

TECHNICAL EDUCATION.

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ABOUT a century ago Samuel Johnson declared that "education was as well known, and had long been as well known as ever it could be." This effervescence of his habitual dogmatism was excited by the appearance of a new treatise on education; but in spite of the impatience with which the subject was thus dismissed long ago, the world in general find that a great deal remains to be said on it, which is calculated to interest still. Among the questions which continue to be discussed in connection with the subject, there is one which becomes more complicated every year by the perpetual increase in the range of studies over which education may extend. It is common to distinguish the studies of an educational course into two classes according to the immediate ends which they have in view. Some studies look merely to the character of the person who is being educated, and their chief end is simply to develop to a state of vigour the powers with which he is endowed, so that he may be able to apply these effectively to any duties to which he may be called in life. These are what are commonly understood by *liberal* studies. There is another class, however, whose primary object is to communicate to the student such special training as may fit him for the particular occupation in which his life is to be principally spent. Such studies are distinguished as *professional*.

No one denies the essential importance of liberal culture in human education; but it has been too often assumed that the necessity of liberal culture requires us to exclude all professional considerations, or at least justifies us in restricting an educational course, either wholly or mainly, to studies that can never be of any service in the subsequent occupations of life. It must, of course, be acknowledged that many studies, like some controversies in medieval metaphysics, which are comparatively trivial in positive worth, may yet, by the enthusiasm of the scholar, be made the means of developing a high degree of intellectual acuteness and power; but there is no reason to suppose that an equal culture might not be obtained in the study of sciences which admit of innumerable applications to the security or the enjoyment of life. It is, therefore, worthy of consideration, whether strictly professional studies might not receive a more prominent recognition, even in those academical regulations which aim merely at liberal education.

But whatever may be the value of professional studies in a system of liberal education, for professional purposes they are, of course, altogether indispensable. Now, among professional studies an obvious distinction may be drawn. Some of the occupations of life have a permanent material product in view; and the education which is designed to prepare for these, is commonly distinguished by the term *technical*, when used in its most restricted sense. *Technical* is originally a Greek word for *artificial*, and therefore it describes appropriately any process by which the art of man transforms a product of nature. Now, all such material products of human art imply the use of a material instrumentality,—a tool, a machine, or other apparatus, as well as the raw substance which is to be transformed. Accordingly, all technical education implies a training in the use of such instrumentality,—a

practical knowledge of the natural properties by which it is rendered serviceable to man.

It is too often forgotten that the primitive instrumentality of man,—the instrumentality, without which all others are valueless,—is his own physical organism. Again an etymological reminder may not be out of place: *Organ* is merely a Greek word for *instrument*. The technical education of men ought therefore, to begin with the training of their bodily organs. The hand is, of course, the organ chiefly—in fact, almost exclusively—employed in the production of human art. We *handle* our tools and machinery; we *manipulate* our apparatus; and all our productions even when elaborate machinery is employed, are described as *manufactures*, as if made entirely by the hand. The psychologist and the anthropologist alike know the value of this organ in discovering the mechanical forces of nature, and in making them subservient to the human will. Since the time when, twenty-three centuries ago, Anaxagoras declared that "man is the most intelligent of animals because he has hands," it has been evident to science that there is no other external organ of the body, in which we stand so decidedly superior to the lower animals. For the general purposes of human life, therefore, an education must be defective, which overlooks altogether the training of the hand; and it may be fairly pleaded that such a training ought to form a part of even a purely liberal culture. One may accordingly join with full sympathy in the lamentations of Mr. Ruskin and others over the neglect of manual skill, even though one may refuse to charge it upon the extended use of machinery, or to encourage a retrograde movement which would require men to produce by the hand articles which a machine can turn out at immeasurably less cost of labour, and with more certainty of mechanical exactness. The very instrumentalities, which human art employs in its productions, give plenty of scope for skilful handling, and demand therefore an education which shall refine the sensibility of the manual muscles. Fortunately this is a training which may be begun even in the nursery, and does not exact that unnatural stimulation of the brain, which exerts such disastrous results on the general health by prematurely adopting other modes of early education. The exercise of his little mind in the intelligent direction of a tool is a kind of labour on which the child is always ready to enter with zest, and therefore with little chance of unnaturally overstraining any of his powers. Every opportunity may therefore be wisely afforded to gratify the childish craving for the use of pen and pencil and brush; and even the handling of sharp-edged tools may, with some simple precautions, be profitably encouraged at a very early age.

All the instruments, which man employs, are but embodiments of natural forces, and all the forces of nature work in accordance with invariable laws. To use an instrument, however clumsily, in the production of any object, implies at least some vague knowledge of the laws governing the forces that are embodied in the instrument, but perfect accuracy in the operation, and certainty as to its result, can be attained only when a vague knowledge has made way for exact science. Even the common tools, which have been the familiar benefactors of man from a period anterior to the dawn of history, depend for their efficiency upon the accuracy of his knowledge regarding the properties of matter, by which they work their results.