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Development of, and present outlook for manual training

Edlund, Frank Albert
Boston University

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DEVELOPMENT OF, AND PRESENT OUTLOOK FOR MANUAL TRAINING

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Frank Albert Edlund

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DEVELOPMENT OF, AND PRESENT OUTLOOK FOR MANUAL TRAINING

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DEVELOPMENT OF, AND PRESENT OUTLOOK FOR MANUAL TRAINING

Previous to the year 1876 there had been some discussion as to the possibility of establishing systematic mechanical work in the schools of the United States but it may be safely said that very little was done until that year. In 1876 there was an exhibition by Victor Della-Vos, a teacher from Moscow, at the Centennial Exposition in Philadelphia. The work displayed created much discussion among the leaders of education in this country. A short time before this exhibition President John D. Runkle of the Massachusetts Institute of Technology had become interested in the tool work which was being carried on under the direction of Victor Della-Vos. This interest was in a measure responsible for the exhibition in Philadelphia. A year later in 1877 President Runkle established woodworking shops in Technology. Inasmuch as the system adopted by President Runkle was built up and organized by Victor Della-Vos, who was Director of the Imperial Technical School of Moscow, it was called the Russian System of Manual Training.

Soon after the adoption of the Russian system there appeared some criticism of it from people interested in tool education. As the Russian method had not been adopted in its entirety the criticisms could well have been modified in the light of more information. The Russians
had two distinct branches in their system: the first, was their instruction shops; and the second, was the construction shops. In the instruction shops the pupils were taught the principles of woodworking, wood-turning, forging, metal turning, etc. This instruction was then followed by the construction shop in which these same pupils applied their knowledge and skill in the actual building of structures and machines. When the system was established in the United States only the first part, or the instruction shop, was taken. Under this condition there was really no educational outlet for the part of the system adopted. Many of the critics of the system called it a "series of models". This was, of course, true but it must be remembered that these objects which consisted of tool exercises, joint construction, etc., were simply one part of the method of Victor Della-Vos.

The tendency that teachers have to organize subject matter and to teach it in a rather rigid and formal way tends to lessen the interest of the subject. This process has been called "schoolmastering" the subject of instruction. Such a process lends itself easily to the instruction portion of the Russian system of manual training. It was probably because of this fault of formalizing the manual training in the teaching situation that it was not permitted to flourish as well as the advocates of the idea had expected. Some of the defects of the Russian
system may be enumerated as follows:

1. The exercises involved are such as to be beyond the capacity of boys below the high school age. Such a condition confines the work in manual training to the years between fourteen and eighteen and puts it beyond the vast majority who most need it.

2. Instruction was given to large groups of pupils from thirty to forty in number at one time. In this way the teacher did the thinking for the class and the pupils merely followed his directions. This method was one which saved expense but which gave little place for a recognition of differences in ability. Under such a method of instruction every pupil did a certain thing at the same time. The teaching procedure, for example, in the case of making an article would be somewhat as follows: The class would be assembled around the demonstration bench and the teacher would, by a process of asking questions and by giving information, provide the necessary instruction for the class to proceed upon. This might be the gauging of a line upon a piece of wood in order to get it to a certain specified size. As soon as the class has finished the gauging it would again be called to order and another demonstration and lesson be given, perhaps, to plane to the gauge line. As can be seen this method forces all of
the pupils to remain together, fast as well as slow, and consequently, under ordinary conditions decreases the interest of the subject.

3. As has been previously stated the Russian system was purely a series of exercises rather than a system whereby something useful was created. Therefore it had to make its appeal upon the basis of its disciplinary value in order to secure and retain a position in the school curriculum. This method will be recognized as the one employed in the other subjects in the curriculum even down to the present time. While it seems curious now, it is nevertheless true, that manual training held itself aloof from any suggestion of usefulness and above all refused to identify itself in any way with industry. Unlike some of the more orthodox subjects it had within itself inherent possibilities of motivation which could more readily justify its place in the school program.

Not long after President Runkle had introduced the system of Della-Vos in the Massachusetts Institute of Technology the St. Louis Manual Training School was opened. The school, which was made possible by some St. Louis philanthropists, was opened on June 6, 1879 and was under the direction of Dr. C.M. Woodward who had been Dean of
the Polytechnic School of Washington University. The minimum entrance age in the St. Louis Manual Training School was fourteen years and the course of study was three years long. The tool instruction included carpentry, woodturning, pattern-making, iron chipping and filing, forge work, brazing and soldering, and the use of machine shop tools. Dr. C.M. Woodward was a leader in creating interest in the teaching of manual and trade subjects. During his leadership of the St. Louis Manual Training School he wrote many articles and in various ways helped in the movement toward making manual training a regular feature in any good school.

From the United States Commissioners Report of 1887 the statement is made that Baltimore was the first city in the United States to adopt manual training as a part of the public instruction. "On the 24th of April 1883, in response to a motion, a committee was appointed by the school commissioners to report upon the best means of fitting boys and girls as quickly as possible for self support. On June 19, 1883, the committee reported that it would be expedient to establish a high school for manual education under the supervision of the board, since a knowledge of some form of industrial labor is as necessary as a knowledge of books; and as the state and city
acknowledge their obligation to teach children to read and write, they cannot deny their obligation to teach them to work, as the latter is as essential for the public welfare as the former. Only a small portion of those who receive their education in the public schools ever enter the professions but the large number become artisans and adopt mechanical occupations for their future support. On petition, the city council empowered the school commissioners to establish the school, and legislative action was taken in January, 1884. In March of the same year the school was opened with sixty students".

New York City in June 1887 adopted an experimental course in manual training wherein it was to be tried out in the grammar grades. It was in this elementary work that the Naas System of woodworking was introduced. The Naas System had been arranged by Otto Salamon of Naas, Sweden. Mr. Salamon was the Director of the Naas Normal College where he trained teachers for his system. Through the activity of one of these teachers the system was brought to the United States. In July, 1888, Mr. Gustaf Larsson came to Boston from the Naas school. In Boston, Mrs. Quincy A. Shaw who was well known for her public-spirited and philanthropic interest in education, gave Mr. Larsson opportunity to teach in two private summer schools.
In the same year Mr. Larsson conducted a course for the training of teachers of wood working and later this developed into the Sloyd Training School. The Sloyd Training School continued as a separate and independent institution until 1921 when it was taken over by the City of Boston.

The system of manual training now in general use in the United States is the system created by Otto Salamon. Like the Russian system it had to adjust itself to the concept of education which was common at the close of the nineteenth century. Public education at that time was defined as follows:— "Education is designed to be a systematic influence for the good, exercised by the teacher upon the minds and characters of the pupils". Naturally teachers came to the conclusion that instruction should be imparted not for the sake of the knowledge to be derived, most of which must of necessity they thought be forgotten, but principally as a means of developing character.

The influence upon the aims of manual training by the aims of education in general is very evident. B.B. Hoffman a writer in the field of manual training said that sloyd had for its aims:— "To instil a love of work in general; to create a respect for rough, honest
bodily labor; to develop self-reliance and independence; to train to habits of order, exactness, cleanliness, and neatness; to teach habits of attention, industry, and perseverance; to promote the development of the physical powers; to train the eye to the sense of form, and to cultivate the dexterity of the hand."

Dr. C. Hanford Henderson stated in the "Sloyd Bulletin" in 1899 that: "That the task proposed for itself by manual training is exceedingly subtle,—to engage the interest and spontaneity and affection of a child, to cultivate the sense of beauty and the finer sense of touch; to increase the general bodily health and poise, and finally, by the directed and purposeful overcoming of the resistance of material, to give power of brain and skill of hand."

Mr. Gustaf Larsson in a lecture delivered at the International Congress of the World's Columbian Exposition, Chicago, July 28, 1893 said: "Manual training is for the sake of general development, physical, mental, and moral, and it also means that kind of hand-work"; and again in another portion of the lecture he said, "The general aim of sloyd is the moral, mental and physical development of the pupil, the mental development being secured by help of the physical."
Under the influence of the educational philosophy in 1900 manual training became formalized and justified itself in a large part upon the idea of formal discipline and certain concomitants of learning such as the inculcation of neatness, perseverance, industriousness, appreciation of labor, etc. B.B. Hoffman said in another portion of his book already referred to:—"Primarily Sloyd is to be used as a means of formal education—formal as opposed to material. A material education seeks to impart a definite knowledge of things for their own sake. A formal education seeks chiefly to develop the innate powers, and selects and imparts knowledge in order to strengthen character, will power, memory, perception—in short, all of those faculties of the mind which at birth are dormant, and which gradually and through education become to a greater or lesser degree marked characteristics of the individual".

Dr. David Snedden summarizes in his book "Vocational Education" the aim of manual training as it was first understood. He says:—"Manual training when first proposed as a subject of study and practice for upper grades and high schools, was believed by many to offer the only available means of giving in schools what was some years ago vaguely conceived as vocational training—"education through doing"; "tool experience", "tool sense", "technical knowledge"
as it has been variously called".

Another quotation showing a similarity of thought as to the objective of manual training is that of Dr. Thomas M. Balliet, Dean of the School of Pedagogy, New York University who said that:—"Manual training has for its chief aim general education. It is an additional means in the modern curriculum of appealing to the pupil and developing his mind. It appeals to the motor executive side of his nature, to his mechanical interest, which was entirely ignored in the old time school".

From the foregoing discussion of the way in which educators looked upon the purpose of manual training in the public schools one can see why it did not measure up to the expectation of the school going public. When manual training was introduced into the schools parents as well as pupils welcomed it as something that would have a practical value and that it would function in the after school life of the child. This expectation was almost wholly frustrated because of the effort made by the educators to put it into the curriculum upon the basis of "disciplinary values", "training for power", etc., etc. The attempt was made to make manual training a useless subject and the attempt it may be said was almost completely successful. As the outside world became more and more complex in its industrial activity the criticism of the
backwardness of the manual training policy became strong. As an example of this criticism and its subsequent development Charles H. Judd writes in the January 1923 number of the Elementary School Journal as follows:—"The decade of the nineties and the first decade of the new century may be described as decades of gradual realization on the part of communities that the schools must be changed in some way so as to meet the demands of the new industrial and social era. In 1899 John Dewey gave to school people the impressive statement of the social and industrial changes which would call for a complete reorganization of elementary education.

Dewey’s message as impressive as it was, did not break the conservatism of the schools, and we find next that the schools are attacked from an entirely new angle by forces demanding that conventional practices be modified to meet social demands. In 1905 in the state of Massachusetts there was organized a public commission which was charged by the legislature with the duty of introducing into the educational system some kind of instruction which would prepare workers for industrial work. The manufacturers had come forward with a statement to the effect that the pupils were not trained to meet the demands of
modern life and that there must be a change in educational attitude and policy. In 1906 the National Society for the Promotion of Industrial Education was organized. In 1917 largely through the efforts of this society, a federal board was organized and provided with funds to bring about a new type of school attitude toward industrial problems and to set up a new type of instruction. Because the common schools seemed both unable and unwilling to take any direct part in industrial education the effort was made to organize separate schools for such education. In these separate schools there was to be no evasion of the direct issue, no delay in bringing the pupil into direct contact with industrial processes, no complicating attention to matters of general culture.

Another example of the change in point of view in considering manual training is reflected by Paul H. Hanus in his book "Beginnings in Industrial Education". "It was the bearing of manual training upon preparation for vocational needs that caused the first advocates of the subject, after the Centennial Exposition to urge its claims on the attention of our schools. But so strong was the opposition to teaching a utilitarian subject in the public schools that the claims of manual training have been based, until quite recently, chiefly on its "psychological value"
I do not wish to belittle the psychological value of manual training, but the strongest reason for giving it a place in our scheme of public education is that it introduces our youth to a sympathetic understanding of the constructive activities which constitute so vital a part of contemporary life. It has not been entirely possible to rob manual training of its distinctly useful quality in public elementary and secondary education, although attempts have sometimes been made. Nevertheless in many schools it has been pretty thoroughly academicized. A little further on he says, "It is strange that we should be so reluctant to admit the distinctly useful in our scheme of public elementary and secondary education,—that is, to admit that one of the functions of the public school is to recognize the claims of elementary vocational training as entirely legitimate and desirable."

Not only did the outside influences of industrial interests tend to modify the attitude of educators toward manual training, but also, some change was due to the influence of the Herbartian movement. Herbart had attempted to formulate a psychology of the learning process, and in his system he opposed the doctrine of formal discipline. The disciples of Herbart many of whom returned to America attacked the doctrine of formal discipline to
such an extent that it no longer held a strong position in the psychology of education. That the elimination of the old doctrine has been slow may perhaps be established by taking a quotation from Bonser and Mossman's book called "Industrial Arts for Elementary Schools" wherein the authors say:—"Of course the breakdown of formal discipline as a doctrine was gradual. Indeed there are some even to-day who would teach manual training for its disciplinary values."

It is true that even to-day the courses in manual training retain some of the characteristics that subjected the subject to so much criticism in the past. In modern schools we often find that teachers are forcing the pupils to make articles for which they have no use and no interest. When Dr. Prosser investigated the Mechanic Arts High School at the request of the Boston School Committee he found that even there the woodworking course consisted chiefly in the making of joints and the doing of abstract exercises. While some slight attempt has been made to vitalize the woodworking in the Mechanic Arts High School there is nevertheless much formal and abstract work still done. That we have not completely left the old conceptions as to the function of manual training is confirmed by the study made by F. G. Bonser. He writes as follows under the caption, "Inadequacies
of manual training". Investigation of the courses proposed and taught in our schools leads one to note these prominent inadequacies in manual training:—

1. Want of relationship of work to life. The sequence of the models was in tool processes.

2. Failure to provide for the individuality of the child. Each must conform to the system.

3. Lack of motivation. The work was all prescribed in a fixed course.

4. Placing the emphasis upon the product as the objective rather than upon the growth of the child.

Even though the Russian system was so severely criticized because it was too theoretical it is interesting to note that some of the manual training in the United States in the beginning was even worse in this respect. The Russian system in its construction shop portion did make large numbers of joints but it rarely embraced tool exercises for their own sake. There was usually something made even though it was useless. To bring out the difference an example of the first lesson in manual training as published in an early book in the United States was as follows:—

"Learn to strike the light blow. Stand with the right side towards the bench, on which is placed a piece of soft board. Take the handle of the tool firmly in the right
hand. Close the fingers over it and extend the thumb along the side. Let the face of the tool rest on the board, and the forearm just above and parallel with the upper surface of the bench. Now raise the hammer with the wrist movement, keeping the forearm in the same position, and strike light blows in this way until the lesson is fully mastered."

The lessons then continue by teaching the medium blow, the heavy blow, and the blow of precision. The nailing process is taken up in a similar fashion. The pupils are given boards into which they drive nails in certain specified ways and then finally to learn how to withdraw nails. The course teaches each tool and develops the lessons in the way of exercises which have no result as far as making anything is concerned. In the case of learning to saw the boys are given a board and a saw and taught to saw off certain lengths. In boring the boys simply bore holes in various ways and then the wood is discarded. In the entire course there is not one useful object made.

A person experienced in the teaching of woodworking will appreciate the difficulty in the teaching of the type of course suggested above. The picture that one could conjure up in thinking of what would happen, under ordinary conditions, when twenty boys are given boards to hammer at random would make the teacher shudder. The above course
is a decided step behind the Russian system. Under a new situation with the past experience of others to draw on, the above course demonstrates the great difficulty people encounter in getting ideas.

With the purpose in mind of making a comparison between two courses representing the change which has taken place in manual training teaching in the past twenty years two representative courses have been selected. The first course was published in 1905 and the second course is the one in use at the present time in the Boston School system. The excerpts from the earlier type of course are taken from a course made by A.C.Horth of the Roan school for Boys in Greenwich, published by Spon and Chamberlain, New York. The first lesson of the above course is quoted in detail and is as follows:

Exercise 1.

Sawing with Tenon Saw.

Benchwork: Materials.- A piece of wood 12 inches long should be cut from a planed board of 2 inch by 1 inch yellow deal batten and given to each boy, who would also have a sawing board, tenon saw, 4 1/2 inch try square, steel rule and marking knife.

Teaching Method. Draw the attention of the class to the face marks, and show the correct method of holding try square and marking knife, and commence by marking off a
line 1/4 inch from the end and carry it around, keeping the square either on face side or edge. This end must now be sawn off square. The whole length of the saw blade should be used, and with the handle grasped firmly the cuts should be made deliberately. The first attempt may be a failure, but by standing the block on the sawn end the boy will see the amount of his error, and will make another attempt. When this end is square repeat the process on the other end. This should leave a piece of wood at least 11 inches long.

At this stage show that the saw cut has a certain thickness, and if the piece of wood which is being cut up is ten inches long and four cuts made in it the piece would then be less than 10 inches. Great care must be taken that each piece cut off measures the exact size. Start by marking off the 1/2 inch piece, and then, placing the saw just outside of the line saw it off. The other pieces should be sawn off in the same manner, and if care has been taken they will measure 10 inches when placed together and a fair command of the tools used will be gained."

The course then continues with a series of exercises each exercise being usually a lesson. These are as follows:

Exercise 2. Paring with the chisel.

Exercise 3. Grooves of varying widths and depths

Exercise 4. Exercise in vertical paring.
Exercise 5. Housing Joint
Exercise 6. A letter rack
Exercise 7. A Cross Halving Joint
Exercise 8. A calendar stand
Exercise 9. A Lapped Halved Joint
Exercise 10. A Brush Rack

Final Exercise Examination test

Each one of the above exercises is developed in the course similar to the first lesson which was quoted in its entirety.

The course for the second year closely resembles the one for the first year in both principle and method. Without quoting the entire method for each case the reader will get the idea of the course by reading the names of various exercises.

Second Year Course

Exercise 12. The tongue and groove housing joints
Exercise 13. A pencil rack
Exercise 14. Mortise and Tenon Joint
Exercise 15. A Thermometer Stand
Exercise 16. A Brible Joint
Exercise 17. A Try Square
Exercise 18. A Cogging Joint
Exercise 19. A Watch Stand
Exercise 20. A Double Mortise and Tenon Joint
Exercise 21. An Inkstand
Exercise 22. A Haunched Mortise and Tenon Joint
Final Exercise. Examination

Third Year Course.

Exercise 23. Dovetail Joint
Exercise 24. A Vernier
Exercise 25. Model of Geometrical Planes
Exercise 26. Geometrical Models
Exercise 27. Lap Dovetail
Exercise 28. A Tusk Tenon
Exercise 29. A Test Tube Stand
Exercise 30. An Adjustable Stand
Exercise 31. A Dovetail Joint
Exercise 32. Inclined Plane and Friction Apparatus
Exercise 33. A Marking Gauge

Final Exercise. Examination

In the light of the criteria suggested by Frederick G. Bonser the above course in manual training would rank comparatively low. This course would not harmonize with the modern philosophy of education which indicates that the activities of the school should have a visible and tangible connection with life. The work in the course is similar to the Russian system but some advance is shown in the introduction of a few useful articles. The course is too difficult for the average boy in the elementary and intermediate schools. In the Mechanic Arts
High School in Boston, where only boys who are selected upon the basis of their mechanical inclination attend, the course is far more elementary than the one quoted.

An examination of the course reveals the fact that the course has little relationship with life. The boy who is forced to take it would probably lose whatever interest he may have had in the subject. Here is a good example of what happens when the woodworking is made academic and formal. It is generally admitted that the possibilities of motivating manual training are exceedingly favorable. It seems more than strange from the modern point of view that these possibilities should have been almost entirely neglected.

The course presents little flexibility and the pupil is forced to make things for which he has no use. The interest of the environment should determine to a large extent what the course in manual training should be. As far as possible, after the boy has acquired the necessary skill, he should be permitted to follow his own choice of objects to be made. The interest of the pupil should be harnessed to the work in manual training so that he will draw his educational load agreeably.

While it is difficult to say definitely where the author meant to place his major emphasis, it appears to fall upon the making of the joints. In conducting a manual training
course attention should be given to the pupil to the greatest possible degree. The article made is, of course, important but a balance is necessary between the boy and the object made in order to make the subject function to highest degree.

The examination at the end of each course is contrary to modern educational practice. Dr. William H. Kilpatrick writes, "Schooling must no longer be the mere acquiring of facts and skills to go back on demand at examination time. The new school must be an effort to educate for life through life". It is a hopeful tendency that examinations are being stressed less and less and are being eliminated entirely in modern schools. To definitely specify examinations in manual training is detrimental because it prepares the pupil's mind in a way to make him emphasize the examination as the major objective. He tends to look upon the subject as just another course to be gone through and an examination to be "passed" in the end. If the teacher is expected to make his class pass certain tests at the end of the term, he will work toward this end so that shall be no reflection upon him. With both the pupil and teacher unduly concerned with a future examination the manual training loses much of its educational value and succumbs to a bare routine.
The philosophy of the old type course of study in manual training suggested that a boy learned to be truthful by making his edges true. The never-changing testing tools, the ruler and try square, afforded no chance for deception. The use of these tools, it was said, tended to inculcate the attribute of honesty. At the present time such concomitants would not be accepted as objectives for manual training. It is very doubtful whether the use of the never changing testing tools will prevent the practice of deception out of the schoolroom situation. In other words there is no guarantee that the attitude of refusing to yield to practices of deception would carry over into real life even if they were produced by a course in manual training.

At the present time manual training teachers are generally given a large amount of freedom in the conduct of their courses. Very few school systems have specified courses which must be rigidly adhered to. In most cases the course depends upon the ingenuity and resourcefulness of the teacher. Only the large cities have published detailed courses in manual training and these are usually only suggestive. As an example of the modern type of course the Boston Syllabus of Shopwork has been selected. The statement introducing the manual training for the eighth grade is as follows:—"The shopwork of this grade should make
demands on the pupils for some originality and initiative in selecting and planning for the execution of problems involving somewhat exacting tool manipulation. From the problems suggested selections may be made from each group. These may be presented to the class as a whole, or different problems may be given to different boys in the class according to their abilities."

The suggestive course for the eighth grade consists of the following objects:-

1. Blackboard Eraser
2. Drawing Board and T-square.
   a. Checker Board
   b. Winding sticks
   c. Lap Writing Board
   d. Tray
   e. Dough Board
3. Bench Hook
   a. Lamp for gas or Electricity
4. Diploma or picture frame
   a. Step Ladder
   b. Table
   c. Stool with woven top
   e. Pedestal
5. Covered box
   a. Knife box
   b. Window box
c. Shoe polishing box
d. Concrete form for flower pot
e. Medicine cabinet
f. Cart
g. Book supports

In connection with the above course there is a list of 124 articles that may be made by the pupil if the instructor considers that the boy is able to complete the work.

Mr. Ambrose Caliver, Director of Manual Arts, at Nashville, Tennessee, in his instruction has selected a roller bearing coaster as the first article to be made in his course. Mr. Caliver in stating the reasons for this selection writes the following:—"I chose the wagon, which is my own design, because it has practically the same appeal to all students. I find most of the boys want to make a wagon for themselves or for some of their relatives. The wagon was selected because it involved every elementary principle of woodworking that is ordinarily taught through a series of projects. The wagon is also of such nature as to appeal to the boys' sense of complexity."

Mr. Herman Hjorth, Director of Technical Work, San Juan, Porto Rico, in a preliminary statement concerning his course in manual training writes:—"From the traditional coat hanger, brush holder, keyboard and kindred unin-
inspiring problems of early manual training days, wood-working in the schools gradually developed into cabinet making, wood turning and carpentry." Mr. Hjorth in his teaching follows no course but permits each boy to select and make a piece of furniture.

W.H. Hewitt, Manual Training Instructor in Saskatoon, Canada demonstrates in his conduct of manual training that he has adopted the newer point of view. In his description of the manner in which he carries on his work and what the pupils make he says:—"A few of the things made include cedar chests; billiard boards; jumping standards and other athletic apparatus; medicine and china cabinets, book, magazine, specimen, mechano and radio cases; skis and toboggans; desks and tops for study tables, picture frames, trays, hall trees, table lamps, floor lamps, footstools, jardiniere stands, violin cases, game tables, smoking cabinets, piano benches and scout equipment".

In the South Boston School of Art the pupils whatever is within their power after they have made one simple object. This first article is required in order that the pupils may become introduced to the school and the instructors. Most of the boys who attend this school come from the public schools where they have had some manual training. The
boys vary from those who are in the sixth grade to those in the first year in high school. Those who have had considerable experience are given the freedom to make whatever is reasonably within their powers. Each pupil is free to progress on his particular piece of work just as rapidly as he is capable. There are no general demonstrations, but each pupil is given direction and instruction individually. By employing this method each student feels the responsibility for his own progress and as a consequence the feeling of being unhampered induces him to further work.

In the work of the type represented by the above illustrations there is sometimes the tendency on the part of the instructor to curb the enthusiasm by insisting upon adult standards of accuracy. It goes without saying that the article should be as well made as possible but at the same time the standard must be within the boy's field of attainment. The instructor should generally follow the psychological process of the pupil rather than the logical process of trade or shop development. When the student has himself accepted something which is obviously below a reasonable standard the instructor can usually influence the boy to improve upon the work in question. The situation is one in which the boy voluntarily attends a school and is making something of his own choice for himself or for his home.
The boy is also aware of the competition which is present in getting a bench to work at. There is usually a long waiting list at the school. Under such favorable conditions the instructor can easily demonstrate to the boy who is working for himself and, of course, the better the work is done the greater the satisfaction of the pupil. The work is further facilitated by the realization on the part of both the pupil and the instructor that the work is worth doing. The enthusiasm of the boy is contagious and the process becomes one where both parties are together working out the problem.

At the end of the year there is an exhibition at which the work done during the year is displayed. The exhibition is advertised in the local paper and much enthusiasm is created in the boys over this event. The evening on which the exhibition is held the parents of the boys are present. At the close of the exhibition, which is two hours in length, the articles are taken home. The entire situation lends itself very readily to complete motivation. The problem of discipline does not exist because of the competition previously mentioned, in obtaining a bench at which to work. The articles made include, toys, taborets, medicine cabinets, radio boxes, music stands, footstools, smoking cabinets, piano benches, costumers, knife and fork boxes, etc. Considerable repair work is also done. The students are encouraged to bring broken furniture and repairs are made as best possible. In general, the work is made as real as possible so that there will be no need of bolstering up
the situation by a resort to artificial argument. An attempt is made to let the work speak for itself so that the boy will need no other demonstration as to its interest and value.

The instances cited in the foregoing show a definite change in both the method and purpose of manual training. The newer practice attempts to assign to the pupils the tasks which adapt themselves to their personal inclinations. This method is, of course, directly opposed to the traditional doctrine of formal discipline. Thorndike has written as follows on the disciplinary value of studies:—"What is hard and distasteful to a pupil has disciplinary value for him; that any subject has as much disciplinary value as any other, both being equally well taught; and that what is otherwise indefensible has disciplinary value". The more modern point of view in regard to manual training takes cognizance of the inherent interest of the subject and motivates through the utilization of this interest. It carries the process through by granting the student the maximum amount of freedom in his choice of work. Teaching of various skills and knowledges is given when the need for such teaching arises. In this procedure the pupil realizes the importance of the information which he receives. Modern manual training seeks to actually apply Dewey's precept of "learning by doing" something worth while.
One of the best expressions of the newer attitude is given by Oscar L. McMurry when he writes:—"Not fragments of things but wholes take the front place in our minds in all constructive projects. In the earlier crude stages of manual training this was not so. Single joints and minor details of technique were set up as aims in themselves. It is a matter of significance whether we employ the constructive efforts of children upon parts and fragments—the so-called elements of instruction—or upon complete and serviceable objects as entire units of construction".

In the past manual training has suffered because of the lack of properly equipped teachers. In the beginning it was assumed that the subject could be taught by anyone. For example, Samuel G. Love, Superintendent of the Jamestown, New York, Public Schools in his book entitled, "Industrial Education" writes as follows: "A good janitor who is a mechanic can be employed to instruct the boys in the shop, or if he cannot do it an older or more mature pupil can be put in charge of the shop, and by employing two or more of these, the shop can be kept open for work all day". The early instructors of manual training were in most cases simply mechanics and usually lacking in the preparation necessary for successful teaching. As one would naturally expect, he was frowned upon by the teachers of other sub-
jects. There came to be a stigma attached to the subject itself because of the poorly prepared and frequently un­
couth teachers.

Snedden as late as 1920 writes that educational ad­
ministrators have difficulty in securing teachers of man­
ual training. Schools for preparing teachers in manual
training are relatively few in number even to-day. Never­
theless such schools are in existence and many normal schools
are engaged in this work of teacher training. The Colleges
of Industrial Arts also prepare teachers for the subject.
The College of Industrial Arts, Denton, Texas trains tea­
chers for manual training and at the completion of the course
gives a B.S. degree. Those who major in woodworking study
also English, history, sociology, economics, physics, math­
ematics, and any of the subjects found in the regular col­
lege curriculum. If they take the course with the view to
teaching manual training they must take two years of their
electives in education, one year of which is psychology,
principles of education and general methods and the other,
problems of teaching manual arts—namely, history and lit­
erature of manual arts, organization and methods of teach­
ing manual arts, and practice teaching.

Many of the state universities have established as
part of their schools of education a vocational department.
This department includes training for teachers in indust­
rrial education, part time education, and commercial education.

With the inclusion and recognition of manual arts as a subject worthy of university attention the status of the teacher in manual training has steadily risen. At the same time the more severe demands upon the prospective teacher of the subject has led to the elimination of many who were unfit and unqualified. The salutary result of this has made itself felt in the general improvement of the manual training movement. Superintendents and supervisors now seek to secure well trained and well educated teachers for the manual arts work. William E. Roberts, writing in Bulletin No. 11, 1924, Bureau of Education says, "There is every indication of a demand for a higher type of teacher than has been acceptable in the past. Better professional training, more culture, and a broader educational outlook, as well as skillful craftsmanship are demanded."

With the advent and general acceptance of the junior high school the teacher of manual training stands as an important factor in its organization. This importance is recognized in the new demands made upon him, both in preparation and in the duties of the school. In many communities it is required that he have an educational equipment equal or equivalent to other teachers of the same grade,
and this demand will be extended as trained teachers can be more easily secured. In addition to broad general and special training it is essential that he be high minded and have a sympathetic regard for boys. The opportunity for personal relationships are many in manual training, and the influences for good should be correspondingly great.

As the criticism of the present educational system becomes greater and it becomes more difficult to continue the old methods of curriculum making the place of a vitalized manual training will be enhanced in its security. Leading educators are insisting that the modern curricula be developed upon the scientific principle of community survey instead of upon the opinions of committees or upon traditional procedures. At the present time the educational world is astir regarding the educational value of many subjects in the school curricula. It is now quite generally admitted that the educational needs of a nation can be effectively met only by an organization of educational institutions designed to serve the society in which they exist. The United States has become highly industrialized and the difficulties of being adjusted to this complex life have been correspondingly increased. The pressure upon the schools is in the direction of more school work which has its value in the fact that it actually functions in real life.
This work will be such as to yield vocational training of the right kind.

In this movement for a more useful and purposeful field of study manual training conducted in the light of modern methods will find a place. It will be easier to justify the position of manual training in the school of the future because it embodies many of the qualities that the newer education stands for. The comparative youth of the manual training movement and its freedom from a long tradition will enable it to adjust itself to changing conditions. The growth of the junior high school has given an added impetus to manual training as a part of its procedure. The tendency at present is to devote more time to this hand work so that a more complete and thorough field of work may be covered. If the present movement of vitalizing school curricula continues, as it doubtless will, the future for manual training as an educational medium is assured.
The year 1876 marks the beginning of real interest in manual training as a school subject in the United States. This beginning was due largely to the woodwork displayed at the Centennial Exposition in Philadelphia by Victor Della-Vos. President John D. Runkle of Technology was so convinced of the value of the subject that he introduced it in his institution. Since the system of manual training that President Runkle introduced came from Russia it was called the Russian System of manual training.

Although the Russian System served to bring manual training to the attention of educational leaders it did not satisfy the demands made upon it. The Russian System came to be criticised because of its formal procedure and soon came to be known as a "series of models". This defect was due to the adoption of only the "instruction shop" by the United States. In the instruction shop the pupils were taught the principles of woodworking, wood-turning, forging metal turning, etc. This instruction was then followed by the construction shop in which these same pupils applied their knowledge and skill in the making of articles. Since only one part of the Russian System had been adopted it was quite natural that it should not have come up to expectations.

The movement for manual training had, however, been started and soon other schools followed the lead of Tech-
nology in the introduction of manual training. The St. Louis Manual Training School was opened in 1879, under the direction of Dr. C. M. Woodward. The tool instruction in this school included carpentry, woodturning, pattern making, iron chipping and filing, forge work, brazing and soldering, and the use of machine shop tools. The leadership of Dr. Woodward was such that it added strength to the manual training movement.

Public school educators soon followed in the lead of Dr. Woodward and the city of Baltimore adopted manual training as a part of public instruction in 1884. This was followed by its introduction in the city of New York in June 1887. In July, 1888, Mr. Gustaf Larsson brought the work to Boston where he started the Sloyd Training School for teachers. From this time on manual training was generally recognized as a legitimate school subject. At the same time there was also much opposition to it because of its expense and its "material nature".

In order to secure a place in the curriculum the advocates of manual training were forced to justify their subject on the basis of the then popular educational philosophy. B.B. Hoffman, an advocate of manual training, said: "Sloyd is to be used as a means of formal education- formal as opposed to material. A material education
seeks to impart a definite knowledge of things for their own sake. A formal education seeks chiefly to develop the innate powers, and selects and imparts knowledge in order to strengthen character, will power, memory, perception—in short, all of those faculties of the mind which at birth are dormant, and which gradually and through education become to a greater or lesser degree marked characteristics of the individual."

It can be quickly seen that manual training conducted in the light of the above definition would not satisfy the school going public. Manual training soon fell into the category of a "useless subject". The revitalization of the subject was due to a large extent to the influence of John Dewey. His statement that education should not be mere book learning alone, but that it should come to the pupil from the actual practice of useful occupations, fits in very readily with a good program of manual training.

The breaking down of the old doctrine of formal discipline under the influence of Herbart and his followers, gave a greater opportunity for a manual training to function. This change in educational psychology and philosophy can be easily demonstrated by comparing an early course with one of the modern courses. Such a comparison shows that the early course embodies few if any useful articles but concerns itself with exercises and
the making of joints. The early courses show a want of relationship of work to life. There is a failure to provide for individual differences. There is also a lack of motivation. Everything was prescribed in a fixed course.

The newer course would place a much greater emphasis upon the freedom of the pupil to determine what he wishes to make. It would suggest the making of useful articles in which the boy is interested. The newer method offers the widest possible latitude to the pupil under the guidance of the instructor. The work is motivated to the fullest extent. Little is said about the disciplinary value of manual training. The instructor maintains a balance between education of the boy and the importance of the object made. Modern manual training seeks to actually apply Dewey's precept of "learning by doing" something worth while.

Manual training suffered at the beginning from the lack of properly prepared teachers. It was said that any person having a little knowledge of mechanics could teach the subject. As is quoted in the main thesis one superintendent of schools said that a janitor or some older boys could keep the school shop running. It came to be true that manual training teachers were not well
prepared educationally. They were frowned upon by the teachers of the well established subjects and not without reason. A stigma came to be attached to the subject itself because of the poorly prepared and frequently uncouth teachers. It is, of course, needless to say that the subject is still frowned upon by some even to-day.

As manual training became more generally adopted it attracted a better type of teacher. Schools were soon established in which teachers were trained for the work. State normal schools helped in the training of teachers for manual training. Then later, state universities established vocational departments in their schools of education in which they prepared teachers for the subject. With the recognition of manual arts as a subject worthy of university attention the status of the manual training teacher has steadily risen. At the same time the more severe demands upon the prospective teacher of manual training has led to the elimination of many who were unfit or unqualified. The salutary result of this has made itself felt in the general improvement of the manual training movement. Superintendents and supervisors now seek to secure well trained and well educated teachers for the manual training work. William E. Roberts, writing in
Bulletin No. 11, 1924, Bureau of Education says, "There is every indication of a demand for a higher type of teacher than has been acceptable in the past. Better professional training, more culture, and a broader educational outlook, as well as skillful craftsmanship are demanded".

The general acceptance of the junior high school has given the manual training teacher an important part to play. This importance is recognized in the new demands made upon him, both in preparation and in the duties of the school. In addition to broad general and special training it is essential that he be high minded and have a sympathetic interest in boys. The opportunity for personal relationships are many in manual training, and the influences for good should be correspondingly great.

At the present time the educational world is astir regarding the educational value of many subjects in the school curriculum. It is now quite generally admitted that the educational needs of a nation can be effectively met only by an organization of educational institutions designed to serve the society in which they exist. The United States has become highly industrialized and the difficulties of being adjusted to this complex life have become pressing problems. The pressure upon the school is in the direction of school work which has its value in
the fact that it actually functions in real life. This work will be such as to yield vocational training of the right kind.

In this movement for a more useful and purposeful education manual training conducted in the light of modern methods will find a place. It will not be difficult to justify manual training in the school of the future because it embodies many of the qualities that the newer education stands for. The comparative youth of the manual training movement and its freedom from a long tradition will enable it to adjust itself to changing conditions. The growth of the junior high school has given an added impetus to manual training. If the present movement of vitalizing school curricula continues, as it doubtless will, the future of manual training as an educational medium is assured.
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