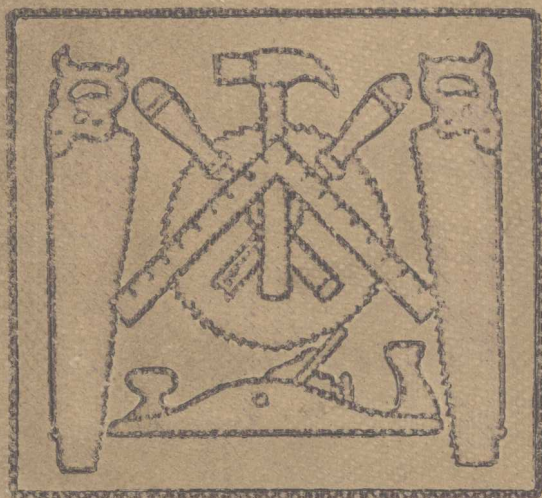


EDUCATIONAL
WOOD WORKING
FOR
SCHOOL AND HOME



JOSEPH · C · PARK

EDUCATIONAL WOODWORKING FOR HOME AND SCHOOL

BY

JOSEPH C. PARK

STATE NORMAL AND TRAINING SCHOOL
OSWEGO, NEW YORK



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WE are always in these days endeavoring to separate intellect and manual labor; we want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen in the best sense. As it is, we make both ungentle, the one envying, the other despising, his brother; and the mass of society is made up of morbid thinkers and miserable workers.

—JOHN RUSKIN.

PREFACE

THE increased popularity of manual training as a part of the curriculum of the public schools, and the demand for a text-book that can be put into the hands of pupils so that they may be held responsible for important subject-matter in connection with wood-work are the two main reasons which have led to the publication of this volume. The book, for convenience, is divided into parts, but it is not intended that Part I shall be completed before Part II is taken up. On the other hand, work should be given from the different parts from the beginning, and pupils should be held responsible for the work given just as they are held responsible for work in arithmetic or geography.

The book is intended to be used under the direction of a skilled instructor who has sufficient technical knowledge and teaching ability to lead his pupils to become capable in this line of work. Many illustrations of positions while at work are therefore omitted, because the instructor should show correct positions in the use of tools and should insist that the pupils acquire correct habits in their use.

The "Schedule of Work" (page 14) gives in a general way the plan of the work. In some schools it may be necessary to make a few changes in this schedule, owing to local conditions, but as far as possible it should be followed. The work under "Topics for Study,"

"Technical Operations," and "Tools" should be given in the form of regular recitation work, having both oral and written work. Pupils should have sufficient work with the "Key" so that they may be able to know the names and characteristics of common woods. The work in all of its phases should be vigorous and full of well-directed activity.

The writer wishes to acknowledge his gratitude for helps given in the preparation of this volume, aside from the various sources which are given in the foot-notes, to the following:—

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The writer is also deeply indebted to the following people, who so kindly sent to him for publication in this volume drawings of successful projects which have been used in some of the leading manual training centers in the United States:—

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The tables given under Wood (Part III) are taken from Bulletin No. 10, United States Division of Forestry.

Some of the matter given in the Introduction, and on nails and nailing, screws and glue, is taken from articles which were written by the author for *American Education*, and are published here by agreement.

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JOSEPH C. PARK.

STATE NORMAL AND TRAINING SCHOOL,
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EDUCATIONAL WOODWORKING FOR HOME AND SCHOOL

INTRODUCTION

MANUAL TRAINING: WHAT IT IS AND ITS PLACE IN EDUCATION

MANUAL TRAINING is a term used extensively by educators in defining a part of a system of general education. One would infer from the term "manual," meaning hand, that this branch of education is the training of the hand, but it is more than this. Not all that is done with the hand is manual training in the school sense of the term. In laboratory work in physics and chemistry the hand is trained to use apparatus in a skillful way, but this is not considered as manual training. Manual training is a general term which signifies the expressing of ideas in things by means of tools in working with such materials as paper, cardboard, clay, wood, iron, brass, copper, tin, etc. Manual training does not include work with apparatus, neither is its purpose to teach a trade.

Man is by nature a "tool-using animal" and has been so from remote periods of antiquity. Let us stop to consider briefly how much of the history of mankind is written in the tools that have come down to us. We look at the pens made of reeds which were used by the

ancient Egyptians and a series of facts are revealed by means of those tools which were used by man more than four thousand years ago. Axes made of stone, copper, bronze, etc., are dug out of the earth, and each tells a different story of the life of savage peoples of antiquity. The story of man's development is written in his tools just as plainly as the history of our earth is written in the rocks.

It is almost impossible to conceive of man without tools, yet in the beginning of human existence he had no tools. He was naked and without food and fire, living in caves and hollow trees, searching for fallen nuts under the trees and for fish and game in the streams and mountains. He was ever hiding from stronger animals and always seeking an opportunity to attack weaker ones.

Some one has wisely said that human culture began with fire, but no one has said when fire was first used by man. Doubtless some rude tools were invented before fire was discovered, and these tools probably led to the discovery of fire. With fire came protection and comfort. It drove away the fierce animals, which were afraid of fire; it protected man from cold. The weaker members of the family were left by the fireside while the stronger ones went out in search of food.

But man needed more than fire for his protection, for he was one of the weakest of animals. In expressing the weakness of man in this early period, Katharine Elizabeth Dopp¹ says: "He could not run as fast as the horse, swim as well as the fish, fly as the eagle, crawl as the serpent, or

¹ "The Place of Industries in Elementary Education," p. 19, The University of Chicago Press.

render himself inconspicuous by changing his color to correspond with the natural objects with which he habitually came in contact, or by maintaining such a control of his muscles as the wild calf and other animals do when they remain motionless in order to be unobserved. He was not protected with armor as the turtle is, with a thick skin as the rhinoceros, with a heavy coat as the mammoth, or with feathers and fur as the birds and beasts of prey. In his conflicts he could not strike as the cave bear, kick as the horse, crush as the rhinoceros, gore as the urus, or pierce and rend as the tiger. In the exercise of his senses and in muscular force he was surpassed by many of them." What man needed most in his weak condition was tools, and being endowed with intelligence he was able to construct them, although very crude ones, out of the materials at his command. At first his hands and teeth were substitutes for tools. His first constructed tool was the hammer. This he may have used in opening the shells of oysters, nuts, etc. In combat he fought at close range and therefore his blows were weak. Later he found that by using a club as a hammer he could strike a harder blow and thus slay even much stronger animals than himself. Still later it became necessary for man to fight at long range, and out of this necessity grew the need of, and therefore the invention of, the bow and arrow — tools of great utility among primitive people.

The development of the bow and arrow was a great step in man's advancement, for at long range he could kill large animals, which furnished materials for food and clothing. In making and operating the bow and arrow

man developed physically and mentally. Many problems came up in the construction and use of these tools, the solution of which demanded the activity of reason. In making the bow there was the kind of wood to be considered, when it should be cut, the seasoning of the timber, the shape and length of the bow. In making the string for the bow and in making the arrows other problems arose, all of which were carefully worked out in the course of time.

Among some of the Indian tribes of to-day certain rules regarding the bow and arrow which were worked out centuries ago are still in use. Of course, a boy could not use a bow that was made for a man, and two men differing in physical strength could not well use the same bow; so a difference in the size and strength of the individual led to modifications of these tools so that they could meet the requirements of each individual. Each individual made his own bow and arrow, and in making them certain units of measurement were and are still employed. The Indian hunter in making his bow does not use a standard length; the bow must be exactly eight times the span from the thumb to the little finger of the hunter using it, and the length of the arrow must be exactly the distance from the armpit to the end of the thumb, measuring on the inside of the extended arm. Similar methods were employed in the making of all tools. In writing of the bow and arrow, Thomas Wilson¹ says: "The bow and arrow was the greatest of all human inventions — greatest in that it marked man's first step in mechanics, greatest in adaptation of means to the

¹ *Smithsonian Report*, 1894, p. 980.

end, and as an invented machine it manifested in the most practical and marked manner the intellectual and reasoning power of man, and his superiority over the brute creation. It, more than any other weapon, demonstrates the triumph of man over the brute, recognizing the limitations of human physical capacity in contests with his enemies and the capture of his game." His necessity demanded the bow and arrow, and this led to its construction and use. As man increased his variety of tools, he was gradually lifted to a higher plane of civilization.

Economists have classified the activities of the race into three main divisions, as follows: First, the house industries, or the period of domestic economy, which lasted from the earliest times until the beginning of towns in the tenth century. Second, the period of town economy, or the period of handicrafts, extending from the tenth century to the beginning of modern times. Third, the period of national economy, or the age of machinery and the factory, in which we now live. In passing through these activities many stages are represented. We note the hunting stage, the fishing stage, the pastoral stage, the agricultural stage, the age of metals, the stage of trade, travel, and transportation, the city state, the feudal system, the handicraft system, and the factory system.

It is believed that the child in the course of its development passes through practically all of the stages that the race has passed through, and manual training in the home and in the school helps to supply the needs of the child in passing through the different stages of his development. Manual training not only helps the child to appreciate the activities of life of to-day, but it also shows

the relation between the activities of the past and the present. Manual training deals with life, and is one of the serious considerations in the history of child development. In Carl Bucher's "Industrial Evolution"¹ he writes: "After all, the comforting result of every serious consideration of history is, that no single element of culture which has once entered into the life of men is lost, that even after the hour of its predominance has expired it continues in some more modest position to coöperate in the realization of the great end in which we all believe, the helping of mankind toward more and more perfect forms of existence."

The rough highway between the aboriginal and man has been paved by means of the seven hand tools — the hammer, the axe, the saw, the plane, the square, the chisel, and the file. The influence of tools upon civilization is expressed most graphically by Carlyle in these words: "Man is a tool-using animal. He can use tools, can devise tools; with these the granite mountains melt into light dust before him; he kneads iron as if it were soft paste; seas are his smooth highways, winds and fire his unwearying steeds.

"Nowhere do we find him without tools; without tools he is nothing, with tools he is all."

In early times, before the institutions of society became so complex and so far reaching in their demands and influences, the home was one of the most potent factors in education. In rural communities to-day and in the best regulated homes wherever they may be this institution is still a powerful influence in the cause of

¹ Page 184.

education. The homes of our ancestors were made by men and women of great practical efficiency and this efficiency was imparted to the rising generation largely through the influences of the home. In speaking of the influence and efficiency of men and women in early times, Henry Turner Bailey, in "The Arts and Crafts in the Public Schools,"¹ says: —

"The Man. — Cleared land, cut wood, made rails and posts, built stone walls; built barns and sheds, made simple furniture and farm utensils, involving carpentry, blacksmithing, and painting; cared for bees, poultry, sheep, cattle, horses; could break colts and steers; milk, shear sheep, butcher; could plow, plant, cultivate and harvest vegetables; sow, mow, reap, thresh, and winnow grain; could read the sky, tell birds, wild animals, insects, and common plants and trees at sight; could plant, prune, and graft trees; make maple sirup and vinegar, cure ham and bacon; fish, trap, and hunt successfully; make shoes, harnesses, and simple tools; weave baskets; make kites, bow guns, darts, whistles, etc., for the children; repair anything; shave himself; make a telling speech at town meeting.

"The Woman. — Understood all phases of house-work, sweeping, dusting, washing, ironing; could cook, make yeast, soap, candles, butter, cheese, sausages, preserves of all sorts, candy, wines, and cordials; could spin yarn from wool and thread from flax; dye and knit, weave and embroider; shrink cloth, bleach cloth;

¹ An address before The American Institute of Instruction at New Haven, Conn., July, 1906. Published in the January, 1907, *School Arts Book*, The Davis Press, Worcester, Mass.