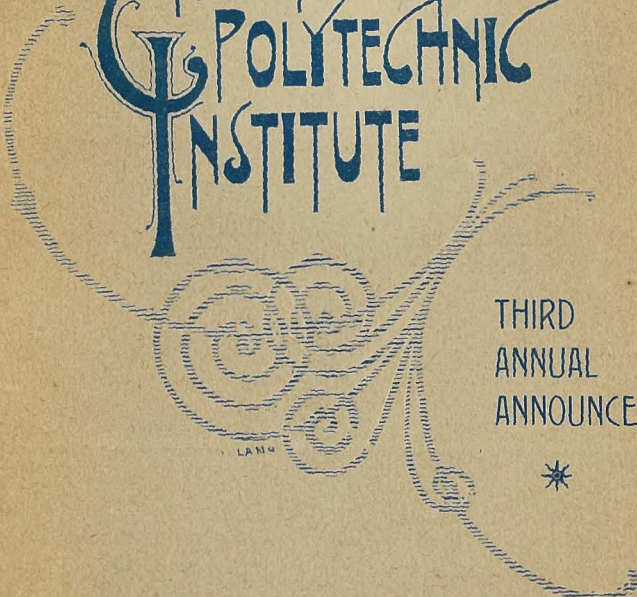


THROOP POLYTECHNIC INSTITUTE



THIRD
ANNUAL
ANNOUNCEMENT



PASADENA, CALIFORNIA

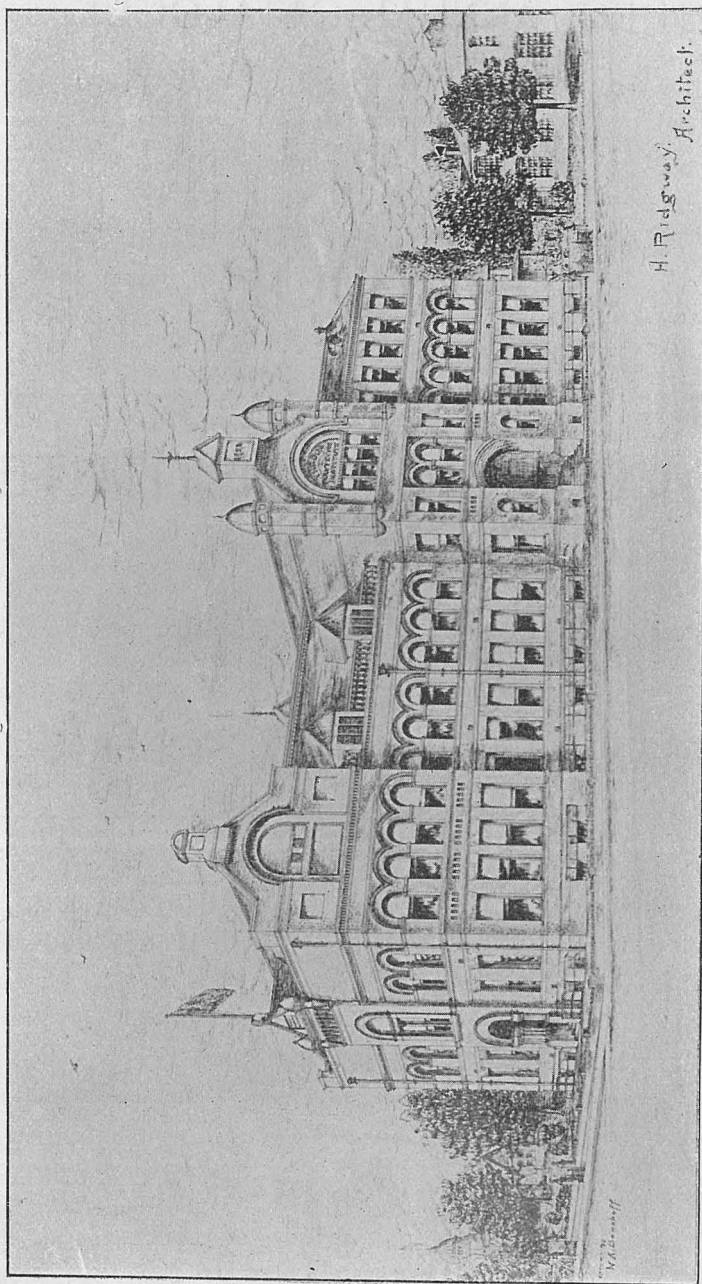
..... 1894-1895

THIRD ANNUAL CATALOGUE
OF
THROOP
POLYTECHNIC INSTITUTE
AND
MANUAL TRAINING SCHOOL

PASADENA, CAL.

1894-1895

KINGSLEY-BARNES & NEUNER CO,
LOS ANGELES



EAST HALL — THROOP POLYTECHNIC INSTITUTE.

CALENDAR

1894-1895

Fall Term begins	-	-	-	Wednesday, September 19, 1894
Thanksgiving Vacation	-	-	Thursday, Nov. 29, to Monday, Dec. 3	
Fall Term ends	-	-	-	Friday, December 21

HOLIDAY VACATION

Winter Term begins	-	-	-	-	Monday, January 7, 1895
Winter Term ends	-	-	-	-	Friday, March 29

SPRING VACATION

Spring Term begins	-	-	-	-	Monday, April 8
Spring Term ends	-	-	-	-	Wednesday, June 19

SUMMER VACATION

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* To be filled in June of 1894.

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*()
Sloyd Room.

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* To be filled in June of 1894.

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HISTORICAL SKETCH

FOUNDING.

THE THROOP POLYTECHNIC INSTITUTE of Pasadena, California, was founded by Hon. Amos G. Throop, who endowed it with \$200,000, and consecrated all his energy to its support, in 1891. Articles of incorporation were filed September 23d; the first Board of Trustees organized on October 2d. A five years' lease of the Wooster Block, a handsome and commodious four-story brick building, situated at the corner of Fair Oaks avenue and Kansas street, was at once secured and immediately fitted up with appropriate furnishings. The doors of the College were opened to students on November 2d. It was established as an institution of learning, embracing the different departments of higher education, to furnish to students of both sexes and all religious opinions, a liberal and practical education, which, while thoroughly Christian, is to be absolutely non-sectarian in its character.

In 1892 it was determined to make Manual and Industrial Education the characteristic feature of its endeavor.

LOCATION.

Pasadena is generally acknowledged to be the most beautiful residence city in California. It has a population of over ten thousand, and its suburbs are the homes of about five thousand more. It is situated within ten miles of the city of Los Angeles, at the head of the San Gabriel Valley, and at the base of Mount Wilson, the most picturesque of the California Alps. In beauty and healthfulness, in the culture of its homes, and in its high social and moral tone, Pasadena is without a rival in the Golden State. It is reached by the Santa Fe and the Los Angeles Terminal railways. An electric railway, whose lines pass just in front of each of the Halls, is now in process of construction. This road extends from Los Angeles through South Pasadena, Garvanza, on to Altadena, and thus connecting with the Mountain Railway to Echo Mountain and Mount Lowe. Students living at any point along this line will be enabled to live at home and make the daily trips to and from the institution for little more than ordinary street-car fare.

COURSES, DEPARTMENTS, ETC.

In addition to the regular courses of the Manual Training School and Polytechnic College in which large opportunities for professional work will be offered, special provision has been made for the preparation of teachers for service in high schools as instructors in the Languages, Mathematics, Natural Sciences, etc. The training of teachers for Manual Training and other schools, in which education by doing has become a real thing, will receive practical attention. Special Laboratory opportunities will be offered mature students who have had experience in the school-room.

A fully equipped Sloyd School, in charge of an expert teacher, will receive eighty boys and girls not under ten years of age, in four classes of twenty each, and give them, in connection with thorough instruction in the elementary

branches, the most approved form of hand and eye culture for pupils of this age. It will be the aim of this department to give pupils the individual attention which would be impossible in any school with large classes.

A Department of Accounts, Stenography and Typewriting will furnish first-class business training.

The Department of Art offers excellent facilities in both Painting and Drawing.

The Department of Music affords opportunity for a higher grade of musical culture than is ordinarily available.

SPECIAL LECTURES.

The management has the assurance of Norman Bridge, A. M., M. D., Professor of Clinical Medicine and Physical Diagnosis of Rush Medical College, Chicago, that he will give a number of afternoon talks during the coming year on the hygiene of school life and intellectual growth, as well as of general living, to all the students. He will also give several personal and confidential talks to the young men alone.

Dr. Kate S. Black, of Pasadena, has signified her willingness to contribute to the general course as well as to give a series of talks to the young ladies alone.

ATHLETICS, MILITARY COMPANY, ETC.

Every encouragement will be given to the legitimate growth of athletics. Baseball, football and tennis associations have already been organized, and students desiring to join these should make application to the secretary of the respective associations; provided, however, that applications for membership in the baseball or football teams must be accompanied by the written endorsement of parent or guardian. An excellent military company, "The Throop Polytechnic Cadets", was organized in November, 1892, and a second company in October of 1893. They are well uniformed and armed and have been drilled in a thorough manner. Membership in any of the athletic organizations is subject to forfeiture for failure in any regular line of school work. The faculty committee on athletics may at any time cancel membership in any athletic organization for neglect of class work, shop or laboratory demands.

HOMES FOR NON-RESIDENT STUDENTS.

Non-resident students will be able to find good homes in the community at from six to seven dollars per week. A number of families have, with the approval of the management of the Institute, arranged to open private homes for students where not only pleasant rooms and healthful fare can be assured, but where the general living and study habits of pupils will be carefully supervised. A list of such homes may be secured on application to the Secretary, Frank J. Polley. The dormitory plan has been abolished, owing to the firm conviction that in so favored a community as Pasadena better home surroundings and more healthful social influences can be furnished for young people in the families willing to accept such responsibility than would be possible in any dormitory.

LIBRARY.

A Library has already been established and the collection of valuable works of reference begun; about one thousand volumes, bearing chiefly on English Literature, History and Natural Science, have been purchased. The works on

Physics, Chemistry, Electricity, Botany, Zoölogy, etc., have been placed in the various laboratories. The remainder of the library was located in the general assembly and study room. Through the generosity of Mrs. Jeanne C. Carr the school received three hundred volumes of historical and scientific books, which proved a very valuable acquisition to the working library.

DISCIPLINE.

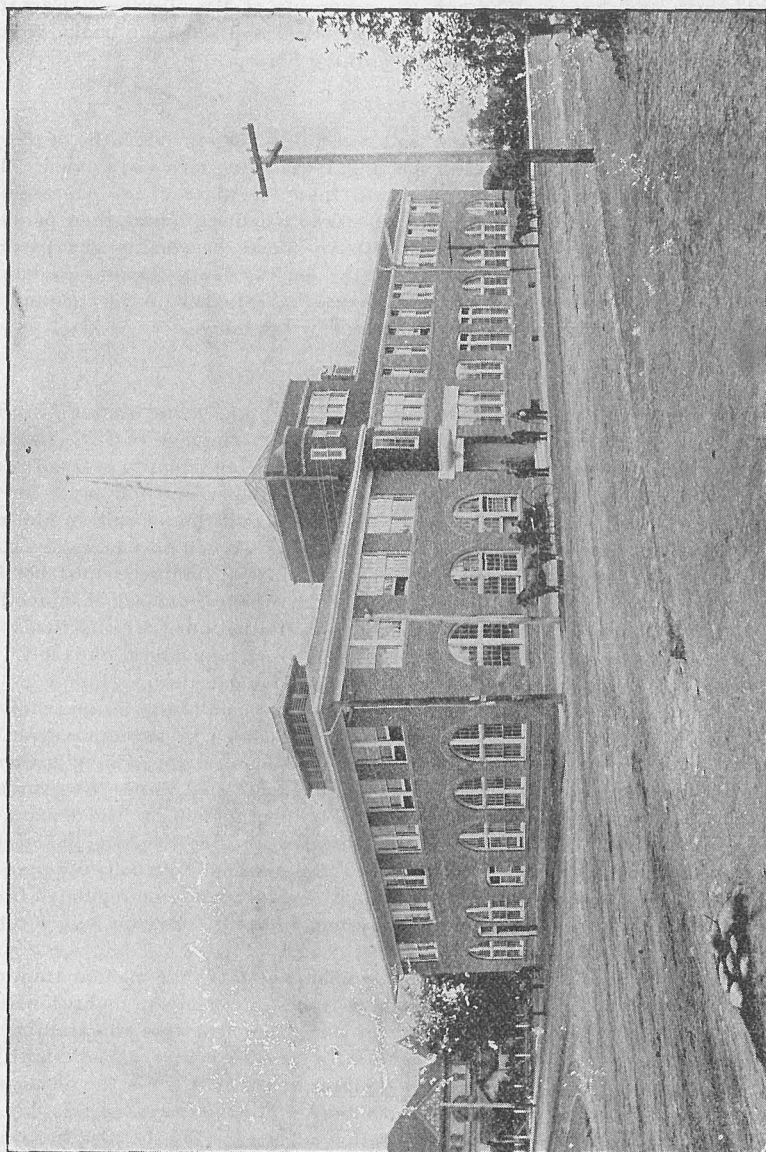
The discipline of the institution will constantly keep in mind the development of self-governing citizens, self-respecting, law-abiding men and women. The helpfulness of the ever-watchful friend will take the place of the educational police officer. Students will be expected to attend whatever church their parents or guardians may elect. Sixteen societies have houses of worship and pastors located in this city. Representatives of all the leading denominations are found on the faculty, and a definite effort will be made to establish in the community such a relationship for the student as is desired by the home.

MANUAL TRAINING DEPARTMENT

It has been determined to make this department one of the leading features of the institution. One of its chief purposes, in the language of Prof. George S. Mills, is "to foster a higher appreciation of the value and dignity of intelligent manual labor. A boy who sees nothing in manual labor but dull brute force, despises both the labor and the laborer. With the acquisition of skill in himself comes the willingness to recognize skill in his fellows. When once he appreciates skill in handicraft, he honors the workman. The social influence must not be underrated. Many perplexing questions of the day arising from lack of sympathy between the classes, and the consequent lack of discrimination between skilled and unskilled labor, will grow clearer as the influence of such an education is felt."

As has been well said by Dr. Woodward, "A manual training school is not a school for the training of carpenters, blacksmiths, machinists and mechanical engineers. In a manual training school, properly so-called, no attempt is made to cultivate dexterity at the expense of thought. No mere slight-of-hand is aimed at, nor is muscular exercise of itself held to be of educational value. An exercise whether with tools or with books is valuable only in proportion to the demand it makes upon the mind for intelligent, thoughtful work. In the school-shop the stage of mechanical habit is never reached. The only habit actually acquired is that of thinking. No blow is struck, no line is drawn, no motion regulated from muscular habit. The quality of every act springs from the conscious will, accompanied by a definite act of judgment."

While 'tis true that the young man or woman who takes the manual training course may master any one of a score of arts, trades or callings in months, where the average man or woman requires years, it is far from true that this training is only or chiefly valuable to the boy who is to be a carpenter, a blacksmith, a draughtsman, architect, a machinist, an engineer or an artist. For the physician or surgeon no preparatory training is worth more. For the lawyer in this day of endless commercial litigation, what preparation is better? For the preacher what training can better fit him to appreciate the condition of the masses of the people? And as "Learn to do by doing" becomes something more than a fine institute sentiment, such training for the teacher is indispensable. The man who has to manage large commercial, manufacturing or constructive enterprises needs



POLYTECHNIC HALL.

such training for the protection and economic expenditure of his capital, more than the laborer needs it for the winning of his livelihood.

It must not be assumed that the girl who takes this training is to become a draughtswoman, a milliner, an artist, architect, a professional cook, housekeeper or dressmaker, a typewriter, a pharmacist, or a teacher. True, she has prepared herself to rise to mastery in these lines; but she has also prepared herself for the thorough management of a home. She has secured a training as essential for the lady whom others must serve as for her whose skill wins her daily bread.

POLYTECHNIC HALL.

The shops and laboratories of the Manual Training Department are located in the Polytechnic Hall, which is a two-story brick structure with a frontage of 140 feet on Fair Oaks avenue and 80 feet on Chestnut street. It was designed by T. W. Parkes, A. R. I. B. A., and built by Matthew Slavin. It was finished and partly furnished for use on October 25, 1892.

FORGING SHOP.

The forging shop, which is situated on the first floor, was equipped at the commencement of the past year and two classes entered upon its work. The Buffalo Forging Company manufactured its outfit, which consists of twenty-three forges and anvils, together with a full equipment of smithing tools for each student. Five sets of quadruple Buffalo forges and three single forges are used. A No. 9 steel pressure blower supplies blast for all the fires, while the atmosphere of the shop is left pure and free from smoke by the use of a sixty-inch up-blast steel-plate Exhaust Fan. All the furnaces are supplied with telescopic hoods. An emery grinder and a combined hand and power drill, together with four blacksmith vises, complete the equipment of the forging shop which is in many particulars superior to any shop in the country.

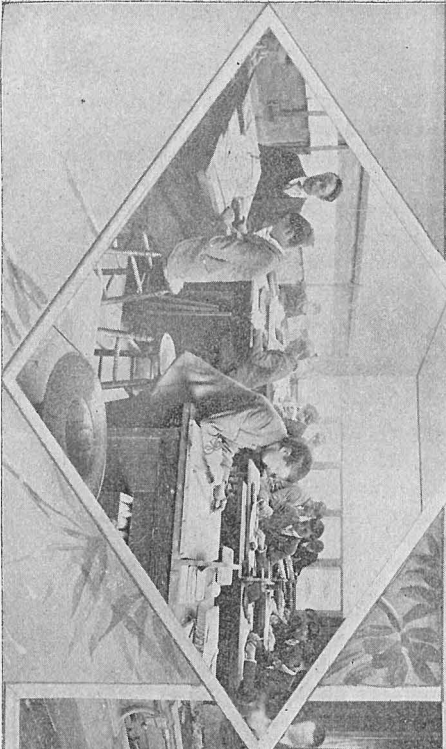
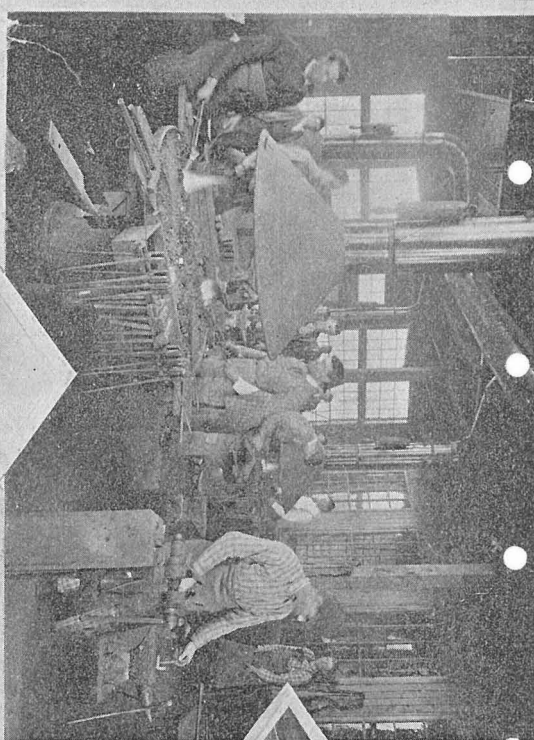
The power for the operation of the fan and blower, together with lathes in the wood-working shop, is obtained from a twenty-horse power Otto Gas Engine. This engine is located in a small room adjoining the smithing shop. Its advantage for work of this character consists in the fact that no expert engineer or other attendant is required after the engine has been started. It is left practically without any attendance until it become necessary to shut down. With the equipment of the machine and pattern shops, however, a new fifty-five horse power steam engine has been ordered and will be in place September first.

PATTERN SHOP.

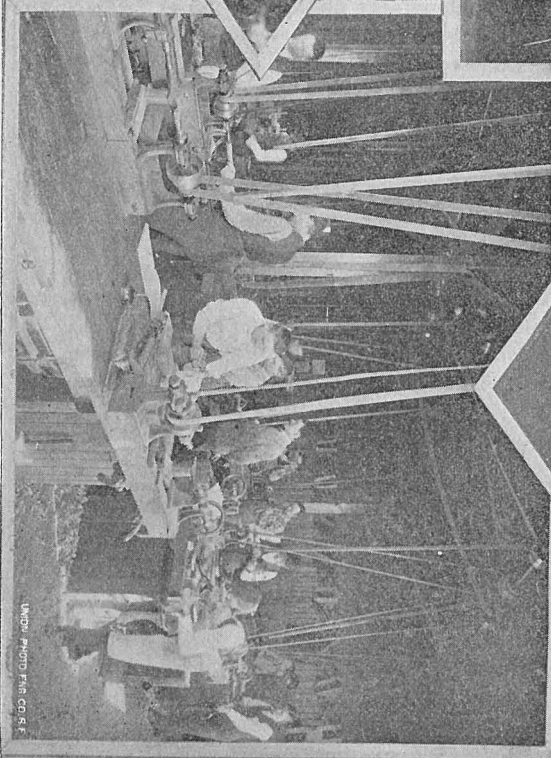
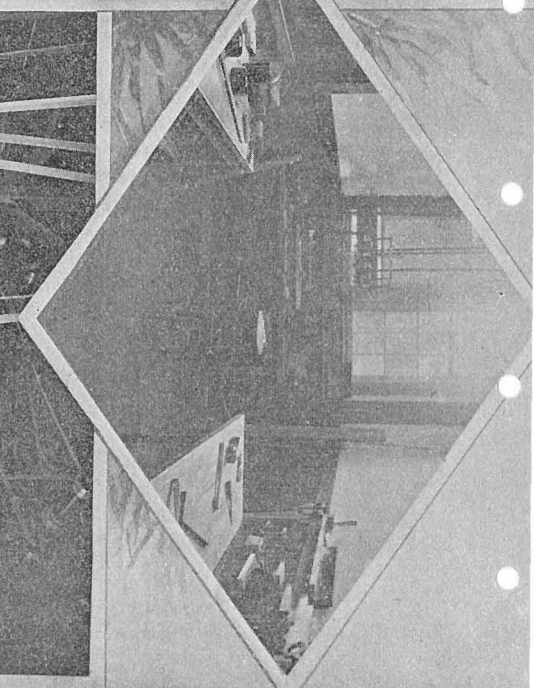
The Wood Carving Department will be removed from Polytechnic Hall to new quarters in East Hall, and the room thus vacated will be fitted up with twenty-one wood workers' lathes and twenty-one sets of joiners' and pattern makers' tools. This will not only accommodate two overflow classes from the regular wood shop, but will be open to the two classes that began work in the machine shop in September of 1894.

MACHINE SHOP.

The order for the equipment for this shop has been placed, and there will be installed during the summer a fifty-five horse power steam engine, a universal



FORGING SHOP.
MECHANICAL DRAWING ROOM.



ELECTRICAL LATHE ROOM.
JOINERY AND TURNING SHOP.

UNION PHOTO EN. CO. S.F.

milling machine, a planer, a shaper, two drills, two speed lathes, an electrician's lathe, ten engine lathes of from fourteen to twenty-four inch swing, together with a full equipment of machinist's hand tools.

WOOD SHOP.

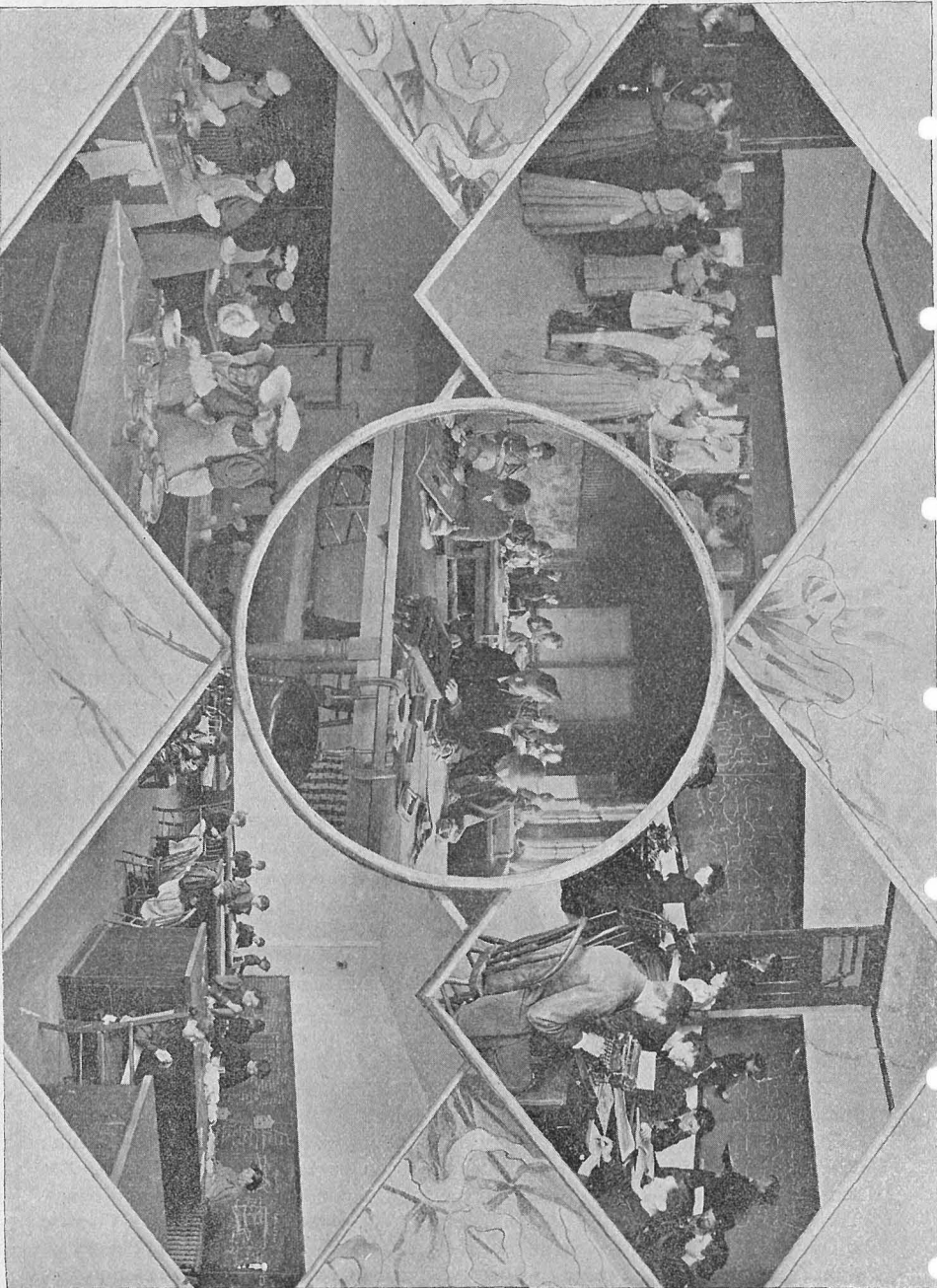
The wood shop has been provided with twenty work benches, at each of which four students can work daily. Every bench is provided with a drawer for each student who has occasion to use it, in which, under Yale lock, are placed the planes, chisels, wood-carving and turning tools used by the student to whom that drawer is assigned. To sharpen and keep these tools in proper condition for use involves, probably, as much skill as does their actual use. Accordingly no two students are permitted to handle the same tools.

At the side of the bench is found an outfit of tools, which are used in common by three or four students during the day, and comprise the following: one tri-square, one T bevel square, one foot-square, one marking gauge, one pair of inside calipers, one pair of outside calipers, one pair of compasses, one hammer, one mallet, one oil can, one oil stone, one back saw, one hand saw, one rip saw, one screw driver, and one six-inch Coe's wrench. At the student's right on the bench is found a fourteen-inch lathe, while at the opposite end of the bench is placed his bench stop and lightning-grip wood-worker's vise. He is thus equipped with all the appliances and tools necessary to do most thorough work in joinery, turning, inlaying and carving. A continuous table on the south and west sides of this shop furnish a special place for woodcarving and making working drawings. A special pattern-maker's lathe and well equipped bench is provided for the use of the instructor, while a large band saw serves to cut up the lumber for the needed exercises. The tools in the department were furnished by the Simmons Hardware Company, while the lathes and band saw were made to order by Hall & Brown, of St. Louis. A fine fret saw has been placed in this shop by the business men of the city during the past year.

PHYSICAL AND ELECTRICAL LABORATORIES

These laboratories occupy the four rooms on the west side of the hall and south of the machine shop. During the year there have been added to their equipment an electrician's lathe, a volt meter, an ammeter and two galvanometers. Students are now at work on the drawings for a new sixty light dynamo, which they will begin to build in September. Students in these laboratories have access to a small but valuable working library, comprising such books as:

Airy, Geo. B., *On Sound*; Anthony and Brackett, *Text-book of Physics*; Ball, R. S., *Experimental Mechanics*; Barker, Geo. F., *Physics*; Clausius, Robert, *Mechanical Theory of Heat*; Clausius, Robert, *Die Potentialfunction*; Clifford, W. K., *Elements of Dynamic*; Daguin, P. A., *Traité élémentaire de Physique*; Daniell, Alfred, *Principles of Physics*; Delaunay, Charles, *Traité de Mécanique Rationnelle*; Dalaunay, Charles (trans. by Bauschinger), *Vorschule der Mechanik*; Everett, J. D., *Units and Physical Constants*; Ganot, *Physics*; Gavarret, Des *Lentilles placées dans l'air*; Glazebrook and Shaw, *Practical Physics*; Grassmann, Robert, *Das Weltleben*; Helmholtz, H., *Vortraege*; Jackson, L. W., *Treatise on Optics*; Joule, J. P., *Scientific Papers*; Lloyd, Humphrey, *Wave Theory of Light*; Maxwell, J. C., *Theory of Heat*; Merriman, M., *Method of Least Squares*; Newton, Isaac, *Principia*; Parkinson, S., *Optics*; Peirce, B. O., *On Sound*; Peirce, B. O., *Newtonian Potential Function*; Pickering, E., *Elements of Physical*



CLAY MODELING ROOM.
COOKING SCHOOL.

CARVING ROOM.

STEREOGRAPHIC DEPARTMENT.
SEWING AND DRESSMAKING ROOM.

Manipulation; Rankine, W. J. M., Applied Mechanics; Ritter, August, Lehrbuch der technischen Mechanik; Stewart and Gee, Lessons on Elementary Physics; Tait, B. G., Properties of Matter; Tait and Steele, Dynamics of a Particle; Thomson and Tait, Treatise on Natural Philosophy; Tyndall, On Sound; Tyndall, Heat; Tyndall, Light and Electricity; Williamson and Tarleton, Elementary Treatise on Mechanics; and many others; Whiting, Harold, Physical Measurement.

Students in the Electrical Laboratory have access to the best available reference books. Chief among those already furnished are:

Ayrton, W. E., Practical Electricity; Cavendish, Henry, Electrical Researches; Becquerel, A. C., Traite Experimental de l'Electricite; Fleming, Alternate Current Transformers; Gladstone and Tribe, Chemistry of the Secondary Batteries of Plante and Faure; Gore, The Art of Electric Metallurgy; Gray, A., Absolute Measurements in Electricity and Magnetism; Houston, Dictionary of Electric Words, Terms and Phrases; Hospitalier, E., Applications de l'Electricite; Jamin et Bouty Traite de Electricite, Etc.; Jenkin, Fleming, Electricity and Magnetism; Kapp, Gihbert; Electric Transmission of Energy; Kempe, H. R., Electrical Measurements; Lodge, O., Modern Views of Electricity; Niaudet, Electric Batteries; Riess, P. T., Lehre von der Reibungs electricitaet; Slingo and Brooker, Electrical Engineering; Thompson, Silvanus P., Electricity and Magnetism; Thompson, S. P., Dynamos and Dynamo Electric Machinery; and others.

SEWING AND DRESSMAKING ROOM.

East of the Physical Laboratory is a large room devoted to sewing and garment making. It has been equipped with four large tables furnished with sufficient number of drawers to accommodate three classes of sixteen members each in garment making. An outfit of Standard Sewing Machines has also been placed in this room for the use of the classes in sewing. A patent gas iron-heater, pressing-boards, together with necessary needles, scissors, thimbles, scales, tape-lines, etc., for the use of individual students, complete the equipment of this department. Adjoining the main sewing-room, a retiring room for fitting purposes is provided.

CHEMICAL LABORATORY.

EQUIPMENT.

The Chemical Laboratory is found on the second floor of Polytechnic Hall, south of the wood shop. It is furnished with experiment tables, capable of accommodating comfortably twenty-four students at once, and having drawer space for forty-eight. The tables are fitted with water and gas, and shelves for reagents, as well as drawers in which individual supplies are kept. In connection with the laboratory, at the southwest corner, is a supply room where the various chemicals and apparatus are kept and furnished to the students at cost. Adjoining the laboratory on the north is a room which is designed as a balance and burette room for use in quantitative analysis. This room contains the chemical library, which, being so easily accessible from the laboratory, makes it of the greatest efficiency. It is furnished with a small but carefully selected number of standard chemical books which are of every day use to the students. It is desired to make this library freely accessible to interested persons not students of the school. The laboratory is furnished with the following special apparatus, in addition to the general equipment of glassware, etc.: An analytical balance, sensitive to one-twentieth milligram, for quantitative analysis; three burettes for accurate measurement of liquids; an automatic still for furnishing distilled water, capable

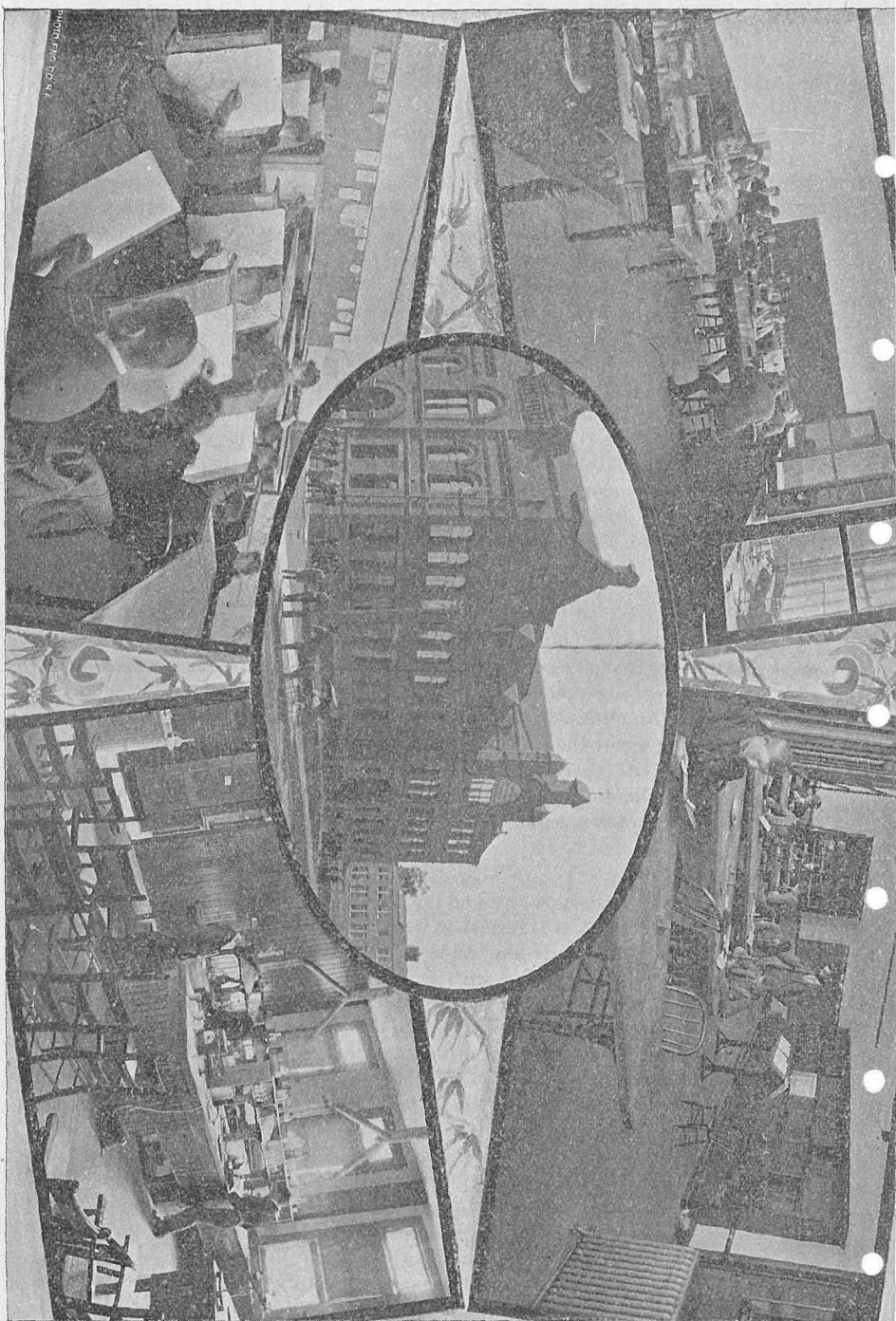


PHOTO BY CORA

PHYSICAL LABORATORY
FRESHMAN DRAWING ROOM.

THROOP POLYTECHNIC INSTITUTE.
EAST HALL.

BIOLOGICAL LABORATORY.
CHEMICAL LABORATORY.

of distilling one-half gallon per hour ; a blast lamp and bellows for glass working ; a gas melting furnace, capable of melting twelve pounds of metal at one charge. The last two are placed upon a special table, with a two inch cement top to prevent danger from fire.

COOKING ROOM.

Next south of the chemical laboratory the cooking room is located. This is supplied with four tables, upon each of which is located two gas stoves. Along either side of the table are the drawers containing the caps, aprons, sleeve protectors, note-books, etc., of the two young ladies assigned to work at that side of the table. The right-hand drawer contains cooking utensils, mixing, measuring-dishes, stirring-spoons, kitchen knives and forks, etc., while in the closets beneath are found a full assortment of stove and kitchen furnishings. At either end of the table, towels, lid-lifters, etc., are hung. Two girls work at each stove, so that, at present classes of sixteen can be accommodated, each student participating in every process called for in the instruction. The floor is so piped that an additional table can be put in, thus providing for classes of twenty at a time. A large dust-proof cupboard, containing meal and flour bins, dish closets, etc., occupies the southwest corner of the room, while in the southeast corner stands a large water heater and Lowe patent gas range. A large refrigerator and closet for furnishings complete the equipment of this room.

DRAUGHTING ROOM.

The remainder of the south wing is occupied by the draughting room, which is furnished with twenty desks, each containing six drawers and six slides for drawing-boards. In the drawers, provided with Yale locks, as is the case in all other laboratories and work-rooms, are found the rulers, triangles, curves, draughting instruments, etc., of the individual students. Stools are supplied for each place, so that a student may work standing or sitting. The T squares used by the students are hung along the walls about the room. The room is lighted by large windows on the east and a full skylight, all of which are provided with shades by which the lights can be fully controlled. Thus the present equipment provides for six classes of twenty students each without necessitating any interference with the special instruments of any student.

EAST HALL.

To relieve the crowded condition of the first year, and provide for the increased attendance, a new building, 150 feet long by 68 feet in width, three stories in height, with a full basement, was erected directly east of Polytechnic Hall. The building stands back thirty feet from Chestnut street and twenty feet from Raymond avenue. It cost finished and furnished nearly forty thousand dollars. It was designed by H. Ridgway of Pasadena, and was built by M. Slavin, Esq.

On the first floor are class-rooms for Latin and Greek, French, German and Spanish, English Language and Literature, Mathematics, History, Stenography, Typewriting and Book-keeping, and the Preparatory department. A double office is found to the left of the main entrance, while at the rear are cloak and toilet-rooms for both ladies and gentlemen.

The second floor is given up to a large assembly room, which will accommodate 400 students ; a library for the accommodation of 8000 volumes ; cloak and toilet-rooms for ladies and gentlemen ; and the quarters of the Department of Biological Sciences.

The assembly room, with its high arched ceiling extending into the third story, leaves but half of that floor to be utilized for working purposes. A draughting room, 45 by 36 feet, lighted by north windows and a large skylight, with an adjoining dark-room and blue-printing room, occupies the west end of this floor. The museum and class-rooms for Physical Geography, Geology and Astronomy also find places here. The basement, which is finished, lighted and ventilated in keeping with the other floors, provides quarters for the Sloyd School, Preparatory departments, wood-carving classes, etc.

BIOLOGICAL LABORATORY.

In the northwest corner of the second floor of East Hall is the 19x50 laboratory, in which are seven microscopic tables, closets, cases, sinks and aquaria. In the southwest corner is the room for recitation and for work in physiological botany, and, between the west ends of the two, the instructor's private work-room.

The students are furnished compound and dissecting microscopes, a complete set of dissecting and microscopic tools, and the chemicals and reagents necessary for successful microscopic work.

In addition, the laboratory is furnished with microtomes, a camera lucida, injecting apparatus, a microscope and attachments for bacteriological work, culture dishes, and apparatus for dry and steam sterilization.

In this laboratory are placed the reference books in Botany, Zoölogy, Physiology, Entomology, and allied subjects, additions being made to the original number as they are needed.

As indicative of the character of the reference library for this department, we submit the following list of books used by the classes of the past year: Goebel's *Outlines of Classification*; Strasburger's *Botanische Practicum*, Fränkel's *Bacteriology*, Bessey's *Botanies*, Gray's *Botanies*, Youman's *Botanies*, Campbell's *Botany*, Goodale's *Physiological Botany*, Darwin's *Cross and Self-Fertilization*, De Candolle's *Origin of Cultivated Plants*, Arthur, Barnes, and Coulter's *Plant Dissection*, Johnstone's *Manual of Botany*, Bailey's *Horticulturist's Rule Book*, Ward's *The Oak*, Massee's *Plant World*, Cooke's *Microscopic Fungi*, Huxley and Martin's *Practical Biology*, Whitman's *Microscopic Methods*, De Bary's *Fungi*, Wolle's *Fresh Water Algæ*, Desmids, and *Diatoms*, Gray's *Synoptical Flora*, Greene's *Pittonia*, *Flora Franciscana*, and *Manual of the Bay Region*, Chapman's *Flora of the Southern States*, Coulter's *Rocky Mountain Botany*, Underwood's *Our Native Ferns*, Hackel's *True Grasses*, Watson's *Botany of California*, Burrill's *Parasite Fungi*, Ellis and Everhart's *Pyrenomycetes*, Massee's *British Fungus-Flora*, Hervey's *Sea Mosses*, Lesquereux and James' *Mosses of N. A.*, Woodhead's *Bacteria and their Products*, Britton's *Flora of New Jersey*, Kingsley's *Natural History*, Claus and Sedwick's *Text-book of Zoölogy*, Hornaday's *Taxidermy*, Morgan's *Animal Life*, Maynard's *N. A. Butterflies*, Brook's *Handbook of Zoölogy*, Orton's *Comparative Anatomy*, Jordan's *Vertebrates*, Emerton's *Spiders*, Bell's *Comparative Anatomy*, Hyatt's *Guides in Science Teaching*, Parker's *Zoöatomy*, Bumpus' *Zoölogy*, Agassiz's *Natural History*, Geddes and Thompson's *Evolution of Sex*, Holder's *Zoölogy*, Packard's *Zoölogies*, Tyler's *Anthropology*, Hertwig's *Embryology*, Minot's *Human Embryology*, Gray's *Anatomy*, Cleland's *Physiology*, Morse's *Zoölogy*.

The Institute also takes the following biological journals and places them upon a rack in the laboratory where the students have free access to them: Pop-

ular Science Monthly, Science, American Naturalist, Zoe, American Microscopical Journal, Botanical Gazette, Bulletin of the Torrey Botanical Club, Erythea, Meehan's Monthly Botanisches Centralblatt, and Insect Life.

WOOD CARVING SHOP.

Room 13 of Polytechnic Hall was fitted up with tables and cases for classes of twenty pupils. Each student was furnished with a pair of clamps, a slip-stone and a case of thirteen Addes carving tools. The cases furnish individual lockers for the students and storage for the finished work of the class. One full set of wood-working tools is also provided for this department. For the coming year this shop will be quartered in a new well lighted room on the first or basement floor of East Hall.

SLOYD SCHOOL.

In rooms adjoining the wood carving shop the work rooms of the Sloyd School will be found. Provision has been made for four classes of twenty students each. In point of material equipment and teaching force this department will be second to none in the school.

MANUAL TRAINING SCHOOL COURSES.

Five parallel lines of work constitute the course of study for the Manual Training Department, which extends over four years, in which the school time of the student is about evenly divided between mental and manual exercises. Forty-five minutes of each day are given to free-hand, architectural and mechanical drawing, while one and one-half hours daily are devoted to shop work. The five lines of work above referred to are as follows:

First. A course in English Language and Literature, History, Civics and Economics. Especial attention will be paid to the study of the English Language. No other proficiency will be accepted as excuse for lack of ability in the art of writing or speaking English.

Second. A course in Mathematics, including Book-keeping, Algebra, Geometry and Trigonometry.

Third. A course in Science, including Biology, Physics, Chemistry and Electric Science.

Fourth. A course in Freehand, Architectural and Mechanical Drawing.

Fifth. (a) A course of Tool Instruction, involving carpentry, wood-turning, molding, brazing, forging, soldering, bench and machine work in metals, special work in electrical appliances. (b) Instruction in Domestic Economy, including sewing, cutting and fitting of garments, home decoration, together with clay modeling and wood carving.

COURSE OF STUDY.

The order of study and work is substantially as follows:

First Year:

1. Mathematics—Course I.
2. English—Course I.
3. { Science—Botany I, or Zoölogy II.
or
Languages—Latin I, French I, or German I.
4. Drawing—Course I.

5. Shop Work — { Course I in Joining, Turning, etc., for young men.
Course I in Sewing, or Course I in Clay Modeling and
Wood Carving for young women.

Second Year :

1. Mathematics — Course II.
2. English — Course II.
3. { Science — Botany III, Zoölogy IV, Physics I, or Chemistry I.
or
Languages — Latin II, French II, German II.
4. Drawing — Course II.
5. Shop Work — { Course II in Iron Work, Forging, etc., for young men.
Course II in Clay Modeling and Wood Carving, or
Course II in Sewing, etc., for young women.

Third Year :

1. History — Course I or II.
2. { Any two of the following : { Mathematics III and IV.
English III.
3. { { Latin III, or French I, or German I.
Science, Physics II, or Chemistry II, or Electric
Science I, or any Science Course in first two years.
4. Drawing — Course III.
5. Shop Work — { Course III in Pattern Making and Machine Shop Exercises for young men.
Course III in Cooking, Marketing, Chemistry of Foods, etc., for young women.

Fourth Year :

1. History — Course III.
2. { Any two of the following : { Mathematics — Courses III and IV or V and VI.
English — Course III or Course IV.
3. { { Latin IV, or French II, or German II.
Science — Botany III, Zoölogy IV, Physics III, Chemistry III, or any Science Course of the first three years.
4. Drawing — Course IV.
5. Shop Work — { Course IV, in Machine and Electric Work for young men.
Course IV, in Garment Making and Costuming for young women.

The Wood Carving and Clay Modeling Courses are open to young men as electives.

If French or German is chosen, it must be followed for not less than two years.

Courses in Greek and Spanish are also offered as electives.

If Latin is chosen, it must be followed for not less than three years.

To graduate from the Manual Training School Course students must complete thirty-six annual hours of work. An annual hour is such work as requires one recitation period daily for a year. For example, drawing is prescribed for one period daily for four years and counts as four annual hours. Shop work is prescribed for two daily periods throughout the course, and counts as eight annual

hours. Three other subjects are to be taken daily, which require preparation out of class time. The preparation is counted as the equivalent of the class exercise. Thus English or Mathematics, while receiving each the same class time per day as Drawing, counts owing to the time involved in preparation as two hours each year where Drawing counts as one. The completion of the first year of the course outlined above would give a student credit for two annual hours in Mathematics, two in English, two in either Science or Languages, one in Drawing, and two in Shop Work. Thus nine annual hours would be the credit for satisfactory completion of a full year's work in the course. To graduate, a student must have included in his thirty-six annual hours at least eight hours in some one of the following subjects; viz., English, Mathematics, Modern Languages, Ancient Languages, Natural Science or history. As will be seen from the following table twelve annual hours of definite Manual Training are absolutely required and prescribed. Of the remaining twenty-four annual hours ten are prescribed, ten are elective within a generously prescribed range, and four are absolutely elective.

SUBJECTS REQUIRED FOR GRADUATION FROM THE MANUAL TRAINING
SCHOOL.

Prescribed Work	{	Manual Training	{	Drawing,	4	annual hours						
			{	Shop Work,	8	" "						
	{	General Lines	{	English,	4	" "						
			{	Mathematics	4	" "						
{			History,	2	" "							
Wholly Elective Work.....						4 annual hours						
Work Elective within limits of	{	Mathematics—	{	Zoölogy, Botany or Biology and Physics or Chemistry.								
		English—										
		Science—										
		Languages—					{	French, German or Latin.				
		History—					{	Greek and Roman, Modern or French and English.				
							{			10 annual hrs		
							{					

The advanced courses in technical college lines are almost totally elective. They compose work in Physics, Chemistry, Biology, Civil Engineering, Electrical Engineering, Mechanical Engineering, Normal Training for Teachers of Sloyd and Manual Training in all its departments.

Students preparing to take any of the Engineering Courses can so arrange their elective work that the last year in the Manual Training School, together with all the shop work and drawing of that course, may be counted among the requirements for the degree in the Engineering or technical college course.

COURSES IN MATHEMATICS.

For admission to first year's work in mathematics, applicants must pass a satisfactory examination in Arithmetic. Fundamental principles and processes must be thoroughly understood, and facility must be shown in the solution of

problems. Orderly and logical arrangement of work and neatness of execution are insisted upon.

I. Algebra, Fundamental operations. Special attention to the mastery of the subject of factoring and its applications; simultaneous equations, involution and evolution; radical and imaginary expressions. The work of this year is covered by such a text as Wentworth's School Algebra to Quadratics.

II. Plane Geometry. Regular work contained in some such work as Wentworth's New Plane Geometry. The work is supplemented by the original problems in this book, and by other original work.

III. Higher Algebra. Indeterminate equations, inequalities, theory of exponents, radical expressions and rationalization, imaginary expressions, square root of binomial surds, quadratic equations, theory of quadratic equations, with solution by factoring, logarithms, variation, arithmetical, geometrical and harmonical progression, binomial theorem, undetermined coefficients, permutations and combinations, theory of limits, and continued fractions.

IV. Solid Geometry. The course given in Wentworth's Plane and Solid Geometry, Books VI-VIII, inclusive.

V. Plane and Spherical Trigonometry and Surveying. This work is practically covered in Wentworth's Plane and Spherical Trigonometry, and Surveying with Tables.

VI. Analytic Geometry. The regular course in Wentworth's Analytic Geometry, supplemented by a large number of practical problems.

VII. Calculus—Integral and Differential.

VIII. Analytic and Applied Mechanics.

COURSES IN ENGLISH.

I. A knowledge of the elements of English Grammar is a necessary prerequisite to this course. Kellogg's Rhetoric will form the basis of the technical instruction given in sentence structure, paragraphing, and qualities of style. In addition, Gayley's Classic Myths will be used as a text-book. The text will be supplemented by the use of the best translations of the classic originals, and by the study of English poems based upon the myths. Weekly compositions on some topic connected with the reading will be required.

II. Kellogg's Rhetoric will be completed, but the greater part of the year will be devoted to the study of Shakspeare's Merchant of Venice, Julius Cæsar, and Macbeth. The first reading will be accompanied by a discussion of the story and the characters, and some exercises in independent criticism. The second reading will involve paraphrases, written outlines of scenes, and a study of syntax. The reading of the best criticism will follow the completion of each play, and a study of the English drama and of the life and times of Shakspeare will complete the work.

III. Hale's Longer English Poems and Milton's Comus will be read and studied during the first half of the year. These poems will be treated as each one demands, and will require a study of biography and historical sequence of authors; exercises in critical comparison with studies in qualities of style; and written work on the topics suggested by the reading. Burke's American Speeches and Thackeray's novel, The Newcomes, will occupy the second half of the year. The American speeches will give an opportunity for the study of argument, for analysis of modes of reasoning, and for some discussion of the principles of general

politics. The novel will be read in class and treated with the ordinary mechanism of instruction; namely, recitation, reproduction of scenes, character sketches, and comparison of characters among themselves and with others. In addition, it is designed to train the pupil in careful reading; to enlarge his ideas by an acquaintance with a world of thought and action outside of his own circle; to develop his ethical sense, and to guide him in looking for something more than the mere story.

IV. This course will be offered as an elective to pupils who have completed the work of the preceding courses, or their equivalent. It will include a history of English Literature, with special attention to three important types of literary expression, the essay, the epic poem, and the novel.

COURSES IN LATIN.

I. Collar and Daniell's *Beginners' Book*, through first and second terms. Special attention given to vocabularies; translation of the exercises from Latin into English and from English into Latin; conversations based upon the sentences and exercises translated will be held occasionally for memory-training.

Structure of Latin sentence and comparison with English sentence-structure. Paradigms will be mastered, not simply to be recited by rote, but that the pupil may be able to compare them and to see the laws which govern their formation.

II. *Cæsar's Commentaries*. Critical study of text with translations into idiomatic English.

The laws governing indirect discourse and the Subjunctive Mood are studied. Incidental study of the Gallic State, of the Gallic Province, of Germany, and of the constitution of *Cæsar's* army; sight-reading and composition. The theory of word-formation will be briefly examined.

III. *Cicero's Orations*. Textual study as in *Cæsar*, sight-reading and composition; historical allusions investigated; the system of Roman Government; powers of officers; customs and occupations of the people; geography involved in the text is made an incidental topic for study.

IV. *Virgil's Aeneid*. Structure of the poem, with the theory and practice of scansion of Latin poetry, especially of the hexameter; translation into idiomatic English; study of the superstitions and religious rites of antiquity, as well as of the myths and legends; minute word-study and analysis.

V. *Horace. Satires, Epistles and Odes*. The work will be similar to that done in the study of the *Aeneid*, except that more extended investigation will be made of Latin verse.

VI. *The Germania and Agricola of Tacitus*. Particular study of the author's style.

Cicero's De Officiis, De Senectute and De Amicitia.

COURSES IN GREEK.

I. The alphabet, inflections and simple translations will be studied the first term. The second term will have similar work, with the study of vocabularies. Composition exercises and conversations will be used for memory training. *White's First Lessons* will be used as a text-book. The third term will be spent on the first four chapters of the *Anabasis*.

II. *Anabasis* completed. Careful translation into English; points of linguistic or historical interest studied; prose-composition will be a part of the work through the year, as also sight-reading.

III. Homer's Iliad. Usual amount of college preparatory work, Plato's Apology and Crito.

COURSES IN SPANISH.

I. (a) 1. Worman's First Spanish Book and conversational exercises; 2. Knapp's Spanish Grammar and written exercises.

(b) 1. Worman's Second Spanish Book and conversational exercises; 2. Knapp's Spanish Grammar and written exercises.

(c) 1. Worman's Second Spanish Book and conversational exercises; 2. Knapp's Spanish Grammar and written exercises; 3. Study of Spanish Idioms (Becker and Mora.)

II. (a) 1. Knapp's Modern Spanish Readings; 2. Knapp's Spanish Grammar, with oral and written exercises.

(b) 1. Knapp's Modern Spanish Readings; 2. Knapp's Spanish Grammar, with oral and written exercises.

(c) 1. Knapp's Modern Spanish Readings; 2. Knapp's Spanish Grammar, with oral and written exercises; 3. Study of Spanish Idioms (Becker and Mora); 4. Drill in Correspondence, and also in Ceremonial Formulas in Spanish.

COURSES IN FRENCH.

I. (a) 1. Van Daell's Introduction to the French Language; 2. Worman's First French Book and conversational exercises; 3. Phonetic Study and Practice of French Pronunciation.

(b) 1. Van Daell's Introduction to the French Language; 2. Sauveur's *Causeries Avec mes Élèves* and conversational exercises; 3. Special Study of Irregular Verbs.

(c) 1. Van Daell's Introduction to the French Language; 2. Sauveur's *Causeries Avec mes Élèves* and conversational exercises; 3. Special Study of Irregular Verbs.

Written exercises from English into French will be required throughout the whole year.

II. (a) 1. Dufour's French Grammar, First Part; 2. Knapp's Modern French Readings; 3. Oral Exercises and Written Compositions in French.

(b) 1. Dufour's French Grammar, *Seconde Partie*; De La Syntaxe (in original French); 2. Knapp's Modern French Readings; 3. Oral Exercises and Written Compositions in French; 4. Lectures on the Rhetorical Structure of the French.

(c) 1. Knapp's Modern French Readings; 2. Exercises in French Syntax and Idioms (Chardenal); 3. Original Theses in French; 4. Lectures on French Rhetoric.

III. (a) 1. Exercises in French Syntax and Idioms (Chardenal); 2. Madame Thérèse (Erckmann-Chatrian); 3. Lectures on the History of the French Language and Literature.

(b) 1. Exercise in French Syntax and Idioms (Chardenal); 2. Picciola—*Un Roman* par M. H. B. Saintine; 3. Lectures on the History and Characteristics of the French Novel.

(c) 1. Exercises in French Syntax and Idioms (Chardenal); 2. *La Famille de Germandre*, par George Sand; 3. Lectures on Comparative Philology as especially related to the French and the modern languages of Europe.

Conversational and written exercises are continued throughout the whole year and are systematically and periodically arranged.

COURSES IN GERMAN.

I. (a) 1. Worman's First German Book and conversational exercises; 2. German Lessons (Collar's Eysenbach); 3. Written exercises from English into German.

(b) 1. Studien und Plandereien (First Series) and conversational exercises; 2. German Lessons (Collar's Eysenbach); 3. Written exercises from English into German.

(c) 1. Studien und Plandereien (Second Series) and conversational exercises; 2. German Lessons (Collar's Eysenbach); 3. Written exercises from English into German.

II. (a) 1. Stein's German Exercises; 2. Wilhelm Tell (Schiller); 3. Lectures on the History of the German Language and Literature.

(b) 1. Stein's German Exercises; 2. Wilhelm Tell completed, and Iphigenia auf Tauris (Goethe) begun; 3. Lectures on Swiss History as illustrative of Wilhelm Tell, and on Classic Mythology as explanatory of Iphigenia auf Tauris.

(c) 1. Stein's German exercises; 2. Iphigenia auf Tauris (completed); 3. Lectures on the Distinctive Characteristics of the Literature of the New High German Period,

III. (a) 1. Nathan Der Weise (Lessing); 2. Special Study of Conditional Sentences in German; 3. Lectures on the Revolution in German Literature accomplished by Lessing, and on the peculiar features of the German Drama.

(b) 1. Maria Stuart (Schiller); 2. Special Study of Indirect Discourse and of the subjunctive in German; 3. Lectures on the effect of the Thirty Years' War (1618-1648) on German Literature.

(c) 1. Goethe's Faust; 2. Special Study of the German Auxiliaries of Mood and Tense; 3. Special Lectures on the Careers and Works of Goethe and Schiller considered individually and comparatively.

Throughout the whole year original Theses in German will be systematically and periodically required.

COURSES IN HISTORY.

I. Greek and Roman History. Careful study of the chief epochs of Greek and Roman history, with special reference to the development of institutions and the growth and influence of the respective arts and literatures of each. In connection with this is a three-weeks course on the ancient civilization of Egypt.

II. Mediæval and Modern History. Particular attention will be paid to institutional growth.

III. Federal and State History and Government. This course will be required of all students before graduation. It will endeavor to consider the origin and trace the development of constitutional government, making a special study of the United States and California. "The State" by Woodrow Wilson will be the manual in the hands of the students, and its bibliography will be accessible to students taking this course.

IV. English History. A study of social and institutional development for the first half year, followed by a similar study of French History for the remainder of the year.

COURSES IN BIOLOGY.

I. General structure, physiology and classification of plants; dissecting, drawing and describing individual plants, as types of groups; the first half of the

year spent upon the groups from the Protophytes to the Pteridophytes, inclusive, and the remainder upon the Spermaphytes; collection, classification and preservation of one hundred plants, representing as nearly as possible all the plant groups; McClatchie's Guide in the Study of Plants as a laboratory guide, with readings from Campbell's, Bessey's, Johnston's, and Bennet & Murray's botanies, the current journals and other works.

II. General structure, physiology and classification of animals; dissecting, drawing and describing typical forms; the first two-thirds of the year spent upon Invertebrates and the last third upon Vertebrates; Colton's Practical Zoölogy as a laboratory guide, with readings from Kingsley's Natural History, Claus' and Sedgwick's Text-Book of Zoölogy, Hyatt's Guides in Science Teaching, Packard's Zoölogy, the current journals and other works.

III. Vegetable anatomy, histology and physiology, with the structure, life histories, and classification of algæ, fungi, and Bryophytes; microscopic methods, use of microtome, etc.; Bessey's and Campbell's Botanies as text-books, with Sach's and Goodale's Physiological Botanies, Goebel's Outlines of Classification and Special Morphology, De Bary's Fungi, Whitman's Methods in Microscopy, the current journals and other works as reference books.

IV. Comparative anatomy, histology, physiology and classification of worms, spiders, insects and Vertebrates; microscopic methods, use of microtome, etc.; Bell's Comparative Anatomy and Physiology, Parker's Zoötomý, Hyatt's Insecta, Packard's Guide in the Study of Insects, current journals and other works as reference books.

Course III is open to those that have taken Course I, and Course IV to those who have taken Course II. Double the amount of the recitation period is required to be spent at laboratory and field work, as preparation of all lessons in this department.

PHYSICS.

I. The course in physics covers one year, three periods of forty-five minutes each being devoted to the subject each day; two of these are spent in the laboratory, the other either in recitation or lecture. Hall & Bergin's Text-Book of Physics is used. The laboratory method of teaching is strictly adhered to, and such apparatus as is comparatively easy to construct is made by the students. For this purpose a work-shop is provided, fitted up with both wood and metal working tools. Special attention is given to the mechanical and electrical parts of the subject, and many excellent opportunities are afforded in the various shops and laboratories of the Institute for making practical applications and illustrations of the principles taught. The lectures supplement the text book by pointing out applications.

ELECTRICAL ENGINEERING.

I. A combined lecture room and laboratory course in Electrostatics, Magnetism and Voltaic Electricity. The plan of the work will follow somewhat closely that found in Stewart Gee's Practical Physics, Vol. II. This is followed up by the study of the theory of direct current machinery and its applications in the commercial world. A part of the laboratory time is spent in making tests of dynamos and motors. Students are taken to visit electric plants from time to time.

II. The study of the open coil machine, the arc light, switch board and the

arc lamp; design of both the electrical and mechanical parts of direct current machinery; the theory of alternate current machines and transformers; central station wiring; a course of lectures on electric railroads; polyphase currents and the transmission of power.

COURSES IN CHEMISTRY.

I. General Chemistry. This course is intended for beginners, and gives an elementary survey of inorganic and organic chemistry. Special attention is paid to chemical change, laws of combination, reactions, atomic and molecular theory, physics of gases, chemical problems. The aim of the instruction is to develop independence of thought and work, each student performing for himself a large number of experiments, keeping accurate notes of phenomena observed and conclusions which he draws from them. Lectures and recitations supplement the laboratory work, and students are taught to use several standard text books rather than confine the study to one. The library of the department is well adapted for this method of work.

II. Qualitative and Quantitative Analysis. During the second year students receive instruction in Qualitative Analysis during the first two terms, and as in Course I, perform a great deal of laboratory work. The analysis of unknown substances takes a large part of the time. In the third term Quantitative Analysis is begun, and may be continued in the third year if desired. Opportunity will also be given for those who desire to pursue more advanced work in Analytical and Organic Chemistry.

COURSES IN SHOP WORK.

WOOD SHOP.

I. Carpentry and Joinery—Special instruction in the use and care of tools; inlaying; wood turning; straight shoulder and molded; center turning; chucking; inside turning; turning simple bowls and cups.

CARVING SHOP

Wood Carving—Preliminary exercises in the care and use of tools; carving the plain and curved surfaces; horizontal and vertical lines; letters and inscriptions; low relief, half relief, high relief, filled and curved surfaces with both conventional and naturalistic treatment; the use of oils, stains and varnish, in finishing woods.

The student will be required at the end of the year to design and make some one piece, involving the elements of carpentering, turning and carving mastered during the year.

SMITHING SHOP.

II. Iron-work, including forging, bending and up-setting; welding; tool making; ornamental iron work; making steel tools, brazing, etc.

As in the wood shop, each student will be required to design some special piece at the close of the year, involving the various elements of forging mastered.

PATTERN SHOP.

III. Pattern-making; molding; turning; metal spinning; chipping and filing; fitting; the use of taps and dies; machine work; the theory of cutting tools, turning, boring and screw cutting.

MACHINE SHOP.

IV. Machines and Electricity—The special study of machinery and care of the same; the study of construction, testing of electrical machinery, wiring, lighting, etc.; building of engines, dynamos, motors, etc.

PLAIN SEWING.

(a) Three days a week, one and a half hours per day. The fundamental principles of hand-sewing, basting, running, hemming, hemstitching, felling, etc.: drafting and making an under-garment by hand; lessons on material used.

(b) Machine-sewing, plain stitching, hemming, tucking and gathering; making of garments by machine and hand.

(c) Continuation of white sewing; practical experience in shopping by each pupil; neatness and accuracy required in each course. During the year a complete set of underwear must be made by each pupil.

(d) In connection with the plain sewing, two lessons a week of one and a half hours will be devoted to the cultivation of taste: studying the proportions of the human figure; from this, designing basques and gowns in pencil; after some experience similar sketches in flat water-color washes. This work being preliminary to artistic combination of fabrics in the dressmaking course.

DRESSMAKING.

(a) This course is devoted to the principles of dressmaking: Drafting a basque and sleeves from actual measurements; cutting, fitting and finishing a basque; cutting and making a shirt; choice of materials, price, quantity and amount needed.

(b) Drafting continued: Cutting of fancy fronts to basques; pupils are required to plan an entire dress with written description of it before beginning, including collar, trimming sleeves, etc.; making of dress.

(c) Drafting and fitting seamless waist, lownecked waist, princess dress, etc.

(d) With the foregoing special attention to bearings of dress on health; how to dress to preserve health and strength; rational dress reform studied; presentation of physiology of dress by special lectures.

COURSE IN COOKING.

(a) The fundamental principles of cookery and practice in the preparation of vegetables, soups, meats, cereals, biscuits, eggs, etc.; cost of materials; chemistry of food; care of a kitchen; serving a simple dinner.

(b) Instruction in preparation of more complicated dishes: bread, fish, oysters, pastry croquettes, game, etc.; care of silver and glass; setting and serving a table; table etiquette; chemistry continued.

(c) Entrees, salads, deserts, cake, jellies and creams; giving of entire breakfasts, luncheons and dinners; ordering; proportions of food needed; garnishing; short course in invalid cookery; carving.

(d) Presentation of the physiology of nutrition by special lecturer.

COURSES IN MECHANICAL DRAWING.

I. Pencil work, drawing from objects, parts of machines, etc., in orthographic projection; working drawings in pencil, for shop use; pen lining and simple geometrical constructions, with their applications; lettering and tinting; isometric and cavalier projection, with simple constructions of shades and shadows; simple constructions in carpentry and architectural plans; drawings from objects and casts.

II. Shop drawings for wood and iron work; drawings for carvings; shades and shadows; perspective; orthographic projection, with development of surfaces; architectural drawings; tracing and blue printing.

III. Sketches from models, and designs for construction in clay, wood, iron, etc., and for wood carvings; problems in stone-cutting and sheet-metal working; coloring and conventional methods used in topography; problems in descriptive geometry, with applications; drawing of plans, elevations and sections of machines.

IV. Architectural orders, drawings of selected architectural studies; graphical statics, composition and resolution of forces studied graphically; stress diagrams for roof trusses and for the action of stationary and travelling loads upon beams; drawing and designing machines; problems in construction of gearing.

COURSES IN FREE-HAND DRAWING.

I. Beginning with the simplest pencil work, marking off geometric figures and placing the wave line, or stem foundation for all design; to which will be added conventional and naturalistic forms to complete the design.

This will be made in outline with pencil, in the shape of circles, squares, spandrels, etc.

The second term's work will be done from cast, making careful outline studies, adding breadth of light and shade, followed by shadow and one tint.

The third term, principles of perspective will be given from models, and applied, by each pupil, making sketches involving the principles taught.

II. Pupils giving especial attention to clay modeling and wood carving will make more designs in pencil, to fill given spaces, taking the motives from historic ornament.

Pupils not especially connected with these classes may give more time to designing, book-covers, titles, oil cloths, and possibly wall paper, adding color in flat tint when sufficiently advanced.

Both naturalistic and conventional treatment will be studied, and a few talks will be given on the History of Ornament.

Students will continue working from cast, the advanced ornament, etc., mask, and possibly from the head.

Still-life, involving simple composition, and some attention given to color during the third term.

A sketch class will be formed to work from the costumed figure, or from the head, life size, as soon as there is a demand for one.

A class will work in water color, from still life, and flowers, as soon as their work in black and white is satisfactory.

COURSE IN CLAY MODELING.

I. Simple leaf form modeled from cast, ornament, and advanced ornament.

Ornament modeled in relief from the flat.

Original designs modeled for carving; and masks modeled if the pupil can do ornament well.

II. Masks, heads, and busts will be modeled, and possibly full-length figure from cast, if the quality of work will permit. Work from life will be taken up as soon as the pupils are ready for it.

COURSES IN WOOD CARVING.

I. Accurate cutting required in pine, across, diagonally, circular, and with the grain of the wood.

Lining and stamping both light and heavy.

Simple conventional form modeled in low relief.

II. Second year pupils will model the different styles of historic ornament, making their original arrangement of design ; also drawing the plan, and making the furniture they carve. As soon as students have completed carvings in the different styles of historic ornament they will begin carving in the round.

Drawing, carving and clay are so closely related the one to the other, that one must have a knowledge of the three to succeed in carving, first placing the thought with the pencil, on paper, then modeling it in clay, and finally cutting it with the chisel and gouge in wood. To continue the work in carving, one must have a knowledge of light carpentry, turning, scroll-sawing and mechanical drawing.

Pupils will not begin carving in the round until they can execute well, faces, and figure in outline, and light and shade.

Artistic anatomy will be studied in connection with all figure and life work.

All work will be individual as far as possible, and no student will be kept back by the class, but may advance as rapidly as their work prove them qualified to go.

COURSE IN STENOGRAPHY.

The purpose of the course in this subject is the equipment of young men and women for practical service as stenographers and amanuenses. The time allotted to the work is six months, in which every student is expected to devote not less than one-third of each day to this particular department. Certificates will be granted to all students who acquire the ability to write at the rate of one hundred words per minute for ten consecutive minutes, matter not previously seen by them, and who then are able to transcribe the same immediately. Pupils who have attained this degree of efficiency have mastered the principles of shorthand, so that the highest skill and accuracy is to be reached thereafter simply by practice.

COURSE IN TYPEWRITING.

The students are given thorough training in the use and care of the Densmore, Remington and Caligraph machines. No student will be permitted to take up this course who cannot devote to it at least one-third of his time. To obtain the certificate of the school, pupils must demonstrate their ability to carefully copy new matter at the rate of forty words a minute for ten consecutive minutes. The instruction in this work aims to reach the individuals so that the student may be permitted to advance as rapidly as his ability warrants. The following outline will indicate the chief features to which special attention is paid: [1]. The mastery of the key-board, including accurate fingering and evenness of touch. [2]. Graded word exercises. [3]. Mastery of commercial, legal and legislative phrases. [4]. Special drill in spelling, punctuation, capitalization, business correspondence, etc. [5]. Work on architectural specifications, legal testimony and statutory forms. [6]. Speed exercises, including tests of speed in writing upon the machine from dictation. [7]. Letter press copying and manifoldng. [8]. Special training in the mechanism, adjustment, repair and care of the machine.

BOOK-KEEPING.

The purpose of this work will be: [1]. The mastery by the general student of the elements of accounts. [2]. The special training of young men and young women for positions as book-keepers and accountants.

The study then, in this work will include not only mastery of the elementary principles, thorough drill in journalizing and posting, the making of the trial balance and the balance sheet, but will familiarize the student with the various auxiliary books. Thorough drill will be given in rapid calculation, the computation of interest, the writing of notes, checks, receipts, etc. Students desiring to continue the work through the year will have special opportunity to do so.

COURSE IN SLOYD.

The four years' course in tool-work and drawing here submitted is one which is especially adapted to elementary schools. It includes the making of fifteen different joints and involves the use of forty-seven tools. The course represents seventy-two different exercises. It is now employed in several schools in Boston as a regular part of the work, where it is thought to have proved its value by stimulating mental activity which has shown itself in better work in other branches of study. "In developing the sensitiveness and strength of the hand this system aims to develop a like sensitiveness and strength of the conscience and intellect."

Prof. Gustaf Larsson, the father of American Sloyd, says :

"Sloyd is not the outgrowth of a single mind, or of the experiments at one time or place, but the result of the work of wise investigators and practical teachers in many countries. Based, as is the kindergarten, on the philosophy of Fröebel and Pestalozzi, Sloyd aims primarily, by its appeal to many activities, to make the boy, and not the wooden model. This system was originally planned after the Swedish Sloyd as taught under the direction of Herr Otto Salomon, who has devoted a lifetime of faithful study to this subject at Nääs, at which place educators from all parts of the world have contributed their thought. As a result of actual experience in Boston, since 1887, with classes of boys, it has now been carefully adapted to the needs of American children. The drawing as an integral part of Sloyd work is a conspicuous American gain. For valuable suggestions regarding methods in the making of working drawings, this course of work is indebted to Mr. Frank M. Leavitt of Jamaica Plain.

That Sloyd can be successfully adapted to the educational system of any country is shown by reference to the principles herein stated upon which Sloyd insists as the basis of any course of models.

The aims and means of Sloyd are the *harmonious development* of the pupil, giving him by manual exercises and the use of the creative instinct such *general training* as will tend to fit him, mentally, morally and physically for any subsequent *special training*.

Important among Sloyd methods are :

- 1st. Strictly *progressive educational exercises*, mentally as well as physically.
- 2d. The appeal to many activities, by means of a judicious *variety of exercises*, treating the hand, like the eye or ear, as an avenue to the mind.
- 3d. Freehand work, or modeling with *the knife*.
- 4th. The making and the use of *working drawings*.
- 5th. *Form study* by means of methods of work which will not fail to develop the muscular sense of form.
- 6th. The cultivation of the *æsthetic sense*. "The pupil must be led to see and feel the simple beauty of proportion, of harmony of parts as well as grace of outline, elements of beauty which are a direct outgrowth of the useful, as well as the beauty of mere ornament which is something more or less externally added.

For this reason Sloyd attaches much importance to the free-hand modeling in wood of solid forms.

7th. *An essential proportion* between problems of thought, of drawing, and of tool work.

8th. The cultivation of habits of *accuracy* and thorough *honesty* by the pupil's correction of his own mistakes, no concealment of which can be tolerated.

9th. Consideration of *the general physical development*, to which a judicious sequence and combination of tools may be made to contribute materially.

10th. *Both class instruction and individual instruction*, a true progression of exercises making both possible even with large numbers.

11th. The "New Education" demands whenever possible, as a means of mental development, the use of the complete thought, of the phrase instead of the spelling lesson. In sympathy with this idea, Sloyd employs "*the useful model*", and as the exercises embodied in this model are based upon pedagogical principles, so must the teaching be, Sloyd therefore requires a *trained teacher*.

It will be seen that a consideration of this fact must influence the choice of tools, since there are those by use of which, although correct work may easily be produced, the physical development of growing children is not promoted, the best positions being difficult to attain during their use. The advantage of those tools which afford equal development to both sides of the body will easily be seen.

COURSE I

ORDER OF EXERCISES FOR SLOYD SCHOOL

PRELIMINARY SLOYD

DRAWING.	NEW EXERCISES.	NEW TOOLS.	No	Models Representing the Exercises.	Kind of Wood.	Dimensions. Inches.
Practice with rule, pencil, try-square in drawing parallel lines.	Measuring and lining, rip and cross-cut sawing.	Rule, pencil, try-square, splitting saw, back saw.	A.	Preparing for Nos. 1, 2, 3.	White wood.	7x5x $\frac{1}{4}$
Oblong, use of dimension and extension lines; dimensioning	Planing with and across the grain; sand-papering with block.	Smoothing plane, block plane, bench hook, sand-paper.	1	Ruler.	" "	6x1x $\frac{1}{4}$
Oblique lines; dimension fraction.	Oblique planing.		2	Label.	" "	5x1x $\frac{1}{4}$
Circle; semi-circle-dimension.	Boring and filing.	Compass, center-bit, flat file.	3	Key Tag.	" "	4x1 $\frac{1}{2}$ x $\frac{1}{4}$
Use of centre lines.	Gluing sandpaper.		4	Pencil sharp'nr	Cherry.	5 $\frac{1}{2}$ x1 $\frac{1}{4}$ x3-16
Dimensioning spaces.	Curve sawing; smoothing with spoke-shave.	Turning saw, spoke shave.	5	Round mat.	White wood.	6x $\frac{1}{4}$
Square.	Filing right angles.		6	Thread winder.	" "	2 $\frac{1}{4}$ x2 $\frac{1}{4}$ x $\frac{1}{4}$
Quarter foil.	Filing quarter foil.		7	Quarter foil mat	Cherry.	6x6x3-16
Right angle triangle.	Block planing without bench hook.		8	Triangle.	Maple.	5x5x $\frac{1}{8}$
Compound curves.	Boring arcs.		9	Fish line winder	White wood.	6x1 $\frac{1}{4}$ x $\frac{1}{4}$
Ellipse.	Modeling with spoke shave.		10	Cutting board.	Pine.	11 $\frac{1}{2}$ x8x $\frac{1}{2}$
Find center of arc with given radius.	Filing symmetrical curves.	Half-round file.	11	Yarn Winder.	Cherry.	3 $\frac{1}{2}$ x2x3-16
Pentagon.	Filing bevel.		12	Vase stand.	White wood.	5 $\frac{1}{4}$ x5 $\frac{1}{4}$ x $\frac{1}{4}$
Quadrant.	Screwing hooks.	Bradawl.	13	Key board.	Cherry.	8x2 $\frac{3}{4}$ x3-16
Detail Drawing.	Nailing.	Hammer, nail set.	14	Bracket.	White wood.	13x4 $\frac{1}{2}$ x $\frac{1}{4}$
Drawing from description.	Compass sawing.	Compass saw.	15	Frame.	Cherry.	8 $\frac{1}{2}$ x6 $\frac{1}{4}$ x3-16

ORDER OF EXERCISES FOR SLOYD SCHOOL

COURSE II

DRAWING.	New Exercises and Review of Preliminary Course.	TOOLS USED.	No.	Models Representing the Exercises.	Kind of Wood.	Dimensions. Inches.
Working drawings, full size, including free-hand curves and simple geometrical problems, excepting Nos. 4, 6, 11 and 13, when the children read another's drawing.	Straight, oblique and cross whittling.	Knife, ruler, lead-pencil.	1	Wedge.	Pine.	3x1x $\frac{1}{4}$
	Point whittling; sandpapering (without block).	Sandpaper.	2	Flower pin.	"	12x $\frac{1}{2}$
	Rip sawing; narrow surface planing; squaring.	Rip saw, jack plane, try-square.	3	Flower stick.	"	15x $\frac{1}{2}$ x $\frac{1}{2}$
	Boring with drill bit; fitting peg; curve whittling.	Bit-brace, drill bit.	4	Penholder.	"	7 $\frac{1}{2}$ x $\frac{1}{2}$
	Cross-cut sawing; gauging; end planing [in bench hook]; boring with augur bit; sandpapering (with block).	Cross cut saw, marking gauge, block plane, bench hook, auger bit.	5	Tool rack.	"	16x1 $\frac{3}{4}$ x $\frac{3}{4}$
	Curve sawing; smoothing with spokeshave; boring with bradawl.	Turning saw, spokeshave, bradawl.	6	Coat hanger.	"	15 $\frac{1}{2}$ 1 $\frac{3}{8}$ x $\frac{3}{4}$
	Broad surface planing; vertical chiseling; horizontal boring; filing; end planing (without bench hook).	Chisel, flat file, compass.	7	Cutting board.	"	18x7x $\frac{5}{8}$
	Nailing; sinking nails.	Hammer, nail set.	8	Flowerp't stand.	"	15x5 $\frac{1}{8}$ x17-16
	Making halved together joints.		9	Flowerpot stool.	"	5 $\frac{1}{2}$ x1x $\frac{3}{8}$
	Countersinking; gluing; screwing.	Countersink, screwdriver.	10	Bench hook.	Pine and cherry.	14x5 $\frac{1}{2}$ x1 $\frac{3}{8}$
	Modeling with spokeshave; scraping.	Cabinet scraper, half round file.	11	Hatchethandle.	Beech.	14x1 $\frac{3}{4}$ x $\frac{3}{4}$
	Beveling with spokeshave.		12	Corner bracket.	Pine.	10x10x1 $\frac{1}{2}$
	Oblique planing.		13	Hammer handle.	Beech.	12x1 $\frac{1}{4}$ x $\frac{3}{4}$

COURSE III

ORDER OF EXERCISES FOR SLOYD SCHOOL

DRAWING.	New Exercises and Review of Preceding Work.	NEW TOOLS.	No.	Models Representing the Exercises.	Kind of Wood.	Dimensions. Inches.
The same as the second year, increasing in difficulty as the models become more complex.	Spacing with compass ; veining ; carving.	Bevel, veiner, skew chisel.	14	Key board.	Pine.	15x2x $\frac{1}{2}$
	Wedge planing ; filing edge ; notching ; punching.	Round file, carver's punch.	15	Paper knife.	Maple.	13x1 $\frac{1}{4}$ x $\frac{1}{4}$
	Beveling edge with jack-plane and file ; boring with center bit.	Center bit.	16	Ruler.	"	16x1 $\frac{3}{4}$ x3-16
	Planing a cylinder ; fitting axle.		17	Towel roller.	Pine.	18 $\frac{3}{4}$ x4 $\frac{1}{4}$ x2 $\frac{1}{4}$
	Open mortise and tenon joint ; making and fitting dowels.	Mortise gauge, mallet.	18	Frame.	"	10x8x $\frac{3}{4}$
	Fitting and nailing square joints.		19	Box.	White wood.	11x5x2 $\frac{3}{8}$
	Grooving with gouge.	Gouge, round cabinet scraper	20	Pen tray.	Gum wood.	10 $\frac{1}{2}$ x2 $\frac{1}{4}$ x $\frac{3}{4}$
	Chamfering ; straight-edge beveling.		21	Hat rack.	Pine.	18x2 $\frac{1}{4}$ x3 $\frac{1}{2}$
	Half lapping ; grooving with chisel.		22	Picture frame.	Gum wood.	10x8 $\frac{3}{4}$ x $\frac{1}{2}$
	Compass sawing.	Compass saw.	23	Cake spoon.	Cherry.	13x2x $\frac{5}{8}$
	Grooving with rabbet plane ; mitreing.	Rabbet plane.	24	Picture frame.	"	8 $\frac{1}{8}$ x6 $\frac{1}{4}$ x7-16

COURSE IV

ORDER OF EXERCISES FOR SLOYD SCHOOL

DRAWING.	New Exercises and Review of Preceding Work.	NEW TOOLS.	No.	Models Representing the Exercises.	Kind of Wood.	Dimensions. Inches.
Working drawings to scale and from description. Difference between orthographic and isometric projection and perspective drawing. Lettering work and making blue prints.	Half oblique dovetail.		25	Foot stool.	Pine.	13x7x6
	Vertical gouging; cutting with drawing knife.	Drawing knife.	26	Scoop.	Cherry.	9½x1⅜x2¼
	Plain dovetailing; carving curve design.	Paring tool.	27	Book rack or bracket.	Pine.	16x5¼x6½ or 8½x7x5
	Square grooving; half-round beveling with plane.		28	Knife box.	"	12½x9x29-16
	Plain jointing; use of matching plane; cleating.	Jointer plane, matching plane, cabinet-makers clamps.	29	Drawing board.	"	19x13x½
	Dovetailing with mitre; shellacing.		30	Tray.	Cherry and mahogany.	16x105-16x2½
	Panel grooving; half-blind dovetailing; Blind mortise and tenon joint; fitting hinges and locks; polishing.	Framing chisel, plough, mitre box.	31	Tool chest or cabinet.	Pine.	27¼x13½x9¾

SPECIAL COURSES IN DRAWING AND PAINTING.

Beginners in this department start with the representation of simple models which teach the principles of perspective. At this stage little is said of the theory of perspective, the object being to induce pupils to see perspective without troubling themselves too much about the applied theory. Thus by degrees they assimilate, as it were, the substance of the science easily and unconsciously and can readily fit what is thus acquired to the completely formulated theory at the proper time.

The harmonious grouping of models and their relation to each other is studied, not only in outline, but in light and shade and color, comparisons being made with objects of similar shape; and later those objects are drawn and shaded, at first being done in pencil, and later in pen and ink and charcoal.

This studio work in drawing from models and objects prepares students for out-of-door landscape sketching, either in pencil, sepia or color. From time to time the pupil will have the practice of out-of-door work.

Those who wish to give special attention to figure work will draw in charcoal from casts, and as they advance shade in broad washes in sepia, and so on, until they can work from life with color.

Advanced students will work in oil and water colors from life and still-life and be allowed considerable latitude as to subjects, etc.

Each pupil will be treated separately and given the practice he most needs, and may advance as fast as possible, regardless of others.

The following is the schedule of terms to students taking these courses:

DRAWING.

FOR TERM	{ One lesson per week	\$ 6		
OF	{ Two lessons per week	10	BY THE YEAR	{ \$15
TWELVE WEEKS	{ Three lessons per week	15		{ 25
				{ 40

PAINTING.

FOR TERM	{ One lesson per week	\$12		
OF	{ Two lessons per week	25	BY THE YEAR	{ \$30
TWELVE WEEKS	{ Three lessons per week	40		{ 50
				{ 70

Special rates will be made to students desiring both painting and drawing or desiring the use of the studio and the attention of the teacher every day in the week.

GENERAL INFORMATION.

Students of sufficient preparation, desiring to take special courses, will be admitted on application to the President. Application should be filed with the Secretary as early as possible.

Students will be admitted to the Manual Training School on diplomas of graduation from California Grammar Schools or on the certificate of admission to any high school accredited to the Universities at Berkeley or Palo Alto. The Faculty reserves the right to examine for classification all students who present themselves. Graduates of accredited high schools will be received in any departments of the Institute for the work of which they are prepared. Others must pass the entrance examinations. All students must present satisfactory evidence of good character and of honorable demit from the school with which they were last connected.

Classification examinations will commence on September 18, and departments will organize on September 20.

Term bills will be payable strictly in advance, and students should present the Secretary's receipt for the same on making application for admission to classes.

No allowance will be made for absence, unless occasioned by protracted illness. All requests for rebates must be addressed to the Executive Committee.

Students can obtain good board in homes approved by the school, for from six to seven dollars per week. Parents desiring for their sons and daughters homes where they will be under special and careful guardianship can be recommended to the same on application to the Secretary. A number of members of the Faculty will take students into their homes and direct their study and living.

TUITION AND EXPENSES.

Tuition per term	\$30.00
Tuition per year, if paid in advance.....	80.00
Vocal Music, per lesson.....	2.00
Instrumental Music, per lesson.....	1.25
Art, per lesson.....	1.00
Stenography and Typewriting, per month.....	10.00
Stenography and Typewriting, per six months.....	50.00

Students will make a deposit of five dollars to cover loss, breakage, etc., in Laboratory and Workshops. Any unearned balance of this sum will be returned to students at the end of the year. This deposit must be kept good.

For further information address

PRES. CHARLES H. KEYES,
THROOP POLYTECHNIC INSTITUTE,
PASADENA, CALIFORNIA.

STUDENT LIST FOR 1893-4.

Adams, Charles H.....	Pasadena
Allen, Robert S.....	Pasadena
Allen, William G.....	Pasadena
Amlar, Frank L.....	Los Angeles
Baker, John.....	Pasadena
Baker, Calvin F.....	Pasadena
Baker, Ruth E.....	Pasadena
Baldwin, Miss.....	Chicago, Illinois
Banning, John M.....	Los Angeles
Barker, Vira.....	Pasadena
Barker, Edward.....	Pasadena
Bixby, Jotham, Jr.....	Long Beach
Black, Emma M.....	Pasadena
Blanchard, Ada.....	Pasadena
Bley, John P.....	Pasadena
Bley, Alberta W.....	Pasadena
Blick, John C.....	Pasadena
Blick, Kate.....	Pasadena
Bonner, Ella.....	Pasadena
Brady, Miss.....	Pasadena
Brand, Milo B.....	Pomona
Britton, James.....	Pasadena
Brooks, Clinton W.....	Pasadena
Brown, Lulu.....	Pasadena
Brown, Edward L.....	Los Angeles
Burnham, Sophrene.....	Pasadena
Bushnell, Miss.....	Pasadena
Caldwell, James H.....	Pasadena
Campbell, Jennie E.....	Findlay, Ohio
Carlton, Don W.....	Los Angeles
Carter, J. Raymond.....	Chicago, Illinois
Chase, Evelyn.....	Pasadena
Clark, Mary.....	Pasadena
Clark, Addie O.....	Pasadena
Clark, Ellis.....	Butte, Montana
Cockrell, Ella.....	Los Angeles
Colyer, Gertrude.....	Pasadena
Conger, Ray E.....	Pasadena
Conger, Lida B.....	Pasadena
Conger, Lulu.....	Pasadena
Cook, Morris M.....	Los Angeles
Cowan, Besse J.....	Pasadena
Corson, Flavilla F.....	Pasadena

Corson, Ralph J.....	Pasadena
Craig, John W.....	Pasadena
Craine, Mary.....	Santa Monica
Cruickshank, Geo.....	Pasadena
Daggett, John S.....	Pasadena
Daggett, Helen.....	Pasadena
Dedual, Andrew G.....	Pasadena
Dennis, Charles W.....	Nevada City
Dodworth, Arthur.....	Pasadena
Doty, Geo. F.....	Pasadena
Douthett, Harry.....	San Diego
Dunbar, J. Elbert.....	Pasadena
Dunham, Geo. E.....	Los Angeles
Ellis, Bertha A.....	Pasadena
Ellis, Myrtle M.....	Pasadena
Enderlein, William.....	Los Angeles
Erskine, Harold.....	Racine, Wisconsin
Erskine, Ralph.....	Racine, Wisconsin
Farris, E. Lu.....	Pasadena
Fay, F.....	Worcester, Massachusetts
Fay, Miss.....	Worcester, Massachusetts
Ferguson, Clarence.....	Los Angeles
Fish, Verna E.....	Pasadena
Fish, Carrie.....	Pasadena
Frost, Carrie.....	Pasadena
Gaylord, Horace A.....	Pasadena
Gaylord, Harry D.....	Pasadena
Gaylord, James H.....	Pasadena
Gaylord, Robert H.....	Pasadena
Glassell, Alfred L.....	Los Angeles
Godin, Arthur.....	Los Angeles
Gray, Roy.....	Pasadena
Greer, William L.....	Pasadena
Grey, William.....	Pasadena
Grey, Ethyl.....	Pasadena
Grether, Paul W.....	Pasadena
Grinnell, Harold D.....	South Pasadena
Grimm, Dorothea C. M.....	Pasadena
Grinnell, Joseph.....	Pasadena
Groenendyke, Edward.....	Pasadena
Groesbeck, James R.....	Pasadena
Hansen, Waldemar C.....	Pasadena
Hardison, Ruth.....	Santa Paula
Harris, Fred J.....	Pasadena
Hart, Edwin.....	Sierra Madre
Haskell, Beulah.....	Pasadena

Hasse, Carl E.....	Santa Monica
Hawley, Milton.....	Pasadena
Haynes, Dian M.....	Pasadena
Henry, Paul.....	San Jacinto
Hewitt, Ernest W.....	Pasadena
Hewins, M.....	Pasadena
Hewins, Frank.....	Saco, Maine
Hickson, James L.....	Los Angeles
Hiller, Edgar.....	Los Angeles
Hiller, Willett H.....	Los Angeles
Hodge, Arthur.....	Pasadena
Hodgson, Eunice H.....	Pasadena
Holmes, Edward W.....	Dover, Delaware
Howe, Eliot.....	Pasadena
Hubbard, Samuel H.....	Wheeling, West Virginia
Hubbard, Ethel.....	Pasadena
Hull, E. O.....	Cleveland, Ohio
Jewett, Frank B.....	Lamanda Park
Johnston, Blanche.....	Pasadena
Judson, William B.....	Pasadena
Judson, Carl.....	Pasadena
Judson, Harry.....	Pasadena
Judson, Clarence B.....	Pasadena
Kayler, Mary.....	Chicago, Illinois
Keese, Sada.....	Pasadena
Kellogg, Elmer.....	Goleta
Kenney, O. G.....	Fillmore
Keyes, Maud V.....	Pasadena
Kimble, Griffith E.....	Valle Vista
Kimble, Robert.....	Los Angeles
Knight, Alpha.....	Pasadena
Knight, John O.....	Pasadena
Kretchmar, Minnie.....	Altadena
Kunzman, Harry.....	Pasadena
Lacey, F. G.....	Los Angeles
Lang, Anna.....	Pasadena
Lansing, Alida P.....	Denver, Colorado
Latimer, Jennie.....	Pasadena
Latimer, Dottie.....	Pasadena
Latimer, Leota.....	Pasadena
Lentz, M. Elise.....	Pasadena
Lowe, Sobieski.....	Pasadena
Louthian, Laura A.....	Pasadena
Lowell, Otis M.....	Oakland
Macomber, Roy.....	Pasadena
Mace, Laurence H.....	South Pasadena

Madigan, Mrs.	Sierra Madre
Mallory, Conroy B., Jr.	South Pasadena
March, James N.	Alhambra
Markham, Alice	Pasadena
Martin, Helen M.	Pasadena
McCaldin, Sarah A.	Pasadena
McCollum, John	Pasadena
McGrew, Anna M.	Pasadena
McKinney, Guy B.	Louisville, Kentucky
McMahan, Bess L.	Pasadena
McQuilling, William	Pasadena
Mead, Miss.	Minneapolis, Minnesota
Meloy, David C.	Santa Monica
Menner, Ivy	Pasadena
Menner, Lottie	Pasadena
Merrill, Jere H.	Los Angeles
Michener, Harvey	Pasadena
Miller, Geo. E.	Pasadena
Miller, Chas. A.	Los Angeles
Miller, Bernhardt B.	Los Angeles
Monroe, Grace	Pasadena
Moore, Arthur L.	Glendora
Moore, Frank I.	Pasadena
Morrison, Maggie L.	Valley Center
Moss, Clemence	Sierra Madre
Mosher, Katherine A.	Pasadena
Mushrush, Eva	Pasadena
Nash, Carl E.	Pasadena
Nelmes, Jeanie	Pasadena
Nelmes, Thomas H.	Pasadena
Nolan, Nellie	Pasadena
Obear, Julian	Azusa
Ozmun, Roy W.	Los Angeles
Overmire, Mabel	Sierra Madre
Parker, Henry A.	Martha's Vineyard, Massachusetts
Parker, Harold A.	Pasadena
Pearce, Grace	Pasadena
Peuser, Elsie	Chicago, Illinois
Phelps, Joseph W., Jr.	Pasadena
Pinney, Frank	Pasadena
Pixley, Ethel	Sierra Madre
Potter, John A.	San Jacinto
Pratt, Armstrong C.	Rialto
Prentiss, Sarah E.	Pasadena
Randall, Herman P.	Pasadena
Randall, Mrs. Dr.	Augusta, Maine

Reed, John O.....	Deer Lodge, Montana
Reed, Ole B.....	Pasadena
Rice, Isophoena.....	Pasadena
Rice, Theron.....	Pasadena
Rice, Merrill B.....	Tustin
Rice, Harvey.....	Tustin
Robinson, Ida.....	Tustin
Roche, Frank K.....	Pasadena
Roche, Harry.....	Pasadena
Rorick, Norma.....	Pasadena
Rubican, Helen H.....	Santa Monica
Russell, Emma.....	Pasadena
Scofield, Harry.....	Lamanda Park
Scudder, Katherine.....	Pasadena
Scudder, Rhodin C.....	Pasadena
Senter, G. Stanley.....	Pasadena
Shoemaker, Richard R.....	Pasadena
Shroeder, Grace.....	Pasadena
Snider, M. E.....	Chicago, Illinois
Snyder, Blanchard.....	Anaheim
Spalding, Mrs.....	Pasadena
Spence, John W.....	Los Angeles
Springer, Christina M.....	Chatsworth
Stevens, Charles W.....	Boston, Massachusetts
Strock, Earl.....	Riverside
Shorb, J. Campbell.....	San Gabriel
Smith, Delos W.....	Lafayette, Indiana
Sovereign, L. Douglas.....	Pasadena
Spalding, Mrs.....	Pasadena
Stimson, Charles W.....	Los Angeles
Stokes, Guy H.....	South Pasadena
Templeton, John A.....	North Pasadena
Thompson, Geo. L.....	Pasadena
Towne, Burton A.....	Minneapolis, Minnesota
Towne, Marion.....	Minneapolis, Minnesota
Traphagen, Ethel.....	Pasadena
Turbett, Blanche.....	Pasadena
Turner, Edson.....	Pasadena
Vallette, Arline.....	Pasadena
Vose, Richard.....	Los Angeles
Vannier, Florence.....	Sierra Madre
Wagner, Mrs.....	Pasadena
Walmsley, Victor.....	Glendora
Warden, Miss E.....	Worcester, Massachusetts
White, Frederick H., Jr.....	Milwaukee, Wisconsin
White, Fred P.....	Chino

Whitmore, Ben L.....	Pasadena
Wickens, Kate P.....	Pasadena
Williamson, E. V.....	Lafayette, Indiana
Wilson, Harry.....	Los Angeles
Williams, Jos. M.....	St. Catharines, Canada
Williams, B.....	East Los Angeles
Wilson, Hugh W.....	Pasadena
Wood, Corinne A.....	Pasadena
Worthington, Wm. H.....	Ramona
Wyman, Elliott.....	Los Angeles
Yerxa, Thos. F.....	Minneapolis, Minnesota
Yerxa, Herbert.....	Minneapolis, Minnesota

1. Girls Enrolled	88
2. Boys Enrolled.....	152
3. Pasadena Students	138
4. Non-resident Students	102
5. Total Enrollment	240



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