UNITED STATES BUREAU OF EDUCATION
BULLETIN, 1913, NO. 25 - - - - - - - WHOLE NUMBER 535

INDUSTRIAL EDUCATION IN COLUMBUS, GA.

BY

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, D. C., April 4, 1918.

SIR: All are beginning to feel that the work of the public schools should be better adapted to the conditions and needs of the children, and that to attempt to run all children through the same kind of school mill, in the same way and in the same time, is not best. The city of Columbus, Ga., was one of the first in this country to work out certain phases of the problem of adaptation. The accompanying manuscript sets forth clearly how this has been done in two schools of that city. I recommend that it be published as a bulletin of the Bureau of Education.

Respectfully submitted.

P. P. CLAXTON, *Commissioner.*

THE SECRETARY OF THE INTERIOR.

INDUSTRIAL EDUCATION IN COLUMBUS, GA.

In the year 1898 compulsory elementary courses in manual training and domestic science were introduced into the grammar schools of Columbus, Ga. This then advanced step in education in this section was taken in response to a general feeling that the school work of this city was not meeting the needs of the people. There was not, of course, a demand in so many words for practical courses for the schools, but there was expressed dissatisfaction with what was offered, and many children themselves showed their want of interest by leaving school as early as their parents would permit.

This work has since been extended through the first year and a half of the traditional high school, and differs little from the work done in these departments in many other cities. The plan has been to devote one double period a week to shop or laboratory work and one period to drawing, which to some extent is correlated. A building specially constructed and equipped for this purpose is used as a manual training and domestic science center for a group of schools, and all shop and laboratory work is done here. For the first four years these subjects are taught in a very elementary way by the grade teachers. After that the work is conducted by special teachers.

INDUSTRIAL WORK FOR NEGROES.

Industrial work was introduced into the schools for negroes at the same time that it was given to the white children, but since it is not identical it might be well to make some statement of the extent of the work in our colored schools. In these schools the industrial, as well as the academic work of the primary department (which includes the first, second, third, and fourth grades), is directed by the grade teacher. The industrial work in grades 5, 6, 7, 8, and 9 is conducted by special teachers for the various subjects taught. One hour per day is given in each of these grades to industrial work.

The boys divide time equally between the work in the carpentry department and the blacksmith shop. The section of the grade that gives one hour to carpentry to-day will spend one hour in the blacksmith shop to-morrow. In other words, they alternate between these subjects.

The girls give equal time to cooking, sewing, and laundering. When a class leaves the academic department it is divided, one part

taking cooking, another sewing, and the other laundering; and the next day, of course, they change.

The child is therefore given industrial work five hours a week for five years. This is thought to be sufficient to give his education a practical turn and in a measure help him to begin the work of life on a higher level than he could possibly do otherwise. Then, too, such training enables the boy or girl to advance more rapidly.

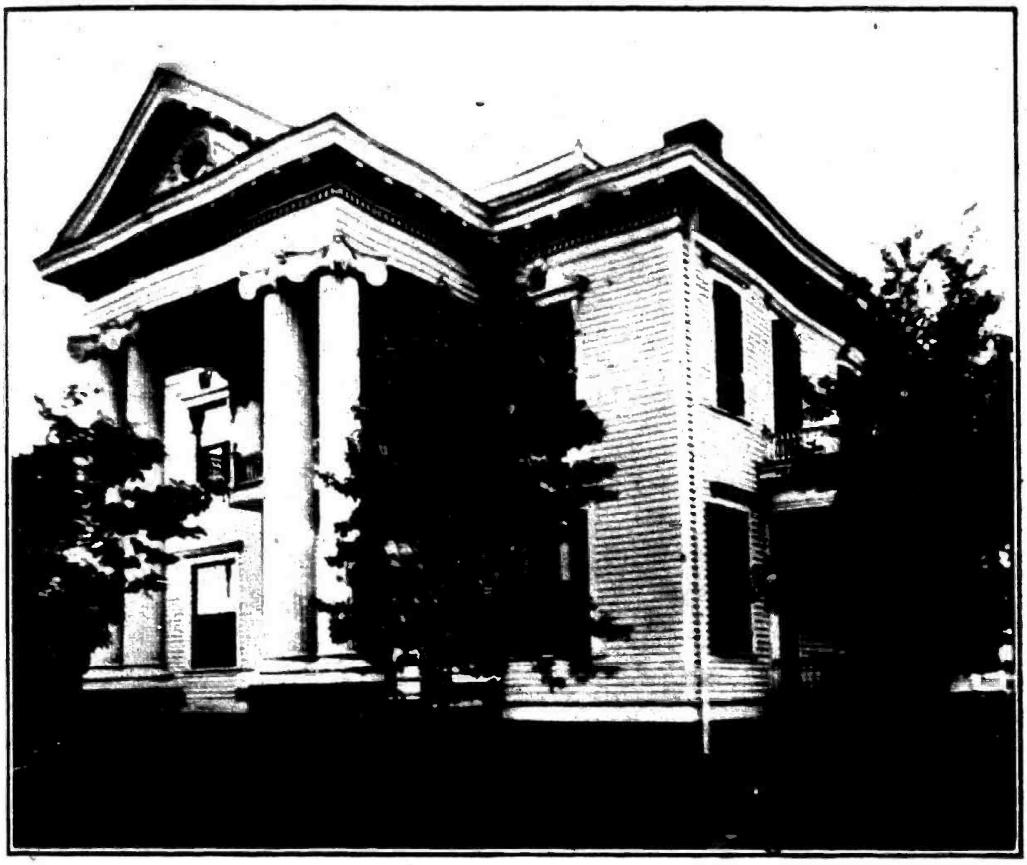
The value of the equipment for the blacksmith shop would not exceed $150, not counting the cost of the special building. The wood shop is equipped only with benches and hand tools, and the total value of this equipment would not exceed $200. The sewing department is equipped with a half dozen sewing machines, tables, chairs, etc., and the cost of equipment for this room is $200. The kitchen is equipped with one coal-burner range, one gas range, and individual equipment for classes. The value of this is about $150. The equipment for the department of laundering is very simple, consisting of tubs, ironing boards, ordinary flatirons, electric irons, etc., and is worth $75.

The main purpose in the work for the negroes is to prepare them for the lines of industrial work open to them. No attempt is made to give them training in the use of high-grade machinery. The school has developed a number of good blacksmiths, carpenters, cooks, seamstresses, and laundresses. Pupils who remain in the schools long enough to complete the course receive in compensation for their labor upon leaving school about twice what they would receive for unskilled labor such as they would be able to render without such training. It is often the case that one of these boys is able to earn $2 a day at the age of 17, when his father, without such preparation, receives $1.25 for unskilled labor.

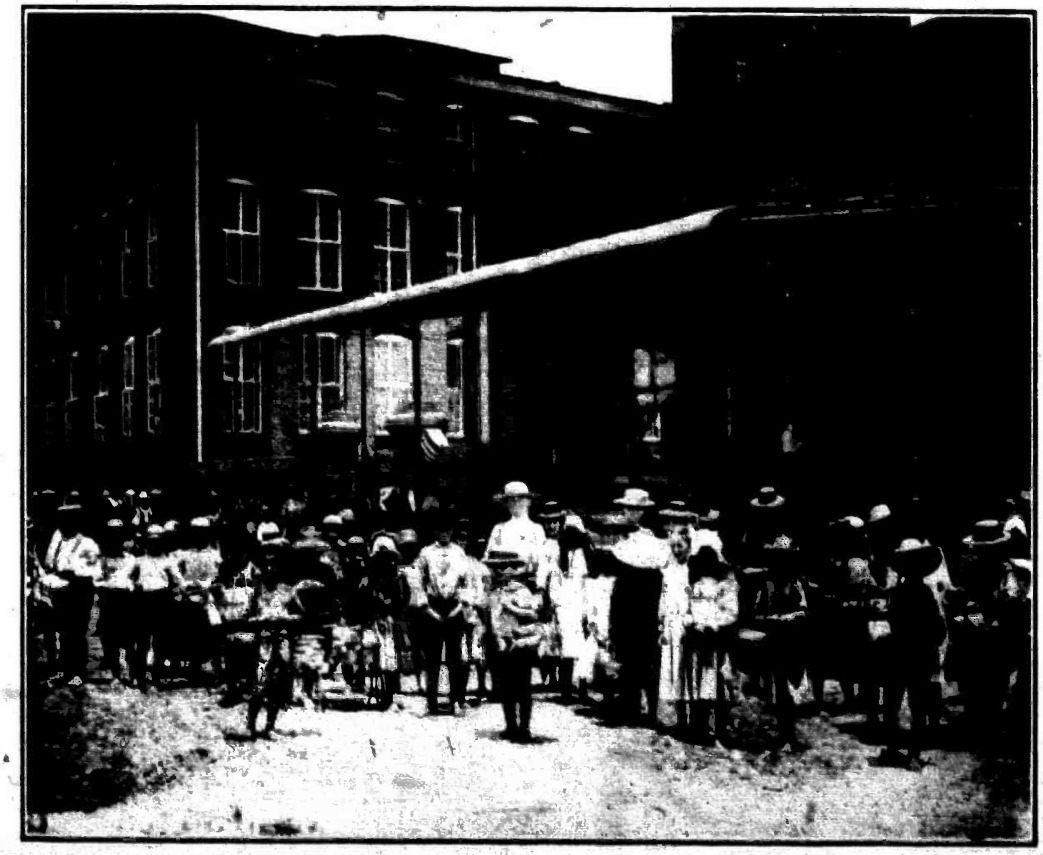
A SCHOOL FOR CHILDREN OF MILL OPERATIVES.

Soon after the introduction of manual training and domestic science into the public schools a school was established in a cotton-factory district, under the name of the Primary Industrial School, for the children of mill operatives. Since that time the name has been changed to the North Highlands School to remove any prejudice that might exist against the school on account of its name.

The mill-operative element in Columbus comprises about one-fourth of the city's white population, and there are possibly 800 children of school age among these operatives. In the absence of compulsory education laws, few of these children prior to this time attended any school, and when they did enter they seldom remained long enough to secure its benefits. Less than 5 per cent continued in school after they were old enough to work in the cotton mills.



A. SCHOOL FOR CHILDREN OF MILL OPERATIVES.



B. DINNER CARRIERS AT THE MILL.

A. CLASS IN SEWING.

B. GARDENING FOR GIRLS.

This school was first organized in an old rented residence ill-adapted to its uses save in the matter of the social feature. It remained here for three years, or until 1904, when the board of education, in order to more fully carry out the purposes of the school, purchased at a cost of $10,000 a large colonial home, with spacious grounds, near the center of the mill population.

The main dwelling, which contains 10 large rooms, is located on a three-fourths of an acre lot, and through the kindness of the owner an adjoining half-acre lot is used, and thus the grounds are enlarged. On the place purchased there was a modern barn, which was transformed into an almost ideal structure for a kindergarten and a wood shop for the boys.

This school is not made to conform either in course of study or hours to the other schools of similar rank in the system, for the board desires to meet the conditions and convenience of the people for whom the school was established. Classroom work begins in the morning at 8 o'clock and continues until 11 o'clock, with a recess of 10 minutes at 9.30. The afternoon session begins at 1 o'clock, and the school closes for the day at 3.30 o'clock.

The long intermission in the middle of the day is necessary in order that children may take hot lunches to parents, brothers, sisters, and others who work in the mills. Many of the mills are some distance from the school—some more than 1 mile away. Most of the children, therefore, walk more than 2 miles during the noon hour. Besides, they are compelled to wait 20 or 30 minutes for the operatives to eat their dinners before taking the baskets back. Some children earn several dollars per week by carrying such baskets to mill operatives. The price usually paid for taking lunch to one person for a week is 25 cents, and children often take lunches to several persons. They frequently style themselves "dinner toters" and the school the "dinner-toters' school."

The academic courses in this school are similar to the courses offered in the other schools of the system, except in its severer adherence to the "three R's." Knowing that the time is very limited in which these children will attend school, more attention is given to what may be regarded as the fundamentals. While the prescribed course contemplates seven years, few continue after the fifth or sixth year, so strong is the call of the mills. Not more than 1 per cent finish this school and pursue their studies further.

The three morning hours and the first hour in the afternoon are devoted to academic studies, while the last hour and a half of the day is given to practical work. On account of the simplicity of the work, one teacher may have three or four sections in one room, giving 15 or 20 minutes to the lesson, according to grade.

There are in this school 175 in attendance at this time. All boys are required to take elementary courses in wood work and gardening. The shop equipment is simple, consisting of a dozen workbenches, with vise and the usual bench tools. The total cost of these would not exceed $300. The tools used in gardening are hand plows, rakes, hoes, spades, pitchforks, etc. The value of these is about $50. The boys who work in the wood shop to-day work in the garden to-morrow, and on the other hand those who work in the garden to-day go to the shop to-morrow, alternating between the two.

Girls are given work in basketry, sewing, cooking, poultry raising, and gardening. Time is about equally divided among these activities. The value of the equipment in these departments is about as follows: Machines, etc., for sewing, $100; kitchen and dining-room equipment, $200; incubator, brooders, poultry house, etc., $200.

In all of these lines of work it is now the hope of the school only to better living conditions a little among the people for whom it was especially organized. The transformation is necessarily slow. In the beginning, no doubt, the advocates of this type of school thought that many might be induced to continue in school and do more advanced work, especially along vocational lines. In this respect the school has been a disappointment to some. We are seldom able to induce pupils to finish even the limited course offered in this school.

The present teaching force was selected from the corps of the grammar schools of the city system. Only teachers who showed special aptitude for dealing with pupils such as they would meet in this school were transferred, and then only after they had requested the change. The principal and five assistants are all women that have had training along industrial as well as academic lines.

The school formerly observed the same time for vacation as the regular grammar schools of the system. It was found, however, that there was considerable loss in not keeping in constant touch with these people. After a three-months' vacation it required some time to reorganize the forces that make for good attendance and social welfare. Besides, the grounds, with the swimming pool, shower baths, gymnasium, etc., are of more value to pupils and people (all of whom have access to the grounds) in summer than any other season of the year. So the school is now in session all the year round, and pupils are promoted quarterly. The teachers take their vacations at different times, each one working three out of four quarters of the year. The teachers live in the school, which is open to the people of this community in the evening, as well as at other hours when the school is not in session.

While this school may not have met the full expectations of some of its friends in some respects, it has more than done so in others. The social work, such as looking after and advising in cases of sickness, has been especially helpful to the people of the community. Every day the principal and teachers visit some of the homes, sometimes distributing needed charity and giving helpful suggestions on sanitation, caring for the sick, etc.

Confidence is now so strong that one of the teachers every Saturday morning collects the physically defective ones in the community and takes them to the free clinic for operations or treatment. At first parents would see their children die rather than permit them to be operated upon, but now they seldom decline to permit them to be taken by a teacher to the free clinic, when in the judgment of the teacher it is necessary.

The school is used as a medium for the distribution of certain charity. One local woman's club supplies buttermilk in summer and soup in winter to the kindergarten pupils, while another undertakes to keep up a well-selected library suited to the needs of these people. A Sunday-school class of one of the leading churches has installed simple gymnasium apparatus. One generous man who is an employer of some of the people here donated a high-grade piano, that the young people might assemble in the evenings and have music. The best musicians of the city sometimes go out in the evening and play for them. Other employers often donate cash sums of money immediately preceding the Christmas holidays, that Santa Claus may visit the school at the appropriate time, bringing joy to the hearts of the pupils.

Organizations for the older people are maintained in the school under the direction of some of the teachers. Preceding each Christmas, the mothers assemble at the school and aid the teachers in making and arranging Christmas presents for each of the children.

The grounds, which are supplied with swings, joggling board, swimming pool, etc., are open to the children at all hours of the day and all days of the week. It is not infrequent that, when the mother goes to work at 6 in the morning, she sends her children to the school to enjoy the privileges of the grounds until the opening of the school at 8 o'clock.

While this school has done good work and its benefits have been felt, we are sure that the weakest point in it is in not being able to hold the children long enough to receive its full benefits. An enforced-attendance law would aid very materially in this respect.

THE INDUSTRIAL HIGH SCHOOL.

The favorable response of the people and pupils to the substitution of practical work in the elementary schools led to the suggestion and later to the establishment of a vocational school of high school rank. This suggestion was reenforced by the great need of more skilled labor in this industrial community. The name given to the school was the Secondary Industrial School, but this name was afterwards changed to Columbus Industrial High School on account of the seeming connection between this school and the Primary Industrial School mentioned above. It was thought in the beginning that the Primary Industrial would prepare pupils for the Secondary Industrial, and when it failed to do this, the names indicated a relationship that did not exist, and they were therefore misleading.

Columbus, being at the head of navigation on the Chattahoochee River, enjoys cheap and abundant water power. This fact, and its proximity to the coal and iron fields of Alabama, make it a manufacturing and industrial center of considerable importance in this section. There are located here a number of woodworking industries, iron works, foundries, cotton mills, ice plants, flour mills, etc.

Accordingly, in 1906, largely through the generosity of wealthy and well-to-do citizens and former citizens of this city, the Industrial High School was projected as a part of the local school system, and was formally opened in December of that year. It was the first school of this character in the United States so established and maintained.

A lot was donated containing 2½ acres, located in the northern part of the city near the end of the car line, 1½ miles from the center of the city; and upon this the main school building was erected. Since then the city authorities, realizing the great benefits that come from ample playgrounds, purchased for the school an adjoining lot of 1½ acres, making in all 4 acres. This acreage will be sufficient to add other buildings and at the same time maintain an athletic field for tennis, basketball, baseball, football, etc.

While it was not emphasized at the time of the establishment of this school, the pure air and ample grounds have meant much to its pupils in the way of health, pleasure, and comfort. In fact, all that could be said in this respect for "country schools for city boys" can be claimed for this location. Some have entered this school who were subnormal in physical development, but who during the three years out here have developed into first-rate athletes. Indeed, the nature of the work within the school and the grounds without have produced fine physical results in almost every instance.

Plans were drawn providing for one central building and several smaller ones. The principal building was intended to be used for

administrative and academic purposes largely, and the special departments were to be housed in separate smaller buildings. So far the main building is the only one that has been erected. This building is 145 feet long, 75 feet wide, and has three stories besides the basement. It contains in all 40 rooms. The installation of an automatic sprinkler system gives ample fire protection. The cost of this first building was about $70,000, and its total equipment is valued at $30,000.

At the laying of the corner stone of the building there were a number of distinguished speakers, and in the light of subsequent results it will be of interest to note the prophetic words of some of them.

James E. Russell, dean of Teachers College, said:

> We have been engaged in developing a system of education in this country for about 300 years, and this school is the first of its kind in all our history to be dedicated to the proposition that the common man, as well as his more fortunate brother, is entitled to vocational training. We have colleges and universities and professional schools galore for those who can go to them, but nowhere in this country can the boy or girl who must earn a living at the age of 18 or 20 find the necessary industrial training given at public expense. * * * And you citizens of Columbus, in building this school, are entering into a solemn obligation to make it a success; you are duty bound to make it succeed, not only for the sake of your own children, but because you are voluntarily taking upon yourselves the task of leading the American people to a broader conception of public education than they have ever had before.

In speaking of the need of such a school in this section and in this city, G. Gunby Jordan, at that time president of the board of trustees, said in part:

> To fill positions of prominence in our present and future mills and institutions, and to provide the South with valuable technical skill, the board of trustees of the public schools of Columbus have determined that our school system shall be a perfect one, concluding with this junior school of technology, this secondary industrial school, this trade school with academic department, where intimate reciprocity shall exist, a school which will give much from within and receive much from without. In its halls rich and poor will meet on equal terms as learners. Its departments will throb with life and grow with the world without.

Carleton B. Gibson, the superintendent of schools at that time, said of the school:

> To generously maintain such a school will be giving to the people, the common people, the wealth-producing people, the very best there is in education. It will be fitting the youth for immediate honorable service to mankind, which is one of the chief functions of education, and for remunerative employment where their skill and efficiency will make themselves successful and will combine to the greater industrial work of the South.

The aim of this school is to give to the boys and girls of this community and contiguous territory an opportunity to make some definite preparation for life's work, as well as to give them the culture that may be obtained from the study of the ordinary high-school

branches, all of which are taught in this school except the languages. It was not and is not our purpose to make journeymen, but we do so prepare pupils that they may begin life upon a higher level than those who have not had their activities so directed; and we intend that their preparation shall be such that there shall be absolutely no limitations placed upon their advancement in their vocations in after years.

The school appeals strongly to that class of young people who are so industrially and commercially inclined that they leave school and accept positions where little skill is required, at meager salaries, rather than pursue to them meaningless and uninteresting courses. While it was not so intended particularly, young people are finding the work of this school a fine preparation for the higher technical institutions, such as the Georgia School of Technology and the Alabama Polytechnic Institute. About 25 per cent of the graduates of the school continue their studies in these institutions, where credit is given hour for hour for work done in the industrial as well as in the academic departments of the school.

The grammar schools provide a seven-year course including, besides the usual academic work, courses in manual training and domestic science, as mentioned above. Then pupils who complete the grammar schools may enter either the traditional high school or the Industrial High School. The former offers a four-year course of 180 school days per year, while the latter offers a three-year course of 225 school days per year. Pupils in the seventh grade (the last year of the grammar schools) are advised of the purposes and training that each of the high schools has to offer, and then they are left entirely free, so far as the school authorities are concerned, to choose between them.

A pupil may be transferred from one high school to the other if he and his parents and the superintendent are convinced that a mistake has been made in the choice of schools. There is no special articulation in the work of the two schools, and consequently there is usually a loss of a half year or more whenever a pupil is transferred. During the first year or two after the industrial school opened there were quite a number of transfers asked for, but now the purposes of the two schools are so well understood that not more than two or three transfers are made per year.

Pupils are not admitted to this school until they are 14 years of age. The average age at the time of entrance is 14.9 years. They are permitted to enter after they have completed the seven-year grammar-school course, making the terms of admission about the same as those for the traditional high school. Thus it will be seen that this school takes them just at that period of life when so many

drop out of school altogether, and prepares them for remunerative positions which in the past they have been unable to secure.

There is no prejudice against attending this school. There may be found here the sons of the well-to-do and the sons of the less fortunate, plying their work side by side in their overalls. The school is maintained by the people in the interest of no class, and its doors are open to all alike. A fee of $5 is charged pupils living within the city limits for the use of all books and supplies for the term, and a tuition fee of $15 is charged nonresident pupils, in addition to the above fee for books and supplies.

The school day begins at 8 o'clock in the morning and closes at 4 in the afternoon, for five days in the week. Only one intermission is given each day—from 12 to 1 o'clock. For the first three years the school was in regular session from Monday morning until Saturday noon, but now only those pupils are required to return on Saturday who have not maintained the required standard during the week. Many, however, do voluntarily come on Saturday for the purpose of working in the industrial departments on articles for their own use and pleasure.

While it was intended to duplicate in a measure conditions and hours that are maintained in the industrial plants of the city, it was found that some objection was raised to making school work so serious as to occupy practically the whole time of young people of this age for six days in the week. The pupils themselves objected to six days' work, and this perhaps grew out of the fact that all the other schools of the system had holiday on Saturday. The present practice is found to be more satisfactory from the standpoint of results and no doubt will be continued.

The school year begins the first Monday in September and closes the middle of July. Formerly the school was in session 11 calendar months in the year, but experience has taught us that it is better to give a vacation of six weeks in place of a month. In the first place, the old custom of having a three-months' vacation between sessions was hard to overcome, and the fact that this school was in session so long after all other schools of the system had closed we found was affecting its attendance to such a degree that the board deemed it advisable to make this concession and extend the vacation two weeks.

All pupils are required to take academic work of high-school grade in mathematics, history, English, and science (see tabulated course of study). The extent of the work in these subjects is about the same as that of the usual high school. It may be seen that there are 720 school days in the four-year course of the traditional high school, while there are 675 days in the three-year course of the Industrial High School. There are, therefore, only 45 more days in the one than in the other, to say nothing of the difference in the length of the

school day. The traditional high school is in session 5½ hours per day, while the Industrial High School is in session 7 hours per day, making a difference of 1½ hours. In the latter a little more emphasis is placed upon what might be called practical topics, or those that bear most directly upon the shopwork and consequently upon the usual work of life. while in the former the academic courses embrace much that might be regarded as cultural without so much regard to the uses that it may be put to in ordinary life. For instance, in the course in English more time is given to composition; business communications, and forms in the Industrial High School than in the traditional high school; while on the other hand the traditional high school gives more attention to the study of pure literature. And so it is with the other academic subjects taught in the two schools. As a matter of fact, however, pupils who have gone from the Industrial High School to higher institutions enter the same class in the academic subjects (except the languages) as those who go from the traditional high school.

The academic work is related as closely as possible to the trades courses. For instance, the science teacher cooperates with the specialist who is in charge of the textile department in the matter of dyeing. The chemistry course, so far as the pupils in this department are concerned, has special reference to the work of that department; while in the domestic science department the chemistry has special reference to the analysis of foods and their nutritive values. In the department of English, pupils are required to take topics from their trades courses as subjects for themes, and the special teachers of the trades courses correct the papers with reference to facts, while the head of the English department criticizes and grades them with reference to their form and literary value. The problems in mathematics used in the classroom grow largely out of the work of the shops. And the history teacher presents his subject especially from the industrial point of view.

VOCATIONAL COURSES.

All pupils, besides being required to take the full three-year academic course, must choose one of the trades courses. One-half of each day is devoted to the industrial work and the other to academic studies. That pupils may keep in touch with real conditions in industrial life, they make frequent excursions under the direction of teachers to the mills, foundries, and machine shops. They there see work carried on in a large way similar to what they are attempting to do in a small way at school. Classes are carried, of course, where the work is similar to that which they are undertaking to do in the school shop; that is, textile pupils visit the cotton mills, while mechanic arts pupils visit the machine shops, foundries, etc. These

A. CLASS IN COOKING.

B. BOOKKEEPING.

visits are made about once a month, and the classes are absent from the school about two hours on each trip. The heads of the departments of the larger manufacturing plants have all shown a real interest in the students of the school in not only permitting them to visit the factories, but in explaining and calling attention to all special features.

The school offers for girls trades courses in millinery, dressmaking, and business training, while every girl is required to take the course in home economics. For boys, trades courses are offered in carpentry, machinery, textile work, and business training, and all boys taking the courses offered in the mechanical and textile departments are required to take a three-year course in mechanical drawing, that they may be able to make working drawings of machines and to build machines from blue prints down to scale.

HOME ECONOMICS.

In cookery there is individual equipment for 22 pupils. Each girl has a drawer in which are all the utensils necessary for ordinary cooking, and a storeroom furnishes a reserve supply for extra occasions. Each desk is supplied with a gas plate with two burners. For baking there are two gas ranges and a wood stove, while an electric toaster and percolator give training in the use of electricity as a means of cooking, and a fireless cooker also plays its part in the equipment. The cost of this entire equipment is $500.

This course includes practical cooking, digestion of food, food values, cost of products and their preparation, and proper combinations for the child, the adult, and the invalid. In addition to the regular class instruction, practical work is done each day in the preparation of the school lunches, which are sold to the pupils and teachers of the school at a nominal price—just the bare cost of the materials used.

Some of the pupils depend entirely on this school lunch counter for their midday meal, while others only use it to supplement cold lunches brought from home. There are served here daily sandwiches, fruits in season, chocolate, milk and lemonade (in summer), and one "special." The last-named consists of soup, croquettes, potato dishes, various kinds of salads, pastry, cakes, ice cream. The price of a single sandwich is 3 cents, or two for 5 cents. The price of fruit varies with the market, but a pupil can buy at any time as much fruit as he would care for at one meal for 5 cents. Any one of the drinks mentioned is served at a cost of 3 cents, while the price of the "specials" varies from 3 to 5 cents. The average cost of a lunch is 10 cents.

One hour before the lunch period, at the time of the change of classes, a copy of the menu for that day is sent to every department

of the school, and orders are taken that there may be no waste of material in the preparation of the lunch. The items on the list are called to the class by the teacher and the number desiring each is recorded. The classes in home economics take turns in preparing and serving these lunches, which gives valuable experience in large-quantity cooking to be completed at a definite time. These school lunches are served in the general lunch room, but in addition there is a model dining room in which formal lunches are served from time to time, and this is required as a part of the course. A course dinner for as many as 40 people has been served here by the girls.

The following is a detailed statement of the course in home economics:

COURSE IN HOME ECONOMICS.

FIRST YEAR.

First term.—Study of carbohydrates, including vegetables, cereals, and flour mixtures, with theory and practical lessons under each; digestion and nutrition; place in diet. Laundering of dish cloths, towels, and table linen; ventilation, sanitation, and daily care of dining room and kitchen; care of pantries and refrigerators.

Second term.—Study of protein, fats, mineral matter, and water; uses in system, digestion; source and practical cooking under each. Physiology of digestion; elementary lessons in hygiene, laundry, sanitation, home decoration, household economy, with practical work in the care of kitchen and dining room. Preservation of food.

SECOND YEAR.

First term.—Review of five food principles, further cookery under each, with study of digestion, nutrition, source, methods of preparation, and place of each in the diet. Special study of and experiments with flours, cereals, and vegetables. Chemistry of cleaning and laundering; elements of bacteriology; principles of decoration and home furnishing; study of heating and ventilation.

Second term.—Cooking in groups; preparation of meals for limited numbers; study of menus as to desirability, suitability, and use. Dining-room work, serving meals, care of room, care of silver, linen, and china, table decoration, and training of servants.

THIRD YEAR.

First term.—Dietetics. Study of special menus as to use, desirability, cost and service; menus for families of different incomes; household accounts; direction of servants, planning of work, care of home, including daily and weekly care of kitchen, pantries, refrigerators, dining room, living room, and bedrooms. Economics of sanitation and heating; laundry and marketing with field work.

Second term.—Diet for invalids, infants, and growing children. Dining-room work; group work in serving meals from limited amounts; economy and physiology of nutrition, bacteriology in the home. General review of the first principles of cookery with regard to dexterity, celerity, and economical manipulation of materials.

DRESSMAKING AND MILLINERY.

The training in dressmaking aims to fit a girl not only to be able to save money by making her own clothes, but to be a means of livelihood. She is given practice in both hand and machine work, from the making of simple undergarments to the more difficult work of making dresses and doing fine handwork. The equipment in this

department consists of six machines of two kinds, six adjustable dress forms, two cutting tables, and the necessary cabinets for keeping the work. An electric motor shows how electricity saves both time and girl power, while an electric iron is a very necessary part of the equipment. The cost of this entire equipment is $500.

In the third year the pupil is given instruction in millinery. This has a value for the girl who wishes to make her own hats, as well as for the girl who desires to use her education along this line as her means of support.

The following is a detailed statement of the course in dressmaking and millinery:

COURSE IN DRESSMAKING AND MILLINERY.

FIRST YEAR.

First term.—Cutting, fitting, and making of apron, cap, and sleeves. Study of measurements. General principles of machine sewing. Drafting pattern. Making of underclothes, drawers, underskirts, underwaist, and nightgown.

Second term.—Drafting shirtwaist pattern. Study of styles and materials suitable for shirtwaist. Making of tailored shirtwaist suit. Practice in sketching and varying the styles based on shirtwaist model.

SECOND YEAR.

First term.—Drafting, fitting, and making lined waist. Treatment of seams, whalebones, hooks and eyes. Making a woolen skirt and drop skirt.

Second term.—Designing in stitchery and trimmings for entire gowns and selected parts. Study of color harmonies and contrasts, appropriateness in design and decoration for type figures, textures and purpose of gowns. Practice in sketching. Making of embroidered dress.

THIRD YEAR.

First term.—Hand sewing. Making of children's clothes. Drafting patterns. Selection of materials. Costume design and fulfilling orders. Skill in workmanship.

Second term.—Millinery. Remodeling old hats, renovating old materials, ribbons, velvets, curling of plumes; making hats of straw, velvet, chiffon, etc.; use of wire, making of wire frames; bonnets for children and elderly persons; lingerie and evening hats; hats for different occasions; study of color harmony, choice of materials, history of millinery.

The tabulated course in this department is as follows (in periods per week):

FIRST YEAR.

First term:		Second term:	
Cookery	3	Cookery	1½
Sewing	2	Sewing	2
Arithmetic	5	Arithmetic	5
Grammar and classics	5	Grammar and classics	5
Physics	5	Physics	5
United States history	5	Algebra	5
Physiology	1	Physiology	2

SECOND YEAR.

First term:		Second term:	
Cookery	3	Cookery	3
Sewing	2	Sewing	2
Rhetoric and classics	5	Rhetoric and classics	5
Algebra	5	Plane geometry	5
Chemistry	5	Chemistry	5
Civics	5	History of western Europe	5

THIRD YEAR.

First term:		Second term:	
Cookery	3	Cookery	3
Sewing	3	Millinery	3
Solid geometry	5	Trigonometry	5
Physics	5	English literature	5
History of western Europe	5	Economics	5
Chemistry	5	Chemistry	5

MECHANIC ARTS.

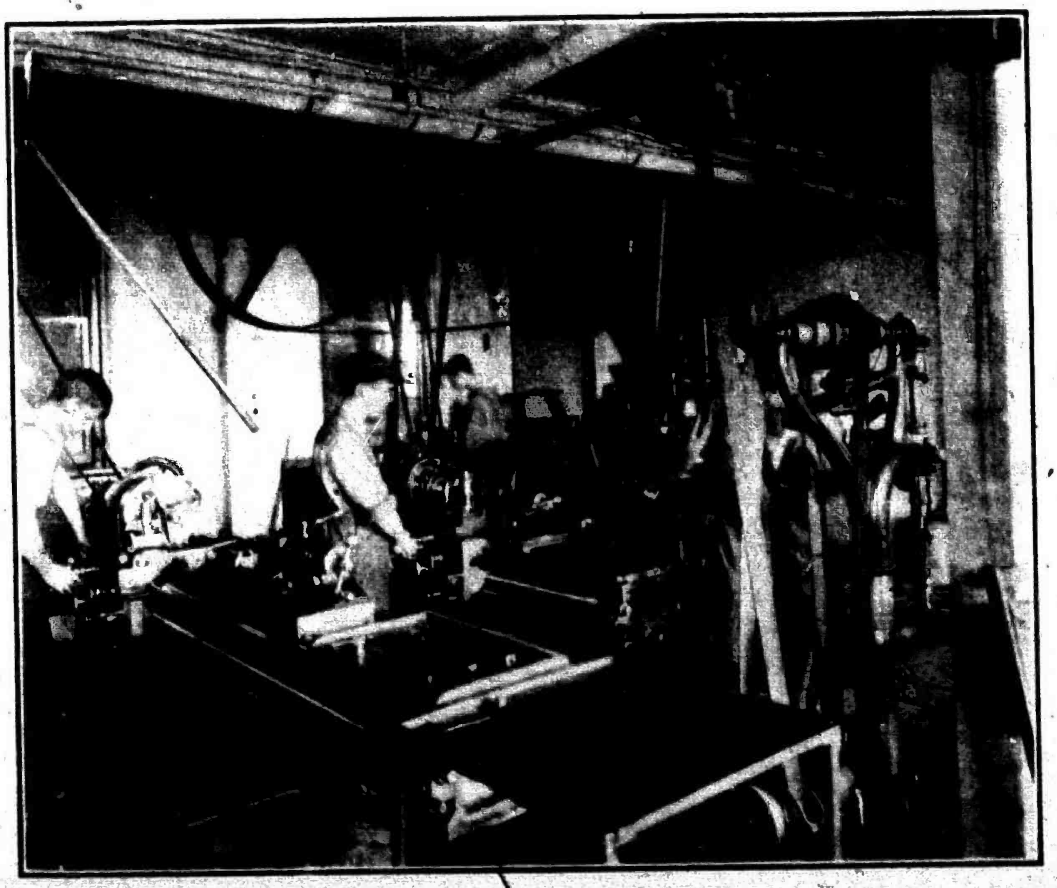
In the mechanic arts department the students spend the first year in the woodworking shop, this time being about equally divided between carpentry, wood turning, patternmaking, and cabinetmaking. This preliminary course is very general, and most stress is laid upon teaching principles which are applicable to all the trades. To the machinist, patternmaker, or draftsman it gives elementary but definite ideas as to the use and construction of patterns; to the carpenter it is but a stepping stone; and to the worker at the forge it gives skill in working to dimensions and in forming pieces.

No work is done in any department with the purpose of consigning it to the scrap heap as soon as the work is finished and graded. In other words, students make from the very beginning articles of intrinsic value, much of which consists of apparatus, tools, and fixtures for use in the school. Among other things that they have made for their own school are 137 lockers, 25 desks for the business training department, and the entire equipment of the mechanical drawing department, consisting of 50 drawing tables, 50 drawing boards, 50 stools, T squares, etc., the value of which is $450. All work of whatever kind is done to working drawings, and in most cases the student works from his own blue prints.

There is an intimate connection between the drawing-room and each of the shops, and students in the various courses are given drafting which conforms to the needs of the shop in which they are working. Especial emphasis is placed upon acquiring the methods of the modern shop. Not only the "how" and "why" are taught, but the student is given as much skill as he is capable of gaining.

The wood-shop equipment consists of one planer, one jointer, one shaper, one band saw, one circular saw, six lathes that will turn any-

A. SECTION OF WOODWORKING SHOP



B. MACHINE SHOP.

thing from a penstaff to a porch column, one postborer; also a power grindstone and emery wheel. The 12 work benches are each equipped with a full set of ordinary tools, and a large number of general tools are kept in a toolroom and can be obtained by the student upon deposit of a tool check with the tool keeper. The value of the equipment in this department is $1,900.

In the course in carpentry and joinery, after elementary instruction in the laying out of work, small articles embodying all the simple joints, such as scarf, half lap, miter, mortise, and tenon are made. Doors and windows are framed, using material which has been planed and shaped to size out of the rough. The laying out, flooring, and finally the framing, sheathing, and shingling of a small house are undertaken. A great deal of work in this shop consists of making cabinets, drawing tables, furniture, and fixtures for the school. Instruction is given in the use and care of the shaper, band and scroll saws, buzz planer, and all ordinary woodworking machinery.

The course in wood turning and patternmaking begins with the handling and sharpening of the turner's gauge, chisel, and boring tools. Much work consists of making common articles, such as vase forms, ballusters, table legs, and newel posts. These are followed by finishing articles in hardwood, such as dumb bells, towel rings, and card receivers, which bring in center turning, face-plate work, fitting, chucking, and polishing.

Beginning with simple patterns, which give an acquaintance with patternmaking processes and considerations necessary to successful molding, the work continues with split and cored patterns and those involving bench work with chisel and plane, as well as the lathe and band saws, in cutting to irregular templates. And, finally, patterns for pulleys, gear wheels, and completed machine parts are made.

Parallel with the patternmaking a course in molding is given. This is not intended to develop molders, but rather to give clear ideas as to the requirements of a successful pattern to either the patternmaker or draftsman. All the ordinary terms and methods are taught and the patterns made in the school are tried by making from them castings in plaster, lead, or white metal. These tested patterns are then sent to an iron foundry for castings for machine-shop use.

The course in cabinetmaking embodies the building of cabinets and all pieces of furniture. The student is given instruction in the building and fitting of drawers and doors, the strongest and common methods of putting together cabinets and furniture, the different joints used, how to veneer, and, lastly, how to give a good finish with stain and varnish.

The forge shop has 12 fully equipped Buffalo forges of the downdraft type. The anvils are 100 pounds in weight and are mounted on heavy wooden blocks. The cost of this equipment is $600.

The machine-shop equipment consists of one Blaisdell-Whitcomb 14-inch lathe, one Bradford Machine Co.'s 16-inch lathe, one Cincinnati milling machine, one Steptoe shaper, one drill press, also a Universal grinder and power hack saw. A long workbench is built halfway around the shop, against the wall, and is equipped with eight heavy machinist's vises. Each boy is furnished a pair of inside and outside calipers, a hammer and a scale, and the other necessary tools are furnished from the tool room upon deposit of a tool check. The value of the equipment of this department is $3,000.

The course in the forge and machine shop begins with a thorough explanation of all the tools and appliances and in the use and care of them. The making and keeping of good clean fires is emphasized. The necessary processes of working iron, such as bending, drawing, forming, upsetting, and scarfing are taught in the making of staples, hasps, chains, hooks, bolts, and tongs.

Welding iron and steel, using the butt, scarf, and lap joints is taught, ending in a course in the making of steel tools and the process of hardening, tempering, and annealing.

Instruction is given in the manufacture of iron and steel from the ore, so as to enable the boy to understand thoroughly the characteristics of the different materials used in the smith shop, and to help him determine at once which is best fitted for the work in hand.

It is to be understood that the boy does not simply observe and discuss the work being done, but is required to gain the handicraft for himself, under instruction which conforms as nearly as possible to the up-to-date shop. About six months are given to forge-shop work, the aim of this being to enable the student to forge and temper his own lathe and planer tools, as well as to do the regular blacksmith work. The other five months are devoted to work on the drill press, speed lathe, clipping and filing, and to the simpler milling machine.

The last year of this course is given to the accurate turning, milling, and shaping to gauge, as well as to the making of turning, driving, and pressed fits. This work is applied practically in the building of all machines and engines. In this year also a great deal of stress is laid on tool making, because a good machinist must know something about the upkeep of his tools. In this course reamers, taps, dies, as well as sample gigs, to be used in duplicate manufacturing, are made. Each student carries his work through from the beginning to the end, starting with the machine work, filing and finishing, and ending with the hardening and tempering. The work consists of clamps, bolts, V blocks, parallel strips, and ends with the complete building of drill and arbor presses and speed or wood turning lathes for the school.

The tabulated course of study for this department is as follows (in periods per week):

FORGE AND MACHINE SHOP COURSE.

FIRST YEAR.

First term:		Second term:	
Carpentry (half term)	15	Pattern making (half term)	15
Lathe turning (half term)	15	Cabinetmaking (half term)	15
Drawing	6	Drawing	6
Arithmetic	5	Arithmetic	5
Grammar and classics	5	Grammar and classics	5
Physics	5	Physics	5
History	5	History	5

SECOND YEAR.

First term:		Second term:	
Forging	15	Machine-shop practice	15
Drawing	6	Drawing	6
Rhetoric and classics	5	Rhetoric and classics	5
Algebra	5	Plane geometry	5
Chemistry	5	Chemistry	5
Civics	5	History of western Europe	5

THIRD YEAR.

First term:		Second term:	
Machine-shop practice	15	Machine-shop practice	15
Drawing	5	Drawing	5
Solid geometry	5	Trigonometry	5
Physics	5	English literature	5
History of western Europe	5	Economics	5
Chemistry	5	Chemistry	5

TEXTILE ARTS.

In the textile department the three-year course has been so arranged as to give the student a very thorough and practical knowledge of all the processes used in converting raw cotton into yarn and into fabrics of plain and elaborate design. However, the graduate is given a sound foundation in mathematics, physics, chemistry, English, and drawing, in addition to carding, spinning, weaving, dyeing, and designing. Much practical work is assigned in order that the student may meet with and learn to surmount all the difficulties that cotton-mill men have to contend with. The yarn and cloth made by the students are required to be of standard grade and are afterwards put on the market and sold. The products of this department find a ready sale, and the department is practically self-supporting.

A market is found for these goods among the retail merchants of this city. The department usually uses one 500-pound bale of cotton per annum. The raw cotton purchased at an average price of 12 cents per

pound is manufactured into twine, several grades of homespun, sheeting, toweling, and hosiery. There is of course greater margin between the raw cotton and the manufactured product in some fabrics than in others, but upon an average the finished article is usually sold for a little more than twice the original cost of the raw product. All of the output is sold except the toweling, which is used by the various schools in the local system, and the textile department is given credit for what the toweling would bring upon the market.

The equipment of the textile department, which is valued at $8,000, consists of machinery of the best make and latest models. This has been carefully installed with the idea of making it as nearly as possible in accordance with the plans followed in mill construction in the South. The rooms are all supplied with humidifiers, enabling the degree of humidity to be regulated according to the demand of the goods being manufactured.

The carding equipment is as follows: One Kitson automatic feeder; one Kitson combination breaker and intermediate lapper; one Saco-Pettee revolving flat card; one Howard & Bullough revolving flat card; one Lowell railway head and drawing frame; one Saco-Pettee slubber, 44 spindles; one Saco-Pettee speeder, 72 spindles; grinding, stripping, and burnishing rolls, set of carders' tools, and change gears.

The spinning equipment consists of one Fales & Jencks combination warp and filling frame, 80 spindles, individual drive; one Whitin combination warp and filling frame, 80 spindles; one Draper twister, 60 spindles; one Draper spooler, 60 spindles; one Oswald lever quiller; one Tompkins reel; one 6-spindle Universal winder.

The weaving equipment consists of one Entwistle beam warper; hand-weaving room with complete equipment of six 30-harness dobby hand looms with shuttles; harness, beams, hecks, etc.; one Crompton & Knowles dobby loom; one Lowell 4-harness loom; one Draper-Northrop loom; one Crompton & Knowles plain loom; one 416-hook Crompton & Knowles Jacquard machine; one 42-inch Lowell plain loom; one complete set of Jencks hosiery knitting machines; one Standard knitting machine; one Wildman ribber; one Brinson ribber.

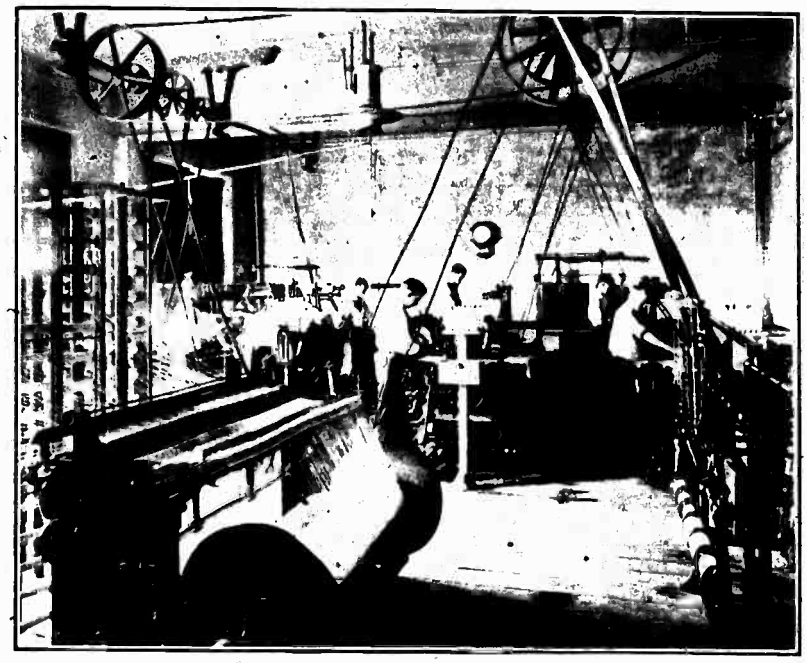
The dyeing equipment consists of one Tolhurst hydroextractor; one Elauder-Weldon skein dyeing machine; one skein mercerizing machine.

The following is a brief statement of the course in the textile department:

Textile Course.

First year.

Designing.—Construction of weaves and manner of representation, explanations of the terms "warp" and "filling," ground weaves and some of their derivatives, including plain weaves, color effects on plain weaves, rib weaves, plain and figured common twill weaves, plain and fancy basket weaves, color effects on twill and basket weaves,



A. WEAVING.

B. SPINNING; TEXTILE DEPARTMENT.

broken twills, steep twills, pointed twills, skipped twills, reclining twills; also the color effect on these weaves, construction of drawing in draft and harness chain.

Weaving.—Power loom, weaving on plain and Draper looms, making fabrics of simple design.

Carding and spinning.—Operation of the machines in the carding and spinning departments, giving a general idea of the mechanical details of the work.

SECOND YEAR.

Designing.—A continuation of the work taken up in the first year, embracing curved twills, shaded twills, combination weaves, simple satins, figured satins, satin derivatives, such as double satins, satin granites, broken and figured satins, shaded satins, etc.

Weaving.—Continuing the work of the first year, taking up more complicated weaves on dobby and 4 by 1 box looms, hand weaving (using designs of simple and complex nature), dressing warp for power and hand looms, beaming it, drawing it in, reeding it, placing it on the loom, study of motions on the loom with drawings and lectures.

Carding and spinning.—More practice in the operation of the machines, drawings made of the various parts, lectures.

THIRD YEAR.

Designing.—Continuation of work of second year, embracing honey-comb weaves, dress goods, novelty weaves, weaves with an extra warp and filling, figured dress goods, and double cloth. Jacquard work, description of the Jacquard machine, simple types of machines, making Jacquard designs.

Fabric analysis.—The dissecting of cloth for the purpose of finding the weave, counts of yarn used, per cent of take-up and shrinkage, ends and picks per inch, total ends in warp, width in reed, etc., reproducing cloths from samples.

Weaving.—More weaving on power loom, cloth finishing and loom fixing, drawing motions, recitations and lectures, cloth calculations.

Carding and spinning.—Work to be similar to that of the year before, but taking up calculations and also work in changing machines from one number hank to another, recitations and lectures.

Dyeing.—Experiments in dyeing yarn, taking up the various dyestuffs, their mode of application to the fiber, effects of developing, after treatment, etc., Also doing any dyeing that may be required for weaving purposes.

The tabulated course of study in this department is as follows (in periods per week):

FIRST YEAR.

First term:		Second term:	
Designing	7	Designing	7
Weaving	4	Weaving	4
Carding and spinning	4	Carding and spinning	4
Drawing	6	Drawing	6
Arithmetic	5	Arithmetic	5
Grammar	5	Grammar	5
Physics		Physics	5
History		History	5

SECOND YEAR.

First term:		Second term:	
Designing	4	Designing	4
Weaving	6	Weaving	8
Carding and spinning	6	Carding and spinning	4
Drawing	6	Drawing	6
Rhetoric	5	Rhetoric	5
Algebra	5	Plane geometry	5
Chemistry	5	Chemistry	5
Civics	5	History of western Europe	5

THIRD YEAR.

First term:		Second term:	
Designing	4	Designing	4
Fabric analysis	2	Fabric analysis	2
Weaving	6	Weaving	6
Carding and spinning	6	Carding and spinning	6
Dyeing	2	Dyeing	2
Drawing	6	Drawing	6
Solid geometry	5	Trigonometry	5
Physics	5	English literature	5
History of western Europe	5	Economics	5
Chemistry	5	Chemistry	5

BUSINESS TRAINING.

In the business training department the three-year course (which is open to both boys and girls) has been so arranged as to include: First, the academic work of the school; second, the various commercial subjects found in the courses of the most approved of the modern commercial schools; third, typewriting, shorthand, and bookkeeping.

In the typewriting department the student is taught to use the touch method (that is, operating the machine without looking at the keyboard), and is given work in writing from plain print copy, shorthand notes, and dictation. Speed, accuracy, neatness, and form of work are stressed. The pupil is given thorough instruction in billing, manifolding, tabulating, the use of the letter press and mimeograph, and cleaning, adjusting, and oiling the various machines.

The first year of the course in shorthand is devoted to the study of the principles and to dictation work in business letters. For this purpose a dictation book is used which contains systematically arranged letters of all the business man is engaged in. The second year is devoted to expert work in dictation and transcripts. The pupil is required to report and transcribe newspaper and magazine articles, essays, lectures, and sermons, legal and court matter. Special attention is given to transcripts, indexing, notes, letter filing, handling business correspondence, and general office usefulness.

The textbook used in bookkeeping teaches the pupil self-reliance and develops his thinking powers, gradually and logically develops the principles of the subject, is complete in instruction, and abounds in illustrations. The writing and filing of commercial papers is fully treated. Single and double entry bookkeeping is thoroughly illustrated and explained. The first year's work is devoted to theory and business practice. Particular attention is given to journalizing, posting, taking trial balances, making financial statements, and closing the ledger.

The second year is devoted to actual business work, where the pupil conducts a business of his own, trades with other pupils, does business with the school banks, retail, wholesale, commission, jobbing, and freight offices. After a pupil conducts a business of his own for some time, he is placed in the various offices of the school, and has complete charge of the different lines of work until he becomes familiar with every detail of office work. Pupils in the business department organize and dissolve partnerships, organize joint-stock companies, corporations, and banks according to law, elect directors and officers, declare dividends, make assessments, etc.

The subject of spelling, which is too often neglected, is stressed in this department. In letter writing the pupil is taught to properly construct, arrange, paragraph, and punctuate a letter; and instruction is given on the best forms and usages of business and social letters. Penmanship is one of the most important branches of the business training course, a legible hand being a business asset of value. Instruction in commercial arithmetic and rapid calculation is given; while through the study of commercial law the pupil becomes familiar with the fundamental principles of constitutional, statute, and common law, with the general law pertaining to all forms of negotiable and nonnegotiable papers, such as checks, notes, receipts, drafts, liens, leases, deeds, mortgages, and contracts, and the laws of bailment, carriers, partnerships, insurance associations, joint-stock companies, and corporations. The pupil is made familiar with parliamentary usage, and from the study of commercial geography he learns something of the source of supply, process of manufacture, cost of commodities, and of the world's great industries, including farm products and the area of their production, mines and their location, manufactures, exports, imports, and transportation facilities.

The equipment of the business training department is up to date, having in addition to special desks made for this particular work in the shops of this school, well-regulated freight, retail, and wholesale offices, jobbing houses, and banks, all using books similar to those used in like concerns in the city, filing cases, comptometer,

adding machines, and various makes of standard typewriters. The value of the equipment of this department is $2,100.

The tabulated course of study is as follows (in periods per week):

BUSINESS COURSE.

FIRST YEAR.

First term:		Second term:	
Arithmetic	5	Arithmetic	5
English grammar and classics	5	English grammar and classics	5
United States history	5	Algebra	5
Physics	5	Physics	5
Spelling, orthoepy, and etymology	5	Spelling, orthoepy, and etymology	5
Rapid calculation (half period)	5	Rapid calculation (half period)	5
Penmanship	5	Theory bookkeeping and business practice	8
Theory bookkeeping	8		

SECOND YEAR.

First term		Second term:	
Algebra	5	Plane geometry	5
Rhetoric and classics	5	Rhetoric and classics	5
Civics	5	Chemistry	5
Chemistry	5	European history	5
Commercial geography	5	Typewriting	5
Shorthand	3	Shorthand	3
Typewriting	5	Actual business bookkeeping	8
Actual business bookkeeping	8		

THIRD YEAR.

First term:		Second term:	
Chemistry	5	Chemistry	5
Physics	5	Trigonometry	5
European history	5	Economics and industrial history	5
Solid geometry	5	English readings and literature	5
Commercial law	5	Parliamentary law	5
Shorthand	3	Shorthand	3
Typewriting	5	Letter filing, mimeograph work, and letterpress (along with other work).	
Business customs and office practice, letter filing, and manifolding (along with other work).			

Before a pupil can graduate, he must not only complete the three-year course in the academic subjects and trades courses, but he must take a position six weeks before the date of his graduation and must "make good," so to speak, under ordinary commercial and industrial conditions. Suitable work is secured for the pupils regardless of the compensation, and reports are received daily on the efficiency of their labor.

There has been a gradual increase in attendance from the beginning. The enrollment four years ago was less than 100, while at

present it is 156. In the first graduating class there were only 9 members; in the class of 1912 there were 20; and there are 42 in the class to be graduated next July. There have been, to date, 62 graduates and, with 3 exceptions, they are pursuing lines of work begun in this school. At first they do not receive high salaries, but promotion has been rapid and certain. The class of 20 last year found places to work immediately after graduation at salaries ranging from $35 to $50 per month. The 8 members of the class who were graduated four years ago are receiving salaries ranging from $75 to $125 per month. It must be borne in mind, too, that not one of these is more than 22 years of age. The combined salaries of the last class to graduate would maintain the school for the present year. The value of the training in this school is not represented by its graduates only, for there are some who were unable, for financial and other reasons, to complete the course who are showing in their various lines of work the effect of even partial training in this school. The average cost of maintaining the school is about $60 per capita per annum.

After all, it must be said that the character and the spirit of the teacher has much to do with the efficiency of any school. A cold, prescribed course, however meritorious, will not and can not hold pupils; but with a course that in itself appeals to the child, the warm, big-hearted teacher may accomplish results far in excess of the teacher who proceeds purely along mechanical lines.

Effort has been made to secure teachers for this school who have had both professional training and experience in business or in the industries. Those teachers in close touch with practical life are more likely to be in sympathy with the ideals of this school. It is essential to success that those who are to work in the school should believe in it. Besides, no one is entirely qualified to give instruction and direction in the industries who has not been actually employed in them. In so far as it is possible to secure them, we employ teachers who happily combine both the theoretical and practical; that is, have had scientific training and practical experience.

The principal of the school, who is also the head of the business training department, was graduated from a normal school, has had several years' experience as a teacher, and for five years was stenographer, bookkeeper, accountant, etc.; he also spent one and a half years in the engineering department of the Frisco Railroad.

The head of the textile department was graduated from the Georgia School of Technology and for five years was employed in different cotton mills of his State as paymaster, assistant superintendent, etc.

The head of the mechanic arts department has his degree from the Alabama Polytechnic Institute and was a teacher in one of the district agricultural and mechanical colleges of this State before his election here.

The department of home economics is under the only woman in the faculty. She received her special training at Pratt Institute and taught several years in New York State before coming here.

The teacher of science and mathematics holds his degree from Brown University, and besides having had several years' experience as a teacher was employed for some time in the dyeing department of a cotton mill.

The head of the department of English and history was educated at the University of Georgia and Princeton University. Besides his three years' experience as a teacher, he was in the real estate business for more than a year.

The salary of a teacher of this school is $200 more per annum than that of a teacher in the academic high school. This difference is made because of the longer school year. Teachers do not object to the longer school year when it is accompanied by an increase in salary.

The health and general physical condition of pupils and teachers of this school, notwithstanding the long school day and long school year, are as fine as may be found anywhere, due undoubtedly to the change of work during the day from mental to manual labor and to the exercise in the pure open air.

The attendance at the traditional high school has not been materially diminished by the establishment of this new school. The work of the high school is really more satisfactory than formerly, for only those are attending this school who choose the kind of education that it offers. These desire to learn something of the languages rather than to take one of the trades courses offered in the other school. Pupils who are preparing to take classic college courses usually come here, while those who are preparing for higher technical schools or who wish to learn a trade along with their regular school work usually go to the Industrial High School. It is entirely safe to say that two-thirds of the students at the Industrial High School would not continue beyond the grammar-school grades if it were not for the vocational courses offered. Indeed, there is strong reason for believing that a goodly number of these would not have even completed the grammar-school grades without such incentive.

The vocational courses thus far introduced in this school were selected to meet local conditions and needs. There is now a strong demand for a course in practical electricity and also one in agriculture. The growing demand for the former is due to the development in the last two or three years in this vicinity of greater water power on the Chattahoochee River, and the latter because of increased interest in recent years in intelligent and scientific agriculture in this section.