August 7, 1958

To the Graduate Council:

I am submitting herewith a thesis written by Darrell Dewitt Simmons entitled "A Theoretical Basis for Industrial Arts in the Public Schools." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration and Supervision.

Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:

Dean of the Graduate School

A THEORETICAL BASIS FOR INDUSTRIAL ARTS IN THE PUBLIC SCHOOLS

A THESIS

Submitted to
The Graduate Council
of
The University of Tennessee
in
Partial Fulfillment of the Requirements
for the degree of
Doctor of Education

---

by

Darrell Dewitt Simmons

August 1958

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D.D.S.

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CHAPTER I

INTRODUCTION

> . . . within the walls of the school we hear the murmurs of the "classical" and the "non-classical," the "major" and the "minor" subject, "down to the shops," "required," "not required," "dumping grounds," "hand work," and many other such utterances. This is indicative of confusion and an educational framework divided within itself.[1]

The feeling exists within the industrial arts area that with proper objectives and a good public relations program this confusion will become nonexistent as the program becomes integrated into the American educational system. The writer, having participated in the industrial arts programs of the elementary, junior, and senior high schools, and higher educational fields, has seen little evidence to indicate that a better understanding of the purposes of the industrial arts phase of education has come about. The cause or causes, whatever they may be, have become a problem of deep concern for this writer. Is it possible that the industrial arts program has little to offer to the educational processes of our youth? What are the reasons for the many misunderstandings evolving from this new approach to education? Might it be the fault of the teacher of the industrial arts subjects, the teaching profession as a whole, or the lay public

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[1] Donald Maley, "Industrial Arts Teaching, Past and Present," The Industrial Arts Teacher, 14:21, June 1955.

in general? Just what is the proper role of industrial arts in the student's educational experiences? If these problems and misunderstandings can be brought to light under the influence of the more modern concepts of how one learns and the implications of the highly industrialized society, surely some of these differences can be alleviated.

Purpose of the Study

The purpose of this study was to clarify and, in some degree, reduce the confusion that appears to exist in the area of industrial arts by investigating the theoretical basis for industrial arts in the public schools. It is believed that this confusion in industrial arts is grounded in the more basic confusion found in the strange mixture of philosophies, mind substance theories, traditional methods of teaching, and rigid course content. To achieve this purpose it appeared necessary to investigate these elements.

Concern for the Study

When social, industrial, psychological and other changes force a re-evaluation of an area of educational activity, and a new approach to that area of education is indicated, many factions tend to retard or resist the change. Industrial arts was faced with such a re-evaluation when the Smith-Hughes bill was made into law. The Act, passed by Congress in 1917, was for the purpose of promoting and developing vocational education through a cooperative plan of federal

and state governments.[2] Since manual training was not included in the appropriation, there was an immediate need for a restudy of the purpose and objectives of the program now divorced from vocational education. As a result of this restudy, the name industrial arts replaced the old name, manual training. This rapid transition created much confusion surrounding the area now known as industrial arts.

Lay Citizen's Conception of Industrial Arts

The understandings which the public citizen has concerning the present program of industrial arts are quite varied. This may be due in part to the rapidly evolving program during the past few years or perhaps may be charged to the negligence of the professional group in enlightening the public as to the nature of the changing program.

> Industrial arts as a subject in the public schools has passed through a series of evolutionary changes since its first introduction into the United States during the latter part of the nineteenth century. It was originally justified on the basis of its training of "hand and eye," . . . .
>
> . . . after the first World War, it became common practice to justify industrial work in the schools on the basis of trade or pre-vocational values.
>
> As early as 1908, however, leaders like Russell, Richards, and Bonser began to see in industrial arts a medium for enriching the offerings and extending the values of the regular school program. Since that time, it has become commonplace to refer to this type of work as a part of general education.[3]

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[2]Federal Security Agency, Office of Education, Administration of Vocational Education, Bulletin No. 1 (Washington: Government Printing Office, 1949), p. iv.

[3]Gordon O. Wilber, Industrial Arts in General Education (Scranton, Pennsylvania: International Textbook Company, 1954), pp. 1-2.

When asked to define industrial arts, the lay citizen will probably reply, in a somewhat puzzled manner, that it is "manual training." This answer may have been stimulated by the type of program that was evident when he attended public school. In any event he usually displays a confused concept of the present program content and objectives and of the changing philosophy that is responsible for this evolvement. This reference to industrial arts as "manual training" is still much in evidence today.

Confusion Within the Teaching Profession

Many members of the teaching profession have a misconception of the intent of a good program of industrial arts. It is referred to as the "shop program." Students who are having difficulty in other areas are sent to the shop with the accompanying statement: "They cannot learn anything in my class. See if you can train them to use their hands." This gives cause for the industrial arts teacher to wail about the industrial arts program being a dumping ground.[4] This statement also gives rise to the dichotomy of the hand versus the mind which seems to be becoming increasingly pronounced in some of our school programs. Subject areas or courses tend to separate themselves into academic on the one hand and the

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[4]John A. Fuzak, "Analysis of Developments to Determine Implications for Industrial Arts," The Industrial Arts Teacher, 17:17, November-December 1957.

practical or applied on the other. The academic group sets as its purpose the development of the mind and states that, as they understand it, the other area is to develop man's working ability in the manipulation of things which tend to have little or no reference to the development of the mind. This results in a separation of the important kinds of education. The statement of a teacher, "Train them to use their hands," was more appropriately applied under the philosophy of manual training, but it hardly fits the objectives and purposes of the industrial arts program today.

Problems Arising from the Division of Industrial Arts and Vocational Education

As mentioned above, about the time of World War I there was a division or break-away of the industrial arts from the vocational program. Federal aid to the vocational education program stimulated this separation. In 1917 Congress passed the Smith-Hughes Law, and this nation embarked upon a national program of vocational education. Vocational-industrial education, frequently referred to as trade and industrial education, accepted as its major objective the development of skills in the various trades.

> The early history of industrial arts and vocational industrial education in the United States is one and the same. For many years, both general and vocational values were claimed for a single course, one value for a student who was headed toward higher schooling and another value for a student headed directly toward the trades and industries. Undoubtedly, values existed for boys headed in either direction, but a good job of

> teaching could not be done when there were two targets to shoot at, so to speak. This dual purpose in educational handwork persisted down to the enunciation and subsequent development of the social-industrial theory of industrial arts.[5]

The industrial arts group took this opportunity to shed more completely the cloak of "manual training" and developed its program further in the direction of general education with more emphasis upon the project method of problem solving and less emphasis upon purely manual skills as an end result.

> Manual training, given for purposes of general education, was soon to be expressed in terms of the newer theories and beliefs in education; it was soon to emerge from a "special" subject into one that was considered fundamental and one that was to be required in grades seven, eight and nine. Its very name was gradually to be changed in many states to industrial arts education.
>
> . . . . . .
>
> The term "industrial arts education" is coming into greater use to designate the enriched, enlarged, broadened, and modernized manual training.[6]

> Industrial arts has particular contributions to make in this matter of developing native capacity for problem solving. One is through the educational project, either the individual or the group. . . .[7]

As a result of this rapid change in program content and objectives, the lay public and many members of the teaching profession

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[5]John F. Friese, Course Making in Industrial Education (Peoria, Illinois: The Manual Arts Press, 1946), pp. 50-51.

[6]F. Theodore Struck, Foundations of Industrial Education (New York: John Wiley and Sons, Inc., 1930), pp. 31-32.

[7]Friese, op. cit., p. 66.

have had difficulty in understanding the relationships of the two programs, industrial arts and trade and industrial education, and because of this confusion refer to them as one and the same, "shop programs."

Limitations of the Unit Shop

As industrial arts emerged from manual training, it retained many of the characteristics of the manual training program. The use of unit shops was one of the elements carried over into the new program. The unit or area shop, as it is sometimes called, was a shop equipped with tools and machines necessary for work in a single area of activity. Those more commonly found in the schools were woodworking shops, metal shops and drafting programs. As these programs were already accepted hesitatingly in the school programs, effort was made to develop the unit shop program to a more acceptable status.

> Most industrial arts education from approximately the seventh grade up is today being given on the unit shop plan. This means that the instructor handles one type of shopwork, such as woodwork, or metalwork, or electrical work, instead of a variety of these.[8]

These programs were independent of each other and as time passed their course content became more fully developed. The unit shop brought about two major difficulties; one, the unit shops

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[8]Struck, op. cit., p. 43.

were so large and well equipped that the establishment of other shops was out of the question; two, there was little or no integration between the programs. The large unit shop led to a very rigid program with limited integrated experiences available for its students. Exercises slowly gave way to the project that the students and, quite often, the teacher chose for construction, but there are still evidences of required exercises in industrial arts programs today.

The Project as a Learning Activity

The industrial arts activities and the understandings of the purpose were thought to be well established in the total school program at one time, but for some reason the intended activity experiences have taken a few unusual turns. The project or activity of the student has in some instances become busy work. This term, "busy work," seems to recall the saying of old, "An idle mind is the devil's workshop." Activities of an exercise nature had added incentive in this country as the result of a Russian display at the Centennial Exposition in 1876.[9] In some instances the project activity has lost some of its general education intent in that the emphasis has been to learn how to saw a board square or how to drive a nail correctly. This has tended to reemphasize the skill involved in the project and de-emphasize the activity or project as

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[9]Struck, op. cit., pp. 27-28.

a learning experience. This direction tends to point back to the idea of manual training. The concept behind the project method of instruction has often become misplaced both in the elementary grades and in the high school.

The Use of Textbooks and Workbooks

Industrial arts teachers often point with pride to their ability to teach some of the shop subjects without what appears to them to be the restricting influence of textbooks. However, this is often only a surface indication. Usually the course content has been analyzed to the point that a complete and rather comprehensive outline of the course content has been developed. This outline insures complete coverage of the subject matter that the teacher, or the head of the department, thinks should be included and makes sure that all classes will be given the same opportunity to acquire the same skills and facts. Workbooks have been utilized to a great extent, particularly in the drawing areas. These workbooks are filled with drawing problems from which the teacher may select and assign to the class. Discussion of theory followed by the assignment of problem numbers from the workbook and evaluation of the plates handed in tend to sum up some of the programs of drafting. All of this tends to become contradictory to the concept of individual differences.

Reluctance to Restudy the Objectives of Industrial Arts

Those interested in industrial arts persuaded The American Industrial Arts and Vocational Association to give attention to establishing a set of objectives for industrial arts. This was accomplished in the early 1930's. Since that time, little effort has been made toward a re-evaluation of these objectives. There seems to be a feeling that a good program has been found and it should be kept intact. The program cannot reach the heights it should if the objectives and purposes are continually revised. Let all effort be put forth to erase the misunderstanding that exists concerning the present program and give little or no thought to the re-evaluation and realignment of the industrial arts area. These expressed feelings have resulted in a satisfied, docile attitude within the industrial arts teaching profession. There is seemingly little effort in certain areas of this country to evaluate the program in the light of the many changes that have become evident in the industrial society.

Disagreements Within the Industrial Arts Teacher Groups

The writer does not mean to convey the thought that the industrial arts teacher is the only person who is not confused on this issue. Far from it. The differing philosophies that exist within the ranks, along with some evidence that many of the industrial arts teachers have not been concerned with the problem of developing a personal philosophy of life and education, would indicate that there is considerable disagreement within the area of industrial arts. Many

industrial arts teachers continue to insist that the acquisition of manual skills is the most important objective of the industrial arts program. The writer is not intending to say that there should be no differences within the ranks; in fact, these differences often are the cause of a re-evaluation resulting in a better program in industrial arts; rather the concern is that one's philosophy should at all times permit him to maintain an open mind concerning the problems of education.

Need for the Study

Modern society seems to have accepted the belief that nothing is static; things, people and nations are in a process of change. In like manner, one may say that because of this continual change there is no "one way" of doing a thing. If this idea of change is true, then it would mean that educational curriculum should not be static but should continually change as society changes.

> The good curriculum is never static. Many parts of a curriculum may at first appear to be static. . . . Many items, such as the alphabet and the number system, have a high degree of fixedness, but the possible variants and changes coming from them are infinite in scope. . . . The curriculum comes from the needs of the group and these needs are always changing.[10]

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[10]Clyde B. Moore and William E. Cole, Sociology in Educational Practice (Boston: Houghton Mifflin Company, 1952), p. 344.

If one accepts this concept of change, then it would seem desirable to make studies periodically of various phases of the educational system. These studies should attempt to determine changes in culture so they might have their proper impact upon the educational system.

Change in Culture Calls for Change in the American Educational System

In the infancy of this country an individual's world was usually small and his experiences were limited. Education of that day was aligned somewhat appropriately with his experiences. About all the formal education one needed for his small world was some time spent in the elementary school program learning the rudiments of the three R's. There were certain exceptions, those being in the areas of the ministry, the law and the medical profession.

Other appropriate types of educational experiences in those days were the father-son, mother-daughter relationships and some use of the apprenticeship system that was brought over from Europe. These systems were appropriate enough to prepare one for successful living in his small world. As the culture changed and the country developed a more complicated pattern of living, the educational system needed adjustment to meet the demands of the time. Some of the changes that were necessary in the educational system were self-evident and the leaders of the educational program could grasp them readily. One of

these changes was brought about by the child labor laws.[11] As a result of these laws, an influx of pupils in the schools became increasingly evident. The traditional school programs were not suitable for many of these students. In fact, one may say that flooding into the classroom was the non-verbal minded student.

Another example is the compulsory attendance law.[12] This had its impact upon the school attendance of the youth of the country and has in turn brought about many changes in the educational program.

Some of the changes needed were not as evident as the two mentioned above. The slower developments of the society are rather difficult to apply to the educational program. The slow changes in beliefs and opinions concerning the proper role of religion in the public school program are examples. It behooves the educational institutions to be appropriately aligned with the social changes so that the implications or adjustments necessary in the educational system may be instigated for the further development of society.

Influx of the Non-verbal Type of Student

As mentioned before, the compulsory attendance law and the child labor laws caused a considerable buildup of students of the

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[11] F. Theodore Struck, Vocational Education for a Changing World (New York: John Wiley and Sons, Inc., 1945), p. 237.

[12] State of Tennessee, Department of Education, Public School Laws of Tennessee (Nashville: 1954), pp. 134-140.

non-verbal type in the educational institution. This was contradictory to the idea that education was primarily for the verbally gifted, the basis of the traditional educational system. With the influx of this new type student certain changes in the educational program were needed so that these so-called non-verbal minded students might secure benefit from the public school system. This student had difficulty with the environment found in the traditional classroom. He did not respond in the normal manner to the experiences which were employed in the classroom of that day. Educational leaders noticed an immediate need for a change in the curriculum which could be adapted to this type of student. The activity type programs found entrance into the classroom at this time. These programs emphasized the learning through doing type of experiences. The programs most responsible for these new experiences were what are now known as the vocational education programs, the industrial arts programs, and the arts and crafts programs.

As these students began to get more and more education, the requirements for the working world began to be elevated in like manner. It soon became highly desirable for one to secure a high school diploma before seeking employment. This gave added emphasis for the student to remain in school through the high school program. As some of the students did not intend to pursue higher education, their training was terminated at the twelfth grade level. They expected to enter the work-a-day world and begin earning their livelihood. They naturally

expected the high school program to equip them better for the jobs then found in the society. As a result of this need, the vocational education program came to the front and offered the student this type of education. The trade and industrial education group established as its foremost objective that of imparting or developing the skills desired for entrance into the chosen trade.

All predictions given by those studying the problem of enrollment of the public school system indicate that enrollment will increase tremendously within the next few years. The demand for high school education is becoming increasingly pronounced. What does this mean for the type of education now in existence in the public schools?

Diversity in Philosophy

Manual training made its entrance into the public school system in the latter part of the nineteenth century. There were no teacher training institutions established for the preparation of industrial arts teachers at that time. This brought about the necessity of securing the early teachers of industrial arts from the artisan occupations. These were brought into the classroom to teach the skills which they possessed. As the transition was made from manual training to industrial arts, there were many of these artisan teachers remaining in the classrooms. Some had augmented their training with additional schooling, while some continued in the traditional pattern of imparting skills. Numerous teachers colleges began to incorporate a program for industrial arts teachers. The teacher supply was limited.

Even to the present day some schools must hire a person who does not possess the qualifications desired by the state department of education in order to have an industrial arts program. This fact has caused difficulty on two fronts. First, the academic teacher in the public school system has hesitated about accepting the industrial arts teacher as his educational counterpart, and second, this practice has caused a wide diversity in the philosophies employed in the industrial arts program. As has already been stated, there are those who think that the major purpose of industrial arts is to develop manual skills. On the other side, there are those who feel the program of industrial arts should develop a problem solving citizen. There are members in the profession who feel that the project which the student constructs should be chosen by the teacher or at least chosen from a group of projects selected by the teacher. On the other hand, there are some who believe that the project is chosen by the student as a result of a problem that the student needs to solve. This person feels the teacher will give the student some guidance in the selection of that project; however, the end result is that the project in itself is not the ultimate but that the competence derived from the solution of problems surrounding the project shall be paramount. Other differences within the profession are found in the use of workbooks, the use of textbooks in the classroom, and the use of lesson guides and lesson plans in the presentation of material assigned to that block of time. The five-step method of instruction has been utilized for some

time within the industrial arts program. The demonstration method of instruction is used extensively.

There still exists a feeling of separateness between the teachers of industrial arts and those teachers in the academic programs. Many educational authorities feel that there should be cooperation and integration between the various programs in the school system. One could list more of these differences that exist because of the differing philosophies, but this is sufficient to show the wide diversity that exists within the profession of industrial arts.

Technical Culture Calls for Familiarity with Technical Products and Processes

No one wishes to live in fear of the unknown. If a member of society were given a choice of living in strange and unfamiliar surroundings or living in a culture where he understood the many technical advances of the day, it is felt that he would choose the latter. In the highly industralized American society one comes in contact with many unusual inventions developed by ingenious technology. In the home the modern kitchen is becoming increasingly automated. The stove equipped with a mechanical brain controlling the temperature and the time needed for the preparation of food, the refrigerator that defrosts itself periodically, and the many other gadgets found in the kitchen that aid the housewife in the doing of her many duties are inventions of a technical society. Should the housewife know which button to push or would it be more desirable for her to know the

principles involved in the manipulation of these gadgets?

The farmer no longer judges the size of his crop by the number of teams needed to work it, but operates his farm mechanically with many contrivances developed for the production of farm products. The mechanical cotton picker has seen increased use within the last decade. Much farm labor has left the farm for the urban areas, partially because their services were not needed continuously in the farming regions.

The business man in his office utilizes many types of electronic machines. These machines work with amazing accuracy and speed in the computation of problems, the compilation of data, even to the development of the weekly payroll.

Can an understanding of contrivances which are found in a technical society improve life in that society? Will this understanding aid one in the better utilization of his monetary means in the selection of these gadgets for use in home or business? John Dewey states when speaking of social efficiency,

> . . . If he is not trained in the right use of the products of industry, there is grave danger that he may deprave himself and injure others in his possession of wealth. No scheme of education can afford to neglect such basic considerations.[13]

Norbert Wiener states in The Human Use of Human Beings,

> We are the slaves of our technical improvement . . . we have modified our environment so radically that we must now

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[13]John Dewey, Democracy and Education (New York: The Macmillan Company, 1916), p. 139.

> modify ourselves in order to exist in this new environment. We can no longer live in the old one. . . .[14]

It would seem desirable, then, that the educational system should be sensitive to the technical nature of the society in which it exists.

Statement of the Problem

As has been previously indicated, this study is concerned with the existing confusion that seems to surround the area of industrial arts and its role in the educational program. The problem appears to be composed of two major sections. The first revolves around the need for a logical redefinition of industrial arts; the second phase comes from the need to apply the redefinition to actual industrial arts program planning.

In each of the major problem areas there are certain sub-problems. In the first phase (redefinition) the following are evident:

1. To examine the history and growth of industrial arts. This is not to be an historical study, but it is felt necessary to give certain of the elements running through the development and growth of the industrial arts through its various stages so that one can see a direction or a

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[14] Norbert Wiener, The Human Use of Human Beings (London: Eyre and Spottiswoode, 1950), p. 46.

trend in its development. The implications involved in learning by doing, training of the hand, and the like, will be shown as the development of industrial arts is traced from the written history.

2. To examine the nature of man--his biological needs, his philosophical values and his methods of learning.
3. To analyze the elements found in the modern culture and show how they exert forces upon man in his development.
4. To examine the educational needs in an industrial society.

In the second phase (application) the following sub-problem is evident:

1. To employ the educational needs in the development of appropriate principles for use in describing an industrial arts program in the educational framework of a democracy.

Limitations of the Study

This study attempts to start from a very broad base and by a gradual process of limitations arrive at the desirable kinds of elements necessary for an industrial arts program. Due to this intended scope, it becomes necessary to summarize and pull out the pertinent points from the mass of material available. Space will permit only a brief treatment of many of the important topics surrounding the nature of man and the type of culture in which he lives. Only those topics which seem to have implications for the development of an educational system were

used. A rather condensed treatment of the history and trends of the activities of industrial arts nature are given.

Organization of the Study

Chapter I points up the wide variations that seem to exist within the industrial arts area along with some reasons why these variations are in existence. The purpose of the study and the statement of the problem give some direction toward an attempt to eliminate some of the misunderstandings.

Chapter II includes the histery and trends of activities of an industrial arts nature as they have had influence upon the educational programs during the past centuries. Various leaders and programs are pointed up as examples of experimentation toward an appropriate system of education.

Chapter III includes a treatment of the nature of man. Attention is given to man's uniqueness in his biological development. The importance of a consistent philosophy encompassing a set of values as conceived under interaction of man with man is discussed. Some attention is given to the various theories of the mind. The problem of how man learns is discussed.

Chapter IV presents a study of the society in which man lives. The complexity of this modern culture with its traditions, institutions, the machines of industry and the influence of automation, the influence

of science in this industrial society, and the democratic concept which tends to give direction to behavior in a democratic nation are discussed in some detail.

Chapter V deals with the formation of the educational needs as they are inferred in Chapters III and IV. Some attention is given to the listing of educational needs of Tennessee. From the "needs" guiding principles are pointed up for use in describing an industrial arts program.

Chapter VI utilizes the guiding principles as developed in Chapter V toward the definition of appropriate kinds of experiences needed in an industrial arts program, grades one through twelve.

CHAPTER II

HISTORY AND TRENDS OF INDUSTRIAL ARTS

In order to understand better the position of industrial arts in the educational process, it seems desirable to give attention to a study of the educational history and trends as they have developed and grown during the past centuries. Trends are tentative movements having influence in all directions--starting, stopping, turning in many differing directions as they encounter the various influences of the social order. At times these trends show fairly well defined lines of movement only to culminate into a period of confused and divergent directions. These movements tend to mirror the whole of life--the educational process, the political development, the religious concept, in fact, the complete social order. "In other words, history and trends must in a measure summarize the whole."[1] Knowing that this effort will lack perspective in all directions, nevertheless, the treatment will attempt to show the major trends and their implications toward education in general and more particularly surrounding the method of teaching through concrete example.

For the purpose of this study this chapter is organized into five periods of time. It is believed that this arrangement will

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[1] William T. Bawden and others, Industrial Arts in Modern Education (Peoria, Illinois: The Manual Arts Press, 1934), p. 123.

indicate a trend in the educational movement of that period. Particular attention is given to activities of an industrial arts nature and their place or function in the society of that period. The arrangement of the headings are: (1) Concepts of Manual Skills in Education Before the Reformation, (2) Education During the Reformation, (3) The Beginning of Modern Education, (4) Manual Training Movement in the United States, and (5) The Industrial Arts Movement in the United States. At the completion of each topic an attempt will be made to summarize briefly the trend of thought toward education through manual work. This trend often varies, according to the social class under study, nevertheless, an attempt will be made to generalize by pointing up the major trends as they appear in the culture.

Concepts of Manual Skills in Education Before the Reformation

Prehistoric Cultures

It is believed that primitive man was driven by hunger to seek food and by cold or heat to provide clothing and shelter for himself and his family. This drive of the elements of nature created a necessity for the members of the primitive culture to develop skills involved in the making of tools and weapons for physical needs and protection.

> For that long period of man's history that is all prehistory, we have no written descriptions of cultures. We

> find only the tools men made, the places where they lived, the graves in which they buried their dead. Fortunately for us, these tools and living places and graves all tell us something about the ways these men lived and the things they believed.[2]

In the earliest known culture the ritual of religion and the development of skills in the making and utilization of weapons necessary for the existence of mankind was handed down from father to son and from one generation to the next. This handing down of customs and skills was by unconscious imitation. The son imitated the father as he went about the business of providing for his offspring and the daughter imitated the mother in the preparation of food and the making of garments to protect against the elements.[3]

As man began to gain control over some of the forces of nature, the social pattern of the group changed. The control of fire enabled man to develop new crafts in the tool and weapon making skills. He was able to manipulate some of the soft or low melting temperature metals for the production of tools of the craft. This new development led to a division of labor which in turn created new social groups, some of which pursued the same crafts.

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[2]E. Adamson Hoebel, Jesse D. Jennings, Elmer R. Smith, Readings in Anthropology (New York: McGraw-Hill Book Company, Inc., 1955), p. 28.

[3]Charles A. Bennett, History of Manual and Industrial Education Up to 1870 (Peoria, Illinois: The Manual Arts Press, 1926), pp. 11-12.

> . . . With this division of labor came also new social groups, common experiences in work drew men together; groups and gilds were formed of those pursuing the same craft; and sometimes a whole community became famous for skill in a single craft.[4]

At this stage of the culture, learning changed from an unconscious imitation to a conscious imitation, thus the beginning of the apprenticeship system of education which has developed and prospered down through the ages. This learning through imitation in primitive life was not a rationalized process of instruction. It was a technique of teaching routine, not of theory. The young of the society imitated or copied the activities of the adults until they could produce the exactness of the activity being performed.

As the peoples of the then small world developed their social pattern of behavior, trade between tribes began to flourish.

> The groups comprising the peasant-village societies were small, rarely exceeding three or four dozen householders. . . . There is evidence of close integration, and of mutual cooperation for collective purposes. . . . At base each village was essentially self-sufficient. However, in time the increase of luxury goods gave rise to exchange over large areas.[5]

The leaders of the various groups in the primitive culture were the ones who could manipulate material things with a high degree of skill. The metalsmiths, the carpenters, the masons, the weavers, and

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[4] Ibid., p. 12.

[5] William A. Smith, Ancient Education (New York: Philosophical Library, Inc., 1955), p. 13.

the like, were the ones who were the leaders of the tribes, villages and groups in early history.

Greek Attitudes Toward the Mechanic Arts

During the infancy of the Greek nation, high respect for the handcrafts was maintained and those in possession of these skills held high offices in the state. As the nation grew to a world power, this seemed to change. Slaves were bought and trained to do the manual skills. As this slave trade continued within the Greek culture, the status of manual skills was gradually lowered to the point that anyone forced to perform a skill or trade for the necessities of life was considered in the lower social class.

Education within the various classes of the Greek culture was considerably different. A gentleman of the Greek nation was a man who could devote all of his efforts to the state. He was not hampered by the problems of providing for the physical necessities of life. He had financial security. He could own land, factory or business, and he hired overseers to look after his property and to govern the slaves who worked in the business. The gentleman looked down upon work performed by the slaves and the crafts performed by hired men as being that of a mechanical nature. As a result, anything of a mechanical nature found no place in the education of the upperclass youth.

Socrates (470-399 B.C.) is said to have had considerable contempt for the mechanic arts. One of the reasons for this contempt

was that anyone pursuing the crafts would of necessity remain in an unnatural position during the long hours of the day, hence his body would become deformed and his mind feeble.

The attitudes of the upperclass did not prevent the lower and middle class from utilizing the apprenticeship method of instruction in the transmitting of their skills.

> Among ancient peoples the apprenticeship relation was often that of either father to son or of master to an adopted son. It is quite clear that these relationships implied instruction even as it does today, but it is not always so evident how much instruction was involved, nor how much drudgery unrelated to the "science" and "mystery" of the trade was required.[6]

This was the method used to hand down the arts from one generation to another. However, the apprenticeship system used in the lower class was approximately the same system of education used in the upper level to train orators, lawyers and physicians.[7]

Ancient Jewish Education and Handwork

The ancient Jewish education was basically religious training and was for the purpose of making every child a firm believer in Jehovah. Each child was instructed in the law during the forepart of the day under the tutorship of a rabbi. He returned home in the afternoon to learn a trade under the direction of his father. One

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[6] F. Theodore Struck, Foundations of Industrial Education (New York: John Wiley and Sons, Inc., 1930), p. 3.

[7] Bennett, op. cit., pp. 15-16.

feature of this custom is not the fact that each boy was required to learn a trade in order to earn his daily bread, but that the learning of a trade was according to the law. It was the religious duty of the father to teach his son a trade. A son who was not taught a trade was thought to be a social parasite; therefore, he was dangerous to the society.[8] Christ himself was taught the trade of carpentry during his stay here on earth.[9]

Some evidence points in the direction that the Jew gave some religious significance to labor in that some were permitted to shorten their prayers so they might indulge in their trade. In the Jewish belief of handwork and education there seemed to exist the separation between manual skills and intellectual development. Labor was looked upon as a source from which one could obtain the necessities of the body so the mind might be free to pursue the more intellectual studies, which were the reading and discussion of the Jewish law.

Education in the Middle Ages

The early Christian Monks in attempting to interpret some of the teachings of Jesus, the carpenter of Nazareth, and the activities of his disciples withdrew from society and built monasteries so that they might study and meditate in their religion. This continued for

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[8] Ibid., p. 14.

[9] The Holy Bible, Mark 6:3.

several centuries; in fact, this was one of the chief methods of education up to about 1500 A.D. The two periods in which education in the monasteries was more pronounced were the period of transition, the time when the German barbarian tribes fused with citizens of the older civilizations, and the Dark Ages, frequently referred to as the age of feudalism. These monasteries were said to be communities within themselves, completely equipped to furnish the necessities of life so that their need for the outside world was naught. Inside the cathedral walls one found gardens, mills, bakeries; in fact, all of those trades considered desirable for existence. Each person within the walls participated in the manual work. It was considered part of his religious duty to so indulge, as this was thought to be according to the teachings of Christ.

During these two periods, the monasteries were open to anyone who sought opportunity for a life of reflection and study. Many parents were encouraged to send their sons into the monasteries so they could partake of this advantage. Generally, those entering the monasteries pursued the priesthood; however, there were some few cases in which the person was permitted the opportunity to study the writings outside the religious literature. These studies centered around the seven liberal arts which were said to include all learning.[10]

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[10]Bennett, op. cit., p. 21.

Monasticism was, in fact, a system of education in which the hand played an important part, although handwork was not the primary purpose of education. The participation for a certain number of hours per day in manual labor was considered essential for the religious life in the monasteries.

Outside the monasteries there existed another type of education which has descended from the early Greek culture: that of apprenticeship. Guilds were developed and organized during the Dark Ages, not so much for the educational intent, but so that they could band together for protection against the state and church and the feudalistic lords. In fact, many of the guilds established great followings and were sororities, fraternities, or large companies organized for their mutual protection and interest. They did do a number of things for the people in their societies. As stated earlier, their unified groupings gave them a little more freedom to do those things they thought necessary for society. The masters within these organizations were required to teach their trade to apprentices, or the young, within the group. Poor work was not tolerated; therefore, these organizations, the guilds, did promote a high degree of craftsmanship in all of the arts.[11] The guilds did render some service to people outside their society through their

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[11] Loc. cit.

method of worship and their efforts to aid the poor and the sick.

The craft guilds established a new respect for learning during this period of time. This new meaning had its effect during the Renaissance period in the form of great masterpieces of literature, art, architecture and of the industrial arts to an extent the world had not known. Struck states, "Guild life also brought about a gradual evolution from serfdom to freedom, from labor[er] to owner, from worker to craftsman."[12] The apprenticeship or guild system did much to hold some semblance of education outside the monastic influence.

A separation or division of two kinds of education, that of training the mind and that of training the hand, were employed during these two periods. The apprenticeship system was utilized in the lower classes for training in a craft or trade. Training inside the monasteries was primarily for the purpose of cultivating the mind so that it might seek and dwell upon the truths of the universe. These two systems were completely separate in the society and there is difficulty in showing similarity between them. The guild system expressed belief in the utilitarian theory, education for practical values, while education within the monastic walls was more of the repression theory. This theory held that human nature was innately bad and could only be improved through strict training. Education in the monasteries was for

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[12]Struck, op. cit., p. 8.

the preparation of life hereafter with little or no reference to comforts of life here on earth.

The Renaissance and Intellectual Freedom (1400-1600)

The Renaissance is that period of time between the Dark Ages and the Reformation. It had its beginning in Italy and spread northward through Germany, France and into England. It had three major growths, intellectual, asthetic and scientific. The humanists of this period tried to introduce into contemporary life the values they found through readings of the medieval literature. It was in reality a revival or rebirth of the intellectual freedom of the social order. The curriculum of higher education consisted primarily of the seven liberal arts. The education of this period was for the higher citizens with little or no reference to the training for manual skills. It was believed that the father could properly judge his son's ability to pursue higher education.

> The Utopians made choice of a few "which be exempt and discharged of all other labours, and appointed only to learning; that is to say, such in whom, even from their very childhood, they have perceived a singular towardness, a fine wit, and a mind apt to good learning." "All in their childhood be instructed in learning . . . in their own native tongue." This expresses the attitude of humanism to the question of the distribution of education.13

13William H. Woodward, Education During the Renaissance (Cambridge, England: University Press, 1924), p. 117.

> Should a boy be incurably idle or dull he must be transferred from higher to lower disciplines, to spend his time upon manual arts rather than upon liberal studies; such a boy, prepared for a mechanical or industrial career of lower type, with restricted outlook upon the world, cannot expect to become an influence in the community; and therein consists, as Palmieri holds, the sufficient stimulus to a boy to perseverance in higher studies. Already we trace the conviction which was deeply fixed in the minds of the humanists of the following century that the bent and force of youthful wits could be accurately estimated by the observant teacher at a very early age, and the future career of the pupil thereupon determined.[14]

There is some evidence, however, pointing toward artistic efforts in the upper classes of nobility, particularly as this influence reached the English culture.

> If the child be of nature inclined (as many have been) to paint with a pen, or to form images in stone or tree, he should not be therefrom withdrawn or nature be rebuked which is to him benevolent; but, putting one to him which is in that craft wherein he delighteth most excellent, in vacant times from other more serious learning, he should be in the most pure wise instructed in painting or carving.[15]

Very little reference is given at this time toward the education of the masses of the people; however, the apprenticeship system did continue unabated. One significant feature that entered the school at this stage was that the classroom should be a place of joy with plenty of light and pleasing conditions, which heretofore had been unknown. Many of the concepts and ideas of this period were used by

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[14] Ibid., p. 77.

[15] Sir Thomas Elyot, "Of the Knowledg Whiche Maketh a Wise Man," quoted in William H. Woodward, Education During the Renaissance (Cambridge, England: University Press, 1924), p. 278.

Martin Luther, Pestalozzi and others in the Reformation period. The writings and experiments of the educational leaders of the Renaissance show much improvement in thought and method of education. However, the concept of an educated person was one who had accumulated a great many facts and stored them in his memory for later use.

Trends

In that broad period of antiquity the individuals who possessed the ability to manipulate materials were the leaders of society. Those who could make the best weapons and build the best traps were called upon to lead the various groups found in the primitive culture. Education during this span of time was by unconscious imitation. The early Greek nation held high esteem for those who possessed manipulative skills. Under the influence of slave trading the artisan soon found himself at the bottom of the social strata. Slaves were taught to do the manual work needed. As a result, there arose the leisure class, people of power, wealth and social prestige. This group frowned upon the manual arts as being low and degrading activities.

The Jewish nation and the Christian monks attempted to elevate manual work from its low status by making it a part of the religious responsibility of the people. One must work enough to supply the needs of the body so that the mind may pursue the spiritual truths, thus a separation of the two kinds of learning.

The apprenticeship developed in the Greek nation and was utilized to impart skills by conscious imitation: "Do as I do." The masses received little attention in educational matters other than the apprenticeship system during this period.

During the period of intellectual freedom, the humanistic element partially freed the educational concepts from religion to more emphasis upon nature. This element was felt in the higher classes. Attention was called to the arts if one were so inclined and did not perform them for a livelihood but as a part of the "good life." An educated man was one who could gather many facts and store them in his memory for later use. Thus, manual activities began at the top and fell to a very low status during the Greek period. The slow movement up the opinion ladder, begun by the Jews, is a long and laborious process.

Education During the Reformation

The Reformation, that period of time which followed the Renaissance, opened up many new educational possibilities and gave impetus to many changes in the teaching methods. New philosophies began to appear upon the horizon and new understandings of the ideas of "learning by doing" and sense impressions began to flourish.

Educational progress generally was centered around one person who was the leader of a movement. As a general rule, he developed new ideas of education and either wrote about them or put them into

practice in experimental schools. The leader gathered about him followers who were interested in learning his methods or people who believed as he did. Under these conditions it would seem wise to study the leaders, their writings and experiments, as this was the place where advancements in educational methods and thoughts had their inception.

Martin Luther (1483-1546)

As the world began to evolve into the more modern trends or philosophies of thought, Martin Luther created much confusion with his new concept of religion. He was a man of very unusual qualities and with flaming courage which carried him through his war with the Roman Catholic Church. He and his friends were responsible for establishing the doctrines of the new church and devising a school that would educate the children, both boys and girls. Martin Luther is probably better known for his work in the development of the theology based upon the Bible rather than upon the church doctrine; thus the beginning of the Protestant reformation. Martin Luther's schools were a creation of the church movement and did not have many of the aspects of the monastic education. They were developed for indoctrination into the new religion or new faith which Martin Luther developed. Luther and his friends left their imprint upon the schools of their countries.

> Their greatest single contribution was the principle of universal education. The popular educational systems of the world date from the Reformation and are further developments of the basic ideas then presented. The

> education of girls was a part of the general plan. . . . The barriers against feminine education had therefore been let down a little by humanism, but it took the Reformation to initiate general education for women.[16]

The idea of teaching as a career which started in the Renaissance was further fortified by Luther and his friends; and it became an accepted profession along with medicine, law, and the church. Luther felt that education should be for all people, rich and poor, and should include both boys and girls. He advocated a school of two hours per day so that the boys might pursue the economic duties of home uninterrupted. He thought it was desirable that these two occupations, the school and their home duties, march side by side. This method had some resemblance to the Jewish system of education; however, the curriculum was changed considerably.

> . . . The school has become more comprehensive. The curriculum advocated by Luther included Latin and Greek and Hebrew, logic, mathematics, and music, and also history and science, as then understood.[17]

Education in the monasteries was basically for the preparation of life hereafter with little or no reference toward life here on earth. The humanist during the Renaissance gave great reference toward life here on earth, which resulted in an increased amount of physical education in the educational process, particularly for the higher classes within the society. Martin Luther advocated a mixture of these two,

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[16]Luella Cole, A History of Education, Socrates to Montesori (New York: Rinehart and Company, 1950), pp. 236-7.

[17]Bennett, op. cit., p. 31.

preparation for life hereafter plus a certain degree of competence in living on this earth. Thus one sees in his educational program a place for the moral and religious teachings with some attention given to the sciences, mathematics, music and recreational activities having a tendency toward health education.

Richard Mulcaster (1531-1611)

Richard Mulcaster was one of the early English schoolmasters and did much to bring about the beginning of modern science in education. He believed the hand, the ear, and the eye to be the greatest instruments for the development of learning. He believed in basic education for all but that the few who had special abilities be chosen and given a higher education than the basic reading and writing he advocated for the masses. Mulcaster is actually the first to be given credit for using drawing as one of the fundamental studies in the school curriculum.[18]

Francis Bacon (1561-1626)

At the beginning of the seventeenth century educational thought was affected by the writings of Francis Bacon. His philosophy of realism was somewhat different than the thinking up until this time.

> . . . His thinking took him out of the beaten track of those who found all learning in the writings of antiquity, and revealed to him in nature and the arts of daily life the basis for a new learning. He did not believe that all wisdom had been revealed to man, and so

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[18] Ibid., pp. 33-34.

he sought to indicate a method of new discovery.[19]

He charged the people not to be wrapped up in the past, to look at the present and behold its beauty, to look to nature and listen to the voices of nature to learn her ways and her doings. He did much to improve the thinking toward the scientific approach. Observation without the bias of past dogma would do much to help or aid experimentation. Bacon's point of view toward handicrafts is revealed in the fact that he was probably the first to use the term, "manual arts." In his writings he condemns the people for looking upon things mechanical as of low and vulgar types of activities fit for the lower and slave class of people. He gives his thoughts toward those things mechanical when he states:

> 5. Those who become practically versed in nature, are the mechanic, the mathematician, the physician, the alchymist, and the magician; but all (as matters now stand) with faint efforts and meagre success.
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> . . . . . .
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> 7. The creations of the mind and hand appear very numerous if we judge by books and manufactures; but all the variety consists of an excessive refinement, and of deductions from a few well known matters; . . .[20]

Bacon points out that the way to study nature was to go straight to nature and learn through the senses those things which nature holds. He gave to intellectual life a new impulse into the field of experimentation.

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[19] Loc. cit.

[20] Robert Ulich, Three Thousand Years of Educational Wisdom (Cambridge, Massachusetts: Harvard University Press, 1954), p. 306.

Bacon's philosophy of realism gave the motivating force needed in education that later developed into the modern school of applied science.

Trends

As the world emerged from the Dark Ages into that period called the Reformation, many changes became evident. The thought of universal education for all (both boys and girls) was advocated; a balance of education for life on earth and life hereafter was attempted; learning through the senses was expanded. The realist influence of looking to nature for the good and beautiful things of life had its effect upon the scientific movement. Thus some attempts at including activities of various kinds into the organized educational program were made. Teaching emerged as an acceptable profession comparable to medicine and law. The opinions concerning the mechanic arts changed very little, but evidence of their use in the educational program was an indication of some advancement.

The Beginning of Modern Education

The intellectual growth of the Reformation preceded the scientific growth about two hundred years. Scientific ideas did not come into acceptability until the close of the Reformation period. Science came into its own during the sixteenth and seventeenth centuries through various ways. Galileo's experiments with falling bodies and

his studies of the heavens created much dissension. Scientists dissected the human body for the first time since the time of the Greeks. The medical profession did much experimenting in blood circulation and bacterial work. The mathematicians worked out many theorems that stand today. Arithmetic was used in solving practical problems of military engineering. Algebra, logarithms and other geometric concepts had their appearance and were accepted as a phase of the educational process. This seems to have been brought about by the change in thought concerning the stress placed upon experimentation, observation and inductive reasoning.

In approaching the study of this period when intellectual thought and scientific development were having profound growth, one finds educational leaders who were the nucleus of new movements or trends toward the modern educational concept. Here again it would seem desirable to investigate the educational leader, his writings and his experiments.

Johann Amos Comenius (1592-1670)

Comenius belonged to the Moravians, a religious sect whose beliefs were based upon the simple life and the return to the original gospel of Christ (resembling the modern Quaker). During his early childhood he attended school very little and did not participate in the secondary school until he was about seventeen years of age. Due to this mature age he was rather critical of the methods then employed in the schoolroom. He completed training for the ministry of his

particular sect at an early age, but because of his age was not permitted to administer to a church. He was, however, assigned the responsibility of a school. While fulfilling his responsibility to the school, he began to formulate his thoughts concerning education. He wrote textbooks which proved to be highly successful for the youngsters in his school. His textbooks contained pictures and accompanying Latin and vernacular words in description of those pictures. "Comenius was especially emphatic that all learning must come through the senses."[21] All of his books were adapted to the ability level of the group intended. "Comenius was one of the first teachers to insist that the materials used in school should be specifically adapted to the abilities and interests of children."[22]

Comenius' theory on discipline is not far from that held today. He believed that discipline was necessary at times, but that the punishment should never be associated with school work. He held that it was important that school work be made interesting to keep the children involved in the work eliminating the need for discipline within the classroom. He believed motivation was necessary in the classroom and that ideas and interest could be kindled by the teachers. He was very critical of the use of the writings of antiquity in educating youth. His religious creed held that education should be related to the needs

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[21] Cole, op. cit., p. 341.

[22] Ibid., p. 342.

of every day life instead of being related remotely to matters of the writings of antiquity. He believed that knowledge for knowledge's sake had no practical purpose and was of no use to anyone.

The school system which Comenius established was very similar to the one existing today. In it one finds the infancy (mother knee), paralleling the modern kindergarten; the vernacular school paralleling the elementary school; the Latin school (gymnasium), the counterpart of the secondary school; and, finally, the university and travel, which parallels higher education. He had much to say about the first three, but did little writing on the upper level since his experience in that area was limited. The objectives and subject matter of the vernacular school were similar to the elementary school of today, aside from the religious topics involved. One of the objectives of the vernacular (elementary) school was:

> (xii) Finally, to learn the most important principles of the mechanical arts, both that they may not be too ignorant of what goes on in the world around them, and that any special inclination toward things of this kind may assert itself with greater ease later on.[23]

If for no other reason, Comenius would be considered a famous teacher because of his writing of the illustrated books for children. The method employed by him was rather crude by today's standards, but the principle is still used in the writings of today.

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[23] Keatinge, The Great Didactic of John Amos Comenius quoted in Ibid., p. 339.

> He substituted teaching through the senses for the memorizing of hardly understood words. He used the vernacular. He selected the words to be taught in terms of their usefulness. He introduced pictures for simple phrases, devoid of literary flourishes. He graded his material in terms of difficulty. He wrote dictionaries for children, defining only those words needed for a single book.[24]

Comenius' contributions to education are: (1) He wrote textbooks especially adapted to the needs of the children. (2) He taught Latin through the vernacular. (3) He applied great emphasis upon the training through the senses. In speaking of the mechanic arts, Comenius gave no indication that he would have a laboratory or practical application of these crafts, but that he would have them acquired from a textbook prepared for that purpose. Handwork in his school consisted mostly of writing and transcribing portions of printed books; however, he did have some of the early printing mechanics in his schools.

Jean Jacques Rousseau (1712-1778)

Rousseau, a Frenchman, was the author of Emile, a book which caused tremendous upheaval in the educational thinking of the time. Rousseau laid down his thoughts concerning the educational problems of his day and used Emile, the main character of his book, as the recipient of the type of education he thought best. Education should

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[24] Ibid., p. 354.

be natural and spontaneous and should be nothing more than a progressive system of nature. He would have the teacher point to the phenomenon of nature thus awakening the curiosity of the student and keeping that curiosity alive. He believed that experience was the best teacher, and he would have everything possible taught by action. Only those things which could not be explained by action were to be explained by words. In talking about handwork, he said that Emile would learn more by one hour of manual labor than he would retain from a whole day of verbal instruction. He would have Emile taught the simple manual arts, not for the purpose of earning a living, but because it would be a vital process of his education. These statements concerning the value of manual arts in education place Rousseau ahead of many of his predecessors.

> . . . His recognition of the fact that the manual arts may be a means of mental training marked the beginning of a new era in education. It prepared the way for the educational methods of Pestalozzi and those who followed in his train.[25]

Rousseau would have had Emile learn several trades at once. He made it clear that he would not have him learn a trade for its practical use, but for its value as a means of acquiring what he considered to be the right kind of education. This may be very similar to the general shop found in the junior high school program today. Unfortunately, Rousseau did not put his theory of the education of Emile into practice.

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[25]Bennett, op. cit., p. 81.

Johann Henrich Pestalozzi (1746-1827)

The son of a physician of modest means, Pestalozzi, grew up in an atmosphere of love, devotion and rigid economy. He was considered a very poor student in the elementary school and was at times dubbed the dunce of the class. At the university level, Pestalozzi was influenced greatly by the faculty and soon became a distinguished scholar. At first, Pestalozzi trained for the ministry; but his shyness, awkwardness and rather thick speech made this occupation impractical. During his study in law, he encountered the writings of Rousseau. These writings were at that time condemned by the Swiss government and Pestalozzi and some of his friends became indignant, undertaking a crusade against the local injustices. This action closed the door to his being appointed to a position in the state.

Pestalozzi decided to enter the profession of agriculture; but before beginning his study, he married into a family of some wealth. They moved to a farm and in time a son was born. He educated his son by utilizing some of the techniques and methods discovered in Rousseau's writings, changing and modifying them to suit his own thoughts concerning education. Seeing his son's need for continual activity, he devised a plan to put this activity into useful work without over-fatigue.

> . . . it would be possible not only to teach children to earn their bread but to cultivate their intellectual and moral nature at the same time. He thought, too, that a country life, in which the cultivation of the land was combined with some sort of handicraft would provide the

best means for teaching the poorest children.[26]

Pestalozzi put his theory into practice when he brought to his farm some twenty poor children, clothed, fed and treated them as his own.

> So he turned his farmhouse into a refuge for destitute children! It had occurred to him that the natural need for children to be active and the natural versatility of their inborn powers could, if properly guided, lead to self-support at an early age and also be the means for the development of their intellectual and moral natures. He conceived, therefore, a project for combining education, moral regeneration, and practical training in both agriculture and handicrafts. The experiment began with several children, some of whom were vagrants picked up from the wayside. The children lived with Pestalozzi, who clothed, fed, and taught them. On pleasant days they worked beside him in the fields, and on rainy days they spun cotton indoors. Of formal schooling there was little, but Pestalozzi was always with them and always teaching them by means of conversations on all kinds of topics.[27]

> From the educational viewpoint this experiment was a complete success. In a few months the poor children had undergone a remarkable change. They had become cheerful and frank; they enjoyed their work as well as their lessons. But from the financial standpoint the experiment was not a success; it was found that the work done by the children was by no means sufficient to properly cultivate the land.[28]

The experiment closed due to a lack of funds, not because it was an unsuccessful educational experiment, but because of Pestalozzi's inadequate business sense and poor organization of the project.

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[26]Roger DeGuimps, Pestalozzi--His Life and Work, quoted in ibid., p. 111.

[27]Cole, op. cit., pp. 458-9.

[28]Bennett, op. cit., p. 112.

After the failure of this experiment, he attempted to put some of his theories and ideas into writing, the best of which is the story of Leonard and Gertrude. After the French invaded Switzerland in 1798, Pestalozzi was given a chance at a new school. This gave him an opportunity to try out some of his new theories concerning methodology in the classroom. Pestalozzi's methods were quite modern.

> . . . [The] basic idea that education consists of guiding children into a natural and orderly unfolding of their innate capacities, plus several brief experiments to show how his idea of a "child-centered" school would work.
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> Pestalozzi believed that in every child there lay dormant a wealth of abilities, feelings, tastes, and sentiments, waiting to be evoked by the proper environment. The whole problem of education must therefore be seen from the developing mind of the child, not from the already developed mind of the educated adult. Education was to be from within, not from without; and the child, not the subject matter, should be the center of the educational system. Instead of stifling a child's individuality under a mass of borrowed ideas, a teacher should encourage every pupil to develop himself in whatever way was most suited to his talents. Growth was more important than achievement, and reaching an incorrect conclusion by one's own mental effort was preferable to memorizing the right answer given in a book. The objective of education was thus the harmonious development of all the powers--moral, intellectual, and physical--of each individual child.[29]

Following the practice of Comenius, Pestalozzi used illustrations in teaching the facts of nature. He went one step further, using the actual object in the instruction. He frequently used the method of setting an object in front of the students, asking them to tell what they saw in the object.

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[29]Cole, op. cit., pp. 476-7.

> Pestalozzi believed that children in school should learn to work, not only because of the economic value of skill and the habit of labor, but because this experience gave sense-impressions which, like the study of objects, became the basis of knowledge. He recognized the fact that "doing leads to knowing."[30]

Pestalozzi said there were two ways of instructing, either one goes from the words to the things or from the things to the words. He much preferred the second method. He was in no hurry to teach the child to read or write, but wished to have the sense impressions precede the words. It was not until he established the foundations of human knowledge within the student that he had him work or study from books.

Pestalozzi was appointed headmaster of a new school venture. He gathered around him many helpers in developing his new ideas of education. The school gained great national prominence and created interest over the then known world. People came from all countries to talk with Pestalozzi, to visit the school, and to learn of his methods. This school with its new methods created many enemies. After about twenty years its popularity began to decline until it closed in 1824.

The sole purpose at the beginning of Pestalozzi's educational venture was to alleviate the poor and distressed children of his country. His idea of having children earn their way by manual labor as they carried on their education proved to be, under his guidance,

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[30] Bennett, op. cit., p. 120.

an unsuccessful experiment financially. However, he did utilize manual labor, both the skilled and unskilled, as a means of teaching the traditional school subjects. His methodology has become more fully understood under the psychology of modern education. The student studying the history and philosophy of industrial arts will find that Pestalozzi has been given the title, "the father of the manual training movement."

Johann Friedrich Herbart (1776-1841)

Herbart was old enough to participate in the work of Pestalozzi in his last experimental school. Pestalozzi's methods of instruction somewhat confused and intrigued Herbart and he studied his methods and ideas thoroughly. Herbart, with an intellectual type of personality, acquired a seat at the university as professor of philosophy. He believed that the activity of labor might be used as a means of discipline.

> . . . Children in any case must be occupied, as idleness leads to mischief and unruliness. If the occupation is some useful work (such as manual or field labor), so much the better. And better still, if, by means of the occupation, something is taught and learned which contributes to future culture. But not all occupation is instructive, and where the government of children is already difficult, then learning is not the most suitable occupation. Many grown-up boys are better brought under control with an artisan, a merchant, or a farmer, than in the schools.[31]

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[31] Johann Friedrich Herbart, The Science of Education, Translated by Henry M. and Emmie Felkin Swan as quoted in ibid., p. 161.

Although Herbart's philosophy was sometimes difficult to interpret, his basic ideas were of great importance in the educational process.

> He believed that the mind at birth was a blank and possessed innately only one power, that of entering into relation with its environment by means of sense perception through the workings of the nervous system. The mind was therefore built up through the presentation of ideas from the external world, not through the development of its own innate faculties, of which it has none.[32]

Herbart advocated the theory of mental states and utilized the concept of apperception in his doctrine of learning. Education consisted of establishing certain associations of the new with the old. In introducing a new topic the first step was preparation of the student by the teacher to receive this new knowledge. The first step called, from the subconscious, facts already accumulated so that they might be associated and assimilated with the new. All learning took place in this manner. Herbart's lesson plan was logical and easily standardized. The five steps in Herbart's system were preparation, presentation, association, generalization and application. There is considerable evidence indicating its continued use in American education.

Froebel and His Theory of Self-activity

Friedrich Wilhelm Augustus Froebel (1783-1852) studied for some time under Pestalozzi's influence and eventually developed what

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[32]Cole, op. cit., pp. 495-6.

is known as the kindergarten. The early life of Froebel did not flow quietly. He had an unhappy boyhood. His mother died when he was very young. Because of difficulties with his stepmother, he went to live with an uncle in Switzerland. Froebel's uncle was more tolerant and liberal than his father and he received kindness and understanding during his stay in Switzerland. Froebel returned home, his education supposingly finished, and found his brothers attending the university. There were no funds available to educate him in the university. After many heated controversies with various members of his family, Froebel did manage to secure some training at the University of Jena. While at the university, his father died and he was forced to seek work. He worked at numerous occupations, some of which were land surveying, accounting, and as a private secretary. He came in contact with one of the model schools of Pestalozzi's doctrine and became enthusiastic concerning the experiments. This resulted in his decision to teach. After some experience in teaching, he saw the need for more education and spent some time working with Pestalozzi. After two years he resumed his university study which was again interrupted when he joined the army. Upon discharge from service he again gathered experience in many unrelated occupations. In 1816 he began to teach in some of the German schools. These schools enabled him to demonstrate some of his theories of education. It was during the nine years at Keilhau that he wrote his most important work, The Education of Man. Due to the religious persecution in Germany, he spent some time in Switzerland

but found his activities restricted somewhat by the state government and returned to the village of Blankenburg in Germany, opening his first school known as the kindergarten.

Froebel's educational views were in contradiction to some of those held by Herbart, particularly pertaining to the function of the teacher. Herbart put the main emphasis upon the teacher and his functions in the classroom and Froebel placed his upon the child.

> To him the child was the sole source of educational principles, and the teacher merely followed where the pupils led. The child thus becomes educated by developing himself through his own creative activities. Education, according to Froebel, is the constant progressive adjustment of an individual to the world around him by which he discovers his true self; it is thus only one phase of the general process of evolution. It is therefore not the teacher's business to teach but to keep out of the way and let the child grow.
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> . . . . . .
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> Self-activity is a second principle of Froebel's approach to education. His concept of self-activity may be defined as an activity determined by one's own interests, sustained by one's own power, and carried to conclusion in an atmosphere of freedom from interference by others. Because he was willing to leave children free and to take his cue from them, Froebel discovered the great educational value of play, of handwork, and of spontaneous co-operation among children. He did not, however, leave children without guidance. Like many other people with a quick intuitive understanding of human nature, he saw what each child was like and what he needed, just as clearly as he saw the color of the child's eyes.[33]

Froebel spent a considerable amount of his time working with the younger children. The materials he developed for kindergarten use are

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[33] Ibid., pp. 527-8.

still familiar, either in their original or derived forms. Froebel used three approaches to his kindergarten work--gifts and occupations, the play circle and the play songs. The gifts and occupations were of an unusual nature. They were prepared in a box for distribution to those interested in purchasing. They were graded according to difficulty with rather complete instructions for their use. The gifts consisted of geometric blocks and other material arranged in a box so the child could manipulate, study them in directed play, and also use them in free play to build structures of the imagination. The occupations included in the kit were activity materials for modeling, drawing, sewing and coloring. They consisted of pencils, paper, cardboard, clays; in fact, many of the things one might find today in local five and ten cent stores for use in the classroom.

The few women teachers in the schools before this date were there because of financial necessity brought on by family difficulties. They had received little or no preparation for teaching. Froebel found that women made good teachers in the kindergarten, and he set about training many of them for positions in the kindergarten schools. He utilized the idea of the laboratory or training school of today in the preparation and training of women teachers.

In some of his writings Froebel would have handwork treated as a subject of instruction; however, due to the fact that his experience pertained mostly to kindergarten, he did not actually try handwork as a subject. Froebel conceived the kindergarten as an

educational institution, the counterpart of the nursery and kindergarten schools of today. Froebel's ideas of the environment found around small children in the kindergarten are quite prominent today. Socialized games, songs, dramatizations, stories, play games continue to be part of the self-activity of kindergarten for children over the world.

Otto Salomon and the Sloyd of Scandinavia

During the latter part of the nineteenth century, there developed in the Scandinavian countries a system of activity in the home referred to as the sloyd or home sloyd. Due to the long afternoons and evenings around the fire, the family participated in many individual and group activities. These handcrafts were generally in wood and were often sold to increase the earnings of the family. When equipment began to enter the picture, an industry of sorts arose from the home sloyd. Otto Salomon, seeing the advantages incurred around the fireplace in the home sloyd system, set about with the help of others to develop the Swedish sloyd system of education. At one time he received some federal money to help set his new system of education going forward.

The term, sloyd, is one for which there is no exact counterpart in the English language, but it may be said to stand for manual labor proper to schools and domestic work. Salomon placed the sloyd training in the primary schools of Sweden. The manual training was limited to the following materials:

1. Iron-working: forging, lockmaking.
2. Working in straw and willow: basketmaking.
3. Working in paper and cardboard.
4. Woodworking, including turning, sculpture, carpentry, wooden-ware.[34]

Salomon established the famous school at Naas in 1872 and opened the school for children ten to fourteen years of age. His idea spread and was accepted so completely that within a very short period of time it was considered essential for all of the schools in Sweden. This program was intended for those boys and girls who had completed the work in the folk schools and was considered by Salomon as a part of the general education. The objectives of the sloyd system, as seen by Otto Salomon, are:

1. To cause the child to acquire a general skill of hand.
2. To awaken in him the taste and love of labor.
3. To call forth spontaneity--the initiative.
4. To give him experience of the fact that order and correctness in labor are necessary elements of progress.
5. To develop the faculties of attention and perception.
6. To render the child earnest and persevering.
7. To inspire the esthetic sentiment without allowing it to become vague or exaggerated.
8. To neutralize the injurious effects produced upon the system by intellectual studies, and by the sitting position which the child must maintain during the ordinary lessons.[35]

> . . . [The Sloyd system] was for purposes of general education; it was considered valuable for every child.

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[34]Struck, op. cit., p. 23.

[35]Otto Salomon, Address, September 21, 1883, quoted in ibid., p. 24.

> . . . The Swedish system . . . was worked out by an educator whose primary interest was the enrichment of the education of all children during the elementary-school period, recognizing individual capacities and individual speeds in learning; it was an individual-production system, not a mass-production system of general education.[36]

Salomon later extended the term, sloyd, to educational sloyd of which there were three main objectives, or outstanding characteristics: "(1) making useful objects, (2) analysis of processes, and (3) educational methods."[37]

The first part of the sloyd system consisted of forty useful models graded according to difficulty. Each exercise introduced a new process in progressive order of execution. Sixty-eight fundamental tool exercises were included in these forty models. The knife was the principal tool used, particularly in the early part of the course. In the latter part of the course, exercises were useful objects for the homes. Salomon utilized the analysis of work processes of all hand tools and arranged them in progressive difficulty. He employed the useful article as a method of awakening the curiosity of the students and keeping that curiosity alive. He believed that experience was the best teacher. He had everything possible taught by action and only those things that could not be explained by action were explained by words.

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[36] Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917 (Peoria, Illinois: The Manual Arts Press, 1937), p. 67.

[37] Ibid., p. 64.

The Russian System of Manual Training

At approximately the same time as the sloyd system was being developed in the Scandinavian countries, Victor Della Vos was developing a school which later became the Imperial Technical School in Moscow. Whereas the Swedish sloyd system was based upon a set of objects or projects, each one complete in itself, the Russian system was based upon the series of exercises independent of a completed object. A characteristic of his early program was that his system involved organization of the instruction shops kept separate and apart from the construction shops. The student had to participate in the first and show adequate skills before he was permitted to work in the construction shop. Some of the underlying principles of the Russian system are as follows:

(1) Each art or distinct type of work has its own separate instruction shop; e.g., joinery, wood turning, blacksmithing, locksmithing, etc.

(2) Each shop is equipped with as many working places and sets of tools as there are pupils to receive instruction at one time.

(3) The courses of models are arranged according to the increasing difficulty of the exercises involved, and must be given to the pupils in strict succession as arranged.

(4) All models are made from drawings. Copies of each drawing are supplied in sufficient number to provide one for each member of a class. The drawings are mounted on cardboard (or, for the blacksmith shop, on wooden boards) and varnished.

(5) The drawings are made by the pupils in the class for elementary drawing, under the direction of the teacher of drawing with whom the manager of the shops comes to an agreement concerning the various details.

(6) No pupil is allowed to begin a new model until he has acceptably completed the previous model in the course. He must receive at least a grade of three, which is considered good.

> (7) First exercises will be accepted if dimensions are no more than approximately correct; later exercises should be exactly to dimensions; therefore, the same marks given a student at different periods during his course do not express the absolute, but the relative, qualities of his different pieces of work.
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> (8) Every teacher must have more knowledge of his speciality than is necessary merely to perform the exercises in the course of instruction. He must keep constantly in practice so that his work may be an example of perfection to his pupils. Such dexterity increases the authority of the teacher.[38]

The equipment in the shops consisted of a work station and a set of tools for each individual. As the student proceeded from one exercise piece or operation to another, the work was inspected by the instructor before he was permitted to proceed to the next exercise. The exercises in the school were graded according to difficulty. Each pupil was provided with a workbook and he was required to record each successive step as he worked each exercise. The method of instruction was in group demonstration, followed by individual instruction to eliminate any wrong work habits. The same exercise pieces were required of all students and they were taken in the prescribed order. All students were treated alike. Rules, orders, inspections were quite at home in this system. It should be kept in mind that this system was produced for the college grade student in a technical program; nevertheless, out of it grew a system affecting the educational process to this day.

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[38] Ibid., pp. 17-18.

> But the outstanding fact concerning the system remains that it was the first to use scientific principles in analyzing the mechanic arts and basing courses of instruction on these analyses.[39]

Before this time most of the methods of learning the manual arts or trade were by the traditional methods of apprenticeship. Here appears a new method for mastering the elements of the arts.

> . . . When the idea of analyzing the manual arts into their elements and of arranging these elements in pedagogical order was shown to be possible and practicable, it was recognized that these arts could be taught in schools by essentially the same teaching methods as the other school subjects.[40]

Della Vos made numerous showings at the centennials over the world, the most important one being that of the Centennial Exposition in Philadelphia in 1876. There Russia was permitted a space in the display creating, at the time, little excitement; but J. D. Runkle, of the Massachusetts Institute of Technology, and Dr. Calvin M. Woodward, of the Engineering Department of Washington University, took note and were greatly impressed with the method developed by Della Vos. Thus, the manual training movement, as Russia knew it, was brought to the United States.

Trends

This period was very productive in the development of educational ideas and thought. From the many experimental schools and

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[39] Ibid., p. 47.

[40] Ibid., p. 13.

early educational writers which seem, according to standards today, to have been awkward and, at times, unscientific, come the educational methodology of today. Viewing the changes, new thoughts, new developments as they merge into the educational scene, one sees that some have been only temporary and that others have grown, developed and maintained a berth within the educational framework.

Below is given a brief listing of the educational concepts that had their beginning during this period. Attempt has been made to arrange them in the order of their appearance; however, this is not always true as they appeared in different parts of the world at different times.

1. Graded and pictorial textbooks.
2. Instructional materials at children's level.
3. Learning through the senses.
4. Learning by action.
5. Education should be natural and spontaneous, not forced.
6. Manual arts recognized as a means of mental training.
7. Education from within--an unfolding.
8. Child centered education.
9. Doing leads to knowing.
10. Mind is a blank at birth.
11. Five step method of lesson presentation.
12. Kindergarten, self-activity, play games.
13. Women teachers.
14. Laboratory school for teacher training.
15. Handcrafts (sloyd) as general education.

16. Exercise method of instruction.

17. Useful project method of instruction.

18. Work books.

19. Scientific analysis of the elements of the mechanic arts.

A number of the items above are found in the educational methodologies of the modern school; however, one quickly agrees that some do not have a place in the classroom. Activities and learning are becoming co-partners in education. Handwork is becoming more acceptable, having validity and purpose in the educational system of the day.

The Manual Training Movement in the United States

The colonization and settlement of this country took place during a romantic period requiring energy and heroism on the part of those undertaking the venture. The early settlers had many losses and discouragements before any apparent headway was made. Not until the first half of the seventeenth century did this country become a colony strong enough to be of some economic worth to the mother government.

Early Education through Handwork

The early settlers brought with them their religious views, opinions of education and the apprenticeship system of training. The earlier schools were church directed and gave a good part of the day to religious teachings. The apprenticeship system was paramount as a

means of imparting skills, knowledges and the mysteries of the trades. Life around the home indicated activities of various kinds; consequently the young received many experiences. As the educational system began its evolution from private church schools to the early types of public schools, there developed a concern for training of a mechanic nature, resulting in the growth of an organization known as the Mechanics Institute Movement. It began about 1820.[41] Due to the efforts of this movement many schools were developed, the most famous being Franklin Institute of Philadelphia, the General Society of Mechanics and Tradesmen of New York City, and the Ohio Mechanics Institute of Cincinnati. Many of these schools were technical, scientific and engineering in nature. They were the result of scientific development and industrial progress in this country. They offered training in the form of instruction in the mechanic arts, but not until 1868 is there any reference to shop work for educational purposes. A machine shop was established by Icabod Washburn in the Worcester Polytechnic Institute, Worcester, Massachusetts.

> . . . There were two vitally important factors in the plan for this shop: (a) It was to be run as a commercial shop, producing articles to be sold. (b) The shopwork was to be done by the students in order to learn how to do it; no pay was to be received for the work done. There was, therefore, a wholly educative purpose in giving the shopwork training. The money received for the products of the shop was not expected to pay all the expenses of the shop. The shopwork was to be on essentially the same

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[41] Charles A. Bennett, History of Manual and Industrial Education Up to 1870 (Peoria, Illinois: The Manual Arts Press, 1926), pp. 317-325.

educational plane as the laboratory work in science.[42]

This shop was such a success that many of the technical schools established shops in conjunction with their course work. However, due to inadequate experimentation with teaching methods and procedure, their success depended upon the method used in each school. As a rule, the method used was a "do-as-I-do" type of instruction.

Activities in the grammar schools developed quite rapidly during the period. In the Boston elementary schools sewing and drawing were activities as early as 1835. By 1848 drawing, as a course, was placed on the list of grammar school studies and by 1864 it was a required course. Other large metropolitan areas began similar programs following the leadership of the Boston school system.

The private schools did much to cause the public school leaders to realize that manual training had something to offer to the educational process. The experiments of the private schools proved highly successful and could not be ignored. A private school known as "The Whittling School" was opened in Boston, not so much for the tool skills but to insure appropriate use of leisure time.

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[42]Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917 (Peoria, Illinois: The Manual Arts Press, 1937), p. 311.

Various groups and organizations were developed to aid the program of activities of a manual training nature. One organization plied its efforts toward a textbook entitled Woodworking Tools: How to Use Them. This book was copyrighted in 1881.

The kindergarten movement, which realized its initial impulse from the kindergarten of Froebel, was known as the Kitchen Garden Association.[43] As a result of this effort and with the help of others, manual training grew quite rapidly in the grammar schools in the 1880's.

The Influence of the Russian System

Dr. Calvin M. Woodward, Professor at Washington University in St. Louis, was developing some methods of shop activity in his school to aid students pursuing engineering training to better visualize the mathematical problems encountered. He was in the process of establishing a method of instruction when the Russian exhibit at Philadelphia in 1876 caused him to realign his thinking. The display created little comment at the time, but Professor Woodward and Dr. John D. Runkle, another leader in the field of education of technical schools, gave them considerable study. They began to see in the Russian method a partial solution to the problem which confronted them. In 1877 Professor Woodward issued a statement to

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[43] Ibid., p. 412.

the University officials concerning his new ideas of education, utilizing shopwork and placing it upon the same educational plane as other school subjects. He would have the mechanic arts taught in the same manner and under the same guidance as the teaching of science, mathematics and the languages. Thus the mechanic arts were not to teach trades but they had direct educational value. In the manual training school which he established, instruction in what he called the "universal tools" was given four to eight hours per week.[44]

Dr. John D. Runkle, President of the Massachusetts Institute of Technology, saw somewhat the same elements in the Russian display as did Woodward. He observed large numbers of students entering the mechanical engineering course who had little or no shop experience. There was no method of securing this experience in the school program, consequently the graduates were having difficulty upon entering this professional work. He saw this as a major fault in the technical educational system. Before this time he had given considerable thought to establishing a small manufacturing plant in connection with the school so that the students might secure experience. However, he realized that there would be considerable opposition to this venture because of its competition with private enterprise. He believed that the Russian display held a method of instruction that

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[44] Ibid., pp. 317-20, 336-9.

could be used in a shop system in his school. He established a group of "instruction shops" in many of the mechanic arts needed by the young engineers attending the University. The mechanical engineering students received instruction in shopwork and others were permitted to elect shop instruction. This new school was given the name, The School of Mechanic Arts. This school was open to boys who could pass certain examinations--arithmetic, geography and English--and who were not less than fifteen years of age. In addition to instruction in shopwork, arithmetic, algebra, geometry, English, physics and drawing were also included in the two-year program. Professor Runkle was quick to recognize the value of instruction in the mechanic arts for the purposes of general education. He recommended a special mechanic arts high school for the larger cities where groups of shops could be developed for city-wide use.[45]

It may be noted at this time that the Russian system of education was for the college level student and the original program in this country was designed for the college student. However, recognizing the general educational value and seeing a system of instruction which could be placed on the level of the elementary, junior and senior high school student, shops of various types were finding their way into the school programs over the nation. In reality the manual training movement of this country took the best

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[45] Ibid., pp. 320-36.

from the Russian system--the graded exercises and operation of the tool analysis--and the best from the Swedish sloyd--utilizing the principle of the object being of useful value--and formed a course of instruction in the manual training schools.

Concept of Manual Arts

As a result of the preliminary foundation work developed by Woodward and Runkle, manual training was soon to be given a permanent place in the educational program. The program grew, beginning to enter into the secondary schools, and there developed within the manual training movement considerable differences of opinions as to the purposes and intent of manual training. There was a group of people who felt that manual training was lacking in aesthetic values. These people believed that the term "manual training" should be changed to manual arts and that emphasis should be placed upon the creative and crafts approach to handwork. Some of the leaders of this movement were Charles A. Bennett, Ira S. Griffith, Dr. William T. Bawden, Robert W. Selvidge, and Frank M. Leavitt. The term "manual arts" was not accepted universally but did come into quite prominent use in certain sections of the country. Manual arts was used until the newer term "industrial arts" had its birth between 1909 and 1911.[46]

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[46]G. Harold Silvius, Teaching Multiple Activities in Industrial Education (Bloomington, Illinois: McKnight and McKnight, 1956), p. 7.

A Period of Controversy

In the 1880's the program of manual training became evident in many localities. Some believed, as did Woodward and Runkle, that there was a place for manual training in the educational program for its general educational value for all students. There were others who believed that manual training was a means of acquiring skills so that one might learn a trade. Then there were others who felt it was not necessary to introduce manual training into the common schools because manual training did not have anything to offer for the preparation of youth, either for vocations or for general education. As these groups gathered in momentum, they began to form tighter organizations for the perpetuation of their ideas. The main battle of this time was between the strict academic group and the two other groups combined. The trade training group and the manual training for general education group put aside their differences as the issue became heated. After a period of ten years the academic group began to admit reluctantly that manual training did have some place in the school program; however, they were not sure of its proper function.

As the issue began to recede, the two factions that had joined forces divided again into groups, and the problem of trade training versus general education values drew much attention. These groups often met head-on at the conventions where they expressed their divergent views. The vocational education (trade training) group

gained in popularity in the early part of the 1900's. The Douglas Commission of Massachusetts was appointed by the governor of that state in 1905 to do research into the needs for education with emphasis toward preparation for a trade.[47] At that time the report of this Commission had profound influence upon the thinking of the people in Massachusetts and the surrounding states. Numerous states began to offer aid to vocational education. The vocational education group then began to work for federal aid. The first meeting of the National Society for the Promotion of Industrial Education was called in 1906.[48] It had annual meetings thereafter and worked for federal aid to vocational education. After gathering considerable data and making numerous research studies, the group secured legislative backing for federal aid. On February 23, 1917, President Wilson signed the Vocational Education (Smith-Hughes) Act,[49] thus granting federal aid to vocational education. Since the battle for federal aid was won by those believing in trade training, the manual training (manual arts) group did not benefit from the federal act. As the vocational movement in education brought about by federal aid began to take form, the term "manual arts" began to give way to the term

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[47]Bennett, op. cit., p. 513.

[48]Layton S. Hawkins, Charles A. Prosser, and John C. Wright, Development of Vocational Education (Chicago: American Technical Society, 1951), p. 63.

[49]Ibid., p. 118.

"industrial arts." The leaders in the industrial arts area began diligent work to develop a sound philosophy for the industrial arts program.

Trends

The early church schools and the apprenticeship system were the means of early education in America. As America began its rise toward industrialization, the mechanics institutes developed to serve its needs. Theory of mechanics was taught for many years before shopwork was employed as a part of the program. This laboratory program was a "do as I do" type. Woodward placed shopwork on an equal basis with other subjects in the Manual Training School in St. Louis.

In the New England states sewing and drawing were utilized as activities in the grammar schools. The early kindergartens used Froebel's system almost intact. Thus one can see activity type education in the kindergarten, in grammar grades and in higher education at the technical training institutes. From these influences, along with the private manual training school experiments, manual training gained entrance into the secondary school programs.

Soon after entrance into the secondary school program, attempts were made to include more artistic influences in the program and to change the name to manual arts. Other controversies developed between the academic groups, the trade training groups and the manual training for general education groups. When this confusion cleared somewhat,

the academic group admitted that manual training did have a place in general education. The trade training group secured federal aid and developed a program of vocational education, thus taking another step for education beneficial to all students.

The Industrial Arts Movement

In October 1904, Charles R. Richards, then Director of Manual Training at Teachers College of Columbia University, stated in an editorial in the Manual Training Magazine that the term "industrial arts" would be more appropriate than the term "manual training." He believed this should be done because of the change of viewpoint. Leaders were beginning to look at the elements of the industries and their influence upon modern civilization. Industrial arts began to come into acceptable use, as stated above, about 1910.

> In 1913, Frederick G. Bonser, professor of education at Teachers College, Columbia University, contributed an article to the School Arts Magazine that expanded the conception of industrial arts in the elementary school. It considered it as both a subject and a method--an end and a means.[50]

John Dewey had considerable to say about the place of shop in the lower grades of the elementary school.

> . . . He, too, accepted the idea that manual training in the lower grades of the elementary school, at least, should be regarded as a method of teaching--as a means of teaching related subject matter--but in these grades he would make the industrial occupations so broad and rich in related content that they would very readily and

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[50] Bennett, op. cit., p. 453.

> naturally become the basis for instruction in the so-called other subjects. Moreover, he would not select occupations that were merely typical of adult life, but occupations that were real in school life.[51]

In the term "industrial arts" the word industrial is emphasized. One may say that industrial arts is a study of the arts of industry. Industrial arts has grown from infancy to a full blown program in the school system in less than a hundred years.

Industrial Arts Enrollment

Participation in activities of an industrial arts nature in the elementary grades is quite difficult to show, since the activities generally cut across all the blocks of subject areas. Some of the larger schools offer industrial arts as a course in the higher grades. Others have the activity in the homeroom, either under a special teacher or the classroom teacher. The activity may be included in a block of time or may be integrated with various other experiences found in the classroom. The activity may be known as industrial arts, crafts, arts, laboratory or by many other titles.

Enrollment in industrial arts in the junior and senior high school becomes somewhat easier to determine since industrial arts is a course of study. The program is more prominent in the junior high curricula and is considered a requirement for all boys in many states. Below is a table compiled by the U. S. Office of Education in 1951

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[51] Ibid., pp. 451-2.

listing the percentages of secondary school pupils enrolled in industrial arts:

WHERE DOES YOUR STATE STAND?

Percentages of secondary school pupils
(Grades 7-12) enrolled in Industrial Arts

STATE	PERCENT	STATE	PERCENT
Arizona	20-25	Nebraska	20-25
California	40	Nevada	25
Colorado	25	New Hampshire	25
Connecticut	35	New Jersey	35
Delaware	35	New Mexico	15-20
District of Columbia	35	New York	25
Florida	10-15	Ohio	30
Georgia	10-15	Oklahoma	20-25
Idaho	15-20	Oregon	20-25
Illinois	25	Pennsylvania	35
Indiana	25	Rhode Island	35
Iowa	25	South Carolina	10-15
Kansas	30	South Dakota	15-20
Kentucky	10-15	Tennessee	10-15
Maine	15-20	Texas	15-20
Maryland	40	Utah	30
Massachusetts	30	Vermont	10-15
Michigan	30	Virginia	10-15
Minnesota	30	Washington	35
Missouri	10-15	West Virginia	15-20
Montana	15-20	Wisconsin	25
		Wyoming	20-25

Only six states enroll fewer than 10 percent of their secondary pupils in industrial arts, the lowest percentage being 3.6.[52]

Industrial Arts Aims and Objectives

When any program undergoes a change, the immediate need of establishing the aims in the new program becomes paramount. Many

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[52] U. S. Office of Education, Offerings and Enrollments in High School Subjects (Washington: Government Printing Office, 1951), as quoted by C. J. Gerbracht in "The Trend Is Evident," School Shop, 14:13, October 1954.

attempts were made to establish an acceptable listing of aims for manual training. One listing is given for later comparison.

1. To inculcate a correct knowledge of the use and care of woodworking tools.
2. To implant the habit of carefulness in accomplishing work.
3. To develop the power to plan work.
4. To teach quickness of perception; to train the judgment; to render the memory exact and reliable.
5. To turn the pent-up energies of the boy into channels of usefulness.[53]

As the program evolved rapidly from one phase to another, few listings of any consequence were made. When the program was established as a phase of general education and had assumed the title of industrial arts, a concerted effort was made to develop an acceptable set of objectives.

The executive committee of the American Vocational Association appointed a committee to study the many problems of industrial arts in 1928. This committee made many reports, and in 1933 submitted a report on "The Objectives of the Industrial Arts Teacher." This report was later included in a publication of the American Vocational Association. The listings of objectives are:

1. Interest in Industry.--To develop in each pupil an active interest in industrial life and in the methods and problems of production and exchange.
2. Appreciation and Use.--To develop in each pupil the appreciation of good design and workmanship, and the ability to select, care for, and use industrial products wisely.
3. Self-discipline and Initiative.--To develop in each pupil the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations.

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[53]William T. Bawden, "Early Conceptions of Industrial Arts," Industrial Arts and Vocational Education, 41:186, June 1952.

4. Cooperative Attitudes.--To develop in each pupil a readiness to assist others and to join happily in group undertakings.

5. Health and Safety.--To develop in each pupil desirable attitudes and practices with respect to health and safety.

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

7. Orderly Performance.--To develop in each pupil the habit of an orderly, complete, and efficient performance of any task.

8. Drawing and Design.--To develop in each pupil an understanding of drawings, and the ability to express ideas by means of drawings.

9. Shop Skills and Knowledge.--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.[54]

Other efforts to develop aims in the industrial arts program have been from the individual standpoint. As Wilber's listing is probably the most widely accepted of this type, it is included here for comparison purposes.

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes and operations, products, and occupations.

2. To develop recreational and avocational activities in the area of constructive work.

3. To increase an appreciation for good craftsmanship and design, both in the products of modern industry and in artifacts from the material cultures of the past.

4. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry intelligently.

5. To provide information about, and--in so far as possible--experiences in, the basic processes of many

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[54] Improving Instruction in Industrial Arts, Report of Committee American Vocational Association (Washington: American Vocational Association, Inc., Industrial Arts Division, 1948), p. 51.

industries, in order that students may be more competent to choose a future vocation.

6. To encourage creative expression in terms of industrial materials.

7. To develop desirable social relationships, such as cooperation, tolerance, leadership and followership, and tact.

8. To develop safe working practices.

9. To develop a certain amount of skill in a number of basic industrial processes.[55]

Teacher Training in Industrial Arts

As stated previously, many of the first manual training teachers were secured from the artisan trade. They were placed in the shops to teach their skills to the students. Some were good teachers, but many were lacking in teaching methods.

The first attempt to offer instruction in the arts was in 1861 at Oswego State Normal in New York state. Instruction was given in stick-laying, weaving, paper cutting, color, form and inventive drawing along with other school activities.[56] In 1880 a shop was fitted in the basement. Students could go there during off hours and were helped by the school janitor. No regular class was offered until 1893. The professional type course was not included for sometime.

The State Normal School at Bridgewater, Massachusetts, opened

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[55]Gerdon O. Wilber, Industrial Arts in General Education (Scranton, Pennsylvania: International Textbook Company, 1954), pp. 42-43.

[56]Charles A. Bennett, History of Manual and Industrial Education Up to 1870 (Peoria, Illinois: The Manual Arts Press, 1926), p. 464.

an industrial laboratory for woodworking in 1881. Many normal schools began building shops, but none offered the type training to prepare a teacher for secondary school teaching. Schools started offering programs for the training of teachers. The privately endowed institution helped considerably in this effort. Finally the program of teacher training became evident in the university.

The State of Tennessee authorized the establishment of three normal schools, one for each grand division of the state, in 1909. These normal schools were placed in operation in 1911 and 1912. They were for the purpose of training teachers in specified subject areas. "Manual training" was listed as one of the areas in which teachers were to be trained.[57]

There always seemed to be a demand for industrial arts teachers. This may have been due to the inadequacy of the teacher training programs to supply the new programs being developed and to maintain established programs. Many of the teachers entered industry from the industrial arts shops. This may have been an indication on the part of industry of a desire to secure employees educated in this manner.

The higher educational institutions in the United States granted the following degrees in 1955 in the industrial arts field of study:

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[57] Acts of the State of Tennessee Passed by the Fifty-sixth General Assembly, 1909, chap. 264, pp. 907-917.

Bachelor's Degree	(first level)	2,738
Master's Degree	(second level)	544
Doctor's Degree	(third level)	1458

Dr. John Ludington, Specialist in Industrial Arts Education in the United States Office of Education, states that there were approximately 20,000 full-time and 5,000 to 10,000 part-time industrial arts teachers in all the parochial, private and public schools in the nation in 1954.[59]

Trends

Before the passage of the Smith-Hughes Bill there was a movement to replace the term "manual training" with the more appropriate name "industrial arts." This effort did not reach its objective until after World War I when the name "industrial arts" came into universal use.

The development of industrial arts can be seen in the increased enrollment of students and in the large number of teachers now employed to teach industrial arts. The use of activities in the lower grades is somewhat more difficult to determine as programs under various titles and conditions exist. Industrial arts in higher education has made some progress as evidenced by the number of degrees conferred in

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[58] U. S. Department of Commerce, Statistical Abstract of the United States 1956 (Washington: Government Printing Office, 1956), p. 131.

[59] G. Harold Silvius, "Progress at Mid-Century," Industrial Arts and Vocational Education, 43:14, January 1954.

1955.

It seems that industrial arts is fast becoming accepted as a valuable and necessary part of a modern educational system. The uniqueness of the program adds much to the desired learning activities appropriate for education in a democracy.

Summary

It is believed that leaders of the primitive tribes were men of high manipulative abilities. Leaders of the early Greek nation were also men who could manipulate materials. As slave trade developed, there was a separation of manipulative activities and so-called mental activities. Over a period of time the separation of the more important activities of life caused the artisan class to be looked down on as citizens. In fact, they were considered no better than slaves who were often taught the same trade or skill. Those who had to work for a livelihood were placed in the lower strata of society. Efforts have been made to elevate opinions toward work, placing it in a religious context or popularizing such statements as "great is the dignity of labor" or "an honest day's work."

It is difficult to employ in the educational process activities frowned upon within the culture. Consequently, activities which had any semblance of labor or work were excluded from the educational process. From this lowly state the slow climb up the opinion ladder began. Its progress in history has been quite erratic, filled with

many controversies. Its progress may be noted through the places held in the present educational system by those things of an activity nature. Progress has been made. There is some degree of respectability attached to "learning by deing," but there is still much progress to be made in the area of employing activities in the educational system in the desire for the "good life."

CHAPTER III

MAN IN THE CULTURE

Introduction

For thousands of years man has proclaimed allegiance to the spiritual world as his primary purpose, yet he has created the most unusual material culture that the world has ever known. This suggests that there appears some confusion about man's nature and what motivates him to do the things that he does. A great deal of this confusion originates from the use of traditional concepts which appear, under close scrutiny, to be somewhat inadequate. The confused understanding of human nature is often motivated by these traditional concepts, along with the idea that it is perhaps better not to know. Man seems to desire to maintain a pretense thereby preserving certain illusions about one's self, so that he may not be required to look at unwelcome facts concerning his own human characteristics and nature.

From Atomistic to Organismic Science

In spite of these things, facts about man have been steadily growing through the use of modern science techniques. Paleontology, the study of ancient life, has developed a clear picture of the biological history or ancestry of man. Physical anthropology and biology have become adult sciences within the past century and now give a better understanding of man's basic nature. The social sciences,

sociology, cultural anthropology, archeology and psychology have aided considerably in the understanding of man's behavior. All of these sciences have developed into important disciplines. Instead of the various sciences slicing up the subject of man, as one would slice a mince meat pie, they are coming to the understanding that they all start from a common center, that the whole is a large circle and not a triangular wedge. This concept shows plainly a need for improved integration in the various sciences. Each science must come to the stage where it sees the parts as they are related to the larger wholes. The impressions within the philosophical realm indicate a trend toward holism where all reality is seen as a system of functional relationships. Gestalt psychology is quite thoroughly holistic in nature. Biology has begun to look into the complex relationships of the organism and the environment, thus giving the larger organismic view of life.

The insistence of certain groups upon maintaining the unnatural dichotomy between the physical and spiritual man seems to have had little effect on the studies of modern science. The old problem of mind-body concept has not yet completely disappeared from the scene and tends to appear within some of the scientific investigations, perhaps without conscious awareness of its presence. However, every effort is made to eliminate those elements that tend to hinder intelligent research. Many scientists are beginning to see that it is a mistake to do research or work within the area of the nervous system without taking into consideration the needs of the physical body and,

in like manner, the biologists when approaching a study of the body take into consideration the way the organism works in its cultural context.

For the purpose of this study, investigation will be made into: (1) The biological nature of man. (2) The philosophical approach to a guiding set of values with increased emphasis upon the theories of mind and matter as conceived under the various psychologies. (3) A discussion of the Gestalt theory of learning with some indication of differences with certain other theories of learning as they have implications upon educational progress.

The Biological Man

As one delves into the problem of life, he is confronted by many hypotheses that science is still striving to test. Where did life get its many variations that one sees in existence around him? What is the secret behind the living cell's ability to reproduce self? How did man evolve from this complexity of living organisms to the state in which one finds him today? How is it that man is the only organism that shows any considerable ability to think? These and many other questions are pondered daily by the scientists as they do research into the biological nature of man and the evolution of life.

Two methods of research are employed in the search for the nature of life. One faction believes that in order to know about man one must study the subject man. Observations of the human animal in his

environment are tabulated, in fact all of the scientific evidence that one can gather concerning his behavior, both biological and cultural, are compiled. Upon years of research and volumes of data, trends tend to develop with which one can do further research. This type of research is rather long and tedious as one can only go to limited means to control the research experiment. In the study of life excluding the human, scientists have conducted controlled research. Some scientists believe that the study of the lower forms of life will reveal some insights into the nature of man. Numerous experiments are conducted within the realm of the animals most closely related to man.

Patterns of Organic Life

As one views the organisms, including some of the lower forms of life, the slime mold and virus, there appear patterns which arise from the order. These patterns tend to recur regularly as organisms reproduce themselves. Over the millions of years of organic evolution patterns of the organisms have developed into many shapes, forms and configurations. As these organisms grow and develop, divide and multiply, the patterned behavior of each kind of organism tends to multiply into many facets.

> The human organism is a product of that evolutionary process wherein these persistent configurations became established and transmittable through eggs and sperms in which this organizing function is passed on to the offspring to operate in its growth and development and its functioning activities.[1]

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[1]Lawrence K. Frank, Nature and Human Nature (New Brunswick, New Jersey: Rutgers University Press, 1951), p. 21.

Stability of Organic Life

The living organisms seem to have order or regularity which they exhibit, yet over a span of time they show growth and change in this order through alteration of dimensions and patterned life. Within each organism there exists something that strives to maintain life postponing disorder until death. In many of the organic parts of the body dead cells are replaced with like live cells. The skin, for example, makes replacements upon its cell structure periodically. The liver throws off dead cell structure and new cells are developed to replace the dead. This order within the organism is not independent of each organism or part of the organism, but has an interrelatedness. For example, upon extreme fright one notices an increased beating of the heart, more rapid breathing, tightening of the muscles, and often a vocalized expression of the fear in which the total organism tends to maintain a balance within its internal environment. Thus the organism is made ready to ward off any unpleasantness that might cause harm to it.

Organic Memory

Living cells of the human organism tend to maintain a pattern in the process of their growth and development. When the sperm has fertilized the egg of the human, it will not result in a cat, neither will the fertilized egg of the cat produce anything other than a cat. This seems to indicate a form of heredity or organic memory, that is, the fertilized egg will produce in its growth and development the same

basic kind of organism as its parents. The heredity problem is not yet clear from a scientific point of view; however, it is an accepted fact that the egg cell and the sperm contain chromosomes and genes in which this memory or capacity to keep cells and organisms true to their parenthood is believed to be located. This pattern of the individual organism is evident in the development before birth and continues through the life span controlling the growth and maturation giving evidence of repair and replacement of the various organs of the body as they appear to tire, grow worn, or get old; thereby maintaining a state of equilibrium until death overtakes the organism.

> . . . Thus the heredity process provides for a high degree of regularity and uniformity from generation to generation and within the life of a single living organism. But it also permits variations and deviations since each egg and sperm will have a somewhat varying assortment of genes derived from the ancestral store and they will combine in different ways, depending apparently upon their location in the chromosomes.[2]

The biological processes of development and growth brought about by the fertilization of the egg which produces a new life are basically alike in each species of the plant and the animal kingdom. Wheat will reproduce wheat. Elephants will reproduce elephants. In spite of this regularity, life patterns can be varied through the hereditary elements of the genes as they tend to appear in different amounts within the offspring giving some variabilities. The geographical environment, the atmosphere, the land, the sea, the

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[2] Ibid., p. 69.

temperature, and the like, which is in a continual process of change, has added to the complexity of organic life. Some species have ceased to exist. Others have risen to the challenge of survival in this continually changing environment and have made adaptations within the internal environment. These tend to develop or adapt to the environment taking on new elements within their pattern of behavior, thus the evolution of organic life.

Man--The Latest Development of Evolution

As this evolutionary process continued in the production of organisms, there appeared the human as a relatively new kind of organism.

> He derived from his mammalian ancestry the same basic biological functions and processes, but he was different from all preceding forms in having certain capacities: a flexibility and adaptability beyond others with few or no coercive instincts, but with a large brain capable of ideas, of imagination, of foresight, and of speech, with skillful hands for manipulating materials.[3]

Thus it is believed that man is the latest development of the organisms to evolve and is equipped as no other organism to try out a new system of survival within this ever-changing geographical and climatic environment.

> Although human beings are animals, there are a good many respects in which man differs from other animals, especially in "what he does with his life." From a strictly physical and zoological point of view man differs from other mammals and particularly from the other primates only in degree. In non-scientific language you might say that he "is made of the same stuff, but he has more of it," at least as regards certain

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[3]Ibid., p. 46.

> traits. Also the "stuff" as put together in man is organized along lines which, if not distinctive in kind, are nevertheless unique in result. This is especially true of the nervous system, for example, which is of the general mammalian type and which is composed of the same kind of tissues and interconnections as in other animals. Even the basic plan of the nervous system is typical of that of other mammals, particularly the Primates, but there is more of it, particularly in the brain, and the complexity of organization and function far outshadows that of any other animal.[4]

As the nervous system seems to be more developed within the human animal, a comparison of man with the most similar lower animals might give some insights into the uniqueness of man. The average capacity of the European human skull is about 1,450 cc. as compared to the gorilla which seems to average between 400 to 500 cc. This is not to say that man has the largest brain capacity. The elephant has a larger brain than man, but in relationship to body size man is far superior to the animal kingdom and other primates. This superiority seems to give man the potential ability to develop unique characteristics.

> . . . But of major importance is man's large brain which has made it possible for him to develop language and symbols, to create ideas and tools and otherwise to live by intelligence as well as by organic memory. This large brain, however, has a profound influence upon his internal environment as well.[5]

The lower animals maintain the survival pattern through organic memory and the stability of organic life. They meet the problems of

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[4]John Gillin, The Ways of Men (New York: Appleton-Century-Crofts, Inc., 1948), p. 23.

[5]Frank, op. cit., p. 53.

the environment by trial and error. Man, because of the unusual ability to communicate in a highly developed symbolic language and because he is a thinking animal, does not need to respond to the elements in the same manner as the lower animals. To do so does not utilize these unusual abilities. Man needs to apply these abilities toward understanding the biological drives so that he may eliminate the trial and error so pronounced in the lower animals. By doing this man lifts himself above the other animals thereby indicating an element of intelligence on which to base his behavior.

Many other points could be developed showing similarities and differences between the human and other primates; items such as posture and locomotion, body member comparison with emphasis upon the hand and size of the skull to mention a few.[6]

The characteristics surrounding the nature of producing offspring indicate that human sexual activities are more or less continuous throughout the year, whereas the other primates have season sexual activities. The human infant, born at any season of the year, must have protection and care from the elements. He has a longer period of helplessness or dependence than does the other species; likewise, he has a longer period of adolescence. With this in view the human infant is dependent upon the social environment for his moral humanity.

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[6]Gillin, op. cit., pp. 29-48.

> For the child is biologically dependent upon his parents, vulnerable to the social influences of adults, and hence a potential culture-bearer. This basic inter-individuality is biologically given in the nature of his species. But what is done with it, and through it, varies from society to society and from family to family. The child is the domesticate of the man.[7]

Man and Machines

As one looks at living organisms, especially the human organism, one wonders about the differences which exist between them and machines. It may be stated that living organisms have purpose in their existence, but do not machines also have purpose? Is not the purpose of the machine to saw a board or to bore a hole? Yet when one analyzes the differences that exist within the purpose of the organism of man and the purpose of a machine, one finds that there is considerable difference. Man built the machine and put into the machine man's purpose. This makes the machine a pseudo-organism in terms of purposes. Man built into machine his purposes and they become man's purposes and not the machine's purposes for itself. In case of a breakdown, the living organism, as stated earlier, can within limits maintain an equilibrium, can repair itself, can replace dead cells, can reconstruct or realign its activities and stubbornly resist the atrophy that works to destroy organismic life. By contrast the machine, through use, wears out its parts and cannot rebuild them. It does

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[7] Weston LaBarre, The Human Animal (Chicago: The University of Chicago Press, 1954), p. 219.

not maintain the ability to reconstruct its actions. It can only make readjustments in its behavior to the extent to which man has built these properties into the machine.

Bilogical Drives of Man

Built within the internal environment of man seems to be a will to live, a self-preservation. This seems to be the most powerful of all urges of the biological man. The protoplasm maintains the stability to keep it living. It reproduces cells, it feeds the starving cells, it causes the organism to take into it from the external environment certain elements to maintain this equilibrium. There seems to be nothing supernatural in the organism's will to live because it is found in all living matter and to some extent in non-living matter. All organic and inorganic matter tends to maintain a state of equilibrium. A tree when scarred tends to cover the scar with protective tissue. A rock tends to form a coating over the surface disturbed.

As a result of this basic self-preservation, fear of the elements that tend to hinder life become quite important. This fear or, to put it another way, the search for security is an element within the basic drive of self-preservation. Fear in a sense is noted even in lower forms of life. The amoeba shows fear and moves away when danger comes into its environment. Animals have physical fear and seek physical security. Primitive man feared some of the animals, but he feared most the unknown, those things that he could not see or understand.

The organism was continually searching for security through various methods, thereby avoiding or lessening the element of fear.

This will to live calls forth other needs of the biological man. The need for food or other substances to maintain or to replace energy lost in the process of metabolism is one of them. Some people feel that man does not eat food because he wants to or because he likes the taste of food, but that he eats food because of the need that his body cells have for this replenishment of this energy. To the powerful self-preservation urge the need for food becomes an important drive of the organism.

The human belongs to the animal kingdom and, as he is a being derived from the act of sex, this biological act is stated to be one of the drives of the human animal. Because of the development and character of man's biological body and that drive found in all animal families, the purpose to perpetuate the strain becomes a basic drive of the animal. When animals grow and procreate, the male and female do not have an agreement as to the outcome or purpose of the sex act, but they tend to get together because of the powerful attraction that they have for each other which they seemingly cannot resist. The sex act is considered very painful to some animals eliminating the possibility of pleasurable purpose. The sex drives of the human seem to be according to nature. The sexual attraction seems to have followed the evolutionary stage of the living organism for the past millions of years, but there remains a unique change brought about by the social

man. Man has been required to control his sex behavior according to the specified rules established by the group. He must conform to these guides or be punished by the group. This has changed man's sex behavior, but it does not alter the fact of the basic sex drive.[8]

Biological Needs Are Educational Needs

Man, being a biological creature, has needs common to other biological organisms. Education is concerned with the needs arising from this biological nature. Certain of the educational needs originate from this unique nature of man and other needs are determined from the society in which man lives. Because man is equipped with the unique ability to think, to form ideas, to be a thinking creature, the organism's development is a primary concern of education. Education has the responsibility of stimulating man to act intelligently when dealing with these basic drives. This is the only way man can elevate himself above the other primates. These biological needs are not contrary nor do they hinder the cultural growth but augment or aid in the development of the total organism. They form a large segment of the educational needs as stated in the educational system.

Summary

Out of this long span of evolution the development of life from the simple form to the more complex has brought about the development

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[8] J. M. Martinez, Man in Nature and Behavior (New York: Philosophical Library, 1951), pp. 47-48.

of man in his uniqueness, equipped with a nervous system unparalleled in history, a nervous system having the ability to think, to determine its behavior, to live rationally in its environment. Man, having derived from the animal kingdom, contains some biological drives which are determinant in his behavior, the paramount one being that of self-preservation. Resulting from this major drive of self-preservation, one finds three basic drives: (1) Fear or the search for security. (2) Hunger or want of food. (3) Sex. These need to be considered as a program of education is developed so as to increase or to aid in the development of the thinking man.

Philosophy

It has been said that it is more important for a country to know the enemy's philosophy than it is to know its number of fighting personnel. A nation's philosophy determines the values which are employed in its decision making. In like manner, it would be of great value for the board of education to know the philosophy of the prospective superintendent. This does not belittle the importance of knowing the number of the enemy or the experiences and formal training of the prospective superintendent, but means that man's behavior is governed by a set of values. These values indicate philosophical theory. One may expect a certain pattern of behavior from a person holding one philosophical belief; from another set of philosophical values another pattern of behavior appears.

Consistent Behavior

Within this pattern of behavior all actions should be in harmony with the set of values. Behavior in conflict with a consistent philosophy would not appear. If philosophical insights are of value in the time of world conflict, and aid judgment in the selection of a school superintendent, then it ought to work as well for the social interaction of man with man, in fact, all human behavior. This consistency in behavior leads to better communication, better understanding, and results in more harmonious relationships within the society.

If an understanding of philosophy can give one insights into the behavior of man, then it would be desirable to know something of this broad field of concepts. What is this element that can point up the behaviorial pattern of an individual or group?

Philosophy Defined

The word philosophy, in its broad sense, may mean a point of view, a body of theories and ideas, the interpretation of facts and data, or a method of behavior. Philosophy seeks to give direction to living, it establishes goals, aims and values, giving purpose to life.

> [Philosophy is] "the love or pursuit of wisdom." . . . concerned with the study of truths, or principles, ... the attempt to answer ultimate questions critically, after investigating all that makes such questions puzzling. . . .[9]

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[9] Joe Park, Selected Readings in the Philosophy of Education (New York: The Macmillan Company, 1958), p. 3.

> Philosophic meditation is the attempt to construct a rational, coherent, conceptual system of knowledge which will be adequate for understanding the world in which we live as well as ourselves.[10]

Many types and kinds of philosophies have been developed, some to grow and gain a foothold in the world, some to lapse with the passing of time, some to evolve into the more basic and acceptable philosophies of today. Here in America one also finds various philosophical beliefs in existence.

Eclecticism

Eclecticism, or the selecting of parts of certain beliefs from two or more of the various philosphies, comes into the picture to some extent. One may say, "I am an Eclectic. I choose the best from each philosophy." Eclecticism could indicate a formative stage in one's philosophical beliefs or a process of developing his values, which is, by no means, undesirable. However, it could develop into an excuse for a lack of intelligent convictions or to justify disorganized beliefs or could at times become opportunistic--behavior adjusted to the situation at hand for the purpose of self gain. Selecting parts of various philosophies to direct one's activities may be illustrated in the example where man has one set of values in business, uses another set of values at home with his family, and uses still another on Sunday when he engages in spiritual life experiences. Thus he can use various

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[10] Louis O. Kattsoff, Elements of Philosophy (New York: The Ronald Press Company, 1953), pp. 5-6.

techniques in his business that might be considered dishonest according to his Sunday set of values. These three sets of values are often in conflict, but the person is not conscious of the conflict or refuses to acknowledge it. Unless one is aware of the set of values that are in use at the time, this type of person is usually unpredictable. His behavior seems to be determined by the whims of the day. If he happens to be in a place of authority, his employees have difficulty in determining what is expected of them. It can be seen that a consistent philosophy, a consistent set of value beliefs, would be highly desirable in man's association with man. One cannot adhere to more than one of the philosophies and expect consistent improvement in his mode of behavior for he may offset today what improvement he may have made yesterday. It becomes desirable for man to strive in the direction of a consistent philosophy of life.

In this study the writer does not intend to develop a philosophy, but instead will strive to point out some concepts that have implications for a way of life and for education. Some effort will be made to show contradictions that exist between the three major philosophical concepts: Idealism, Realism and Pragmatism.

Pragmatism

Of all the many philosophies in existence today only Pragmatism can lay claim to being American in origin and development. This system of thought, as developed by the founders, Charles S. Peirce, William

James and John Dewey,[11] has had considerable influence upon the American way of life and upon contemporary Western thought. Much has been written within the last century concerning this philosophy. Pragmatism is based upon human experience, human will, and human intelligence. Each thinker in the pragmatic sense is free to define and to apply these concepts toward the solution of particular problems.

Truth. What conception does the pragmatist hold about the element of truth? The pragmatist states that when an idea works or solves the problem or leads to the solution of a problem it is pragmatically true. This leads one to say that truth is human in origin, truth is functional, truth is socially verifiable, truth is always subject to revision upon the development of new discoveries or new problems or new understandings of society.

> Applied to the conception of truth, itself, the Pragmatic Method declares that true ideas, even in the sciences, are only those whose predicted consequences have been verified in experience by all competent observers when these ideas were used instrumentally to solve specific problems of understanding and control generated by environmental conditions.[12]

This leads to the saying that "it is true if it works," which is quite different from the truth as conceived by the idealists who say that truth is derived from ideas and ideas come from another world. Truth is revealed to the brilliant minds and is compiled and maintained

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[11] Ralph B. Winn, American Philosophy (New York: Philosophical Library, Inc., 1955), pp. 162-171.

[12] Ibid., p. 165.

in the great books. Truth exists separate and apart from this world. Truth is non-changing. The brilliant minds are permitted to see some of these universal truths through intuitive reasoning and revelation.

The realists indicate that truth is of this world and it is the purpose of man to find this truth. Truth is non-changing, truth is constant and has made itself known in the materialistic laws of the universe. Truth can be discovered through the senses. Pragmatism does not start with the eternal truths of the idealist or the natural laws of the realist; consequently, it is free to pursue the intellectual betterment of man and arrive at the conditions under which the "good life" can be better developed in the social structure of the world. The pragmatist does not have to look to authority to determine truth for him. He does not have to look to science to reveal the truth but can by intelligent action arrive at an intelligent approach to a solution of the problem, thus enabling him to verify his hypothesis. If it works, then the hypothesis is true for the occasion. Therefore, truth is verifiable.

Theories of Mind

Beliefs basic to any theory of society are ideas that one holds concerning the nature of reality. One of these basic concepts that has been with civilized man down through the ages is the problem of mind or mind substance. Since the beginning of recorded history, man has developed many theories of mind and matter from which four

concepts seem to have been developed more fully. Upon these notions concerning the mind man has worked out his beliefs and practices involved in education, theology and his association man to man. As these concepts evolve one from another, new theories of psychology develop with them. These new theories of the nature of the mind modify the educational processes and practices to some extent.

> . . . That the distinction between mind and matter, far from being self-evident, was slowly wrought out through ages of reflective thinking scarcely occurs to the average person. Nor is he likely to realize that this distinction is full of obscurities and difficulties. He simply accepts or absorbs this distinction, which has become an integral part of his spiritual heritage, in much the same way as he acquires a knowledge of the number system or of his mother tongue. All these things are as much a part of his environment as the ground on which he treads or the flowers of the field. Consequently he takes them all for granted.[13]

Animism. In the beginning primitive man made no distinction between mind and matter and he described all things in the nature of purpose intended. Every object about him acted essentially from some cause or motive as did human beings. The river rose, the wind blew, the sun moved in the heavens, and the stone tumbled from its resting place because they wanted to. They had purpose which was made known by their actions. He explained these actions the same way he would explain the actions and attitudes that governed his behavior. This conception of mind and matter is known as animism. Man living

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[13] Boyd Henry Bode, How We Learn (Boston: D. C. Heath and Company, 1940), p. 9.

under this concept employed many rituals and had mysterious ceremonies to appease the wrath of the gods. He sought for strength in these gods and for damnation upon his enemies. His education consisted mainly of the mastery of the established rituals and ceremonies together with certain crude skills which he needed to employ the few existing tools.

There are many signs of the existence of this theory today, such things as knocking on wood, the lucky horseshoe, or asafetida around the neck to ward off disease. One may be observed aiming a vicious kick in the direction of an object upon which he has stumped his toe, or the golf player may be observed in a state of infuriated behavior after consecutively making a bad stroke with iron or wood. He has an impulse to get even with the instrument by wrapping it around the nearest tree. These tend to point toward the theory of animism.

Dualism. As the result of careful thinking and observation over a long period of time, man has come to distinguish between mind and matter. He has learned that inaminate things act only according to fixed laws of nature and that the whole of the physical universe is a system of interacting or interlocking causes. This concept led quickly into the dualistic theory of matter. Those things which would react to the physical laws of the universe were placed in the concept of matter and all of those behaviors that could not be determined or that would not fit the rigid mechanical laws were placed into the

realm of the mind. This called forth a refinement of the conception of the mind and divided all material into the animate and inanimate. The mind is matter but yet does not contain space. The mind is free and responsible for its acts. The mind can live in the past as well as the future.

> . . . Having these qualities, man cannot be regarded as merely a part of the mechanical system which constitutes the material universe. Moreover, the entire system of religion and ethics would collapse, and this would be too high a price to pay. It became necessary, therefore, to round out the picture of the universe by making provision for a second kind of reality in addition to matter, a reality which is usually designated as spirit or mind or soul.[14]

While society is quick to assert that mind and matter as thus conceived are united in man, it is a union of opposites. It is indeed one of the strangest unions of the universe. The pair are as different as can be and the classical physicist indicates that mind is "an existence of a wholly different order, an existence which is a real existence despite the fact that it has no spacial qualities whatsoever."[15]

Mind made up of faculties. This concept or theory of mind is a definition that the average man of today accepts or believes. This is the concept that he has been given from past generations. The statement that the mind is located in the head but yet does not contain space was confusing and at times very mysterious, yet one does not

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[14] Ibid., p. 15.

[15] Ibid., p. 16.

attempt to verify this concept but accepts it as a matter of course. The psychologists turn to the physicists for an explanation of the mental substance of this theory and they state that since substance is a source of all power and energy then mind and substance must have mental power. Thus the mind is said to exercise through the sense organs and express itself in memory, reading, judgment, imagination, love, fear, and hate. For each of these separate functions there was assumed to be a separate faculty. Thus the mind was made up of faculties each having its own function. This led to the faculty psychology. Although it is now rejected by scientists in every field, this psychology has exerted much influence upon the education and theology of the past. Its influences are still felt in the practices of today. The traditional liberal arts colleges, for example, are generally dedicated to the training of this type of mind. Education, according to this thought, is a very simple matter. It consists of exercising the various faculties as one would exercise the muscles. This exercise is supposed to have lasting effect upon the faculty concerned. It does not make too much difference what the exercise is. The important thing is that the faculty should be exercised in order to develop it. One is supposed to memorize many lines of poetry. This develops the faculty of memory. Latin, Greek and mathematics are other subjects that are given a place in many of the traditional colleges and are employed in training the faculties.

Mind made up of mental states. The belief in mind as a series of mental states or consisting of mental "stuff" disregards the idea

of faculties. This concept states that the mind is the sum total of all mental states. Images are brought in through the sense organs and stored away in the subconscious apperceptive mass. The sense organs are simply receiving sets which are in contact with the environment and they relay or bring into the mind the facts, the images and the things perceived. As new images come through the senses, they are mixed with the old experiences and blended together. The old experiences provide a background for the new experiences. This assimilation is aided in the classroom through the use of the Herbartian five step method of lesson presentation. Education then becomes a matter of building up the apperceptive mass through combining the new with the concepts already in the mind. This method of education gives new ideas, insights and purposes to the world in which one lives. Under the theory of apperceptive mass, education becomes a matter of major importance. It appears somewhat different from the educational concept needed for the training of the faculties.

> . . . the aim was to impart to the learner a great many facts. These facts were to be stored in his apperceptive mass, to be available whenever he needed them for some particular purpose. . . . The belief in the value of having available large quantities of facts led to the notion that the "competent" person was the individual who possessed these great amounts of knowledge--the "walking encyclopedia" type of person.[16]

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[16] Orin B. Graff and Calvin M. Street, Improving Competence in Educational Administration (New York: Harper and Brothers, 1956), p. 130.

Learning comes about by arousing or awakening out of the apperceptive mass those experiences that are familiar to the one being perceived at the moment or the experiences that one is approaching so that he may apply them to the topic being studied for the proper assimilation of facts. Transfer of training is effective only to the extent that the new situation is similar to the old situation already stored in the apperceptive mass.

Monistic theory of mind and matter. The monistic philosophies solved the problem of mind and matter by omitting one of the terms. Materialism disposed of mind and stated that nature is the whole of reality, whereas others stated that ultimate reality of the universe was spirit.[17] Another approach to solving the many mysteries surrounding the mind and body concept is by utilizing or combining the two, mind and matter, into a single entity as followed by pantheism where mind and matter are reduced to a single substance.[18]

Behaviorism and mind theory. The behaviorists are not troubled with the dualistic concept. They rule mind out of the picture. All human behavior is nothing more than the stimulus-response concept. They believe that the mind is a function, a function that takes place in a neuro-muscular organism as it reacts to its environment. It

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[17] Park, op. cit., p. 7.

[18] Winn, op. cit., pp. 131-137.

assumes that for every stimulus received there is a concomitant response. This interaction of stimulus response is the function called mind. It is known by some as the S-R Bond theory. The behaviorist attempts to explain all behavior in terms of stimulus and response and believes that all behavior can be reduced to material terms. Education becomes a matter of conditioning reflexes and forming new connections so that they become fixed in the form of desirable habits and patterns of behavior. This concept has little or no use for transfer of training and at times even denies the existence of such. Elements must be identical before transfer can be made and transfer does not appear often as new experiences call forth new responses. This theory was quite prominent at the time the vocational education act was being developed and gave much direction to its arrangement.

Field concept. The physicist, due to the difficulty of explaining his theory of matter and new evidences upon the concept of matter, was impelled to look at the atom not as a unit but that the atom is located in a field.

> If one then considers any galaxy as an energy field in which a myriad of forces equalize one another according to regulatory principles so that there exists a constant state of equilibrium, he begins to arrive at some notion of what is meant by a field in the physical world.[19]

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[19] Louis P. Thorpe and Allen M. Schmuller, Contemporary Theories of Learning (New York: The Ronald Press Company, 1954), p. 233.

The earth is round and revolves about an axis. It also rotates around the sun along with many other planets, yet does not collide with the planets. Man manages to keep from being flung into space in this rotating process. The physical scientists state that it is because of the well organized principle of mass and motion that keep the fields of energy in a state of equilibrium.

> . . . Every atom is located in a "field" and is continuous with that field, and every field is, in turn, overlapping with other fields, world without end. The field, and not the atom, is now being regarded as the unit of action. A change anywhere is a change in a whole field; it is a manifestation of a process that is as wide as the field itself.[20]

The field concept may be applied to the individual and his environment. Bode states that:

> . . . The objects or experiences towards which attention is directed are never the whole of what is actually present, but always appear within a larger context or "field." This is sometimes expressed by saying that every experience has both a foreground and a background. In the foreground is the object with which our attention is occupied; in the background is a great variety of material that is perceived at best but dimly and obscurely.[21]

Gestalt theory of mind. The concept of matter put forth by modern physicists provides a basis for a new mind theory. In this new theory the mind definition has received considerable overhauling. In the first place the concept of the term "mind" in the field idea takes

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[20] Bode, op. cit., p. 216.

[21] Ibid., p. 128.

on a smaller connotation, and in many experiences of the individual there appears really no need to refer to the mind at all. The mental states theory held that sense perceptions of color and sound are associated as a mental activity, but from the standpoint of the field theory they are not mental at all but natural occurrences of the environment and the perceptions are created in a field. Colors and sounds are in the object within the field. These perceptions then become part of the environment and cannot be said to be a part of the mind. There is no need to look further than the physical organism and its relations to its field to explain perceptual qualities as they exist in the environmental status.

> . . . Mind as a concrete thing is precisely the power to understand things in terms of the use made of them; a socialized mind is the power to understand them in terms of the use to which they are turned in joint or shared situations.[22]

Every field is somewhat different from the field of another person and each field is quite different in itself. If one believes in individual differences, it becomes evident that no two organisms perceive the same field in the same manner. In other words, sense qualities vary depending upon the object, the observer and the time of observation. Therefore, it becomes necessary to state that the sense perceptions are located wherever they happen to be and it is unnecessary to say that they are located in a mind.

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[22] John Dewey, Democracy and Education (New York: The Macmillan Company, 1916), pp. 39-40.

Many drivers of automobiles are said to look ahead or drive ahead. This is in a sense the field concept. All of the perceptual qualities involved in the field are responded to and adjustments are made appropriate to the changing field. These responses may be noted in the slowing up, speeding up, or braking. Through sense qualities he is able to see where he is and where he is going. Each activity of the perception is a function of the field. The car approaching the highway from a side road enters the perceptual field and alters that field. The driver senses this change and redirects his activity to maintain a balance. A perceived object appears in some kind of context and modifies all of the elements within that field.

> . . . Sense qualities are "sensory," not because a mind is involved but because sense organs are involved. The responses of the perceiving body are essential conditions for the occurrence of these qualities--and the same hold true for dreams, thoughts, memories, and the like.[23]

The nervous system is highly modifiable and what one perceives tomorrow, even though it appears to be the same field, will be somewhat different. There will be a carry-over of the responses of yesterday. To illustrate a point, one might use the age old example of the infant and the flaming match. It is very difficult for the adult to know what the infant sees when looking at the flaming match as the past experiences will be somewhat different for the two. As a result of the first contact with this experience, the infant will change or modify his nervous system. When next the match appears, instead of

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[23]Bode, op. cit., p. 223.

reaching as he probably did the first time, the infant's nervous system is changed as the result of being burned and a different set of responses enters into the field. Consequently, the match is seen differently after the first experience.

> . . . In this transformation of the perception we have the meaning of "mind." . . . The term mind is a name, not for a substance or a mental state, but for a function of the environment.[24]

A change within the perceived object of a field is a change both in quality and function and the responses to the field are different. The objects take on a different meaning which provides guidance for behavior. The match becomes hot to the infant, the scissors look sharp, the ice pick looks dangerous, the bull looks vicious.

> . . . These things are not "in the mind"; they are as truly "objective" as the shape and size and weight of objects. They are not in the mind because the mind is not a thing--whether a substance or a collection of mental states--but a function.
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> . . . . . .
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> Mind, then, is a function of symbolizing or forecasting, or, as we sometimes say, of understanding or foreseeing.[25]

Concept of mind and education. How does this new concept of the mind alter the outlook upon the educational process?

> . . . If mind is a function, there can be no room for a faculty psychology. If this function is a function of a "field," then education cannot be a process of organizing mental states. Lastly, if this function is a process of progressively shaping up the environment so as to bring

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[24] Ibid., p. 224.

[25] Ibid., pp. 224-225.

> an ongoing activity to a successful termination, then education cannot be identified with a mechanistic stamping in of S-R bonds.[26]

How then does this new idea of the mind enter into the problem of learning? It appears that a continual evaluation may show need for altering and redirecting one's activities as the environment takes shape. For example, suppose a person is utilizing the band saw to saw an irregular curve on a wooden object. In performing the activity of following the prescribed outline, the operator notices that the machine does not respond in the usual manner. With closer observation he notices that the set has been removed from one side of the band saw blade causing it to saw a line askew to its intended direction. This element in the field creates a necessity to realign one's behavior so that the element of difficulty can be compensated for in the completion of the operation. He realigns this element within the field and alters his actions. This means that the whole field consisting of this element, the machine and its inadequate saw blade, brings about a realignment of the environment and it is in a continuous reorganization. The person alters his activity or behavior so that compensations may be employed in the field to change the operation obtaining a more satisfactory solution.

> . . . learning is the result of directional activities engaged in by the human organism as it attempts to achieve purposes and solve problems. This learning is of a higher order than pure habit response and consists of getting

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[26] Ibid., p. 232.

> meanings through the seeing of relationships. All the factors which bear upon a concern or problem constitute a barrier situation which prevents advance toward a goal; seeing relationships between the factors as they are arranged in a particular situation, and gaining some insights as to how the factors can be manipulated to improve the situation, is learning of the highest order.[27]

This concept of matter then means that the total organism is involved in the learning process. For educational purposes one cannot take part of the person and assume to educate it, but must accept the youngster in his wholeness and place him in an environment which is conducive to problem solving.

Education and Philosophy

As newer educational procedures and improvements began to enter the program of education, people tend to look upon them as being movements or improvements in the traditional practice of the educational program. However, the newer practices soon appear in conflict with the rather formal educational program. As this progressive movement gains momentum and gathers many followers, the traditional group rallies forces to stamp out this undesirable change. With the competent leadership of John Dewey this new educational move achieved considerable status in the educational system of America. The leaders of this new movement insisted upon the paramount importance of human intelligence. Because man is the director of his own activity, his intelligence should be the determinant of his behavior. The school

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[27] Graff and Street, op. cit., p. 134.

has the responsibility for encouraging everyone to develop and employ intelligence in the behavioral pattern of life, for only through intelligent behavior can man hope to approach the "good life."

The pragmatist insists that education is life itself. The experiences that one obtains in the process of developing his intelligence is as real as life. The new experiences, knowledges, activities and concepts that one gains in his process of education are the continual readaptation of his behavior in the social context. The realists would say that education is acquisition of subject matter. The idealist would say that education is for the development or discipline of the mind so that it may become a more effective reasoning device. They insist that education must not be concerned with vocations but with the more highly intellectual type of activity pursuant of the revealed truths of the universe. The pragmatist would disagree and say that education is life--not a preparation for life.

Democracy. The pragmatic concept is in harmony with the democratic principles that are held so dear in this country. The worth and dignity of an individual and his ability to guide and direct his own activities in a problem solving manner maintain high priority in the concepts of pragmatism. Man is free in the social intercourse of his activities to exchange ideas and to accept those things that he believes to be of benefit to him and to the society. He is not static in these ideas, but must work toward the improvement of the individual, resulting in the improvement of the total society

in which he lives. The realist's society would be somewhat static. Science will in time discover the best way of life and society, knowing this, will make little or no effort until this best way of life has been discovered. When these natural truths or mechanistic laws have been discovered and incorporated in society, there will be no further change in the culture. The idealistic philosophy employs the dualistic concept. There are those who are more intelligent, contain more ability, and who have been trained in the reasoning power, and they are to direct the working masses. This tends to establish an autocracy and augments class societies. This tends to be in conflict with the democratic concept of the worth and dignity of each individual and has little common ground with the pragmatic concept.

Theories of Learning

The school is the formal agency of society charged with the responsibility of providing certain education for the people. Because of the nature of this obligation, the problem of learning becomes paramount. However, human growth and development, with the concomitant problem of learning, is fundamental to both the psychologist and the educator. Learning theories have been one of the major developments of the psychologists as they dealt with the study of behavior. Only within the last fifty years have the educational psychologists approached the problem of learning.

This problem is not new. For many centuries people have learned and at the same time wondered how this learning took place. What happens during the process of learning? This question is not yet answered to the satisfaction of all. There remains today much disagreement as to what learning actually is or what transpires in the organism as it learns.

Learning Defined

Learning has too often been associated, or even synonymous, with memorization of facts and the acquisition of knowledge or skill. One would agree that these are legitimate forms to be employed in learning, yet they do not constitute the whole of learning. Some psychologists attempt to divide learning into types, while others say that there is only one type of learning with variables within that one type. One would say, for example, that learning to saw a board square or learning to drive a nail is quite obviously learned. The possession of a good vocabulary and the ability to communicate intelligently are acquired or, in a manner, they have been learned. One acquires certain prejudices and social ideas which are the result of social interaction. The problem solver seems to approach a problem with a high degree of intelligence arriving at what seems to be a logical conclusion. This is learning.

It can be easily seen why some psychologists would prefer to characterize different types of learning for the convenience of discussion and clarification. The behaviorist would say that learning is

the stamping in or the development of connections between the synapse thus forming a "bond." The mental states psychologist would say that learning is the acquisition of facts stored in the apperceptive mass. Gestalt or organismic psychologists would define learning in the following ways:

> . . . [Learning is] referring in general to all changes which take place in the organism as the result of the interaction of the individual with his entire environment.[28]

> Learning is the process by which an activity originates or is changed through reacting to an encountered situation, provided that the characteristics of the change in activity cannot be explained on the basis of native response tendencies, maturation, or temporary states of the organism (e.g., fatigue, drugs, etc.).[29]

> Learning may be considered in its broadest sense as a process of adaptation. Through the process of learning, men acquire new ways of behaving or performing in order that they can make better adjustment to the demands of life.[30]

> Learning is the tendency of any p t or phase of what one has lived so to remain with the learner as to come back pertinently into further experience.[31]

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[28] A. M. Jordan, Educational Psychology (4th ed.; New York: Henry Holt and Company, Inc., 1956), p. 6.

[29] Ernest R. Hilgard, Theories of Learning (New York: Appleton-Century-Crofts, Inc., 1956), p. 3.

[30] G. Lester Anderson and Arthur I. Gates, "Chapter I, The General Nature of Learning," The Forty-Ninth Yearbook, P t I, Learning and Instruction (Chicago: The National Society for the Study of Education, 1950), p. 16.

[31] Park, op. cit., p. 133.

Maturation and Learning

The biological development of the organism seems to have influences upon the problem of learning. Understanding of child development is an important aspect of teacher preparation. There has been some misunderstanding concerning maturation. Some think that maturation will cause the child to do the things that he should when he is physically ready and that the school's responsibility is to provide the rich environment for the unfolding. This is evident by the assumption on the part of some that "reading readiness" will come with time and this is waited for rather than worked for. This may be pointed up by the fact that one cannot walk without legs, yet with legs, he must learn to walk. Development does depend in a degree upon maturation, but other factors such as nurture and attitudes need to be considered in the problem of learning.[32]

Problem of Semantics

It appears that the English language does not provide an easy means of communication. It is quite difficult for one to explicitly define or picture thoughts in the English language so that misunderstandings do not develop. Because of this fact some believe that the differences now existing in the theories of learning are a problem of semantics, and that in reality there is much closer agreement among

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[32]Anderson and Gates, op. cit., pp. 21-24.

the various theories than indicated. If and when the misunderstandings or the semantic difficulties are eliminated, the psychologists may come to a better understanding of the various concepts.[33] If this is true, then it seems that semantics is one of the paramount problems of psychologists as they approach the problem of how one learns.

Theories and Methods

Because the teachers in this country have been basically "doers" in the educational sense, many are in a hurry to get things done. They become quite impatient with learning theories because the apparent difficulties and slowness in applying them to classroom instruction. As a result, they bypass the theories of learning with their demands for new conceptions of practice in favor of the more stereotyped instructional methods. If a teacher feels that a classroom technique seems to be effective, he may assume that it is fulfilling the purpose and accept it as part of his repertoire of classroom methodology. This practice does not have theoretical direction and is quite certain to result in conflicting classroom behavior. The apparent difficulty in understanding the theoretical implications of the theories of learning does not necessarily excuse the educator in his ignorance of these theories. It seems that one preparing to teach should consider it part of his responsibility to acquire understandings of the learning theories as they have advanced in recent years. Both learning theory and methodology are necessary in the classroom. Neither can be

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[33]Thorpe and Schmuller, op. cit., p. 9.

sacrificed because of a lack of understanding.

It is not the writer's intention to give a comprehensive discussion of the various psychologies of learning, but rather to point up some of the important concepts as they have meaning for learning. Certain Gestalt psychological concepts are central to the discussion to follow. Alternative concepts from other learning theories will be used for purposes of clarification.

Gestalt Psychology

Just prior to the advent of behaviorism in the United States, there appeared a different approach to research in the study of man and his behavior. This research was conducted in Germany about 1910 by Max Wertheimer.[34] As a result of the study, he, along with his two associates, W. Kohler and K. Koffka, developed the Gestalt theory of psychology which later had wide repercussions in American education. This new theory was based upon perception. It is known that an image visualized tends to remain with the organism for a short period of time after the object has disappeared. This principle is used in moving pictures and television today. These quickly changing frames give a wholeness to the movement being perceived. Using this concept in the area of learning, it is believed that past experiences become part of the organism and remain with it for some time. The laws of

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[34] Hilgard, op. cit., p. 222.

organization seem to apply equally to perception and to learning. Koffka devoted considerable attention toward the influence of experiences upon present performance.

> The problem is best approached via memory, in which the past is represented somehow in the present. A second problem concerns the gradual transformation which takes place as skills of the trial-and-error sort are mastered. Finally, of course, there is the problem of restructuring the present field, as implied in insightful learning and in productive thinking.[35]

Law of Pragnanz. As stated previously, the Gestalt psychology grew out of a study of perception. Principles were developed from which later emerged a system of psychology that could deal with the problem of learning and of teaching. When dealing with learning and behavior, Koffka believed that perception somehow tended to move toward completion and tended to take hold of what was perceived. That perceived something was composed of "Gestalten" consisting of various elements such as symmetry, regularity, goodness and the like. It seemed to be one aspect of human perception that the organisms tended to go toward the "good" Gestalt rather than toward an imperfect one. In other words, it might be described as water finding its own level or arriving at a state of equilibrium. In human behavior, this may be illustrated by an embarrassed or flustered individual apologizing for or explaining his behavior to a friend, thus relieving his tensions and returning to a state of equilibrium.[36]

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[35] Hilgard, op. cit., p. 229.

[36] Thorpe and Schmuller, op. cit., pp. 210-211.

Koffka developed other laws of more general principles which are: (1) The law of similarity--the tendency to form groups in perception of like or similar elements, (2) The law of proximity--the relationship as to nearness of the perceptual parts. (3) The law of closure--the indication of desire to complete a part circle or figure into a whole. (4) The law of good continuation--the idea that straight lines tend to continue, circles tend to continue as circles, and the like. These have certain implications which can be applied toward the elements of learning.

Past experiences (trace theory). Because of the importance of past experiences in the Gestalt concept, modification brought about through these experiences is considered to be a very definite part of learning. The trace hypothesis is rather a complicated development; however, the essential features of the theory are:

> . . . (1) a trace is assumed which persists from a prior experience, so that it represents the past in the present; (2) a present process is also posited, one which can select, reactivate, or in some manner communicate with the trace; and (3) there is a resulting new process of recall or recognition.[37]

Koffka believed that a trace of some sort persisted in some way in the brain for a time after the experience. This trace, which is the result of past experience, is used to modify the immediate experience; however, in the process of perception the organism can

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[37]Hilgard, op. cit., p. 230.

select or reactivate in some manner bringing out the appropriate traces to be utilized in the present experience resulting in a continual modification of the traces.

The question may be asked, "What happens to the old traces as learning comes about and forms new traces?" As new traces are formed from repetition, the old traces are continually being transformed and the preceding traces are disrupted. At this point the question as to the value of repetition may be raised. The Gestaltist refers to such consolidation of traces as becoming increasingly available and desirable. They hurriedly warn, however, that this repetition can be much overdone. A trace system may become too available for one process; consequently, when a similar process comes upon the scene, it tends to have a narrowing or blinding influence resulting probably from too much drill or repetition. It might be pointed out that some processes are directly dependent upon some type of stimulus, and when the stimulus is presented the second and third time, the process is somewhat different since it has responded the first time to the stimulus; therefore, the second exposure could be recognized as familiar but not the same. If this familiarity is recognized, it is sufficient to show that learning took place with the first exposure.

Insight. Much misunderstanding surrounds the problems of insight and trial and error. In brief, insight may be defined as that sudden flash which results when an individual successfully grasps the problem which, up to this time, seemed to have baffled him. It may be

noted by the expression, "Oh, I see," which implies that suddenly the situation has been cleared, the parts have fallen into place. This is what the Gestaltist calls gaining insight into the problem. Some of the characteristics that influence the possibility of insight may be stated thus:

1. The abilities of insight depend upon one's capacity.
2. The previous experiences regulate the speed of insight; however, past experiences do not guarantee that insight will be possible.
3. The design or arrangement of the situation.
4. Insight may follow a period of trial and error; however, this trial and error need not be blind or fumbling behavior. It may be a trial and error selection of the appropriate traces.
5. The solution to problems gained by insight can be repeated in the solution of similar conditions.
6. After having achieved this insight it can be used in new situations or new problems.[38]

Holistic concept and insight. The mechanistic concept does not lend itself well to the problems of insight because it becomes difficult to have insight upon seeing the parts separately. Insight will probably come more quickly upon seeing the whole of the field. For

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[38] Thorpe and Schmuller, op. cit., p. 220.

example, notes of music have very little meaning unless they are arranged in the order and with the accompanying characteristics the composer intended. Then they have a melody or have value. A note by itself has very little meaning. The parts of a table have very little meaning by themselves. They are nothing more than boards of some dimension, but when they are placed in their relative position, they take on new meaning. They develop a wholeness--a table. The wholeness has more meaning and takes on a different form from that which one finds in the summation of the boards of various dimensions. The Gestaltist would quickly agree that past experiences with these things assists in acquiring insight if these past experiences had meaning. The fact that one has a considerable vocabulary does not necessarily mean that he can write a poem. The fact that one can identify the type of wood to be employed in the construction of an item does not necessarily mean that he can construct the item.

Trial and error and insight. Random trial and error with seemingly no thought or justification is inexcusable in intelligent behavior. In fact, haphazard trial and error indicate the lack of intelligent behavior. There is a place for a type of intelligent trial and error which may be better described as problem solving. For example, when an hypothesis is tested, that is a trial. Error may appear, calling for a realigning, and the development of a new hypothesis aimed toward the solution of the problem. This is intelligent trial and error, not the running of the gamut of habits until one is found that fits

the condition. Random trial and error and insight are not compatible. Trial and error in this sense has little to offer toward the gaining of insight.

Implications for Education

The interpretation of the Gestalt psychology, with its trace theory and law of Pragnanz, is quite a difficult task. Yet, applying this interpretation to classroom methodology to guide behavior in establishing a good environment for purposeful learning is a challenge of major importance to the educator.

There are several problems of the nature of learning with which any acceptable psychological theory must deal. These include the role of habit formation in the educational picture, the instructional environment conducive to a "good" learning situation, the meaning and development of a curriculum, and the development of the personality. Following is a brief discussion of the Gestaltist concept of these matters with some sidelights on different viewpoints as expressed in other psychological theories of learning.

Habit formation. Under Watsonian behaviorism attention was called to the correct habit formation. If a child did a thing in a particular way, the chances were that he would continue to act in like manner; therefore, it became quite important for the teacher to direct the first response so that it would be correct. In this way one could develop the correct habit responses of life's behavior. As an example, if there is a correct way to grip the hand saw handle, this

correct way must be used the first time the child uses the hand saw so that he will not develop the wrong habit in using this tool. This correct habit response also applies to spelling, word pronunciation, multiplication tables, reading and the like.

This conception of habit formation left out a major principle of development. As a child moves from one phase of development to another, he revises many of his behavioral habits to suit the occasion. The dirty, ragged, unkempt adolescent will develop into a rather dignified gentleman in dress and appearance when he acquires his first girl friend. This change tends to contradict the concept that habits once formed will be utilized in like manner the rest of one's life. Habit formation under the Gestalt notion does not have the same meaning as under the behavioristic concept. Education under the Gestalt psychology seeks to develop ways of doing things that will be helpful to the person in making adequate adjustments for the "good life." Dewey states that:

> . . . Habit means that an individual undergoes a modification through an experience, which modification forms a predisposition to easier and more effective action in a like direction in the future. Thus it also has the function of making one experience available in subsequent experiences.[39]

Mechanical habit apart from knowledge, understanding, or insight does not lend itself well to change or novelty. For example,

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[39]Dewey, op. cit., p. 395.

as long as the machine is operating in a normal manner and nothing unusual shows up, the mechanical habit may be able to suffice; but when something unexpected occurs in the running of the machine or when different sizes of stock are being interchanged, the student does not have habits on which to rely. This would mean that man should understand the machine and know what he is about, rather than depend on a set of mechanical habits to guide his behavior. Understanding of a machine encompasses much more than a set of mechanical habits. It includes the element of safety, how the machine may react under various conditions, and all of the idiosyncrasies of the machine. In brief, habit supplies one with a fixed method of attack, whereas insight implies that the selection may be made from a wider range of traces. Situations to which one responds through mechanical habit have little significance for intelligent insight. When intelligence comes into play in determining new behavior, there is a mental reward or action which is much more satisfying and meaningful to the individual. Habit formation under the trace concept indicates that each repetition is not the same repetition but that it has similarity to the first. If too much drill is employed, it tends to stifle the intelligent behavior of the individual when unusual or even similar cases arise.

The phrase "motor learning" is often used in conjunction with penmanship, swimming, and many other "manual" movements that the body performs. The motor or observable behavior seems to take precedence

in this type of action or learning, but it should be remembered that the total organism is necessary to the performance of the complete act. The total organism is involved in the learning or acquisition of any skill.

Instruction. The Gestalt psychology indicates that instruction will be geared to individual differences. Each child's level both in maturation and aspiration will be taken into account. The employment of this concept is hindered, however, by the crowded classroom conditions which make individual instruction rather difficult. The instructor can provide motivation that is on the intelligent level of the individual and can present the material in a pattern rather than in the atomistic form. Instruction will be for the development of the intelligent person through a problem solving system and not, as the behaviorist would indicate, the mere stamping in of the correct responses or behavior habits. The teacher becomes more of a guidance and consultant person working with individuals, groups, and the class in a democratic manner.

Curriculum. The problems and interests of the student play a dominant role in determining the appropriate activities to be utilized in any subject area. Student participation in planning the activities encourages him to analyze his needs and relate them to the group needs. The experiences scheduled have real meaning. He sees the relationships of the various phases of the program as they are related to his own needs and the needs of the group. This method gives the student a feeling of

being able to direct his own program as he strives for self-realization. It permits him to gain insights into the purpose of the total program.

Student direction and planning are, however, geared proportionately to maturation and to the past efforts to direct and plan a program. It would be impractical to expect students in the elementary grades to assume the same responsibilities for program direction as high school students. The student should attempt to do more and more planning toward the stage of self-direction as he matures. This is a growing process.

The teacher's part in all of this planning is not that of a laissez-faire attitude. He takes on more responsibilities. His leadership and guidance take on many new characteristics. He directs the activities within the level of maturation of the individual. He gives leadership in determining the program appropriate to the interest and needs of the group. The curriculum is not student planned, nor is it teacher planned, but it employs the combined efforts of teacher and pupil in an intelligent democratic manner.

Some high school courses are considered electives. The student often gives an indication of his need by selecting this or that course. Guide lines of a broad nature are already formed for these areas; therefore, the teacher-student planning stays within the confines of this framework.

This student-teacher planning cannot be carried out under the behavioristic influence or the great books notion where authorities

have established the content of the curriculum. They know what is best for the young. Life's problems have been analyzed and the way of solving those problems found. They know what habits or knowledges a person should have. Textbooks and workbooks have been developed under close direction. These represent the authority for the content of the course and curriculum.

Personality. In the process of learning there is need to give serious attention to the student's personality problems, intellectual growth, and psychological needs. The teacher plays no small part in this process. His role as counselor takes on new meaning. He needs to observe the growth and development of each child under his charge. Because the Gestalt theory employs the movement of the individual into a field, the teacher is responsible for presenting suitable stimuli for the motivation of the pupil to his fullest extent. The development of the personality is involved in learning, and as such, it becomes an interlocking aspect of the educational process. Personality is "a complex entity whose reactions represent relationships entered into with other entities constituting its environment."[40] Some of the more common entities are attitudes, understandings, skills, experiences, knowledges, values, beliefs, and the effects of the various institutions of the culture. All of these things go to make up what one may call personality. Personality has a certain degree of stability.

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[40] Park, op. cit., p. 234.

Change is very slow, permitting one to recognize the same person from day to day.

Personality development as a school objective has come to be held in high esteem. Some have criticized it on the basis that it has taken the place of some of the legitimate subject matter content. Others feel that the attention given to personality development is not a rival at all to subject matter, but that it tends to develop the total person. Therefore, it is a responsibility of the school system to contribute as much as possible to the optimum development of each person.

CHAPTER IV

MODERN CULTURE

In the beginning this country consisted of small bands of people, many of whom sought a type of freedom not available to them in their mother country. Of the many beliefs they brought with them, one seems to have been paramount in their thinking: the right of each person to worship according to his beliefs. This seems to have been the beginning of democracy in this country. How it has changed and what caused it to change is a very interesting bit of history. Is it right and proper to accept opinions, beliefs, knowledges and modes of behavior of the past generation without question? Is this the way to perpetuate a society? It is now known that any social structure that remains at the status quo will soon fall. It can no longer compete with an intelligent, vibrant society--a society that is continually striving to better the life of the individual within its group. Modern culture is what it is because it has accepted elements from the past, both good and bad. The more intelligent members of the culture have accepted these elements with the stipulation that they may be altered, redirected, or excluded when evidence is found to support a better way of life.

Complexity of Modern Culture

As the culture evolved and its many changing political, economic and social issues became increasingly complex, it became necessary for

man to find improved ways of transmitting the culture. Man set aside a block of time when each individual received instruction in the customs, traditions and skills believed necessary and good to preserve and continue a way of life. This duty was placed upon the educational phase of the society.[1]

As each generation transmitted its new found knowledge, along with the traditions, beliefs and know-how, to the new and coming generations, growth occurred in many directions. The scientific and industrial competences have occupied attention in recent years and have developed to a high degree. Because man desires to do away with poverty and want and because of his inventive genius, that segment of the modern society which is now called industry received a large share of credit for the modern way of life.

> The social and economic pattern of living in Tennessee is vastly different today from that of a quarter of a century ago. Changes that have occurred are due mainly to the rise of industrial activity as a primary base of the State's economy, a decline in the relative importance of agriculture as a way of making a living and as a way of life, and a mass movement of the population from rural areas into urban centers inside and outside the State. . . . These conditions present tremendous challenges to education at all levels.
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> These challenges involve a constantly expanding need for broader and more intensive programs concerned with the various aspects of a growing and complex industrial society.[2]

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[1]Joe Park, Selected Readings in the Philosophy of Education (New York: The Macmillan Company, 1958), p. 3.

[2]The Tennessee Legislative Council, Public Education in Tennessee--Grades 1 through 12 (Nashville, Tennessee: 1957), p. 1.

The problem of describing the culture within the framework of the total elements involved and its potential influence upon mass humanity is a difficult task, one that would take considerably more attention than can be given here. The complexity of modern society with its many social beliefs, habits, customs, traditions, institutions, philosophies, and the like may be compared to the heavens at night where one finds many celestial bodies of various magnitudes. As one attempts to enumerate the elements that are evident in a complex social structure, the listing becomes cumbersome.

Below is a pictorial representation of the interaction of two large elements found in modern culture, education and industry. It can readily be seen that the complexity grows geometrically as an attempt is made to show the various elements of society and their interaction. If attempt is made to include more than a few elements in a diagram, the interactions soon become so numerous as to be meaningless.

It will be noted that there are movements of influence in all directions. Industry can affect the culture directly and through education. In like manner, education can affect the cultural behavior and can exert influence upon the culture through industry. The interactions of the various forces soon become as plentiful as the highways leading to and from a large city or the network of roads across the nation.

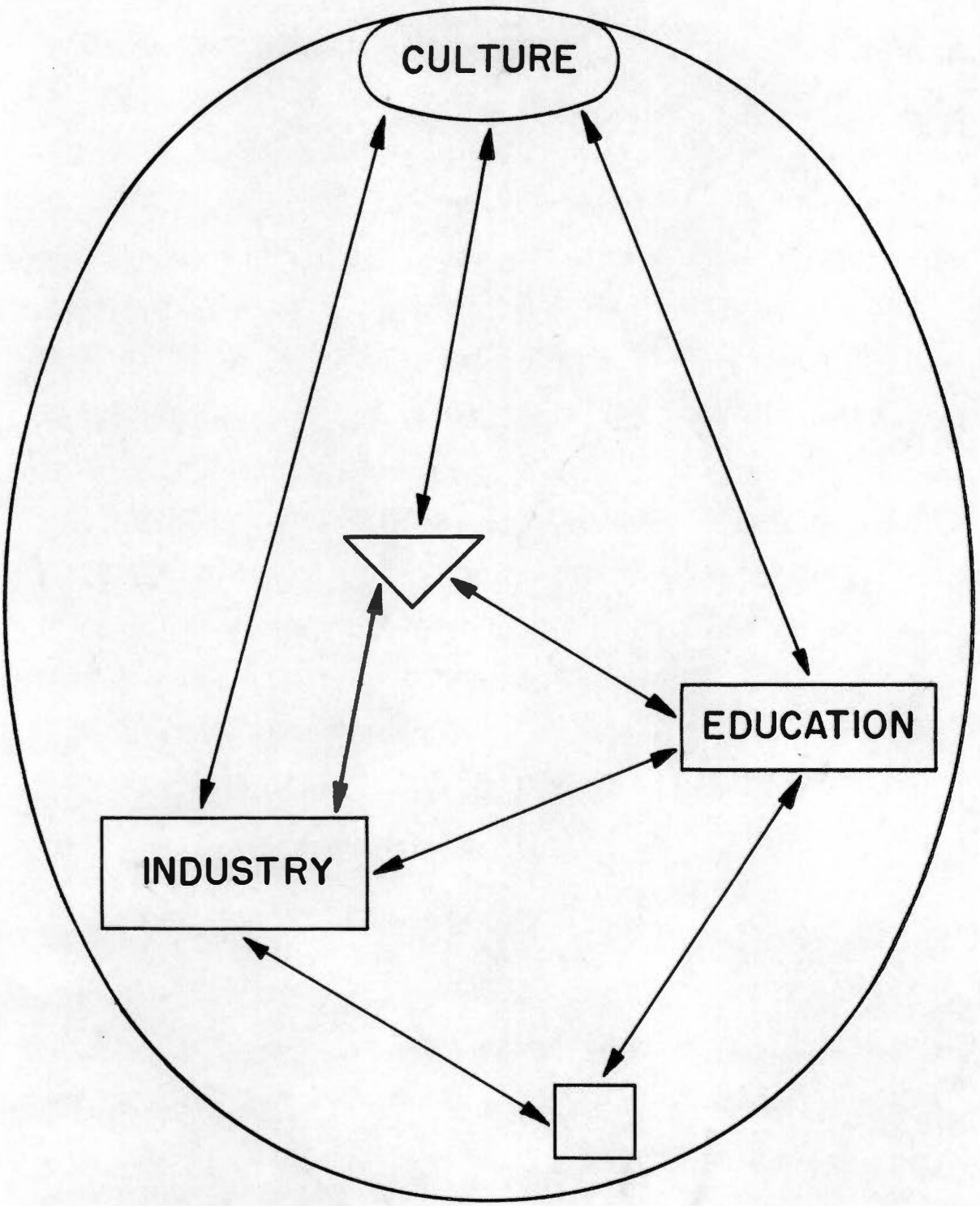


FIGURE I. INTERACTION OF CULTURAL FORCES

The growth of industrial and technical development has changed the society of this nation. Industry demands higher technical skills. It has given labor shorter working hours. It has given the masses more buying power, more leisure time, increased security and has for the first time in the history of the world alleviated for a considerable number of the people of this nation the element of want. As the approach is made toward more complete automation, industry will continue to exert influence upon the society and the way of life.

It is the business of the school to develop democratic citizens who have competence in social living and have gained abilities to gather the necessities of a livelihood. Industry has caused some changes in the educational program. ". . . education's own influence depends primarily upon the strength and sanction it receives from the cultural forces with which it is interfused."[3] Many new programs have found their way into the classroom within the last century. As industry has made greater demands the technical schools have developed more completely. The vocational educational program (federally aided) has come into the modern high school. Industry then does demand that those responsible for education take cognizance of the nature of industry as changes are made in the system responsible for the improvement of society.

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[3] Theodore Brameld, Ends and Means in Education: A Midcentury Appraisal (New York: Harper and Brothers, 1950), p. 127.

For further insights into the complexity of society, a discussion of some of the larger elements of society seems justified. Five of these will be considered here. (1) Traditions greatly influence society and often cause it to react in many strange ways. Attention will be given to traditional causations surrounding philosophy, politics, religion, sex, dress and education. (2) Machines have brought about considerable change in modern society. Emphasis will be given to automation and its probable influence toward cultural change. (3) Institutions are plentiful in the American culture. The church, state, family and economic institutions will be given some attention. The school as an institution will be discussed in some detail. (4) Science, its struggles with various social forces and its rise to respectability, has implications for the modern culture. (5) Democracy as a way of life will be discussed briefly.

Traditions

It would be difficult for every new generation to take over the development of society and start from the beginning. Each new generation accepts or is indoctrinated with some of the traditions of the older society. The traditions are handed down from generation to generation.

> . . . Naturally each generation inherited the accumulated beliefs of the past; and fortunately so, for the most part, since the alternative would have been utter intellectual darkness. A half light is better than no vision; besides, light is something that has to evolve, like the coral. As

> a result of this process of accumulation and transmission, even we moderns, like all our forbears, live in a medium of inherited popular beliefs covering every conceivable problem and phenomenon of our life and environment.[4]

It would be well if all of these traditions were good, but society takes the bad with the good. It becomes the indirect problem of education to aid in weeding out or redeveloping traditions so that the undesirable ones may be eliminated. Each generation receives from the previous generation mores, collected knowledges and much scientific know-how. All of these things are being developed by various steps, eliminating falsehoods in the scientific and knowledge accumulations. With the slow moving society it has taken many generations of the past to work facts and data up to their present status.

It has been stated that children will most likely receive or adhere to the same concepts of religion as their parents.

> People born Catholic or Moslem stay with that faith and die in it. After more than three hundred years of Catholic propaganda, education and domination, the Indians of South America still cling to their old religion, and though they pay lip service to Christianity, they are pagans at heart.[5]

> Religion is also a very solid and respectable pillar of the "status quo," acting as a stabilizing and conservative force, that is why it has always obtained the wholehearted support of the wealthy and the powerful.[6]

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[4]Park, op. cit., p. 16.

[5]J. M. Martinez, Man in Nature and Behavior (New York: Philosophical Library, 1951), p. 84.

[6]Ibid., p. 130.

Many of these groups do not further pursue the reliability or delve into the innermost sanctum of their religious convictions, but accept them at face value without question.

The concept about sex has considerable impetus toward the behavior of a society. There appears to be a current change in attitude as some attention is now being given to instruction in sex education in the public schools.

The social dress is traditional. There is a change in dress, but it is usually gradual. The various countries of the world dress somewhat differently and their dress is an accepted custom of the people. The Chinese citizen dresses differently than the Frenchman. The Eskimo is accustomed to a different dress from the American. The custom of dress does contain some connection to climatic conditions, but only in a broad sense. One of the usual habits of dress of the American culture is the tie worn by the male. What good this item of apparel does toward keeping the individual warm or comfortable, it is difficult to say; yet, it has been a part of the American dress for generations.

There is a tendency on the part of the lay citizen to believe in the type of education he or she experienced. This system of education he understands, whereas new methods or new subjects inserted into the school program often leave him in a state of confusion. "What was good for my forefather is good enough for me and my children."

> . . . forces in America which attempt to preserve inherited educational practices simply because they are inherited--the forces which in every society shy at change; which see in the slightest progressive act some threat to the achievements of our forefathers; which oppose experimentation not because of understanding what a particular experiment involves but, more likely, because they lack such understanding.[7]

Tradition in the school may be based upon the philosophy of an individual. If education is for the study of the great principles of truth--eternal truths--handed down from the past, then the curriculum would consist of a study of the learned men of all ages. Attention would be pointed toward the great books program. The classics would be searched for truth--truth that is good and beautiful. The traditional college preparatory programs of the secondary schools and the liberal arts programs in the colleges are still based largely on such a concept of education.

> . . . Its curriculum would consist of "the permanent studies"--the classics of such great fields as philosophy and literature--and in addition grammar, rhetoric, logic, and mathematics.[8]

Many other traditions have influences upon the social behavior. Some of these are political affiliations. "Our family members have been Democrats for generations. We vote no other way." Many families are held together by traditional behavior. The attitudes toward the older and younger members of the family are tradition bound. The concept

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[7] Brameld, op. cit., p. 19.

[8] Ibid., p. 21.

held concerning the current problem of race relations is begun in early childhood. Many other basic beliefs about life are instilled in the young by the adult population.

Traditions are necessary for the existence of mankind. They can be the stepping stone to greater good for humanity or they can be a retarding process. If education can arouse the individual to analyze intellectually the traditional elements and to eliminate the undesirable, then society can go forward. If the members of society do not possess this ability, some traditions will become a retarding factor to social progress.

Machines

The prehistoric man developed crude tools of stone and used them to provide the necessities of his simple life. As man began the slow progress toward more complete living, many seemingly unimportant ideas and inventions were added to his supply of knowledge. These mechanical contrivances aided him in supplying the basic needs for his family and home. These mechanical gadgets were a part of the society of that period just as were many of his rituals and customs of worship. As man began to evolve slowly from the primitive stage, the invention of the wheel had profound influence upon his way of life. The wheel invention created much change in the society. It was employed by some groups to aid in transportation and used by others in the art of ceramics. As various members of the social groups began to gather certain mysteries

of their trade, they developed tools that would aid them in the better performance of their art. In this evolvement society began to use the elements of nature to aid man in doing physical work. He harnassed the wind, the water, and, in many cases, he used human and animal power in providing the sources of energy to make his work lighter and more efficient.

Man finally developed enough know-how and mechanical ingenuity to work out machines that would aid him in carrying out his tasks. This brought about a diversity, actually a reduction, in the artisan skills of the people. It resulted in more articles for the society at a reduced cost with an easier and more efficient way of doing the work. He harnassed new sources of energy--electricity and atomic energy. These changes brought about a highly industrialized civilization. Many machines were developed to do the physical work. These machines were operated by man. Man was the overseer; yet, man was the slave to the production procedures brought about through the use of machines. It is said that man is an extension of the production line. As one observes the highly industrialized industry where the production line is the necessary element, one notices man doing one job repetitiously from day to day. He becomes a necessary item in the production line and becomes an extension of the production line. In this status man is not a problem solving individual. This activity reduces him to the lower state of a mechanical robot, causing his mind to become inactive due to the nature of his job.

Intelligence in the industrial phase of modern culture seems to be gradually receding from the operation of production and becoming concentrated in the departments of design, conception and execution of machines, and in the areas of planning and personnel. These are the new areas that seem to be gaining momentum as industry approaches the era of automation.

The automobile is one of the results of twentieth century industrialization. It has caused considerable change in the way of living. It is now an accepted and commonplace item in American society. The automobile has broadened the world for the owner. He is able to drive four hundred miles easily in one day. This is much more rapid transportation than was possible with the types of conveyances known in the early stages of this country.

Automation

The American industry is now undergoing another unique change--the change to automation. Many attempts have been made to give an acceptable definition of the term automation, one that would satisfy both industry and business. General Electric defines automation simply as "continuous automatic production."[9] Mr. Brodinsky, in an article in The Nation's Schools, defines automation as:

> Something built into mechanization which will take and give many kinds of directions--compensate for deficiency

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[9] Ralph J. Cordiner, Testimony on Automation (Schenectady, New York: General Electric Company, 1955), p. 3.

that may develop when compared to the original specifications.[10]

The dictionary defines automation as a "science of operating or controlling a mechanical process by automatic means, such as electronic devices."[11] Most definitions acknowledge an element of feedback for the purposes of judgments, corrections, or adaptations. It may be controlled by a tape system or other electronic devices.

Due to the unique nature of industry under automation, it will of necessity need to operate twenty-four hours per day. This is brought about by the tremendous expenditure necessary for tooling up an automated plant. This will mean increased production which is in the best interest of all--the producer, the employee and the consumer. With increased production comes lower prices, increased wages, more buying power. For centuries peoples of the world have felt the pangs of hunger and want. Man has long had a desire for the basic needs and he has had to work long hours in order to satisfy these needs. Within the last century man has finally come to the stage in life where he can earn the necessities, with a few luxuries, by working eight hours per day. This leaves him a considerable amount of his waking hours to do those things that he has always wanted to do. As labor enters automation with this basic forty hour week, it seems

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[10] B. P. Brodinsky, "Automation Means a New Era for Education," The Nation's Schools, August 1956, p. 35.

[11] The American Everyday Dictionary (New York: Random House, 1955), p. 31.

likely that the working hours may be shortened still more. Because man must be better equipped to perform the responsibilities of this task under automation, he must have more and better education. This, along with increased productivity, seems to imply a healthier industrial citizen, one who desires time to pursue the pleasures of life with his family and associates.

As stated previously, the production worker is often an extension of the production line, and as such he may also be a slave to this production line. This possibility seems to be largely eliminated under automation. Automation will control the repetitious jobs found in mechanized industry and the human robot will no longer find employment.

> Automation will require ability to think, a trained imagination, and good judgment, plus some skill in logical methods, some mathematical understanding, and some ability well above the elementary level to read and write--in a word, the normal equipment of educated people.[12]

> Automation will upgrade the semi-skilled machine operator of today into a highly skilled and knowledgeable technician--multiplying his income again. . . . Automation will lead to "the human use of human beings"--that is, to our using man's specifically human qualities, his ability to think, to analyze, balance and synthesize, to decide and to act purposefully--instead of using him, as we have done for millennia, to do all the dreary work machines can do better.[13]

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[12] Peter F. Drucker, America's Next Twenty Years, Reprinted from the March, April, May and June 1955 issues of Harper's Magazine, p. 11.

[13] Ibid., p. 10.

A highly important fact to consider is that the development of automation frees man of the more irksome type of activities so that he may be concerned with the more important problems of industry. Life in this new culture will become more enjoyable. One will have the time to become engaged in the higher types of activities conducive to intellectual selfhood.

Skills that were essential ten years ago are no longer needed under automation. This means that the worker will need to look anew at his capabilities. This is not the sole responsibility of the individual worker, but also becomes a social obligation of management and labor. Automation must not be responsible for mass unemployment. Industry must be mindful of the people affected. This is one of the many problems that must be solved effectively as modern society goes about the task of converting to an automated industry. It should be kept in mind that this is not an overnight transition, but is one that will take a number of years to accomplish.

> Socially, the shift in job opportunities therefore should be healthy. But it will still impose on management a responsibility to plan systematically for the retraining and placement of workers during the shift to Automation. Union leaders, too, should similarly accept responsibility for the changes in their rules that will be necessary.[14]

Technological progress tends to set off a chain reaction in economic growth. More production machines reduce cost and the price

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[14] Ibid., p. 11.

of the commodity, thus increasing the volume of business, in turn creating a need for more workers. Unfortunately, this reaction cannot continue indefinitely without the incentive of new markets. New markets may be obtained in a number of ways: ship to foreign countries, arrange price and commodity within reach of the lower income group, create buying power through higher wages, or create a need or desire in the groups not now using a product.

Groundwork is now being laid toward a new contract between the producer and the consumer. Basically, it works on the premise that with an agreed monthly payment industry will periodically replace the old appliances with new ones. This arrangement would give industry a more stable market for its products. It would also assure the consumer of having available the latest developments within the technological field. This arrangement would give automated industry the incentive to proceed more rapidly toward complete transition.

Air travel has narrowed the boundaries of this country considerably. Intercontinental air travel has caused man to become more conscious of the societies in other parts of the world. As the scientific and technological efforts continue in the direction of interplanetary travel, man's horizon continues to increase in complexity. His duties toward man in other parts of the world become more important. As the horizon becomes wider, interest will become more diversified. The individual can no longer live in isolation in his own small universe, but he must be concerned about the welfare

of the one-time distant societies. Automation will speed this phase of social change as the machines of man's ingenuity continue to alleviate human suffering and want. Machines do influence the type of culture existing in a nation.

What does all this mean for the educational phase of modern culture? Will the gradual changeover to automation create a needed change in the educational content or objectives? What will this change mean to the programs that require two to six years for the learning of a trade or skill? Will the individual with such training be equipped with a skill that soon becomes obsolete on the labor market?

> Under Automation, a school could do a student no greater disservice than to prepare him, as so many do today, for his first job. If there is one thing certain under Automation it is that the job--even the bottom job--will change radically and often.[15]

Education is said to be a reflection of the culture. It can only be as good as the culture demands. Education is the medium whereby the society changes its beliefs, its ideas and its values. It is the area where democratic society expects the development of democratic citizens. It appears that man in the automated society must be educated for change--for change seems to be the only thing that is constant.

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[15] Loc. cit.

Institutions

Institutions in modern culture are plentiful. They give impetus toward a mode of behavior for the people of a nation.

> . . . the term institution is applied to those features of social life which outlast biological generations or survive drastic changes that might have been expected to bring them to an end.[16]

The family may be called an institution since the behavior patterns of a family are more lasting than the life span of one generation. A ceremony may be used and followed for many generations without the participants knowing the origin of its inception. In some cases if the origin became known, the ceremony would be repudiated, discontinued, or changed. When the mores become stable in a pattern of behavior for a group, the result is usually an institution.

The church, the state, the school, the family, the civic organizations are all institutions with which one is familiar. As society becomes more complex, the number and variety of the institutions multiply.

It is stated that one can judge the progressiveness of a community by a study of the number and kinds of existing institutions. Many of these set the economic standards for a community. Others are the stabilizing or determining factors in the development of the morals of the individual resulting in the mores of the social group. Some

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[16] Alfred McClung Lee, Editor, Principles of Sociology (New York: Barnes and Noble, Inc., 1955), p. 225.

institutions are dominated by a kind of dogma that tends to maintain a status quo resulting in a society that shows very little social change.

Some authors divide the institutions into broad classifications--those basic institutions that furnish the economic base to society and the service institutions that give society its cultural services. Some attempt to separate institutions from folkways is made. In fact, there are many various classifications to be found. Important classifications of the major types of institutions are: the family, political institutions, economic institutions and the church.[17] As these are the major institutions, it would be well to look into them in more detail.

The Family Group

The family in society implies many things--wedlock, established household, reproduction of the race, property interest, and the like. The activities carried on by the family vary from one social class to another, from one country to another, even from one region to another.

The family unit in this generation has changed considerably. Some fifty years ago the large farm family had economic advantages

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[17] Harry L. Shapiro, Man, Culture, and Society (New York: Oxford University Press, 1956), pp. 261-285.

over the small family. The children could be put to work on the farm at a very early age, helping to raise the family's economic status. The fear is now expressed that the family as an institution is losing its importance and is about to disappear. The family in the higher economic bracket tends to have fewer offsprings than one in the lower bracket. This may be due to a number of reasons, one of which may be an improved understanding of the cost of rearing a child to adulthood in the modern society.

In order to study a family in society it is necessary to know many things. The marriage manners, race, religion, class, occupation, and other factors, all have an effect upon the household that is maintained. The family unit in its activities have effect upon the personality of the individual and his choice of occupation. The relation of the family to other institutions, such as schools, churches, and government, depends in various ways upon the nature of family life. The ideas or beliefs of the family concerning divorce, the family structure, the idea of husband governing the household or of a cooperative enterprise have effect upon the personality development and morals of the individuals in that family. No other institution has as great a role in the transition of the individual from infancy to adulthood, and to some extent thereafter, as does the family. The family may become a we-group, have definite speech mannerisms, have an anti-Jewish attitude, or may be completely void of any prejudicial attitude toward any group. All of these different potentials should be understood

by people in education since they have profound effect upon the institution of the school.

Economic Groups

The economic institutions to a considerable degree govern the production and distribution of the commodities of society. The chain stores, the factories, the banks and many other institutions with their various specialities form a good part of the economic life. The stock market is a good example of an institution that is controlled by the people's choice. It is felt that in a modern society these institutions have great effect upon cultural development.[18]

The Church

The church is an institution that has been in evidence in one form or another since primitive man. Any phenomena that could not be understood became objects of worship. There developed right ways of behaving toward the sun, the moon, a storm, a fire to the extent that to behave otherwise was to ask for the wrath of the gods. Without plan or design each group developed a pattern of behavior and worship and became an institution with many rites and rituals. Religious requirements differ among the many faiths on the face of the earth. Here, in this country, one finds a breakdown of the Christian faith. The Catholic and Protestant beliefs are further divided into

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[18] Paul H. Landis, Man in Environment (New York: Thomas Y. Crowell, 1949), pp. 347-357.

sects--all having different beliefs or behavioral habits in their order of worship.

The church today does not have the economic and political power that it once had, but it is still important in those fields. The churches of today are faced by a growing secularization of life and by an increasing indifference on the part of the populace. In spite of this indifference the church exerts many forces upon the social behavior of other institutions as well as upon the individual.

The School

The school is fast becoming one of America's greatest institutions. It was established early in this country's history as a phase of religious training. The purposes then were considerably different than are the aims and objectives of the modern school. The early schools were responsible for the three R's with some religious and moral instruction. Other means were utilized to give social and economic security.

> . . . Today, however, the problem of passing on the cultural heritage to the young, of teaching them the things they must know to function in the social system, has far exceeded the ability of the family and of the neighborhood to educate. With the increasing complexity of the cultural heritage, its transmission to the young has become such a major task that education has emerged as one of the great institutions of our time, and the end is not yet.[19]

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[19] Ibid., p. 297.

In rapid succession the changes of poor schools, public schools, compulsory attendance, restriction of religious teaching, federal aid, and the like, were demanded. It seems that every year increased responsibility is placed within the realm of education. The unprecedented number of high school graduates and the influx of college freshmen are adding greatly to the burdens of the slow changing educational system. The American people are now faced with a controversial problem. It may be many generations before the question of integration recedes from the foreground in American education.

The American school is taking over responsibilities that were once considered home duties. It is supplementing the economic institutions. The loss of the apprenticeship system as a paramount method of training has placed added responsibility on the public schools and colleges. The school is looked upon as the institution to instill into the individual respect for law and government and to train individuals for loyal citizenship. It is charged with developing an understanding of right and wrong and producing an acceptable moral citizen.

The schools of a democratic nation have different objectives than do the institutions under other forms of government. As an agency of democracy, education becomes a door through which individuals may approach the broad opportunities that are available in a democratic culture. In democratic societies education tends to shape the individual for an individualistic social order.

> The high school, in that it deals with a large youth group on the threshold of maturity, has probably been the most leveling influence in American democracy. It throws together youth of all classes and lets them compete on the basis of ability. For this reason, it tends to erase class lines and to encourage participation as equals on the basis of intelligence. Extracurricular activities and social life also erase class barriers, paving the way for intermarriage across class lines.[20]

Many of man's institutions are built out of the past through the elements of trial and error. When an institution fails to meet adequately the needs for which it is intended, it is eliminated and another takes its place. When the educational institution no longer meets the basic human needs, then it too will pass from the scene.

Science

"Ours is an age of science. The inductive technique of objective research dominates the work of the intellect; and an amazing array of new knowledge is forthcoming as a result."[21]

The rise of modern science has been a struggle for freedom from external control. It has been an effort to free man from the supernatural preconceptions of clerical domination. This has been a hard and long battle and it is not over. For example, a number of the states have acts of legislation which prohibit the discussion of scientific data pertinent to the origin and development of man.

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[20] Ibid., p. 303.

[21] Park, op. cit., p. 12.

During the Middle and Dark Ages scientific progress was particularly slow because of the religious element of that time. It was held that the universe was divided into two parts, the natural world and the supernatural world. For generations things of the supernatural world overshadowed and dominated the elements of the natural world. Therefore, ideas, beliefs and opinions concerning the existence of man arriving from the supernatural concept superseded any evidence put forth by the natural world. The great truths from the supernatural were conjectures of the mind as revealed through meditation. Consequently, very little effort was applied toward the scientific study of nature as such. In fact, the church discouraged such scientific adventure and whenever evidence was put forth by some faction which was or could be in contradiction to the ecclesiastical truths, that faction was persecuted by the church.

It was not until after the Dark Ages that a study of science began to flourish. Man began to seek out the truths of nature and placed less emphasis upon the revealed truths found in the religious dogma. True, this advancement was slow and the society did not accept readily any proof of data about nature arrived at through scientific investigation. The laws governing the bodies of the universe were established by the church and were believed by the religious groups. Any evidence brought forward by science upsetting these theories was looked upon with contempt. Galileo created trouble for himself when he dropped the balls from the Tower of Pisa, thus upsetting the concept of gravity established by the church.

During this age when scientific progress was slow, learned men (so-called) had considerable contempt for the practical or the manual pursuits and processes of everyday life. Consequently, they strived to develop knowledges and facts from general principles, logical reasonings, revealed truths and armchair logic. It did not seem feasible that learning or truth should come from actions or the study of the physical things of the universe for they were not held with as high an esteem as the supernatural. It is interesting to note that the sciences of today actually developed from the useful occupations of the social structure.

> . . . Physics developed slowly out of the use of tools and machines; the important branch of physics known as mechanics testifies in its name to its original associations. The lever, wheel, inclined plane, etc., were among the first great intellectual discoveries of mankind, and they are none the less intellectual because they occurred in the course of seeking for means of accomplishing practical ends. The great advance of electrical science in the last generation was closely associated, as effect and as cause, with application of electric agencies to means of communication, transportation, lighting of cities and houses, and more economical production of goods. . . . chemistry grew out of processes of dying, bleaching, metal working, etc., and in recent times has found innumerable new uses in industry.
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> Mathematics is now a highly abstract science; geometry, however, means literally earth-measuring: the practical use of number in counting to keep track of things and in measuring. . . .[22]

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[22] John Dewey, Democracy and Education (New York: The Macmillan Company, 1916), pp. 235-6.

Most people think of physics, chemistry and biology when science is mentioned, but a study of science seems to mean little unless it transcends into the social sciences. Scientific experimentation is not an end within itself, but is for the purpose of improving the social sciences, the behavior of man with man, man with the elements, or the control of nature for human uses. Even today the supernaturalist attempts to impose dogmatic views about nature and the universe upon the society, when science has proven through intelligence applied in the scientific method that he is in error.

Let it be brought out, however, that many church leaders are now of the opinion that freedom of thought and belief are primary spiritual values. These leaders perceive each human being as having freedom--being able to make up his own mind on the basis of the evidence available to him regarding his moral and spiritual beliefs. They have respect for the intelligence of the individual and his ability to evaluate data for himself. This is a step toward closer harmony between religion and scientific development.

> . . . These modernists have learned that the growing faith in the power of man to develop his own directing moral principles, along with the spread of scientific inquiry to all realms of experience, including the realm of human personality, morality, and religion, carry far-reaching implications for classical religious outlooks. It is becoming increasingly apparent that the effort to achieve a new religious orientation in harmony with modern habits of thought entails a more drastic reconstruction than many had anticipated. Modernists shrink from this reconstruction and are involved in deep conflict as they seek to reconcile their contradictory outlooks and allegiances. Many believe that the new

> religious orientation will have to assume a bolder position.[23]

Discussion has been given concerning science and its difficult battle to win acceptance in the lives of men. Having won this acceptance, science has established segmented bodies of subject matter that are now being taught in schools. As society arrives upon the threshold of technological and scientific developments, having placed satellites in outer space, and now culminates in thoughts toward interplanetary travel, what should be the status of science in American society? What are the principles that the scientists may apply in the laboratory? Can those scientific principles be applied to social sciences and the behavior of man? Is there a method of science employed by a person who is said to have competent behavior? In order to have competent behavior one must have an element of intelligence and intelligence implies the scientific method for problem solution. Accepted ways, social customs of behavior or emotional reactions tend to reject problem solving, thus intelligent behavior.

The scientific method has been discussed in detail in many publications. In brief, the scientific method is said to employ several steps toward the solution of problems.

> . . . identifying the problem, gathering information relative to the problem, making a guess or hypothesis regarding possible solutions or remedies for the problem, engaging in activities designed to test out the truth of the hypothesis, and finally, evaluating the effectiveness of the action and, if necessary, formulating new hypothesis to further attack the problem. So stated, however, the

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[23]John L. Childs, Education and Morals (New York: Appleton-Century-Crofts, Inc., 1950), p. 124.

> scientific method becomes a rather rigid activity. These steps constitute only a small part of the method; of considerable greater importance is the mental attitude. In the final analysis, the scientific method represents an attitude toward truth and constitutes a procedure for applying certain rigorous criteria to the attitudes and findings.[24]

Ever since this method of problem solving has come into use by the human race, it has been opening many new doors and creating need for many changes in the social behavior of mankind. Not only is the scientific method being employed in the laboratory, but it is being employed in modern societies to produce or to modify a way of life. Edison's work with electricity was a product of the laboratory that gave impetus toward social development. It made possible many contrivances which are used in the homes today. The modern automobile, the Diesel trains, the modes of entertainment are all results of this scientific development. New knowledges gained through the laboratory do affect the area of human relations and do not terminate with the discovery of knowledge. This is an illustration of how scientific fact can alter or change human life. Scientists now believe that cancer is curable. If and when the data and knowledges are available, mankind can alter its behavior to employ these new facts of the scientific laboratory.

How shall this total element of science be treated in the institution of the school? Should it be taught as an end in itself?

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[24] Orin B. Graff and Calvin M. Street, Improving Competence in Educational Administration (New York: Harper and Brothers, 1956), pp. 140-1.

The school curriculum contains certain bodies of accumulated knowledges headed under physics, chemistry, biology, botany and the like. These bodies of knowledges grew out of useful social occupations as stated previously. They have been separated from man's behavior, set apart and called a body of subject matter. Should these bodies of knowledge or subject matter be segregated into their various elements or is there a connection between them? Does a study of plant life cut across many of the so-called subject matter areas? The fact that these bodies of knowledge actually originated from social occupations is significant in the light that they should be still associated with social occupations.

> . . . For in schools, occupations are not carried on for pecuniary gain but for their own content. Freed from extraneous associations and from the pressure of wage-earning, they supply modes of experience which are intrinsically valuable; they are truly liberalizing in quality.[25]

Knowledge, data and facts are so plentiful in the rapidly moving society that it becomes impossible for one to gather all of the knowledge he must have under the apperceptive mass concept. Therefore, it becomes necessary for him to develop some system or method of working with these facts and ideas as they become evident in the experiences of man. The scientific method of approach becomes quite important in the democratic way of life. The scientific method is in agreement with the mind substance theory in the field or Gestalt concept. Is

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[25] Dewey, op. cit., p. 235.

it possible then that in educational institutions, when approaching the broad area of science and its implications toward social living, the method of employing the facts and data should have high priority toward implementing social change? Could a problem solving citizen be developed, one who could employ the scientific method in the solution of the many problems of life, rather than the walking encyclopedia type of citizen who has pat and definite answers for those experiences or situations that he may confront? Science then might be the foundation for the modification of men's thoughts in the purposive behavior for the improvement of society. Through scientific enlightenment, the responsibility of man toward using science to modify the behavior of himself and his associates--consequently, the total mass of people--is the ultimate goal of scientific investigation. This is the real meaning of social progress.

The Democratic Concept

Democracy and education have been inseparably rooted in the lives of the American people since colonial days. Unfortunately, many of the citizens accept democracy as handed down from the preceding generation without question or thought of how it came about or what it means for them as individuals and as citizens. This is not intended to be under the democratic concept.

Growth in Democracy in America

Democracy began in America when the nation was composed of a number of small independent groups. These groups lived under unusual conditions. The vast domain of uncultivated land with its ever-widening frontiers, together with the isolation from the European countries, accounted greatly for the failure of European feudalism to reproduce its pattern of government in the new world. These new frontiers meant opportunity for new starts in the struggle for a life of economic independence and freedom. This mode of life left its imprint upon the psychology of the early Americans as they moved into these new frontiers and established a system of government. Their governing system changed as the settlement grew to statehood, giving direction and insight into a democratic way of life as larger groups attempted to govern their behavior.

Variations Within a Democracy

There is considerable agreement on the interpretations of the ideals of democracy, but because the American system of government is rooted in a number of different social and political theories, it does not always run smoothly. There are always present the movements and forces of the people. This prevents the system from becoming static. As the citizenry gives attention to the major policies, they refuse to become excited or emotional about the minor adaptations and their influences. The free discussion and the ability to criticize the

government along with other responsibilities tend to result in a government for and by the people. This form of government is characterized by a minimum of imposed restrictions as they are derived from the people. It seeks to direct the efforts of government toward expressing the wishes of the majority; however, it does not overlook the importance of the minority groups.

The Basic Precepts of Democracy

The authors of the Declaration of Independence refused to spell out the great human ends of the phrase "life, liberty and the pursuit of happiness," and apply it to any institutional form of government. They believed that when any form of government did away with, or was restrictive to, these ends, it became the right of the people to abolish it. The Bill of Rights gives expression to the idea that the democratic society is an open society. In order to be a society of this type certain basic precepts must form the framework of that system.

Respect for the individual. All individuals are entitled to respect and equality in every aspect of life. Man, as a human being, has a uniqueness. He has capabilities and has the freedom to develop these abilities to the fullest potential. In fact, under this concept it is his obligation to inform himself in order to assume an intelligent role as an individual in the democratic way of life.

Cooperative living. The freedom of individual development and the responsibility which each individual has toward the government

suggests another responsibility--that of not interfering with the development of others in the social context. It becomes necessary to foster the traits of socialization and intelligent interaction with the group. One cannot develop in isolation; consequently, interdependence among individuals becomes a necessary element in a democracy. People must know how to work together. They must know how to live intelligently with one another. There is occasionally a need to restrict an individual when his freedom becomes an infringement upon the freedom of the other person in his right to individual and group participation.

Free play of intelligence. In the concept of democracy there is a great dependence upon the intelligence of a common man. This principle is based upon the idea that the individual is to have the right to govern and direct his own behavior, to establish his own goals in life, and to assist others whenever possible in establishing group goals. This form of government can be only as good as the intelligence of the masses. This is not a question of being governed by a few, but becomes a system of the masses ruling themselves. Democracy can be no stronger or better than the intelligence and the character of the people of which it is composed. It cannot depend upon the rights of kings, the inherited titles of the ruling class, or the leadership of a dictator, but must look to an enlightened citizenry for the expression of their feelings, wants and aspirations.

> . . . In a democracy the intelligent participation of all members in the solution of problems is required. This means that individuals must have command of the means of solving problems rather than of ready-made solutions. The rapid development of new problems further emphasizes this need. Consequently, aims of education for American schools must be defined in terms of certain generalized controls of conduct which, if developed, will lead to the realization of the democratic ideal.[26]

This is diametrically opposed to the authoritarian type of government where it is believed that the elite have the intelligence to govern the masses of the people. Dictatorship thrives on the ignorance of the masses.

There are other ways of stating basic ideas and assumptions found in a democracy. The following list seems to sum up the democratic ideals.

> Democracy assumes that:
> 1. Paramount value is placed on the dignity and inherent worth of each individual.
> 2. All who are influenced by a decision should have an appropriate part in its determination and in its implementation.
> 3. Every individual is obligated to become reliably informed concerning social problems and to act with others in their solution.
> 4. Actions, both individual and group, should be based on the method of intelligence rather than upon intuition, revelation, authoritative decrees, or impulse.
> 5. Both social and individual development of the best kind is realized through calculated evolutionary means rather than through expediency or revolutionary violence.
> 6. Freedom of action is not laissez-faire license, but rather is earned as the result of increasing individual and group responsibility for the results of action.[27]

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[26] Hollis L. Caswell and Doak S. Campbell, Curriculum Development (New York: American Book Company, 1935), p. 125.

[27] Graff and Street, op. cit., p. 170.

Implications for Education

Because of individual importance, education must be mindful of the individual's needs, abilities and interests. Attention to individual differences becomes quite important as each person has the right to develop to his fullest. Uniformity of teaching, assignments and requirements tends to violate this concept. The teacher must study the individual in all of his uniqueness so that he may apply proper motivation for the development of the total program.

Cooperative living emphasizes group and individual responsibilities in their interaction. As stated previously, the individual cannot live apart from the rest of the society; therefore, he must learn to work in groups for group betterment. Actual participation in group planning and discussion on real problems of the social scene are indicated. The teacher cannot talk democratic planning and action and run the class in an authoritarian manner. Democratic insight will come through democratic activity.

The third concept of democracy indicates the need for an intelligent citizen. How can intelligence be acquired? Is it possible to teach problem solving? Can students learn to gain insights? These are some things with which the teacher as a member of the social institution should be concerned. Unless the intelligent behavior of a problem solving citizen is the goal of the educational institution, it is ceasing to fill its responsibility as an institution of a democracy.[28]

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[28]Edward A. Krug, Curriculum Planning (New York: Harper and Brothers, 1950), pp. 289-291.

CHAPTER V

THE LEARNING NEEDS

As evident from the earlier discussion, this study is attempting to proceed from a very broad base and by a process of selection develop criteria which may be useful in arriving at a specific kind of program for industrial arts training. Thus, the study has dealt with the larger natures of the culture and of the individual within the culture.

The study now comes to the point where it is necessary to consider the specific learning needs of man and, as a further requirement, the learning needs that will be satisfied through educational institutions and those that will be met through other kinds of institutions and activities.

Man Determines Culture Versus Culture Determines Man

The nature of the culture is such that it contains many forces which are exerted on peoples of the culture. By forces one means the institutions, the ideas, the movements or developments that may ultimately become movements, in fact, just about anything that operates in determining what the culture is or what it may become. As man is the central figure in all of these forces, they create for him the problem of determining how he will live and how he may expect to live.

> . . . "Is man the force that molds or is man the product of forces that have been molding him?" This is a fundamental question. . . . That is, whether man chooses his destiny and guides it toward moral ends, and therefore is purposeful in his living, or on the other hand, whether man is only a kind of result of what goes on around him.[1]

This seems to be an age old problem with man. Those holding to the philosophy of materialistic determinism would say that man's decision and thinking at any moment is a product of all of these external forces in his environment. He actually thinks and acts the way he does because of the forces outside him. If it be true, that man is determined by the external forces and further that he is powerless to change these forces, then there is no need to go further.

Fortunately, the Western world does not hold to this view of man. Man is something more than the result of these external forces. Man is a moral being and, as such, he has the ability to know right from wrong, the true from the untrue. Having these qualities, man can set goals for himself. In an effort to reach these goals man begins to mold the external forces so that they may assist him rather than resist him.

When one looks at the modern world and makes some effort at comparison with the world some centuries ago, it appears that there has been considerable progress. How did this come about? Was it because of the forces surrounding man, or was it because of man's determination

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[1]John T. Caldwell, "Some Forces in Our Modern Culture," Educational Quest, 2:2, Summer 1958.

to improve the culture? There are forces which no single individual can control. They will affect him and his children after him. It becomes necessary for him to understand these forces and to give some conscientious effort by giving some direction to them so that he may not become a victim, or merely a resultant, of these forces. Man may work with groups, thus exerting more influence upon these forces, which may result in more direction to them. All of these forces are connected and cannot, in reality, be separate one from the other. They are manifested in a number of ways. They pose many problems; therefore, it seems that man must have a degree of intelligence and must give concerted effort toward giving direction to these forces. In this manner, man can direct the cultural forces in the direction of the attainment of the "good life."

The Source of Learning Needs

The intent of the discussion in Chapters III and IV is to gain insights into the nature of learning needs and their origins. Some of these needs seem to be the result of the unique nature of man. Others are derived from the highly developed culture and the forces which they exert upon the individual. Still others are drawn from man's philosophical beliefs and the values he establishes for the good life.

The Nature of Man

Man is a biological creature and as such shares the biological needs with other living organisms. One of man's needs is to understand his growth pattern with the realization that he has a uniqueness in this pattern which tends to resist being forced into any standardized mold. There is a desire to belong, to be a social citizen, to be a member of a group; and, as a member of a group, man feels a need to have a part in developing the behavior of the group. He has a desire for participation in interesting problems which tend to give him a feeling of success. There is a need to be liked, to be admired, or to be given the respect that comes through the concept of the worth and dignity of man. This, he may secure by becoming an active, intelligent member of a group in society. This action calls forth certain needs which he must acquire.

The Culture

The culture is man-made, yet there is an element of persistence that tends to stabilize some of the institutions, traditions and modes of behavior in spite of man's effort to change. This complexity of the modern culture which tends to emit pressure upon man from all sides creates many problems for man. Must he surrender to these forces or should he divert his efforts toward a change for the betterment of man? As man emerged from a land of want to a culture of plenty, resulting from scientific and industrial know-how, his problems tend to multiply. His moral responsibilities loom larger and he feels an

obligation toward the less fortunate of the world. The democratic ideals have more meaning for him as a way of life. He feels closer to the distant lands. He sees a membership in a world culture rather than a small segmented group.

Because many institutions have compiled great amounts of useful knowledge about medicine, science and, for that matter, about man, it has become increasingly impossible to master all of the knowledge. If man cannot gain insight into the great bodies of knowledge, then he must resort to intelligent behavior resulting in the use of the scientific method of problem solving.

The Philosophy of Life

Values are guides for man's behavior. They form the basis on which man establishes his goals or objectives. Man's philosophy is the determinant of his values. A philosophy that enables man to be the director of his own life's purpose means that he must have ability to govern his own activities, to determine his own fate. This places a great responsibility upon the intelligence of an individual. He must strive to gain consistency in the values he holds. To make decisions and determine behavior under a consistent value pattern is no easy task. It does not come to those who wait, but man must work toward this intelligent behavior as he strives for the "good life."

The Intelligent Citizen

In analyzing the sources of learning needs one point seems to be paramount. Throughout the discussion of the nature of man, the

culture, and the philosophy of life there appears to be a consistent need for intelligent behavior.

1. Man should be an intelligent problem solver.
2. Man needs intelligence to determine his own government, his own goals, his own actions.
3. Man's philosophic values indicate the need for a high degree of intelligent thought in order to gain consistent and competent behavior as a problem solver and a self-directing citizen of a democracy.

Thus, the need to learn to behave intelligently is accepted as the number one learning need of mankind. It is also accepted as being the number one reason for having formal educational institutions such as the school.

Listing of Needs

The function of transmitting desirable elements of the culture and improving intelligent behavior usually takes the form of a formally prepared list of "needs." The most famous list of needs is the Seven Cardinal Principles. Other lists have been developed and, in most cases, are expansions of the Cardinal Principles into more descriptive terms. Some of the later lists have been developed through school-community participation. The Tennessee list of needs was developed in this manner.

The Tennessee Needs

The list of needs derived from a study authorized by the Tennessee Legislative Council for grades one through twelve is given below. This study was made during the school year 1957-58; thus it represents a recent attempt at listing the learning needs.

1. Competence in the use of the fundamentals of learning and communication
2. Competence in developing and maintaining satisfactory relationships with others
3. The achievement of understandings, habits, and attitudes conducive to physical and mental health
4. Competence in the practice of civic skills
5. Competence in the use and management of natural resources
6. Understanding and appreciation of our basic American institutions
7. Vocational competence
8. Ability to purchase and use goods and services wisely
9. Use of spiritual, moral, and ethical values that will provide sound guides for personal living
10. Appreciation of beauty in all aspects of living
11. Appreciation of the attitudes of science and skill in the use of the scientific problem-solving method
12. Understanding world relationships and becoming an effective participant in world affairs.[2]

The Tennessee list of needs stands up very well when compared with other lists of needs. All important elements seem to appear in the list.

Basic factors in the Tennessee list of needs. Certain needs on the Tennessee list have been established to develop skills. Others are concerned with the gaining of knowledge. Some aim at insuring the

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[2] The Tennessee Legislative Council, Public Education in Tennessee--Grades 1 through 12 (Nashville, Tennessee: 1957), pp. 56-7.

development of attitudes and values, and some are pointed in the direction of science and the development of problem solving.

To indicate the intention of each need listed, Figure 2 has been prepared. Rather than list the needs again, the numbers below correspond to those of the preceding list of needs.

Notice that only one of the needs gives any direct reference to problem solving. It seems to be assumed that the possession of skills, knowledges and attitudes would be sufficient to produce intelligent behavior.

Lack of meaning for program direction. Despite the fact that the Tennessee list of needs compares favorably with other listings, it does not give much direction to an educational program. The needs seem to be abstract statements that can be interpreted in many ways. Varying types of educational programs and classroom methodology can be justified under the Tennessee list. For example, if the teacher wishes to whip the student for not complying with his instructions, it can be justified under the guise that he is being taught how to get along with people. The list of needs tends to be nothing more than beautifully sounding phrases to which most people will subscribe. They become nothing more than cultural platitudes which have little direction for an educational program.

Needs Gleaned from the Nature of Man and the Culture

When viewing the theoretical approach made in Chapters III and IV of this study, nine needs seem to emerge as being desirable for man.

Need	Skills	Knowledge	Attitudes	Method of Science
1	x			
2	x		x	
3	x	x	x	
4	x			
5	x	x		
6		x	x	
7	x	x		
8	x	x		
9		x	x	
10		x	x	
11	x	x	x	x
12		x		

Figure 2. Analysis of the basic factors in the Tennessee list of needs.

Many of the needs appear to be the major responsibility of the institution of the school, while others seem to suggest school, community and home cooperation. The writer does not intend to suggest that these needs are all inclusive. They are the ones that seem to be suggested through the preceding treatment of the nature of man and the nature of society.

1. Need for an understanding of, and intelligent behavior toward the basic drives of man. This understanding is directed toward the biological needs of the organism which indicates insight into health and sex education.

2. Need to develop ability to plan and work with individuals and groups as an intelligent participating member. Man cannot live in a vacuum, but must of necessity live with other people. He needs to be able to work with the people with whom he associates. Only through the intelligent planning and work of each member of a group can the group expect to approach the "good life."

3. Need for increased faith in and use of the scientific method of problem solving. The scientific method as developed by scientists in the laboratory may be employed in life's everyday problems. The increased uses of the scientific method leads toward more intelligent problem solution.

4. Need for an understanding of the broad concepts of the industrial culture and how to live intelligently with the everchanging industrial contrivances. This need becomes increasingly paramount as

the scientific and technological developments of the industrial culture become increasingly complex. It is impossible for one to know all of the knowledges and skills of industry; therefore, some understanding of the materials and their use may result in intelligent consumption of the products of industry.

5. Need for belief in the worth and dignity of the individual as a world citizen. This need is basic to a democratic way of life. As travel becomes easier, emphasis is placed upon man as a world citizen. In this capacity man is concerned about people in distant countries.

6. Need for self-understanding so that each may develop himself to his fullest potential. In a democratic form of government each person is charged with the responsibility of understanding himself, thereby providing opportunity for the realization of his potential abilities. He is further charged to develop himself to this fullest potential, for only through self-realization can man give his fullest ability to decision making in a democracy.

7. Need for freedom of thought, the right to question, the obligation to seek truth for oneself. America is based upon the concept of freedom of speech. Basic to this principle is the more forceful concept, freedom of thought with the right of each individual to seek truth for himself.

8. Need for developing a consistent set of values which gives direction to one's behavior. Man's behavior is mirrored in a set of values. Occasionally one behaves because he feels it is the thing

to do and cannot give reason for his behavior. It is doubtful that he is operating under a well thought out consistent set of values. Man's moral and spiritual behavior is determined by the values he holds concerning life. These should contain the element of consistency.

9. Need for vocational competence. As America is basically a working society and as man spends one-third of his day in work so that he may accumulate the necessities for life and leisure, he needs preparation for a vocation or profession. In the highly industrialized and automated society this vocational competence is not a "blind alley" vocation, but one in which the person can be an intelligent problem solving member in his chosen work.

Lack of appropriate program direction. The nine needs derived from the theoretical treatment reflect the theory of mind, philosophical approach, learning theory and type of culture under which the treatment is made. In other words, the above needs should indicate the democratic concept with all of the implied notions that are necessary for the "good life" in a democratic society. The needs should also imply the theoretical notion of pragmatism as it is used in the discussion. However, in studying the needs listed above, one may see indicated these elements, but they are not necessary for the fulfillment of the needs. Therefore, something else is needed. A pattern or guiding principle is needed to give direction in developing a program that will achieve these needs in the manner and method desired. Thus, this list is troubled by the same problem confronting the Tennessee list

of needs. Some method or system that will employ more directional control should be used to achieve the desired educational program.

Directional Criteria for an Educational Program

In an effort to give the educational needs more meaning, they may be viewed in light of three major elements which tend to place them in a kind of pattern. These three elements are:

1. The intended purpose of the school.
2. The values that give a basis for operation.
3. The characteristics of the situation in the light of facts, methods, and the like.

The list of needs when applied to these elements takes on a kind of pattern, one that places the needs into a context where the kind of job to be accomplished can be determined. In this light the "needs" imply more direction.

Again the meaning of the needs may be heightened by the application of appropriate value patterns. These values may be stated in the form of rights of the learners in a society. These rights may be stated in the following manner:

1. Right to the same worth and dignity accorded to the more developed and mature members of the social group
2. Right to physical welfare, health protection, and growth
3. Right to grow and develop in a climate of mutual respect and affection
4. Right to think. Freedom to inquire into any and all areas of human thought
5. Right to be free from the negative and adverse kinds of motivations such as fear, rejection, privation, etc.

6. Right to receive the best of the cultural gains of the past--best of human experiences, best methods of problem solving, etc.
7. Right to understand the directional trends of his society and freedom to attempt to modify those directions if he so chooses
8. Right to contribute, both in effort and ideas, as much, and as rapidly, as his level of development permits. (Be inducted as a participating member as rapidly and efficiently as is possible.)[3]

Under the use of the pattern idea the lists of needs provide more direction for an educational program. The "needs" cease to be cultural platitudes and take on values as criteria for the evaluation of an educational program. However, this method seems to result in a complex state of affairs wherein it is difficult to establish clear guide lines for program direction. There seems to be a need for a set of guiding principles that can be more readily understood by those interested in education.

Governing principles have been developed that seem to be appropriate for this purpose. They give direction for achieving the desired kind of education for a democracy.

1. The educative process should be centered in problem solving. This is not to say that skills and knowledges are unimpor ant. It recognizes, however, that skills and knowledges are not apt to be functional unless they are learned in problem-solving situations. More important than this, however, is the recognition that problem-solving ability is a prerequisite to all democratic living; and that democracy can improve itself only to

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[3] "Educational Needs" Report prepared by the Committee on Curriculum and Instruction of the Tennessee Legislative Council's Study of Public Education, Grades 1-12 (Tennessee Legislative Council, October 1957), p. 22. (Mimeographed)

the extent that (a) individuals solve problems, and (b) individuals combine with others in the solution of their common problems.

2. The responsibility for his own education must be gradually shifted to (and accepted by) the learner as he pursues his educational career. This principle is extremely important in directing an educational process that seeks to develop the leadership qualities required to initiate action in defining and solving problems. Also, this principle safeguards the individual "needs" of the learner.
3. The educational process must, in both its beginning stages and continuously, be aimed at assisting the individual in a critical appraisal of his own capacities in relation to social demands of the culture (personal, civic, vocational). Again, this important principle is highly essential in the development of initiative and general leadership ability. Obviously a person without genuine self-understanding is not in a position to acquire a functional education. This principle also is aimed at assisting the individual in clarifying his "needs."
4. The educational process must be fashioned to provide for the development of the highest order of individuality within a cooperative social framework. This principle recognizes that the individual is the paramount aim, but it also recognizes that individuality cannot find either the means for expression or any high order of expression without the impact of other personalities. It also recognizes that the order of problems faced in our own age are of such nature that most defy individual solution and require the cooperative application of the scientific method.
5. The educational process should be based upon understanding that learning involves "seeing" or creating relationships. Understanding involves getting at the relationships between "wholes" and "parts." Learning proceeds from "wholes" to "parts" and from "parts" to "wholes." In this procedure new insights--new relationships--are gained which are complementary in nature; the insights are more comprehensive with respect to the function of the "whole" under consideration and more specific and penetrating with respect to the function of the "parts."[4]

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[4]Roald F. Campbell and Russell T. Gregg (Editors), Administrative Behavior in Education (New York: Harper and Brothers, 1957), pp. 150-151.

Within the light of the above guiding principles, the two lists of needs stated earlier in this study take on new meaning and now furnish the educator with a purpose, a method, and a way for determining program content and methodology in an educational process.

CHAPTER VI

THE INDUSTRIAL ARTS PROGRAM

The major objective of all education, as previously pointed out, was to develop, in some way, a man who behaves intelligently. It has also been shown that statements of man's learning needs take the form of listings and that these listings may indicate intelligent behavior, but the word "intelligence" fails to appear in the lists given. However, when the learning needs are viewed in the light of guiding principles, they have much more meaning for program direction.

Industrial Arts and the Learning Needs

Industrial arts as a part of the educational program should fulfill, in part, these listed needs. What can industrial arts give toward the realization of these needs? What can industrial arts contribute to intelligent behavior?

Intelligent Man Knows His Culture

During the last two hundred years, the American culture has basically changed from an agrarian to a complex industrial and scientific society. This physical environment, which man has devised, has alleviated many of his wants, but in turn has created many problems for man.

In considering the control of the physical environment it is evident that man has exercised ingenuity in devising ways and means

of understanding this environment, and this understanding has led to a more successful control. It seems self-evident that the student who aims to develop intelligent behavior would need to have experience and involvement in the many skills, knowledges and techniques which go to make up the structure of the physical environmental approach. Basically, this involves a consideration of the physical sciences; however, there is considerable evidence that such a consideration is not a sufficient involvement to make possible intelligent human behavior in the area of control and utilization of the physical environment. This apparent contradiction comes about because of the great variety and great expanse of human knowledge relating to the physical environment. It is an accepted fact that no one person can contain more than a small amount of this highly specialized knowledge and skill, and further that it is necessary to specialize in a rather narrow range of this material if one is to make professional use of it. This brings about the recognized dilemma of having someone who knows a great deal about a limited area or someone who knows a little about a broad area. It will be recognized, of course, that this is the basis of the time worn argument between the necessity for general education and the necessity for special education.

This argument between general and special education is usually resolved by indicating the need for both. A person needs a generalized knowledge of many areas of human endeavor because he is living in a society that functions as an industrial society. As a consumer and

participant in the society, he must have some skills and understandings of these broad areas if he is to be an intelligent member of the group. Further, if he is to make the maximum contribution, he must be highly specialized and skilled in one phase of work so that he can be a member of a special team in this industrial society.

An additional dilemna. From the above it seems evident that the development of a citizen with broad general knowledge with an area of special skills would pose no particular problem. Each human being could have a general introduction into many of the areas of the specialization and, as he became more acquainted with the area, he could choose one wherein he would become more specialized. This would provide a broad understanding of the many areas but would also provide the needed specialization which is essential in the functioning of the very interdependent culture.

In practice, however, the success of this type of education has not been outstanding. As it usually works out, the teacher is a specialist in the area and, regardless of whether the student is interested in developing a highly specialized skill or simply some general educational understandings of the matter, the teacher starts all students out as if they were going to be specialists. Thus it works out in practice that students are taught as though they were specializing in many areas. They do not get the essential concept of the area because they do not and, in fact, cannot pursue any of the areas for any great length of time. It so happens that most of the beginning lessons in

the area have to do with the minute techniques of the area and do not have included in them any of the really basic concepts of the area.

It is also evident that there are different levels of sophistication which come into play. If a person is going to have a wide understanding of the important concepts found in many areas, these concepts are going to have to be stated in familiar and somewhat simple terms. Inversely, if the person is going to specialize in an area, he will need to have acquaintanceship with the most advanced concepts available in the area. These will include terms which have subtle shades of meaning and which are essential to the specialist in the area but which simply clutter up the effectiveness of the communication when they are used in the layman's sense. Thus it becomes evident that there is the need for a type of educational situation which will enable the student to grasp, in somewhat simplified terms perhaps, but nevertheless in their essentials, the important foundation in many of the disciplines. Because of limitations of time and the great breadth of the field, this is all that will be possible in terms of a general education. As this is accomplished, the student will then enter into the more sophisticated and more subtle meanings that are included in the knowledge and skill of the specialist within a particular area. Because of his wide variety of understandings, he will be able to work successfully with people in a great many areas and will also have specific skills in a limited area himself. This kind of educational program will fulfill the criterion that the learning need is primarily

one of causing the student to develop ways of behavior which are intelligent.

Atmosphere of Problem Solving

The concern with the various ways of learning and with the need for the student to become involved in learning more about the nature of the mechanical and industrial culture of which he is a part has led to the kinds of learning situations commonly known as industrial arts. It is recognized that a learning situation proceeds best when the student is working on interesting problems. In industrial arts this has led to the use of the project method; however, it is to be recognized that the project method has had various kinds of emphases and various kinds of learning theories. This is possible because any phase of the problem solving activity can be emphasized and other phases can be de-emphasized. Each problem has some skills and knowledges involved in its solution. Each problem (project) contains certain theoretical considerations, certain planning and evaluation features. Any one or various combinations of these may be emphasized, as well as the acquisition of skills. In the modern industrial arts theory the emphasis has been given toward the idea of thinking, planning and evaluating, as well as the formerly emphasized execution stage.

The trend in industrial arts has been to meet the learning needs of behaving intelligently. This is in line with the existing principle that the major learning need in the culture is to learn to behave intelligently and rationally. Thus, as part of general education,

the industrial arts program should not aim to develop particular skills, although this will be used as a vehicle to give the needed understandings into the area, but to develop better understandings of the nature of the problem solving process.

It is not the primary objective of the student to build furniture, although in many instances furniture may be constructed because it is being used as a vehicle to teach the procedure of being intelligent with the products of nature and our culture. Contained in the above stated approach is a closer relationship between the abstract and concrete than usually exists when learning fails to employ an activity process. For the first time the student may apply the knowledge of fractions to the reading of a scale or the knowledge of physics to a real situation. This tends to give the problem solving process a sense of reality.

Knowledge Put to Use

The young are by nature equipped with a bountiful supply of energy. This energy makes the student vibrant, alive, always involved in the process of doing something. If the child does not possess this energy supply, he is immediately taken to the doctor under the assumption that he is not well.

The learning process should encompass this doing tendency instead of applying all effort toward making the student quiet, dignified, rather attentive, thus giving the appearance of being interested in what the teacher is saying or diligently reading the textbook for facts

and data. This urge to be active may be motivated toward activities that will make learning more real. It can give the student an opportunity to put facts and knowledge that he has gathered in a problem solving context. Thus board feet measure takes on new meaning. Communication means informing others in an intelligent manner of the circumstances and results of an activity.

Industrial arts can aid the learning process at all levels by permitting the student to apply knowledge. Abstract knowledge suddenly takes on a new meaning. It can be applied to concrete situations.

Needs to Which Industrial Arts Gives Direct Contribution

Some of the broad areas to which industrial arts can make great contributions have been discussed. There is now need to look at the industrial arts program in light of the preceding lists of needs.

Industrial arts has a place in the area of general education, and as such, contributes to the attainment of all needs that pertain to general education. However, due to the nature of the industrial arts program, more direction contribution can be made to many of the needs of the Tennessee list, as well as the list developed from this study. The needs of the Tennessee list to which industrial arts can contribute directly are:

3. The achievement of understandings, habits, and attitudes conducive to physical and mental health

. . . . . .

5. Competence in the use and management of natural resources

. . . . . .

8. Ability to purchase and use goods and services wisely

. . . . . .

11. Appreciation of the attitudes of science and skill in the use of the scientific problem-solving method.[1]

Industrial arts contributes directly to the following needs (see pages 179-181) which were developed in this study.

1. Need for an understanding of and intelligent behavior toward the basic drives of man.

3. Need for increased faith in and use of the scientific method of problem solving.

4. Need for an understanding of the broad concepts of the industrial culture and how to live intelligently with the ever-changing industrial contrivances.

6. Need for self-understanding so that each may develop himself to his fullest potential.

7. Need for freedom of thought, the right to question, the obligation to seek truth for oneself.

This does not mean that the industrial arts program does not contribute to the attainment of the other needs. The amount of attainment will be determined by the student's felt needs and the guidance given by the teacher. For example, if there is need for understanding and practice in civic skills, it may be met through class and group

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[1]The Tennessee Legislative Council, Public Education in Tennessee--Grades 1 through 12 (Nashville, Tennessee: 1957), pp. 56-7.

organization and interaction. In any event the awareness of a concern for any of the needs may become a primary objective of a learning experience. Thus, the industrial arts experiences are directed toward more specific attainment of some needs, but any of the listed needs may become paramount as the needs of the students are made known. In this way industrial arts contributes much toward the attainment of educational needs.

Mention has been made of the importance of industrial arts and how it serves as an essential part of the general education of the American student. It has been shown that Americans live in a highly industrialized culture, that this culture is democratic in nature, and further that each person, in order to live intelligently and participate in the affairs of the culture, must know something about industry and the products of industry. The following discussion will consider the industrial arts program in the public schools in three particular grade levels. The first level to be considered will be the primary level, then the intermediate stage, and finally the many problems surrounding industrial arts as they appear in the high school.

The Primary Grades

In the early primary grades, and even in the kindergarten, the process of education is started by beginning to socialize the child and make him a creature who is at home in a learning environment and receptive to the learning processes. Since the child, as was effectively pointed

out by Dewey, learns very rapidly through his play, much of the early activities of the school is built around a play scene. Only gradually is the child brought under a more disciplined routine and is more carefully directed into the study of specific subject matter.

It is recognized that the child at this early age learns much through the manipulative processes. He is fascinated by handling materials, finding out what he can do with them and "making" things.

Early Industrial Arts Materials

It is at this early and manipulative stage that the child begins to be acquainted with the various materials that later will form the "stuff" that he will use in industrial arts and still later in industry, if he chooses an industrial vocation. Thus in the early kindergarten stage and in the primary grades the plastic materials and the various clays are appropriate. These materials provide an opportunity for the youngsters to get acquainted with the feel of material and the manipulation of those materials toward some desired end. At this stage he is not very well coordinated and has little muscular power, so the use of the more resistent materials would be considerably limited. That is, he would not be able to cut wood and shape it into any sort of complicated pattern, neither is he equipped to handle the various metals except in a limited sense. However, it is to be recognized that the braiding materials are appropriate for this age level and children can learn rather effectively some complicated braiding techniques.

The child is capable of gluing together many interesting items so as to form objects which will not only be interesting to him but which will also begin to liberate his artistic sense. At the primary stage the child can find much fascinating activity in gluing together bits of wood, paper, metal, string, and the like, to form objects.

Art Integration

As was implied above, at this stage the child's latent art abilities can be started on the road to development. Thus paints, colors, and various kinds of art materials can be incorporated with other types of materials used in the early industrial arts program. It is here that the child learns the importance of color and its arrangement so as to bring about a pleasing expression.

Although it is rather easy to lose sight of one of the major objectives of the industrial arts activity, that of developing a problem solving individual, such must be carefully kept in proper focus. With all of the interesting materials and all of the various activities that may be brought about through the use of the materials, it is easy to lose sight of the fact that the materials are just that; materials to be used to an end, and are not of primary importance in themselves. This means that the child must be faced with carefully graduated problems. One of the greatest lessons to be learned is in the collection and bringing together of materials and the improvising that occurs when the exact specified material is not readily at hand.

Suggested Activities

The activities and materials available for the primary grades are seemingly inexhaustible. In addition to the customary pencil, paper, paint and crayon work, other media such as clay, leather, plastics, textiles, wood products, plants, to list a few, lend themselves well to the various abilities of primary children. These are some of the products of the industrial culture. Some suggestions as to the doing activities through the media given above are sewing, weaving, model building, toy making, block printing, leather tooling, clay modeling, bird house building, gardening, caring for animals and the like.

In order to give some indication as to the possibilities involved in an activity of apparent simplicity and with all of the facets for various learning processes, a suggestion of some of the variations are indicated in Figure 3. It must be kept in mind, however, that these activities must derive from the needs of the child and his ability level. These examples are only suggestive and do not represent a system or form to be utilized in the classroom in their present state.

Some of the desirable features of a good learning situation found in the above examples might be itemized in the following manner:

1. Individual activity and responsibility
2. Group planning and group work
3. Subject matter areas not segregated

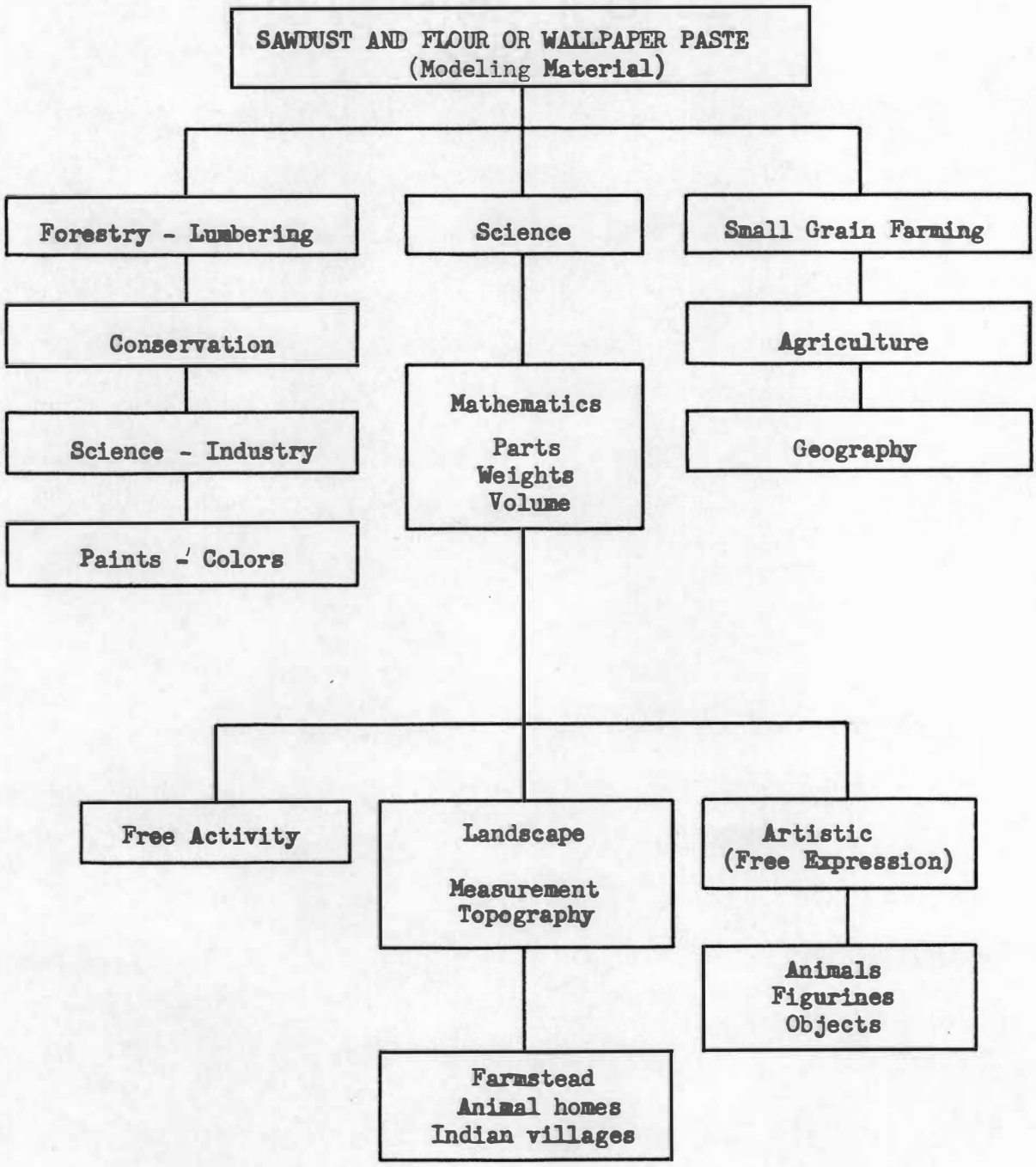


Figure 3. Learning environment possible through inexpensive modeling material.

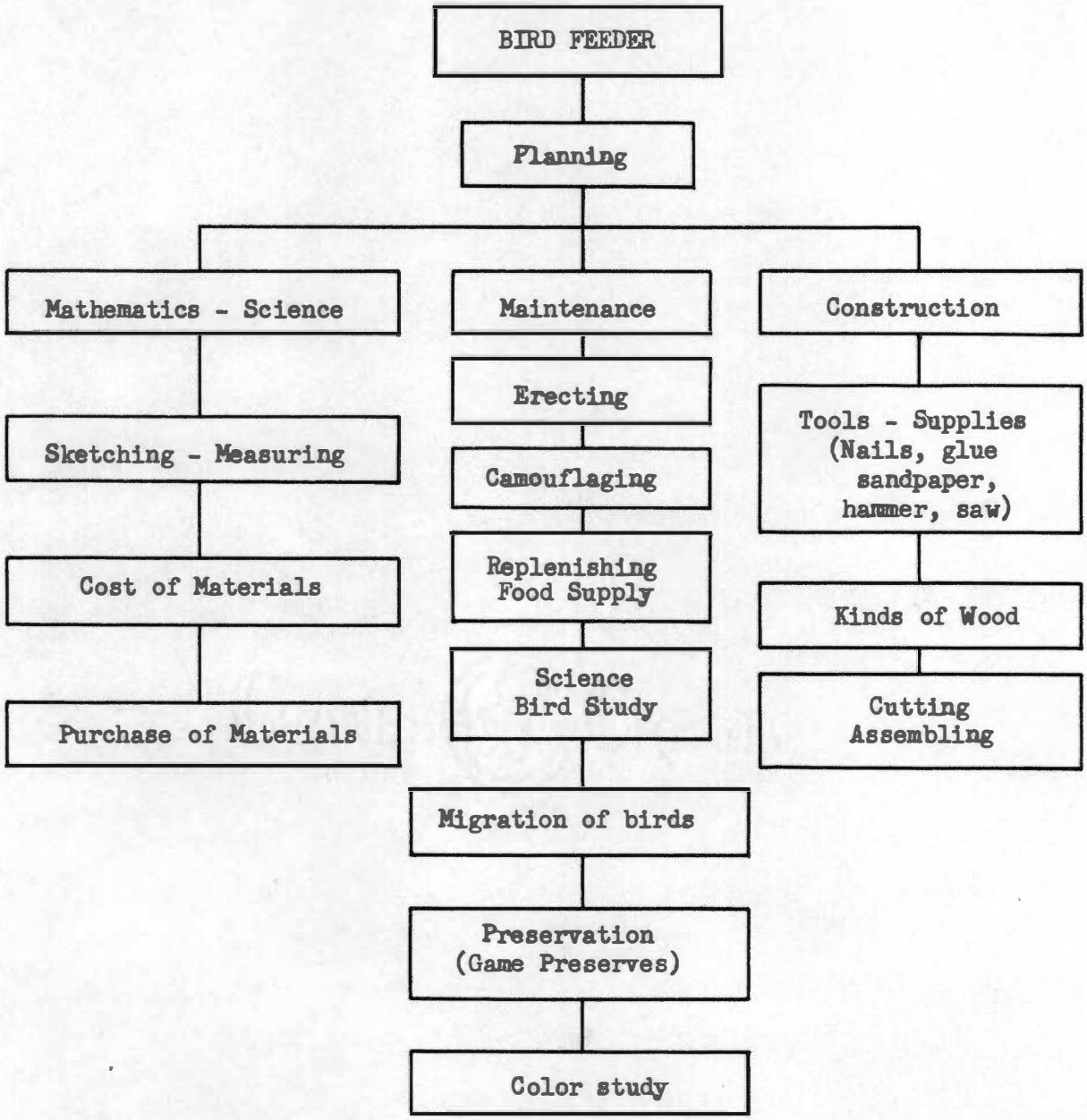


Figure 4. Learning environment possible through bird feeder activity.

4. Oral and written reports

5. Library research

6. Visits to local industry

7. Suggests other learning activities.

It may be pointed out that observation has revealed that present day kindergartens and early primary grades are doing in a large measure the kinds of things that are suggested above. Children participate in learning how to be social beings and teachers in these grades have incorporated a great many of the manipulatory ideas that have been suggested. There is a slight tendency to adhere to the old educational rule that "an activity is not educational unless it involves paper, a pencil and, of course, books." This means that a considerable portion of the art and industrial arts activities have been in the form of drawing on paper with the various crayons and in doing art work largely with paper and the other art media. In some instances, it has been observed that much of the problem solving value has been removed because the teacher has provided carefully drawn patterns and has urged the child to "stay within the lines." It is recognized that this tends to stifle the ingenuity of the child, to destroy his tendency toward being creative, thus making him a robot who follows directions rather than a thinking person.

The Intermediate Grades

As mentioned above, the program of beginning industrial arts, which really incorporated many of the things taught in early art activities, has been and is being rather effectively taught in the primary grades. Such is not the case, as observed, in the intermediate grades. Somewhere along about the fourth or fifth grade, teachers begin to be conscious of all of the facts that exist in the world and the dearth of facts possessed by the growing child. This becomes a powerful motivating device for the teacher because the child is rapidly growing up and he really possesses very few of the essential facts that need to be known by any educated adult. He does not know the capitals of the forty-eight states in the United States. He does not know why plumbers are called plumbers. He does not know how to spell many words. He does not know all of the multiplication table, and, in fact, he is at this point a very ignorant creature.

Shift to Factual Learning

This brings about a shift from activities which are in the nature of orientation and problem solving to a situation where drill in the facts of the world is of utmost importance. It is no longer important that the child discover for himself the unique features of the world within which he lives. The important thing has been discovered and it is now time for the child to quit fooling around and get busy soaking up the facts that are available to him. It is true

that some art activities remain. Some activities, such as music, because of their cultural value, are left intact, but in most cases the child does not have time for creative work and for problem solving or experimentation.

It is seen that in this kind of situation there is little room for industrial arts activities. If such activities are provided, they are heavily loaded with work to learn the names and characteristics of the materials, the names of the tools and the various parts of the tools, such as, "The hole in the head of the hammer is called an eye and the piece of wood that sticks through this hole is called a handle."

It is interesting too that about this time some of the children begin to get discouraged with their school work. This may be because of some psychological blocks, a lack of effort, or lack of motivation. The motivation that is provided is extrinsic and is in the form of rewards and punishments and not in the form of the worth of the activity; consequently, these children decide that they are not cut out for school and not destined to be educated people. Nevertheless, they are taught in a very powerful kind of system. They are forced by parents to continue in school. If their parents do not force them, they are required by law to stay in school. The teachers are circumscribed by the curriculum so that they can vary the program very little and there is nothing the child can do except to suffer through the learning of these facts and to learn, in addition, to hate the whole business.

Industrial Arts at This Level

It will be remembered that in the discussion of needs it was pointed out that the child needed to have many things in his store of learning but that the ability to be an effective problem solver was more important than the ability to recall a great many unrelated, and perhaps useless, kinds of facts. It is, at this point, that a greatly improved industrial arts program could serve the learning needs of many of the children. Children at this age have developed the capacity for collecting things and one of the important activities would be a collection of the various kinds of materials that are used in the industrial applications of the society. This would provide the child first hand information as to the characteristics of these materials and this would include not only some verbal knowledge of the material but the added value of having handled and manipulated the materials. Also at this age, the coordination of the child is in great need of development. Although care is needed and many safety precautions must be taken, it is at this stage that the child can make rapid strides in learning to saw, shape, bend and fashion materials to make various kinds of objects.

Art interests. The intermediate stage is also a time when the art interest of many children tends to lag. They have grown away from the childish activity of colored crayons and finger painting and unless furnished with further stimulation toward artistic development, they will tend to remain at this level. The consideration, however, of

art as it applies to more concrete objects and perhaps more useful objects will contribute to the child's further growth in art and to use of colors and the arrangement of materials so as to create artistic value.

Industrial arts augments other subject areas. The suggested activities may tend to imply that at this stage the learning of subject matter and the improvement of the child's arithmetical skills is not of importance. This is not the intent of this program. However, many studies have shown that children learn these skills and accumulate these facts much more easily and retain them over much longer periods of time because they are learned in a problem solving situation, because they are necessary to the successful completion of the projects, and because they are of intrinsic value in the activity and interest of the child. Many teachers find, for example, that in the traditional type of education the child may learn to change feet into yards, yards into inches, and the like; however, upon being asked to make a practical application, the child has little notion as to whether a foot is longer than a yard or an inch is longer than a foot. It seems that the child has learned to manipulate symbols without having concrete meaning to those symbols. This is probably the most serious criticism that is leveled at traditional education and it is through the use of industrial art materials that the child will receive some experiences with actual materials. Thus the symbols which refer to those materials will have more meaning and will become a much more integrated part of

the child's educational equipment. It will thus be available for use at future dates and in future problem solving activities.

Industrial arts not a separate subject area. Industrial arts as a phase of general education in the intermediate grades receives no block of time, as is the tendency for other subject matter areas of the curriculum, but is evident throughout all learning experiences of the classroom. In the intermediate grades, as in the primary grades, industrial arts should be an integral part of the learning process and not a separate subject. Because of this nature, the regular classroom teacher is the motivating force in the learning situations in the classroom and he is to coordinate these activities. To do otherwise tends to separate activities from other areas and make it a type of learning apart from the regular learning process.

Leadership in the learning activities. Student needs become evident in the increased difficulty and variations of desired learning activities. The elementary teacher will realize increasing limitations as the complexity of these learning activities progress. He often finds that the knowledge and know-how in an area can no longer suffice for the desired learning activities of the area. A teacher may realize that he possesses little or no ability to work with music. In like manner, he may not possess artistic interests and abilities to the degree that he can give leadership in the art activities of the classroom. Training in music and art seems to add little to his abilities. These deficiencies point up a void in the experiences available

to the elementary student. Must the student be denied experiences in learning activities because the teacher is deficient in one area? This is a question of major importance. It may be true that the regular classroom teacher can gain sufficient competence to give leadership to the usual industrial arts learning activities of the early grades, but this problem becomes increasingly difficult as one progresses to the higher elementary grades. Activities tend to take on a more industrial-like complexion and specialization, resulting in situations where it is difficult for the classroom teacher to give competent directions and leadership.

This problem may be alleviated to some extent by selecting teachers with varied interests. One teacher may, for example, be strong in artistic abilities, another may have competence in music and music appreciation, while the third may be proficient in manipulative abilities. These teachers can aid one another as the needs of the students indicate characteristics of learning activities. In this way the learning environment can have unity and coherence.

Physical facilities. The physical equipment needed for the intermediate level begins to take on some degree of diversity. Some of the more simple equipment needed in activities may be utilized in the classroom, but as more complex activities appear, there is need for more of the specialized types of equipment. It becomes necessary to accumulate this equipment in a special laboratory to augment the classroom equipment. This laboratory will be accessible to individuals and groups as the need appears from classroom problems. This situation

indicates a teacher with special competence in the use of this equipment.

Types of intermediate activities. It is indicated, therefore, that in the intermediate grades the child will have experiences with many kinds of materials and processes, both utilitarian and artistic, so that his store of experiences with practical and actual material will be greatly enriched. A list could be compiled with some of the kinds of things that children can do effectively at this age and skill level. This list might include such things as: (1) Collections of various materials and objects to be displayed in the classroom. These collections, of course, can be much more meaningful if, under the guidance of the teacher, they are classified and the student learns the importance of the technique of classification. (2) Building things for the classroom and for the playground. At the elementary level the construction of aquariums and terrariums is an acceptable activity. The children can participate in making book shelves, decorating and painting them, and in making equipment for the playground such as shuffleboard sets, archery sets, ping pong paddles and many objects of this nature. Of course, it is again important to remember that the construction of these items is not the real aim. They are simply the vehicles by which the child learns problem solving and they also provide the means by which much arithmetic is learned and much English is acquired in various writing activities that are an integral part of the projects. It might also be mentioned that geography and

history are both integral parts of these items. The construction of an historical replica of an early fort, or the construction of armor such as that worn by soldiers of an earlier date all form interesting kinds of things to be done.

Industrial Arts in High School

The development of an industrial arts program in the high school that is compatible with the theoretical treatment of this study seems to have many problems that were not evident in the industrial arts program of the elementary grades. Many of these problems are traditional, some are theoretical, some evolve from the school organization, and some stem from the industrial program content and methodology. Because of these seemingly difficult obstacles, it seems more appropriate to describe the desired industrial arts program of this area briefly, and give major treatment to the obstacles and to the improvements that may be made in the industrial arts program as it moves toward the desired characteristics.

Brief Description of Industrial Arts Program in High School

Student activities begin to lose some of their apparent simplicity as the students begin to show a variety of interests based upon considerable understandings derived from problems solved in the elementary grades. Chosen problems are likely to become more difficult, more abstract, and more industrial in nature which indicates a need for

better equipped laboratories and more competent instructional staff to give leadership and guidance to the students. These facts tend to cause a subject area to appear separate and apart from the other subject matter areas of the school. However, this should not be the case for the learning process should be continuous and have some degree of unity. The learning environment should encompass the broad areas of the school curriculum, not the segmented parts as is the tendency under the narrow subject matter areas. In other words, there would be experiences in math, physics, English, industrial arts and these should have a unity, a coherent purpose, which is to develop the student to his fullest potential in an atmosphere of unity, cooperation and understanding. These, in conjunction with the student needs, work together for the common good of a democratic citizen. It may be pointed out, however, that there will still be need for the English teacher, the history teacher, the math teacher, the industrial arts teacher; but they have a singleness of purpose which is to motivate and give guidance for the development of a critical thinking, problem solving, self-directing citizen for an industrial culture.

This concept is logical and consistent because man needs to be free to solve his own problems and to determine truth for himself. How can he gain competence in directing his behavior if he is not permitted to deal with real problems, derived from his own needs, while in the formative stage of life? The student of the culture today cannot hope to master all knowledge and as problems of all descriptions

begin to exert their forces, he must be in a position to react to them intelligently.

Dr. Harrison Brown, Professor of Geo-chemistry at the California Institute of Technology, a panelist on a Columbia Broadcasting System television program on the subject of "Education for What?", indicates that the problems of living in the complex industrial society of America are tremendous. As industrialization spreads to other nations over the world, bringing with it the power to wage nuclear war, the problems of the world society become more complex. The present problems of just living in one's nation--the problem of leisure, of conformity, of creativity, of mental health, of understandings--are problems that cannot be solved by a robot or narrow specialist. They can only be solved by persons educated in the broad sense of the word.[2]

Difficulties Which Prevent the Development of a Desired Program

There are some major difficulties that the people interested in industrial arts must give considerable attention before a modern program can be developed.

Industrial arts departmentalized. The nature of the high school organization is such that it becomes necessary to establish a well organized subject matter before an area can hope to become accepted as a

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[2]Dr. Harrison Brown, Panelist on Columbia Broadcasting System Television Program, "Education for What?", February 23, 1958.

legitimate subject in the high school curriculum. Industrial arts leaders saw this necessity. Since industrial arts has become accepted as a legitimate subject matter area, several changes have been made which have resulted in established aims, objectives and methodology appropriate for this area of knowledge. Because of its apparent uniqueness as a subject area, industrial arts has been given special consideration: a special room, some special equipment and a specially trained teacher who could work in these types of activities.

Concept of training--not education. With many the feeling exists that the fast learner should pursue the academic subjects while the slow learner should be trained via vocational education and the practical arts. This is vividly pointed up in a statement by Dr. Clarence Faust, President of the Fund for the Advancement of Education and Vice-president of the Ford Foundation. When talking about range of ability and the slow learner, Dr. Faust says that he protests the tendency to locate a gifted group capable of learning and to relegate the remainder of the students to vocational education, subjects that can properly be called training rather than education.[3] The latter part of this statement is indicative of two kinds of learning--the real learning (academic) and habit formation (trade training). This concept of education must be changed before the described program of

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[3]Dr. Clarence Faust, Panelist on Columbia Broadcasting System Television Program, "Education for What?", February 23, 1958.

industrial arts can materialize.

Philosophy of units versus parts. One of the major difficulties involves the concept of subject matter areas. Educators of necessity are so involved in developing a good program in specific areas that a major concept in the educational institution is seemingly ignored. It is very important that this or that department get its share of time with the student so that he may partake of what the department has to offer for education.

Dr. Harold Taylor, President of Sarah Lawrence College, states that he was opposed to the tendency to slice the youngster up into athletic, social, intellectual, consumer, producer, husband and wife, and attempt to adjust subjects to each of these. The essence of education lies in finding a unity of these things. Educators should be less troubled about courses that are not generally recognized as academic and more concerned that the subjects be dealt with with intellectual vigor and understanding.[4]

The typical high school program. Another difficulty to overcome is in the nature of the industrial arts programs. In the South the typical high school program often consists of a student taking woodworking and/or drafting and the total industrial arts experience may consist of this. To add to this apparent narrowness of possible

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[4] Dr. Harold Taylor, President of Sarah Lawrence College, Panelist on Columbia Broadcasting System Television Program, "Education for What?", February 23, 1958.

activities, the student spends a great amount of his time "copying plates" in drafting and making a standard project in woodworking. These are just about as real as those problems he finds in the algebra book. It seems that the industrial arts program has been overshadowed by strict lesson plans and course of study to the point that the problems of the student mean very little in the maze of required material that the student must cover. This creates a problem within the industrial arts organization--one to which considerable attention should be given.

Changes That Can Be Made Toward Achieving the Desired Program

Obviously it is impossible to make a sudden and radical change in the educational institution, but while waiting and working for this needed change, industrial arts people can give attention to some of the items that have caused so much confusion. Some of these items seemingly have become skewed in regard to the intended purposes of the industrial arts program. The writer does not mean to infer that these objects should become fixed or stereotyped goals, but effort should be given to prevent methods or items from reverting to discarded or disproven concepts of the past. Some of the controversy stems from semantic origin and, as such, should be clarified. In fact, there appear many things that the industrial arts group can do to help make the transition to a more desirable learning environment come about quickly and with less confusion in the process.

The slow learner. Arguments have raged back and forth concerning the subject of using the industrial arts as a place to put the slow learner. In a way, this may be an acknowledgment on the part of some teachers that they cannot approach the student, they cannot motivate him enough to get him into the learning process. On the other hand, it is a nod of approval to the industrial arts area that it may have something that can cause the slow learner to grasp the situation and give him a real desire to learn in a real situation. However, if one is not careful, two kinds of learning seem to crop up--a kind of learning for the fast learner, which seems to involve only the "mind," and a kind of learning for the slow learner, which seems to involve only manipulation. This is to be avoided for it would seem that if industrial arts has something unique which challenges the slow learner to learn faster, then, in like manner, even the fast learner may do better. Again the very nature of the industrial arts program would tend to eliminate the "educated fool."

Real problems through project selection. The project method of instruction has been employed in industrial arts methodology for over a century. It has been both criticized and praised. Both the criticism and praise are somewhat justifiable. The project method has brought something new into the learning process. On the other hand, the misuse of the project is evident in method and selection. Examples of this misuse are: project is teacher assigned, teacher manipulated, based on requirements of the teacher, selected for ease

of construction, selected because of skills involved, selected because of its intended use upon completion. All of these tend to ignore the real purpose of the project method concept which is the backbone of the industrial arts program.

Education, at its best, is directed toward developing intelligent behavior. Intelligent behavior infers self-realization. A student must understand himself, must strive to know hiw weaknesses and his abilities, and with this self-realization the student assumes more and more of his educational direction. He begins to understand that he needs experiences in this or that area if he is to become a competent individual. In the effort to direct his own activities, to understand himself, he is concerned with ways in which he can improve himself by eliminating a deficiency in certain areas. He sees a need for understanding and insight into these areas. In industrial arts he chooses the project, not in the manner stated above, but because he sees a need for the experiences that this project will give him toward the total development of his personality. He may see an area of industry about which he has little knowledge. For example, he may never have worked with wrought iron. He begins a search into the various ways in which he can eliminate this apparent deficiency. Among other media he may choose a wrought iron coffee table because he sees that this will give him what he needs, the experiences desired in this industrial area. This method of selection seems to indicate more insight into the problem of project selection than does one selected

because it has use. The guidance that the teacher can give is not to select a project but to help the student discover what will best help him in this business of self-realization.

Integration with other subject areas. As has been noted, in the lower grades industrial arts is not a subject area within a segregated allotment of time but is integrated within the various other blocks of time. In the high school industrial arts tends to lose this desirable element because it is set aside in a special room with a special teacher. This integration should be an objective of the industrial arts teacher as this is an approach toward the desired learning environment found in the elementary grades. This could make learning in both of the areas more meaningful. For example, when the student comes to the stage of figuring cost of material involved in a project constructed in the shop, it can be integrated with the math area. When building an high-fidelity set considerable insights are needed in physics and music, especially when dealing with sound waves and electrical circuits. This, as stated previously, tends to give learning more meaning and aids in making learning a whole rather than segmented parts.

Employing sound guidance principles. Because of the informal atmosphere within the industrial arts program, the guidance possibilities are unlimited. As stated previously, in the problem of project selection the teacher makes every effort to get the student to understand himself and to evaluate himself. Through this self-evaluation

the student begins to see what he can do, what his potential abilities appear to be, and to analyze some of his apparent weaknesses. He begins to develop confidence in himself through the results of his effort toward the solution of real problems. He begins to see himself as a member of the adult world. The confidence and the understanding of his potential ability may be directed toward an area of specialization resulting in an awareness of his profession or life's work.

Some criticisms may be directed toward the project with its apparent narrowness of learning possibilities. If this situation should arise, the teacher through the guidance program encourages the student to understand the limitations of his project, thus seeing the need for certain other bits of information, certain know-how, and certain knowledges. The student then makes a concerted effort toward gaining these elements in addition to his problem. Thus he is encouraged to see the total picture, the elements of industry, his potentials, his weaknesses, and to reorganize these things toward a better understanding of life.

Summary

The purpose of this study was to reduce some of the confusion that appeared to exist in the areas of industrial arts. It was believed that some of the confusion may be contributed to traditional forces, but many of the difficulties stem from confusion within the more basic

elements surrounding the nature of man and the nature of society. If an understanding can be conveyed within this realm, much of the existing confusion could be eliminated.

The elements that seem to be more pertinent to the nature of man and education were discussed in Chapter III. Man and his place in society and the many forces of the culture were pointed up in Chapter IV. From this theoretical discussion educational needs were developed. These needs were viewed with the intent of using them for program direction. The Tennessee list of needs were also studied for this purpose. It appeared that a set of needs were meaningless statements until they were viewed under a set of guiding principles. This seemed to be necessary because many types of educational programs could be developed to meet the needs as they were stated. The guiding principles mirrored the philosophical concepts of man in a democracy and, as such, they insured man the opportunity to obtain the needs in a manner compatible with a democratic way of life.

The industrial arts program was described for the elementary and intermediate grades according to the theory developed earlier in the study and in light of the educational needs. This was more difficult for the high school program due to the increased number of obstacles. The type of program desired was indicated, but obstacles to overcome and methods for improvement were given major consideration in the discussion of industrial arts in the high school. This was deemed desirable due to a number of things--classroom methodology,

program organization and philosophical values--which seem to retard the more complete development of a desirable industrial arts program at the present time.

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