A STUDY OF THE CRAFTSMEN OF ANCIENT AND MEDIEVAL
CIVILIZATIONS TO SHOW THE INFLUENCE OF THEIR
TRAINING ON OUR PRESENT DAY METHOD
OF TRADE EDUCATION

APPROVED:

J. A. Blackburn
Major Professor

George Beamer
Minor Professor

J. A. Blackburn
Director of the Department of
Industrial Arts

Dean of the Graduate School
A STUDY OF THE CRAFTSMEN OF ANCIENT AND MEDIEVAL CIVILIZATIONS TO SHOW THE INFLUENCE OF THEIR TRAINING ON OUR PRESENT DAY METHOD OF TRADE EDUCATION

THESIS

Presented to the Graduate Council of the North Texas State College in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

180170
John Rowlett, B. S.

Denton, Texas
August, 1950
TABLE OF CONTENTS

LIST OF TABLES ........................................ iv

Chapter
I. INTRODUCTION ......................................... 1
   Statement of the Problem
   Delimitations
   Method of Procedure
   Sources of Material
   Definitions of Terms
   Related Studies

II. THE ANCIENT CRAFTSMAN .......................... 12

III. THE CRAFTSMAN OF THE MIDDLE AGES ............ 28

IV. TRADE TRAINING TODAY ............................ 58

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .... 82
   Conclusions
   Recommendations

BIBLIOGRAPHY ........................................... 89
LIST OF TABLES

Table                                                                 Page

1. Breakdown of Work Experiences for the Machinist trade ............... 71
2. Typical Schedule of Wages ........................................... 78
CHAPTER I

INTRODUCTION

The differences of opinion concerning the teaching of skills as against general education, or whether trade training has a place in our schools at all, is a live question today after centuries of controversy. The aim of our teaching is still a question and has been since, according to Jowett's translation, Aristotle, in his Politics, Book VIII, said concerning education:

For mankind are by no means agreed about the things to be taught, whether we look to virtue or the best life. No one knows on what principle we should proceed—should the useful in life, or should virtue, or should the higher knowledge be the aim of our training?¹

When we consider that Aristotle died in 322 B.C., that he felt confused by the issue during his time, and that we still are confused, the problem of education is a very complex one.

In contrast with Aristotle's uncertainty as to the aims of education, the ancient Jew was more positive in his beliefs. To the ancient Jew, education meant an equal division between religious instruction and trade training. That trade training was held in high esteem by the Jews is clearly

¹Benjamin Jowett, Aristotle's Politics, Book VIII, p. 2.
emphasized in the Talmud—"the Jews' book of traditionary law. Throughout the Talmud, statements such as these are found:

As it is your duty to teach your son the law, teach him a trade. He who does not have his son taught a trade prepares him to be a robber. He who applies himself to study alone is like him who has no God."

It seems that from the dawn of recorded history each succeeding civilization has faced in a different manner the problem of transmitting trade skills to the younger generation. It is the purpose of this study to show what influence the trade training programs of ancient and medieval civilizations have made on our present day trade education techniques, and also to point out the trends in trade training programs as they exist today.

It would seem logical that one of the best ways to throw light on the study of trade training is to see our present methods evolve in the perspective of its long development in the past. In tracing the history of trade training back to its beginning, it was found that the sources of recorded information concerning it dwindled into non-existence. However, the lack of recorded materials does in no way signify that education in the crafts did not exist long before man made his first attempt to record his ideas.

---

2Leo Auerbach, The Babylonian Talmud, p. 185.
and thoughts by making crude carvings and paintings on the walls of his dwellings.

This study begins from the date of earliest recorded history. However, the vocational training of primitive man, as it was thought to have existed before recorded history, is brought forward for the sole purpose of laying a foundation for the remainder of the study.

Statement of the Problem

The problem is a study of the craftsmen of ancient and medieval civilizations to show the influence of their training on our present day method of trade education.

Delimitations

The problem is limited to a study of ancient and medieval craftsmen and their methods of vocational training as they existed from the dawn of recorded history until the beginning of the Industrial Revolution. The study ends at this point because it is here the apprenticeship system began its decline; the program that replaced it is of little value to this study because of its inefficient method of training craftsmen.

Method of Procedure

In Chapter II a study will be made of the ancient craftsman and his works as they existed from the earliest date of recorded history through the beginning of the Middle Ages.
In this chapter extensive use is made of the Bible because it is in this document that many of the earliest ideas concerning trade training were first recorded.

In the third chapter a study will be made of the craftsmen and their guilds as they existed during the Middle Ages and until the beginning of the Industrial Revolution. A study of the guilds is necessary at this point, since it is so closely related to our "labor and management" as we know it today.

In Chapter IV the influence of the early crafts and guilds on our present day vocational training programs will be pointed out and considered.

Chapter V will embody the summary, conclusions and recommendations.

Sources of Material

The sources of material used in this study were historical books and periodicals obtained at the North Texas State College library, Texas State College for Women Library, and the Dallas Public library.

Definitions of Terms

Vocational training, vocational education, trade education, and craft training are used interchangeably to mean that type of training that is acquired through either formal or informal apprenticeship and which enables the trainee to earn a livelihood through the skill of his hands.
Craftsman refers to one who has become exceptionally skilled in a particular craft or trade.

Journeyman refers to one who has acquired the basic skills and fundamentals of a trade or craft, but who has not had the experience to become a master craftsman and to own his own shop.

An apprentice is a beginner, a novice, or one who is going through the process of learning a trade or craft.

Ancient civilizations are defined as those which existed from earliest recorded history through 300 B.C.

Medieval civilizations are those that existed from 300 B.C. until the beginning of the Industrial Revolution.

Related Studies

Studies concerning ancient and medieval trade training programs are extremely few. There seems to be no dissertation or thesis related to this study; instead, it was necessary to rely on historical books and articles published by recognized authorities in the field of trade training in the past.

In 1927, an article was published by Arthur B. Mays dealing with old forms of apprenticeship. In this article, Mays made a series of important statements that are closely related to the present study. One such statement is as follows:

That there ever was a time since the beginning of human history when some form of apprenticeship
did not exist is highly improbable. To permit the young to participate in adult activities and through imitation and occasional instruction to acquire the skills, customs, and ideas of the old generation seems to have been the normal method of education from the beginning of human society.\(^3\)

In discussing guild supervision of the apprenticeship programs, Mays has the following to say:

"At its best, guild apprenticeship constituted a remarkably efficient means of industrial education. Usually the apprentice was indentured to a master craftsman for a period of years during which he lived in the master's house and shared in the social life of the family. He was taught a trade, reading, writing, the keeping of accounts, and the religious beliefs held by his elders. His conduct was supervised by the master and his physical needs provided.\(^4\)"

Mays' study also revealed that a craft guild existed in England in the first part of the twelfth century, but that the guilds did not reach an important level in that country until the fourteenth and fifteenth centuries.

In 1912, J. F. Scott wrote an article on the decline of the English apprenticeship program. He concluded that English apprenticeship and the craft guilds failed to survive the Industrial Revolution in their original forms because they tended to remain static in a rapidly changing world. In referring to the adequacy of English apprenticeship during the Middle Ages, Scott states: "Eminently suited as the

---

\(^3\)Arthur B. Mays, "Old Forms of English Apprenticeship," Industrial Education Magazine (September, 1927), p. 81.

\(^4\)Ibid., p. 84.
institution was to the conditions of the Middle Ages, however, it was not equally well suited to all times and conditions.\textsuperscript{5}

Scott recognized that the apprenticeship system under the guilds achieved its purpose during the Middle Ages largely because of the close personal relationship that existed between master and apprentice. In pointing this out, Scott states:

\begin{quote}
The English apprenticeship system under the control of the guilds was something of a success, this success being largely due to the personal relationship existing between master and apprentice, and the effective supervision of their relationship by the craft guild.\textsuperscript{6}
\end{quote}

E. W. Hopkins conducted a similar study of the crafts and guilds of India during ancient and medieval civilizations. In tracing back the history of the guilds in India, Hopkins finds the earliest date that a guild was known to have existed was in 600 B. C. He points out that many students of Indian history believed that guild life extended back many centuries before this date.

In his study of the formation of the earliest guilds in India, Hopkins found that the metalworkers in gold and silver were mentioned more frequently than any other craft.

\textsuperscript{5}J. F. Scott, "The Decline of the English Apprenticeship System," \textit{The Elementary School Teacher}, XIII (December, 1912), 446.

\textsuperscript{6}\textit{Ibid.}, p. 451.
In one of the ancient Indian law books written in the third century A. D., Hopkins found this harsh law concerning gold-smiths:

The king is therefore directed to see to it that a goldsmith found guilty of cheating shall be chopped up into very small pieces with sharp knives, whereas ordinary thieves or cheats are merely beheaded.7

Hopkins theorized that laws such as these caused the craftsmen of all trades to unite in India to form the early guilds. In forming this common bondage, the craftsmen of a guild were in a position to ostracize any member that failed to follow a prescribed code of ethics, or failed to meet a certain standard of workmanship. Although this penalty is less severe than that set down by the king, it served its purpose because without the backing of a guild, a craftsman found it next to impossible to market his product.

Hopkins' study points out that the method of trade training carried on in ancient India was very similar to that of other countries of that period. If a boy wanted to learn a trade, he was free to do so regardless of caste.

The young man left his father's house and lived with a master. This master taught him and fed him and made him work, but might not make him do any other than the trade work which he was learning. The pupil is expressly commanded to be humble before his master. The reason for

7E. W. Hopkins, India Old and New, p. 169.
this was that knowledge is like a river, ever advancing downward to a humbler level; therefore as one's knowledge grows broader and deeper one should become ever more humble toward the source of one's knowledge.\(^8\)

S. V. Venkateswara also made a study of the crafts and guilds of ancient and medieval India. This study closely paralleled the one made by Hopkins with the exception that it is not as thorough or as conclusive. It is pointed out that the Indian system of trade education was much the same as it was in other ancient countries; it was primarily one of hereditary transmission.\(^9\)

Venkateswara also found that the ancient Indian craftsman enjoyed special protection and encouragement.

Those who conspired to lower the quality of the work of artisans, to hinder their income or to obstruct their sales and purchases were severely punished. Anyone who caused an artisan the loss of a hand or an eye was liable to capital punishment.\(^10\)

The study points out that even the princes did not scorn manual labor. It was not uncommon for a prince to become an apprentice to a potter or a gardner. Even in the royal families it seems that idlers were not tolerated.

W. L. Westerman, one of the most often quoted authorities of vocational training in antiquity, has made several studies of the ancient craftsman and his methods of passing on trade

\(^8\)Ibid., p. 175.

\(^9\)S. V. Venkateswara, Indian Culture Through the Ages, p. 155.

\(^10\)Ibid., p. 156.
skills to the younger generations. His most noted study was one dealing with the apprenticeship program of ancient Egypt. He found, as have many other writers, that the tombs of the ancient Egyptians are a real source of historical information. Apprenticeship contracts have been found in these tombs that date back as far as 18 B.C., and it is thought that many more are still uncovered. In discussing the nature of these contracts, Westerman points out:

Of the nine pure apprentice contracts found to date, five are for the weaving trade, and one each for apprenticeships in nail making, flute playing, shorthand writing and hairdressing. 11

In studying these ancient contracts, Westerman found that they differed in many respects. In some of the contracts it was pointed out that the master or teacher would receive pay for his instruction. In others, the master was compelled to pay the apprentice a wage that increased as the apprentice became more skillful. In discussing this issue, Westerman states:

The apprentice of the flute player and shorthand writer is in no way useful to his teacher until he has acquired such skill in the trade that he can as an independent workman earn money for his master. For this reason the teacher, or master workman, receives pay for his instruction. With the apprentice of the weaver, hairdresser, or nail maker the case is different. From the outset the apprentice is economically useful about the shop. Therefore the

master workman is willing to pay wages to the apprentice from the beginning.\textsuperscript{12}

Westerman's study, like the others that have been considered, used only recorded material as a basis for his findings. It would be illogical to assume that trade education had its beginning simultaneously with the introduction of recorded history. Instead, it has probably existed in some form since man first inhabited the earth. The trade training of early man as it was thought to have existed is described briefly in the next chapter, for the purpose of showing its evolution into the ancient apprenticeship systems. It would be difficult to complete this study without having first viewed trade training as it was thought to have existed in its earliest beginning; even though it might appear hazy, it seems easier for one to see the end when he has first seen the beginning.

\textsuperscript{12}Ibid., p. 608.
CHAPTER II

THE ANCIENT CRAFTSMAN

When seeking data beyond the scope of recorded information, it seems necessary to rely on people who view the past in a manner different from that of the historian. Our modern archeologists and anthropologists believe that, in some form, man has existed on the earth for half a million to a million years. For the countless centuries when man did not devise ways to improve their tools or their conditions of living, education was at a standstill. When men first found that they could hunt better by using stone axes and spears instead of their bare hands, culture appeared. When they taught each other and their children the use of such implements, a form of vocational training began.¹

Recent archeological investigations have made clear that the earliest significant developments of human life and social organizations began in Egypt about six thousand years ago. Egypt was the birthplace of a great many things that make our own civilization what it is today. Through the Jews, and later through the Greeks, Egyptian ideas were

transmitted to the western world. It is, therefore, quite impossible to get a clear understanding of vocational training in antiquity without viewing the industrial organization of ancient Egypt.\textsuperscript{2}

To trace Egypt's gradual growth from a primitive state to one of advanced civilization would be a task for the historian. It is not the purpose of this paper to trace the historical growth of Egypt, or for that matter, of any other country, but instead to bring forth only that historical evidence which serves as a link between the ancient and the modern craftsman.

Ancient Egyptian history, like that of many other countries, may roughly be divided into a Stone Age, a Copper Age, a Bronze Age, and an Iron Age, each in turn gradually giving place to the next. The distinguishing feature of these several periods was not the mere employment of stone, copper, bronze, or iron, as the case might be, since each of these was employed in all the succeeding periods and was even known as a curiosity and occasionally used in the preceding period, but it consisted of the use of the special material after which the age is named for weapons and tools.

The first inhabitants of Egypt of which there is any knowledge were the Old Stone Age people. In referring to

\textsuperscript{2}Fredrick Eby and Charles F. Arrowood, \textit{The History and Philosophy of Education Ancient and Medieval}, p. 36.
these early Egyptian settlers, Lucas says:

Whence they came and the reason for their coming are both unknown, but that they must have originated outside Egypt is manifest unless Egypt is 'the cradle of the human race,' which is not suggested by anyone. Once in the country, however, abundant game and water and a pleasant climate would be sufficient reasons for their remaining.3

The exact manner in which civilization developed in Egypt may never be known; however, one of the first steps was taken when the Egyptians first banded together as tribes and began to move about the desert as groups rather than as scattered individuals. In any society, be it primitive or modern, it is necessary that social groups be formed for the protection of the members of that group. It is probable that the primitive Egyptians first banded together when they found it was easier to combat their common enemies as a group rather than as individuals. Group life was even more necessary when men began to settle down in the river valleys of the Tigris and Euphrates in Mesopotamia and of the Nile in Egypt.

In referring to these early civilizations, Fredrick Eby says:

Life along these rivers required such effective social organization and such long range guidance that leaders emerged who could plan the ways in which their neighbors could be defeated in war, or canals and ditches could be dug to control the floods of the rivers for agricultural purposes.

3A. Lucas, Ancient Egyptian Materials and Industries, p. 398.
or the masses of people could be kept at their appointed tasks. These leaders became the kings and priests who gave order to life, organized a government, and commanded obedience because of the belief in their divine guidance.⁴

Thousands of generations slowly passed following the age when primitive men first began to live in tribes. During these thousands of years, the conquest of external nature was slowly taking place. First came the domestication of animals and the practice of agriculture, and then establishment of village life. These developments called forth the expansion of the arts and crafts.⁵

When once a tribe became settled in a place—even though temporarily settled—needs would arise that demanded satisfaction. Thus, shelters from the weather would be built, baskets and pots would be made as containers for grain and water, sleeping mats would be plaited, and clothing would be woven. Lucas estimates these events as having taken place back in the Old Stone Age, or around 10,000 B.C.⁶

It would seem obvious that even at this early date a form of vocational training was present, because the various crafts that existed during this period would have dwindled into non-existence had not someone passed the necessary skills

⁵Carl Bucher, Industrial Evolution, p. 53.
along to other people. Although formal apprenticeship was probably unheard of at this early date, it would seem reasonable to assume that the father taught his skills to the sons, and the mother followed the same procedure with the daughters.

Following the Stone Age, the next step that the primitive civilizations went through was the Copper Age. Some authorities think that copper was being used as far back as 13000 B.C. The foundation for this belief is the fact that the copper instruments of early civilizations resembled in design the stone implements which had preceded those made of copper. That the Egyptians knew how to produce copper weapons and utensils is evident from well preserved specimens discovered by archaeologists in numerous excavations, and also through paintings on tombs and the furnishings of ancient temples.\(^7\)

In reference to the art of copper working among the primitive civilizations, Smith has the following comment:

The art of working copper and of making instruments from copper alloys achieved a high degree of excellence among primitive nations and the copper-smith held a respected position in society. The secrets of the profession were closely guarded and in most cases were transmitted from father to son only.\(^8\)

\(^7\)Copper and Brass Research Association, The History of Copper and Brass, pp. 1-5.

\(^8\)Robert E. Smith, Units in Patternmaking and Founding, p. 48.
Lucas states that copper pins and beads have been uncovered that date back as far as 5000 B.C., and that as early as 3400 B.C. the Egyptians were in possession of copper axeheads, chisels, knives, daggers, spears, and other implements including household utensils.  

One of the outstanding events in the history of Egyptian civilization was the discovery of bronze and the subsequent introduction of the Bronze Age. This alloy, which is a mixture of copper and tin, has been traced back as far as 3200 B.C. and some authorities on the subject believe that it had a sparse existence long before this date.

The Bronze Age in Egypt lasted thirteen hundred years, and was succeeded by the Iron Age. The earliest iron objects found in Egypt were small, crudely fashioned beads. A chemical analysis was made of these beads, and it was found that they were not formed from man-made iron, but had a meteoric origin. In reference to primitive man's efforts to make iron, Lucas states:

The first production of iron was almost certainly an accident, possibly due to the use by mistake of iron ore in place of copper ore and there cannot be any doubt that when first obtained the metal was treated in the same manner as copper and bronze in order to shape it, namely by hammering it cold, which naturally was found to be useless.


10 W. M. Petrie, The Arts and Crafts of Ancient Egypt, p. 110.
Somehow it was eventually discovered that if repeatedly heated in a charcoal fire and well hammered between the separate heatings and cooled by plunging it into water, iron would acquire a degree of hardness superior to that of copper.\textsuperscript{11}

Smith visualized the discovery of iron in a different manner from Lucas. In discussing his theory, Smith features this discovery as being the result of an intense fire built on rocks that were rich in iron ore. In discussing this invention or discovery, Smith states:

One might speculate further that this fire occurred on a hill or mountain side where there was a natural draft, thus creating a fire of intense heat. The intense heat caused some of the iron ore to liquify or melt and run down the side of the hill forming a rather thin irregular sheet. From this crude sheet, man formed his first iron implements much as he had previously done with stone.\textsuperscript{12}

Strangely enough, the oldest recorded information concerning iron work also contains the earliest statement directly related to trade education. This information is found in the book of "Genesis" which was estimated to have been written around 400 B. C. It is with the introduction of this first recorded material dealing with trade education that this study leaves the realm if unrecorded information and continues with facts and data that are more conclusive than the information considered previously. The following, dealing with iron work and early trade education, is found


\textsuperscript{12}\textit{Smith, Op. Cit.}, p. 58.
in Chapter 4 of the book of "Genesis": "And Zillah, she also bare Tubal Cain, an instructor of every artificer in brass and iron."\(^{13}\)

It is quite evident from this ancient record that the Jews held a man who worked with his hands in high esteem. Throughout the Bible, passages such as the following may be found: "In the sweat of thy face shalt thou eat thy bread,"\(^{14}\) and "In all labour there is profit: but the talk of the lips tendeth only to penury."\(^{15}\)

Throughout the Bible references are made to the builder, the tentmaker, the weaver, and the metalsmith; this indicates that many crafts were practiced in Biblical times.

The first definite known records of a legal, indentured program of trade education belong to a relatively late period. However, it is reasonable to assume that in ancient civilizations it was a customary procedure for the father to teach his son a trade. In some instances the father had no son. It seems only logical that, if an orphan boy had no father, he might be adopted into a home where there was no son and be taught a trade. The basic source for this belief comes from the Code of Hammurabi which was written about 2250 B.C. This Code stipulates that a child, whether fatherless

\(^{13}\)"Genesis," Holy Bible, Chapter 4, Verse 22.

\(^{14}\)Ibid., Chapter 4, Verse 19.

\(^{15}\)"Proverbs," Holy Bible, Chapter 13, Verse 11.
or not, could be adopted for the purpose of learning a trade.

This law of Hammurabi's, lying in the midst of several laws dealing with the adoption of sons, says:

If an artisan has taken a son to bring up and has caused him to learn his handicraft, no one has any claim. If he has not caused him to learn his handicraft, that nursling shall return to his father's house.16

Although the Code of Hammurabi was written about 2250 B.C., this does not mean that the laws set down in the Code were first practiced in that year. The Code was merely a collection or summary of laws handed down from the courts of Egypt for several thousand years, and it is quite probable that these laws dealing with apprenticeship may have been in use as far back as 4000 B.C.

During this same period a city, Mohenjo-daro, was being built in India, which has long been acclaimed for its unique construction. This city, which was buried until 1922, contained engineering features that were unequaled for many centuries. It seems to have been laid out and developed by precision methods as all the streets were straight and their intersections would be comparable to those of a modern city. Among the most unusual things found in this ancient city were the baths which were almost modern. In describing

---

this ancient city, Spencer states:

The buildings were made of burnt brick set in mud mortar. . . . Private houses had baths with careful drainage systems; and in addition to these was a public bathhouse connected with the central sewage of the town. The drain pipes were of pottery, painstakingly joined together. Not until the nineteenth century did Europe have any sanitation which could match this which existed in India, five thousand years ago.¹⁷

It is quite evident from the above quotation that a high degree of craftsmanship was employed by the various artisans who took part in the building of Mohenjo-daro. It would seem that skill such as that reflected in the building of this unusual city could have been attained only through an intensive and enduring craft training program of some nature. It is doubtful that any organized apprenticeship training existed at this early date; instead the skills were probably passed down from father to son as it was done in Egypt under Hammurabi's rule.

There is reason to believe that as far back as 2200 B. C. a highly organized craft program was in existence in China. Crafts believed to be in practice at this early date in China were those of the metal worker, the potter, the silk reeler, the weaver, and the jeweler.¹⁸

In commenting on the reign of Yu in 2205 B. C., Griffis makes the following reference to work in gold and silver:

¹⁷Cornelia Spencer, Made in India, p. 2.
During Yu's reign, more aboriginal tribes were conquered and the realm was extended. As gold and silver was now mined, stamped money took the place of the old-fashioned barter.\textsuperscript{19}

As there was no power machinery in existence at this early date, it is probable that the task of making these ancient coins fell to the hands of the most experienced Chinese goldsmiths and silversmiths. It is not unlikely that they labored ponderously for many days making the dies with which to stamp the coins and then worked equally as hard trying to make the crude coins resemble one another.

In addition to the craftsmen already mentioned, it is thought that the brick mason played an important part in the development of early China. Any craft or trade that has to do with the construction and maintenance of dwellings would seem indispensable. In describing the tomb of Yu, Hommel has the following to say:

The mausoleum of Yu was surrounded by a brick wall; first they were likely only sundried or adobe bricks, but by the time of the Han Dynasty the art of burning bricks had become fully developed.\textsuperscript{20}

The ancient Chinese craftsman who worked with iron was unsurpassed for many centuries, even though his methods of production were very primitive. The history of Chinese iron work indicates that the Chinese craftsmen developed a form

\textsuperscript{19}W. E. Griffis, \textit{China's Story}, p. 66.

\textsuperscript{20}Rudolf Hommel, \textit{China at Work}, p. 259.
of cast iron 1500 years before it was introduced in Europe. This iron was produced in crude furnaces for which the only source of power was a charcoal fire.\textsuperscript{21}

The most important sources of information concerning the crafts in antiquity are the writings of the scribes and philosophers who lived during that time. It is noted that, although the crafts and those who worked in them were held in high esteem by some people, there were many others—especially the philosophers—who thought that working with one's hands was degrading. Evidence of this negative attitude toward craft work is found in writings that date back as far as 2000 B.C. The following quotation, written by a scribe who lived during this period, obviously reflects the negative attitude of the writer toward the crafts.

There is no other occupation above that of letters. ... It is the most important of all the crafts. It is not a vain thing—he who applies himself to this profession from his youth up, gains honor. ... He is sent on missions. He who does not take up this profession will be clad in sackcloth.

I have never seen a blacksmith on an embassy, nor a smelter sent on a mission, but I have seen the smith at his work ... at the mouth of the furnace of his forge ... his fingers as rugged as the hide of a crocodile, and stinking more than fish spawn.

Has the worker with metals more leisure than the man with the hoe? ... His field is the block of wood under his hand, his tools are of metal. ... At night the laborer is free, the artisan's hands are still busy ... for at night he works with his torch.

\textsuperscript{21}Tawney, Op. Cit., p. 110.
The stone-cutter who seeks his living by working in all kinds of durable stones... when at last he has earned something and his two arms are worn out, he stops. But if at sunrise he remains sitting, his legs are tied to his back. 22

The quotation above clearly indicates an attitude toward the craftsmen that has persisted down through the ages, and even today it fits into many philosophies.

In studying the writings concerning labor and the crafts as they existed in ancient civilizations, one would be making a mistake if he did not consider the thoughts and ideas found in the Bible. Although they were in conflict with many other writers, the scribes who recorded the Bible regarded the laborer and craftsman as ideal citizens. Throughout the Bible statements such as the following may be found:

Wealth gotten by vanity shall be diminished; but he that gathereth by labour shall increase. 23

Let him that stole steal no more; but rather let him labor, working with his hands the thing which is good. 24

He cometh poor that dealteth with a slack hand; but the hand of the diligent maketh rich. 25

It is evident from the above passages that, in Biblical times, the man who worked with his hands was respected as a worthwhile citizen.

22Buchner, Op. Cit., p. 31
23"The Proverbs," Holy Bible, Chapter 9, Verse 11.
In studying the Bible, it is noted that many of the passages can be interpreted in several ways. One such passage, which was written about 1000 B.C., might easily be referring to craft training.

Train up a child in the way he should go; and when he is old he will not depart from it.²⁶

No one knows what the writer had in mind when he recorded this statement; however, it seems that he was referring to some sort of training which might be interpreted to mean an early form of apprenticeship.

Passages from the Bible indicate that several crafts were being practiced by the various artisans. From the "Book of the Chronicles" the following reference is made to the goldsmith and the silversmith:

The gold for things of gold, and the silver for the things of silver, and for all manner of work to be made by the hands of artificers.²⁷

Also found in the "Book of the Chronicles" is the following excerpt taken from Solomon's letter to Hiran:

Send me therefore a man cunning to work in gold, and in silver, and in brass, and in iron and in purple and crimson and blue; and that can skill to grave with cunning men that are with me in Judah and in Jerusalem.²⁸

²⁷"The First Book of the Chronicles," Ibid., Chapter 29, Verse 5.
In "The Acts of the Apostles" reference is made to the silversmith, Demetris, and his fellow workers who were idol makers. They are described in the following manner:

For a certain man named Demetris, a silversmith, which made silver shrines for Diana, brought no small gain unto the craftsmen whom he called together with the workmen of like occupation, and said, Sirs: ye know that by this craft we have our wealth—moreover ye see and hear that not alone at Ephesus, but almost throughout all Asia, this Paul hath persuaded and turned away much people, saying that they be no gods which are made with hands—so that this craft is in danger of extinction. 29

It is quite possible that the silversmiths had a guild at this time and that this speech made by Demetris was given at a guild meeting. Whether or not a guild existed at this particular time is not known; however, it did exist in spirit as is indicated in the above quotation because these silversmiths were gathered together with a common problem—that of facing extinction; and the solving of common problems seems to have been the essence of early guild organization.

No one knows for sure when the first guild was organized, but it is believed that one existed in India as far back as 600 B. C. 30 E. W. Hopkins, a noted authority on Indian history, traced the guilds back to this early date. He was quick to assert, however, that many students of history believed that guilds were organized at a much earlier date.


It is the purpose of the next chapter to trace the formation of the guilds from their early date and also to study the organization of the various apprenticeship systems. During this period, or about 600 B. C., the Golden Age of Greece was coming into existence. As this civilization was foremost in its time, it seems logical to begin the study in this country. It would seem almost impossible to study the crafts and guilds of ancient Greece without considering the views of that country's noted philosophers on the subject. Many of the ideas set down by these ancient thinkers are still embedded in the minds of many people today. From ancient Greece the study will trace the crafts and guilds through all their different stages until the whole system began to disintegrate during the Industrial Revolution.
CHAPTER III

THE CRAFTSMAN OF THE MIDDLE AGES

Six hundred years before Christ, in a little community on the far western border of the settled and civilized world, a strange new power was at work. Something had awakened in the minds and spirits of the men there which was to influence the world so much that even today many of the ideas and concepts developed there are considered ideal. We think and feel differently because of what happened in the little Greek town of Athens during a span of two or three centuries twenty-four hundred years ago. It was in this town that the world’s most noted thinkers and philosophers lived; and in many respects their mode of living has yet to be surpassed.\(^1\) Their thinking touched upon every problem that was of interest; and it was only natural for some of their discussions to center around the craftsman and his trade.

Many of the philosophers held the craftsmen in contempt and branded them as being unworthy of citizenship. Socrates (470-399 B.C.) was an exception. He thought of the crafts as being worthwhile. In attempting to explain the attitudes

of his friends toward the crafts, Socrates states the following:

The so-called banausic arts have a bad name, and quite reasonably they are in ill repute in the city-states. For they ruin the bodies of those who work at them and those who oversee them. They compel these men to remain seated and to work in gloomy places, and even to spend entire days before a fire. While their bodies are being enervated, their souls, too, are becoming much enfeebled. More especially, also, the banausic arts offer men no leisure to devote to their friends or to the state, so that such men become base in relation to their friends and poor defenders of their fatherland. And so in some of the cities, especially in those which are considered strong in war, no citizen is permitted to work at any banausic craft.\(^2\)

This paragraph is characteristic of a number of paragraphs which might be found in the writings of Plato and Aristotle. The explanation of this negative attitude toward the crafts is quite obvious. The Greek city-state was founded upon the idea of a citizen army of small landholders—men who owned and worked their own farms. Agricultural work was never regarded by the philosophers with the same contempt as were the crafts because outdoor life fitted men for war. The crafts, on the other hand, unfitted them for the defense of the state, which was the chief and first obligation of citizenship.

Plato had nothing but ill-feelings toward craft training; to him the only education worthy of the name is liberal education.

\(^2\)Charles A. Bennett, History of Manual and Industrial Education up to 1870, p. 15.
That education in virtue . . . which makes a man eagerly pursue the ideal perfection of citizenship, and teaches him how rightly to rule and how to obey . . . this is the only training which upon our view would be characterized as education; that other sort of training which aims at the acquisition of wealth or bodily strength, or mere clearness apart from intelligence and justice, is mean and illiberal and is not worthy to be called education at all.³

Although Plato had a low estimate of the educational value of craft training, he is one of the first to recommend that it should begin in early childhood.

According to my view, he who would be good at anything must practice that thing from his youth upwards, both in sport and in earnest, in the particular way which the work requires; for example, he who is to be a good builder should play at building children's houses; those who have the care of their education should provide them when young with mimic tools, and they should learn beforehand the knowledge which they will afterward require for their art. For example, the future carpenter should learn to measure or apply the line in play.⁴

It was quite common for fathers to train their sons in the crafts which they themselves practiced. Plato states that "the sons of the craftsmen learn their fathers trade so far as their father and his friends can teach it."⁵

"Did you never notice," he says in another place, "how the the potter's boys look on before they touch the wheel? And shall potters be more careful in educating their children


⁵Ibid., p. 401.
and in giving them the opportunity of seeing and practicing their duties than our guardians will be?6

Plato expresses himself as opposed not only to attempts to give the same person craft training as well as a liberal education but to attempts to master more than one of the crafts.

Now of artisans let the regulations be as follows: In the first place, let no native or servant of a native be occupied in the handi-craft arts; for a citizen who is to make and preserve the public order of the state has an art which requires much study and many kinds of knowledge, and does not admit of being made a secondary occupation; and hardly any human being is capable of pursuing two professions or two arts rightly, or of practicing one art himself and superintending some one else who is practicing another. Let this then be our first principle in the state; no one who is a smith shall also be a carpenter, and if he be a carpenter he shall not superintend the smith's art rather than his own.7

In Plato's ideal republic, the craftsman would constitute a distinctly inferior class—a class of people who would be unfitted for war or the pursuit of science. In discussing his ideal republic, Plato states:

In the ideal city, it is true, a life of labor can still be honorable. But in real life it is almost impossible for the craftsman to master all the wild beast element which he contains within himself. The body and soul of the craftsman bear the stamp of his gross life. And since the

---


craftsman cannot be a good man, it is necessary
that the good man should lead the craftsman.8

It seems that Solon and Plato differed considerably
as to whether or not the craftsmen was fit for citizenship.
Solon expressed his desire to help the craftsmen by grant-
ing them political existence and giving them representation
in the assemblies. Solon also put into effect a law dealing
with the training of apprentices. He established a law
that compelled fathers to teach their sons a useful trade
or forfeit all rights to support in old age.9

Aristotle was another philosopher who thought that no
good could come of those who worked in the crafts. He be-
lieved that a craftsman could never be virtuous; he condemned
without mercy every occupation which was not derived directly
from nature. No one of the manual trades escaped his cen-
sure. He believed that the most mechanical crafts were
those which deformed the body, the most servile were those
which required the most time, the most degrading were those
which required the least virtue, but that even the most
elevated was both degrading and servile.

Socrates was an exception in his opinion of craftsmen.
He loved to go into the shops and talk with the workmen.
When men who lived on their income were reduced to poverty,
he encouraged them to work. His opponents reproached him

pp. 954-956.
for teaching that all work is good. In reality he only recommended those occupations which did not deprive a man of leisure—the source of liberty. But even that was enough to distinguish him from the other philosophers and from his immediate disciples. In one of his lectures, Socrates asked the questions: "Who are the wiser, the lazy ones or those who are usefully employed? Who are the more righteous, those who work or those who fold their arms and dream of means of subsistence?"\(^{10}\)

Later the New Comedy, the mouth piece of popular sentiment, made reference to the trades.

> Earn your living in any way, provided you do nothing evil. Laziness does not feed a poor man. . . . nor a man fallen into poverty be sure of his living if he has no trade. . . . But I have wealth, lands, houses . . . You know the turns of fate, which in a night make a well to do man a beggar. You must shelter in the haven of the trades to lower your anchor in all security.\(^{11}\)

It is easy to see from the above quotation that the Greeks looked to the trades as a means of livelihood. It seems that the Greeks must have been a little conservative in their financial outlook; although the man mentioned above had many riches he was advised to have a trade to fall back on—for security reasons if for nothing else.

That Plato held for the crafts nothing but utter contempt is further emphasized in his Republic. In discussing


\(^{11}\)Ibid., p. 167.
the kinds of knowledge that might be found in a state, Plato says, "There is the knowledge of the carpenter; but is that the sort of knowledge which gives a city the title of wise—certainly not; that would only give a city the reputation of skill in carpentry." 12

In referring to the business success of the average craftsman, Plato recognizes nothing but failure. He uses the following example of the potter to support his belief:

When a potter becomes rich he will fail to take the same pains with his art. He will grow more and more indolent and careless and as a result he becomes a poor potter. But on the other hand if he has no money, and cannot provide himself with tools or instruments, he will not work equally well himself nor will he teach his sons or apprentices to work equally well. Then under the influence either of poverty or of wealth, workmen and their works are equally liable to degenerate. 13

The above quotation is typical of many that might be found in the writings of Plato. Although Plato came from an aristocratic home, it is still hard to understand why he took such a negative attitude toward the craftsmen because his most noted teacher, Socrates, was truly a friend of the worker. This attitude was probably developed through association with others who were wealthy, and in order to maintain dignity it was necessary for him to denounce the


crafts and anyone who practiced them. It seemed to have been the custom for those in the higher classes to scorn all forms of manual work except agriculture. This occupation escaped their censure because working out in the open developed the farmers' bodies and made them fit for war.

The belief of many authors that a highly specialized craft training program was in existence before Christ is well founded. Contracts have been found in ancient Egyptian tombs that outline the relationship between the apprentice and the master craftsman and indicate the trade to be taught and the required period of apprenticeship. These contracts date as far back as 18 B.C., and it is thought that many earlier ones are yet to be uncovered.

It seems that, in some of the ancient Egyptian communities, it was the custom of the local embalmer to wrap the mummy in a papyrus covering before committing it to the tomb. As the papyrus was to serve only as a protection against dust and moisture, the quality or newness of the papyrus was relatively unimportant. It was this papyrus covering that revealed nine of the oldest apprenticeship contracts that have been recovered to date.

The apprenticeship contract below is quoted in full because it is one of the oldest known to man, having been issued in 183 A.D.

Ischyrylon, son of Heradion and . . . of Oxyrhynchus, son of Sarapion also called Leon, son of Heraclides, his mother being . . .
of said city, weaver, agree with each other as follows: Ischyron on the one part that he has apprenticed to Heraclas . . . Thonis, a minor, to be taught the art of weaving for a period of five years starting from the first of next month, Phaophi, and will produce him to attend the teacher for the stipulated period every day from sunrise to sunset, performing all the orders that may be given to him by the said teacher on the same terms as the other apprentices, and being fed by Ischyron. For the first two years and seven months of the third year Heraclas shall pay nothing for the boy's wages, but in the remaining five months of said third year Heraclas shall pay the wages of the said apprentice twelve drachmae a month, and in the fourth year likewise for wages sixteen drachmae a month, and in the fifth year likewise twenty-four drachmae a month; and Heraclus shall furnish for the said apprentice in the present twenty-fourth year a tunic worth sixteen drachmae, and in the coming twenty-fifth year another tunic worth twenty drachmae, and likewise in the twenty-sixth year another tunic worth twenty-four drachmae, and in the twenty-seventh year a tunic worth twenty-eight drachmae. The boy shall have twenty holidays in the year on account of festivals without any deduction from his wages after the payment of wages begins; but if he exceeds this number of days from idleness or ill health or disobedience or any other reason, Ischyron must produce him for the teacher during an equivalent number of days, during which he shall remain and perform all his duties, as aforesaid without wages, being fed by the said Ischyron because the contract has been made on these terms. Heraclas on the other part consents to all these provisions, and agrees to instruct the apprentice in the aforesaid art within the period of five years as thoroughly as he knows it himself, and to pay the monthly wages as above, beginning with the eighth month of the third year. Neither party is permitted to violate any of the aforesaid provisions, the penalty for such violation being a fine of one hundred drachmae to the party abiding by the contract and to the Treasury an equal sum. This agreement is valid. The twenty-four years of the Emperor Caesar Marcus Aurelius Commodus Antoninus Augustus Armeniacus Medicus Parthicus Sarmaticus Germanicus Maximus, Thoth 25.

I, Heraclas, son of Sarapion, also called Leon, have made this contract and consent to all the
aforesaid provisions. I, Thonis, also called Morous, son of Harthonis, wrote for him as he was illiterate.\textsuperscript{14}

Westerman found eight other apprenticeship contracts similar to the one quoted above. In all, five were for the weaving trade, and one each was for hairdressing, shorthand writing, flute-playing and nail-making. Each of the contracts differed in several respects. It is noted that even among the weaving contracts the terms of apprenticeship varied from one to five years.\textsuperscript{15} It seems feasible that only a very loosely knit guild organization would have tolerated such inconsistency in training periods. Undoubtedly each master had his own ideas as to how long an apprentice should serve and saw to it that these ideas were reflected in the contract. We find in later years that the guilds regulated the terms of apprenticeship and set the standards for each of the crafts.

Using Westerman's data as a basis, it seems that the apprenticeship of Roman Egypt was widespread in nature. It is known that indentured contracts were used, but it is thought that they were enforced by common law rather than by official methods. It was a moral and social obligation for each of the parties bound by the contract to fulfill his part.


\textsuperscript{15}\textit{Ibid.}, p. 608.
Mays' study reveals that a similar program of apprenticeship existed in Rome just before the Christian era. Part of his study is based on the following epitaph found on the tomb of a twelve year old Roman slave: "He was the joy of his master and the pleasing hope of his parents. With his trained hands he knew well how to fashion jeweled necklaces and to place all kinds of gems in a golden setting."16

It has been generally accepted that twelve was the earliest age at which a boy might enter the ancient apprenticeship system. The above quotation would almost disprove this theory. If this apprentice was as skilled as his epitaph implies and he died at the age of twelve, then he must have started his training at a very early age. It is possible that since the boy was a slave, as were many of the Roman artisans, he was allowed to commence his trade training earlier and was not bound by a contract as was a "free apprentice." Also, it would seem that early trade training among the slaves would mean a definite financial gain for the owners. Exploitation of the slaves by forcing them to learn a trade that they might or might not have been interested in could have been one of the factors that led to the decay of the Roman Empire.17

16Mays, Op. Cit., p. 82.
17Carl Bucher, Industrial Evolution, pp. 96-100.
Between the beginning of the Christian era and the decline of the Roman Empire, there is little evidence of craft training except in India. This does not mean that India was the only country in which craft training existed at this period; instead, it seems that India carried on the most extensive program.

It has already been mentioned that guilds were prevalent in India as far back as 600 B.C., but it was not until the beginning of the third century A.D. that they reached their highest point. Hopkins believed that the guilds during this period had power that has yet to be equaled. In regard to the guilds at this time, Hopkins makes the following observation:

Till the time of Vishnu's law-book, third century A.D. no one of the guilds appears as pre-eminent, but in this work metal workers and smiths of silver and gold are mentioned particularly, though this pre-eminence may be due to accident. But the circumstance is interesting because exactly these guilds became the chief guilds of ordinary towns, and because they were very likely the first to band together in self-defense, they served as a guide for other guilds.18

A program of apprenticeship identical to the one that existed in Roman Egypt during the Christian era was being administered by the guilds of India. As in Egypt, the apprentice left his father's house and went to live with a master. The master taught him and fed him but was restricted by contract from making him do work other than

the type that related to his trade. All work done by the apprentice was marketed and the profit went to the master. If it were written in the contract, however, the apprentice might receive a reward for proficient work.\textsuperscript{19}

Examples of highly skilled Indian craftsmanship still exist today. The Iron Pillar of Delhi, which dates about the year 400 A. D., was made of pure rustless iron. This pillar, which stands over twenty-eight feet high and is over sixteen inches in diameter at the base, was made four hundred years before the largest known foundry of the world could have produced it.

The Saltanganj Buddha, another masterpiece of craftsmanship, was cast of pure copper and weighed over a ton. This idol also dates back to 400 A. D. and, like the Iron Pillar of Delhi, no scientific explanation has yet been made in regard to how it was built at such an early date.\textsuperscript{20}

During this same period it is noted that the craftsmen of medieval France were not experiencing the same degree of freedom as those in India. France, which was a part of the Roman Empire, was struggling in the death throes of a decaying empire as were other countries under the rule of Rome. It must be remembered that under Roman rule the craftsman enjoyed only a qualified freedom. They were free to

\textsuperscript{19}Ibid., p. 175.
practice their craft, but the product of their work had to make a contribution to the state. For example, in Roman Gaul there were several imperial factories engaged in the making of weapons. The craftsmen were technically free, but they were subject to definite regulations governing their work. With the collapse of the empire, many of the crafts and arts were either lost or forgotten. During this period of chaos, many of the objects of luxury were not made because there was no market value for them. Many of the craftsmen, finding themselves without work, turned to the monasteries for relief during this period of turmoil. Many of the crafts would undoubtedly have fallen into oblivion had the monasteries closed their doors to those who practiced them.

The manual work of the craftsman was viewed with respect by the early monks. St. Benedict, who founded the order of the Benedictines at Monte Cassino in Italy about 529 A. D., placed manual labor high on his list of things that a monk should do. He advocated manual work as a combat against idleness which, in his opinion, was a breeding place for evil. He emphasized, however, that the artisan was first a monk and that his craftwork was secondary to the routine duties that were expected of monks. In reference to this, St. Benedict says the following:

Artificers, if there are any in the monastery, shall practice with all humility their special arts, if the abbot permit it. But if any one of them becomes inflated with pride on account of knowledge of his art, to the extent that he seems to be conferring something on the monastery, such a one shall be plucked away from that art; and he shall not again return to it unless the abbot perchance again orders him to, he being humiliated.\(^2\)

It must have been hard for the craftsmen to maintain an equilibrium during this period of quick change. First, when the Roman Empire was at its peak, they were in great demand; and when it fell, they had to seek shelter and work wherever they could find it.

During the same century, it is thought that the craftsmen of Mexico and Central America were enjoying a much fuller life than were their fellow-artisans on the European continent. No evidence has yet been uncovered as to what kind of craft training existed at this early date, but numerous examples of highly skilled work have been found. The craftsmen who worked with metal, and particularly those who worked with gold, seem to have made the largest contribution to craft work during this period. In reference to this craft, Spinden says:

Metal working was unknown to the Mayas of the First Empire, but is abundantly illustrated in cities of the Second Empire, especially Chichen Itza where the pieces are predominantly of Costa Rican and Colombian manufacture evidently secured in trade. We are therefore justified in concluding that the splendid Isthmian gold work came

\(^2\)Charles A. Bennett, History of Manual and Industrial Education up to 1870, p. 25.
into being after 630 A. D. and was typically developed after 1200 A. D.\(^2\)

The gold worker during this period was highly skilled at casting. No one knows for sure what technique these craftsmen used, but it is known that gold plating was well within the realm of their skills. It has been suggested that the first step in this process was the making of a mold which was composed of clay and charcoal. This mold, which bore an imprint of the object to be cast, was lined with fine gold shavings or dust. Molten copper would then be added causing the gold to melt and the two metals to fuse, the gold staying on the outside.\(^3\)

As in Egypt, the best source of information concerning craft work in Mexico and Central America is the grave. It must be remembered that a very small per cent of the gold work done at this time escaped the plunderers of the Spanish army. It seems that most of the gold work that has been recovered to date has come from the graves of the ancient chiefs. It is possible that the Spaniards ignored these graves for fear that they might stir up rebellion among the deceased chiefs' followers.

The worker in stone also left many works of art for future generations to admire. Many of the knives used for

\(^2\)Herbert J. Spinden, *Ancient Civilizations of Mexico and Central America*, p. 196.

\(^3\)George C. Vaillant, *Artists and Craftsmen in Ancient Central America*, pp. 75-83.
ceremonial blood letting were made of stone, and it took a skilled worker to hone them to the required degree of sharpness. Skilled workmanship is also reflected in axes that were ground for jade and serpentine. Even with our modern tools it would be a difficult task to reproduce some of the stone work that these ancient artisans created.

In the city of Tikal, which is located in the interior of Guatemala, examples of remarkable wood carving have been found in the temples. In reference to this craft, Hewett makes the following observation:

> From nowhere else in Central America, and from but few places in the world, do we have such beautiful examples of ancient wood sculpture. It is a master work of the highest order, unsurpassed in my estimation by any piece of wood sculpture in the Old World.25

Although we find no evidence of trade training in these early civilizations of Central America, it is almost certain that it existed in some form. The highly skilled works produced during this time indicate that craftsmen with exceptional ability were practicing their trade. Skills had to be passed on in some manner or the trades would be lost; we know that the latter didn't happen because many of these crafts still serve the Central American as a source of livelihood. It is highly probable that these craftsmen used an informal type of apprenticeship. If a boy wanted

---

to be a wood carver, he probably worked with an old master craftsman for several years until he learned enough to do the work for himself. In many cases the master craftsman was probably the boy's father. However, if a boy wanted to learn a trade other than the one practiced by his father, he was more than likely adopted by a craftsman of his chosen trade in much the same manner as was practiced during the reign of Hammurabi, a Babylonian ruler in 2250 B.C. Regardless of the method of training used, its efficiency can not be criticized as a majority of the crafts that were being practiced during this period are still in existence today.

The eleventh century marks the beginning of a new era for the craftsmen and their trades. The most notable change was the granting of political and social freedom to those who worked in the crafts. Heretofore, the craftsmen were considered as inferior; and consequently, their social standing was very low and their political expressions were limited.

The rise of the medieval towns composed primarily of merchants and craftsmen, permanently altered the social standing of these groups. They now made up the core of community industry, and without them the other citizens would be at a loss. The craftsmen were placed in a distinct caste. They occupied a position that ranked socially just under the nobles and public officials. In France, the
artisans were a powerful group and their interests were considered important in the complex struggles between the rulers and the Church. This political importance held true not only in France but also among the other leading countries of the world.

In France, particularly, there is reason to believe that the crafts were undergoing a period of rapid development. From the tax rolls of Paris in 1292, Jean Garlanate made a comprehensive study of the crafts as they were practiced in the city at that time. Not only did he find that several major crafts were being practiced, but also that they were broken down into many minor subdivisions.26

The degree of specialization is well indicated in the leather trade. Work in leather was broken down into the following major divisions: Workers in cordovan leather, shoemakers, glovers, saddlers, cobblers, belt-makers, shield-makers, tanners, and furriers. Also the lorimers, who were makers of metal fixtures for leather harnesses, were considered by some as being members of the leather working industry.

The metal trades were broken down in much the same manner as in leather work. Trades listed under metal work were: blacksmiths, goldsmiths, silversmiths, cutlers, buckle-makers, sword-grinders, bell-founders, goblet-menders,

coppersmiths, tinsmiths, refiners of gold and silver, gold-thread-makers, gold-beaters, workers in hammered copper and tin, makers of plain nails, makers of fancy nails, bolt-makers, locksmiths, spur-makers, makers of chain mail, makers of metal plates, shield makers, and helmet makers.\textsuperscript{27}

It is noted that not only were the leather and metal trades broken down into a high degree of specialization but also the trades of the builder, the woodworker and the weaver. The divisions will not be enumerated as they were broken down in much the same manner as the trades already considered.

The masters who practiced the above mentioned trades had assistants of two classes: apprentices--young men or boys learning the trade; and journeymen--young men who had completed their apprenticeship but for some reason had not yet become established masters. These distinctions, based primarily upon the degree of maturity and training of the workman, were handed down and developed by previous generations of craftsmen.

In most instances, before a craftsman could become a master, he not only had to serve the required period of apprenticeship for his particular trade but also had to be financially able to maintain a workshop. It must be

\textsuperscript{27}\textit{Ibid.}, pp. 68-70.
remembered that the work was done almost entirely in the house of the master craftsmen. Usually the shop was just a room or other portion of the house set aside exclusively for craft work. Before an apprentice could afford a house in which to set up a shop, it was usually necessary for him to serve as a journeyman for several years. However, if he could afford to set up his own shop after coming out of apprenticeship, in most cases he would be allowed to become a master. One restriction was placed on him, however; he was required to work at his craft for a year before he could take on an apprentice.

In the ordinary course of things, craft training was handed down from father to son; and unless some special arrangements were made, craft knowledge could scarcely be secured in any other way. As time passed, this hereditary transmission of trade skills was replaced to a certain extent by a newer method of apprenticeship. This method, that of adoption, was known as far back as 2250 B.C. in the days of Hammurabi but only became widespread in use during this period. When a boy desired to take up a trade other than that of his father's, it could be arranged after the manner of an adoption. This adoption, which took the form of a contract, set forth all the obligations of the parties concerned—the master and the apprentice.

In most apprenticeship contracts it was specified that the apprentice was to serve his master to the best of his
ability, not only in the business but also in the performance of household tasks and other services that the master might specify. The minimum duration of apprenticeship was usually fixed at six years, though as many as eleven years were required in some trades. In some of the less important crafts, a period of three years training was thought to be sufficient. In France, the statutes of the goldsmiths provided that training should end when the individual was capable of earning one hundred sous per year in excess of board. In all cases, it seems that the duration of apprenticeship was determined by the time element involved in learning the trade. On the average, it was thought that seven years was a sufficient term of indenture.

The master craftsman had obligations to perform as well as the apprentice; these responsibilities were usually set forth in the contract of indenture in general terms. He was usually bound to instruct the apprentice in the skills of the trade to the best of his ability. Not only was the apprentice to be trained in skills of the craft, but it was also the duty of the master to help and guide the apprentice into a wholesome social development. The most important element in the social development of the apprentice was the close personal contact which he had with the master day by day. Working with the master, the apprentice

\[28^{ibid.}, \text{p. 83.}\]
had an opportunity to meet both those people who came into
the shop to sell and those who came to buy. This training
was indispensable, as the apprentice learned the economic
aspects of craft work as well as the necessary skills
required to carry on the trade.

The relationship of master and apprentice outside the
shop was of such character as to effect the most desirable
education for the apprentice in business and in all those
important social contacts. In his study of medieval English
apprenticeship, Lyon came to the following conclusions:

The master was bound to feed, clothe, and
house the apprentice. The younger man ate at
his master's table, slept under his roof, aided
the wife and family of the guildsman in their
home, and was in a very full sense one of the
family.\textsuperscript{29}

The period of training was supervised by the craft
guilds of which the master was usually a member. These
guilds developed very slowly and existed for centuries
before obtaining any degree of importance in town life.
Scott says that a craft guild is known to have existed
in England as early as the first part of the twelfth cen-
tury. It is probable that during this century the guilds
were starting their upward climb to importance; but as it
has already been pointed out, a guild was known to have
existed in India as early as 600 B.C. At any rate, it

\textsuperscript{29}Leverett S. Lyon, "Medieval English Apprenticeship as
was during the twelfth and thirteenth centuries that the
crafts began their expansion and specialization.

When the number of fellow townsmen plying a single
craft became large, there was an irresistible tendency for
all the craftsmen to work together in the interest of that
particular craft. This led to the formation of the guilds.
The minute regulations of industrial processes soon became
too complicated and technical for the craftsmen to look
after, so the details were turned over to the craft guilds.
In many cases, these guilds were associations of men who
often had united primarily for religious purposes.\textsuperscript{30} Almost all the trades and manufactures of England were under
guild control. The guildsmen made regulations for the
conduct of their trade, and by combining themselves into
a body their members were able not only to win rights and
privileges from king and overlord, but to push their business
in neighboring towns, and exact for themselves justice and
consideration.\textsuperscript{31}

Guilds were in their origin voluntary, and it was
quite possible for a group of craftsmen in some town to
refrain from forming themselves into a guild, or for a
town not to have any guild at all. As time progressed,
membership in the guilds was required of every practicing


\textsuperscript{31}Mays, \textit{Op. Cit.}, pp. 81-84.
craftsman. Dunlop makes the following reference to this rule: "No one would be allowed to practice a trade within a town where a guild existed before he had been made a member; he would have to work in accordance with the guild rules." 32

Supervision of the apprenticeship program was an important duty of the guilds. It was necessary for the guilds to keep a watchful eye over the masters to insure that the apprentices were receiving proper instruction. Many masters would keep more apprentices than they could instruct. Instead of being apprentices, they were actually just workers; and it was necessary for the guilds to regulate this error in order to uphold the standards of the craft.

The quality of work produced by the craftsmen was also under the careful scrutiny of the guilds. Therefore, the inspection of goods with which the guilds were charged was a matter of great importance. In many of the crafts, the raw materials to be used in production were definitely specified. As each craft endeavored to create high standards of workmanship, it was necessary for the guilds to see that no inferior materials were used. In the crafts which required a high degree of workmanship and close attention, night work was forbidden. This regulation also came under the supervision of the guilds.

The apprenticeship system in England might well be classified as a success due to the effective supervision of the apprentice by the master and also by the craft guilds. Although this institution was well suited to the Middle Ages, it was not equally well suited to all times and all conditions. In some of the older towns, the guilds may have had considerable control over the local market, but they had little or no control in the newer industrial centers of England, such as Manchester and Birmingham.

The close of the fifteenth century and the opening of the sixteenth century may be thought of as the passage from one era to another—from the Middle Ages to modern times. It was during the sixteenth century that the guilds started their gradual decay and along with it the decay of effective apprenticeship program that had existed in some form or another for innumerable centuries. Several things began to undermine the structure of the guilds at this time.

During the reign of Queen Elizabeth, the government began to take an active part in the administrative policies of the guilds. In 1563 an industrial code, the Statue of Apprentices, was passed. This law made labor compulsory and made it the responsibility of the justice of the peace in each community to regulate the wages of the various trades. It required a seven year apprenticeship for every person who

---

should engage in any trade, established a working day of
twelve hours in summer and during daylight in winter, and
enacted that all engagements except those for piece work
should be by the year.

It is obvious that this law stripped the guilds of
many of their responsibilities and also their power. The
village governments used the Statute of Apprentices as an
example and began to set up minute regulations governing
craft work.

A heavier blow struck the guilds in 1547 as a result
of the Reformation.34 It has been noted that many of the
craft guilds owned property, some of it donated by guild
members for the purpose of having a meeting place. This
property was confiscated by the State to be used for edu-
cational purposes. This blow fell just at a time when all
the economic influences were tending toward their disinte-
gration.

Another law passed under Elizabeth's reign attempted to
deal with the curse of pauperism. At this particular time
the towns and villages of England were falling into decay,
agriculture was giving way to sheep farming, and the land
was full of unemployed people.35 To prevent the rising
generation from growing up in idleness, the Poor Law was

35Edward P. Cheyney, Industrial and Social History of
England, p. 158.
passed in 1601. It provided that the parish authorities might bind out beggar children as apprentices. By means of this law, Parliament hoped to bring about greater stability in industrial life and thus to increase the strength and prosperity of the realm of England.

The law dealing with the curse of pauperism tore loose the foundation of an apprenticeship system that had existed for thousands of years. The first noticeable change was the fact that the number of apprentices per master was greatly increased. Also many of the children were drawn from the lowest level of society. They were apt to be idle and unwilling to work, and were, therefore, likely to receive little consideration from their masters. A law of the latter seventeenth century widened the gulf by compelling masters, whether willing or not, to receive these pauper children as apprentices at the request of the authorities.

A final blow to apprenticeship as it existed under the guilds came with the introduction of the factory system and machinery. It must be remembered that, during this period of industrial revolution, England was one of the leading nations of the world. Ships sailed from English ports carrying products to the four corners of the world, and in doing so established a system of world trade and commerce. At this time the emphasis was on quantity of goods produced more than on quality. Also, these world traders were not concerned with the manner in which the products were made. It
made little difference to them whether or not the goods were produced in a factory or in a master craftsman's workshop.

The factory system replaced the old apprenticeship program without any difficulty. When a country is undergoing a period of expansion, production methods usually replace the slower processes. English factories became assembly lines of workers. Instead of receiving a complete and thorough trade education, the apprentice, as he was still called, was merely taught one or two operations of a machine and his apprenticeship was considered complete. Often times this training only took a month or so. The apprentice was merely becoming an unskilled operator of a machine and this was usually as far as he advanced. He could never look forward to his own shop as an apprentice under the guilds did. His destiny was to be an operator of some sort of a machine for the rest of his life because to set up a factory and become a master required an enormous amount of money compared to that required in the days of the guilds.

In conclusion, the apprentice who was trained under guild supervision received a very good education, both socially and in the skill of the trade. When the guilds lost their control of apprenticeship and the state took it over, the apprentice was at a loss as far as any kind of education was concerned. He merely became a machine operator and was subject to the many abuses of the factory system.
The next chapter will consider the two outstanding philosophies governing apprentice training today. One theory is that trade training can be taught in school; the other, which is an evolution of the old apprenticeship method, advocates that trade training must take place on the job. The influence of the old apprentice system on present methods of trade training will also be pointed out.
CHAPTER IV

TRADE TRAINING TODAY

The United States has long been recognized as a country noted for its ingenious technological advancements. This reputation is further emphasized by the fact that American industrial life is made up of nearly 5,000 different occupations. These diversified trades are a far cry from their simple beginnings many centuries ago. In early civilizations, there was but one accepted route that a boy might follow to learn a trade. That was the serving of an apprenticeship that lasted from four to twelve years. As the trades expanded as a result of the Industrial Revolution, the problem of trade training became a complex one.

The effects of the Industrial Revolution not only destroyed the old apprenticeship system but also changed the whole structure of our society. Towns which were once market places for the small craftsmen now became vast industrial centers. Today, as in yesteryear, the world demands the many factory goods which are produced by American industry. In answer to this demand, a new process came into being—mass production.

With the introduction of mass production in American trade work, an important change took place among the laboring
forces. Previously, there were three types of tradesmen: the apprentice who was learning the trade, the journeyman who had learned the trade and was now classified as a skilled craftsman, and the master who was the owner of a shop and employed journeymen and apprentices to work for him. These three major divisions of labor still existed during and after the Industrial Revolution, but their meaning was different from what it was during the days of the guilds. Although the term "apprentice" was used, it generally meant a cheap form of child labor. A journeyman was one who had learned to master a few simple operations on a machine, and that was about the extent of his industrial training. The master was replaced by the modern factory owner. Hence, the three major divisions of labor evolved in the Industrial Revolution to mean something entirely different from their original meanings.

Today, industry has four general divisions of labor. The first and largest division of labor is the unskilled group of factory workers--people who have no trade and can only perform simple machine operations and other non-skilled work. Another group is the potential tradesmen--the apprentices of modern day industry, and this group is one of the smaller of the four. The skilled and semi-skilled tradesmen make up the third group. It is into this group that the trained apprentices will progress. The fourth group is made up of the engineering forces and the management, this group
having its counterpart in the masters under the old guild system. Several avenues of training have been opened to these groups, each claiming some distinct advantage over the other. As the skilled tradesmen make up the backbone of industry, the methods employed in training them will be considered first.

Apprenticeship in the United States today is not entirely run on a local basis. The federal government has had an increasing interest in apprenticeship for the last few years. As the United States is a government of the people, and since trade training is of vital importance to so many, it is only natural that our government has carefully considered this issue. In March, 1934, the government embarked on a nationwide apprenticeship program under the National Recovery Act. An organization known as the Federal Committee on Apprentice Training was created by congressional order under the National Recovery Act program. Even though the National Recovery Act was ruled unconstitutional in 1935, the Federal Committee on Apprentice Training was continued under the Department of Labor.¹ This committee is made up of representatives from the three groups that are most concerned with apprenticeship—labor, management, and government.

Congress, in keeping with our democratic ideals, restricted the government's participation in the national

¹Paul Bergevin, Industrial Apprenticeship, p. 21.
apprenticeship program to an advisory service. While the purpose of this group is advisory and not directive, the committee has a distinct interest in establishing sound programs of trade training that conform to recognized standards. These standards are necessary because fluctuations in the trades have been such that it is to everyone's advantage that men trained as skilled tradesmen in any locality of the nation should be able to use those skills in any other part of the country. The Apprentice Training Service, which carries out the policies of the Federal Committee on Apprentice Training, is constantly endeavoring to improve these training standards.

In order that this program might be practical, the advisory service provides each state with field representatives located in each of the key industrial centers. These representatives are available to assist labor, management, or public agencies in the organization and maintenance of training programs. For states not having apprenticeship committees, one of the duties of field representatives is to work toward the development of such a committee.² Pending a state organization, these representatives act in its place in setting up programs and in laying the foundations which may later be taken up by the state. Through its

representatives, the Apprentice Training Service is achieving basic standard in many sections of the nation.

Working closely with the representatives of the Apprentice Training Service, many of the states are achieving a high degree of success in the operating of apprenticeship programs. It goes without saying that a national program of apprentice training would be doomed to failure without the support of the states. It is to each state's advantage to maintain an efficient training program in order that its industries will have competent workers who can turn out products on a competitive basis. States that fail to see that its industrial workers are properly trained will eventually notice that its industries are lagging behind the more wide-awake states. In reference to this, The Yard Bird, a union newspaper in Maine, states the following: "The main interest of the council is to train young men in various local industries so that experienced men will be available to fill executive positions and increase the productivity of Maine industries."

The crux of a state apprenticeship program lies in what is generally called a state apprenticeship council. In most states this council is appointed by the governor, its membership being made up equally of representatives from labor and management. As it has been pointed out before, the foundations

---

3The Yard Bird, cited by Hedges and Patterson, Educating for Industry, p. 63.
for state apprenticeship councils are usually laid by government representatives of the Apprentice Training Service. Once this council has been inaugurated, one of its first tasks is to set up a state plan for apprentice training. In reference to the duties of a state apprenticeship council, Patterson and Hedges, who have both had wide experiences in trade training, lists the following duties of a state apprenticeship council:

The council sets up machinery whereby apprenticeship systems and individual indentures can be registered and reviewed. This machinery, if it is to be accepted by industry, must be simple, prompt, and accurate. Since public agencies, whether right or wrong, are generally charged with being excessively conscious of procedures and therefore difficult to deal with, the council must establish registration and review on as businesslike a basis as possible. A state-wide program of apprenticeship will amount to little or nothing if it is not able to secure factual information on the location and number of bona fide programs and apprentices.4

In order for apprentice training to remain on a high level of efficiency, it is necessary that a close working program exists between state and federal apprenticeship agencies. One of the initial steps of the state apprenticeship councils is to seek recognition of the Federal Committee on Apprenticeship as its official agency in the state. With state and federal organizations working together in close harmony with industry, a very efficient program of apprenticeship can be administered.

Although the state and federal agencies play an important part in apprenticeship training, the most important element of the whole program is the apprentice training itself. As it has already been pointed out, there seems to be two dominating theories today concerning the teaching of trade skills. The most outstanding theory is that trade education can be successfully mastered in the vocational schools. In order to gain a complete understanding of apprenticeship, it is necessary to consider each of these methods of training and its contribution to trade education.

The first method to be considered is apprenticeship on the job. This type of training is, in a sense, an evolution of the original apprenticeship training system that existed until the Industrial Revolution. Many aspects of this training have changed to meet the needs of present day industry. However, according to the Dictionary of Occupational Titles compiled by the United States Department of Labor, the term apprentice still means the same as it did 3,000 years ago.

Although often loosely used, this title is intended to mean a worker not less than sixteen years of age engaged under direct journeyman supervision, and according to a prescribed or traditional series of work processes graded to coincide with increasing trade maturity in learning a skilled occupation that requires, during the learning process, several years of reasonably continuous employment prior to the time that the worker may be considered a qualified journeyman. In general, apprenticeship is legally recognized only if recorded in a written contract, indenture, or agreement, in which, in return for
services rendered, the employer promises to teach the worker the processes of his trade. The terms of an apprenticeship agreement usually include specific reference to the duration of the apprenticeship period, a progressive scale of wages, and the nature of the processes to be taught. Frequently the agreement also specifies the amount and nature of related schooling in vocational subjects in which the worker shall engage during his apprenticeship period.\(^5\)

The success or failure of an apprenticeship program depends to a great extent on the quality of apprentices employed. It is to a company's advantage to carefully consider each apprentice's qualifications before hiring him. This is wise because a training program is usually expensive, and only those who can meet its standards should be allowed to enter it.\(^6\)

The age limit at which an apprentice can enter apprenticeship should be between the ages of seventeen and twenty years. A major factor in setting up this age limit is the fact that the apprentices will complete their training somewhere between twenty-one and twenty-four years of age. This leaves many years of useful labor before them. Not only is this to the advantage of the apprentice, but it is also to the benefit of the employer who will be given an opportunity to reap the fruits of his investment. These men are young enough, after they have finished their apprenticeship, to be

\(^5\)Dictionary of Occupational Titles, Part I, United States Department of Labor, 1939.

\(^6\)Frank Cushman, Training Procedure, p. 5.
considered as future plant foremen and managers. Among the larger firms today, it is a general policy to make promotions from the ranks of men who have been trained by the company. Hence, the incentive for a young man to make the best possible use of his apprenticeship and to remain with the original firm is greatly increased.7

Generally, it is not recommended that older men enter into apprenticeship training. Supporting this belief is the fact that older men usually have domestic responsibilities that constitute financial burdens. It would be difficult for a man with a family to live on the wages of an apprentice, especially during the first year or so of employment when the salary is at an extreme low. However, the G. I. Bill has been a boon to the returning serviceman who desires to learn a trade. The government subsistence plus an apprentice wage provides a comfortable living for the trainee.

Under the guilds, the apprentice received his education along with his apprenticeship. In the larger firms today, a certain amount of education must be completed before a boy is qualified to enter apprenticeship training. Generally, it is desirable for a candidate who wishes to enter apprenticeship to have a high school education. It is an accepted theory that a trainee is better equipped for modern

---

apprenticeship with this type of training.\textsuperscript{8} Also, the student who has taken industrial arts in high school usually makes the best of his apprenticeship program. In reference to the values of pre-vocational training in relationship to success in apprenticeship, Leavitt makes the following reference:

It is only when one has experienced the shock of misfit between what he has thought will hold, on the one hand, and what he finally finds to be true, on the other, it is only then that one is really sharpened to the point of developing good judgment. Leave out the test of practice, and people can think all sorts of things and be entirely wrong.\textsuperscript{9}

Basic experience in tools and machines with the idea of pre-vocational training has long been one of the staunch objectives of industrial arts.\textsuperscript{10} Hence, the student who has taken industrial arts will more than likely prove to be desirable material for apprentice training, providing he meets the other requirements.

It seems that the most effective apprentice training today is the type that is administered by the large corporations and not by the small manufacturers as many people might think. Today, examples of this highly efficient training may be observed in such companies as Ford, Western

\textsuperscript{8}Randolph Karch, "Printers Define Apprentice Qualifications," Industrial Arts and Vocational Education, XXVI (December, 1931), 408-412.

\textsuperscript{9}Frank M. Leavitt, Examples of Industrial Education, p. 15.

\textsuperscript{10}Emanual E. Ericson, Teaching the Industrial Arts, pp. 253-254.
Electric, Brown and Sharpe, and Westinghouse. To be complete, this list would probably embody many of the other well known corporations of the nation. The type of programs administered by these companies are each modifications of a broad plan of apprenticeship. Logically, each company must adapt the program to meet its particular needs.

In general, present day apprenticeship is composed of two distinct but closely associated elements—shop work or the practical trade training gained in the plant, and the related instruction taken either in the plant or in the public schools. Both of these parts are essential to the proper organization of apprentice training, and the true effectiveness of the program depends to a large extent on the quality of each of these factors as well as their correlation.

Trade training is usually carried on in the plant or shop where the apprentice works with the regular practicing tradesmen. The most effective training is carried on in the shops where journeymen serve in the capacity of shop instructors. The success or failure of apprentice training is greatly influenced by the competence of these tradesmen, as well as by the supervisors who plan the apprentice program. Paul Bergevin, Director of Industrial and Adult Education in Anderson, Indiana, sets up the following criteria for the selection of journeyman instructors: 11

1. He should be interested in young men.
2. He must be able to understand the young person.
3. He should have an agreeable personality.
4. He should be clean.
5. He must know his trade, especially the part he is supposed to be teaching the apprentice, well.
6. He must be a teacher. He must know how to appeal to young people's interests, to instill in them a desire to learn and learn well.

In keeping with the old apprenticeship idea that an apprentice should receive a well rounded education in his trade, modern apprenticeship stresses diversified trade training along with specific instruction. The apprentice in cabinet making, for example, will be poorly trained unless he knows something about the other trades related to his own. In order for a cabinet maker to be a true craftsman, he should be familiar with the trades related to cabinet work. In large plants, for example, the cabinet apprentice is transferred from his duties in the shop to duties in the drafting room for several weeks, and here he learns the fundamentals of drafting. He by no means learns the trade, but at least when he leaves the drafting room and goes back to the shop, he has an appreciation of the problems of the draftsman. He might even be able to visualize that his own trade is just one part of an intricate whole, and that it takes all trades working together to make the plant a success.

As in the days of the guilds, the apprentice learns his trade from every standpoint—that is, if he is fortunate
enough to be working for a company that maintains an efficient training program. In order for the program to be efficient, the apprentice should be allowed to work on actual jobs in the plant instead of just practice work. The skills of a true workman can only be learned by constant application and practice on actual problems and jobs. As will be pointed out later, this is one of the advantages of plant training over the trade school method of education.

An important factor in apprentice training, as in years gone by, is that the apprentice should not be a burden to the organization. In the days of ancient apprenticeship, the apprentice's work was sold along with that of his master's; hence, the apprentice was self-sustaining. The modern day apprentice who works on jobs to be marketed is paying his own way in much the same manner. Also, in working with salable goods, the apprentice feels that he is actually making a contribution to the profits of the plant and, therefore, will take more pride in his work.\textsuperscript{12}

The old master always taught his apprentice the elementary operations of the trade first. As soon as the apprentice mastered these skills, he began to learn more difficult tasks. This was to his advantage as he was increasing his skill; also, it was to the master's benefit as the productivity of the shop increased in direct proportion with the

skill of the apprentice. This method of instruction has its counterpart in the ideal apprenticeship program today. In order to determine the proper length of time that an apprentice should spend on a particular job, a careful analysis should be made of the particular trade.\(^{13}\)

Naturally, the period of time that an apprentice should spend on a job will vary according to his ability; however, it is still feasible that a general outline of trade experiences be made in order to insure that the most important parts of the trade are covered. The following general breakdown of work experience is for the machinist trade.\(^{14}\)

**TABLE 1**

**BREAKDOWN OF WORK EXPERIENCES FOR THE MACHINIST TRADE**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Name of Unit</th>
<th>Approximate Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tool crib and preliminary</td>
<td>400 hours</td>
</tr>
<tr>
<td>2</td>
<td>Drill press</td>
<td>100 hours</td>
</tr>
<tr>
<td>3</td>
<td>Lathe operation</td>
<td>1,500 hours</td>
</tr>
<tr>
<td>4</td>
<td>Shaper</td>
<td>300 hours</td>
</tr>
<tr>
<td>5</td>
<td>Planer</td>
<td>200 hours</td>
</tr>
<tr>
<td>6</td>
<td>Milling machine, universal and vertical</td>
<td>1,500 hours</td>
</tr>
<tr>
<td>7</td>
<td>Grinders, internal, external, and surface</td>
<td>1,000 hours</td>
</tr>
<tr>
<td>8</td>
<td>Drafting room</td>
<td>150 hours</td>
</tr>
<tr>
<td>9</td>
<td>Turret lathes and screw machine</td>
<td>400 hours</td>
</tr>
<tr>
<td>10</td>
<td>Boring mills, horizontal and vertical</td>
<td>200 hours</td>
</tr>
<tr>
<td>11</td>
<td>Bench and floor work</td>
<td>750 hours</td>
</tr>
<tr>
<td>12</td>
<td>Welding and heat treating</td>
<td>250 hours</td>
</tr>
<tr>
<td>13</td>
<td>Machine maintenance</td>
<td>1,500 hours</td>
</tr>
</tbody>
</table>


The breakdown of work experiences, page 71, was made from a careful analysis of the machinist trade. Each of the major divisions will be broken down into sub-divisions according to difficulty, each part being related to the whole. It is noted that according to this particular trade analysis, it takes 8,000 hours, or approximately four years, to learn the machinist's trade. In setting up this standard or limit that so many clock hours must be served before one can learn a trade, it must be recognized that there is a difference between a trade and a job. It has now been accepted by many industries that any skill that takes less than 4,000 hours to learn is a job and not a trade. Actually, in a majority of the trades, an apprenticeship of four or more years is served. Even after this training period is ended, the beginning craftsman is by no means skilled; several years of trade practice will make the apprentice a finished craftsman.

In addition to the actual shop work, a certain amount of related information must be mastered by the apprentice. It is now generally accepted that not less than 144 hours per year must be spent in acquiring information relating to the trade. There are two general methods of giving this related instruction. One is through the use of the public
schools; the other is using a special classroom set aside by the plant for this particular purpose.15

Related instruction given in the plant seems to be more desirable than that given in the public schools.16 As one of the major objectives of related information is to link theory with actual shop practice, the plant makes an ideal classroom. For example, if the instructor is lecturing on the theory of cutting threads on a lathe, he can add meaning to his instruction by taking the apprentices to the machine shop and putting his theory into practice in the form of a demonstration. It is at this particular point that many tradesmen realize that teaching is no simple job.

A common fault of many trade instructors is their assumption that they will make efficient teachers simply because of their skills in the trade. For example, a skilled draftsman might think that just because he shows the proper method of laying out a drawing that all the apprentices will follow this procedure. It is only after he attempts to teach in this manner and discovers how little the apprentices have learned that he realizes the need for a better understanding

15W. F. Patterson, "Twenty-five Years of Apprenticeship in America," *Industrial Arts and Vocational Education*, XXVIII (January, 1939), 10-12.

16Homer J. Smith, "Aims and Types of Industrial Education," *Industrial Arts and Vocational Education*, XXVIII (February, 1939), 45-47.
of how learning takes place. Hence, the instructor should
have a knowledge of teaching methods and also an understand-
ing of basic psychology—especially the psychology of learn-
ing.17

There are many conflicting opinions on how many hours
of related instruction an apprentice should be given, and
also on the proper length of the class period and its fre-
quency of meeting. It is a generally accepted theory that
at least 144 hours of related instruction should be given
each year, the present day trend being toward more hours of
related instruction. Usually this instruction is given
twice weekly in two hour sessions; however, some organiza-
tions believe one class period of four hours length is more
effective. Each method has its advantages and should be
adopted to meet the needs of the particular plant.

It is the policy of many companies to pay the appren-
tices full wages while attending related information classes.
In some cases, the apprentice attends the classes at night.
Some companies are of the opinion that it is the apprentice's
obligation to attend the classes on his own time. Since the
company is furnishing the instructor and classroom facili-
ties, the least an apprentice can do, in the company's
opinion, is to attend the classes without expecting pay.
This obligation is set forth in the apprentice indenture.

17Gerald B. Leighbody, Methods of Teaching Industrial
Subjects, p. 1.
As in the days of the guilds, one of the most important factors in modern trade training is the use of apprenticeship contracts. Through this medium, a binding agreement is made between the apprentice and the company, this agreement specifying the obligations of each party to the other. In order to show clearly the nature of modern apprenticeship contracts, an example is quoted below:

This indenture made this _____ day of _____ 19_, by and between ____________, a minor, residing at ____________ in the county of ____________, state of ____________, hereinafter called the apprentice, party of the first part, ________, and ____________, of ____________, Parent (or Guardian) of said apprentice, part of the second part and ____________, Company, a corporation having its principal place of business in ____________, hereinafter called the Employer, party of the third part:

(1) WITNESSETH, that the said apprentice, who is a minor, of the age of _____ years on the _____ day of _____, 19_, evidenced by the joining of said party of the second part in this instrument, does hereby, of his own free will bind himself to well, honestly, faithfully and industriously serve the ____________, Company at their works in ____________, for a full term of four (4) years, commencing _____, 19_ and ending _____, 19_, or as hereinafter provided. Each year is to consist of ________ (_______) hours, of which not more than ________ (_______) hours, without pay, shall, in the discretion of the Employer, be allowed each year for recreation, etc.

(2) Should any lost time occur it shall be made up by said apprentice at the end of each year and no year of service shall commence until the time lost in the preceding year, and the prescribed work for that period in Mathematics and Drawings, if any, has been fully made up. The Employer reserves and shall have the right at any time to

---

discharge the apprentice for cause, and thereby
be released of its obligation hereunder and
should the state of business demand it, to sus-
pend him, wholly or in part, and the making up
of time so lost shall be at its discretion; should
suspension be necessary, he shall, if he so re-
requests, receive a statement giving length of
service and why suspended.

(3) For each hour of actual service rendered
the apprentice shall be paid the following:
1st year __________________ cents per hour
2nd year __________________ cents per hour
3rd year __________________ cents per hour
4th year __________________ cents per hour

(4) When working piece work, the apprentice
will be allowed, in addition to his wages, as above
specified, fifty (50) per cent of the difference
between his regular wages and the amount regularly
paid by the Employer to others for such piece work.

(5) And the said apprentice agrees that he
will not leave said Employer during the term for
which he is indentured; and the said party of the
second part agrees to provide suitable and proper
board, lodging and medical attendance for the minor
during the continuance of this agreement.

(6) It is further agreed, that, except in case
of sickness, legal holidays, or days on which the
works are closed, said apprentice will not absent
himself from work for any cause without permission
of his foreman, and that he will attend class
sessions regularly as required, for which he will
receive the same hourly rate of wages as for regu-
lar work. The apprentice will be required to
perform his duties with punctuality, diligence
and fidelity, and to conform to the rules and
regulations which are or may be adopted for the
government of the shops.

(7) And the said Employer agrees that it will
teach, or cause to be carefully and skillfully taught,
to such apprentice, every branch of the trade to
which such apprentice is indentured, and that at
the expiration of such apprenticeship (including
the making up of lost time, and the prescribed
work in Mathematics and Drawings, if any) in a
faithful and satisfactory manner it will give
such apprentice a certificate, in writing, that
such apprentice has served at such trade or craft
a full term of apprenticeship as specified herein,
and the sum of One Hundred Dollars ($100.00).

(8) If the apprentice be retained in the
employee of the Employer at the completion of his
full term, he shall thereafter be paid a rate of wages commensurate with his ability as a journeyman, giving due consideration to the condition of business.

(9) All wages earned under this agreement shall be in lieu of all maintenance and shall be paid to and received for by the apprentice on the regular pay days of the Employer as may be established from time to time.

IN WITNESS WHEREOF, the several parties have hereunto set their hands and seals, the day and year first above written.
Signature of Apprentice__________________
Signature of Parent or Guardian_____________
Signature of Employer____________________

The apprentice contract just quoted seems thorough in its coverage of the subject. One point that needs clarification, however, is the paragraph that sets forth the apprentice’s wage schedule. In this contract, the wage scale had been left blank in order that the contract form might be used for more than one trade.

Under the ancient apprenticeship system, the apprentice drew little or no wages at the beginning of his training period. As the months went by and he became more skilled, his value to the master increased and his wages were raised in commensuration with his abilities. During the apprentice’s last few months of training, his wages neared those of a journeyman worker because by this time he was a valuable man around the shop.

Listed in Table 2, page 78, is a general percentage scale that many industries base their apprentices wages on. It is noted that modern day apprenticeship follows the same general theory of wage increases as did the ancient program;
the more experience an apprentice has, the higher his wages are. Extreme care was taken in making out this wage schedule; the scale had to be neither too high nor too low to meet the needs of modern day industry. If it were too low, apprentice training would cease to appeal to many of the higher type young men who would ordinarily enter into apprentice training. Too high a salary schedule would increase the tendency to assign the apprentices to jobs that they were not qualified by experience to hold. Although the starting wages for apprentices might appear low, it should be remembered that the American apprentice is paid two or three times as much as his fellow apprentices in other parts of the world.

**TABLE 2**

**TYPICAL SCHEDULE OF WAGES**

<table>
<thead>
<tr>
<th>Period</th>
<th>Percentage of Journeyman's Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First six months</td>
<td>40</td>
</tr>
<tr>
<td>Second six months</td>
<td>45</td>
</tr>
<tr>
<td>Third six months</td>
<td>50</td>
</tr>
<tr>
<td>Fourth six months</td>
<td>55</td>
</tr>
<tr>
<td>Fifth six months</td>
<td>60</td>
</tr>
<tr>
<td>Sixth six months</td>
<td>70</td>
</tr>
<tr>
<td>Seventh six months</td>
<td>80</td>
</tr>
<tr>
<td>Eighth six months</td>
<td>90</td>
</tr>
</tbody>
</table>

There are some who believe that trade training can be imparted in another way besides through apprenticeship.

---

These people advocate the full time trade school as a means of trade education, their belief hinging on the theory that trade skills can be mastered under school room conditions. Actually, the trade school was first stressed by educators when it became apparent that apprentice training in the industries was only a farce. Instead of trying to improve the apprenticeship system, a substitute was devised.

Although the trade schools have a strong point in the fact that they give training to many who would otherwise quit school, their many weak points overshadow their strong ones. The basic theory behind the trade school seems to be unsound. It takes very little reasoning to come out with the answer that trade skills cannot be mastered in the average trade school. It is true that many of the larger trade schools are making a worthwhile contribution toward industrial training; however, even the training in these schools can not compare with actual apprentice training.

The atmosphere that exists in a trade school, or any industrial school for that matter, is not comparable to that of industry. The essential elements that make up trade training--namely, wages, production speeds, high standards of workmanship, and the threat of being fired for inefficiency--can only be imitated in an artificial sense in the trade schools.

---

Another factor that is detrimental to the advancement of the trade school is its inadequacy of physical facilities. Modern industry is constantly devising new methods of production, better machines, and at the same time discarding obsolete equipment. The majority of trade schools can never hope to keep up with these advancements because of the expense involved. It is true that some of the larger trade schools are providing a valuable service by investing in as much equipment as possible. The Washburne Trade School in Chicago, for example, has made notable advancements in trade training. During World War II, it operated on a twenty-four hour basis and provided instruction for many war workers. However, where there is one outstanding school such as Washburne, there are hundreds that are trade schools in name only.

One only has to read the newspaper and see the advertisements playing up the Government Issue Trade Schools to come to the conclusion that many of the trade schools today are not concerned with imparting skills. It seems that the government tuition is of more concern to these schools than the teaching of trades. The great uprising of Government Issue Schools may well bring about the downfall of trade schools in general. Public opinion is running high against

---

these schools, and in many cases this factor alone decides whether or not something survives or falls by the wayside.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The differences of opinion concerning the teaching of skills as against general education, or whether trade training has a place in our schools at all, is a controversial question today after centuries of consideration. It seems that from earliest civilizations man has faced the problem of transmitting trade skills to the younger generation in a different manner. It is the purpose of this study to show what influence the trade training programs of ancient and medieval civilizations have made on our present day trade education techniques, and also to point out the trends in trade training programs as they exist today.

It would seem logical that one of the best ways to throw light on the study of trade training is to see our present methods evolve in the perspective of its long development in the past. In tracing the history of trade education back to its beginning, the sources of recorded information dwindle into non-existence. However, the lack of recorded materials does in no way signify that education in the crafts did not exist long before man made his first attempt to record his ideas and thoughts by making crude carvings and paintings on the walls of his dwellings.
When seeking data beyond the scope of recorded information, it seems necessary to rely on people who view the past in a different manner from the historian. Our modern archeologists and anthropologists believe that man in some form has existed on the earth for a half million to a million years. For the countless centuries when men did not devise ways to improve their tools or their conditions of living, education was at a standstill. When they began teaching each other and their children the use of such implements, a form of vocational training began.

Recently archeological investigations have made clear that the earliest significant developments of human life and social organizations began in Egypt about six thousand years ago. Egypt was the birthplace of a great many things that make our own civilization what it is today. Through the Jews, and later the Greeks, Egyptian ideas were transmitted to the Western World. It is, therefore, quite impossible to get a clear understanding of vocational training in antiquity without viewing the industrial organization of ancient Egypt.

To trace Egypt's gradual growth from a primitive state to one of advanced civilization would be a task for the historian. It is not the purpose of this paper to trace the historical growth of Egypt, or for that matter, any other country, but instead to bring forth only that
historical evidence which serves as a link between the ancient and the modern craftsman.

Ancient Egyptian history, like that of many other countries, may roughly be divided into a Stone Age, a Copper Age, a Bronze Age, and an Iron Age, each in turn gradually giving place to the next. We can only assume that trade training took place during these ages; it is apparent that some form did exist or the skills developed during these periods would have disappeared. Actually, the first record of any form of trade training was found in the Code of Hammurabi, a Babylonian ruler of the twenty-second century, B.C. Since this period, many records have been uncovered, each indicating that some sort of trade training was being practiced. Even the Bible refers to training in the crafts. Also, it sets forth a philosophy that honors and recognizes the man who works with his hands.

In Greece, about 600 B.C., a new and different philosophy from that of the Biblical writers was being formed concerning the craftsman. The thinking of Grecian philosophers touched upon every problem that was of paramount interest to the people; hence, it was only natural for some of their discussions to center around the craftsman and his trade. It was the general philosophy of the Grecian thinkers to hold the craftsman in contempt and to declare him unworthy of citizenship. An explanation of this negative attitude toward the crafts is quite obvious. The Greek
city-states were founded on the idea of a citizen army of small land holders, men who owned and worked their own farms. It was thought that work in the shops caused a man to lose his physical strength; this in turn made him unfit for the defense of the state, which was the chief obligation of citizenship.

The monasteries played an important part in the preservation of trade training during the dark ages. With the fall of the Roman Empire, many of the craftsmen, finding themselves without work, turned to the monasteries for relief during this period of turmoil. Many of the crafts would undoubtedly have fallen into oblivion had the monasteries closed their doors to those who practiced them.

With the introduction of the eleventh century, a new era began for the craftsmen and their trades. The most notable change was the granting of political and social freedom to those who worked in the crafts. Heretofore, the craftsmen were considered inferior and, consequently, their social standing was very low and their political expressions were limited.

The rise of the medieval towns composed primarily of merchants and craftsmen, permanently altered the social standing of these groups. They now made up the core of community industry, and without them, the other citizens would be at a loss. The craftsmen were placed in a distinct cast; they occupied a position that ranked socially
just under the nobles and public officials. In France, the artisans were a powerful group and their interests were considered important in the complex struggles between the rulers and the Church. This importance held true not only in France but also among the other leading countries of the world.

In the ordinary course of things, craft training was handed down from father to son, and, unless some special arrangements were made, craft knowledge could scarcely be secured in any other way. As time passed, this hereditary transmission of trade skills was replaced to a certain extent by a newer method of apprenticeship. This method, that of adoption, was known as far back as 2250 B.C., in the days of Hammurabi but only became widespread in use during a much later period. When a boy desired to take up a trade other than that of his father, it could be arranged after the manner of an adoption. This adoption, which took form as a contract, set forth all the obligations of the parties concerned—the master and the apprentice.

This apprentice training was supervised by the craft guilds of which the master was usually a member. These guilds developed very slowly and existed for centuries before obtaining any degree of importance in town life. It seems that when the number of fellow townsmen plying a single craft became considerable, there was an irresistible tendency for them to work together in the interest of that
particular craft. This was the beginning of the guild, a very powerful organization until the fifteenth century.

The close of the fifteenth century and the opening of the sixteenth century may be thought of as the passage from one era to another—from the Middle Ages to modern times. It was during the sixteenth century that the guilds started their gradual decay, and along with this decay came the decay of the effective apprenticeship program that had existed in some form or another for innumerable centuries. The introduction of the factory system during the Industrial Revolution struck a final blow to apprenticeship. It was in this era that the apprentice became a machine operator and was an apprentice in name only.

Today, there are two outstanding philosophies governing trade training. One theory is that trade training can be taught in school; the other, which is an evolution of the old apprenticeship method, advocates that trade training must take place on the job.

Conclusions

1. Trade training on the job is the most effective means of trade education.

2. Trade skills cannot be mastered in the average trade school. One of the major reasons for this is the fact that the conditions that existed in industry cannot be reproduced in a school room.
3. It seems that the apprentice program advocated by the federal government is an evolution of the old guild apprenticeship. If it were supported by all parties concerned, an effective means of trade training might be found.

Recommendations

A topic that seems to merit further study is the place of trade schools in our present day industrial society. It seems feasible that in some manner, the trade schools might be modified to meet the needs of both industry and the public.
BIBLIOGRAPHY

Books


Auerbach, Leo, The Babylonian Talmud, New York, Philosophical Library, 1944.


Binns, Charles F., The Story of the Potter, New York, Hodder and Stoughton (no date).


Cushman, Frank, Training Procedure, New York, John Wiley and Sons, 1940.


History of Copper and Brass, Copper and Brass Research Association, New York.


Hopkins, E. W., India Old and New, New York, Charles Scribner's Sons, 1902.


Knight, Melvin M., Economic History of Europe to the End of the Middle Ages, New York, Houghton Mifflin Co. (no date)


Ludwig, Oswald A., Metalwork, Bloomington, Illinois, McKnight and McKnight, 1947.


Smith, Robert E., *Units in Patternmaking and Founding*, Bloomington, Illinois, McKnight and McKnight, 1939.


Articles


Karch, Randolph, "Printer's Define Apprentice Qualifications," Industrial Arts and Vocational Education, XXVI (December, 1931), 408-412.


Patterson, W. F., "Twenty-Five Years of Apprenticeship in America," Industrial Arts and Vocational Education, XXVIII (January, 1938), 10-12.


Smith, Homer J., "Aims and Types of Industrial Education," Industrial Arts and Vocational Education, XXVIII (February, 1939), 45-47.

Tweedside, R., "Apprenticeship, Old and New," Industrial Arts and Vocational Education, XXVI (December, 1931), 408-412.