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### Industrial arts in the junior high level schools of Montana

Charles Bernard Walter

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INDUSTRIAL ARTS  
in  
THE JUNIOR HIGH LEVEL SCHOOLS  
of  
MONTANA  
by

Charles Bernard Walter  
B.E., Western Montana College of Education 1938

Presented in partial fulfillment of the  
requirement for the degree of  
Master of Education

Montana State University

August 1951

Approved:

Louis Carlton  
Chairman of Board  
of Examiners

W. T. Clark  
Dean, Graduate School

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## CHAPTER I

### INTRODUCTION

In the fall of 1950, a group of industrial arts teachers, including the author, had gathered in the Miles City junior high shop and were "talking shop." They were exchanging ideas with the thought in mind of setting up a program to offer those persons interested in crafts an opportunity to try out their abilities. The talk led to what other schools were offering in the industrial arts field to junior high, senior high, and adult evening groups. The talk inspired the author to find out what was being offered in the industrial arts program in the other Montana schools.

When he began to inquire about bulletins or other printed publications that would give such a picture, he found that there was no such information available. He thought a survey to acquire such information would make an interesting study, so proceeded to do just that. It was decided to narrow it down to the junior high school level.

Statement of the problem. It was the purpose of this study (1) to determine the extent to which industrial arts were taught in the junior high schools of Montana, (2) to discover the types of industrial arts taught; (3) to determine the available industrial arts equipment in these



schools, (4) to secure from industrial arts instructors opinions as to what equipment was considered necessary for the adequate realization of the objectives of an industrial arts program, (5) to discover the different visual aids used, (6) to poll industrial arts teachers on their opinions as to weaknesses and strengths of various aspects of the industrial arts program, (7) to secure teachers' ratings on the importance of the various objectives of industrial arts, (8) to determine what courses should be added to the curriculum, and (9) to determine the most frequently taken courses in industrial arts. ✓

Limitations of the study. The study was confined to the junior high school level as the author was teaching in that field at the time.<sup>1</sup> A survey of both junior and senior high school level industrial arts programs would have been too broad for such a study. Questionnaires were sent to all Montana schools that enrolled junior high school level pupils in order to acquire as complete a picture of their industrial arts programs as possible.

Classes labeled industrial arts, shop, handicrafts, manual training, craftwork, metalwork, and the like were included in the study.

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<sup>1</sup>See special definition of junior high school level on p. 5.

Industrial Arts defined. "Industrial Arts" is merely a term used by writers in speaking of manual training or craftwork. Other terms used are "crafts," "arts and crafts," "handicrafts," and the like. In reality "industrial arts" covers a very broad field. Maris Proffitt in Newkirk and Johnson defined industrial arts in this manner:

Industrial arts is a phase of general education that concerns itself with the materials, processes, and products of manufacture, and with the contribution of those engaged in industry. The learnings come through the pupil's experiences with tools and materials and through his study of resultant conditions of life.<sup>2</sup>

Greenbie, in writing of leisure time activities uses two terms in one paragraph when she comments:

In the new centers for leisure-time activities, people turn to the manual arts now with a kind of hunger. . . their hands itch to make something, to grasp what they want in life with hands of skill. For men, especially, the various crafts bring a great release.<sup>3</sup>

Marsh defines the term "arts and crafts" by explaining each part separately: "Craft is dexterity and skill in manual employment. Art is the expression of an idea in form, color, sound, or movement."<sup>4</sup>

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<sup>2</sup>Louis Newkirk and William Johnson, The Industrial Arts Program (New York: The Macmillan Company, 1948), p. 6.

<sup>3</sup>Marjorie Greenbie, "From the Arts of Leisure," Recreation, 29:411, November, 1935.

<sup>4</sup>Chester Marsh, "Enlarging the Arts and Crafts Program," Recreation, 32:97-99, May, 1938.

No doubt exists that both skill in manual employment and the expression of an idea in form and color are necessarily employed in the construction of a pleasing and useful piece of craftwork. However, the term "arts and crafts" as applied to industrial arts work is somewhat misleading because of its inference that two distinct subjects will be combined under one course--which occurs many times. Besides, the title infers that the subject will be taught as part of an art course, which in some cases may be desirable but not necessarily so.

Probably, if one were forced to choose whether craftwork would be taught in an art department or in an industrial arts (formerly manual arts) department, he would discover that by far the greater number of facilities, tools, and machinery would be available in the latter department for teaching a greater number of crafts than in the former.

The industrial arts program should be concerned with a variety of life problems, including the production, selection, and consumption of industrial products, occupational exploration and guidance, appreciation of good design and construction, maintenance of the home and its mechanical appliances, and the construction of articles for use in the home and recreational activities. Every project made in the junior high school industrial arts program should be initiated by definite pupil interest and appeal. In addition to

the exploration of broad general occupational fields through manipulative experiences, the pupils also gain information through study and investigation, illustrated talks, demonstrations, audio-visual aids, and visits to industrial plants.

Junior high level defined. Junior high level as used in the study indicates grades seven and eight or grades seven, eight, and nine. In the 8-4 plan, grades seven and eight are considered to be junior high; whereas, in the 6-3-3 plan, grades seven, eight and nine are accepted as junior high school.

Importance of the study. With the advent of the junior high school have come problems in curriculum organization brought about by the desires and needs of junior high school graduates anxious to continue their education but unwilling or unable to attend high school.

Regarding the importance of an extended educational program to the future of our country the following comment was made:

The youth now enrolled in the public schools of America will face during their lifetime what are probably the greatest problems that have ever confronted any generation in the history of our country. It is significant, therefore, that the education of the coming generation be both comprehensive and purposeful. If these young people can be retained in school throughout the fourteen years of public education, the oncoming generation should exhibit a competence for coping with the great problems of reconstruction which was not possessed

by the American people at the conclusion of the first World War.<sup>5</sup>

It is maintained that a curriculum must be wide enough in scope to include the needs of all the students. It is believed that many of these needs can be met by the fulfillment of objectives of industrial arts courses.

Industrial arts should assume a position of high value in a curriculum which attempts to give students a chance to secure training in each field which is based on the industries and occupations of the community, and which enrolls students of the widest possible variance of abilities and requirements, as would be the case if all junior high school students were included.

It seemed, then, both fitting and timely that a study be made of the industrial arts program as it existed in junior high schools in Montana. Fitting, because of the need for an adequate industrial arts program in this age of machine-made articles and of high pressure on living, timely, because of the acceleration of the junior high school movement and the great interest displayed by specialists in the revision of the junior high school curriculum.

The findings of such a study could possibly be of value in establishing junior high school courses, and in

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<sup>5</sup>John A. Sexson and John W. Harbeson, The New American College (New York: Harper and Bros., 1946), 49-50 pp.

adjusting junior high school curricula to the needs of the students.

## CHAPTER II

### HISTORICAL BACKGROUND ON INDUSTRIAL ARTS

In order to help one better understand industrial arts it was necessary to review its history, to find out about its beginning, its periods of development, the effects of the war, and the evolving philosophies.

Early European. The advancement of industrial education was slow in Europe. One reason was that industrial education stood apart from culture. The Romans, who were aristocratic, felt that the Greek idea was right in that industry should be entirely separated from culture. The scholastic system was not in favor of industrial education either. The people looked down on those connected with industry. In regard to such, P. R. Cole makes this comment:

It was one thing or the other; one might either be a Latinist, logician, and theologian, or a son of industry. One could not be both. The former was considered a scholar, the latter an ignoramus.<sup>1</sup>

During the Renaissance, the scholars regarded the study of classics as the dominating factor in education. They glorified books. Again Cole writes:

Bookishness is the hereditary foe of the industrial life; it removes men's eyes from the world about them

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<sup>1</sup>Percival R. Cole, Industrial Education in the Elementary School (Boston: Houghton Mifflin Company, 1914), p. 9.

and concentrates their attention upon the ideas of the past. The educated man henceforth was the classicist, who had neither time nor inclination for industrial interests.<sup>2</sup>

During the Reformation, things might have been different for industrial education if the reformers had not had such strong pressure over them. They realized the needs of the bulk of the people, but had no choice under such circumstances. Cole says this about the Reformation:

The Reformation might have made a difference in favor of industrial education had not the reformers been obliged to educate leaders. Their main need was of clergy and scholars to defend their theological positions. Consequently, although Luther, Calvin, and others were not blind to the needs of the masses, they concentrated their efforts upon the secondary or Latin schools.<sup>3</sup>

In England, it was felt that primary education should be cared for by charity. The pupils were educated by the people for whom they worked. It was felt that they should remain in that station of life. Culture was for the upper classes of people and did not deal with the practical things of life. It was from England that the United States inherited most of its prejudice against industrial education in the schools.

One of the few early Englishmen, who thought otherwise in regard to industrial education, was John Locke who

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<sup>2</sup>Ibid., p. 10.

<sup>3</sup>Loc. cit.



believed, "Manual training should be taught since every gentleman should know a trade."<sup>4</sup>

John Locke stressed learning through experiencing rather than through memorizing, and said that a child's natural interest should be made profitable in his education. His general aim was, "a sound mind in a sound body." He stressed discipline and became known as a disciplinarian.

Pestalozzi had a very careful rearing and a good education. When he was still a youth he became interested in the social problems of the masses and hoped to be able to improve their conditions some day. Later he started an industrial school for the poor children where manual training was taught, in addition to the three R's. Meyer said Pestalozzi's aim in education was: "Education is the natural, progressive, and harmonious development of the powers and capacities of the human being."<sup>5</sup>

#### IN THE UNITED STATES

Manual training. As an educational term, manual training includes the handwork used in school as a means in general education. It differs from trade education in that it emphasizes the educational element rather than the com-

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<sup>4</sup>Adolph Meyer, The History of Education (Longmans, Green and Company, 1935), p. 55.

<sup>5</sup>Ibid., p. 61.

mercial or industrial element. Manual training emphasizes manual skill.

Manual training has been slow in coming into the schools because it has had to depend upon private and local introduction. Many people did not have the initiative to get manual training started. However, at the beginning of the twentieth century it started to make more progress. A. R. Brubacher's writing in Encyclopedia Americana gives a resume of manual training when it states:

There had been no national movement prior to 1917. The Ethical Culture Society of New York City made the first step by opening handwork classes for small children in 1878 in connection with its Workingmen's School. This was followed in 1880 by the Washington University in St. Louis, Missouri, under the direction of Calvin A. Woodard. This experiment consisted of a fully equipped manual training high school with a variety of shopwork in wood and metal and mechanical drawing. It was a pioneer school and its success was noticed by many of the large American cities. By 1900 a majority of American municipalities had adopted some form of manual training. Work for girls as well as boys was included in the program.

The courses for girls included sewing, dressmaking, millinery, burnt wood, leather and art jewelry; for boys it included joinery, wood turning, pattern-making, electric wiring, machine shop, forging, foundry, sheet metal, printing, etc.

In the elementary school, handwork has likewise found a large place on the program, beginning in the kindergarten and continuing through the elementary grades. The activities include paper folding and paper cutting, basketry, clay modeling, wood carving, raffia work and the like.<sup>6</sup>

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<sup>6</sup>A. R. Brubacher, "Manual Training," Encyclopedia Americana, 1948 edition, XVIII, 240-241.

Industrial Arts. Around 1880, a demand was made of the schools to provide a substitute for the old apprenticeship system which was made obsolete by the industrial revolution. This was the beginning of organized industrial education in the schools of America.

Because of the shortage of skilled workers, an increasing demand was laid upon the schools to bring their shopwork into a more direct relation with the industrial program which was expanding so rapidly. As a result industrial arts was offered as an essential part of general education to satisfy the industrial public.

Below are some criticisms against introducing industrial arts into the school curriculum, according to H. H. London:

When industrial education was first introduced into the public schools, schoolmen generally opposed it, largely for three reasons. First, they said it was not their business to train workers for industries. Second, industrial activities, they said, lacked content worthy of a place in the school. Third, they believed that industrial education would interfere with the traditional studies and would cost too much. Besides these objections, students of industrial education should realize that there always have been certain stigmas attached to all forms of work education. In the first place, there is the religious stigma, beginning with Adam and Eve in the Garden of Eden and continued by the early church as a means of discipline. Second, there is the social stigma, growing out of indentured servitude, often confused with indentured apprenticeship, out of slavery and out of the use of work education in penal institutions, reform schools, and schools for the feeble minded. Third, there is

the misuse of intelligence test scores and exemplified by the tendency to advise bright students to stick to the academics and dull ones to go to the shop.<sup>7</sup>

Today, however, opinion is reversed and schoolmen quite generally support industrial education. This fact was revealed in the notes which were written at the end of the author's questionnaires. They also indicated that the public was in favor of more industrial education as they had voted funds to build shops and get new equipment to further the industrial arts program. Many of the people today realize the value of industrial arts in modern education and are furthering its development.

The realization is due to industry's demand for skilled labor, labor's interest in the type of education that will increase its earning capacity, the necessity of meeting the needs of those that are not academically minded, the necessity for guidance purposes to explain the world of industry, and the general idea of leveling in education.

H. H. London, of the University of Missouri, comments on the development of industrial education in the following statements:

Before World War II, our programs of industrial education were running along rather smoothly, although they had many defects and met only a small portion of

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<sup>7</sup>H. H. London, "Background and Outlook in Industrial Education," Industrial Arts and Vocational Education, 38:257, September, 1949.

the need for this type of education. When the war came, the schools were called upon to convert their shop programs into war purposes. What they did in providing preinduction and war-production training is common knowledge. But, now that the war is passed and we have moved into a new era of technical and industrial development, the outlook for industrial education has changed. It is difficult to foretell exactly what the future will bring in any field of education. However, there is good reason to believe that industrial education will become even more important in the future than it has been in the past.<sup>8</sup>

Handicrafts. At the beginning of the twentieth century, in the United States, handicraft societies were found in the cities. These handicraft societies, or as they were more often called, arts and crafts societies, were organized by artists and craftsmen who were devoting themselves to the idea of bringing beauty into everyday life through the making and using of fine handwork.

Much can be said for handicrafts. Handicrafts mark the growth of man from before the dawn of history up to our own times. All people are distinguished by the record of their handwork. Especially, agriculture and handicrafts have gone along together down through the ages. Even the traveling tribes, the gypsies, the hunters, the warriors, have had hand work distinguishing their people from others, and yet providing through it a kind of universal language which everyone may understand.

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<sup>8</sup>Ibid., p. 258.

In our own country, the first years of colonial development were marked by such records. The struggles of the new nation in the migrations to the Middle West and Far West, in life on the frontier before the coming of railroads, were all characterized by handicraft culture. Turning to the homelands of Europe, from which so many of our citizens have come, one will find the same indications of characters, of skills, and cultures of their people marked by their handicraft attainment. Evanda Kraus Perry wrote:

Making things with the hands is one of the most soul-satisfying experiences of the human race because it helps the individual to put into concrete form his own feelings.<sup>9</sup>

The Extension Division of the United States Department of Agriculture, operating through state agencies, was the first of the federal groups to initiate a program for improving opportunities for country people, thus increasing their satisfactions in rural life. Connected with the Extension Division are young people's organizations known as the 4-H Clubs, Future Farmers of America, and Future Homemakers of America. They are organized in every state in the union. In them boys and girls and young men and young women carry out well-defined programs for improved methods of farming and homemaking. Much stress is placed on handicraft activities.

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<sup>9</sup>Evanda Kraus Perry, Crafts for Fun (New York: William Morrow and Company, 1940), p. 7.

The Tennessee Valley Authority also encourages handicraft work as a part of the training and educational program in the town of Norris.

The League of New Hampshire Arts and Crafts is the only handicraft organization yet created by state authority. It was founded in 1931 to develop the educational and economic values in arts and crafts.

During the great depression of the 1930's when unemployment was at its height and restlessness and discontent were everywhere, handicrafts was held in high regard as a way out. John C. Kieffer stated the condition and the solution very effectively when he wrote:

When working and with money to spend, spare time was a source of joy, but once thrown upon our own resources for entertainment and life satisfactions, many of us have been found wanting. Lack of skill, together with lack of interest in satisfying activities, has caused almost as much misery as lack of food, clothing, and shelter. . . In handicrafts we have an activity which can give much in the way of enriching life.<sup>10</sup>

Modern schools are proving the value of learning by doing. This process makes partners of joy and achievement. It has the important advantage of bringing appreciative influences into the work and play. In looking toward the future, more time and thought should be given to the producers

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<sup>10</sup>John C. Kieffer, "Planning the Handicraft Program," Recreation, 27:141, June, 1933.

of handicrafts. There is a great opportunity to utilize a well-rounded handicraft program to increase general education and inspiration. The teaching, the exhibitions, the demonstrations of a handicraft program, and the working out of personal, family, and community expressions in handwork can be made to contribute to happiness, welfare, and inspiration of many individuals hungry for "the best things of life." Handicrafts can be a wonderful pastime or hobby for young and old.

Negro and Indian Schools. Many of the trade or industrial schools started in the early part of the nineteenth century have died out. Those that survived have developed into higher technical schools. An encouraging factor in the growth of such schools was the success which was experienced with the education of the Negro. At the close of the Civil War, many emancipated slaves were mingled with the white population of the country. Because of their former habits, conditions during slavery, lack of education, and their new status in a democracy, it was found necessary to give them an education which would enable them to support themselves.

Erhard F. Wendt wrote:

General S. C. Armstrong, in 1868, organized the Hampton Normal and Agricultural Institute at Hampton, Virginia. This school, for the education of the negro, has been characterized as the first industrial school of any importance in the United States. The idea of the founder was to educate selected negro



youths who in turn would teach and lead their people. The success of this school led to the establishment of the Tuskagee State Normal and Industrial Institute in 1870, and of a school for Indians at Carlisle, Pennsylvania, in 1878. The Tuskagee State Normal and Industrial Institute was opened under the direction of Booker T. Washington, a former student of Armstrong. Haskell Institute in Kansas was opened in 1884. It was the success of these schools for the Negro and Indian people that prompted an increased demand for schools of a similar nature for the white children.<sup>11</sup>

During the early twentieth century this educational movement was reflected by the establishment of important privately supported Negro schools. It was also brought out in the establishment of public institutions. During this period state systems of industrial education were organized for the Negroes and Indians.

Effects of War on American home arts. The manner in which Americans went about adjusting their lives to wartime economy appears in an article prepared by Marguerite Ickis where she emphasized the importance of having something to do during blackouts. She suggested handicrafts with a patriotic motive. Even small tots were remembered, and given something to keep them busy and interested in times of extreme mental strain. Below are some excerpts from her write-up:

A timely handicraft present, with a patriotic

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<sup>11</sup>Erhard F. Wendt, "A Brief History of Industrial Arts and Vocational Education," Industrial Arts and Vocational Education, 35:203, May, 1946.

impulse behind it would be a cover for a war savings stamp book.

Your boy in service. . . would appreciate a handsome writing case of cardboard when it was made by one of his own family.<sup>12</sup>

She also suggested that people make entertainment kits to use especially in blackouts. They would help so much in the problem of keeping people busier and calmer. The little tots were given a part as well as the older ones.

The clown puppet will be master of ceremonies. . . Small children will also appreciate the ball, bean bags, and stuffed animals which they helped to make.<sup>13</sup>

When people are busy and can make the best out of what there is around them they are much happier. Art work was an outlet for nervous tensions, both in school and at home. During the war, adult groups as well as school groups were taught how to use machines. In such troubled times when there is so much unrest and people are so very nervous and fidgety, much industrial arts and craftwork is needed. Such courses give people an opportunity of releasing their nervous tension in a useful as well as a happy way. Deyo E. Fox writes the following about industrial arts:

It would be trite to remind the reader that a war was necessary to impress upon the schools that in spite of their elaborate program of studies there existed a wide gap, which had been brought about by the lack of adequate instruction in the field of industrial arts. You will recall that soon after the war began, the War Department sent out an urgent call

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<sup>12</sup>Marguerite Ickis, Crafts in Wartime (New York: National Recreation Association, 1942), p. 22.

<sup>13</sup>Loc. cit.

for the schools to provide training in a variety of preinduction courses. Fundamentally, these courses were based on the industrial arts philosophy. . . we are still living in an industrial civilization. Industrial arts is the recognized representative of industry in the field of education.

Indeed a great many important and far reaching educational changes, as a result of the war years, are upon us and some are already taking place in our public schools.<sup>14</sup>

Industrial arts offerings are being expanded and improved so as to cope with the world today. Increased attention is being given to new industries, new materials, and methods of work.

Changing philosophies. The industrial arts curriculum is constantly changing. Its philosophy, however, is not so different from the standards which general education has set up.

The basic philosophy of industrial arts has existed from the time when prehistoric man left his caves to live in the plains. Ever since that time man's important reason for education was to learn the best way to earn a living. Robert A. Hardin states this about basic philosophy, "We have always had a basic philosophy of industrial arts. It is and always has been 'the welfare of the common man'."<sup>15</sup>

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<sup>14</sup>Deyo B. Fox, "Improving the Industrial Arts," Industrial Arts and Vocational Education, 38:259-60, September, 1949.

<sup>15</sup>Robert A. Hardin, "Our Evolving Philosophy of Industrial Arts," Industrial Arts and Vocational Education, 39:179, May, 1950.

So many people feel that industrial arts is a new field in education, while in reality it is the oldest. Industrial arts is thousands of years older than academic instruction, but it did not become a part of the educational program because for centuries education was only for the wealthy. During that time, skills were passed from father to son by imitation. Again Robert Hardin writes:

Many writers on industrial arts quote educational philosophy as far back as the Renaissance, but documentary evidence of practical or useful education dates back almost 4,000 years. Stone tablets excavated at Ur in Chaldea revealed laws under which young people learned how to do things.<sup>16</sup>

The things we study today as culture of the past are largely outgrowths of hand skills. As an example, King Solomon's beautiful temple was done by one of the most skilled artisans of the time. All the famous art work of the middle ages was done by hand which involved the mind and emotion. The monks are given the credit for the beautiful bookmaking at that time. Even the progress in science and industry has been greatly contributed to by individual hand work. Robert Hardin says, "The culture of the future lies in the handiwork of the present and he who is skilled in the arts and crafts is building the culture of the future."<sup>17</sup>

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<sup>16</sup>Hardin, loc. cit.

<sup>17</sup>Ibid., p. 180.

Some of the early educational writers saw a value in industrial arts. One of these was John Locke (1632-1704), mentioned earlier in the study, who realized the value of handwork. That was why he advocated learning the manual trades. It gave the boys an outlet for their leisure time.

Up to the first quarter of the nineteenth century, Pestalozzi and Fellenberg had done more for industrial arts than any of the other educational writers.

Pestalozzi thought that handwork and academics should go together. He tried to combine study and manual labor, thus making school and workshop one. Progress was made in school by using objects and handwork as a means of teaching the traditional subjects. Pestalozzi was not too successful because of his lack of administrative ability, even though he was interested in educating the poor boys and girls.

Another one of our great educational philosophers was Herbart. He believed that handwork was a necessity in the field of general education. He states:

Elementary schools should have workshops, though they should not actually be technical schools. And every man should learn to use his hands. The hand holds the place of honor at the side of the power of speech in raising man above the beasts.<sup>18</sup>

A few attempts to include handwork in the schools were

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<sup>18</sup>Charles A. Bennett, A History of Manual and Industrial Education Up to 1870 (Peoria: Charles A. Bennett Company, Inc., 1926), p. 161.

made in America before 1870. Around 1870, methods in "manual training" were taking a change. The first period in the development of industrial arts is called the "manual training" period. The aims of manual training at that time indicated the direction of our philosophies then. Erhard Wendt summarized them as follows:

(1) By furnishing an outlet for the constructive impulses, it supplied what so far had been lacking in general education. (2) It made school training more purposeful. People could recognize a more definite relationship between school and industry. Leaders in the movement however, never did believe that it would replace vocational training. (3) The cultivation of habits of industry was felt to be very important. (4) Manual training in the schools was expected to develop a respect for the manual laborer and so raise the status of the working class.<sup>19</sup>

The period from 1880 to 1900 was the time when school men were fighting to get industrial arts as a part of the general educational program. It is often called the industrial arts transitional period. Many of the principles and practices generally accepted now were started during that transition period. At first manual training schools were separate from the academic schools. Individual differences brought about the enrichment of course instruction. It was during this period that instruction sheets were introduced by Decker of Minneapolis.

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<sup>19</sup>Erhard F. Wendt, "A Brief History of Industrial Arts and Vocational Education," Industrial Arts and Vocational Education, 35:153, April, 1946.

A. P. Marble, then superintendent of the public schools in Worcester, Massachusetts, was very much against industrial arts when he said, "There is no information stored up in the plow, hoe handle, steam engine, but there is information stored up in books."<sup>20</sup>

For the defense, Dr. Woodward said, "The obscurities of the textbooks. . . vanish before the steady gaze of a boy whose hands and eyes have assisted in the building of mental images."<sup>21</sup>

The disciplinary value of industrial arts was one of its first pitfalls. Dr. Nicholas Murray Butler said the following when he was defending manual training:

If shopwork is used as a means of manual training, it is because of its disciplinary value, not because of its utility. . . If the term manual training is used in antithesis to mental training it is wrongly understood. Manual training as I use the term, is mental training.<sup>22</sup>

Vocational education was another pitfall for industrial arts. Some of the general public thought that manual training provided vocational training. This led some to believe that the public was paying for such training and it

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<sup>20</sup>Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917 (Peoria: Charles A. Bennett Company, Inc., 1937), p. 361.

<sup>21</sup>Ibid., p. 362.

<sup>22</sup>Ibid., p. 369.

raised a storm of criticism. We owe a large debt of gratitude to Woodward, Russell, Bennett, Richards, and others for fighting the philosophical battle for us within the last century so that we hardly need to justify industrial arts in our minds.

Most of the teaching was done by exercises when manual training was first introduced. These exercises centered around the making of joints, especially in the woodworking courses. A list of twenty-two joints and tool operations were the basis for Dr. Woodward's woodworking course at St. Louis. He was very strict when he organized that course there.

It is thought that the St. Paul manual training school, directed by Charles A. Bennett was the first noticeable one to turn aside from the rigid exercise system.

Bennett says the following in regard to his deviation:

Some progress was made toward flexibility in the organization of shop and drawing courses to meet the needs of pupils of varying interests and abilities. This led to the introduction of completed useful problems and projects after a few fundamental tool exercises.<sup>23</sup>

In that statement is seen one of the first favorable attempts to provide for individual differences in the school

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<sup>23</sup>Ibid., p. 381.



shop.

Near the end of the last decade of the nineteenth century, the emphasis on the development of skills in shop processes was shifted to a broader field of learning and living. Skills were not neglected, but such other values as guidance were brought into the picture. Accuracy and precision were brought in too. Dr. Bonser helped people to see that industrial arts is not only an end but is also a means to an end. In 1932 he made this statement:

A study of the making of books is not primarily to produce skill or craftsmanship in bookmaking--few, if any, of the children in a given school will become bookbinders and, if any of them do, it will probably not be handicraft bookbinding. The purpose is rather to develop an insight into industry whereby the race has put itself on record for untold generations, improving its means step by step, until the great mechanical typesetting machines are subjects of study and understanding.<sup>24</sup>

One can see the philosophy of industrial arts changing all the time. In the lower grades it becomes a means to an end. Toward the end of high school it is often an end in itself. It develops into vocational education some time in the last two years of high school and the beginning of college.

With the change in philosophy and the expansion in industry a change in terminology came too. The first period

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<sup>24</sup>Frederick Bonser, Life Needs and Education (New York: Teachers College, Columbia University, 1932), p. 109.

was called manual training, the second manual arts, and now industrial arts. It is believed that Charles Richards was the one who first suggested the term "industrial arts." In 1904, he wrote an article for the Manual Training Magazine which was published in October in which he named the third period, the industrial arts development. In referring to this change, he stated that:

We are rapidly leaving behind the purely disciplinary thought of manual training. . . Now we are beginning to see the scope of this work is nothing short of the elementary industries fundamental to modern civilization.<sup>25</sup>

In summing up the chapter, the author would like to suggest a definition of industrial arts growing out of the historical development of the field. Definitions help in understanding philosophies. The definitions of "industrial arts" vary somewhat, but the understanding of the meanings vary but little. Probably the easiest definition to understand is the one written by Maris Proffitt which is stated on page 3.

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<sup>25</sup>Bennett, op. cit., p. 453.

## CHAPTER III

### SECURING DATA

Questionnaires. To secure names and locations of industrial arts instructors, a letter requesting that information was sent to the State Superintendent of Schools at Helena. A reply was received from the Vocational Educational Division, as was also a directory of industrial arts teachers. (Copies of the letter and directories may be seen in Appendixes A and B, pages 67 and 70.) However, the directory did not include all the junior high level schools in the state.

A questionnaire, a letter of request for help in the survey, and a self-addressed return envelope were sent to all industrial arts instructors in that directory and to superintendents of schools not included in that list. (A copy of the letter and the questionnaire may be seen in Appendixes A and C, pages 68 and 77.) A total of 209 questionnaires was sent on April 14, 1951. Ninety-three follow-up letters and another copy of the questionnaire were sent May 12, 1951. (A copy of that letter is in Appendix A, page 69). From the 209 schools, 135 returns were received, or about 65 per cent. (A list of the schools sending returns may be seen in Appendix B, page 74).

Visits. Visits were made to six school shops. In-

sufficient time and long distances hindered visiting more schools. Visits on Saturdays were made to some schools, but due to the non-school day, school personnel was absent. Visits, of course, were more helpful to the author than questionnaires, because he could get first-hand information that way.

## CHAPTER IV

### MONTANA JUNIOR HIGH SCHOOL INDUSTRIAL ARTS SURVEY

#### DESCRIPTIONS AND TABLES

Extent industrial arts taught. As indicated by Table I, 135 questionnaires, approximately 65 per cent, were received from the 209 schools included in this survey. Of the 135 returns, seventy-six, or a little over 56 per cent, showed that industrial arts courses were offered; forty-seven, or almost 35 per cent, showed that no industrial arts courses were offered; and twelve, or a little less than nine per cent, offered vocational-agriculture instead of industrial arts. That is, only twelve schools reported that vocational-agriculture was offered. More may offer it but did not state it.

This is only a partial picture of Montana as all the schools did not send returns. Many of the returns from those schools not offering industrial arts suggested that such courses should be in their curricula, some indicated they were thinking seriously of including them, and some told of plans under way to build shops in which to offer industrial arts courses.

TABLE I  
 JUNIOR HIGH SCHOOL LEVEL INDUSTRIAL ARTS OFFERINGS  
 IN MONTANA

Schools				
No. Offering Ind. Arts	No. Not Offering Ind. Arts	No. Offering Vo. Ag.	No. Not Answering Questionnaires	
76	47	12	74	
Total of all schools, 209, to which questionnaires sent.				

Of the seventy-six schools offering industrial arts courses, Table II shows that fifty-seven, or 75 per cent, offer them to boys only; none offered to girls only; and nineteen, or almost 29 per cent, offered to both girls and boys. Home economics was not included in the survey, which probably explains why so few schools showed girls taking industrial arts courses.

TABLE II  
 SEX TO WHOM JUNIOR HIGH SCHOOL INDUSTRIAL ARTS OFFERED

	Boys Only	Girls Only	Both
No. of Schools	57	0	19

In Table III (see Appendix for complete table) the "S" indicates the column for school enrollment and the "I. A.," the column for Industrial Arts enrollment. The figures under the letters indicate the number of pupils enrolled in each school under the various categories and grades. Many of the spaces were left blank in the questionnaires under the school enrollment question; the zero

indicates such in the table. The totals show the number of schools offering industrial arts courses and to which sex and grade level offered.

The majority of schools offer industrial arts courses to boys; very few offer them to girls.

For the boys, forty-two schools, 55 per cent, offered industrial arts courses to seventh graders; forty-seven, or about 67 per cent, to eighth graders; and fifty-eight, or about 74 per cent, to ninth graders. For the girls, nine schools, almost 12 per cent, offered industrial arts courses in grade seven; ten, or 13 per cent, to each of grades eight and nine.

As can be seen by the table, boys tend to go out 100 per cent for industrial arts where they are offered. Thirty-four schools, or almost 90 per cent of the forty-two offering them to seventh graders, show 100 per cent enrollment in industrial arts courses; thirty-six schools, or about 77 per cent, of the forty-seven offering industrial arts, have 100 per cent enrollment among eighth graders. Ninth grade boys do not go in so strongly for this work--only forty schools, or almost 69 per cent of the fifty-eight, show 100 per cent enrollment in industrial arts.

The girls' percentages are somewhat lower, but are good since so few schools offer industrial arts to them. Two-thirds of the nine schools reporting industrial arts

offered to seventh grade girls had 100 per cent enrollment in these courses. In grade eight, 70 per cent of the ten schools, and, in grade nine, 60 per cent of the ten schools had 100 per cent enrollment in girls' industrial arts classes.

TABLE III  
(Totals only)

JUNIOR HIGH SCHOOL STUDENT ENROLLMENT IN SCHOOL AND IN INDUSTRIAL ARTS

	Boys			Girls		
	Grade 7	Grade 8	Grade 9	Grade 7	Grade 8	Grade 9
Total IA	42	47	58	9	10	10
100% IA Enrollment Total	34	36	40	6	7	6

NOTE: For complete Table, see Appendix D.

Courses taught. As indicated by Table IV, many titles were given to the industrial arts courses in the different schools. The numbers under those grade level categories indicate the number of schools offering industrial arts courses by those titles. "Shop" was the most common title; "industrial arts" ranked second, with "woodworking" a close third. "Manual training" was fourth; "farm shop" was the least commonly used term. More than one course was offered in some of the schools, especially at the ninth grade level.

Many of the industrial arts instructors and superin-



tendents gave comments at the end of the questionnaire, in which they stated that different things were being done under the different headings. As an example, some did welding, soldering, wood, metal, and electrical work and called the course "industrial arts," while another called the same work "shop," and still another "manual training." One school called its course "mechanical drawing" when the students did drawing and drafting, while another school called its course "shop" with the same content. One even called a course in drawing and drafting "handicrafts."

TABLE IV  
FREQUENCY DISTRIBUTION OF INDUSTRIAL ARTS COURSES  
UNDER GRADE CATEGORIES

Subject	Times Subject Taught						Total
	Boys			Girls			
	7	8	9	7	8	9	
Elementary Art	1	1					2
Farm Shop			1				1
Handicrafts	1	1	1	1	1		5
Home Mechanics			1		1	1	3
Industrial Arts	11	12	9	1	1		34
Industrial Education	1	1	1				3
Leather Work				1	1	1	3
Manual Arts	1	1	3			1	6
Manual Training	5	5	3				13
Mechanical Drawing	1	2	4			1	8
Shop	13	17	29	3	4	2	68
Shop II		1	2				3
Woodshop	1	1	1				3
Woodworking	7	7	10	3	2	4	33
<b>Total</b>	<b>42</b>	<b>49</b>	<b>65</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>185</b>

In the questionnaire, a copy of which may be seen in the appendix of this study, three main headings ("Shop," "Industrial Arts," and "Handicrafts") were listed under which the instructors were asked to classify their courses. Table V shows all the courses (as shown in Table IV) grouped together under those three headings named in the questionnaire. Most of the courses were classified under the Shop heading. Handicrafts was used the least for the classification of the subjects. However, the notes at the end of the questionnaires stated that more of the handicrafts courses would be offered in the near future. Thus, the trend may be toward more handicrafts courses.

TABLE V  
FREQUENCY DISTRIBUTION OF COURSES  
BY QUESTIONNAIRE HEADINGS

Headings	Boys			Girls			Total
	7	8	9	7	8	9	
Shop	29	34	45	4	5	6	123
Industrial Arts	11	11	15	3	3	2	45
Handicrafts	2	4	5	2	2	2	17
Total	42	49	65	9	10	10	185

Prerequisite courses required. According to Table VI, only four courses required prerequisites. Two Shop classes required seventh grade Shop (or Shop I) before students were eligible to take the advanced shop courses. Sixty-three Shop

courses did not require any prerequisites. In the Industrial Arts group, no preliminary courses were asked for. Nine Handicrafts courses did not require prerequisites, but two did. One Handicrafts course required two years of Woodwork and the other required one year of Woodwork. The instructor, in his note at the end of the questionnaire, stated that the Handicrafts course was quite advanced and that was the reason for requiring two years of preliminary work.

A grand total of ninety courses did not require any prerequisite courses. In most of the schools industrial arts courses seem to be elective and the students were placed in them according to their ability and previous experience.

TABLE VI

## USE OF PREREQUISITES FOR INDUSTRIAL ARTS COURSES

Subjects	No	Yes	What
Shop	63	2	Seventh grade Shop (or Shop I)
Industrial Arts	18	0	
Handicrafts	9	2	1 course--2 years Woodwork 1 course--1 year Woodwork
Total	90	4	

As indicated by Table VII, the thirty-minute periods were very few in number for both groups of students. The most common period length for the boys was the sixty-minute with the forty-five minute period running a poor second. Neither Industrial Arts nor Handicrafts showed any ninety-

minute class periods for either the boys or the girls. Few schools reported ninety-minute periods for boys' Shop; only one showed a ninety-minute period for girls' Shop. For girls, the most common length class period was forty-five minutes.

TABLE VII  
LENGTH IN MINUTES OF INDUSTRIAL ARTS CLASSES

Subject & Grade Level	Boys				Girls				Total
	30	45	60	90	30	45	60	90	
<b>Shop</b>									
7	2	8	14	5		4			33
8	3	11	15	5		4	1		39
9		8	22	15		3	2	1	51
<b>Total</b>	<b>5</b>	<b>27</b>	<b>51</b>	<b>25</b>		<b>11</b>	<b>3</b>	<b>1</b>	<b>123</b>
<b>Ind. Arts</b>									
7		3	8			2	1		14
8		4	7			2	1		14
9		2	13			1	1		17
<b>Total</b>		<b>9</b>	<b>28</b>			<b>5</b>	<b>3</b>		<b>45</b>
<b>Handicrafts</b>									
7		1	1		1	1			4
8		2	2		1	1			6
9		2	3			1	1		7
<b>Total</b>		<b>5</b>	<b>6</b>		<b>2</b>	<b>3</b>	<b>1</b>		<b>17</b>
<b>Grand Total</b>	<b>5</b>	<b>41</b>	<b>85</b>	<b>25</b>	<b>2</b>	<b>19</b>	<b>7</b>	<b>1</b>	<b>185</b>

As indicated by Table VIII, only two courses were taught with one class period per week. Five periods per week

was most common for all the courses, though two periods a week for Shop was shown in ten courses.

The majority of schools conduct their courses for two semesters. This is true under all three headings. A very few schools recorded courses six or eight semesters in length. Four of the Handicrafts courses were offered for one semester only. Other patterns exist in a very few schools.

TABLE VIII  
NUMBER OF CLASS PERIODS PER WEEK  
AND LENGTH OF COURSES IN INDUSTRIAL ARTS

	Shop	Industrial Arts	Handicrafts	Total
<b>Periods Per Week</b>				
1	1		1	2
2	10	3		13
3	4	2		6
4	1	1		2
5	42	9	8	59
7	2	1	2	5
10	3			3
30	2	2		4
<b>Length of Courses</b>				
<b>Semesters</b>				
1	2		4	6
2	46	12	7	65
4	6	2		8
6	1			1
8	1	1	1	3
<b>Quarters</b>				
1		1	2	3
2			1	1
3	1			1
4		1		1
<b>Weeks</b>				
6	1			1
18	2	2		4

More sections needed. In Table IX, the number 1, 2, 3, 4, and 5 indicate the number of sections in demand in each school. The figures under the numbers indicate the number of schools needing more classes.

The table shows that there is a sufficient number of Shop courses in many of the schools, but there is also an outstanding demand for more sections in several of the schools. In some places there were as many as four or five more sections asked for in one school.

Most of the Industrial Arts courses were adequate in their present offerings.

Like the Industrial Arts courses, the demands for more courses in Handicrafts were very low.

TABLE IX  
DEMAND FOR MORE SECTIONS OF COURSES OFFERED

Subject	No	Yes	How Many More?				
			1	2	3	4	5
Shop	35	25	12	8	3	1	1
Industrial Arts	11	4	2	1	1		
Handicrafts	7	4	2	2			

Native materials used. According to the questionnaires, fifty-three schools use native materials in their industrial arts courses, which is almost 70 per cent of the seventy-six schools sending in returns. Of the seventy-six, only twenty-three, or 30 per cent, of the schools did not

use native materials.

Table X shows the distribution of the native materials used by the different schools. The "X" under each number indicates which material is used by the schools.

Cedar was used by more schools than any of the other materials. Native wood and pine, juniper, and fir were used by several schools. Cottonwood, larch, paper, sand, and stones were less commonly used.

TABLE X  
FREQUENCY DISTRIBUTION OF NATIVE MATERIALS USED

Materials	Number of Schools Using Each						
	1	2	4	6	13	17	18
Cedar							X
Clay		X					
Copper		X					
Cottonwood	X						
Diamond Willow		X					
Fir			X				
Juniper				X			
Larch	X						
Leather		X					
Paper	X						
Pine					X		
Sand	X						
Stones	X						
Native Wood						X	
<b>Total</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

As may be seen by Table XI, while most schools appear to recognize four items in their shop programs, some sixteen did not designate any time for design. When one looks at Industrial Arts, he sees that there were almost as many schools which did not use time for design as there were schools who did. They were, however, almost 100 per cent for the other three (discussion, construction, instruction).

Handicrafts show that 75 per cent of the schools use time for both design and discussion. Almost all of them provide the same emphasis on construction and instruction.

TABLE XI  
FREQUENCY DISTRIBUTION OF CLASS TIME ITEMS

	Number of Schools per Item							
	Design		Discussion		Construction		Instruction	
	Yes	No	Yes	No	Yes	No	Yes	No
Shop	41	16	52	5	57	0	54	3
I.A.	11	9	19	1	19	1	18	2
Hand.	9	3	9	3	11	1	11	1

Equipment. The wood lathe seems to be the most popular piece of equipment in the junior high level schools in Montana, according to Table XII. Of the seventy-six schools reporting, sixty-four already have wood lathes and five schools indicated use for them. Many schools (between fifty-three and sixty) have band, jig, and table saws, drill



TABLE XII  
INDUSTRIAL ARTS EQUIPMENT AVAILABLE AND NEEDED  
IN MONTANA JUNIOR HIGH LEVEL SCHOOLS

Equipment	Available	Needed
Acetyline Welder	4	2
Auto Mechanics	1	1
Band Saw	53	4
Buffer	19	1
Compressor	1	1
Drill Press	53	4
Electric Hand Drill	23	2
Electric Soldering Iron	39	
Electric Testing Board	7	1
Electric Welder	6	4
Forge		1
Gas Soldering Furnace	3	1
High Speed Drills	31	
Jig Saw	53	4
Jointer	41	5
Lapidary	1	
Leather Tools	1	1
Linotype Machine	1	
Machine Lathe	14	
Photo Dark Room	7	
Planer	10	8
Plastic Press	2	
Plastic Tools		3
Platen Press	1	
Portable Sander	1	4
Power Grinder	57	2
Proof Press	1	
Rotary Press		1
Sander	47	3
Shaper	3	8
Sheet Metal Machinery	3	2
Spray Gun	14	3
Stamping Press	2	
Table Saw	60	2
Wood Lathe	64	5

presses, and power grinders available. Quite a few sanders, jointers, electric soldering irons, and high speed drills were reported at hand at the different schools. Between one and two dozen schools reported having machine lathes, spray guns, buffers, and electric hand drills. The fewest pieces of available equipment shown in the table are auto mechanics tools, compressors, lapidary, leather, linotype machine, platen press, portable sander, and proof press. Shapers and planers were the most needed as the largest number, eight, in that column was shown for them.

Visual aids used. According to Table XIII, we find blackboard sketches are the most popular visual aids equipment used in Industrial Arts courses. Of the seventy-six schools offering Industrial Arts, sixty-nine, or 90 per cent, use blackboard sketches. Models are used by quite a few schools, 63.1 per cent. Over fifty per cent of the schools use motion pictures as an aid. Very few schools use blown-up photostats, demonstrations, easel sketches, shop magazines, and film strips.

Most teachers use what they have handy, which is the probable reason for the high percentage using blackboard sketches. Audio-visual aids, such as strip and sound films, and slides, are coming into use more and more. The big disadvantage is the scheduling of films at the proper time

TABLE XIII  
 KINDS OF VISUAL AIDS USED IN INDUSTRIAL ARTS COURSES  
 IN MONTANA JUNIOR HIGH LEVEL SCHOOLS

Equipment	Number of	Schools Percentage of
Blackboard Sketches	69	90.0
Blown-up Photo Stats	2	2.6
Cardboard Developments	7	9.2
Charts and Graphs	10	13.1
Demonstrations	2	2.6
Easel Sketches	2	2.6
Glass Projection Boxes	7	9.2
Mimeographed Job Plans	36	47.3
Models	48	63.1
Motion Pictures	40	52.6
Project Plan Books	7	9.2
Shop Magazines	2	2.6
Slides	19	25.0
Strip Films	2	2.6

(and getting them at that time), and the cost of rental. Many of the schools have slide and 16 mm. projectors, but, due to the expense of running the school and the cost of buying films, that aid is slow in coming into use in Industrial Arts courses.

Evaluations and weaknesses. The respective columns in Table XIV are: 5, 4, 3, 2, 1. They stand for outstanding, above average, average, below average and poor. The figures under the number headings indicate the number of schools evaluated under those headings.

The table indicates that most of the teachers feel that the various aspects of their industrial arts program are average or above. It is unusual to see so many schools in the "outstanding" column.

Power equipment shows the largest number in the "outstanding" column, while it has the smallest one of the "average" column. Quite a few schools listed safety provisions and practices, hand tools, and pupil interest as "outstanding." As a whole, the largest numbers are shown in the "average" column with the exception of two, which are for power equipment and pupil interest above average. Pupils' work habits and projects are largely above average. The smallest numbers in the "outstanding" and "above average" are for correlation with other subjects, while the largest

TABLE XIV  
TEACHER EVALUATION  
OF VARIOUS ASPECTS OF INDUSTRIAL ARTS PROGRAMS  
IN MONTANA JUNIOR HIGH LEVEL SCHOOLS

Aspects	Teacher Evaluation					Total
	5	4	3	2	1	
General condition of shop	8	20	29	10	6	73
Hand tools	14	23	28	6	2	73
Power equipment	18	24	23	7	1	73
Safety provisions & practice	15	18	35	5	2	75
Handling supplies	9	13	35	12	3	72
Pupils' projects	8	30	30	6	1	76
Pupil interest	14	33	25	3		75
Pupils' work habits	5	28	38	5		76
Correlation with other subjects	4	8	42	14	7	75

NOTE: The numbers in the table represent the evaluation of the aspects as: 5, outstanding; 4, above average; 3, average; 2, below average; and 1, poor.

numbers in the other three columns are for the same aspect.

The table indicates that quite a bit of improvement should be done on the general shop conditions of the schools, as it showed one of the largest numbers in both of the low columns. The fewest schools regard their pupil interest as below average and none as poor.

Many of the instructors did not answer the part of the questionnaire which asked for the specific weaknesses of the various aspects of the industrial arts program. According to Table XV, of those instructors who did report, general shop conditions showed up the most, with locker space and status of painting and finishing area the predominating weaknesses. The notes at the end of the questionnaires stated that the reasons were that they had no lockers nor finishing rooms available.

When tabulating hand tools, it was found that storage and method of checking showed the most weaknesses in that group, with usability the fewest. In fact, storage in all groups showed up rather badly.

Safety zones, power cords, and outlets showed the greater number of weaknesses when looking at safety provisions and practices.

In regard to pupil groups, careful planning, attitude toward school property, orderly attack, and care of tools and equipment were the outstanding weaknesses indicated.

TABLE XV

WEAKNESSES IN VARIOUS ASPECTS OF INDUSTRIAL ARTS PROGRAMS  
AS REPORTED BY TEACHERS

Reported Weaknesses in Aspects of Industrial Arts Programs	Number of Reports
<u>General Condition of Shop</u>	
Orderly place for everything	3
Clean	3
Locker space assigned	17
Care of projects under way or completed	8
Status of pupil stations	4
Lighting	3
Status of painting or finishing area	16
<u>Hand Tools</u>	
Condition	3
Usability	1
Storage	4
Accessibility	2
Method of checking	4
<u>Power Equipment</u>	
Safety features, use of guards	4
Drill press table	3
Regular oiling and care of motors	4
Place for extra parts	8
<u>Safety Provisions and Practices</u>	
Pupils' clothing	1
Safety zones	6
Location of tools and equipment	3
Evidences of safe practices	2
Power cords and outlets	4
<u>Handling Supplies</u>	
Ordering	5
Storing	11
Distribution	5
<u>Pupils' Projects</u>	
Selection	2
Finish and workmanship	2
Careful planning	11

TABLE XV (continued)

Aspects of Industrial Arts	Number of Reports
<u>Pupil Interest</u>	
Interest in projects	1
Interest in the shop	1
Attitude toward school property	7
Absence of unnecessary noise	3
Everybody busy	5
<u>Pupils' Work Habits</u>	
Care of tools	7
Proper tools for the job	3
Orderly attack	8
Care of table and bench top	6
<u>Correlation With Other Subjects</u>	
Art	6
Science	5
Language arts	6



Only one or two schools indicated weaknesses in the line of pupil interest, and selection, finishing, and workmanship of projects.

Rating of objectives. Interpreting Table XVI, the majority, almost 70 per cent, of the industrial arts men rated objective number 6 as the most highly important. It reads: "To develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests." Not one listed it as of no importance.

The next most important objective was number 3. "To develop in each child the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations." Almost as many teachers checked that one as did number 6 above. A very, very few thought of number 3 as of little or no importance.

Number 7, "To develop in each pupil the habit of an orderly, complete, and efficient performance of tasks" was rated next in importance. For this one, no reports showed for little importance and just one for no importance.

The one in the highly important column receiving the fewest points was number 10. "To provide a means for keeping less academically-minded students in school." It showed the largest numbers in both the little and no importance columns.

TABLE XVI  
TEACHER RATING OF INDUSTRIAL ARTS OBJECTIVES

Objectives	Teacher Rating				
	1	2	3	4	5
1. To develop in each pupil an active interest in industrial life and in the methods and problems of production and exchange.	17	27	24	4	1
2. To develop in each pupil the appreciation of good design and workmanship, and the ability to select, care for, and use industrial products wisely.	39	23	7	4	.
3. To develop in each pupil the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations.	48	21	2	1	1
4. To develop in each pupil a readiness to assist others and to join happily in group undertakings.	27	35	10		
5. To develop in each pupil desirable attitudes and practices with respect to health and safety.	32	31	10		
6. To develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests.	49	21	1	2	
7. To develop in each pupil the habit of an orderly, complete, and efficient performance of any task.	41	25	5		1
8. To develop in each pupil an understanding of drawings, and ability to express ideas by means of drawing.	26	30	14	3	
9. To develop in each pupil a measure of skill in the use of common tools and machines, and an understanding of the problems involved in common types of construction and repair.	33	31	8		1
10. To provide a means for keeping less academically-minded students in school.	9	22	19	15	8

NOTE: The numbers at the head of the table represent the ratings of the objectives as: 1, highly important; 2, important; 3, of some importance; 4, of little importance; and 5, of no importance.

Looking at the whole table, very few listings are shown in the little or no importance columns, whereas the largest numbers are in the highly important and important columns. It also shows us that what one considers highly important, another may think of little or no importance. This is caused by individual differences.

Additional courses needed. According to Table XVII, Metal Crafts is the most highly recommended course to be added to the industrial arts subjects already offered. Auto Mechanics and Vocational Courses ranked second on the list. Quite a few schools want Ceramics and Handicrafts courses. General Shop, Home Mechanics, and Mechanical Drawing showed the fewest requests. Since Shop is such a popular course already, this no doubt explains the reason for its low number of requests here. Five schools want welding and five electricity.

Most popular courses. As indicated by Table XVIII, Shop is rated by thirty schools as the most popular course. Industrial Arts is second with a dozen schools reporting it the most popular. Woodwork wasn't rated as being very popular. At the foot of the list, but at the head of the table, is Farm Shop with only one vote.

This rating of popularity may be due to the fact that Shop is given several interpretations. It may mean wood-

TABLE XVII

RECOMMENDED INDUSTRIAL ARTS COURSES TO BE ADDED  
TO MONTANA JUNIOR HIGH LEVEL SCHOOLS

Courses	Number of Schools
Arts and Crafts	4
Auto Mechanics	7
Ceramics	6
Electricity	5
General Shop	1
Home Mechanics	2
Handicrafts	6
Leather Work	4
Metal Craft	8
Mechanical Drawing	3
Vocational Courses	7
Welding	5
Wood Work	4

TABLE XVIII

MOST POPULAR INDUSTRIAL ARTS COURSES  
IN MONTANA JUNIOR HIGH LEVEL SCHOOLS

Courses	Number of Schools
Farm Shop	1
Handicrafts	2
Industrial Arts	12
Mechanical Drawing	2
Shop	30
Wood Work	7

turning, plastics, leather work, or a host of other crafts. Most schools are so limited in equipment, personnel, and tools that they have to do the best they can with what they have on hand. The letters at the end of the questionnaires stated such. They said they had no choice in many cases.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary. The term "Industrial Arts" has many conflicting meanings. The questionnaires and notes at the end of them indicated such. One instructor may consider metalcraft as industrial arts, while another considers woodturning as such. In reality, they are both correct. The best way is probably to forget the misconstrued definitions or meanings and think of each as a category of industrial arts education.

The different industrial arts instructors listed the courses under various names, but also classified them as "Shop," "Industrial Arts," and "Handicrafts." The most common name listed was Shop, though Industrial Arts was often used. After considerable thought and study the author wonders just how a proper classification of the various courses could be made. Perhaps the best plan might be to cut out all general course names such as Shop, Manual Arts, or Handicrafts and use the general term Industrial Arts.

At the present time, the majority of schools offer industrial arts only to boys, but some of the questionnaire notes indicated an increasing trend to offer it to girls also. Those notes also stated that girls had not been given the opportunity to take industrial arts courses due to the

schedules, lack of room space and equipment, and lack of teachers. Another reason so few girls were included in the survey may be because Home Economics is offered the girls but it was not included in this survey.

The reports sent in by the instructors showed that very few schools require prerequisite courses for industrial arts.

The sixty-minute class period seems to predominate for the boys in the Montana junior high level schools according to the reports received. The forty-five-minute period was more common for the girls.

The length of class period varies with the schedule, the community, and the needs of the individual child, as indicated by the questionnaires. The length of the different courses vary too. Both fundamental and advanced courses are offered at different places in the state.

There is considerable demand for more sections of the courses already being offered. At the present time it is not possible because of lack of space, lack of tools and equipment, lack of proper teachers, and lack of time. The notes written by the administrators and teachers indicated that they were working toward a solution of the problem by building new shops and purchasing more tools and equipment.

Additional courses also are needed according to the questionnaire returns. The notes stated that some of the

new courses will be added this fall or in the very near future.

Visual aids are a great help in teaching. The blackboard is the most popular with job sheets, motion pictures, and film strips coming into use.

Conclusions. The following are some of the conclusions gathered from the study of the questionnaires and notes at the end written by the industrial arts instructors and superintendents.

Some of the communities have well-equipped shops and certified teachers, and practically demand a lot of industrial arts work which lengthens the courses. Other communities do not have the space, equipment, nor certified industrial arts teachers, but still demand that industrial arts be taught. Those elements hinder the length of the courses. Some schools have everything for the industrial arts program except the time and that shortens the length of the courses. The agricultural areas are switching to Vocational Agriculture which shortens or completely eliminates the industrial arts courses. Many of such factors determine the length of the courses. Hiring trade men instead of certified teachers effects the length of courses, one of the questionnaire notes stated.

Most of the industrial arts teachers are using native



materials. The author feels this is good as he thinks that the students need to become acquainted with their environment. Of course, they should become acquainted with other materials outside their community too.

There is a wide variation in the percentage of time spent on the items of design, discussion, construction, and instruction. This has to be the case due to the various groups who take industrial arts. One course may need twenty-five per cent of its time on instruction, while another may need only ten per cent. Many factors have to be taken into account, such as, individual differences of pupils, achievement age, and type of course.

Montana junior high level schools have quite a bit of equipment. Most of the schools have two or more pieces of power equipment and sufficient tools for the present courses. Some schools have plenty of equipment and not the personnel. Other schools have the personnel and no equipment and no finances with which to buy any. Until the schools are properly equipped and the proper certified industrial arts teachers are hired, the public should not expect what they do of the industrial arts courses.

Many of the aspects of industrial arts education are average or above. The ones that were rated below average or poor, such as handling supplies, storage space, paint room facilities, and correlation with other subjects, will

take time to up grade. They always have been a headache and probably always will. The general condition of the shops, condition of hand tools, power equipment, safety provisions and practices, pupils' projects, interest, and work habits were rated average or above by the questionnaires. The notes at the end stated that the administrators, instructors, and many of the school boards are doing all they can to correct and make better those aspects which were rated low in their shops.

The consensus from those that answered the questionnaires was that the most important objective was "to develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests." This is a matter of difference of opinion and does not signify that it would rate first on a national scale. Some people think that industrial arts courses should be a means for keeping less academically-minded students in school, but not according to the ratings of those industrial arts men.

The questionnaires indicated that Shop was the most popular industrial arts course in the Montana junior high level schools of today. This may mean woodturning, carving, mechanics, welding, or a host of things. Until the time comes when we have a proper division of courses, we will have various names for the same work.

Recommendations. This investigation could be used as a pilot study or guide for further study, as very little has been done in this field of industrial arts on the junior high level in Montana.

The writer, on the basis of data obtained from his study, which included questionnaires and letters at the end from instructors and administrators, makes the following recommendations as outgrowths of the study:

1. In grades seven, eight, and nine, more emphasis should be placed upon the development of skill and the exploratory value as a means of providing the student with an increased understanding of the tools, processes, and materials of industry, as this is the fundamental basis of industrial arts. In this age group, industrial arts also provide a valuable medium for developing worthwhile leisure time activities. These activities may in time become the basis for adult hobbies. It also provides the student with elementary understanding of the requirements for a successful entry into a trade or occupation, and information so that he may more wisely evaluate his ability, which will be of value to him when he chooses his life's work. Since a large number of schools are putting in industrial arts, the students should know how to handle the tools.

2. Industrial arts has been offered to boys and not

to girls, so it seems that more handicraft courses should be offered to girls.

3. Since industrial arts does not have a supervisor in the state department it would be a contribution to the industrial arts men if the Vocational Education Division in the State office should be extended to cover industrial arts education..

4. Instructors in industrial arts do not have a recent course of study, so it seems that a course of study with a set program for each course and grade level would be a great help. This would enable the instructor to have some form of a guide with a general level of attainment to work toward.

5. Teachers have disciplinary cases, mostly boys, and to relieve themselves the teachers go to the principal. The principal is overloaded and asks the industrial arts man to take the boys. In this light it seems that the industrial arts department is used as a dumping ground and it should not be, either for disciplinary cases or to keep those less academically minded in school. If the industrial arts instructor is not overloaded and wants to rehabilitate the boys, that is a different situation.

6. Some school administrators, or boards, hire teachers that are certified to coach basketball and teach history, then not having enough money to hire a certified

industrial arts instructor, they have the coach or one of the other teachers take over the industrial arts work. It is not fair to the students. In the light of all this it seems that all industrial arts personnel should be certified to teach industrial arts and also be trained in individual crafts.

7. Some of the schools have sufficient space and equipment. It seems that a broader offering would be desirable where such is available, and if it does not unbalance the curriculum.

8. Each teacher feels his subjects are the most important. With the great opportunity that industrial arts offers, it seems that a greater correlation with other subjects would help more in the development of the whole child.

9. Some administrators and part of public have different ideas on the objectives of industrial arts. Some think that the pupils should turn out large projects such as desks, end tables, magazine racks, and the like. Others think that the pupils should just learn how to square a board, while still others think they should learn the fundamental tool processes. It seems that if the administrators and general public were better acquainted with the objectives of industrial arts, a better feeling would exist and more would be accomplished.

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## **APPENDIXES**

## APPENDIX A

## LETTERS

Vocational Education Division  
STATE DEPARTMENT OF PUBLIC INSTRUCTION  
Helena, Montana

February 23, 1951

Mr. C. Bernard Walter  
1511 Pearl Street  
Miles City, Montana

Dear Mr. Walter:

You appear to have a very worthwhile objective in getting your Master's degree this coming summer. I am afraid I am not going to be of much help to you. I have no questionnaires on industrial arts on the junior high school level that would be of help to you. We do have trade and industrial work in the high schools but we offer nothing on the junior high level.

The enclosed list is all our day trade teachers. In these classes they're generally from the junior and senior classes of high schools. I am also enclosing a list of industrial arts teachers in the Montana high schools for 1950-1951. Now this list does not include any of the junior high teachers. If the junior high is organized for 7th, 8th, and 9th grades, then you will usually find the teachers listed in this directory. However, in the case of a town with a county high school a junior high is usually organized to include only the 7th and 8th grades in such case, the teachers of that industrial arts shop would not be found on this list.

Up to the present, we have not been able to get an all inclusive list. Perhaps you might write the superintendents of the schools and obtain the names of the industrial arts teachers. Then, you should be able to make a rather complete study. If you do secure such a list, we would appreciate it if you would send us a copy.

If we can be of any further help to you, do not hesitate to write us.

Very truly yours,

W. Lyle Roeseler, State Supervisor  
of Trade and Industrial Education

WLR/lh  
Encl.

## COPY OF FIRST LETTER SENT WITH QUESTIONNAIRES

Dear Fellow Shopman:

Little is known about the status of Industrial Art education in Montana. For that reason your assistance is solicited in a study of the offerings and contents of Industrial Arts and Handicraft courses at the junior high school level (grades 7, 8, 9) of this state.

While I am using this survey as a basis for a professional paper to be offered toward my Master's degree at Montana State University, I want it to be useful to you, so a summary of the findings will be made available to you when the tabulations are completed.

Please fill out the enclosed response form as soon as possible, and return in the self-addressed envelope.

Thank you very much.

Yours very truly,

C. Bernard Walter

## COPY OF SECOND LETTER SENT WITH QUESTIONNAIRES

Dear Fellow Shopman:

I need your help very much.

In April a questionnaire was sent to Industrial Art teachers in Montana to determine the status of Industrial Art education in Montana. Your assistance is solicited in a study of the offerings and contents of Industrial Arts and Handicraft courses at the junior high school level (grades 7, 8, 9) of this state. But so far too few answers have been received to make the study worth while.

I am enclosing a questionnaire in the hope that you will find the necessary time in the near future to complete and return it. Your assistance is very necessary to the completion of this study.

Please rest assured that your cooperation will be greatly appreciated.

Thank you very much.

Yours very truly,

C. Bernard Walter

## APPENDIX B

## DIRECTORIES AND LISTS

State Department of Public Instruction  
Helena, Montana

Directory of Industrial Arts Teachers  
Montana High Schools  
1950-1951

Name	School	City	Periods per day	
			Drafting	Shop
Brown, F. O.	Anaconda H. S.	Anaconda	3	2
Arensmeyer, T. F.	Anaconda Jr. High	Anaconda	0	6
Bednar, Ernest	Billings Jr. High	Billings	0	6
Peterson, Robert S.	Billings Jr. High	Billings	6	0
Sirriner, W. Orton	Billings Jr. High	Billings	0	6
Purcell, Thomas	Billings Sr. High	Billings	2	4
Vanover, Howard	Billings Sr. High	Billings	0	6
Bradford, Homer	Butte High School	Butte	5	0
Englebach, Carl	Butte High School	Butte	0	5
Thomas, Clarence L.	Butte High School	Butte	1	1
McKay, Robert	Great Falls High	Great Falls	0	6
Parsons, E. A.	Great Falls High	Great Falls	0	3
Perry, C. B.	Great Falls High	Great Falls	0	3
Savage, John	Great Falls High	Great Falls	5	0
Schlameus, Floyd	Great Falls High	Great Falls	0	6
Robinson, Fred	Helena H. S.	Helena	2	0
Sprinkle, Francis	Helena H. S.	Helena	0	5
Bierriem, W. J.	Beaverhead Co. H.S.	Dillon	1	2
Herberle, Lloyd S.	Broadwater Co. H.S.	Townsend	0	3
Eyerley, Keith B.	Carbon Co. High	Red Lodge	0	7
Mikkelson, Ralph	Custer Co. High	Miles City	0	2
Carlson, Norman	Dawson Co. High	Glendive	1	4
Cass, Donald L.	Fergus Co. High	Lewistown	0	5
Kusler, Calvin	Flathead Co. H.S.	Kalispell	0	4
Robinson, Lynn	Flathead Co. H.S.	Kalispell	1	4
Cullen, Joseph T.	Gallatin Co. High	Bozeman	1	4
Ogren, R. L.	Jefferson Co. High	Boulder	0	1
Schagel, Sterling	Lincoln Co. High	Eureka	1	6
Davis, Ed. S.	Missoula Co. High	Missoula	0	6
Ennis, L. C.	Missoula Co. High	Missoula	5	0
Comer, Elwood	Park Co. H. S.	Livingston	4	2
Porter, John	Powell Co. High	Deer Lodge	1	3
Dorrance, George A.	Wibaux Co. High	Wibaux	0	6
Sherwood, William	Augusta H.S.	Augusta	0	2

Name	School	Periods per day		
		City	Drafting	Shop
Haskell, Leonard	Baker High School	Baker	1	4
Miley, F. D.	Big Sandy H. S.	Big Sandy	0	2
Harris, R. W.	Browning H. S.	Browning	0	1
Lallum, G. G.	Chester H. S.	Chester	0	3
Ham, Melvin	Choteau H. S.	Choteau	0	7
Perry, John	Columbia Falls Hi.	Columbia Falls	1	4
Puckett, Don	Cut Bank H. S.	Cut Bank	0	5
Bateman, Al	Fairfield H. S.	Fairfield	0	1
Lalum, Luther	Fairview H. S.	Fairview	0	1
Blanks, Edwin M.	Forsyth H. S.	Forsyth	0	6
Puckett, George	Fort Benton High	Fort Benton	0	1
Main, Elmer	Geraldine H. S.	Geraldine	0	1
Morgan, George	Glasgow H. S.	Glasgow	0	5
Desonia, Ernest N.	Hamilton H. S.	Hamilton	2	3
Goller, Paul	Hardin H. S.	Hardin	1	0
Bakken, Laurence	Hardin H. S.	Hardin	0	6
Shellabarger, J.R.	Hardin H. S.	Hardin	0	3
Moon, Howard	Havre H. S.	Havre	2	3
Morrison, James	Laurel H. S.	Laurel	0	5
Oursland, Albert	Libby H. S.	Libby	1	2
Matross, Val M.	Lodge Grass High	Lodge Grass	0	2
Lindgren, Wesley A.	Opheim H. S.	Opheim	2	2
Weisz, Henry	Plentywood High	Plentywood	0	2
Stark, Max	Polson H. S.	Polson	0	1
Hughes, Bernard	Poplar H. S.	Poplar	0	6
Wasley, R. W.	Ronan H. S.	Ronan	1	0
Bennett, Robert	Roundup H. S.	Roundup	0	8
Newlon, William D.	Saco H. S.	Saco	0	4
Kober, William	St. Ignatius High	St. Ignatius	0	1
Seljak, H. D.	St. Ignatius High	St. Ignatius	1	0
Fairbanks, Earl	Scobey H. S.	Scobey	0	7
Johnson, D. L.	Shelby H. S.	Shelby	0	2
Wimer, Frank	Shelby H. S.	Shelby	0	1
Eicholtz, Howard	Sidney H. S.	Sidney	0	6
Kleis, John	Terry H. S.	Terry	0	2
Previs, Steve J.	Thompson Falls Hi.	Thompson Falls	0	4
Schendel, Chester	Three Forks High	Three Forks	1	3
Freeburg, Donalds L.	Valier H. S.	Valier	2	0
Sloan, Robert	Whitefish H. S.	Whitefish	2	4
Squires, William	Wolf Point High	Wolf Point	0	5
Saunders, John R.	Alberton H. S.	Alberton	0	2
Likarich, Albert	Arlée H. S.	Arlee	0	2
Whittington, Robert	Belfry H. S.	Belfry	1	2
Midge, Lester O.	Big Fork H. S.	Big Fork	0	4
Frojen, C. A.	broadus H. S.	broadus	0	2

Name	School	Periods per day	
		City	Drafting Shop
Colvin, Harold E.	Brockston H. S.	Brockton	0 2
Goodain, Kenneth	Circle H. S.	Circle	0 6
Stakke, Gordon	Clyde Park H. S.	Clyde Park	1 1
Boe, Myron	Comertown H. S.	Comertown	0 2
Hormann, John	Custer H. S.	Custer	0 4
Quanbeck, Aron	Dixon H. S.	Dixon	0 4
Swatek, Charles	Dodson H. S.	Dodson	0 1
Foss, Harold	Drummond H. S.	Drummond	0 3
Grobe, William	Edgar H. S.	Edgar	0 1
Stibel, Joseph J.	Florence-Carleton Hi.	Florence	0 2
Gaynor, George C.	Grass Range H. S.	Grass Range	0 2
Johnson, A. D.	Harrison H. S.	Harrison	0 2
Muske, Kenneth	Hingham H. S.	Hingham	0 3
Donaldson, Harry	Hot Springs High	Hot Springs	1 3
Bassett, Ronald	Joliet H. S.	Joliet	0 2
Fjølstad, Arnold	Joplin H. S.	Joplin	0 2
Rathe, Marvin	Moccasin H. S.	Moccasin	2 3
Holsinger, Irving	Moore H. S.	Moore	0 3
Rorvik, Allen	Musselshell H.S.	Musselshell	2 0
Melbye, George H.	Nashua H. S.	Nashua	0 4
Rollins, T. M.	Park City H. S.	Park City	0 1
Wantock, Donald W.	Peerless H. S.	Peerless	0 1
Postma, Martin	Plains H. S.	Plains	1 2
Vagg, Douglas	Power H. S.	Power	1 1
Cunningham, J. G.	Reed Point High	Reed Point	0 1
Fuson, Thornton	Roberts H. S.	Roberts	0 2
Norman, Jack	Rosebud H. S.	Rosebud	0 4
Brown, Harold B.	Rudyard H. S.	Rudyard	1 4
Laurent, Earl A.	Savage H. S.	Savage	0 2
Clevenger, C.	Shepherd H. S.	Shepherd	0 5
Kennedy, Glenn R.	Wilsall H. S.	Wilsall	0 1
Peterson, Keith	White Sulphur Springs	White Sulphur Springs	1 1



## TRADE AND INDUSTRIAL EDUCATION DEPARTMENT

MONTANA HIGH SCHOOLS  
1950-1951  
Day Trade

School	City	Instructor	Trade
Gallatin Co. High	Bozeman	G. D. Donald	Auto-Mechanics
Big Fork High	Big Fork	Lester Midge	Auto-Mechanics
Eillings Sr. Hi.	Billings	C. H. Corey	Aviation-Mechs.
Billings Sr. Hi.	Billings	L. H. Ratzlaff	Auto-Mechanics
Butte Pub. High	Butte	R. R. Backer	Auto-Mechanics
Butte Pub. High	Butte	Clarence Thomas	Auto-Mechanics
Cut Bank H. S.	Cut Bank	Wm. R. Chambers	Auto-Mechanics
Custer Co. High	Miles City	H. B. Goard	Auto-Mechanics
Flathead Co. High	Kalispell	B. H. Pond	Auto-Mechanics
Glasgow High	Glasgow	George Hallett	Auto-Mechanics
Great Falls High	Great Falls	C. B. Perry	Machinist
Great Falls High	Great Falls	E. A. Parsons	Radio
Hardin High	Hardin	J.R. Shallabarger	Auto-Mechs.
Havre High	Havre	Fred Ritter	Auto-Mechanics
Helena H. S.	Helena	Giles Russell	Welding
		Wm. Korizek	Auto-Mechanics
		George Larson	Machinist
		John Collins	Radio
Laurel High	Laurel	A. F. Smith	Auto-Mechanics
Mont. St. College	Bozeman	Wm. J. Sutter	Auto-Mechanics
Park Co. High	Livingston	Robert Brookie	Auto-Mechanics
Sunburst High	Sunburst	Walter Bourret	Auto-Mechanics
Shelby High	Shelby	Frank Wimer	Auto-Mechanics

## SCHOOLS RESPONDING TO QUESTIONNAIRES

Name	Location
Alberton Public Schools	Alberton, Montana
Anaconda Junior High School	Anaconda, Montana
Antelope Schools	Antelope, Montana
Arlee High School	Arlee, Montana
Augusta High School	Augusta, Montana
Baker High School	Baker, Montana
Belfry High School	Belfry, Montana
Belgrade Public Schools	Belgrade, Montana
Belt Public Schools	Belt, Montana
Bigfork Public Schools	Bigfork, Montana
Big Timber High School	Big Timber, Montana
Boulder High School	Boulder, Montana
Brady High School	Brady, Montana
Broadus High School	Broadus, Montana
Broadview County High School	Broadview, Montana
Brockton Dist. No. 55	Brockton, Montana
Browning Public Schools	Browning, Montana
Buffalo Public Schools	Buffalo, Montana
Cascade Public Schools	Cascade, Montana
Charlo High School	Charlo, Montana
Chester Public Schools	Chester, Montana
Chinook Public Schools	Chinook, Montana
Circle High School	Circle, Montana
Columbia Falls High School	Columbia Falls, Montana
Columbus High School	Columbus, Montana
Conrad Public Schools	Conrad, Montana
Custer Public Schools	Custer, Montana
Cut Bank High School	Cut Bank, Montana
Darby Consolidated Schools	Darby, Montana
Denton Public Schools	Denton, Montana
East Helena Public Schools	East Helena, Montana
Edgar High School	Edgar, Montana
Ekalaka High School	Ekalaka, Montana
Emerson Junior High	Bozeman, Montana
Ennis High School	Ennis, Montana
Fairview High School	Fairview, Montana
Florence Public Schools	Florence, Montana
Forsyth High School	Forsyth, Montana
Frazer Public Schools	Frazer, Montana
Frenchtown Public Schools	Frenchtown, Montana
Froid Public Schools	Froid, Montana
Fromberg High School	Fromberg, Montana
Fort Benton High School	Fort Benton, Montana
Gallatin County High School	Bozeman, Montana

## SCHOOLS RESPONDING TO QUESTIONNAIRES (continued)

Name	Location
Gardner Public Schools	Gardner, Montana
Geraldine High School	Geraldine, Montana
Geyser Public Schools	Geyser, Montana
Gildford Public Schools	Gildford, Montana
Glasgow Junior High	Glasgow, Montana
Grass Range Public Schools	Grass Range, Montana
Great Falls High School	Great Falls, Montana
Hamilton High School	Hamilton, Montana
Hardin Public Schools	Hardin, Montana
Harlem High School	Harlem, Montana
Harlowton Public Schools	Harlowton, Montana
Havre High School	Havre, Montana
Highwood High School	Highwood, Montana
Hinsdale High School	Hinsdale, Montana
Hobson Public Schools	Hobson, Montana
Ingomar Public Schools	Ingomar, Montana
Ismay Public Schools	Ismay, Montana
Joplin High School	Joplin, Montana
Jordan Public Schools	Jordan, Montana
Kevin Public Schools	Kevin, Montana
Lambert Public Schools	Lambert, Montana
Laurel Dist. No. 7	Laurel, Montana
Lavina Schools-	Lavina, Montana
Lewistown Public Schools	Lewistown, Montana
Libby High School	Libby, Montana
Lima Schools	Lima, Montana
Lincoln--City Elementary	Livingston, Montana
Lodge Grass Public Schools	Lodge Grass, Montana
Malta High School	Malta, Montana
Melstone School	Melstone, Montana
Mission High School	St. Ignatius, Montana
Missoula County High School	Missoula, Montana
Moccasin High School	Moccasin, Montana
Moore High School	Moore, Montana
Musselshell High School	Musselshell, Montana
Nashua Public Schools	Nashua, Montana
Neihart Schools	Neihart, Montana
Outlook High School	Outlook, Montana
Paris Gibson Junior High	Great Falls, Montana
Park City Public Schools	Park City, Montana
Plentywood High School	Plentywood, Montana
Plevna High School	Plevna, Montana
Polson High School	Polson, Montana
Poplar City Schools	Poplar, Montana
Powell County High School	Deer Lodge, Montana

## SCHOOLS RESPONDING TO QUESTIONNAIRES (continued)

Name	Location
Power High School	Power, Montana
Rapelje Public Schools	Rapelje, Montana
Reedpoint Schools	Reedpoint, Montana
Richey High School	Richey, Montana
Ronan High School	Ronan, Montana
Rosebud High School	Rosebud, Montana
Roundup High School	Roundup, Montana
Roy Public Schools	Roy, Montana
Rudyard High School	Rudyard, Montana
Ryegate Public Schools	Ryegate, Montana
Sand Coulee Schools	Sand Coulee, Montana
Savage Public Schools	Savage, Montana
Scobey High School	Scobey, Montana
Sidney High School	Sidney, Montana
Shawmut Schools	Shawmut, Montana
Shelby Public Schools	Shelby, Montana
Shepherd Schools	Shepherd, Montana
Sheridan High School	Sheridan, Montana
Somers Public Schools	Somers, Montana
Stanford Public Schools	Stanford, Montana
St. Regis High School	St. Regis, Montana
Sumatra Public School	Sumatra, Montana
Sweet Grass Schools	Sweet Grass, Montana
Sunburst High School	Sunburst, Montana
Terry High School	Terry, Montana
Thompson Falls Public Schools	Thompson Falls, Montana
Three Forks Public Schools	Three Forks, Montana
Trask Hall	Deer Lodge, Montana
Troy Schools	Troy, Montana
Twin Bridges High School	Twin Bridges, Montana
Valier High School	Valier, Montana
Virginia City Schools	Virginia City, Montana
Washington Junior High School	Miles City, Montana
Washington Public	Glendive, Montana
Westby High School	Westby, Montana
White Sulphur Springs High	White Sulphur Springs, Mont.
Wibaux County High School	Wibaux, Montana
Willow Creek Junior High	Willow Creek, Montana
Windham Public	Windham, Montana
Winifred High School	Winifred, Montana
Winnett Public	Winnett, Montana
Wilsall Consolidated Schools	Wilsall, Montana
Wolf Point High School	Wolf Point, Montana
Worden High School	Worden, Montana

## APPENDIX C

QUESTIONNAIRE ON INDUSTRIAL ARTS EDUCATION  
IN GRADES SEVEN, EIGHT, AND NINE

Name of School	Address
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\* \* \* \* \*

Is the Industrial Arts program in your schools only for girls\_\_\_\_, only for boys\_\_\_\_, for both\_\_\_\_?

At which grade levels are Industrial Arts offered? 7( )  
8( ) 9( ).

How many students are enrolled in your school in each of following categories? Boys: 7( ) 8( ) 9( ).  
Girls: 7( ) 8( ) 9( ).

How many students are enrolled in some kind of Industrial Arts in each of the following categories? Boys: 7( )  
8( ) 9( ) Girls: 7( ) 8( ) 9( ).

\* \* \* \* \*

If you offer a course listed as "Shop" or its equivalent, please fill in blanks below:

What is the actual title of the course?\_\_\_\_\_

Are there any prerequisites to the course? Yes\_\_\_ No\_\_\_.

If so, please list same\_\_\_\_\_

Length of course in semesters\_\_\_\_\_ or in quarters\_\_\_\_\_.

Length of each class meeting in minutes. Boys: 7( )  
8( ) 9( ) Girls: 7( ) 8( ) 9( ).

Number of classes per week\_\_\_\_. Is there a demand for more sections of this class? Yes\_\_\_ No\_\_\_.

If answer is "yes," please indicate how many more are needed.\_\_\_\_\_.

Does the course use some materials native to the area? Yes\_\_\_ No\_\_\_\_\_. If so, please list them\_\_\_\_\_.

Approximately what per cent of class time is spent upon:  
Design?\_\_\_\_. Discussion?\_\_\_\_. Construction?\_\_\_\_.  
Instruction?\_\_\_\_\_.

If you offer a course listed as "Industrial Arts" or its equivalent, please fill in blanks below:

What is the actual title of the course?\_\_\_\_\_

Are there any prerequisites to the course? Yes\_\_\_ No\_\_\_.

If so, please list same\_\_\_\_\_

Length of course in semesters \_\_\_\_\_ or in quarters \_\_\_\_\_.  
 Length of each class meeting in minutes. Boys: 7( )  
 8( ) 9( ). Girls: 7( ) 8( ) 9( ).  
 Number of classes per week \_\_\_\_\_. Is there a demand for  
 more sections of this class? Yes \_\_\_\_\_ No \_\_\_\_\_. If  
 answer is "yes," please indicate how many more are  
 needed. \_\_\_\_\_.  
 Does the course use some materials native to the area?  
 Yes \_\_\_\_\_ No \_\_\_\_\_.  
 Approximately what per cent of class time is spent upon:  
 Design? \_\_\_\_\_. Discussion? \_\_\_\_\_. Construction? \_\_\_\_\_.  
 Instruction? \_\_\_\_\_.

If you offer a course listed as "Handicrafts" or its equi-  
 valent, please fill in the blanks below:

What is the actual name of the course? \_\_\_\_\_.  
 Are there any prerequisites to the course? Yes \_\_\_\_\_ No \_\_\_\_\_.  
 If so, please list same. \_\_\_\_\_.  
 Length of course in semesters \_\_\_\_\_ or in quarters \_\_\_\_\_.  
 Length of each class meeting in minutes. Boys: 7( )  
 8( ) 9( ). Girls: 7( ) 8( ) 9( ).  
 Number of classes per week \_\_\_\_\_. Is there a demand for  
 more sections of this class? Yes \_\_\_\_\_ No \_\_\_\_\_. If an-  
 swer is "Yes," please indicate how many more are needed  
 \_\_\_\_\_.  
 Does the course use some materials native to the area?  
 Yes \_\_\_\_\_ No \_\_\_\_\_.  
 Approximately what per cent of class time is spent upon:  
 Design? \_\_\_\_\_. Discussion? \_\_\_\_\_. Construction? \_\_\_\_\_.  
 Instruction? \_\_\_\_\_.

If you offer other than those courses in the general field  
 of Industrial Art, other than those mentioned above,  
 fill in the blanks below:

What is the actual name of the course? \_\_\_\_\_.  
 Are there any prerequisites to the course? Yes \_\_\_\_\_ No \_\_\_\_\_.  
 If so, please list same \_\_\_\_\_.  
 Length of course in semesters \_\_\_\_\_ or in quarters \_\_\_\_\_.  
 Length of each class meeting in minutes. Boys: 7( )  
 8( ) 9( ). Girls: 7( ) 8( ) 9( ).  
 Number of classes per week \_\_\_\_\_. Is there a demand for  
 more sections of this class? Yes \_\_\_\_\_ No \_\_\_\_\_. If answer  
 is "Yes," please indicate how many more are needed. \_\_\_\_\_.  
 Does the course use some materials native to the area?  
 Yes \_\_\_\_\_ No \_\_\_\_\_.  
 Approximately what per cent of class time is spent upon  
 Design? \_\_\_\_\_. Discussion? \_\_\_\_\_. Construction? \_\_\_\_\_.  
 Instruction? \_\_\_\_\_.

What is the actual name of the course? \_\_\_\_\_.  
 Are there any prerequisites to the course? Yes \_\_\_ No \_\_\_.  
 If so, please list same \_\_\_\_\_.  
 Length of course in semesters \_\_\_\_\_ or in quarters \_\_\_\_\_.  
 Length of each class meeting in minutes. Boys: 7( ) 8( ) 9( ).  
 Girls: 7( ) 8( ) 9( ).  
 Number of classes per week \_\_\_\_\_. Is there a demand for  
 more sections of this class? Yes \_\_\_ No \_\_\_. If answer  
 is "Yes," please indicate how many more are needed. \_\_\_\_\_.  
 Does the course use some materials native to the area?  
 Yes \_\_\_ No \_\_\_\_\_.  
 Approximately what per cent of class time is spent upon:  
 Design? \_\_\_\_\_. Discussion? \_\_\_\_\_. Construction? \_\_\_\_\_.  
 Instruction \_\_\_\_\_.

\* \* \* \* \*

What equipment suitable for industrial arts is available in  
 your school? (Underline).  
 Jig Saw, Wood Lathe, Band Saw, Jointer, Planer, Sander,  
 Drill Press, Power Grinder, Buffer, Lapidary Equipment,  
 Pottery Kiln, Photo Dark Room. Looms, Silver-Soldering  
 Outfit, Machine Lathe, Electrical Testing Board, Plastic  
 Press, High Speed Drills, Electrical Hand Drill, Spray  
 Gun, Stamping Press, Electrical Soldering Iron, others.

What additional equipment is needed? \_\_\_\_\_

\* \* \* \* \*

Which of the following visual aids are employed in present-  
 ing the initial problems and demonstrations in your in-  
 dustrial arts courses?

- \_\_\_\_\_ Blackboard sketches
- \_\_\_\_\_ Mimeographed job plans
- \_\_\_\_\_ Models
- \_\_\_\_\_ Cardboard developments
- \_\_\_\_\_ "Glass" projection box
- \_\_\_\_\_ Motion pictures
- \_\_\_\_\_ Slides

Please list any others \_\_\_\_\_

\* \* \* \* \*

Directions: Opposite each of the items to be checked, circle  
 the number that indicates your evaluation with respect to

the item: (5) outstanding (4) above average (3) average (2) below average (1) poor. In each division (A, B, etc.) underline items which you consider definitely weak.

- A. General condition of shop..... 5 4 3 2 1  
 Orderly place for everything -- clean -- locker space assigned -- care of projects under way or completed -- status of pupil stations -- lighting -- status of painting or finishing area.
- B. Hand tools..... 5 4 3 2 1  
 Condition -- usability -- storage -- accessibility -- method of checking.
- C. Power equipment..... 5 4 3 2 1  
 Safety features, use of guards -- drill press table -- regular oiling and care of motors -- place for extra parts.
- D. Safety provision and practices..... 5 4 3 2 1  
 Pupils' clothing -- safety zones -- location of tools and equipment -- evidence of safe practices -- power cords and outlets.
- E. Handling supplies..... 5 4 3 2 1  
 Ordering -- storing -- distribution.
- F. Pupils' projects..... 5 4 3 2 1  
 Selection -- finish and workmanship -- careful planning.
- G. Pupil interest..... 5 4 3 2 1  
 Interest in projects -- interest in the shop -- attitude toward school property -- absence of unnecessary noise -- everybody busy.
- H. Pupils' work habits..... 5 4 3 2 1  
 Care of tools -- proper tools for job -- orderly attack -- care of table and bench top.
- I. Correlation with other subject areas... 5 4 3 2 1  
 Correlates work with instruction given in: art, science, language arts.

\* \* \* \* \*



Please rate the following objectives of industrial arts as:  
 (1) highly important (2) important (3) of some importance  
 (4) of little importance (5) of no importance.

\_\_\_\_\_ To develop in each pupil an active interest in industrial life and in the methods and problems of production and exchange.

\_\_\_\_\_ To develop in each pupil the appreciation of good design and workmanship, and the ability to select, care for, and use industrial products wisely.

\_\_\_\_\_ To develop in each pupil the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations.

\_\_\_\_\_ To develop in each pupil a readiness to assist others and to join happily in group undertakings.

\_\_\_\_\_ To develop in each pupil desirable attitudes and practices with respect to health and safety.

\_\_\_\_\_ To develop in each pupil a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests.

\_\_\_\_\_ To develop in each pupil the habit of an orderly, complete, and efficient performance of any task.

\_\_\_\_\_ To develop in each pupil an understanding of drawings, and the ability to express ideas by means of drawing.

\_\_\_\_\_ To develop in each pupil a measure of skill in the use of common tools and machines, and an understanding of the problems involved in common types of construction and repair.

\_\_\_\_\_ To provide a means for keeping less academically-minded students in school.

\* \* \* \* \*

Which particular Industrial Arts courses do you advise being added to your present offering? \_\_\_\_\_

Which course is the most popular? \_\_\_\_\_.

Any comments with regard to your Industrial Arts Program that you care to make will be greatly appreciated. Use back of sheet if this place is inadequate.

APPENDIX D TABLE III  
 JUNIOR HIGH SCHOOL STUDENT ENROLLMENT IN SCHOOL AND INDUSTRIAL ARTS

No.	Boys		Girls		Total
	S	IA	S	IA	
1	0	0	0	0	0
2	0	23	0	0	23
3	70	70	0	0	140
4	0	0	0	0	0
5	0	0	0	0	0
6	10	10	0	0	20
7	53	53	0	0	106
8	0	0	0	0	0
9	24	24	0	0	48
10	10	10	0	0	20
11	11	10	0	0	21
12	12	7	0	0	19
13	13	2	0	0	15
14	14	0	0	0	14
15	15	0	0	0	15
16	11	0	0	0	11
17	55	55	0	0	110
18	11	11	0	0	22
19	23	23	0	0	46
20	7	7	0	0	14
21	0	0	0	0	0
22	0	0	0	0	0
23	0	2	0	0	2
24	0	0	0	0	0
25	0	8	0	0	8
26	0	0	0	0	0
27	40	40	0	0	80
28	0	0	0	0	0
29	4	4	0	0	8
30	35	27	0	0	62
31	7	7	0	0	14
32	4	4	0	0	8
33	4	4	0	0	8
34	5	5	0	0	10
35	9	9	0	0	18
36	34	34	0	0	68
37	0	0	0	0	0
38	31	20	0	0	51
39	0	0	0	0	0
40	16	16	0	0	32
41	11	11	0	0	22
42	11	11	0	0	22
43	0	0	0	0	0
44	107	107	0	0	214
45	72	30	0	0	102
46	3	0	0	0	3
47	0	18	0	0	18
48	0	0	0	0	0
49	50	18	0	0	68
50	4	4	0	0	8
51	10	10	0	0	20
52	0	0	0	0	0
53	0	0	0	0	0
54	8	8	0	0	16
55	7	7	0	0	14
56	0	0	0	0	0
57	0	0	0	0	0
58	12	12	0	0	24
59	17	17	0	0	34
60	117	80	0	0	197
61	20	20	0	0	40
62	21	21	0	0	42
63	18	21	0	0	39
64	50	50	0	0	100
65	29	29	0	0	58
66	4	4	0	0	8
67	0	0	0	0	0
68	0	0	0	0	0
69	0	0	0	0	0
70	0	0	0	0	0
71	0	0	0	0	0
72	31	18	0	0	49
73	0	240	0	0	240
74	221	221	0	0	442
75	29	29	0	0	58
76	0	0	0	0	0
Total IA	42	47	58	9	116
100% enrollment IA Total	34	36	40	6	76

NOTE: The "S" indicates school enrollment and "IA" Industrial Arts enrollment