

The Philippine Craftsman

VOL. 1

AUGUST, 1912.

No. 2

THE WORK OF THE SCHOOL SHOPS AND TRADE SCHOOLS.

W. W. MARQUARDT, Superintendent, Philippine School of Arts and Trades; BRUCE INGERSOLL, Inspector of Trade Schools; LUTHER PARKER, Industrial Inspector.

INDUSTRIAL training along the lines indicated by local conditions has been an essential feature of public education in the Philippine Islands. During the past few years, every school child has been given practical training in one or more branches of industrial work such as lace making, embroidery, sewing, cooking, housekeeping, making of hats, mats, and baskets, gardening, farming, ironwork, woodwork, pottery. Woodworking, however, was one of the first industrial subjects to

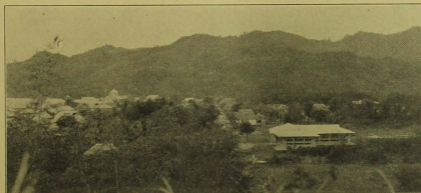


Plate I. A trade school with plenty of room for expansion and a good campus (being cleared), Catbalogan, Samar.

be introduced and developed. Beginning with the Philippine School of Arts and Trades in 1901, it spread gradually through all of the provincial schools, fourteen of which are now regular trade schools of intermediate grade. It also reached downward in the course until it embraced 236 primary or fourth-grade shops.

The keynote of the work in all schools is continued insistence upon utility, and "instruction for construction." Theoretical

exercises of no use as completed articles are not wholly discarded, but emphasis is always placed upon objects of commercial value. Not only is the commercial side of the work stressed in respect to the kind and quality of articles manufactured, but the value of the materials and labor required in the making of all articles is continually kept in the foreground. The annual exposition at Manila enables each school to learn definitely what is being done in other schools and diffuses a higher standard of workmanship throughout the Islands.

In respect to organization, output of commercial products, and the industrial efficiency of their graduates, the trade schools represent the highest point attained in the development of the vocational work of the Islands. The primary woodworking shops are a later development, and have rapidly increased in number.

In a general way the shops may be divided into three classes, municipal, provincial, and Insular, depending upon the branch of the Government which finances them. The accompanying outline will serve to show this general classification.

SHOP AND TRADE COURSES.

Municipal.

In any municipality or barrio.

Primary.

Elementary shop work.

Intermediate.

Shop work in the general course.

Frequently conducted in connection with primary shops.

The trade course.

This course may be given in municipal intermediate shops when students are far enough advanced to undertake regular trade course work. Very few have yet been established.

The regular trade school.

No municipal trade schools have yet been established.

Provincial.

Generally located in provincial capitals; may be established by provincial boards in any other centers.

Primary.

None yet established.

Intermediate.

Shop work in the general course.

Generally located in provincial capitals and operating as a department of the provincial high school. At the discretion of the provincial board they may be established in other municipal centers.

Trade course.

Generally conducted in the shop department of the provincial high school.

Provincial—Continued.

Intermediate—Continued.

The regular trade school.

Organized from the trade classes of provincial high schools in provincial capitals.

Insular.

May be established by the Bureau of Education at Insular expense anywhere in the Islands.

Primary.

Nothing has yet been done except to establish certain primary shop courses as special projects in non-Christian provinces.

Intermediate and secondary.

As special Insular projects, the work of these grades is operated on a regular trade basis. Only one institution, the Philippine School of Arts and Trades, has yet been established, though other special projects may be undertaken by the Bureau, as, for example, in taking over the management of existing provincial institutions.

The exact status of any one of the school courses referred to in this classification can be determined by its position as provincial, municipal, or Insular, its grade as primary, intermediate, or secondary, and the class of work given, whether it is the primary course of shop work, the work provided with the general course, or the regular trade work as it may be given in a special intermediate trade course or in a regularly organized trade school. The terms, shop course, school shop, shop work, trade course, and trade work, are applied to them.

In deciding upon the names by which these various courses shall be known, no special rule has heretofore been adhered to; the terms have grown up with the work. This has not been entirely satisfactory and more than one misnomer has existed in the terms used in connection with shop work. For instance, the term "manual training," meaning generally woodwork, and the term "manual training department of the provincial high school," meaning the shop of a school which has not yet been recognized on the regular trade basis, have come into use. These terms are misleading; it is now the intention to apply the term "manual training" in the sense in which it is used in the United States and other countries, meaning the general training of the hand in any line of handwork, principally for cultural purposes. In discarding this term, which has had a distinct meaning in the schools, it becomes necessary to supply another. For present purposes the term "shop course" will be substituted for the "manual training" of the past, and the trade course will of course include the trade work given in the ordinary school shops as well as the trade work given in regular trade schools. In its

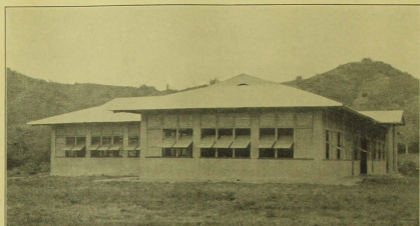


Plate II. The main building of the Trade School at Catbalogan, Samar.

general sense, the term "shop work" will be understood to include all work except that of the trade course; a school shop, however, will include all institutions of this sort except the regular trade schools.

THE PRIMARY SHOPS.

The first primary shop was probably started at Pagsanjan, Laguna, in 1904, with a native carpenter as teacher. The real extension of the work began in Pangasinan in 1906, when a selected class of twenty boys was given a year's normal course in woodworking as a preparation for teaching in the primary shops planned for the municipalities of the province. In 1907 twelve shops were started and another teachers' class was or-

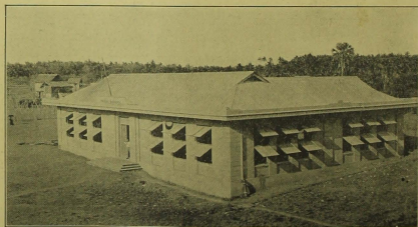


Plate III. The shop building at Lucena, Tayabas.

ganized. The process has been continued until in this province forty municipalities out of a total of forty-six now have primary shops. Since 1907 the number of new shops in the Islands has more than doubled each year; but from now on the rate of extension will necessarily be slower because the municipalities have about reached their limits financially with respect to expenditures for the installation of shops. Out of a total of 779 municipalities in the Islands, 236 are provided with primary shops, having a total equipment valued at ₱33,015, and producing last year a commercial output amounting to ₱20,530.62. Out of a total of 17,343 boys enrolled in the fourth grade 10,356 took primary shop work during the school year 1911-12.

AIMS OF PRIMARY SHOP WORK.

The average entrance age of fourth grade boys is 14 years. At least 50 per cent of these will not continue their schooling beyond this grade. In addition to the imparting of the usual primary education in academic subjects, the primary woodworking course prepares the older and larger fourth grade boys for later work. The aims in teaching shop work in the primary grades are threefold:

(a) To give a general training in the handling of ordinary carpentry tools to those boys whose education will end with

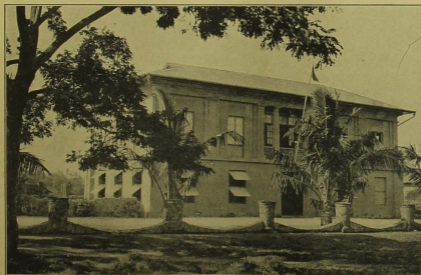


Plate IV. The Albay provincial school shop building.

the fourth grade and who should receive therein enough instruction to enable them to keep up the necessary repairs around

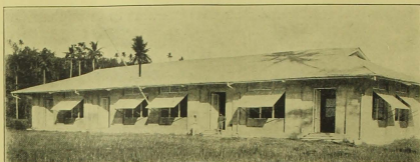


Plate V. Shop building, Leyte Trade School.

the home and to make very simple furniture of bamboo or wood.

(b) To give training in making a set of tools to those larger and older boys of the fourth grade whose schooling will cease with the completion of this grade and who will do more or less work with tools after leaving school in order to make a living.

(c) To ascertain which pupils possess mechanical ability or natural inclination for woodworking, and to prepare them for entrance to a provincial trade school or a shop class in an intermediate school.

PRIMARY WOODWORKING COURSE.

It is easier to arouse and maintain a pupil's interest on a real piece of furniture than on an exercise of no value as a finished product. However, there are certain fundamental steps

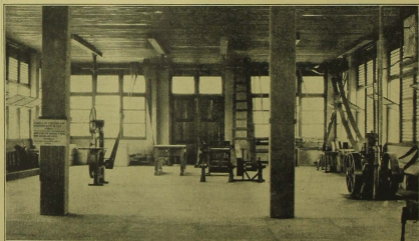


Plate VI. A good arrangement for machinery, with space for piling lumber while sawing and planing.

in tool work such as marking, sawing, planing, and gauging, that should be done only on waste material until the operations can be performed with accuracy and speed in the construction of valuable articles. A regular course has been outlined covering the fundamental steps necessary for a proper comprehension of tool work. The articles prescribed in the regular course are mostly of utility in the homes of the pupils. Careful attention has been given to the character of each article so that a large number of useless pieces may not accumulate in the workshops.

The preliminary steps are provided for under the heading "practice work," but the necessity of frequent variations is fully

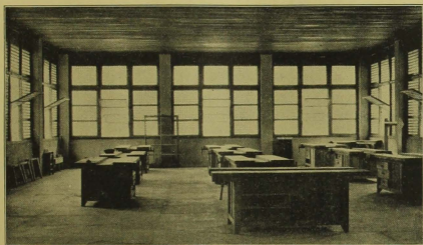


Plate VII. Department of bench wood work.

Ample space between benches for assembling furniture. School shops are cleaned daily.

recognized, and three subsidiary courses have been designed to meet the varying conditions of different localities.

The regular course contains the following outline of work:

- | | |
|--|------------------------------------|
| 1. Rectangular block. | 9. Bracket. |
| 1. (a) Planed strips (optional). | 9. (a) Book shelf (optional). |
| 2. Gauging lines. | 10. Picture frame. |
| 3. Squaring and sawing. | 10. (a) Windmill (optional). |
| 4. Sawing and chiseling. | (b) Water wheel (optional). |
| 5. Bench hook. | 11. Hatrack. |
| 6. Mallet. | 11. (a) Rake (optional). |
| 6. (a) Clothes paddle (optional). | 12. Stool. |
| 7. Liter measure. | 12. (a) Stool, folding (optional). |
| 7. (a) Small chest (optional). | 12. (b) Washstand (optional). |
| 8. Embroidery frame. | 12. (c) Table (optional). |
| 8. (a) Drawing board or mixing board (optional). | |

The subsidiary primary courses provide for:

- (a) Making a set of woodworking tools for home use.
- (b) Making school furniture.
- (c) Erection of a school building and the fabrication of school equipment.

It is often the case that a set of woodworking tools must be made for home use when the parents are not able to buy a set of tools for the boy. For such boys, the following outline may be followed:

- | | |
|--------------------------|--------------------------|
| 1. Rectangular block. | 9. Try square. |
| 2. Gauging lines. | 10. Mallet, rectangular. |
| 3. Squaring and sawing. | 11. Line marker. |
| 4. Sawing and chiseling. | 12. Saw frame. |
| 5. Bench hook. | 13. Smooth plane. |
| 6. Mallet. | 14. Jack or fore plane. |
| 7. Miter box. | 15. Plow plane. |
| 8. Marking gauge. | 16. Tool box. |

In some cases, a suitable shop must be built by the pupils themselves. The benches and equipment must also be frequently made by the pupils owing to the lack of sufficient municipal resources. A teacher who finds himself forced by circumstances to erect a shop and manufacture its furniture and equipment before he has the opportunity of giving the prescribed practice work should so plan his work with respect to each pupil that there will be no serious deviation from a properly graded course theoretically considered. In building a shop, each pupil should be given his work in such a way as to teach him the fundamental processes in the regular order. In making the furniture and equipment the same order should be observed, so that by the time the shop is built and equipped, each pupil will be well grounded in the first steps with tools. This system is slow and difficult, but its adoption is frequently required by local conditions.

School furniture should be made in the following order:

- | | |
|-----------------------|------------------------|
| 1. School desks. | 5. Teacher's table. |
| 2. Blackboard frames. | 5. (a) Teacher's desk. |
| 3. Book chest. | 6. Bookcase. |
| 4. Stool. | |

In some municipalities the cost of good lumber is so high in comparison with the wealth of bamboo, rattan, and palm petioles at hand for the asking, that it is advisable to teach the making of furniture from materials both lighter and cheaper than wood. Experiments have been carried on in working up satisfactory models of home furniture in bamboo and rattan. The work is still more or less experimental but it has reached

such a stage that a course has been outlined for this work and may be substituted for the woodworking course in localities which favor such work. The extent of the Chinese trade in this kind of ware and the abundance of materials in these Islands make this field of endeavor rich in possibilities. Wherever local conditions seem to make it advisable, the substitution of the following course in lieu of the regular course is authorized:

BAMBOO, RATTAN.

- | | |
|-------------------------------|--------------------------------------|
| 1. Clothes hanger, bamboo. | 7. Bed, bamboo. |
| 2. Stool, rattan. | 8. Wardrobe, bamboo. |
| 3. Stool, split bamboo. | 9. Screen, bamboo. |
| 4. Footstool, bamboo, rattan. | 10. Washstand, bamboo, rattan, nito. |
| 5. Chair, bamboo. | 11. Coat and hat tree, bamboo. |
| 6. Table, bamboo. | 12. Carving, bamboo. |

ADMINISTRATION.

The shop is directly under the shop teacher, in most cases a trained man, who is responsible through the principal of the school to the supervising teacher.

In provinces having industrial supervisors the shops are frequently inspected and supervised. In addition to this inspection the division superintendent and the industrial inspectors from the General Office make occasional visits.

Teachers for this work are usually graduates of trade schools, returned pensionados from the Philippine School of Arts and Trades, or pupils trained in normal institutes or special classes such as those maintained in Iloilo and Pangasinan.

INTERMEDIATE SHOPS AND REGULAR TRADE SCHOOLS.

The main object of the primary shop is to teach the pupil the use of tools and the elements of woodworking, while in the



Plate VIII. Regular equipment for school shop.

Notice arrangement with respect to doors and windows. The planer is beyond the band-saw and faces the window on the left.

intermediate grades the pupil acquires sufficient skill to enable him to do fair work in carpentry or cabinetmaking. The

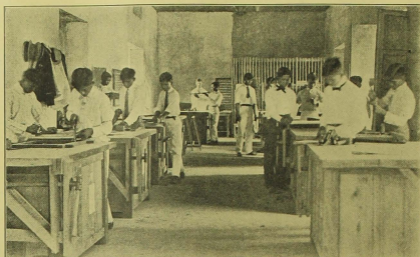


Plate IX. Primary school shop at Candon, Ilocos Sur.

foundation work for all shop and trade courses is the set of exercises prescribed for the primary shop. Pupils entering a school shop or trade school of intermediate grade must begin with the primary work in case they have not already completed such a course.

Twenty-six provincial schools are equipped with woodworking machinery in addition to the regular supply of hand tools which is prescribed for all provincial schools. Fourteen of the schools equipped with machinery have been organized into

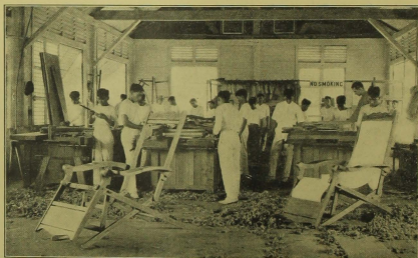


Plate X. Class in woodworking, Sorsogon Trade School.

trade schools. It is the policy of the Bureau of Education to encourage the reorganization of intermediate school shops into trade schools wherever local conditions are satisfactory.

A school shop is an institution devoting itself primarily to the training of the hand as supplementary to the training of the mind. It develops a certain manual dexterity for the effect which such training has on the mind and character of the pupil rather than for the purpose of enabling him to earn a livelihood; its aims are cultural rather than vocational. The trade school, on the other hand, is established for the sole purpose of developing skilled workmen. It is believed that the trade school is the type of institution needed in the Islands rather than the ordinary school shop.

The schools in which these shops are operated give the pupil work in English, arithmetic, geography, civics, physiology and hygiene, and Philippine history and civil government, in Grades V, VI, and VII. In addition to this academic work ninety minutes per day are devoted to shop subjects, as follows: Grade V, drawing and handweaving, basketry, bamboo and rattan work, or woodworking; Grade VI, drawing and gardening or woodworking; Grade VII, drawing and woodworking or gardening. Trade-school pupils take the same amount of English and arithmetic, but in lieu of the remaining



Plate XI. Reading table from school shop of Tarlac and lamp from Capiz. (Genuine tortoise shell is used in the lamp.)

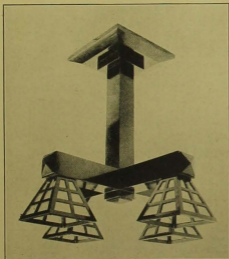


Plate XII. Chandelier of wood and shell, made at the Philippine School of Arts and Trades.

subjects spend one hundred and eighty minutes per day in shop work and drawing.

Out of a total of 17,242 boys in the intermediate grades, some 7,500 were enrolled last year in the shop courses and more than 2,000 in the regular trade classes.

EQUIPMENT.

The standard equipment of machinery consists of a 12-horsepower kerosene engine, a 24-inch single surface planer, a band scroll saw, a circular saw, turning lathes, and a grindstone. In addition to the above, several larger schools have swing cutoff saws, spindle molding machines, matching and molding attachments for the planer, buzz planers, etc. Most of the provin-



Plate XIII. Library set of red narra, Laguna Trade School.

cial schools have one or more forges with anvils and sets of blacksmithing tools. Iloilo, Pampanga, and Pangasinan are provided with ironworking machinery.

A few provinces seemed unable to bring their shops up to the standard, and so the Bureau recently made an allotment of ₱8,000 for additional tools in order to establish a minimum standard. These tools have nearly all arrived from the United States and are being distributed as rapidly as possible.

TEACHERS.

In the following provinces the shop department of the provincial school has been reorganized on the trade school basis, with a separate faculty and student body: Iloilo, Pampanga, Pan-



Plate XIV. Chipping and filing, Philippine School of Arts and Trades, Manila.

gasinan, Cebu, Bulacan, Batangas, Laguna, Oriental Negros, Sorsogon, Ilocos Norte, Leyte, Union, Samar, Bohol. In these schools the teachers are generally apportioned as follows: Shop work, 3 teachers (including principal); drawing, 1 teacher; academic work, 1 teacher. The trade schools in Iloilo, Pampanga, Cebu, and Pangasinan are larger than the other trade schools and have teachers as follows: Iloilo, 11; Pampanga, 9; Cebu, 7; and Pangasinan, 5. In the provincial trade schools about one-third of the teachers are Americans and two-thirds Filipinos. Some of the Filipino teachers have received their preparation in the United States, but the majority of them have come from the larger trade schools, principally the Philippine School of Arts and Trades in Manila.

Each year over fifty selected native teachers and pupils receive a year's instruction in the Philippine School of Arts and Trades at Government expense. Selections are made strictly on merit and the "pensionado" or scholarship student upon his return must teach a period of time equivalent to that during which he enjoyed a scholarship. This pensionado system was introduced four years ago, and in cases where the required preparation covers a period of two years or more, these teachers have gone back to their provinces and done satisfactory work. The law permits the various municipalities to send pensioned pupils to provincial schools under a similar arrangement. During the past six

years all of the advanced pupils in the Iloilo trade school have been required to teach pupils taking elementary work, thus giving them two entire days per week in practice teaching in shop work and drawing under a critic teacher. The difficulty of retaining good teachers is felt here as well as in the United States. Each year the Bureau of Education loses many of its more valuable teachers through the opportunities presented in house building, road and bridge construction, railway work, and many other branches where trained workmen are urgently needed.

INSPECTORS.

At the time of the introduction of the trade and shop courses in the various provinces, the Bureau of Education found it necessary to employ machinery inspectors to attend to the proper setting up of machinery and to supervise any repairs or changes which were needed from time to time in places where machinery had been installed. These inspectors have been very useful in keeping the machinery in good running condition so that the schools lose no time in waiting for planed lumber and other prepared stock.

In the Philippines the shutdown of the woodworking machinery in a school is a much more serious matter than it would be in the United States, owing to the fact that outside of Manila all the trade schools must depend upon themselves for mill work. This delay would not be very noticeable in ordinary shop work, but where schools are doing a large amount of commercial work and employing a large percentage of the students at regular

wages, conditions are very similar to those in a well-organized factory where a shutdown for any length of time throws a large number of people out of employment and has a depressing influence upon the community. In order to minimize the effects of a serious break in the machinery at any place, a machinery inspector is employed so that he can be rushed to the assistance of a school whenever a serious mishap occurs. All of the larger provinces have been supplied with machinery equipment, and only two additional



Plate XV. Forge work.

sets of machinery have been ordered during the past year. In the smaller provinces the required conditions for the introduction of machinery are being met very slowly, so that in the future the number of outfits installed will not exceed one or two sets per year. Partly owing to this fact, and also to the good care being taken of the machinery in all the provincial schools, it has been possible to get along with only one machinery inspector during the past year.

In February, 1910, the principal of the Iloilo Trade School was appointed as inspector of provincial trade schools and school shops, with instructions to introduce the commercial work and the accounting system which had been previously worked out under his supervision.

The commercial work and the accounting system of this school were considered by officials of the Bureau of Audits and Bureau of Education, and their principal features were incorporated in a uniform system prescribed for all provincial trade schools and school shops. Several of the regular forms used by provincial treasurers were added in order to harmonize the various operations with the accounts of the provincial treasurer. As a result of this the Bureau of Audits issued a circular in August, 1910, instructing provincial treasurers and others relative to the proper introduction of the system into all provincial school shops and trade schools.

This inspector's work consists principally in the examination of the school organization with respect to management, buildings, equipment, accounts, teaching force, class work, and commercial work. He advises in regard to improvements in buildings, estimates for the year's work, and the securing of funds for supplies, additional buildings, and equipment.

INTERMEDIATE COURSE.

In the primary shops, one year of woodworking is given. Beginning pupils in woodworking must commence with the practice work and exercises outlined for the primary shops. When a pupil has completed the primary exercises, he takes up the following intermediate work:

- | | |
|--|---------------------------|
| 1. Through mortise and tenon joint. | 9. Desk tray. |
| 2. Blind mortise and tenon joint. | 10. Panel joint. |
| 3. Pencil tray. | 11. Dovetail joint. |
| 4. Lap butt joint. | 12. Drawer dovetail. |
| 5. Small drawer, with lap butt joints. | 13. Wardrobe with drawer. |
| 6. Clothes cabinet. | 14. Lady's writing desk. |
| 7. Footstool. | |
| 8. Drawing board, T-square, and triangles. | |

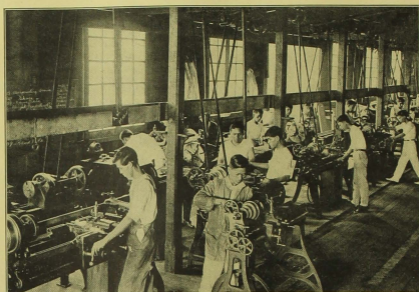


Plate XVI. At work on the iron lathes, Philippine School of Arts and Trades.

The trade course is based upon the shop work outlined above, with the addition of commercial work, which is determined largely by the demands of the locality. School and office furniture is continually required by the various branches of the Government, and private orders from people of the community come in faster

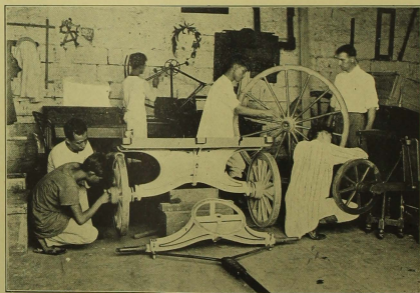


Plate XVII. In the paint shop of the Philippine School of Arts and Trades.

than they can be filled. Before undertaking the construction of the furniture mentioned below, the teacher must satisfy himself that a pupil understands the making of the joints involved before attempting the piece of furniture itself. The following list of school furniture is graded according to difficulty of construction:

- | | |
|----------------------------|-------------------------------|
| 1. Blackboard frames. | 9. Book chest. |
| 2. Drawing boards. | 10. Filing cases. |
| 3. School desk, rear. | 11. Teacher's desk. |
| 4. School desk, front. | 12. Bookcase. |
| 5. School desk, complete. | 13. Cupboard. |
| 6. Stand for native stove. | 14. Industrial material case. |
| 7. Teacher's table. | 15. Field desk. |
| 8. Domestic science table. | |

Suggestions for other articles of furniture are: Benches, stools, chairs, tables, beds, racks, writing desks, stands, screens, windows, doors, and other useful and salable articles in demand.

COMMERCIAL WORK.

One of the main features of the work of the trade schools is the commercial work. The original idea of the commercial work was to furnish employment for many of the advanced pupils who would otherwise have been forced to leave school and work for lower wages than they could make in the school where they are employed as semiskilled laborers. Pupils work half a day at the commercial work and attend the regular classes the other half day. A very important secondary consideration was the inculcation of the business principles in vogue in regular commercial shops.

Briefly explained, this system allows pupils to take contracts for turning out various articles of furniture ordered by the Government or by private parties. If the work is done outside of school hours, the pupil receives wages based upon the rate paid for similar work by private concerns. The school generally furnishes the material for the furniture or other jobs that have been undertaken, and the cost of the article is determined by adding a surcharge of 20 per cent to the value of labor and material, to cover waste, fuel, and depreciation of equipment.

The popularity of commercial work and the resultant efficiency of the pupils trained under this system led to its introduction not only in the provincial trade schools, but also in the shop departments of all other provincial schools. The extent to which it was introduced depended upon the advancement of the pupils and the ability of the teachers to handle the work.

COST OF MATERIALS AND VALUE OF OUTPUT.

On account of the impossibility of securing any quantity of seasoned lumber in the Philippines, trade schools that are doing a considerable amount of commercial work must be provided with a large stock of lumber, so as to allow for its proper seasoning before it is worked up into furniture. It has taken years to impress this fact upon the officials who furnish supplies for the regular trade schools, but each year shows a decided increase in the amount of supplies purchased, which, during the past year, amounted to ₱48,932.28. The total appropriations for the twelve



Plate XVIII. In the carpentry shop of the Trade School.

provincial trade schools during the past year were ₱77,369.97. This included not only the supplies above mentioned, but ₱12,257.68 for new buildings and additions to old ones. The balance, ₱16,180.01, was used for clerical assistance, office equipment, janitor service, and various incidental operating expenses. The total amount of articles manufactured during the past year was ₱53,978.98; the value of articles sold was ₱51,835.60. Excluding salaries of teachers the profit on work turned out during this period was ₱15,965.48. Under the present accounting system, the income from trade schools is returned to the provincial treasury, so that it is readily seen that the schools are not a burden on the provinces, but are more than self-supporting in respect to expenditures for supplies and materials.

THE PHILIPPINE SCHOOL OF ARTS AND TRADES.

The Philippine School of Arts and Trades was organized in 1901 and has grown steadily each year both in respect to enrollment and number of courses. This school is an Insular school and possesses quite a number of characteristics which differentiate it from the provincial schools. The latter offer academic work of intermediate grade only, while this school offers the essentials of both the intermediate and secondary academic courses. The provincial schools provide a three-year course, usually in woodworking alone, whereas this school provides



Plate XIX. The wood machinery department.

a four-year course in eleven shop departments. The following table shows the distribution of pupils by courses and grades:

By courses:		By grades:	
Normal industrial course.....	60	Fourth-year secondary	4
Preparatory engineering	12	Third-year secondary	9
Drafting	20	Second-year secondary	48
Cabinetmaking	114	First-year secondary	116
Building construction	21	Seventh-grade intermediate	98
Wheelwrighting	54	Sixth-grade intermediate ...	113
Machine-shop practice	105	Fifth-grade intermediate ...	155
Stationary engineering	36		
Automobile operation	32	Total	543
Blacksmithing	51		
Ceramics	38		
Total	543		

Most of the provincial schools draw their pupils from one province alone, but this school has representatives from every province. The present enrollment in the Philippine School of Arts and Trades is 543 pupils, representing the following provinces:

Manila	109	Misamis	3
Albay	9	Mountain	2
Antique	2	Nueva Ecija	4
Bataan	1	Nueva Vizcaya	2
Batangas	9	Occidental Negros	4
Bohol	3	Oriental Negros	3
Bulacan	47	Palawan	2
Cagayan	2	Pampanga	42
Camarines	3	Pangasinan	23
Capiz	9	Rizal	61
Cavite	17	Samar	8
Cebu	11	Sorsogon	9
Ilocos Norte	36	Surigao	1
Ilocos Sur	11	Tarlac	9
Iloilo	7	Tayabas	12
Isabela	4	Union	22
Laguna	21	Zambales	11
Leyte	23		
Mindoro	1	Total	543

AIM.

The courses are designed primarily to train young men to earn a livelihood by following a trade. The preparatory engineering course is the only one not so designed. It is given because there is no other institution in the Islands prepared to give the shop work which an engineering student should receive.

Only able-bodied boys who have finished at least the primary course are admitted. The average entrance age is a trifle over seventeen years. Upon matriculation, each applicant for admission must sign a written statement to the effect that he intends to follow a trade upon graduation. Graduates receive certificates upon the satisfactory completion of a four-year shop course. Graduates who have also completed the academic work prescribed for the first year of the secondary course or more are entitled to a diploma only after a year's successful experience in their chosen trades. Graduates of the normal industrial course who complete all of the prescribed secondary work are eligible to civil-service status as junior industrial teachers without further examination.

No pupil is allowed to remain more than two years in the same grade. In case of inability to pass the second examina-

tion, the pupil must leave school unless his shop instructor recommends him for proficiency in shop work, in which case he is continued as a "special," dropping his academic work and devoting his whole time to shop work and drawing. As soon as a pupil is found to possess no mechanical bent, he is immediately advised to leave school, no matter what his academic standing may be.

EQUIPMENT.

Drafting Department.—Two large rooms, well lighted, containing a floor space of 250 square meters, are used for instruction in drawing and design. A separate room containing the necessary apparatus is used for blue printing. Tracings of over five hundred valuable drawings are filed and referred to by a card catalogue. A card index is kept showing the record of all pupils who enter this department. The department is equipped with eighty individual drawing tables, models of various kinds, filing cases for tracings, drawings, and blue prints, and storage cases for instruments and supplies. Each pupil

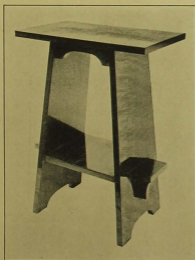


Plate XXI. A magazine stand.

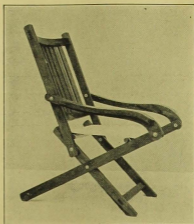


Plate XX. A popular porch chair made in the Cuyo school shop.

has a drawing board, T square, and a complete set of instruments; in addition, curves, protractors, easels, a pantograph, etc., are used as occasion demands.

Machine Shop Practice.—The shop is equipped with one 14-inch and one 20-inch American lathe, one 16-inch Manning, Maxwell and Moore lathe, four 12-inch Niles-Bement lathes, one American shaper, one Le Blonde milling machine, one American crank shaper, one Pratt and Whitney crank shaper, one Sigourney sensitive drill, one Niles-

Bement-Pond 24-inch power drill press, one Barnes 25-inch power drill press, one Greenard arbor press, and one Diamond power emery wheel.

Woodworking.—The woodworking department occupies two large shops. The department for first-year pupils is equipped with a full assortment of hand tools and double work benches. After the first or second year, depending upon individual proficiency, the pupil advances to the wood-machine department which is furnished with one Fay and Egan 26-inch planer, one Oliver hand jointer, one Fay and Egan circular-saw frame, seven Putman 10-inch lathes, two Putman 18-inch lathes, one Fay and Egan 7-inch lathe, one Fay and Egan molding machine, one Oliver wood trimmer, one Fay and Egan band saw, one automatic knife grinder, one power emery wheel, one automatic band-saw sharpener, and one 25-horsepower steam engine and boiler.

Wheelwrighting.—The wheelwrighting department occupies two large rooms, one for the shop and one for painting. The shop is plentifully equipped with a full line of work benches and hand tools in addition to a hub-boring machine and a tenon machine. All of the machines in the wood-machine department are also available for use.

Blacksmithing.—The shop is 110 feet by 36 feet wide. It is equipped with ten concrete forges made by the pupils themselves.

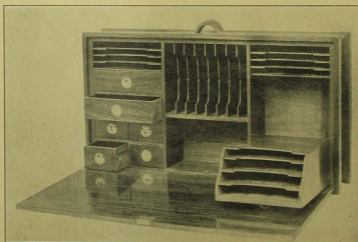


Plate XXII. Portable filing case of tindalo, Leyte Trade School.

The blast is furnished to the fires by a blower operated by steam power. Each forge is equipped with one anvil, one tool stand, hammers, tongs, pincers, flatters, fullers, punches, and round

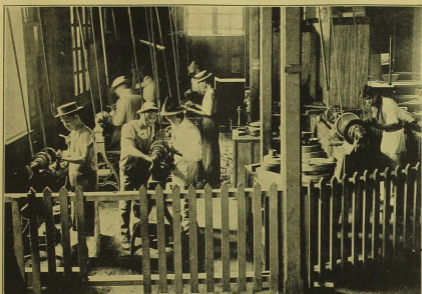


Plate XXIII. Wood turning, Philippine School of Arts and Trades.

and cold chisels. The shop is also equipped with a hand drill, a Niles-Bement-Pond 1,500-pound steam hammer, and a swinging crane to handle the heavy forgings. The power drill in the machine shop is used whenever occasion demands. No pupil is allowed to use the steam hammer until he has learned to swing a sledge. Thus the use of machinery does not preclude the important hand skill which every blacksmith must possess.

Ceramics.—This department is equipped with twelve potters' wheels, sets of molds, clay-refining apparatus, iron glaze mill, ball grinder, lathe, polisher, cup machine, plate and saucer machine, large kiln, and a small test kiln. The building, potters' wheels, blunger, and settling tank were made by the pupils of the woodworking department. The models, kilns, and all kiln furniture were made by the pupils in ceramics.

PLAN OF INSTRUCTION.

The school day consists of six hours and forty-five minutes, of which three hours are spent in shop work and the balance in academic work and drawing.



Plate XXIV. A tindalo pedestal for a heavy vase.

The following extract from the latest catalogue explains the methods in vogue in the school: "In arithmetic, stress is laid upon practical problems which are submitted by the shop instructors, graded by the academic teachers, and taught either in lieu of or supplementary to the regular texts. The problems cover various phases of all trades taught in the school, deal almost exclusively with articles and affairs pertaining to local conditions, and make use of current market prices and measures. In language work, phrases, sentences, paragraphs, and themes dealing with shop work are encouraged. In addition to the common words found in the regular reading texts, a spelling list of all shop tools, materials, and equipment used in each trade has been compiled and made an essential part of the curriculum.

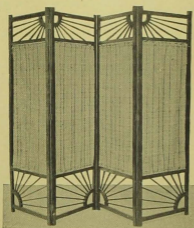


Plate XXV. Folding screen of narra and Ilocano cloth.

In reading, emphasis is placed upon literature dealing with industrial subjects, with the purpose not only of widening the pupil's practical knowledge of the trades, but also of inculcating the dignity of labor. Current newspapers and magazines are read in class so as to stimulate the reading habit and to enable the pupils to grasp the meaning of articles written in what is to them a foreign language. In civil government, the classes review their work by organizing school councils, provincial boards, and insular assemblies. After the first year's work in each shop, the pupils are advanced in commercial work as rapidly as possible. For all commercial jobs, work orders are made out, labor is reported on daily time slips, materials are issued only by the storekeeper on properly executed requisitions, and tools are checked in and out by pupil toolkeepers. Although emphasis is laid strongly upon commercial work and many phases of modern shop organization are maintained, yet the use of carefully worked out exercises in the first year, the judicious intermingling of class and individual exercises, and the correlation of the drawing and academic branches with the shop work, make a real educational institution and not a factory with its usual attendant evils."

The following table sets forth in detail the value of the com-

mercial work performed during the last school year. By "class labor" is meant labor performed during the regular class hours for which the pupils are not remunerated. "Paid labor" indicates the amount paid to pupils for work performed outside of the prescribed daily program of six hours and forty-five minutes.

Shops.	Materials.	Class labor.	Paid labor.	Total net cost.	Selling price.
Finishing	P584.49	P638.98	P146.34	P1,369.81	.....
Automobile	1,975.63	1,068.21	394.90	3,428.74	.....
Wood machine	10,915.76	1,555.46	1,834.75	14,305.97	.....
Wood bench	560.07	265.60	6.53	832.20	.....
Wheelwrighting	624.26	593.22	288.26	1,505.74	.....
Iron machine	834.90	1,712.48	274.06	2,821.44	.....
Drawing	157.79	114.46	306.48	578.73	.....
Blacksmithing	394.71	410.06	12.45	817.22	.....
Pottery	193.30	48.18	.....	241.48	.....
Total	16,240.91	6,396.65	3,263.77	25,901.33	P33,134.43

As many of the jobs run through different shops, the selling price is not determined until the articles are completed and no record is kept of the profit accruing to each shop. In connection with these figures, it should be noted that the wood-bench department is composed solely of beginners and that the pottery department has just completed its first year of existence.

TEACHERS.

The academic department has six American teachers and one Filipino teacher. The industrial departments employ nine

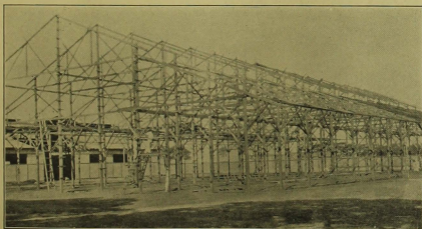


Plate XXVI. Bureau of Education Building at the Philippine Exposition of 1912.

Constructed by pupils of the Philippine School of Arts and Trades.

Americans and eleven Filipinos, the latter including the engineer, the storekeeper, and the time clerk.

SCHOOL RESTAURANT.

One of the special features of the school is the noonday lunch, financed by the Athletic Association. A good native cook and one assistant are employed. One hundred and fifty pupils and eight teachers take their noon lunch at the school restaurant, while some further fifty-odd pupils buy something each day. The staples consist of soup, rice, fish or meat, and homemade bread. These are sold at actual cost or at a loss, while other items, such as cake, coffee, soft drinks, ices, etc., are sold at a small profit. This system enables the poorer pupils to get a substantial hot lunch at rock-bottom prices. At present, the pupils are purchasing



Plate XXVII. Dining-room set made by pensionados in the Philippine School of Arts and Trades.

daily 150 portions of rice, 90 of fish or meat, 5 gallons of hot soup, an equal amount of ice or sherbet, 350 rolls, 200 small pieces of cake, and other minor articles. Each day some extra dish is offered, such as baked beans, tomatoes, or the like. One sack of rice is consumed in three meals.

LAST YEAR'S GRADUATES.

Graduates of the school have no difficulty in securing employment at an average salary of fifty pesos per month. Last year eighteen pupils from the automobile department secured positions, fourteen as chauffeurs and four as mechanics. The Bu-

reau of Education employs most of the graduates in woodwork-
ing. Out of last year's class of twenty-five graduates, twenty
are now teaching for the Bureau of Education. One went to
Butuan in Mindanao, one to the Batanes, one to the Lolomboy
school, and the remainder were scattered throughout the Islands.
Four of the graduates are taking advanced work, and one is
employed as a draftsman.

Out of the nine members of last year's graduating class in
machine shop practice, one is continuing his studies, one is
teaching, five are working for private concerns, and two have
not reported their whereabouts.

This Bureau has recently received a number of school journals
published by several American Indian schools in the United
States. As a general rule, the journals themselves are printed
by the students in these schools and are concrete evidences of
the kind of instruction which the young Indian students are
receiving. Emphasis is placed upon the trades and gardening.
The object is to train the students of these schools for a better
and more independent life than their fathers may have had, and
to fit them to fill some useful place in life; to be worthy and
self-supporting citizens of their country, rather than helpless
charges as in the past. The Indian schools turn out lawyers and
doctors; but they produce in far greater numbers farmers and
mechanics; and the record of graduates in after life, when they
settle down to lives of usefulness and productiveness, is gratify-
ing indeed.

"Introduce a little active participation in the care of plants
and grounds and at once to each and every child the garden
becomes 'our' garden, and an injury to it a personal affair;
any praise or merit becomes a comment on something 'I made
or helped make.' This brings out the care of public property,
consideration for others and responsibility toward public good."
—M. Louise Greene.

"Education is beginning to have a real meaning; it is begin-
ning to teach subject-matter in terms of actual daily life and
is taking hold of every factor that means much to the people."
—Arthur D. Dean.