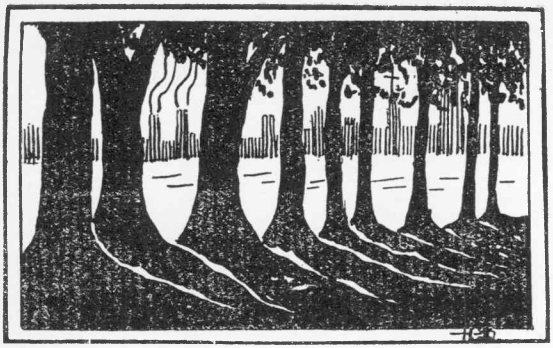

MANUAL TRAINING IN THE STATE NORMAL SCHOOL of COLORADO

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MANUAL TRAINING BULLETIN.

PRINCIPLES UNDERLYING TOOL WORK.

I. The value of tool work in the elementary school is educational; it is an expression of an impression—the realization of an idea in construction; it is incidentally useful in an economic sense.

II. In tool work the children in the elementary school should make such things as are useful in *their* lives *now;* then the things they make are part of *their* lives; not the making of things that are ultimately useful.

1. This word "useful" has been misapplied in tool work in the schools. It has been interpreted to mean "useful" from an economic standpoint.

2. Useful in tool work in the elementary school means to make something that touches the child's life now—gives interest—has educational value. The child may not be interested in this same object the least bit in a week, or month; but the making has served its purpose. The child has had the educational value growing out of thinking, designing, constructing and enjoying something that touches its life at the time. It may be that what he makes has also a permanent value, but this value is incidental. The more stress that is laid on permanent value, the more the economic or commercial side is emphasized.

III. As soon as the doing of a particular kind or piece of work has become automatic, it has largely reached the limit of its educational value.

IV. Tool work should be correlated with other subjects, as history, nature work, science, etc. This is when it has its highest educative value.

V. The aesthetic in tool work should be correlated with the work the child does, in so far as it corresponds with his develop-

ment and interests. Excellent results will grow out of a proper correlation of the tool work department with the art department.

OBJECT.

It is not intended in this Bulletin to map out a course fitted for any set of schools, or for any pupils, but to present some general notions that will aid somewhat in the presentation of manual training lessons.

To get the most good out of manual work, to obtain a full, clear expression of the individual, it is necessary to change the plan that has been followed in the presentation of manual training lessons. The old ideas of having set courses that all pupils must follow in their work are not the best; but an opportunity should be given the pupils to grow along the lines of self-expression. There is no reason why the best approved methods used in the presentation of other subjects should not be equally good in the development of manual training lessons.

A great deal of so-called manual training is not good manual training, for the results of good manual training should be the expression of the individual, or individual manual expression, and not manual copying, copying things made by others; but the realizing of their own ideas in objective form—the development of their own thought and not the copying of the thoughts of others.

DEMANDS.

Manual training demands that energy should be put forth for a long time, one act of willing succeeding another, engendering constant and stubborn resolution, intensifying the powers of observation, teaching how to deal with real number and magnitude and developing physical strength, dexterity and will. It reveals to the child new plans of things and relations which, before unknown, are brought nearer to him; step by step he

gains new insight, developing a desire for the real and actual, adding real experience to theoretical knowledge and assisting in the development of practical intelligence along with theoretical.

SELF-EXPRESSION.

It should give an opportunity for self-expression in the individual. The pupil is not to be turned loose in the manual training rooms to exercise his own whim and fancy in the construction of objects, neither is he expected to develop the entire plan or design for any one object. The same supervision and suggestion should be given in a manual training lesson that is necessary in any well-conducted recitation.

Self-expression means that the appreciation of the pupil will go hand in hand with accuracy in developing plans and skill in construction; it means the adaptation of the work to each locality; and, again, the adaptation of the work in that locality to each pupil. It means greater flexibility in Manual Training courses, that the manual work may come into closer touch with the rest of the school work and into harmonious relation with the child's life. It means that in the child's development his possibilities to grow in manual training are bounded only by his ability to do.

ORDER OF PRESENTATION.

The order of presentation should be based upon the child's powers and not upon any sequence in the use of tools; that is, suggest ideas whose outgrowth in the model will not be beyond the child's ability in construction.

The instructor may select a model from a number of model forms chosen by the class, or one which seems of most interest to the greater number. First, there should be a discussion by the class of the model selected as to its use and materials necessary in construction, etc. Its design, to best accomplish the de-

sired end, should then be thought out by each pupil, or the class as a whole may work out the design. This method is especially good in class work with the primary grades. Following this they will make a finished working drawing according to their own ideas, receiving suggestions from the instructor as to faults, if there be any, in the design. Care must be taken that all operations are within the powers of the child, and, though they work crudely, they will develop something which will accomplish that for which it was intended; from beginning to end it is their own creation. Next will be suggested ideas concerning models which are a little more complex, which bring in a little more deliberation in planning and more difficult processes in construction. In this way the pupils gain greater power than through the construction of models prepared by someone else.

Objects made should be of immediate use to the child. Often a lack of interest is caused by the object being of no value after completion. Make a kite that will fly, a sled that will be useful in play or work; in fact, each object made should fill a place in the child's life.

VARIETY IN MATERIAL.

There must be variety in materials, to deal with out-of-school interests, as well as in-school interests, in finding out the true inclination of each child. No plan in selection of materials can apply to all conditions, but the work in each case must be mapped out to suit the conditions in that particular place.

RELATION OF MATERIALS.

The different articles made may bear a certain relation to each other, and may, taken together, form a unity, as in the development of the playhouse in connection with the study of the home. The use of one material in a manual training lesson may be preparatory, or rather necessary, before the development of a series of lessons with another material.

INTEREST.

The course of work must be of interest to the pupil, not from any standpoint of the teacher, but because it is the child's own notion of what will aid him in actual living. Models may have the name "useful articles," but they are absolutely of no value from the standpoint of the pupil or any one else, unless they express some real, immediate interest of the worker. Interest in flower sticks, thread winders and triangles must, of necessity, be of a forced nature, or, rather, of no interest at all. The work becomes mere drudgery because the articles made are of no interest in the child's life, and, for that matter, in any one's life. The windows at home and in the school room have no need of window sticks. The child can find no one who has any use for a thread winder, flower stick, flower pin or flower pot stand. As a result, articles of this nature, if made, are of no value to the pupils after being completed and do not interest him. They accumulate in the store room, being eventually carted to the boiler room to swell the supply of kindling.

REASONS FOR INTEREST.

That the pupil may get the most good out of the lesson, it is necessary that there be some reason for interest in the article being made—some reason why the pupil should execute the work assigned, other than the mere fact it is to be done. There are various reasons why the work assigned stimulates interest. It may be an aid in his play. What boy would not want to make a sled in coasting season? What little girl would not be anxious to make a doll cradle? They see many possibilities for pleasure associated with those articles after completion. They are of real interest, have a real meaning, and fill an actual place in the child's life. The article made may be of interest because it is a suitable article to present to father, mother, brother, sister or friend.

What boy would not return to his work with renewed zeal after having received the warm and approving congratulations of his mother, after presenting her an object of real value, made doubly so because made by her son. The article may be of interest because it will be of assistance in keeping some of his belongings in a safe place, or add beauty and comfort to his room at home; as a pencil box for the desk, a picture frame, or stool for the room at home, or some other useful and interesting article.

CORRELATION.

Pupils are sometimes interested in making articles that will be of assistance in some other branch of work in the school. Manual training may be easily correlated with arithmetic, geometry, geography, literature and science. This correlation will make these branches appear more real and substantial to the individual. He will, of necessity, measure, compare, divide and calculate angles. Rulers and compasses are in constant use. The calculation of areas is learned, the eye is trained to see, and a knowledge of dimensional space cultivated. Articles made by or belonging to children are cherished as much by them as anything older people may possess, and they aid in building up the actual conditions of their lives. The pupils are generally very much interested in industrial and home development. In the lower grades we place a great deal of stress upon the development of the home and the industries that aid in the making of home and home life more enjoyable. In the higher grades other industries that have been great factors and aids in civilization are presented before the classes. In many cases pupils are able to work out for themselves good, simple working-models of primitive industrial machines.

KINDERGARTEN.

In the kindergarten, one of the principal objects is to train the child's powers of observation, directing, by suggestion, the child's mind along useful and instructive channels. A great deal of the work done in the kindergarten may be rightly classified as manual training work, for they "learn to do by doing" in the placing, building, cardboard work, weaving, stick laying, etc. These are all valuable means of training the imagination and developing lessons along the lines of form, number and magnitude. The manual work must of necessity grow out of the wants in the daily thought and work of the children.

The few suggestions given below have been worked out in the kindergarten:

A house was built during the study and play of the carpenter, which was of the simplest possible form. An ordinary packing case, with a few very simple changes, would possibly answer the purpose best. Various tools used by the carpenter, furniture for the house, as chairs, table, cupboard, bed, ladder, fence, bench, tub, rolling-pin, kneading board, tools for the kindergarten garden, rake, hoe, spade, etc., may be suggested by the teacher. Games, as carts, hoop and stick, etc., may be made of materials suggested by the teachers or children.

PRIMARY GRADES.

A great deal of work done in the first four grades is carried on in the regular class room, avoiding the necessity of fitting up a room especially for the manual training work. The following cuts illustrate work done by the children in the grades.

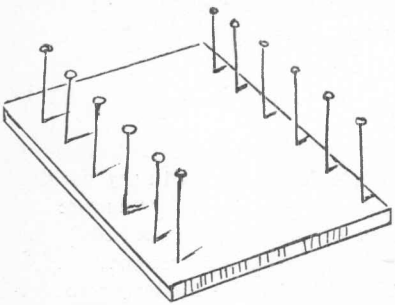
FIRST GRADE.

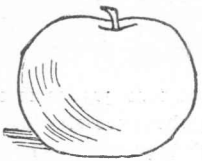
Time: Five twenty-minute periods per week.

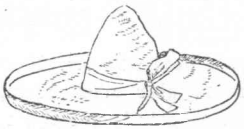
The work done in the first grade is entirely suggested by the subjects developed in the regular lesson along the lines of nature study, home, literature, industries, etc.

Below are a few of the notions that have been worked out in the first grade manual training:

The weaving of a doll's blanket for a doll's bed, on a simple loom, consisting of a small frame with ten nails driven at each end. This work is done in the nature work in connection with the study of the sheep. Cutting and pasting of the pilgrims during the Thanksgiving season. The clay work consists of the modeling of birds, bird nests, people, houses, animals of various kinds, as dogs, horses, cows, sheep, etc. Molding of peaches, pears, apples, etc., in connection with the study of fruits. Sewing: the gathering of seeds to fill a cushion for the doll house. Basketry: the making of baskets of raphia, during the study of fiber, home work or Indian basketry.



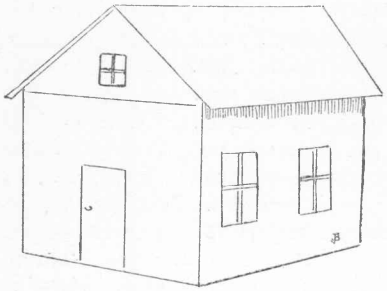




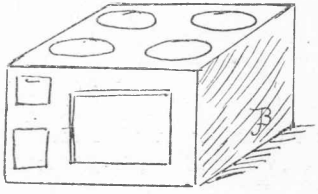
SECOND GRADE.

Time: Five twenty-minute periods per week.

Preparatory pasteboard cutting and pasting preparatory to the developing of the playhouse, as a small village made by entire class, consisting of houses of various sizes, bridges, rivers, etc.

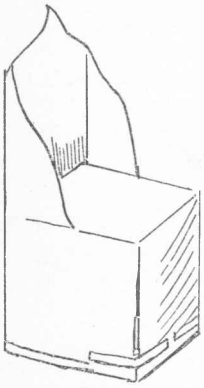


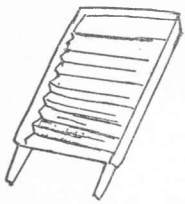
Building Indian village while studying Hiawatha. Log house, brick house or one of any other material suggested by the children. The house may be built in connection with the study of the Puritan, as in the case of the log house, or the kinds of material used for building purposes. Building and furnishing of a pasteboard house in connection with the study of the home. The house should have four rooms, or the number thought necessary by the children for the carrying on of actual housekeeping. The houses may vary in size from year to year, but usually we find one that will fit on the top of the pupil's desk a very good size.

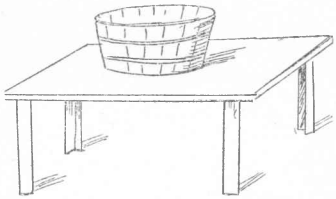


Below are a few suggestions as to furniture and fixtures for the house:

These should vary according to the notions the children have as to what constitute essentials in the way of furniture for the house. Kitchen: tub, washboard, washstand, bucket, stove, chairs, table, designed and colored oilcloth for the floor may be made of pasteboard. The servants' pots, kettles, pans, etc., may be made of clay. Dining room chairs, table, sideboard, etc., of pasteboard. Loom: designing of rugs for floors to be woven on simple looms. Bed room: bed and chairs of raphia, dresser of pasteboard, bowl and pitcher of clay. Parlor: chairs of various kinds, stand made of pasteboard, carpet of silkaline strips woven on loom, curtains of thin paper or cloth, people of pasteboard, dresses of cloth or tissue paper, hats of raphia.

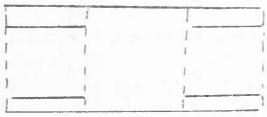


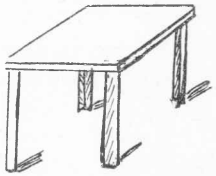




After the house is put up, a fence should be made of bent iron or wire.

In the nature study work a comparison is carried on in the child's mind between his own home and the primitive people

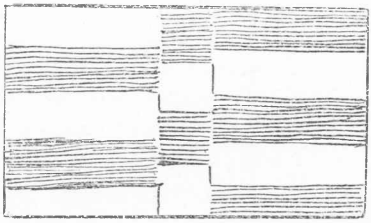




whom he is studying. This furnishes material for oral, written and drawn expression.

THIRD GRADE.

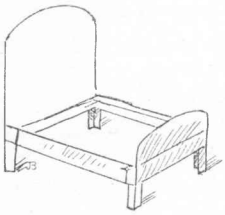
Children in the third grade are old enough to use the simple tools found on the ordinary manual training bench, as, the knife, rip and crosscut saws, ruler, chisels and plane.

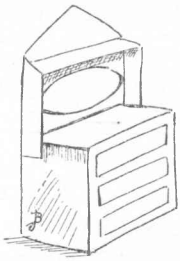


Pupils should be encouraged to make any objects that will assist them in their play; as, small toy carts, furniture for doll

houses, etc. During holiday seasons presents for parents, brothers, sisters or friends may be constructed of wood, raphia, or

cardboard. Many objects will be presented by the children as the ones they wish to make during the season. During the development of a series of lessons upon an industry the different machines used in carrying on that industry should be explained. If a loom, in connection with the study of textiles; looms of different kinds should be described, and, if possible, the children





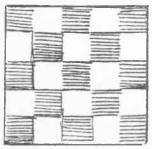
should be shown a loom in operation. After a general notion of a loom, its use, etc., the entire class may make simple looms upon which they can weave simple patterns. In the development of basketry, explain the different materials of which baskets are made, their uses, etc. Afterwards a few simple baskets, or mats, of raphia, hemp or any other suitable material may be made.

FOURTH GRADE.

Time: Two forty-five-minute periods per week.

Simple working drawings of objects to be made.

A series of objects that will be of use to the children and will form a set of objects useful for some purpose or purposes,

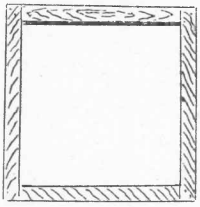


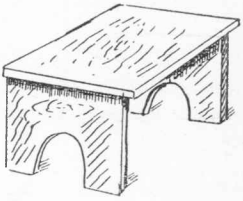
as a writing set, consisting of a rolling blotter of soft wood, book penwiper made with two board covers, bent iron penrack, stamp box woven of raphia, mat of raphia for ink bottle, letter box of wood to hold the mail; many other useful series will be suggested during the year's work. During holiday seasons, presents of different materials may be made.

FIFTH GRADE.

Time: Two forty-five-minute periods per week.

A working drawing, showing the different steps in the construction of the object to be made, should be marked out before the pupil is allowed to begin the construction. Below are the names of a few objects that seem to be very good for boys in this grade:





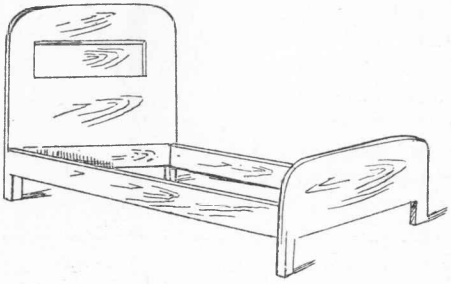
Footstool, out-door seat, book rack, wall shelf, pencil box, plant stand, bird house, rabbit hutch, pin tray, doll chair, doll bed, doll cradle, checkerboard.

Short talks on lumber, kinds, methods of preparing, including the cutting, sawing and drying of lumber before it is ready for use will be very interesting and instructive.

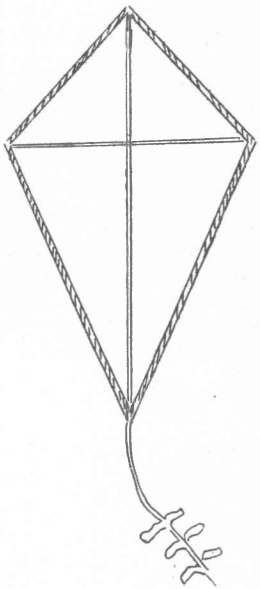
SIXTH GRADE.

Time: Two forty-five-minute periods per week. Working drawings.

Practice and skill in the use of tools in the lower grades has been acquired so that the pupils begin to realize that they can execute well and rapidly. With gain in mechanical skill will come more care in working out the details of plans to be followed. Encourage the making of apparatus useful in games, as boats, sleds and



kites. During the study of the industries, water wheels, undershot and overshot may be made.



They will aid the children in getting a correct notion of the possibilities of water power as an aid in industrial development. A windmill during the study of winds and wind power. Windmills and water wheels may be set up and used to do light play work; as running a saw, pulling a car and various other attachments, according to the ingenuity of the pupil. Other suggestive models are camp stool, doll bed, bread boards, etc.

SEVENTH GRADE.

Time: Two forty-five-minute periods per week.

Working drawings, together with a development of design, with practice in the decoration of objects completed, including pyrography, marquetry and simple wood carving. A few suggestive models are mineral cabinet, bookcase, footstool and door seat, inlaid checkerboard. Bent-iron work, as candle stands, penrack, picture frame and box.

EIGHTH GRADE.

Time: Two forty-five-minute periods per week.

More advanced work along the same lines as those followed in the seventh grades, with more stress placed on the decoration and finishing, as stains, polishes, etc.

HIGH SCHOOL.

Time: Two forty-five-minute periods per week.

The work in the high school is entirely individual, each pupil being expected to work out his own design, preparatory to the constructive work. The course in general will consist of constructive work, picture frames, chairs, tabourets, stools, bookcases, tables, etc. Decorative practice in designing, uses of ornament with a view to suiting the decoration to the object to be decorated. Wood carving, pyrographic decoration, marquetry, staining and finishing.

NORMAL DEPARTMENT.

Junior Year.

Time: Two forty-five-minute periods per week.

The course for those taking the required manual training work includes class work as follows:

The underlying principles of manual training are considered from the historical and psychological points of view, followed by practical work involving the use of various tools and materials in working out a series of objects in accordance with the underlying principles of the system. Models are used during the first semester, that the pupils may in the shortest space of time possible become acquainted with a variety of tools and acquire skill in their manipulation. The second semester is devoted to working out new ideas along the lines of constructive and ornamental manual training. The work is mainly manual, preparatory to taking up the elective manual training in the senior year.

ELECTIVE MANUAL TRAINING.

Time: Five forty-five-minute periods per week.

This course is designed for students who desire to specialize and to prepare for teaching manual training. It is advised that it be taken as the elective work of the senior year. The required work of the junior year makes a good foundation for specialization. Successful practice in the training department is requisite to the completion of the special course.

In general, the course is as follows: Methods in teaching manual training, relation of teacher to work, plans, presentation, execution, correlation, invention, etc. Discussion of materials, means and forms used in manual training, practical limitations of the work, adaptation to conditions, equipment, cost, etc.

The practical work includes work suitable for all grades: Basketry, including the making of trays, baskets, mats and plates of various forms of raphia, hemp and rattan; constructive work in pasteboard, weaving with various materials, yarn, strips of cloth, etc., on loom made by pupils; bent iron, including exercises in the use of stove-pipe iron and more expensive Venetian iron; constructive work in wood, preparatory to decoration, with carving and pyrography; wood carving used in decoration of objects constructed, as chairs, tabourets, jardiniere stands, boxes, bookcases, etc.; pyrographic decoration in wood and leather, as picture frames, book racks, boxes, chairs, sofa pillows, shopping bags, etc.

Practice in designing, historic ornament.

Preparation of materials, care of tools, working drawings, planning models, designing, uses of ornament with a view of suiting the decoration to the object to be decorated.

CORRELATED TOOL WORK—NORMAL DEPARTMENT.

As the student sees the need of apparatus which he can use in some other department, he uses the sloyd laboratory for its construction. This gives rise to considerable correlated work, which changes from year to year, but may consist of—

In the Library Department.

Apparatus of various kinds, T square, triangle, drawing board, sewing bench, card catalog box.

Art Department.

Drawing board, easel, stretcher, palette, molding board, clay modeling tools and board.

Physics.

Apparatus will be made as needed in the classes in physics and chemistry.

Domestic Economy.

Knife, bread board, kneading board, cake stand, wooden spoon, meat board, knife box, towel rack, spoon rack, salt box.

Sewing.

Ironing board, cutting board.

Biology.

Dissecting needles, insect mounts, setting frame, flower press.

Mathematics.

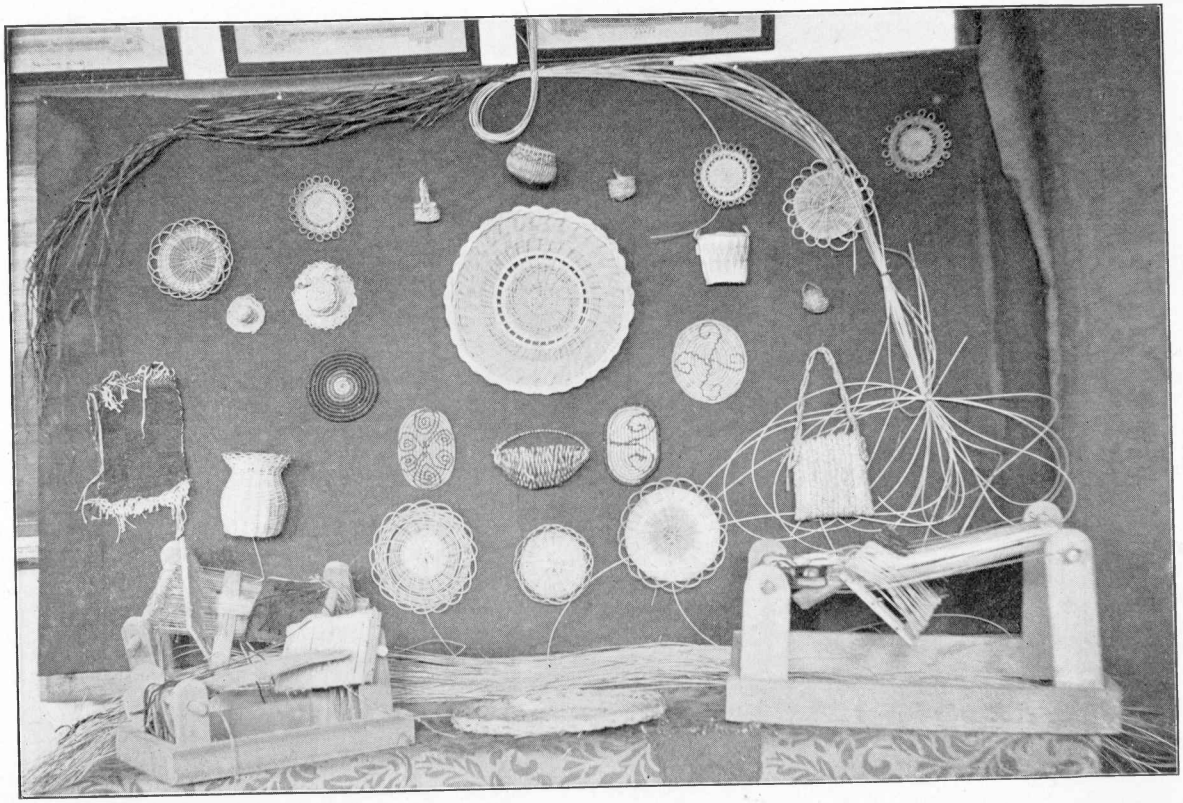
a. Solid: Cube, rectangular prism, rectangular pyramid.

b. Dissected: Parallelogram, triangle, circle, pythagorean block.

LIST OF BOOKS HELPFUL IN TOOL WORK.

Training of a Craftsman.....*Miller*
Color in Kindergarten.....*Milton Bradley Co.*
Manual Training in School.....*C. M. Woodward*
Manual Training and Card Board Construction.....*Frylorn*
Constructive Work.....*E. W. Worst*
Manual Training School.....*C. M. Woodward*
Manual of Hand Lathe.....*C. P. Watson*
Discussion in Education.....*F. A. Walker*
Useful Arts and Handicraft.....*L. Todd*
New Methods in Education.....*L. J. Tadd*
Method of Teaching.....*J. Swelt*
Handicraft..... *J. Sutcliffe*
Theory of Sloyd.....*O. Soloman*
Exercises in Woodcarving.....*J. Sickles*
Essays and Lectures on Kindergarten Principles....*E. Shirriff*
Industrial Instruction.....*R. Serdel*
Manual Training Program of San Francisco, 1900.....
Manual Training for Eight Years.....*G. Roosvelt*
Penn. Industrial Education.....
Graded Schools in America.....*M. H. Page*
Speed Lathe.....*A. Compton*
Delin Course of Easy Wood Work.....*W. G. Field*
Educational Aims and Methods.....*J. Fitch*
Manual Training Made Serviceable to School.....*W. Goetze*
Systematic Science Teaching.....*E. G. Howze*
Knife Work in Room.....*G. B. Kellon*
European Schools.....*Keerum*
Industrial Education.....*S. G. Love*
Evolution of Mass. Pub. School System.....*Martin*
Education of Head and Hand.....*G. Baumberger*
Woodword, English Sloyd.....*S. Porter*

Manual Training.....*A. Bond*
Education in United States.....*R. G. Boone*
Report of Committee on Manual Training in Boston.....
Froebel and Education by Self-Activity.....*Bowen*
Manual Training for Eight Years.....*Charles M. Carter*
Pyrography by Ball and Fowler.....
Manual Training Made Serviceable to the School.....*Dr. Goetze*
Education in Its Relation to Manual Industry.....*McArthur*
Wood Carving.....*C. G. Leland*
Venetian Iron: Metropolitan Handy Series.....
A Hand Book of Pyrography.....*Mrs. Maud Mande*

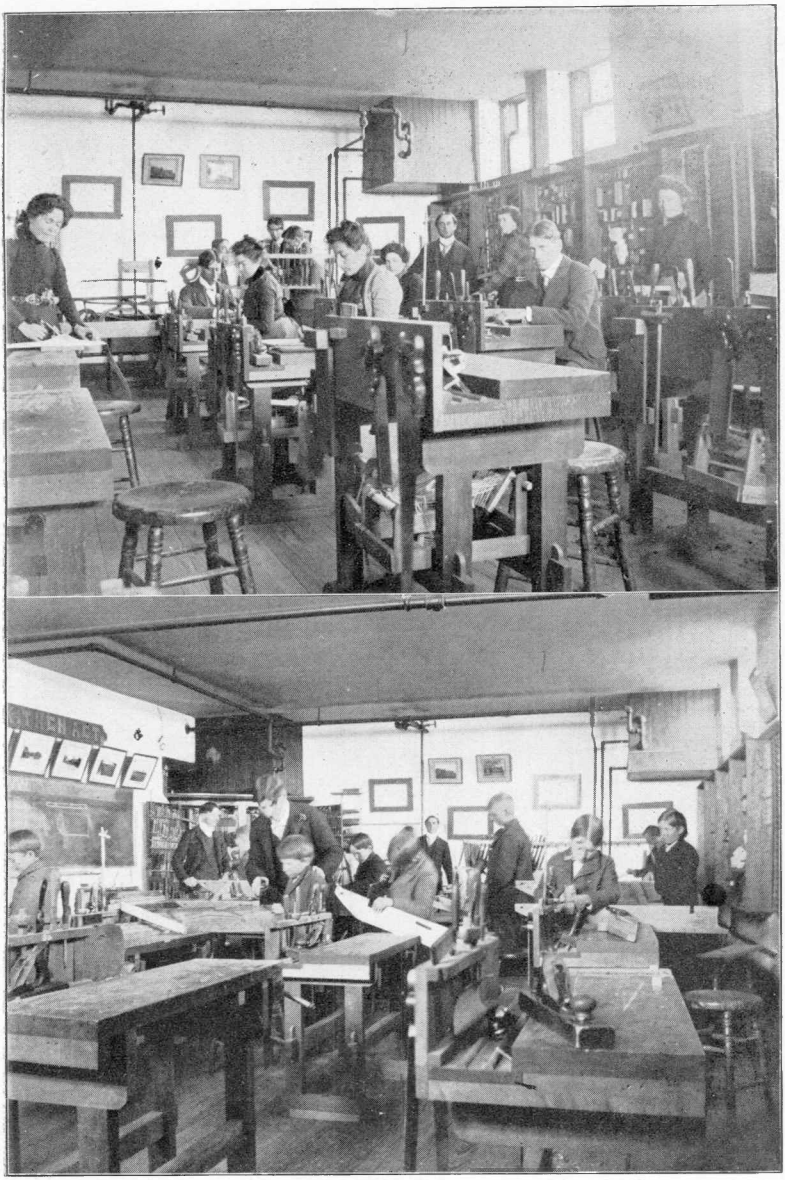


TEXTILE WORK.

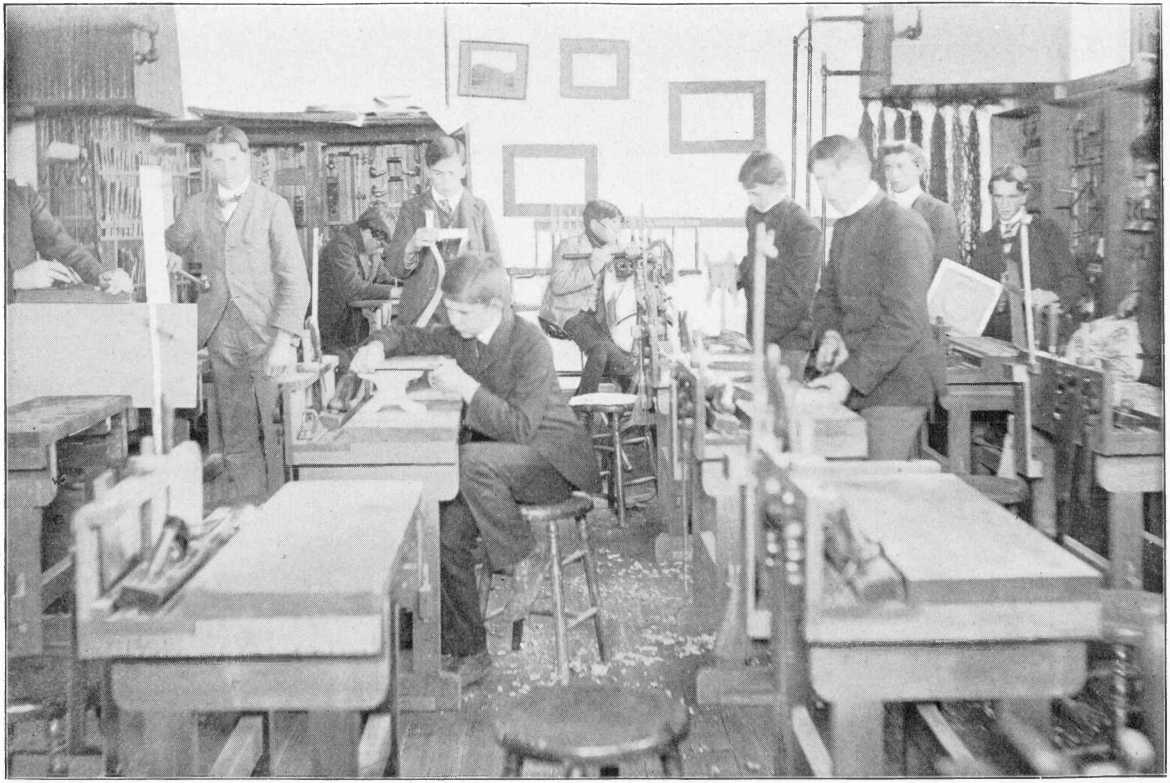
SECOND GRADE.

THIRD GRADE.

HOUSE BUILT BY THIRD AND FOURTH GRADES.
(By Permission of Miss Eleanor Phillips.)



UPPER—NORMAL JUNIORS.
LOWER—FIFTH GRADE.



NINTH GRADE.

SLOYD LABORATORY.