOROTS.

By SHARON R. MOTE, Acting Division Superintendent, Mountain Province.

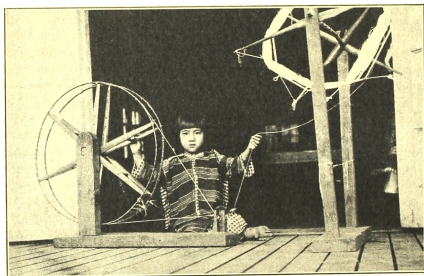
Among the Igorots each tribe has its characteristic designs; and the methods of weaving differ. In Benguet, Amburayan, and western Lepanto, the Ilocano loom is used. In northern Lepanto, Bontoc, Kalinga, and Ifugao, the Igorot loom is employed. This consists only of a harness and reed held in place by the warp itself. The warp is double and one end runs around a horizontal bar fastened generally between two trees, while the other end is attached to the belt of the weaver. She sits flat on the ground and fills in the woof from wooden bobbins.

Loom weaving in the homes is carried on to the greatest extent in western Lepanto and lower Amburayan, where the methods closely resemble those of many Ilocano sections. In Angaki, Concepcion, and San Emilio, Ilocano blankets and cloth are made. Some cotton is raised locally but not enough for home consumption. Cotton is spun by means of a sort of plumb bob. This is given a whirling motion by rubbing the spindle-like projection of the bob on the bare thigh. A hollow bamboo length filled with cotton, is so held in the left hand that the thread in twisting allows the plumb bob just to clear the ground. As the bob whirls, the bamboo is slowly raised to lengthen the thread being spun. When this is as long as the worker's reach permits, the thread is wound around the lower part of the bob, is again fastened to the hook in the top of the bob, and the process is repeated. Another method of spinning is by means of a wheel turned by hand while the thread is run between the toes of the spinner, who sits on the ground beside the wheel.

In northern Lepanto, between the seasons of rice planting and harvest when everybody helps in the fields, considerable home weaving is done by the women on the Igorot loom. In Namitpit, a barrio of Angaki, some women make gee strings, while others weave a blue-and-white check cloth about 61 cm. wide, which in 1-meter strips is extensively used for women's skirts. The weaving done at Guinsadan, a barrio of Bauko, is well known

throughout Mountain Province for quality of workmanship and distinctive design. The Guinsadan blanket is in considerable demand among Igorots, Filipinos, and Americans. It is the blanket used in Benguet as a drapery for the rich men and women who dance at the Igorot feasts or "cañaos," and it is a token of wealth. In Guinsadan most of the women weave during their spare time; and during the year the average family manufactures articles to a total value of probably ₱30. No weaving has been done in the schools of Lepanto.

In Kalinga no girls have been enrolled in the schools, and home weaving is not extensive. All of the weaving is in a few dis-



A Benguet schoolgirl reeling cotton thread on bobbins, preparatory to weaving the cloth to make herself a new dress. The reets are made by the boys in the school shops.

tricts, the most important of which is around Naneng. The people here wove long before the coming of the Americans, and the designs are characteristic patterns that have been followed for generations, red and yellow being the predominant colors. The dyes used are secured from native plants, and the cotton thread is obtained chiefly from Cagayan and Abra merchants. Gee strings, tapises, and blankets are produced.

In Ifugao, the women during their spare time do considerable home weaving on Igorot looms. Gee strings, tapises, blankets, belts, and hip bags are made in color combinations and designs very characteristic of the tribe. An Ifugao may easily be recognized by the color and design of his gee string or dress. Very dark blue, or blue black, is always the principal color, the design

usually being in white, sometimes with a touch of red or yellow. The white effect is secured by dyeing the cloth after the desired design has been carefully covered with wax which prevents that part of the cloth from taking the dye. The Ifugao death blanket which is used to wrap the corpse for burial, bears a number of significant decorations such as the dancing man, the pile of palay, the snake, and the chicken. Some of these have been adopted as standard designs by the Bureau of Education. Little weaving has been done in the schools of Ifugao, as very few girls attend. Several years ago, and again last year, a few girls were enrolled in Kiangnan. Some weaving was done and a few changes in designs and patterns were introduced, but no influence on home weaving was noticeable.

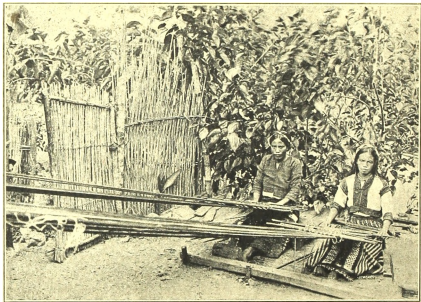
In Bontoc, most of the weaving is done in the town of Bontoc itself. Comparatively few families do any weaving and most of the workers live in or near the Christian section of the town. They carry on this work as a daily business rather than as a spare-time occupation. In a few cases Ilocano merchants hire a number of women to weave, paying them by the piece. The Bontoc gee strings are quite distinctive in design, and workmanship. The prevailing colors are usually red and yellow, or red and blue. In Baguio, numbers of these gee strings are sold to the richer Benguet Igorots, who pay as much as ₱5 a piece and consider them the best obtainable. The tapises and blankets woven in Bontoc are similar in color and design to those of northern Lepanto where the method of weaving them probably originated. Not much weaving has been done in the Bontoc schools, although the girls make the cloth for their own dresses, using the Igorot loom.

In parts of Kalinga, Ifugao, and Bontoc, some gee strings, and tapises are still woven of fibers from the bark of trees. They are generally not dyed. The cloth is usually woven from thread spun by rolling the fibers between the hand and bare thigh, though in some cases whole pieces of cured bark are used. The bark cloth is worn by the poorer people who are unable to buy cotton cloth, for which the thread is imported.

Ten years ago there was no loom weaving whatever among the Igorots of Benguet, and all of the cloth used was purchased from the Ilocanos. The influence of the schools has been greatest in Benguet. Loom weaving there was first introduced by the Bua School, and a little later it was taken up in the Kabayan School. It has since been introduced into Bokod, Daklan, Buguias, Tublay, and Kapangan. The greatest success has been achieved in the Kabayan district. From the first, the people

there furnished all lumber needed in the Ilocano looms, and these were made by the manual training classes. Each girl was provided with a loom, and she was allowed to take it home when she finished school.

It has not been altogether easy to introduce this industry into the homes of Benguet. The camote patch and the rice field, requiring the labor of the women, are ever-present discouragements to home weaving. At first it is necessary for teachers to supervise home weaving, and also to assist in marketing the products. During the past year a considerable number of former



Weaving on Igorot looms.

schoolgirls from Kabayan have done home weaving regularly. Most of the girls weave for a half day and then do other work, although some of them weave only during spare time. Last year 13 Kabayan girls wove over 1,200 yards of cloth. At Bokod and Daklan also, a number of girls did well. During the first two months of this school year, the Kabayan girls sold about ₱30 worth of cloth to their neighbors besides furnishing some for use in their own families. The work was done at home. This year it is expected to increase the amount of household weaving in the Kabayan district. An effort is being made to have all of the girls who previously attended the Bua School do home weaving, the work to be supervised by the principal of the Bua School.

Weaving in the schools is confined principally to making cushion covers and articles which find a ready sale among Americans, though all of the girls first learn to make ordinary Igorot cloth. Designs of articles made in the schools are frequently originated by pupils and teachers, and they are improved on from year to year.

A girl at loom weaving can earn, on the average, about 50 centavos a day. Those who weave at home under school supervision receive all profits accruing from the sales, after payment for materials. The cost of the cotton for dress cloth is almost half the value of the finished goods at its present selling price. The girls who weave at school are given about one fourth of the proceeds. The remainder is used to buy industrial materials and school supplies. During the first two months of this school year, Sucdiat, a fifth-grade girl of Kabayan, filled orders for loom-woven products amounting to ₱44; and at the same time she kept up with all of her academic work in the general course. The material used was worth ₱14 which left a clear profit of ₱30. It is apparent from these figures that in Mountain Province it would be inadvisable to emphasize lace making, at which a girl earns 15 or 20 centavos a day, in place of loom weaving, at which she can earn ₱15 a month while continuing her regular school work.

During the first week in November, 54 subscriptions for THE PHILIPPINE CRAFTSMAN were received in one mail. Only three of these were renewals. In addition to those from every province in the Philippines, there are subscribers to the magazine in New Zealand, Samoa, Burma, Siam, India, and in fourteen different States of the Union.

○ ○ ○

The stock of linen thread in 90 to 140 counts for lace making, has become so low, and the prospect of obtaining an adequate supply in the near future is so poor, that the Bureau has found it advisable to issue a circular on the subject. The direct result of the shortage of thread is a curtailment of production, and the necessity of the acceptance of a few pieces of lace in lengths of less than standard.

○ ○ ○

The first condition in effective design is to know what we wish to do. To know what we wish to do is to have an idea; to express that idea we require principles and a form.—Viollette-Duc.

FILIPINO TRAPS.

[Compiled by Horace E. Culler, from data furnished by teachers of Camarines, Ilocos Norte, Laguna, Misamis, Occidental Negros, Pangasinan and Sorsogon.]

There is something about a trap that is almost sure to arouse interest whether or not there is any thought of ever making use of the device. This interest in traps is almost instinctive. It has survived from a time in the long ago when all men were largely dependent for existence upon such contrivances.

Traps were doubtless among the earliest inventions. They were to primitive man what machines are to the present generation. They were the first labor-saving devices, and their



FIG. 1.

development was the result of primitive necessity. When it is considered that the number of animal forms in these Islands is rather limited, the great variety of traps found here is a source of wonder.

The principles employed in some of these traps bear evidence that their inventors had a much greater knowledge of mechanics than is generally accredited to people of the early ages. So well did the originators perform their tasks that no modification of early models has been made in historic times, and, indeed, improvement appears to be almost impossible.

Traps may be classified into two groups with reference to the manner in which their effectiveness is secured. To one class belong the pitfalls, single nooses, and nets. These are placed along runways, in ravines, or in openings through the forest

where the animals are accustomed to pass, or into which they may be driven. To the other class belong the intricate bird, monkey, and rat traps, the mechanism of which requires some study. Nearly always they involve the spring and trigger

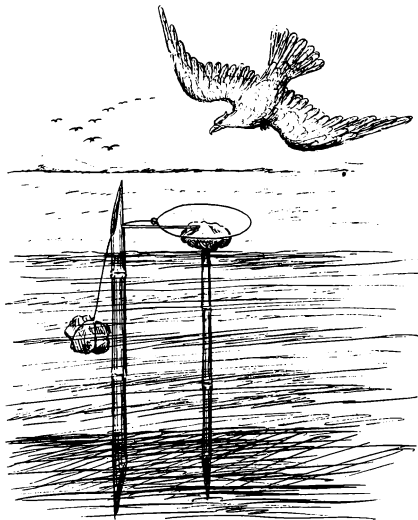


FIG. 2.

principle in their construction. With the exception of those devised to kill their prey by means of the arrow, all of these traps employ the slip noose to hold the animal.

Figure No. 1 illustrates an ingenious yet simple bird snare. It is known as *patapuak* in Pangasinan and as *takuap* in Ilocano. Devices of the type shown in the figures Nos. 2 to 6 differ more

in appearance than in construction. Figure No. 2, called *talangao* in Ilocano and Pangasinan, is set in the water. Figure No. 3 is known as *bantay* in Laguna Tagalog, as *saliret* in Pangasinan and as *batayan-hulug* in the dialect of Occidental Negros. Figure No. 5, *batayan*, is found in Sorsogon; Figure No. 6, *pasanga*, in Pangasinan. In Laguna the spring in all of these traps is known as *bawig*, the trigger as *kiseo*, and the noose as *selo*.

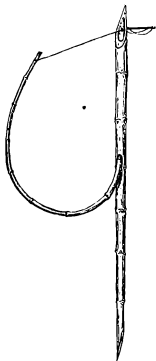


FIG. 3.

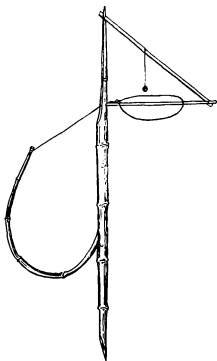


FIG. 4.

Figures Nos. 7 to 10 show other traps operated on much the same principle. Figure No. 7, is called *pagatin* or *padatar* in Pangasinan, *bitag* in Tagalog, *litag* in Bicol (Sorsogon) and *panyakap* in Laguna Tagalog. The device shown in Figure No. 8 is used in Pangasinan for catching crows. Figure No. 9 is called *taguing* in Laguna. Figure No. 10 shows a similar trap used for catching lizards.

Traps which depend for their effectiveness upon kick rather than jerk are shown in the figures Nos. 11 and 12. Figure No. 11 is known as *landet* or *pacatle* in Pangasinan where "catle"

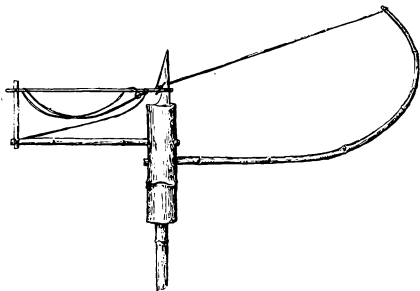


FIG. 5.

means shears. Figure No. 12, the atipil, is used in Camarines for catching rats as well as birds. It is usually placed on the ground in runways.

Interesting though slight variations in rat traps are illustrated in the figures Nos. 13 to 15. These are known as ligpit in Bicol, pagsulang in Visayan, and patibong in Tagalog. The trap shown on the back cover is very common in Albay Province. Figure No. 16, the saltop or "saltoc" is used in the Ilocos provinces.

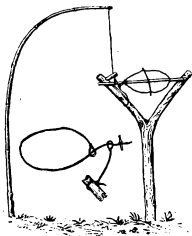


FIG. 6.

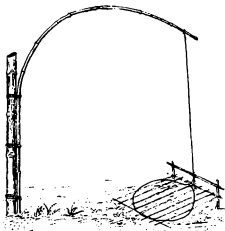


FIG. 7.

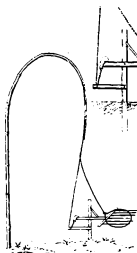


FIG. 8.

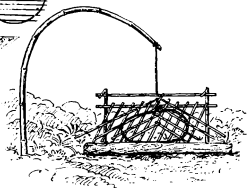


FIG. 9.

The monkey trap shown in figure No. 17 and known as *balang*, is used in Camarines not only for monkeys but for mongooses. Figure No. 18, called *pakwis* in Tagalog, is similar to the *atipil*, figure No. 12. Figure No. 19, the *parucot*, is used in Laguna.

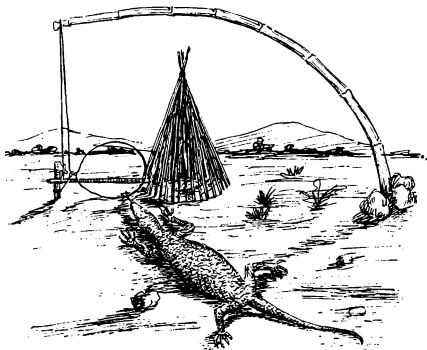


FIG. 10.

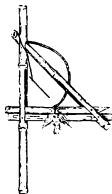


FIG. 11.

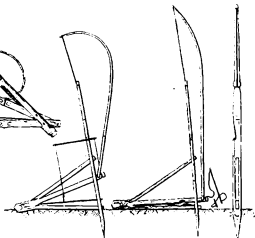
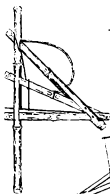


FIG. 12.

Figure No. 20 illustrates a trap for wild hogs known in Pangasinan as balais, in the Bicol provinces as balatic, and in Union as cobó. Figure No. 1 illustrates the pangloob. When a hog

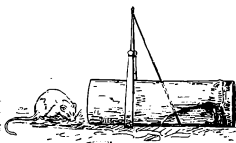
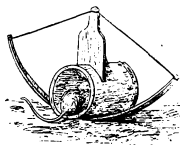


FIG. 13.

enters the garden patch the gate is closed, and he can then only leave at the opening which leads into the pit. Figure No. 22, called pasolo in Tagalog, is an effective though cruel device for catching hogs.

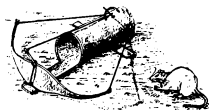


FIG. 14.

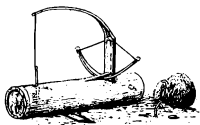


FIG. 15.

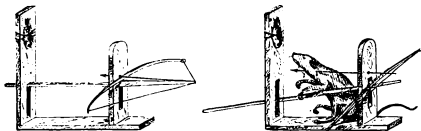


FIG. 16.

The net with which so many deer are caught, while rather simple in operation, requires much time in construction. It usually necessitates from one to several people, assisted by dogs, to make it effective. A deer is driven into the net, the stakes give way, and the creature becomes entangled in the meshes. The net shown in figure No. 23 is known as *batong* in Bicol and as *bating* in Laguna Tagalog. The contrivances illustrated in the figures Nos. 24, 25, and 26 are known as *balais* in Pangasinan. They are not very common forms.

Which kind of trap is most primitive, can only be conjectured; but it seems reasonable to suppose that it is the pit, since it may have been suggested by the case of one traveling through the woods alone and falling into a hole from which it was difficult to extricate himself. The next trap in order of development might have been the noose, the idea being presented by the hunter's becoming entangled in forest vines. The traps depending upon the spring and trigger device may have been suggested by the

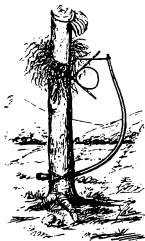


FIG. 17.

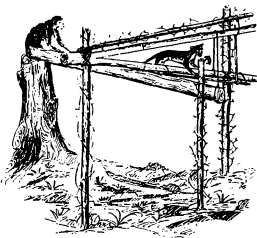


FIG. 18.

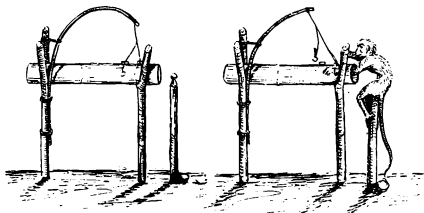


FIG. 19.

accident which befell the hunter in stepping on a stick or vine, the movement of which caused the fall of a heavier object which held him fast.

The simplest contrivance is that most generally used for catching birds. It consists merely of a soft resin daubed on a perch or the branch of a tree to which the bird has been attracted by means of some tempting bit of food. Another very simple device is the coconut for catching the monkey. A small hole is cut in the side of a green coconut, which is left in the locality where the depredations of the monkey are most frequent. Into the hole, which is just large enough to admit the creature's hand, is slipped a piece of nut. The monkey reaches in, grasps the bait and, unwilling to let go, holds on until caught.

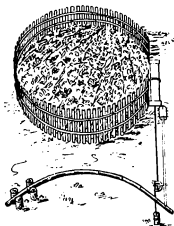


FIG. 20.

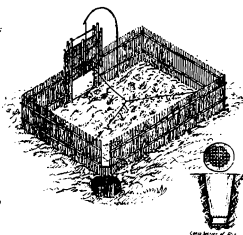


FIG. 21.

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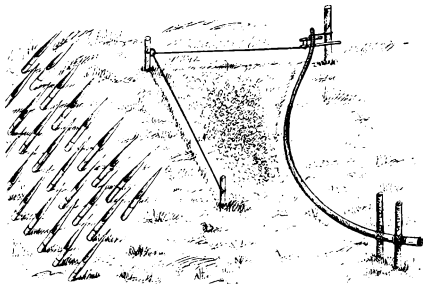


FIG. 22.

The methods by which game is lured to the trap show how familiar with the habits and instincts of the wild life of field and forest must have been the originators of these devices. Of course the most common practice is to put food in the place frequented by the creature; but the knowledge of different instincts is made use of. The wild cock of the forest is caught while answering the challenge of the tame cock which has been tethered in a space surrounded by nooses. The parouet alights on the cage of another in captivity, and is soon caught in the

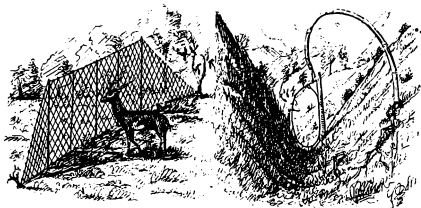


FIG. 23.

FIG. 24.

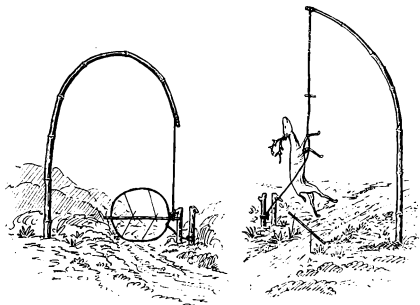


FIG. 25.

multitude of horse-hair nooses. The value of decoys is also recognized in duck traps.

No materials aside from those growing in nearly all sections of the Islands are used in the construction of the native traps.

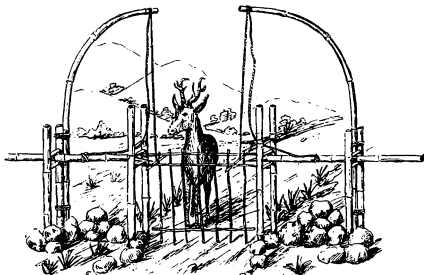


FIG. 26.

Bamboo is made to serve in all such parts as require rigidity or elasticity. Abacá is employed for the coarser nooses and nets, while cotton, horse hair, and various fibers, are used where a fine material is needed.

While the workmanship in practically every case demands only simple operations, the ingenuity displayed in the construction of the devices, and in the selection of the principles upon which they work, is worthy of inventors of no mean ability.

If the remote ancestors of the Filipino people, living under the most primitive conditions, were capable of inventing contrivances which so admirably met their needs, the people of the present day should be capable of much more. But for an equal degree of success their knowledge of essential conditions should be as complete as was that of these early inventors.

THE BUREAU OF EDUCATION SALESROOMS.

On August 9, 1916, the new sales department of the Bureau of Education opened a salesroom on Arroceros, in the building which was formerly the office of the superintendent of the Philippine School of Arts and Trades. One of the three rooms on the lower floor is used as an office, while the other two are given over entirely to the exhibition of articles for sale. The upper floor is used as a lace and embroidery inspection room. The wholesale storeroom is located in the former blacksmith shop of the trade school.

The retail sales for the first three months amounted to ₱4,128.22. Since no advertising is done, this indicates that there is a steady demand for industrial articles in Manila. The prices in general have been satisfactory. The demand for laces is strong, while that for embroideries is good, though not so marked as for other products. This is probably accounted for by the fact that embroidery can be purchased at shops in Manila, or at local centers. In baskets, the smaller ones have been the better sellers. Jardinière baskets have sold better than wastebaskets. Flower baskets and those with covers and handles have been very salable, as have those which can easily be sent through the mails. There is a demand for cheap articles retailing at from 10 to 50 centavos.

The salesrooms are open from 8 a. m. to 3.30 p. m., daily, except Saturday, when the public is admitted from 8 to 11.30 a. m.

ADEQUATE MATERIAL AND EQUIPMENT.

By JOHN C. CUBOSA, Division Industrial Supervisor, Nueva Ecija.

To insure success in school industrial work the prime requisites are an efficient teacher, adequate materials and equipment, and a definitely outlined plan. Filipino teachers have rapidly progressed in technical training and efficiency; and systematic work is becoming more and more the rule.

Materials and equipment are generally sufficient; but inspection of industrial classes shows that a lack of these is the most frequent cause of unsatisfactory work. Even a conscientious pupil soon becomes listless if he is not properly supplied with the articles requisite to good work.

Unless each pupil has the tools and the industrial material which will permit him to work without interruption, and at a speed which will insure satisfactory returns for his labor, the class cannot be called adequately equipped. The gauge, saw, and bolo, for boys, and the model and perforation, for girls, may be used in common. But knives and awls, needles and scissors, all of which are used continually, should be owned by each pupil; and it is these which are too often unsuitable or lacking altogether.

At first friendly borrowing takes place and little harm is done. But as some continue to bother others for rulers and knives, a feeling of resentment arises, bickerings and quarrels ensue, and discipline suffers. As a result, the pupils grow inattentive and inferior workmanship becomes general. In such a case the teacher is to blame. If the equipment is easily obtained, all pupils should be made to provide themselves with everything needed, and those who are careless should not be allowed to annoy others who have properly supplied themselves.

A teacher, especially if assigned to some remote barrio, is sometimes confronted with a dilemma when about to organize the industrial classes in his school. He is supposed to establish a particular kind of work, and yet he may find that needed materials are lacking and that there is no way to secure either these or the equipment required. Resourcefulness generally wins the day; but sometimes haste to obtain results will induce a teacher to countenance careless work on the part of his pupils. Ambition in such a case is dangerous. It is better to give the

children work, elementary if need be, which may be carried on with a very small equipment, than to force them to take up work which demands tools beyond their power to purchase.

Judgment should be used in the selection of industrial courses for each class or school. If funds are not available it is certainly poor policy to choose a form of work for which expensive equipment is necessary. The industries of a school should be such as are already established in the households, or which are at least suited to the locality. This will give a firm foundation on which to start work, and it will bring the quickest returns.

If bamboo and rattan are plentiful in a district and the buri palm is not found, buntal basketry which will necessitate the importation of materials and the purchase of high priced dyes, should not be introduced. Rather, the children should begin elementary handweaving with bamboo strips, progress to basket making, and finally take up the fabrication of export bamboo-rattan baskets. This will train workers thoroughly in one kind of work, expenditures will be reduced to a minimum, and success will quite probably lead to the organization of similar household industries within the district.

Sometimes one teacher will become discouraged in the presence of difficulties, while another in similar circumstances, will find a way to secure the needed equipment. He thus makes possible for his pupils advanced work, which not only promotes enthusiasm and diligence, but brings greater returns for the same expenditure of time, labor and material. Where pupils are poor, and municipal or other funds are lacking, a teacher with spirit will arouse outside interest in his school, give entertainments and benefits, and try every means to establish a fund for financing the industrial work.

In 1915, a few sweet potatoes were brought to Bukidnon from the United States by mail. The name of the variety is not known, but the potatoes look like the yellow Jersey, though they are not quite so pointed. They grow from the vines as do camotes, and they appear to be hardier. To determine how long they would keep, a few from a lot harvested last March, were laid out in a dry place. In the middle of August, before the rats finally got them, they were as solid as ever. These potatoes are much esteemed by the Visayans of the community.



Every man is worth just so much as the things are worth about which he busies himself.—Marcus Aurelius.

COÖPERATION BETWEEN THE BUREAUS OF SCIENCE AND EDUCATION.

By ALVIN J. COX, Director of the Bureau of Science.

Coöperation between the Bureau of Science and other offices of the Insular Government is exceedingly important. The very nature of the work of the Bureau of Science necessitates coöperation of the closest kind in view of the fact that all laboratories of the Government are under one supervision. The report of the special Philippine Assembly Committee appointed in November, 1915, ably pointed out the desirability of this when it says: "In theory, as well as practically, the organization of such an institution as the Bureau of Science is excellent, involving as it does the centralization and concentration of all governmental scientific investigations, thereby, on the one hand, assuring better results as to efficiency and economy and, on the other, preventing the so often criticized duplication of almost identical work by different organizations." By such segregation, the Government is able to afford adequate equipment for one institution, and a higher class of work is produced. The Administrative Code enumerates the particular duties to be accomplished, and ends to be subserved by the Bureau of Science. One of these is the following: "The making of special investigations and the accomplishment of special work which may be needed by other bureau or office of the Insular Government which may require laboratory facilities or scientific knowledge of a specialized character." A large amount of industrial and other work of the Bureau of Science, has been undertaken for the benefit of the Archipelago and its people at large, and in addition has been of great assistance to almost every administrative Government unit. The Bureaus and Offices for which routine work has been performed by the Bureau of Science during the calendar year 1915, comprise the following: Bureaus of Health, Public Works, Supply, Science, Internal Revenue, Printing, Agriculture, Justice, Executive, Lands, Education, Forestry, Customs, Quarantine Service, Constabulary, and Prisons, United States Army and Navy, the various provinces and municipalities, the City of Manila, University of the Philippines, and the Philippine Exposition Board. Not small is the assistance which we have been able to render to the Bureau of Education, and vice versa.

The Bureau of Education must have school buildings. Before the cement, galvanized iron roofing, paint and other material for the construction by the Bureau of Public Works are purchased, they are tested by the Bureau of Science. The composition material which is installed for blackboards, the pencils and other school supplies, are tested to secure the best value before the Bureau of Supply places orders. A study of the soils of some of the grounds laid out as school gardens has been made. An endeavor is being made to establish the characteristics of soils peculiar to tropical conditions; and knowledge with regard to the relation of the chemical composition and physical texture of the soil to fertility, irrigation and the yield of crops, has enabled the suggestion of suitable fertilizers.

The Bureau of Education is emphasizing industrial education, and in its industrial program it should and does rely on the trained scientific staff of the Government. The investigation of industrial materials, or potential industrial materials, for use in the schools of the Philippines, will illustrate this point. In view of the fact that the same plant is often called by different names in different parts of the Islands, it was absolutely essential that those yielding industrial products be properly classified, in order that the numerous native names could be reduced as synonyms of a standard selected name. This work of classification was done by the Bureau of Science, and involved the determination of many hundreds of botanical specimens from all parts of the Archipelago. When the data were worked up in the General Office of the Bureau of Education, the native names and economic notes recorded in the general herbarium of the Bureau of Science, were utilized in so far as such data applied to the matters under investigation. The general collections of the Bureau of Science were also utilized in working out the geographic distribution of the various species of industrial importance. To do this work properly, except for the assistance of the Bureau of Science, the Bureau of Education would have had to employ a highly trained botanist, who, as a preliminary to his work would have had to spend several years in securing a definite knowledge of the Philippine flora. From time to time, as special publications have been prepared in the Bureau of Education, special data from a botanical standpoint, names, both scientific and common, uses, distribution and occurrence of various economic species, have been supplied.

The chemical laboratory of the Bureau of Science has been able to assist the Bureau of Education in many lines, among which the following may be enumerated: The extraction of

buntal fiber, the bleaching of straws and various fibers, methods of dyeing bamboo fibers and straws, information in regard to the native dyes, the treatment of bamboo to render it insect-proof, the rendering of coconut shells impervious to water so that they may be used as flower pots, work on the nutritive value of local foods, the determination of a balanced diet for inhabitants of the Philippine Islands, the investigation of ipel as a coffee substitute, the determination of a formula for re-inking planotype duplicator ribbons, improved methods in the tanning industry and the cost of a small plant for the purpose of instruction in the industry, the prevention of the action of weevils on corn, the examination of clays as to their suitability for pottery and brick work and the location of suitable deposits for pottery and brick raw material, etc. Some investigations have been carried on by Bureau of Education employees under the supervision of the Bureau of Science, as well as by the Bureau of Science employees themselves.

The extraction of buntal fiber may be taken as an illustration of the type of assistance rendered by the chemical laboratory. The Bureau of Education Bulletin No. 33 shows that the present method of extracting the fiber from the petiole of the buri palm used for buntal hats is slow and expensive. The Bureau of Science has undertaken to improve this method, with the result that the quantity of fiber extracted in a given time by one individual is several times larger than the quantity obtained by the method at present in use. The present method consists in drawing one fiber at a time in order that it may be cared for before it discolors. It has been found that the discoloration can be entirely inhibited by immersing in water containing 2 per cent by volume of glacial acetic acid, or by the addition of common vinegar in sufficient quantity to give the equivalent amount of acetic acid. By beating the whole stem, or by crushing it between rollers, the fibers can be separated without difficulty from the bulk of the pulp, and can be extracted from a stem of any length without cutting. Even the brown color, which may have appeared to a certain extent, can be removed and the original color of the fiber restored. After treating the fiber with acetic acid solution, it should be boiled with clean water for at least ten minutes. In no case should a can or other iron container be used, because the tannin in the pulp or fiber will form an ink (due to the formation of iron tannate) with the dissolved iron, and this discolors the fiber. Wooden rollers are probably the best for crushing the stem, and iron rollers must be excluded, for the reason that they impart a blackish color to the fiber.

The mulberry silkworm, while originally a temperate zone insect, has by careful selection through several years of experimentation, become thoroughly acclimated in countries like southern India, Ceylon, and the Philippines. The Bureau of Science has introduced the culture of the polyvoltine silkworm of Ceylon in the Philippine Islands, and, besides developing a Philippine race producing at least eight generations a year, has definitely established the fact that the Japanese monovoltine silkworm cannot be acclimated here.

Silkworms are not attacked by diseases in the Philippines. The introduction of silkworms or their eggs into the Philippine Islands by any other than the Bureau of Science, is prohibited by law. This precaution was taken to keep the Philippines silkworms free from those diseases that at times have seriously injured the industry in other countries.

Enough silkworms are raised by the Bureau of Science so that eggs can be supplied to responsible individuals and to schools. The Batac Farm School of the Bureau of Education has been supplied with eggs, and has been especially energetic in interesting those who will carry on the silk industry. The School has about 900 mulberry trees available for furnishing leaves. During the school year 1915-16, 615 skeins of raw silk and 782 skeins of scoured silk were produced. About 45 girls have been graduated in silk culture, and at present there are 80 girls who are taking up the work. There are over 100 homes in Batac, Ilocos Norte, in which sericulture is being conducted. The schools seem to be one of the best means by which the raising of silkworms can be demonstrated to those who will be most benefited.

The fisheries employees of the Bureau of Science have worked out methods for the preparation of fishery products suitable for the tropics. Bagoong, notoriously a poor product, is a good food product when it is carefully prepared. Methods for preparing salt, dried, and smoked fish have been published in the Philippine Journal of Science. Certain of the schools in the Islands offer excellent opportunities for practical instruction in fishery work. In districts where the population primarily is composed of fishermen, instruction in the cultivation and preparation of sea products and sea crops, would accomplish immediate and practical good. The food value of trepang and dried fish could be greatly increased by improved methods of preparation, and with little or no additional cost.

The Bureau of Education has taken advantage of the information in the Bureau of Science with regard to clay deposits and

clays suitable for pottery work, and teachers in many parts of the Archipelago have sent samples of clay and pottery material to the Bureau of Science for examination. In all cases inquirers have been promptly advised.

Miscellaneous classes of work of many varieties have been performed for the benefit of the Bureau of Education. In 1914 the Bureau of Science made a survey of school children to determine the malarial index. Examinations of sputa in Manila for the detection of bacillus tuberculosis infections have been made. In accordance with existing regulations, examinations for cholera of faeces of teachers going on transports have been made. The photographic facilities of the Bureau of Science have been available to the Bureau of Education. For the demonstration of the Bureau of Education at the Panama-Pacific International Exposition, the Bureau of Science made 2,000 feet of cinematograph films of Philippine public schools and their industrial and other work.

There is a large amount of work which the Bureau of Science performs which involves coöperation between many Bureaus and Offices of the Government. All of the serums and vaccines used in the Islands are manufactured in the Bureau of Science, so in the vaccination of school children against smallpox, the Bureaus of Education and Science and the Public Health Service have a common interest. All of the clinical diagnostic work for the detection of contagious diseases, such as cholera, plague, diphtheria, typhoid, malaria, etc., is done by the Bureau of Science for the Philippine Health Service, all of which is eventually for the improvement of the health of the children.

The employees of the Bureau of Education upon authority from the central office may draw books from the Bureau of Science library which is the science division of the Philippines Library and Museum, and the reading room is open to all during the regular hours, 8 to 5 Monday to Friday, 8 to 4 Saturday, and 8 to 12 on Sundays and holidays. Suggestions and assistance in the organization of school libraries have been freely given, and students have been given full use of the reading room privileges. At the request of the Bureau of Education, employees of the Bureau of Science have from time to time given talks on specialized subjects to conventions of teachers and other gatherings, in order that they might have the benefit of years of experience and thorough study in a given field.

The aquarium of the Bureau of Science contains a large and complete display of curious bright-colored fishes, and various species of crabs, lobsters, prawns, turtles, crocodiles, sea urchins,

starfishes, etc., and many more species of the wonderful and most interesting forms of marine life found in the tropical waters of the Philippines, and is an institution of great educational influence. Free admission to the bona fide school children and teachers of Manila has been provided for. This has been very much appreciated and during the calendar year 1915 there were 16,369 free admissions under this arrangement.

The cooperation between the Bureaus of Education and Science has not been one-sided. Through its organized provincial personnel, the Bureau of Education has generously secured materials and data needed for the investigations of this institution. It is anticipated that the cooperation between the Bureaus of Education and Science will be even greater than it has been in the past, as both institutions are industriously working for the benefit of the Philippine Islands and the Filipino people as a whole.

IMPORTANCE OF SMALL MATTERS.

The industrial achievements of a certain school have long been a source of much satisfaction not only to its teachers but to its pupils and patrons as well. Not long ago, a visitor at this school was shown some very creditable handwoven articles, a splendid garden, a busy shop, and a cooking class which was doing excellent work.

The domestic-science building was the scene of much activity. Some girls were cooking, others were preparing dishes and tables. In fact, everything about the school looked as it ought to, with a single exception.

The near vicinity of the domestic-science building looked decidedly uninviting. The girls threw their dishwater out the front way. They should have emptied it into cans or buckets at the rear. Apparently the teacher thought nothing of this, and doubtless the pupils considered it all right inasmuch as the teachers did not object.

The visitor will long remember this school and the many good features will often come to mind. Had it not been for the condition of the grounds about the domestic-science building, there could be none but most pleasant recollections.

Teachers can not be too vigilant in guarding against negligence even in what may seem to be a trifling matter. The overlooking of one detail may mar the effect of the most painstaking efforts.

LABOR SAVING DEVICES FOR BASKETRY CLASSES.

By EUMENADO VILLANRUZ, Assistant Division Industrial Supervisor, Capiz.

One of the greatest handicaps to efficiency in the production of basketry, has been the lack of tools especially designed to meet the requirements of the work. During the school year which closed last April an attempt was made to adapt some of the tools used by carpenters, silversmiths, and blacksmiths, to the needs of basket makers. Several new instruments were devised, and these proved very successful when tried out in the provincial school. During the long vacation a complete set of tools was made for use in the last normal institute. The teachers, especially those in the classes doing work in polangui basketry were very much pleased at the results secured with the new devices. These are illustrated in Plate I, and a list of them is here set out:

- Fig. 1. Scraper for removing skin of rattan.
- Fig. 2. Steel spoke gauge for preparing spokes.
- Fig. 3. Steel round gauge, large holes.
- Fig. 4. Tin spoke gauge, for adjusting spokes.
- Fig. 5. Tin flat-weaver gauge, small holes.
- Fig. 6. Tin round gauge, large holes.
- Fig. 7. Tin round gauge, small holes.
- Fig. 8. Tin half-round gauge, for rim wrappers.
- Fig. 9. Tin oblong gauge for nito and green bamban.
- Fig. 10. Holder for tin gauges.
- Fig. 11. Rim-trimming clamps.
- Fig. 12. Rim-splicing clamp.

Plate II shows the horse with 8 vises, to which these instruments are attached when in use.

The rattan scraper is made from a sixth part of the blade of a narrow kind of native saw which costs 30 centavos. The teeth of the saw are filed off until the edge becomes as smooth as the back. With a small half-round file, six semicircular cuts of graduated sizes are made on each edge. See Plate I, figure 1. The cuts on one side are lined with very fine teeth made by a small triangular file, while those on the other side are given a smooth and sharp edge. To remove the skin from rattan, the gauge is fastened in one of the vises, and the split rattan, placed in the largest-toothed cut, is held down with the notched piece of wood shown in Plate I, figure 1-A. It is drawn

through each of the successive cuts, being finished on the smooth-edged ones. The process is illustrated by the first figure in Plate II.

The steel spoke gauge shown in Plate I, figure 2, is made from the same kind of native saw as that used for the scrapers. The whole saw is cut into four equal pieces and the teeth are filed off smooth. The gauge is composed of two pairs of pieces so filed that when set together and fastened to a board, they fit each other exactly. Each part of the gauge is provided with six sizes of holes, those below being the larger, the half sides being lined with fine teeth as in the scraper. The upper part

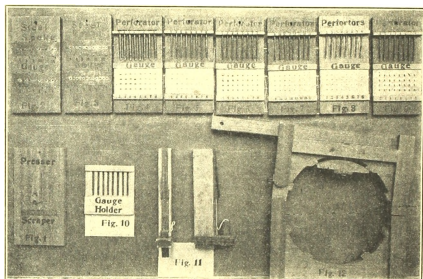


Plate I. The gauges and clamps.

of the gauge is provided with the smaller holes with smoothly sharpened edges. The toothed openings are used first, and the faces of the spokes are finished on the smooth ones. The method employed is illustrated in Plate II, figure 3.

The steel round gauge, Plate I, figure 3, is made in the same manner as the scraper, except that it is specially adapted to use in preparing large round weavers of rattan.

All tin gauges are made from empty petroleum cans. The tin is cut into 15.5 by 9.5 centimeter pieces. The edges of these are turned in and pressed flat so as to secure a uniform size of 14.5 by 8.5 centimeters. The edges are folded to make the sheet of tin stronger. Twenty sheets of this size can be made from one can. Each is pierced with thirty-two holes, of

different sizes. These are set in parallel rows, 1.5 centimeters apart. There are eight holes in a line, and four in each column. The holes are made with the perforators shown in place above their respective gauges. The perforations are graduated, the largest being at the left, and the smallest at the right. In every column the holes are exactly uniform in size. Each successive hole in a line is only 0.25 millimeter smaller than the one preceding it. The gauge is made in quadruplicate so that when the holes in the first line become dull, the others can be used.

The gauge holder, Plate I, figure 10, is necessary for holding the tin gauges to prevent the latter from bending or crooking in use. It can be made of any ordinary board.

The tin spoke gauge, Plate I, figure 4, is used in adjusting the

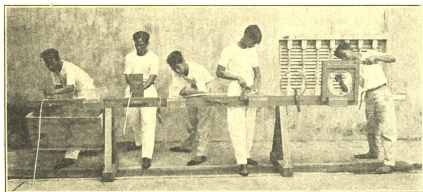


Plate II. The new basketry devices in use. First boy at left, figure 1; gauge on holder, figure 2; second boy, figure 3; third boy, figure 4; fourth boy, figure 5; rim on vise, figure 6; last boy, figure 7.

sizes of the spokes previously run through the steel spoke gauge, Plate I, figure 2. The flat-weaver gauge, Plate I, figure 5, is used for flat weavers, rim wrappers and binders of rattan, buri midribs, agsam, and yellow bamban. The weavers and rim wrappers come out of the gauge in the exact size specified and require only sandpapering and polishing. The tin round gauge, Plate I, figure 6, is used in adjusting the size of the weavers after they have been put through the steel round gauge, Plate I, figure 3. The tin round gauge with small holes, Plate I, figure 7, is for small round weavers and rim wrappers of rattan or other suitable materials. The tin half-round gauge, Plate I, figure 8, is for half-round rim wrappers, usually of rattan. The oblong tin gauge Plate I, figure 9, in which the holes are made wider at the top, is for weavers of nito and green bamban. In pulling the materials through this gauge, the left hand of the

worker remains on the back of the gauge to press down the strip which is being pulled through by the right hand. See Plate II, figure 4.

The two rim-trimming clamps, Plate I, figure 11, form one set. They are used in trimming off the ends of the outer rim foundation which is to be spliced. The ends of the rim are slipped into the clamps, which are firmly locked up. The clamps are then placed in a vise on the horse, and the work is done with a sharp chisel. The clamps are made of board, native saw blades, and some nails. Including labor, the two cost ₱1.

The rim-splicing clamp shown in Plate I, figure 12, is used in splicing the outer rim foundation in such a manner as to secure a perfect form of circle. See Plate II, figures 6 and 7. When the length of the rim has been adjusted to fit exactly in the circle of the clamp, the cut ends are glued. The spliced ends are placed over the block which the bolt holds in position inside the circle. The clamp is locked and the bolt is tightened. The clamp is then put away for a day until the glue dries and the splice becomes firm. With this device pupils are now able to make all basket rims uniform in circumference. The materials required for the clamp are 4 feet of board, 2 hinges, 1 dozen screws 2 six-inch bolts, and some nails. Including labor, the whole device costs ₱1.50.

The horse has four vises on each side. These are made of blocks of hard wood and 9-inch bolts. The triangular box receives all waste materials. The entire cost of the horse is ₱10.

The new devices make possible a saving of time amounting to 40 per cent in the preparation of materials, and from 10 to 15 per cent in the construction of baskets. The work has thus been made more attractive, the product more uniform, and the eyes of the pupils have been opened to new possibilities in the saving of labor by the use of simple mechanical aids.

No man is at his best without labor—manual labor, at that. The exercise makes his muscles strong, his mind clear, his appetite good, his body healthy and his sleep peaceful and sweet.—
J. M. Studebaker.



Nothing made by man's hand can be indifferent; it must be either beautiful and elevating or ugly and degrading.—William Morris.

CRATING BASKETS FOR SHIPMENT.

By E. FORD HICKMAN, Division Industrial Supervisor, Ilocos Sur.

With the increased production of basketry for export to the United States, it became necessary, not only to reduce the cost of packing, but also to provide light crates for economy in rail shipment, where the rate is determined by weight, rather than by volume.

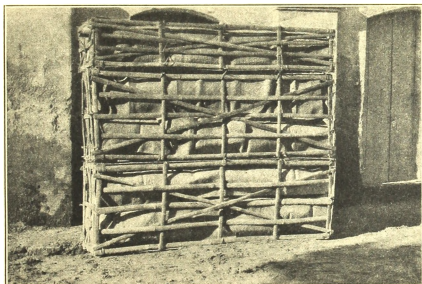


Plate I. These crates in which baskets are shipped possess the necessary qualities of being strong, light, and cheap.

The Bureau of Prisons devised bamboo containers for shipping the rattan furniture made at Bilibid. It was thought that the form used there might be modified to meet the needs of the Bureau of Education. The Bilibid method was investigated, and crates of bamboo tied together with rattan, were designed.

These were first made 65 by 65 centimeters by 2 meters and held 100 wastebaskets of design No. 1036. Four hundred baskets were packed, but it was found that the crates were too heavy to be handled safely, and the length was cut down to 1.3 meters, so that each crate would hold four stacks of 15 baskets in design No. 1036. Some of the pieces of bamboo worked loose

during shipment. To avoid this, the next crates were made by notching the ends of the strips before tying with rattan; also, the braces and the strips meeting at the corners, were nailed. These containers stood the wear and tear of shipping, but were not neat in appearance. At present all are made similar to those shown in Plate No. I and in the drawings, Plate III, which show the construction. They hold fifty waste-baskets of design No. 1936, which are packed in two stacks of twenty-five each. With baskets that telescope, two stacks of twenty-five each, are not nearly so hard on a crate as four stacks of twelve each, because four stacks placed together have a tendency to roll and burst the slats apart from the inside.

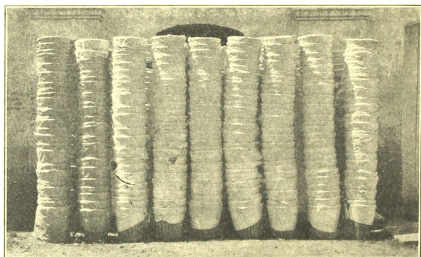
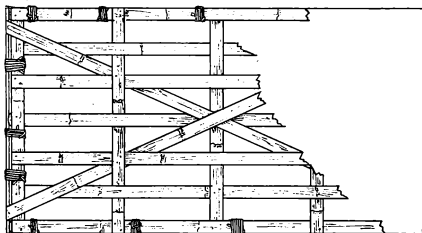


Plate II. Four hundred and fifty wastebaskets, design 1036, wrapped and ready for crating.

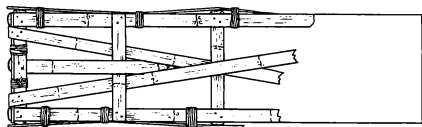
Where the strips are tied, all ends must project beyond the sides in order that the rattan will hold them firmly together. In the crates now made the bamboo strips are cut flush with the sides, the ends are nailed, and rattan is used only in tying the sides together.

These containers can be adapted to the packing of any kind of basketry. The following sizes have been worked out in the division of Ilocos Sur: For 50 wastebaskets, design No. 1036, 32 by 64 centimeters by 2 meters; for 25 bamboo-rattan stools, large design No. 766, 38 by 78 centimeters by 2 meters; for 25 bamboo-rattan stools, small design No. 766, 30 by 62 centimeters by 2.15 meters; for 60 Vigan lunch baskets, design No. 1031, 38 by 52 centimeters by 1.40 meters.

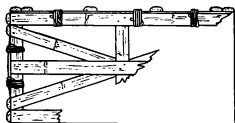
Well-seasoned bamboo, not so old as to be brittle, should be selected. It should be cut into the lengths desired, and then split into strips 4 centimeters in width. Each side of the crate



Top View



Side View



End View

Plate III. Details of crate construction.

is made separately. The drawing shows clearly how the various strips are to be interwoven to secure the maximum of strength.

Each crate of the size shown in the drawing requires 20 strips

of bamboo, 4 centimeters by 2 meters; 16 strips, 4 by 64 centimeters; 16 strips, 4 by 32 centimeters; 4 top and bottom braces, 4 centimeters by 2.12 meters; 4 side braces, 4 centimeters by 2.05 meters; 4 end braces, 4 by 72 centimeters. One-inch nails should be used for fastening.

The bamboo strips are laid flat on a floor, and are interwoven and nailed. The parts of the crates can then be stacked for future use, requiring little storage space. When it is desired to pack the baskets, the bottom, sides and ends of the crate are bound together, the articles are placed inside as in an ordinary box, and the top is tied on with rattan. The time required to make a crate of the kind shown in the drawing is about six hours. The cost is about 40 centavos for labor and 60 centavos for material.

All articles to be packed are wrapped in cheap paper, the crate is lined with buri mats, and the edges of these are tucked between the stacks of baskets.

Baskets that telescope are arranged as shown in Plate II. To protect the rims and sides, a piece of paper, 46 by 61 centimeters in size, is wrapped around the upper half of each basket and turned down on the inside over the rim. This offers sufficient protection to the inside of the rims and the sides of the baskets.

Baskets that do not telescope should be nested if possible. When this is done it is often necessary to pack two or more kinds in the same crate. This makes checking a little more difficult, but the saving in shipping space more than compensates for the additional time spent in packing.

The United States Government will spend \$36,129,000 this year for the development of agriculture and the improvement of rural life.

Sixty-seven State agricultural colleges and experiment stations are devoted to the development of agriculture. Their endowment, plant, and equipment are valued at \$160,000,000, and their income amounts to more than \$35,000,000. They have 5,500 teachers and a resident student body of over 75,000.

Under the Federal-aid road act, within the next five years \$160,000,000 will be spent by Federal and State Governments in improving rural roads.

Each year after 1922, \$8,680,000 of Federal and State Smith-Lever funds will be spent on the direct education of farmers.

GARDENING AT THE TONDO INTERMEDIATE SCHOOL.

By ROBERT E. HALL, Principal.

Land convenient and suitable for school gardening is extremely scarce in Manila. Owing to the rapid increase in enrollment, the intermediate schools have hardly sufficient space in the lots originally procured. Two sites are used for garden purposes at the Tondo Intermediate School. The one used alone until this year contains 1,002 square meters. It is a part of the grounds as surveyed in 1909. Through the kindness of a school



The Tondo Intermediate School garden during vacation.

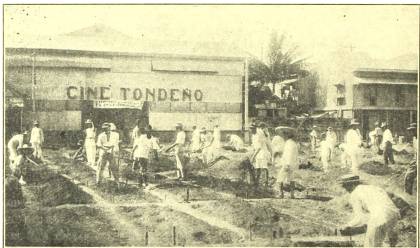
patron, a vacant lot was obtained this year, adding 589 square meters to the garden space. This makes a total of 1,591 square meters now being cultivated by 350 sixth-grade pupils.

The original set of tools was furnished by the Insular Government. This number has been increased by one half at the expense of pupils, through an organization within the school known as The Little Farmers' Society. The list of tools on hand is as follows: 1 crowbar, 20 spading forks, 15 light garden hoes, 20 heavy or plantation hoes, 5 mattocks, 1 pick, 20 sprinkling pots, 20 rakes, 10 round-point shovels, 15 spades, 6 garden trowels, 2 wheelbarrows and 6 galvanized-iron buckets.

Tools are stored in a small room in the shop building. They

are cleaned and put away in regular order after each recitation. A rotating system of issue to, and deposit by pupils is employed. Receipts are filed where the tools are issued. Considering the number of pupils, the tools on hand might appear insufficient, but by arranging for the starting of classes in plot making at regular intervals, they are made to serve all needs.

Garden No. 1 was planted to cowpeas last February. The growing plants received the best of attention until the close of school, at which time they were between half a meter and almost a meter in height. This growth of legumes served as an excellent covering during the dry season. At the opening of school the crop was turned under, and the ground was planted to corn



The second week of school at Tondo. No time wasted here.

and beans. Their rapid growth and large yield proved the value of the vacation crop of legumes. Each pupil took five ears of corn at harvest time in September, and the proceeds from the sale of the remainder, amounting to ₱25, were used to purchase additional tools.

During the tasseling period of the corn, when no further cultivation was required in garden No. 1, all classes worked on garden No. 2, which was then no more than a heap of rubbish.

It is the custom to give pupils all vegetables they raise. Some pupils sell a part or all of their crop in the markets at good prices. On a standard plot one pupil produced seventeen heads of cabbage which he sold by weight at the regular market price, realizing ₱8.50. Jose Novero of this school received fifth prize in the corn-growing contest for 1915. Celery, lettuce, tomatoes,

radishes, mustard, pechay, turnips, beets, pepper, onions, cucumbers, and endive were successfully grown during the past year.

The good results in gardening at this school are largely due to the efforts of the teachers to make a success of the cultivation of every plot, leaving out no detail, and constantly advising pupils in their work. Their willingness to show pupils how to use a spade or wheelbarrow, and in digging up and preparing a plot to be cultivated by themselves, leads pupils to take a correct attitude toward their work. Lesson plans for classroom instruction based on the text, and a lesson-plan book which includes a general scheme of planting, plotting, fertilizing and drainage for the year, have also been of great help.



The garden, two months after school began.

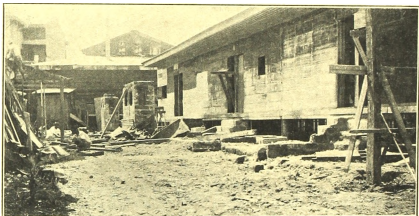
Owing to conditions in Manila, very little gardening is done by pupils below the sixth grade. This makes it possible to develop a spirit of competition in the work. It is common to see a hundred boys in the gardens at other than school hours, and almost every plot receives attention between Friday and Monday. The gardens afford a means of exercise and recreation. The playground is seldom visited by garden pupils except when their classes are scheduled for games.

A system of marking the honor plots is an incentive to the best effort. The garden is inspected by the principal of the school on each Monday morning for the purpose of re-awarding prizes. These consist of five blue silk ribbons of different lengths, fastened to stakes one meter long. The longest ribbon

is placed on the best plot, and the shortest on the plot getting fifth place. To add humor to this scheme and to keep all pupils alert, red cloths are used to mark the two worst plots.

Form 152, Pupils' Industrial Record Card, gives a complete record of the garden work of each pupil, including dates of planting and harvesting. The ratings and data found on this card are taken as a basis for determining the inspection grades at the end of the school year. Pupils having home gardens keep daily record books. These are examined monthly by teachers at the time of inspection of home gardens.

An organization known as the Tondo Intermediate School Agricultural Club was formed at the beginning of the school year. The purpose is expressed in the first article of its con-



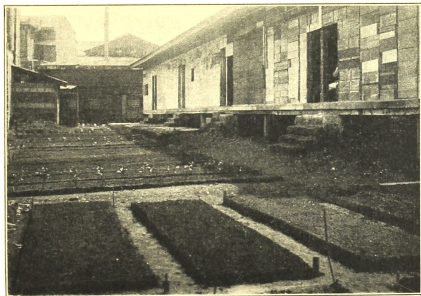
The site of garden No. 2 in June.

stitution as follows: "We, the undersigned, organize this club to make the school agricultural work conform more closely to home conditions; to train ourselves in coöperative endeavor, to seek to bring the home work of the young people not in the public schools more directly under school influence; and to emphasize actual production in order to exhibit a good quality of vegetables on garden day."

To become a member of this society a pupil is required to report to the president the extent and location of the area he expects to cultivate. This club has seventy-five members, each of whom maintains a home garden within the city. This is worthy of notice because it indicates the development of a knowledge of agriculture and its possibilities among pupils and parents, and because it makes for the improvement of premises. As a rule, members of this club are given higher grades than those who do

only school garden work. Marks for home gardening are recorded in the teachers' grade books and in the daily record books of the pupils.

In order to impress the community with the importance of the work, one day in each school year is set aside for the inspection of the school garden by parents. Letters of invitation signed by the principal, are mailed to parents, and the pupils are re-



Garden No. 2 on November 2.

quested to invite friends. The opportunity to make this visit to the school is appreciated by all, and many avail themselves of it.

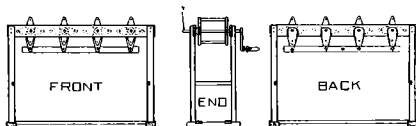
Garden day exhibits have been made an annual affair in this division. All schools having gardens exhibit their school and home products for prizes. The parents visit these exhibits and take much interest in the keen competition of the different schools. The garden day programs in Manila are held at the Tondo Intermediate School on the last Saturday of January.

He who does not know and does not know that he does not know is a fool, avoid him; he who knows and does not know that he knows is asleep, waken him; he who knows and knows that he knows is wise, seek him.—Arabian Proverb.

A DEVICE FOR TWISTING COIR.

By INOCENCIO SISON, Principal, Asingan, Pangasinan.

When the making of coir mats was first introduced into the schools of Asingan, the twisting of coir was done entirely by hand without the aid of any sort of machine. This slow and tedious preparation of materials was discouraging, and so little was accomplished that the work came near being discontinued. But it was observed that a kind of windlass machine somewhat like that used in the coir-mat classes at the 1916 Manila Teachers' Assembly, was in use by some near-by rope makers, and it was thought that it might be applied to the twisting of coir. It was, therefore introduced into the school in January, 1914, and was used until January, 1915.



A windlass machine for twisting coir.

After much study of this machine, Mr. Juan Rueca, instructor in coir-mat making, devised an improved model on which 50 per cent more work could be turned out. The idea next occurred that four single-windlass machines might be united in such a way that only one person would be required for the turning. The device was constructed as illustrated in the accompanying diagram, and it proved successful. It takes five fairly good shop workers about 12 hours to make one like it, and the materials cost only about ₱1.

In using this four-windlass machine, one of the five pupils required to operate it must do the turning, while the others work on four different strands. The method of twisting coir is exactly the same as that used at the 1916 Manila Teachers' Assembly; that is, when the four pupils begin work they tie coir of the desired thickness around the ends of the axles, and while the windlasses are being turned, they keep adding the

same thickness of coir until the desired length of strands is completed. Just as soon as the four strands have been prepared, they can be twisted into two two-strand ropes with one additional single-windlass machine for each rope. Two of the four pupils should turn the single machines while the other two manage the proper twisting of the strands into ropes.

With the four-windlass machine, five fairly good workers can prepare 92 meters of twisted coir strands in fifteen minutes. With the use of the two single machines in addition, two ropes each about 22.5 meters in length, can be made from the twisted coir in twenty-five minutes. Less coir is required in making mats on this new device, and by its use, the production of mats in this district has been increased 125 per cent, without an increase in the number of workers.

AN IDEAL BARRIO SCHOOL.

The ideal one-teacher barrio school is housed in a building of standard plan No. 1 and has an average daily attendance of about fifty pupils in Grades I and II, distributed somewhat like this: Grade I, 30 pupils, 18 male and 12 female; Grade II, 20 pupils, 12 male and 8 female.

The building is conveniently located in the barrio on a well-drained site of about 8,000 square meters, 2,500 square meters being devoted to gardening, 4,500 to the playground, and 1,000 to lawns and ornamental plants.

Four lines of industrial work are taught. The girls all take plain sewing, 8 boys are assigned to basketry, 10 to gardening and the remaining 12 to the care of the premises and school-ground improvement.

The industrial equipment for plain sewing consists of 10 scissors, 5 two-meter tapes, needles, thimbles; for gardening and school-ground improvement, 3 spading forks, 3 rakes, 3 native hoes, 3 garden hoes, 3 sprinkling cans, 6 files, 6 bolos, 1 iron box; for basketry, 10 knives, 1 oil stone, 8 rulers. In addition to these tools there are planes and hammers, and 2 or 3 good saws for the use of the teacher and larger pupils who keep the building, fence and furniture in repair. The furniture of the school consists of at least 30 double desks, 1 teacher's table, a chair, a basin, a drinking jar, and a case for tools and industrial materials. The school is kept supplied with the following materials: sinamay and white muslin for the girls, seeds for the gardening class, prepared material for the basketry class. All equipment is furnished by the municipality. (T. V.)

BALANGOT AND ITS USES.

By PAUL R. PIERCE, Supervising Teacher, Guagua, Pampanga.

Balangot was first employed as an industrial material in the schools of Pampanga in 1914. Up to that time it had been used locally only as string for the tying of packages. In the schools it was first used for making sandals. In 1915 mat making was introduced and it has been continued along with sandal making.

Balangot is a very common sedge which grows wild in the marshes of Pampanga. It is a tall, slender plant having but one stem, which is triangular in shape like the balacbac common to Pangasinan and La Union. Its leaves, which are short and narrow and three or four in number, grow at the very top of the stem. The blossoms turn brown when the plant is about five months old, and at this age it is ready to be gathered for use.

When cut and before being split, the balangot is placed in the sun, on roofs or over lines, for three or four successive days. It may be bleached to as light a shade as buri, but if not placed under cover each night, it turns brown.

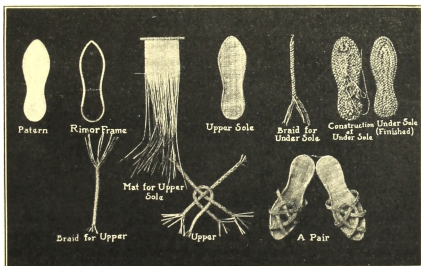
In the fabrication of sandals, frames are made of rattan strips 4 millimeters in diameter, tapered for a distance of 5 centimeters at each end. The joints are lapped and neatly wrapped with strong thread. The length of the strips used will vary with the sizes of sandals desired. Five and six are the most common numbers for local sale. Patterns of frames should be deeply cut into blocks of wood to facilitate the making of frames in uniform sizes.

The first part of a sandal to be constructed is the under sole which is made of three-strand braid, each strand containing two, three, or four unsplit stems of balangot. The average pair of sandals requires about 3 meters of this braid. Next, the upper sole is made from a very closely woven mat of split balangot. Before the mat is fastened to the frame it should be pressed on the wooden pattern or mold, so that its shape will conform to that of the frame. Strips of the same material as that from which the upper is made should be placed between the two soles to act as a kind of cushion.

The upper part of the sandal is made of closely woven braid of from seven to nine strands, each strand consisting of a single split of balangot. The fastening of the upper to the sole should be done over a form in order to shape it to the foot.

Care must be taken that the weaving is close; that enough material overlaps to make the joints of the strips strong; that the ends of braids or strips are cut off or hidden; that the frame is not allowed to get out of shape as the weaving progresses; and that the upper sole is securely fastened to the under sole.

The most skillful pupils can complete a pair of slippers in twelve hours, and the average output of a pupil during the year is fifteen pairs. The cost of making a pair is about 8 centavos where balangot is secured free. Up to the present time the selling price has been 30 centavos. The local demand has increased since last year.



The sampler will be found of much assistance in a balangot sandal class.

Mat making was begun when a special order for various sizes was placed with the schools of this province by the General Office. In the beginning the work was difficult, but it was soon made easier by the use of such devices as board frames and awls, and by a careful apportionment of the work among the pupils.

After some experimentation the largest boys in the class were given sewing; the smaller ones, braiding; the smallest, the gathering of materials. Among the sewers, each boy was given a section of the inside of the mat. The 1.20 by 2.10 meter mat was made in 6 sections, each 30 centimeters wide and 90 centimeters long. These were joined together, so as to make the center of the mat 90 centimeters wide and 1.8 meters long. After that the 15 centimeters border was sewed on, the braid always being run

from right to left around the center. To keep the edges of each section straight, the braid was placed on a specially devised wooden frame while being sewed.

It was soon found that the making of mats larger than 1.20 by 2.10 meters was not practical because of the amount of room required for their construction, and also because of the difficulty in shipping them. After the first order from the General Office was finished, only the 1.20 by 2.10 meter mat and another designed for a doormat, were made. This new mat is the only one now produced in the district. It is 45 centimeters by 1.05 meters in size. The center is 30 by 90 centimeters and a 7.5 centimeter border is attached.

The first price set on mats was 6 centavos for 90 square centimeters but this was little more than enough to pay for the cord used. They are now being sold at 10 centavos for the same unit.

Mats are made along with sandals in the second grades of the central schools. They are easier to fabricate since they do not need special care in so many details, and the demand is about the same—only fair; but the sandals pay better since less cord is required in their construction.

Balangot is constantly being applied to novel uses. A cushion for the seats of automobiles and carromatas has proved very popular. Small mats for lamps and books are the latest articles to be made.

Although the work in balangot is new in the schools, its adaptability to industrial courses has already been proved. It seems reasonable to expect that the schools will be instrumental in introducing the balangot industry in those communities where the sedge abounds, and where it has not been previously utilized.

PERMANENT GARDEN PLANS FOR SCHOOLS.

A great many garden failures are due to the ignorance of teachers new to the locality in which they work, as to the proper plating season. This information is often secured from pupils and is seldom accurate. If each successive teacher of gardening were required to leave a complete record of the weather conditions prevailing during the school year, also a plan for a continuous garden based upon his own experience in the locality, this difficulty might be avoided. Such information is now being compiled for the Isabela Farm School, and it will be kept as a permanent record. (A. G. B.)

THE DAKLAN POTTERY SCHOOL.

By C. H. CROWE, Supervising Teacher, Cervantes, Mountain Province.

Like the people in nearly all parts of the Philippines, the Igorots make simple water jars and cooking utensils from an easily worked, fusible clay; but for the native drinks of tapoi and basi, imported jars are preferred. Many of these are heir-looms, and some of the older ones are valued at as much as ₱1,000 each, while the prices of others are fixed in carabaos. Among the Apayaos, a fine of a jar is common, and their possession of greatest value is a jar.

After all a jar is but a jar, and those of types which are treasured by the Igorots, can be purchased in Japan or China for from ₱2 to ₱8. The paying of exorbitant prices for such common articles is to be discouraged. In April, 1915, an order was given for an inspection of the clays of Mountain Province, the purpose in view being to start the manufacture of jars and to sell them at reasonable prices.

Daklan, Benget, was selected as a desirable location for pottery making. At Daklan there is a deposit of excellent clay which seems to have been formed by the action of hot water and sulphur gases on volcanic rock. There is also a deposit of silica for the glaze, and not far distant, feldspar which is used as a flux in both glazes and bodies. There are many different colored clays, and curiously enough some of the darker ones burn to a light color. There is a small stream that insures plenty of water for refining purposes, and the mountain side abounds with wood for fuel.

A site was selected on a slight rise, not so high as to prevent water from being conducted to it by a ditch, and where there was some protection from typhoons. The ex-presidente of Bokod, an Igorot, took the contract to make a 35 by 70 foot building, and also to hew 200 boards. Within a month the building was finished.

Two Tagalog teachers who had studied in the ceramics department of the Philippine School of Arts and Trades were engaged. Workmen were hired, and 3,000 bricks were made and piled in the factory to dry. A contract was given to furnish wood for firing the kiln.

A glaze mill could not be found, so one had to be made of

stone. Much difficulty was encountered in the construction, but when completed the mill served its purpose.

In July and August there were six weeks of rain, and a spring opened under the middle of the pile of drying bricks. There was a stream of water as large as a man's arm, and practically all of the bricks were reduced to a pile of mud. The loss of labor did not amount to so much, as the bricks could be made in two or three days, but the time lost was of more consequence. In the rainy season it takes from one to three months to dry clay articles before they can be fired. To dispose of the water, covered ditches were dug lengthwise and crosswise in the factory and deep trenches were made around the outside.

There were barely enough bricks left for the arch of the kiln. It was then decided to use stone for the walls, and to construct only a temporary kiln. An excavation was made in the bank near the factory in order to secure a good support for the walls. A hole in the ground served as a smoke flue. By this time it was December, and no provision had been made to protect the kiln from rain. A storm came, and the arch tumbled in. It was rebuilt with considerable difficulty, as many bricks had been broken and there were no more. A roof was also made. A second storm carried away the roof, and the arch had to be repaired once more. This time the kiln had to be built smaller because the number of whole bricks had greatly decreased. Next, a herd of cattle blundered along one night and partially destroyed the kiln again. Eventually it was finished and served the purpose fairly well.

During all of this time, clay had been refined, and jars, bowls, and flower pots made. By the last of October more than 1,000 articles were dry and ready for firing. It was estimated that these would sell for more than ₱1,000, but on the fourth of October there came an unusually severe typhoon, the roof of the factory was carried away and not one article was left whole.

Work was continued, or rather begun again, and by December 23 a presentable exhibit was prepared for the Northern Luzon Fair at Baguio. About ₱100 worth of pottery was sold.

The clay is taken from the bank of the creek about 100 meters from the factory. It is thrown into a blunger or washing tank. Water runs in continuously, and the clay is thoroughly stirred and mixed. The finest in suspension runs out through a bamboo tube and falls through a screen into a settling tank. When the tank is full, the clay is left to settle and the water is drawn off. In the dry season the clay can be put in the sun to evaporate some of the water, but in the rainy season this could not be done.

So the clay was heated in a sort of caldron until it reached the proper consistency. Had the pottery work been started in the dry season, sufficient clay could have been prepared to last during the rainy months.

The salao or jar is made on a potter's wheel. Each half is made separately and is put aside to become somewhat hard. The halves are then set together, and the outside is trimmed or turned to the desired shape. The bowls, flower pots, and small pieces generally, are formed in plaster of Paris molds.

All articles are fired twice, once to form a hard body, and the second time to fuse on the glaze. At the first firing they are simply piled in the kiln but at the second, they are carefully separated to keep them from sticking together.

The glaze is made of dry white lead and silica, with a very small portion of clay added to supply alumina and make the glaze adhere to the articles before firing. The glaze is ground in the stone mill and is then passed through fine gauze.

In January, 1916, the pottery factory was turned over to the Daklan Primary School and no more workmen were hired. Soon after, one of the teachers became sick and went home. Under the supervision of the remaining teacher, about 4,000 bricks were shaped and dried, and over ₱50 worth of manufactured articles sold before the close of school. In July of 1916, another teacher was secured. He had studied ceramics in Japan and taught in Mountain Province last year. With the bricks made by the former teacher, he had the pupils construct a kiln. A considerable number of articles are now ready for firing.

Several rich Igorots are watching the work with great interest. They contemplate forming a company for the manufacture of pottery.

In this country sunflowers do not ordinarily grow so large as in America, but one which is over 20 centimeters in diameter, is reported from the central school at Tagbilaran, Bohol.

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Not so much time is needed in making the new model coir mat as was required for the closely woven and heavy mats of 1915-16; but this does not mean that the new ones should be carelessly woven. A little more pains taken in the weaving will avoid many rejections.

o o o

Some are too eager for new endeavors. More attention should be given to doing better the things that are already understood. (G. S. P.)

A ONE-TEACHER BARRIO SCHOOL.

By J. W. LIGHT, Supervising Teacher, Baliuag, Bulacn.

The difficulties under which the ordinary one-teacher barrio school is conducted are many. To produce results that compare with those of the central schools it is necessary that the teacher be more energetic than the average central school teacher, and that he have constant assistance from the supervising teacher.

A typical barrio school is located at Santa Barbara, Baliuag in a temporary building constructed on a private site that is very inadequate. The teacher is a man thirty-nine years of age, who is of seventh-grade attainment, and who has been teaching for about thirteen years. He took charge at Santa Barbara in June, 1915, when conditions were not favorable. During the previous year there had been a lack of interest on the part of patrons. It was almost impossible to assemble the people for a public meeting, and the teacher seemed to have no influence for betterment. The results secured during the last school year show most forcefully what a teacher who really tries to succeed, can accomplish even under the most adverse circumstances.

The 65 pupils at this school are divided into three sections, Grades 1B, 1A and II, and these are grouped into five industrial classes as follows: Thirteen boys in elementary hand weaving, 8B-I; 11 boys in common native basketry, 11A; 14 boys in primary gardening, 26A; 10 girls in elementary plain sewing, 7A; 17 girls in hat weaving, 10B.

Elementary plain sewing, elementary hand weaving, hat weaving, and common native basketry are given in the morning from 10.25 to 11.25; primary gardening is given in the afternoon from 3.10 to 4.10. The materials for the work in elementary plain sewing and hat weaving are bought in the Baliuag market, 2.5 kilometers distant, while the materials for elementary hand weaving and common native basketry are to be had locally. The teacher has in most cases secured the aid of the parents in preparing materials for the work in common basketry because it is often impossible for the pupils themselves to do it. Lapat for elementary hand weaving is ready for use when bought.

The garden is about 25 meters from the school building and just across the street from an artesian well. Each pupil cultivates 20 square meters of ground, 4 in the school garden and

16 at home. The expense of fencing is borne by the pupils, who also furnish all industrial materials.

The following data will give an idea as to the progress that was made in industrial work during July and August and up to the middle of September of this school year:

Pupils in elementary hand weaving on an average had completed six exercises: in elementary plain sewing, exercises A and B were finished by September 15; in hat weaving, every pupil had a buntal hat a little more than half completed; in common native basketry, each boy had finished a basket; in primary gardening, pupils had the garden fenced and plots prepared for planting.

The records of last year show the following:

Pupils in elementary hand weaving finished the required work long before the end of the year; most of them by February 15, and the remaining few by March 15. All but 3 of the 23 pupils in elementary plain sewing completed the exercises by December 12. The last three finished by February 15. The hat-weaving class of 10 girls completed 10 buntal and seven bamboo hats with a total value of ₱82.10; buntal ₱78.50; bamboo ₱3.60. Only three boys were large enough to be assigned to common native basketry. They completed 21 baskets with a total value of ₱4.15, or ₱1.38 a pupil, 38 per cent more than the minimum requirement for Grade II.

The 12 pupils assigned to gardening produced two crops of vegetables such as pechay and tomatoes. One crop of each of the following was raised: corn, camotes and eggplants. The total value at local prices was ₱14.09, or more than ₱1 per pupil.

The workmanship in all industrial courses, with the possible exception of plain sewing, was equal—and in the case of hat making a little superior—to that at the central school. In the academic course, 83 per cent of the pupils were promoted in March.

A little different attitude toward barrio schools is needed if the best results are to be secured. It should be remembered that the barrio schools find those children who manifest an aptitude for further learning, make them realize that they possess useful ability, and awaken in them an ambition to increase their attainments. Efficient teachers, and adequate sites, buildings and equipment should be provided; and central schools should not be built up at the expense of the barrio schools.

A BARRIO SCHOOL WELL EQUIPPED FOR INDUSTRIAL WORK.

By SILVINO QUINTANO, Supervising Teacher, Ligao, Albay.

A barrio school is properly equipped for industrial work when it has an adequate site, a standard building, sufficient furniture of proper dimensions, the necessary tools for performing the work assigned, a plentiful supply of industrial materials readily available, a trained, wide-awake, ingenious teacher, and a well-balanced arrangement of classes.

The community takes a more favorable attitude toward a barrio school as it becomes better housed and better equipped. Tuburan in the municipality of Ligao, Albay, furnishes a good example. The school in this barrio was opened about ten years ago in a bamboo-nipa house which scarcely afforded room for thirty pupils. For a number of years it existed in this condition and often was on the verge of being closed; but the locality needed a school and a better one than was being maintained. Accordingly, in June 1915, a semipermanent building of standard plan No. 1 was opened in the barrio. The enrollment and attendance were doubled during the first month, and never since the new building was occupied has there been any trouble over the matter of attendance.

Pupils attend not only from Tuburan but from two other nearby barrios. The people are enthusiastic in their support of the school, often donating labor and materials for such work as fencing, when the task appears to be too big for the pupils. The school is located at the juncture of the interprovincial and the Ligao-Tobaco roads. It is about 2 kilometers from Ligao, and the three barrios of Tuburan, Calzada and Batang are all very near. While the school was in the old rented building, the equipment was wholly inadequate, even for the limited enrollment; but once it was properly housed on a suitable site, steps were taken to secure the necessary equipment. Everything needed with the exception of some knives, awls, and bolos, which each pupil furnished for himself, was paid for from municipal funds.

As there is but one teacher in the school, only three industrial courses, are given. These are 13C, lupis basketry; 26A, gardening; and 26F, school-ground improvement. Twenty pupils are making lupis baskets. Although this course was introduced into

the school only at the opening of the present school year, more than 50 articles were finished during the first quarter. The equipment is wholly the property of the pupils. Each boy is required to have a knife and an awl. One or two gauges for shaping the rattan are securely fastened to posts at a proper height for the use of the workers. Twelve pupils are enrolled in the gardening class and 19 in school-ground improvement. The equipment is practically the same for both groups and consists of shovels, spades, rakes and hoes. In addition to these, the pupils bring their own bolos. The lawn mower and hedge shears of the central school are used every week in caring for the premises. The garden tools are stored in the school building when not in use, and they are issued to workers on much the same plan as that used in trade schools and shops. The garden was first planted with local seeds. When these were harvested, the plants from the general allotment of seeds were ready for transplanting, so that by the end of October the school garden was in excellent condition.

Each pupil furnishes his own lupis for the work in basketry, this being an easy matter as the school is located in the heart of a rich abacá-growing district. Rattan abounds in the near-by mountains, and a Saturday's excursion of a half dozen of the larger boys provides the school with a month's supply of rattan. A case is provided for the materials, and in it each pupil keeps a large supply of lupis to which his name is attached.

While the success of this or any other school depends largely upon the material and equipment available, there is one factor that dominates all others in determining the success or failure of a school in any work. This factor is the personality of the teacher in charge. There are teachers, whose schools would fall short even though they were given the best possible equipment; but the teacher at Tuburan does not stop at difficulties. He has been in charge of the school for two years and has secured results. His industrial work is good in both quantity and quality, and without apparent effort he is able to obtain the coöperation of all interested parties.

I hold, if the Almighty had ever made a set of men that should do all the eating and none of the work, He would have made them with mouths only and no hands; and if He had made another class, that He intended should do all the work and none of the eating, He would have made them without mouths and with all hands.—Abraham Lincoln.

FINANCING SCHOOL INDUSTRIAL ACTIVITIES.

By FRANTZ M. GOBALL, Principal, Intermediate School, Iloilo.

One of the chief problems for the principal or the supervising teacher is the financing of school activities. Among the heaviest expenses are those in connection with industrial work. The most successful plan for financing industrial work which has been tried in Iloilo, is to charge each pupil the sum of ₱1 upon entering school, and with this money to organize a sales agency for the benefit of the pupils.

At the beginning of the year an estimate is made of all industrial supplies that will be needed, and these are purchased at one time at wholesale. The school not only receives a discount through buying in large quantities, but it also saves postage and time. The supplies are kept in the storeroom and are issued to teachers as needed. In basketry classes, the school acts as agent for each pupil in the purchase of all his own materials. Thus by buying in large quantities and insisting upon the best quality, the school is able to sell nito, which costs 1 centavo per piece in the market, at three pieces for a centavo; and this leaves a slight profit. Rattan is sold to the pupil at 30 per cent less than the market price, and yet the school makes 20 per cent.

In sewing classes, cloth and buttons are sold at cost. Here the expense per pupil is much greater than in other classes, and the sales agency does not try to make a profit. The following is an estimate of the expenses of a girl taking the housekeeping and household arts course; For cloth and buttons alone, Grade V, ₱4.75; Grade VI, ₱7.25; Grade VII, ₱4.95; for cooking supplies, ₱2 per girl for all grades. It is the usual custom to have the pupil furnish the cloth, thimble and scissors, while the school furnishes the sewing machine, pattern paper, thread, needles, pins and heavy shears.

During the school year 1915-16, the Iloilo Intermediate School purchased from New York a two years' supply of needles, and from Manila merchants, a large supply of embroidery cotton. Due to the rise in prices on both of these articles, the school saved ₱35 on the needles, and nearly ₱20 on the embroidery cotton.

Municipal funds are never used for the purchase of industrial

supplies in this province, and the manufactured articles belong to the sales agency and to the pupil. The pupil may keep his work if he pays to the school the amount due, or he may have it sent to the provincial capital or to Manila for sale. All unsold and unredeemed articles become the property of the sales agency upon August first of the next school year, and they are sold at auction. The proceeds of the sale go to the school.

Owing to the lack of supplies for sale by the Government, the school sales department caused a large number of pads of paper to be made and sold, and also bought and sold pocket dictionaries. The pupils thus bought cheaper than at retail, and the sales agency earned 5 per cent on the money invested.

During the last year with slight assistance from the municipality, the sales agency erected one large and two small tanks to provide drinking water for the pupils. It is estimated that in two years, the sale of water during vacation periods will pay for the entire expense.

One of the easiest methods of raising money for a school is the cinematograph benefit. The total expenses for one night are ₱60, and for two nights ₱100. The profits depend on the films shown and the extras in the shape of songs or drills, but they are sometimes as much as ₱125 for one night or ₱200 for two nights. Even better money makers are the subscription dance and the box supper; but both of these are impracticable for primary and for many intermediate schools.

To humiliate Epaminondas of Thebes, enemies once secured his election as public scavenger. In accepting the place he declared: "If the office does not reflect honor upon me, I shall reflect honor upon the office." Under him, Thebes experienced a "clean-up" campaign such as it never knew before. His victories over the Spartans were of less benefit to humanity than was his victory over himself when by example he proclaimed the dignity of the humblest service.

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READ THE TECHNICAL BULLETINS.

One division refused further orders for filet crochet on the ground that crochet thread was too high priced, stating that a quantity which formerly could be bought for 23 centavos, now cost 60 centavos. Had Technical Bulletin No. 23, 1916, been read, it would have been learned that the same thread could now be purchased for less than the original 23 centavos.

A SLAT HOUSE.

By ALBERT D. WISE, Principal, San Carlos Farm School.

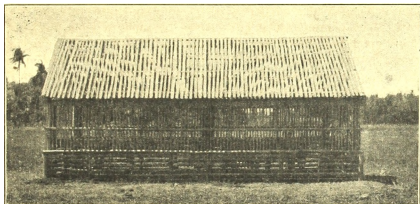
The Pangasinan slat house was devised to meet the needs of farm schools where garden work is done on quite an extensive scale. The common seed house used by most schools does not admit enough light during the middle of the day to produce a strong, hardy, dark green plant. Two years ago the San Carlos Farm School put up a seed house which was designed to admit sunlight to the plants during the middle of the day, while not allowing them to be scorched by the sun or killed by hard rains.

The house is made of coconut logs and bamboo. If it is desired to build it more substantially, hardwood posts may be used. The building is made to face north and south, as this allows the sun to enter during the morning and afternoon. It is not thought desirable to make the building more than nine feet wide, but it may be of any length. A width of nine feet gives space enough for three seed trays, each two feet wide, running lengthwise of the building; two paths each one foot wide; and for 6-inch spaces between the outer edges of the trays and the walls. In small schools, a width of 7 feet will be room enough for two seed trays running the length of the building.

The frame consists of four posts 7 feet long, set 2 feet in the ground. Before being placed, the tops of the posts are deeply grooved so that the roof plate can be sunk into them. The plate can be made of split logs or pieces of lumber. The under side bears notches one and one fourth inches long and three fourths of an inch deep at intervals of one fourth of an inch. These are for the insertion of the top ends of the side slats. Two feet above the ground, heavy, straight pieces of bamboo are fastened from post to post. They are sunk flush with the outer edges of the posts, and notches to correspond with those in the roof plate, are cut in the uppermost portions. These notches are for the insertion of the lower end of the side slats.

The side slats and the spaces between them are all one and one fourth inches wide. A strip of bamboo is fastened along the side of the house to prevent the slats from being sprung from their places. The doorway should be left at one of the ends of the building.

The roof has a thirty degree pitch. It is made of slats split from small bamboo in order to get the greatest possible concave surface. Two and one half inches is the best width. The concave side is turned up to carry off water. Slats are cleaned of joint pith and placed on the roof one and one fourth inches apart.



An excellent seed house at the farm school, San Carlos, Pangasinan.

The spacing of the roof slats together with the size of bamboo used, determine the amount of sunshine and rain that are allowed to enter. Such a roof allows the sun to shine on the plants at intervals during the whole day, yet it keeps out the heavy rains.

This seed house can be built for six or seven pesos, and it will need few repairs for three years or more.

The chief thing that the teacher should watch in herself, in directing domestic-science training, is the balancing of her interest equally between the various phases of the work. Direct betterment should not be neglected. It is best, in all school activities, to stick to the program, and to obviate extra-hour requirements. Application to the task in hand, and ability to lay it aside definitely when the time for it is ended, is fundamental training: its acquirement secures a balanced character. (D. Mc K. R.)

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The Bureau of Education is planning to issue an outline on handweaving for the use of teachers at the Vacation Assembly and at normal institutes. This will be similar to the manual on embroidery, and it will treat of all industrial courses from elementary hand weaving to slipper making.

EGGS AS FOOD, AND THE BEST WAY OF PREPARING THEM.

By Mrs. HANNAH W. THIBBS, Teacher, Central Luzon Agricultural School.

Eggs as well as milk form a perfect food for the young, inasmuch as they are designed to furnish nourishment for a time in the right proportion for growth and development. But for older children and adults, the elements are not in the proportions necessary for complete nourishment of the body. Cereals, fruits, and vegetables must be eaten in order to supply the starches, acids, and minerals lacking in eggs.

In nutritive value eggs equal beef, and in composition resemble such foods as meat, milk, and cheese. Eggs consist chiefly of water, protein, and fat, the protein being necessary in the building and repairing of body tissues and the fat for supplying energy. The white of eggs contains albumen, a proteid, in its purest form. There is also much protein in the yolk but because it is combined with another substance the yolk is more easily assimilated and more nutritious than the white. The mineral matter in the egg is of considerable food value in the building of bony tissues. The breed of fowls producing the eggs, and the color of the shell have no bearing on the food value of the egg providing they are equal in size and freshness and the fowls have been fed the same food.

Generally speaking, eggs which are perfectly fresh have the finest flavor though the flavor is influenced by the food eaten by the hens. After the first twenty-four hours the eggs steadily deteriorate. If exposed to the atmosphere there is evaporation of water and the outer air passes in through the porous shell carrying with it micro-organisms which hasten the process of decomposition. Eggs should be stored in a cool clean place and not exposed to strong odors, which are quickly absorbed and injure the flavor. Eggs left in dirty nests, or in nests containing one or more partially decayed eggs, will have an unpleasant flavor and will decompose more rapidly than if stored under proper conditions.

Due to the hot climate and the limited supply of eggs there is little incentive to store eggs over long periods in the Philippines. However, the care and storage of eggs for short periods is of considerable importance. The principle of keeping eggs fresh for any length of time is based on the exclusion of air.

Clean, fresh eggs packed small end down in sawdust, in salt, or in limewater and stored in a cool place will keep fresh and be fit for human consumption over a longer period than if put away carelessly. Infertile eggs will keep fresh much longer than fertile ones. The production of infertile eggs in the Philippines has received little or no attention.

There are several common tests, more or less reliable, for fresh eggs. When placed in cold water a fresh egg will sink with neither end pointing up. A fresh egg when shaken makes no sound. When held to the light the fresh egg appears clear. The shell of a fresh egg is rough and is usually thick.

Eggs are served in many ways, alone taking the place of meats, or combined with other food materials to give lightness, flavor, or consistency. Well-beaten white of egg incloses air in small bubbles which if distributed carefully throughout a mixture without breaking the air cells will give a lightness which is retained by careful cooking. Various leavening powders also impart lightness but do not give the flavor or supply the nutrients furnished by eggs. Fresh eggs can be beaten or whipped more quickly than old ones and will retain the air longer. This may explain why cakes or puddings will differ in lightness from time to time.

The simple ways of cooking eggs are the ones commonly used, and are without a doubt the best ways. They are cooked by baking, by steaming in or out of the shell, by being placed in hot water whole, or by being broken into hot water, milk, or fat. When broken into hot fat they are sometimes stirred or beaten. Combined with other materials they are baked, boiled, steamed, or fried. In cooking and serving eggs the cleanliness of the shell should not be overlooked. Eggs should always be washed before using. They may hold on their surface impurities which may enter the food either directly or from the hands. As with other foods, no matter how eggs are served they should be so prepared as to be both attractive and easily assimilated.

Heat coagulates a protein. The white of the egg begins to coagulate at the low temperature of 134° F. Additional heat up to about 160° F., causes it to become hard and more or less indigestible. If an egg is immersed and kept in boiling water anywhere from 2 to 5 minutes the egg becomes what is termed very soft boiled, soft boiled, or hard boiled. In each case, however, the white will be more or less hard and elastic and cannot be so easily digested as when cooked at lower temperature. It has been found by experiment that the yolk coagulates firmly at a lower temperature than the white. Such little matters as

amount of water used, the number, size, and freshness of the eggs, the kinds of vessels used and the temperature of the eggs before cooking are all important. Those who have given attention to the cooking of eggs recommend soft cooked, medium cooked, and hard cooked eggs all to be cooked at a temperature below 212° F.

Uniform results have been obtained in the laboratory by careful attention to details. These results can be worked out by any housewife in her own kitchen provided she bears clearly in mind the end she desires. Only general directions can be of aid because the details would not be the same in all cases. General directions for boiled eggs require a vessel that will allow plenty of water to stand over the eggs. Put in the desired number and cover with boiling water. Cover closely and place the vessel where the water will not boil, but keep hot for 6 minutes. The result is a soft cooked egg with very little flavor but one that will be easily digested. If left for 8 minutes the flavor will be developed and a medium cooked egg will result which will be almost as easily digested as a soft cooked egg. To obtain a perfect hard cooked egg it should be kept in the water at a temperature of 175° to 190° F. for 30 to 45 minutes. Then the yolk will be dry and mealy and the white will be solid, yet tender. Each will insure easy mastication and thus more thorough assimilation. Other methods of cooking eggs produce the same changes which take place when eggs are cooked in water, although the changes may not be so apparent.

To repeat, when heated to the temperature of boiling water for a considerable time an egg becomes hard and elastic. This explains the curdling of custards, shrinkage and toughening of omelets, meringues, sponge cakes and similar mixtures where the main ingredient is eggs. If a little white of egg is mixed with coffee, soups, or other liquid, it will coagulate and inclose any floating particles leaving the liquid clear. The economical housewife can use clean fresh eggshells for this purpose as a little albumen always clings to the inner surface unless it is scraped.

The term "digestibility" in discussion of food values refers to the amount of material taken up by the body as the food passes through the digestive tract. From tests made in the laboratory with the same digestive ferments as are found in the body, scientists have obtained results that are interesting and valuable. They have taken into account the body temperature and give comparative results on the digestibility of foods. They have found that hard-boiled eggs require a third longer to digest

in the stomach than do soft-boiled eggs, that soft-boiled eggs require a third longer than raw, and that whipped raw eggs require a little less time than when not whipped. Experiments have shown that egg yolks leave the stomach sooner than the white and that if the egg is cooked at a low temperature, 95 per cent or more of the whole egg is thoroughly digested. It requires a longer time to digest an egg which has been cooked for a longer period. Similar deductions have been made relative to eggs combined with other foods and cooked at a low temperature.

For one who is well and strong it is not of much importance whether the egg is eaten raw or soft or hard cooked. In the diet of the sick it may be of great importance, for the most nourishing foods and those offering the least resistance to digestion should be used. To eat an abundance of eggs and to drink plenty of milk is one means of helping to overcome tuberculosis. If eggs are cooked at high temperature a sick person's digestive organs will be able to digest only a small part and the remainder is left to cause disturbances which usually overbalance any nourishment which may have been derived. It is of the greatest importance to use only fresh eggs for the sick. If, for example, a sick person should be given an egg with an unpleasant flavor he might form such a dislike for eggs that it would be difficult to persuade him to try another.

There are a few people with whom eggs disagree. This is thought to be due to a nitrogenous, fatty substance in the yolk. A sick person who dislikes whole eggs may not dislike white of egg if it is beaten separately.

Children who begin to eat solids need eggs in their diet to help supply the protein. If they are prepared carefully no other food can furnish the same nourishment. Meats contain more or less indigestible portions and are not so readily assimilated.

A wise housekeeper will use eggs to supply the protein of one meal a day as often as possible. She will use them in simple desserts as well as prepared simply for the meat course. Even at the same price as meat the occasional use of eggs should not be regarded as a luxury. Judged by their composition and digestibility eggs are worthy of the high opinion in which they are usually held and this opinion and the supply determine the price at which they can be obtained.

The egg industry is of considerable commercial importance in China, the United States, and some European countries. The fact that in 1915, eggs to the value of ₱828,986 (₱112,000 increase over 1914), were imported into the Philippines shows that

poultry raising could profitably be developed here. As there will always be a market for eggs as food, farmers with more supervision and a little expense can develop the common chickens in value as egg layers and can increase their number. At the same time there is room for others to develop poultry raising as an independent enterprise making it their chief aim to secure a good breed of layers. After a start has been made the most important source of revenue in the poultry industry will be the production of eggs.

WORK AND DISCIPLINE.

The dignity of labor is the basic principle of industrial education, and any conflicting idea tends to neutralize the value of such instruction. A pupil should be made to feel that to engage in productive labor is a privilege and a duty—not a discipline.

The teacher who directs work and who is responsible for its success, must do his utmost to develop and maintain a correct attitude in the minds of his pupils. If he fails here, his work is in vain. Fortunately, most teachers understand this, though some are not above criticism.

Sometimes judgment is not used in the apportionment of work among pupils. Only the larger boys should be assigned to the heavier work in coir mat making, and in gardening; and no child should be started on basketry before his hands are strong enough to handle a knife to advantage. A few cases are known where pupils were required to do extra gardening work as a means of discipline. To punish a child because he forgets his industrial material and equipment, by giving him tasks in the garden, will soon make all industrial activities distasteful to him. A prejudice created by mistaken methods, may last through life, to the permanent detriment of the individual and the community.



The last annual report of the Director of Industries, Cawnpore, India, shows that considerable attention is being given to technical and industrial instruction in that country. Special importance is attached to those schools which are teaching dyeing and loom weaving. Particular attention is given to the use of native dyes, the introduction of improved methods of warping, and the use of the fly-shuttle loom. The dyeing classes are made up of fifteen students each; those in loom weaving are limited to an attendance of six. The students furnish their own materials and they are so interested in their work that classes continue in session from 6 a. m. to 6 p. m.

EDITORIAL.

DEVELOPING A MECHANICAL SENSE.

The development of a mechanical sense among the younger generation of Filipinos who have been trained in the public schools, is a most interesting and gratifying achievement. Through industrial instruction, tools and instruments have come to have a meaning to Filipino boys and girls, and the boys in particular, are exercising their ingenuity to devise means that will permit a maximum of efficiency in production.

In gardening, domestic-science, rattan furniture and basketry classes throughout the Islands, are to be found contrivances that have been invented by pupils in order to meet special needs.

A fuller development of this quality, the manifestation of which has been made possible by industrial education, is sure to take place. The manual skill of the Filipinos is unquestioned; with business training, physical capacity, and mechanical intuition, all of which are being inculcated by the schools, the Filipino workman of the future will be better able to maintain his place in the industrial world.

UNIFORMITY OF EQUIPMENT.

Whether hoops or frames can be employed to the greater advantage in embroidery classes is a matter of conjecture. Doubtless any difference in the quality or quantity of the product depends largely on the familiarity of the workers of any particular locality, with the device adopted; but there can be no question that a definite choice between hoops and frames should be made for each class in order to secure uniformity.

The advantages to be derived from the use of uniform devices are so patent that they would not require mention, were it not for the fact that there are many cases of inconsistent practice. In the first place a class equipped in the same manner throughout looks better than one using assorted implements. Such a class is kept in order more easily, and if anything goes wrong, that fact is more readily discovered by the teacher. A quantity of equipment of one kind can generally be purchased on terms of special advantage, or it can be made quickly and economically in the school shop. Also, when one method of fabrication is consistently followed by a whole group of workers, all have the opportunity to profit by every improvement that may be evolved by individual members.

PLANNING ONE'S WORK.

Whatever the nature of a task, efficiency demands a careful consideration of what is to be done and how best to do it. A plan made before work is begun, will help to make the purpose clear. It will outline the work in accordance with the knowledge possessed at the time of its making. As details are worked out and new possibilities are suggested, the plan is made to conform. It reduces to a minimum, the possibility of making serious mistakes, and it tends to eliminate wasteful experiment; besides, it often furnishes a useful guide for similar work in the future, and it gives a foundation for further progress.

INTEREST IN EMBROIDERY.

Skillful execution of embroidery stitches demands long practice. Although an embroidery class may not have had time to become proficient, only a short experience should demonstrate that work in a frame left open to dust will soon become unsightly. At one inspection recently made, the frames holding the material were found hanging on the wall uncovered, while the class was not in session. The teacher evidently realized that the articles did not make so good an impression as they should have, and by way of excuse remarked that the girls were not interested in embroidery. Had she taken sufficient pains to insist upon the girls following accurately the first steps, it is altogether probable that they would have shown interest enough to keep their work covered, and that she would not have had occasion to make the statement that the class was not interested—a remark the like of which always reflects upon a teacher.

PROVIDING EQUIPMENT ON TIME.

An industrial report dated October 5, stated that several members of an embroidery class were without frames in which to mount their work. A question arises as to how the girls could have been kept busy during July, August, and September. The case is as inexcusable as it is unusual, especially since there was a shop in connection with that school. Were the need for complete equipment better understood, it would not so often be lacking.

Equipment must be ready when needed, and this means that the teacher should have had sufficient experience to be able to plan ahead. If adequate equipment of the right kind is provided on time, the pupils will have confidence in their teacher, and

they will have a strong incentive to do faithful work. It is often possible to estimate the efficiency of an industrial class by the completeness and suitability of its equipment.

COMPARATIVE VALUE OF BOYS' AND GIRLS' WORK.

Not over 40 per cent of the enrollment in schools consists of girls. It is therefore surprising to learn that in one province at least, 90 per cent of the total value of the sales of school-made industrial articles represented the work of girls. Such a condition demands an immediate remedy.

It would seem that with the present industrial organization the value of the boys' work should certainly be as great as that of girls. Where it is not, the situation may be explained in one of the following ways:

(1) The equipment in boys' classes may not be adequate. It frequently is not.

(2) Girls work with finished materials, while boys must spend about half of the time devoted to industrial work in preparing materials.

(3) Boys are sometimes allowed to work on articles for which the sale is very limited.

These are possible explanations—not excuses, and in them may be found suggestions that will lead to improvement.

THE INFLUENCE OF DOMESTIC-SCIENCE INSTRUCTION.

The value of all school work is measured by the extent to which the instruction given influences the lives of the pupils, and the efficacy of domestic-science training is determined by its influence through the girls upon their homes.

Teachers of domestic-science should assure themselves that the lessons learned at school are applied in the households. The most direct way to do this, is by home inspections; but unless a teacher possesses rare tact, more harm than good may result from such procedure. It is a good plan to require the members of cooking classes on different days to bring in samples of food which they have prepared at home in accordance with recipes learned at school. In general a teacher's influence on the home life of her pupils will be limited to the enthusiasm with which she can inspire the girls at school. If they can be made to feel how necessary it is for them to put their learning into practice, they will be eager to do so.

INDUSTRIAL NOTES.

KEEPING TOOLS AND EQUIPMENT FOR INDUSTRIAL CLASSES IN CONDITION.

Before new tools are placed in the hands of pupils several lessons should be given on their use and care. Pupils seldom make a willful misuse of tools, but they often damage them through a lack of instruction as to their uses. A boy first finds out that a light hoe is not intended for digging in heavy soil, after he has tried it and broken the hoe. Pupils should be permitted to take for use only such implements as are suited to the work in hand.

Equipment ought always to be adequate, but not in excess of needs. All of the tools and utensils for shop and domestic-science work, but only a part of those used in gardening, should be furnished by the Government.

Tools supplied by the pupils from their homes are generally kept in better condition than those which belong to the Government. This is because the native tools are simpler than the imported ones, and the pupils are better acquainted with their use and care.

Before an outfit is bought, it should be determined whether or not the work for which it is intended is suited to the school. After the purchase, it should be made almost impossible to change the course. Also, judgment should be used to secure implements which are adapted to the special conditions prevailing in the particular locality. In some places lockers are overstocked with light implements for gardening, when soil conditions demand the heaviest tools. Many schools have in the past purchased shop equipment which was used only for a

year or so, after which the work was discontinued. It is almost impossible to keep unused woodworking tools in good condition.

Broken tools should be repaired if possible. Where they are in such condition as no longer to be serviceable, they ought to be returned to the proper official for the action of the auditor. A long list of unserviceable tools should not be kept on the property records.

Iron tools rust quickly in this climate unless preventive measures are taken. If they are not to be used for some time they should be oiled before being placed in the locker. Garden tools may be kept in condition by cleaning them well after use.

Many tools may be lost in which case the teacher will have to pay for them, unless he is careful to take receipts when he issues them. Several times during the year the tools should be checked with the inventory. (B. F. B.)

AN INDIVIDUAL EMBROIDERY FRAME HOLDER.

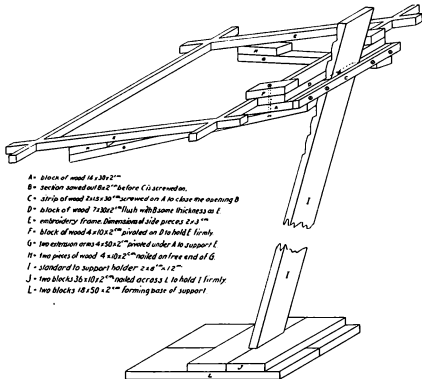
The schoolrooms in Union are crowded to such an extent that in embroidery classes, the usual rack for holding frames can not be employed. To meet this difficulty, the individual frame holder which is illustrated in the accompanying figure, was devised by Mr. Leroy Martin, industrial supervisor for the province. The device as shown offers many possibilities for improvement in construction; especially is this true at point C.

The new frame holder is capable of adjustment to the particular height best adapted to the use of each girl, enabling her to assume a

correct position. It can easily be moved so as to secure the best light. It occupies little space, and can be put away when not in use. The holder is so simple in construction that any fourth-grade shop boy can make it as an additional exercise. Less than three board feet of lumber is required in the making, and the cost of each frame should not exceed 30 centavos. The device makes for

believed that a good local market can be developed for this article after the school has been supplied.

During the quarter ending September 30, the Guinobatan Farm School and the Calatagan Farm School distributed 2,922 plants and cuttings, mostly of American sweet potatoes and Hawaiian pineapples. Seeds were distributed to 220 persons. During the same period the



- A - block of wood 14 x 30 x 2"
- B - section sawed out 8 x 2" before C is screwed on.
- C - strip of wood 2 x 15 x 30" screwed on A to close the opening B
- D - block of wood 7 x 30 x 2" flush with B same thickness as E
- E - embroidery frame. Dimensions of side pieces 2 x 3"
- F - block of wood 4 x 10 x 2" pivoted on D to hold E firmly
- G - two extension arms 4 x 50 x 2" pivoted under A to support E
- H - two pieces of wood 4 x 10 x 2" nailed on free end of G
- I - standard to support holder 2 x 8" x 12"
- J - two blocks 3 1/2 x 10 x 2" nailed across I to hold I firmly
- L - two blocks 18 x 50 x 2" forming base of support

speed, since it leaves both hands of the worker free and allows the two sides of the work to be reached easily.

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ALBAY.

The teachers of the central school of Guinobatan are utilizing the stalks of a wild grass known locally as "bigao," in making screens for the building. The work is very easy and can be done by Grade I pupils. It is

farm was visited by more than 160 persons in addition to those receiving seeds and plants.

The teachers and pupils of the Guinobatan Central School having improved the front lawn to their satisfaction, have undertaken to transform a large, unsightly hill at the rear of the building by terracing it. Although the workers are nearly all from Grades I and II, the undertaking was completed before Nov. 1.

The Bacacay Central School re-

cently moved into its new standard plan seven-room building. The site, which consists of about 2 hectares, is being improved by the pupils. Walks lined with hedges are rapidly taking form. While the work could be accomplished much more quickly by contract, it is believed that the interest aroused by having the pupils prepare and care for the grounds, more than compensates for the extra time required.

In many schools, the improvements of former years, were almost totally destroyed by the typhoons of a year ago. A determined effort is being made to restore them, and to make the grounds more beautiful than ever before.

During the long vacation the fence around the provincial athletic field was destroyed in places, and consequently the pigs and cattle did much damage to the track and baseball diamond. A great deal of hard work was necessary to repair the damage done. Each class from the fifth grade to the fourth year of the high school has willingly taken its turn at the work. As a result, the fence has been repaired, the tract smoothed, and the baseball diamond placed in excellent condition.

The schools of Catanduanes have made a good showing in karagumoy basketry. An order for 120 desk baskets (B. of E. design Nos. 1703 and 1704) was filled in less than six weeks after the opening of schools.

Mr. Felix Abejero of Zamboangita, Oriental Negros, is meeting with such success in teaching bamboo-rattan furniture in Catanduanes district, that teachers, pupils and parents are most enthusiastic. Materials abound on the island, and it is hoped that the making of bamboo-rattan furniture will become a permanent industry there. An industrial center is planned for one of the most favorably located towns. The course is now given in twelve schools of the district. Mr. Abejero will

spend some time in Guinobatan and Albay districts before he leaves.

With the exception of two schools located on distant islands, every central school in the division teaches cooking, Jovellar, Libon, and Tiwi having recently acquired the necessary equipment. Several large barrio schools are planning to introduce cooking for Grade IV girls before the close of the present school year.

Mrs. Francisca P. Vargas, a graduate of the School of Household Industries, is now teaching needlework in the Ligao Intermediate School. She also has charge of a household center of twelve workers, who are filling an order for 500 yards of bobbin lace. An additional 3,000-yard order has been requested for this center.

Several central schools are experimenting with poultry raising in connection with domestic-science classes. The schools at Guinobatan and Malinao have constructed pens, and each is beginning with about 20 fowls that have been donated by pupils. A few thoroughbred Cantonese cocks will probably be secured from the Guinobatan Farm School flock for these schools. (T. H. C.)

In Tabaco it is planned to celebrate garden day, a district academic day, and the district athletic meet, also to hold a district industrial exhibit, on February 24, 1917.

The following schools have organized agricultural clubs: Tabaco Central and Intermediate, Malinao Central and Intermediate, Tiwi, and the barrio school of Estancia. There are chicken raising, vegetable gardening, corn growing, and fruit growing contests. (S. V.)

There being no funds available for fencing the grounds of the Virac Intermediate School, kalungay and gaway-gaway cuttings to the number of about one thousand were obtained, and these were planted at intervals of 15 centimeters. When these grow, they will make a much more

durable fence than bamboo. There is no cost besides the work of obtaining and setting the cuttings. Other advantages are that both of these trees are nitrogen gatherers and sources of food. (G. B. S.)

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BOHOL INDUSTRIAL AND AGRICULTURAL NOTES.

As a means of promoting interest in industrial work, and of encouraging teachers and keeping them informed as to each other's achievements, the division of Bohol occasionally issues "Bohol industrial and agricultural notes." One number consisted of the directions for the design contained on blue print 1064, together with specifications and tracing. Had instructions not come out in this form, the work in classes making these baskets would have been delayed. Thus it is seen that the notes are a convenient means of quickly spreading industrial information which would otherwise be very slow in getting out.

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CAGAYAN.

The shop boys have under construction a domestic-science building.

Pupils in some districts have been paying from 10 to 20 centavos each for sheets of wrapping paper for book covers and industrial albums. Mr. Valentin Thomas, supervising teacher of Alcala district, has remedied this condition by buying paper in reams from Manila firms.

Every school in Cagayan has organized a school improvement and athletic club. These clubs will raise approximately ₱6,000 during the year, more than half of which will be spent to equip schoolrooms and industrial classes.

Mr. Pedro Mallonga has been assigned as inspector of agricultural and gardening clubs in the sixth district.

During the past October the trade school completed jobs to the value of ₱957.94.

○

CAMARINES.

Additional orders for wastebaskets and lupis sandwich trays have been received from the sales department.

Daet district has accepted orders from Naga district and from the Provincial High School to supply 14,500 pieces of white and brown lupis for basketry. The material is prepared by pupils who are too small to be engaged in making baskets.

At the central school of Daet the class of eight boys in bamboo furniture has completed seventeen chairs and several smaller articles. In the lupis basketry class, pupils are given definite assignments each day, and excellent progress is the result. The teacher in charge of both courses is Mr. Froilian Pajarillo.

There is a contest in the improvement of school buildings and premises in Pamplona district. Emphasis is being placed upon the use of orchids and flowering plants in stands for schoolroom and building decorations, and upon hedges for the improvement of school premises.

Arbor day was made a town celebration by the intermediate pupils and teachers of Daet. The forenoon was devoted to tree planting and to a program at which several citizens made appropriate speeches. In the afternoon a lunch was served to more than five hundred parents and friends. In the evening a dance was given in the schoolhouse. (E. S.)

Safety appliances are now installed around and above the machinery in the provincial school shop.

Additional orders for 113 pieces of embroidery valued at ₱132.21 and for 50 sandwich trays at 50 centavos, have been received from the General Office.

The class in embroidery at the Naga Central School has been able to fill all division industrial sales department orders on time. The workmanship and promptness of service are a credit to Miss Rosalia Verdadero, the teacher in charge.

A formal inspection of embroidery work is made once a month in Camarines. Industrial record cards are carefully checked and remarks are entered. As lace work is carefully covered while in process of making, it is only on these inspections that all of the finished work can be seen at once so that results may be compared. The average rate of work is thus determined without waiting for the completion of standard lengths, and grades are fixed with accuracy. The system has created a spirit of friendly rivalry among the girls.

It is ordinarily difficult to keep the various numbers of embroidery thread separate. In a letter file, all numbers can be easily kept at hand without becoming disarranged. If no file can be secured, the different skeins of thread may be kept between the pages of a note book, clips being used to fasten the leaves at top and bottom in such a way as to make separate compartments.

Mr. Miguel Camacho, teacher at the non-Christian school of Consocep, has over 9,000 square meters of land under cultivation. (B. L.)

CORN IN CAMARINES.

Tradition says that certain varieties of corn were brought from Mexico to Naga, Camarines, by an old Spanish veteran in the year 1767; but as corn at that time was generally known by the people of this province, as poor man's food, very little attention was paid to its cultivation. Rice was so plentiful at that time, that Camarines received the name "Granary of the Bicol Provinces;" but in the years 1898-1900, when carabaos were attacked

by rinderpest and the whole province was depleted of its farm animals, people began to realize the importance of corn as an article of food.

The importance of corn as a food supplementary to rice varies considerably in the different parts of the province. In some parts of the towns of Bula, Bato, Buhi, Gainza, Sipocot, and the towns and barrios of San Miguel Bay, almost as much corn as rice is consumed. In other sections corn occupies a minor place in the diet of the people; and in some localities it is almost unknown as a food. Corn is much grown on hill lands either by itself or as a follow crop with sugar cane. Sometimes it is grown as a second crop after rice. Often the corn is planted in small patches here and there among the main crops. Since corn requires less moisture than lowland rice and yields food from three to four months after planting, it often becomes an important crop after or during a rice failure. As a result of the drought of 1911-12 and the typhoons of 1915, corn became an important crop in many parts of Camarines.

When corn is plentiful and rice is scarce, the corn is often ground into meal and mixed with rice for cooking. This mixture is called "logo" and is used by many people to effect economy in the consumption of rice. Sometimes corn is roasted on the cob. Parched corn is also eaten throughout the province.

Through the corn campaigns as conducted by the Bureau of Education the people of Camarines have been led to plant more corn. They now realize its value as a quick-growing food crop. Through domestic-science classes and corn lunches, knowledge of the methods for preparing it as a food has been disseminated among the people. Corn is now being used in many homes because it is liked and not

merely as a substitute for rice.
(R. M.)

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CAPIZ.

The policy in this division is to have a few agricultural clubs well organized and doing good work, rather than to have a large number poorly organized and accomplishing little. The memberships of the clubs recently formed are being limited to 15, except in the pig-raising contest in Romblon, where 22 pupils are enrolled, 7 of them being girls. (W. H. B.)

INDUSTRIAL SUPERVISION.

Mr. Miner F. Smith, division industrial supervisor for Capiz, submits the following on the subject of industrial supervision:

The purpose of supervision is to see that courses are taught not only with a view to commercial returns, but with the object of improving every pupil physically and mentally, and in the ability to be self-supporting.

The supervisor should think more of the end to be gained than he does of the means. Otherwise he may attach too much importance to trifles: a little rust on a needle or a piece of abacá on the floor, may blind him to the excellent work being done and the special interest taken by the class. If he keeps the larger purpose clearly in mind, his spirit will naturally be reflected in the attitude of teachers and pupils. Greater interest will be taken, and more articles, and those of a better quality, will be made.

The supervisor in charge of a division should work out the local problems with the assistance of the industrial teachers. The teachers should follow all directions of the supervisor, who in turn should carry out all instructions from the General Office. Thus, full coöperation of the teaching force will be obtained.

Every school should be visited as often as possible. Some definite thing should be done at each inspection. If many points are taken up they are likely to be forgotten; but if one or two points are made clear, good results will follow. All criticisms should be constructive. There is no place for destructive criticism in the classroom. The supervisor who invariably sees something with which to find fault, and who leaves the good points untouched, is likely to do more harm than good.

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CAVITE.

The construction of the permanent fence at the Rosario Business School is completed. The posts are all of ipel with concrete bases. The greater part of the work was done by the schoolboys. Great credit is due to Miss Mercedes G. Punzalan, principal of the school, and her teachers, for the success of the undertaking. The Rosario Business School Improvement Society has given two benefits to cover the expense of fencing the grounds. The last benefit, a box social and ball held in the school, was one of the most successful events ever held in the district.

A room of the old central school building of Malabon is used as a domestic-science kitchen by the fourth-grade cooking class. It is well equipped and Miss Morente, the domestic-science teacher, is trying to make it a model kitchen.

Cantonese Poultry Association.—The demand for Cantonese fowls has been so great, that it was thought advisable to put some restrictions on the distribution of stock from the Indang Farm School. A Cantonese poultry raising association was organized. Membership in the association is open to any student or graduate of the farm school. An applicant is admitted to membership by a majority vote of active

members with the approval of the principal. Outside farmers can become associate members of the association, upon the recommendation of two active members. There are now 28 members of the association, 25 of whom are active, and 3, associate. They have agreed to raise their poultry according to instructions; and to submit a tabulated report as to the state of their poultry projects once in two months.

The Indang Farm School furnishes two hens, one cock, and a setting of eggs, to start with. These are supplied as soon as the house and yard have been approved by the principal. Only members have the right to exhibit and enter specimens of this breed in any contest. The school will do everything possible to secure a good market for the products.

Permanent improvements on the athletic field of the Indang Farm School are being made, and it will be in good shape by the time the district and sectional meets are held. The whole field is being graded and a permanent oval track is nearing completion. (R. G. McL.)

CEBU TRADE SCHOOL.

Automobile and motorcycle repair work was started in the Cebu Trade School during the 1916 long vacation. Permission to do this kind of work was given on condition that no new equipment would be purchased, so only a small number of tools are available for use, and those belong to the teachers. All machine work must be taken to another shop where the cost is usually high. Supplies are purchased as needed, except such articles as lock-washers and cotter pins, a few of which are kept on hand.

Among the different jobs undertaken have been the following: Cleaning engines; grinding valves; adjusting valves, carbureters, magnets and brakes; replacing brake

and transmission bands; radiator repairs; babbitting bearings.

Eight other shops in Cebu are doing repair work, and the competition cuts down the number of jobs available. All the work done so far has been satisfactory, and the school has not lost a customer. (H. L.)

ILOCOS NORTE.

On October 12 a household center for the making of valenciennes lace was established at San Nicolas.

Since June ₱1,200 worth of furniture has been made in the Laoag Trade School and distributed among the schools of the province.

During October the following articles were shipped to the Director of Education:

Vetiver fans	3,000
Work baskets, No. 1032	80
Work baskets, No. 1016	5
Vetiver baskets	15
Pillow covers, mercerized cotton	15
Pillow slips No. 16-108	48
Pillow slips No. 15-131	10
Table runners No. 9013	10
Table runners No. 9014	10
Table runners No. 9011	8
Motifs, Italian cutwork	24

(H. S. M.)

ILOILO.

The great demand for the output of the Iloilo Trade School not only encourages the boys to become better workmen but the monetary consideration encourages them to put forth their best efforts to secure both quantity and quality. For the first nine months of this year the trade school students have been paid for overtime work ₱1,022.24. Of this sum ₱558.57 was earned during the long vacation. During the past month Rosendo Zaldariaga led the school in value of overtime work, earning ₱12.97. The total payroll for the month was ₱94.81, and the total value of jobs completed was ₱759.95. Such a school is a big asset to any

community, not only financially, but in the qualities of the young men that it is training for future usefulness.

The scope of the work done by the trade school is not confined merely to the making of house furnishings and household articles, but covers the needs of the house builder as well. The boys have just finished the construction of a schoolhouse at Arevalo. The school has been given the contract for the construction of the furniture and fixtures of the Philippine National Bank, and also for the Iloilo branch of the Philippine Library. This certainly speaks well for the excellence of the work done by this school, and Mr. Schwartz, the principal is to be congratulated for the quality, as well as quantity, of the articles fabricated under his supervision.

It has been aptly stated that there are three kinds of men in this world,—those who get behind the wagon and push, those who get in the wagon and ride, and those who sit on the wagon and drag their feet. The boys who are being trained in the trade schools will be in the class with those that get behind and push. (C. E. W.)

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LEYTE.

On enrolling at the Tacloban Farm School each pupil is given a paper on which appears a list of tools with an explanation of their uses. He is then assigned to use a hoe, rake, spade, mattock, or plow. On the next occasion he is given a different tool. The principal or an assistant sees to it that the boy uses each tool so as to do his work in the best, as well as the easiest way. Should a pupil return a tool dirty, he is required to clean it properly, and a second offense is punishable by a deduction from his grade on field work.

When a boy is sent to hoe land,

he is required to cut the grass and weeds and to rake them back with the hoe in order to avoid leaving some of the grass uncut. In hoeing corn, he must take out the grass near the corn or cover it up well if it is still small; if it is large he must pull it out with his hands. In spading up a piece of land, he must sink the spade to the handle and turn the sod over, covering up the grass.

Plowing is the most difficult job for pupils to do right. This is because it requires closer attention than any other work on the farm. The animal must be kept in place, made to go ahead, and at the same time the plow must be held in the ground and made to cut just wide enough to break the soil. The boys either want to watch the animal all the time or else they never take their eyes from the plow. It takes much patience to teach a proper division of attention. (G. W.)

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MINDANAO.

The Madaam Farm School in the province of Davao has recently secured some Cantonese chickens, and poultry raising has been made a part of the regular work of the school.

Fifteen new settlement farm schools have been organized in the province of Davao this year. They are all supplied with work animals and agricultural implements and already have considerable land under cultivation. Dispensaries are maintained in connection with many of these schools.

Twelve rain gauges have been received for use at the agricultural and farm schools in the Department. There are very few stations of the Weather Bureau in Mindanao-Sulu and consequently the amount of rainfall in the various agricultural sections has never been determined. Rain gauges have been installed only at schools that are in session during

the entire year and where there are teachers who can be relied upon to secure accurate information. Monthly reports will be transmitted to the Philippine Weather Bureau.

A large number of teachers' cottages have been constructed during the past few months and the furniture for these is being made by the Zamboanga Trade School, the Davao Industrial School, and local carpenters.

The schools have undertaken to introduce the manufacture and use of Javanese roofing tiles throughout Mindanao-Sulu. A small tile-making center has been established at Taluksaṅgay, a Moro barrio about twelve miles from Zamboanga, where pensionados from the five provinces receive instruction, not only in the manufacture of tiles but also in the construction of tile roofs. It is proposed to use tiles for roofing a number of small school buildings.

The Lumbatan Agricultural School in Lanao province is making progress. The area under cultivation has been increased to 9.9 ha. and during the quarter ending September 30, the amount of produce of the farm, practically all of which was used in the school mess, was as follows:

American sweet potatoes.....	kilos.....	3,280
Irish potatoes	crates.....	3
String beans	bunches.....	40
Dry beans .. .. .	.....	8
Bananas	bunches.....	70
Pineapples .. .. .	.....	56
Radishes	bunches.....	39
Peanuts	gantas.....	70
Cowpeas	bunches.....	50
Coffee	gantas.....	6
Nangens .. .. .	.....	8
Eggs .. .. .	.....	274
Chickens .. .. .	.....	17

Sixty-six fruit trees were set out in the orchard. The school is the center for distributing coffee plants to the Moros of the vicinity, the purpose being to revive and extend the coffee industry of Lanao Province. The work was begun last year

under the direction of Messrs. Gragg and Mercado. The school has five work animals and full agricultural equipments. Funds are available for the construction of new buildings including a dormitory, school building, and teachers' cottages, and authority has been granted for beginning work. With the completion of the new plant the attendance will be increased to 150. This school was organized two years ago by Mr. H. H. Gragg, who was succeeded as principal last July by Mr. J. W. Savage.

Between January 1 and September 25, 1916, the Zamboanga Trade School turned out work to the value of ₱6,704.12, more than half of this sum being for school desks. In October and November, more than 1,300 articles valued at ₱4,300 were made. (G. W. C.)

MINDORO.

People from other provinces are coming here and setting down as farmers and laborers. In the district of Mamburao there are many Ilocanos; in Calapan, settlers from Batangas and Marinduque; in Pinamalayan, there are many from Marinduque; in San José the people are mostly Visayans from Negros.

A number of small islands to the north making up the Lubang group, is the largest school district of Mindoro. The people there raise enough rice, cattle, and chickens for their own needs, and they export cattle and horses. Sponges grow at the bottom of the seas near Tilic, a port of Lubang.

Industrial contests have been held in Caluya, and agricultural clubs have been organized in the Lubang and Calapan districts. Mamburao reports good work in bamboo furniture.

The school grounds of Calapan, Naujan and Pinamalayan, have been considerably improved.

The school at Bulalacao is try-

ing hard to treble last year's output in industrial work.

A drink similar to sarsaparilla can be prepared from a thorny vine with small tubers, found in Mindoro. The tubers are cleaned, chopped into thin pieces and boiled till the water becomes colored like bottled sarsaparilla. The drink is considered to have medicinal value. When drunk as a refreshment, sugar is added. The plant is known here as sarsaparilla. (F. S.)

MOUNTAIN PROVINCE.

The papayas and oranges recently set out in the garden of the Bontoc Industrial School are growing fast.

During July, August, and September, the girls of the Bontoc Industrial School turned out over 100 yards of fine lace and a bobbin-lace luncheon set of 25 pieces. Besides this, they made for dormitory pupils 50 dresses, 50 chemises, and 20 gee strings.

The Kadaclan School, which is located over 75 kilometers northeast of Bontoc near the Kalinga boundary, has been in session less than six months. It deserves special mention for its improved grounds. Hedges and flowering plants are growing around the school yard and magnificent orchids, obtained from the forest, hang in the windows and on the porch.

Arbor day in Bontoc was a big success. Over 30 trees were planted on the school grounds, including papayas, bananas, oranges, and shade trees. The planting of trees in the morning was followed by a girls' indoor baseball game between the Bontoc Industrial School and the Besao Mission School, whose girls walked the 25 kilometers from Besao to Bontoc.

Mr. Simeon Español, teacher of woodworking in the Kiangnan Industrial School, resigned on August 19 to take up private work. His place

has been filled by Mr. Prudencio Cobangbang, formerly teacher at Amduntug.

The people of Amduntug give a large amount of labor annually for the improvement of the school site, and the best barrio school garden is found there.

The boys of Hapao School excel in the art of wood carving.

The Kiangnan Central School has the best garden site in Ifugao, and the boys now have it in shape for the first planting. New land is being put under cultivation, and by March a whole hectare will be producing regularly.

While waiting for lumber, the shop boys of Kiangnan have begun work on articles of tree fern wood. Lumber is being cut and sawed in the forest to supply the dormitories with beds, chairs, and tables.

The people of Talifugo are preparing to build a substantial frame schoolhouse by voluntary labor. Talifugo is in Apayao, and is 148 kilometers from Lubuagan where the supervising teacher lives. The people of Apayao are of the Isnig tribe, and differ greatly from any of the other people of the Mountain Province. Both sexes almost invariably wear great masses of false hair, and it is often quite difficult for a stranger to distinguish between men and women. The clothing for men consists of a light blue, wide turban, a red, short waist, and a blue, very wide gee string. The women dress much like the Tinguians of Abra.

The people of Ableg, Balenciaga, and Patao, in Kalinga, are erecting a two-room frame school building near Ableg to take the place of a bamboo structure. The work is voluntary, the only questions asked the supervising teacher being in regard to plans, and materials needed. Guinaang near Ableg also plans to erect a frame building soon. All lumber for these buildings must be carried on men's shoulders from

ten to fifteen kilometers, but the people are willing to do this without pay.

The boys in the blacksmith shop of the Lubuagan Industrial School are now making branding irons for Kalinga cattle owners. They are also constructing rattan furniture and necessary equipment for the new dormitory school. (S. R. M.)

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NUEVA VIZCAYA.

All of the central schools of the province have been furnished with hand-power sewing machines.

The Solano and Lamo schools are growing rice this year. Each has planted more than seven ares, and seed selection will be taught.

A garden day will be held on March 29 and 30 in connection with the provincial athletic meet and exhibition. Other garden days will be held in all of the central schools and large barrios of the divisions.

About eight hundred bamboo poles have been gathered by the provincial schoolboys for use in building a temporary domestic-science building.

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OCCIDENTAL NEGROS.

San Carlos is one of the best points in this province for commercial gardening. Last year's sales there totaled more than ₱150, and for the first three months of this school year they amounted to ₱50. The ground utilized for gardening purposes is near the sea and is very sandy, but it is kept in condition by the constant admixture of fertilizer.

The best school garden in Occidental Negros from the educational standpoint, is that at La Carlota. An interesting feature is a large plot of pineapples to which papayas afford about the right amount of shade. Both sorts of plants are thrifty and fruiting well.

At Bacolod on October 7, arbor

day was celebrated with more enthusiasm than ever before. Credit is due to the arbor-day committee, organized at the call of the municipal president, Mr. Esteban Henares. (W. J. R.)

Fertilizer found in caves.—Many farmers of Occidental Negros have been using imported commercial fertilizer to improve the land on their farms for growing crops. Because of the high freight rates, however, it has been unprofitable to continue the use of imported fertilizer during the past two years. This caused many to seek for something to substitute for the imported goods.

Caves were discovered that contained deposits of guano. The substance was found to contain the proper elements needed to fertilize the soil. As the experiments proved successful, some farmers have taken out considerable quantities of the deposits and are now improving their land, and getting larger yields and a better grade of sugar. This industry has not been developed on a very large scale as yet.

A difficulty to be overcome is the problem of transportation. The caves are in inaccessible places, and it is almost impossible to get to the material.

There are said to be similar caves in Panay, Cebu, and Bohol which with improved roads and other conveniences may be made to give up much that will improve the farms now poor through constant tillage. (H. M. S.)

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PANAMA HAT PLANTS AT CALASIAO.

Forty panama-hat plants, *Carludovica palmata*, reached Calasiao in September, 1915. They came from the Bureau of Agriculture, through the Bureau of Education. The plants when received were packed in potato crates. All soil had been removed and the leaves cut off prepar-

atory to transplanting. They were fresh and had not suffered from delay in transportation, which was by railroad to Dagupan. The sixth-grade class planted them in the school garden, which has no shade.

Upon consulting an industrial note about panama hat plants, on page 133 of *THE PHILIPPINE CRAFTSMAN* for August, 1915, it was learned that they should be set out in well-shaded places. The plants were immediately



An open and an unopened leaf of the *Carhadovica palmata*. The ruler is 31 cm. long.

transferred to a shaded nursery, where they could be watered easily. The next dry season the 23 plants are to be inspected, and the results

The 40 plants are still living, along with 27 new shoots. Twenty- under various conditions of cultivation will be compared.



The panama-hat palm as growing at Calasiao, Pangasinan, on September 1, 1916.

three other shoots are growing in eight different private gardens in several parts of the town. These last were distributed in August, 1916, and were properly set out. After

The following is taken from H. F. MacMillan's "Handbook of Tropical Gardening and Planting:" "The *Caryota palmata*, natural order, *Cyclathaceae*, is a water plant, suited

to swampy situations or low elevations, attains a height of 6 to 8 feet and is propagated by seed, or division of suckers. It grows luxuriantly in moderately moist, loose, loamy soil, and prefers light shade, but the latter is not essential. A hot humid climate is indispensable. It is a stemless palmlike plant with large palmate leaves, similar to those of the fan palm, with stalks 1.5 to 1.86 meters long, growing naturally in clumps. The flowers, followed by the seed, are produced in cones borne on stalks rising from the base, from 30 to 45 centimeters high. The plant is fully developed at about two or 3 years old, and the same clump lives for many years in the same ground."

It is believed that the vicinity of Calasiao is especially adapted to the propagation of the *Carludovica palmata*, provided that the plants are shaded and irrigated during the dry season. It is doubtful if they can stand the long dry season without irrigation.

The present school nursery contains 180 square meters, located on the north side of the presidencia. A large acacia tree on the west side, caturay trees inside the nursery and the presidencia on the south side, give shade all day. A steady flowing artesian well, 15 meters from the north side, helps to keep the ground moist.

The pupils watered the plants once a week during the dry season from November to April 1, 1916, and the municipal president had them cared for during the school vacation. The pupils have kept the soil shaded and loose for a radius of one meter around each plant.

The growth of the plants during the first year has not been uniform. The largest is 1.5 meters high, and the smallest is about one third as high; each bears 5 leaves. One plant has produced 10 new suckers, but the average increase has been from

one to three. Several plants blossomed but were eaten by insects or blighted, and no seed developed.

The blades of the leaf from which the hat fiber is secured, spring directly from the base. So far, only two of these have been cut, and they were taken to make the pictures which accompany this article. The present growth is one new leaf every three months. In one or two years more it should be possible to use the material.

The first illustration shows the largest plant in the nursery. Unfortunately the tips of several of the leaves were cut. The leaf shown in detail in the second plate, is a good specimen. This compound palmate leaf is divided into four sections, with from 8 to 10 petiolules to a section. The stipels of each quarter of the leaf are divided about midway, but some of the outer stipels are joined through nearly the entire length of the petiolules.

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PALAWAN.

Both the provincial school and the Coron district finished their first embroidery orders in November.

An order for desk baskets from the provincial treasurer will soon be completed. The schools plan to furnish all the desk and wastebaskets used in the province.

The central school of Cuyo is working on an order for bamboo stools for use in embroidery classes. (R. C.)

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SAMAR.

Seven hundred primary school girls throughout the province are working on an order of 14,400 yards of lace, of which 9,000 yards are wide cluny. The value of this order when completed will be ₱6,314. The work is progressing well, a number of girls having nearly completed 24-yard lengths of the easier patterns.

The provincial high school has already filled two large orders for embroidery, and is now at work on the third.

All the basketry workers of the province are making stem and lupis baskets, about thirty different designs being taught. Although most of this work is new, excellent results are being obtained in all towns.

Eight hundred and twenty-seven pesos have been distributed for sales made since July 1, and articles to the value of ₱735 remain in the general sales department.

The lace classes of Basey have forty pupils capable of doing commercial work.

Plain sewing is being taught in all barrio schools in Calbayog District.

Most school gardens are in a flourishing condition and the home gardens, especially those of the provincial high school pupils, are in excellent condition.

Little money is provided by the province for the up-keep of the provincial athletic field. The students of the high school deserve much credit for the work they do, and for the good spirit they show, in improving the grounds. At present they are covering the baseball diamond with marsh sand which will make it one of the fastest diamonds in the Islands. (G. D. N.)

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THE INFLUENCE WHICH THE 1915
BARRIO SCHOOL INDUSTRIAL EFFICIENCY CONTEST HAS HAD ON THE
SCHOOLS OF TARLAC.

The barrio school industrial efficiency contest held last year was productive of good results. The following schools have shown the greatest improvement: Calibuñgan, Dolores, Bantog, Maliwalo, Malacampa, Anoling, Sinilian II, Amacalan, San Francisco, Santiago, Balutu and O'Donnell.

The improvement in gardening in the large barrio of Amacalan,

Gerona, deserves special comment. The school now has a garden of 1,000 square meters under cultivation. Not much vacation gardening was done there owing to the sandy character of the soil, but early planting and thorough cultivation account for the flourishing condition of the crops. In those barrios where water is to be had during the dry season, all-year gardening has been established.

It is believed that the industrial output of barrio schools has been increased generally from 15 to 25 per cent, while in gardening and care of premises, improvement is conservatively estimated at from 25 to 100 per cent.

Adequate equipment has been provided in many barrios since last year. Four schools of Tarlac are now fully supplied with modern desks. Last year there were only two. In many barrios the patrons of the school purchased a part or all of the equipment needed for gardening and school-ground improvement. (G. M. McE.)

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TAYABAS.

Mr. V. Villamor, teacher of gardening, in Tiaong Intermediate School, has placed gardening in this school on a very practical basis. Instead of dividing the garden into numerous small patches, he has divided it into plots ten meters square. At least one of these is assigned to each pupil for cultivation. Three or four adjoining plots are planted to the same crop and are worked at the same time. The pupils break the ground, each one plowing his own part. The ground is pulverized with hand tools, and all cultivation is done by hand. There is no marked division between the different plots, and the garden does not have that resemblance to a graveyard so common in school gardens; but it has the appearance of a business-like truck farm. Only staple vegetables like corn, mongos,

garlic, sweet potatoes, pechay, mustard, and eggplants are grown. (J. C.)

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ZAMBALES.

Mr. Eulogio Recio, who resigned on account of ill health, has been reinstated and assigned to the Iba Central School. He relieves Mr. Julian Divino who has been appointed basketry teacher in the Olongapo Primary School.

The total area under cultivation by the school pupils of the Iba district amounts to 12,333 square meters, 7,148 of which are home gardens.

The municipality of Botolan has more than one hectare in home gardens.

The town of Masinloc has 15 home gardens which are cultivated with carabaos and plows.

The largest school garden in the Castellejos district is that of the San Marcelino Central School. The teacher in charge, Mr. Bibiano Arce, expects to have a good exhibit for the interprovincial garden day.

On arbor day the pupils planted acacia trees along the provincial road between San Marcelino and San Antonio. Each tree has been assigned to the care of two boys during the year. Once a week, the trees are inspected by the teachers.

Each day at the San Marcelino Central School, five girls are assigned to the preparation of food for sale to the public. The work is under the supervision of the domestic-science teacher, Miss Manuela de la Cruz. During the first three weeks, a capital of 50 centavos increased to ₱8.15.

The Villar Settlement Farm School is producing sufficient vegetables to supply all of the needs of the school, enough fruit for use once a day, and enough meat for one meal a week. (W. S. F.)

GARDEN-DAY ARRANGEMENTS, CITY SCHOOLS, MANILA.

It is expected that prizes valued at approximately ₱100 will be given at the garden-day celebration of the Tondo Intermediate School on January 27. The following have been asked to act as judges of school gardens: Mrs. Jaime de Veyra; Mr. Isabelo de los Reyes; Judge Sobral; Mr. North H. Foreman, of the Bureau of Education; and Mr. Boyle of the Bureau of Agriculture. The gardens were visited early in November and again in the middle of December. In January they will be inspected for the last time. Prizes will be awarded for the best school gardens, and also for the best individual exhibits of beets, cabbage, carrots, lettuce, tomatoes, turnips, radish, mustard, pechay, endive, pepper, and eggplant. (J. F. S.)

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THE SCHOOLS IN GUAM.

The schools of Guam are under a superintendent who receives his pay from the Navy Department as a special day laborer. There is as yet no normal or high school established, and the teaching is mainly done by Americans whose services may be available. Detail is also made of enlisted men of the navy when found necessary.

The courses in the schools are arranged the same as in the United States, there being no primary and intermediate course of seven grades as in the Philippines. The girls are taught plain sewing in the Agaña school, and some work is given in mat and basket weaving with pandan.

So far only two graduates of the public schools have been sent to the Philippines to continue their education. These boys went to the Agricultural School at Los Baños, since agricultural education is badly needed by the people of Guam. (L. P.)

LETTER BOX.

[From time to time there are received questions of general interest which require relatively short answers. Whenever the questions are of wide enough application to warrant it, the answers will be published under this heading.]

1. Can export baskets be made successfully of green bamboo or must the bamboo first be dried?

Answer.—Superimposed spokes can be made of dry bamboo but all other spokes and weavers must be made of green bamboo; otherwise, they are not at all pliable.

2. Can these baskets be made successfully from bamboo cut at any time during the year?

Answer.—It is generally true that baskets made during the months from September to December, inclusive, are best, but as schools have to use green bamboo it means that cutting must be done during the entire school year.

As practically all bamboo material for baskets is taken from the hard exterior, the possibility of damage from insects is reduced to the minimum. Where insects attack baskets, it is usually due to their having been made from the inner or soft part of bamboo.

3. How can a teacher determine whether or not the output of his industrial classes is up to standard?

Answer.—The standards with which the teacher has to concern himself are those of quality and quantity. He can be sure that the product is up to standard in regard to quality if it is made in accordance with specifications or if it is like the model which has been approved by the General Office. With respect to quantity, the product will be up to standard if the teacher is familiar with the work; if the attendance has not been allowed to become irregular; if materials of the right kind and in sufficient quantity have always been kept on hand; if the equipment has been suitable and complete; and if arrangements are such that the workers are paid promptly for finished articles.

4. Of what use is Form 153, Quarterly Report of Industrial Work?

Answer.—This form was originated for the purpose of recording summaries of Form 151 which covers materials bought and used, the output, and the amount and disposition of funds received for industrial work. Its main value lies in the possibility it affords for comparisons, and the consequent incentive that it gives for each school unit to do better than during the last quarter; to surpass its record for the same quarter during the preceding year; or to do better than some other industrial group of equal size.