

—but it much more implies, it seems to me, an eye trained to notice and to distinguish, and a hand capable of doing just what is needed.

But shopwork trains and disciplines the mind as well as the hand. When I say this I am conscious that it daily grows more difficult to distinguish between what is mental and what is physical, for every physical act is to some extent a mental act, and is not only brain-effected but also brain-affecting. A person engaged all the time in one simple monotonous act is not liable to be possessed of the brain power that belongs to the person whose occupation leads him to vary the character of his daily toil. This is probably the reason that the playground is so valuable educationally, not perhaps so much that the brain is rested by the change as that by the variety of exercise it is fed and strengthened—altered in its arrangement and material.

Moreover, apart entirely from this, the workshop is one of the best places to train in habits of order, neatness and method. The bench, the chest of tools, the tools themselves, the material used and the machinery, all afford easy and unfailing opportunities for the teacher to foster the habits mentioned. To keep things in their places and to take exactly the right steps in performing an operation can be acquired in a workshop better perhaps than anywhere else. The very tangibility or materialism of the things used makes it possible for a student to arrange and re-arrange, and thus of his own self to correct, improve and perfect much better than in dealing with abstract things, which he cannot so well keep in view.

And again, I have noticed that thoroughness can be better taught in the workshop than almost anywhere else. It is so easy to make a mistake, and it is so visible when made that students become very careful, especially when they know that imperfect work is absolutely refused. The perseverance and watchfulness thus developed are most desirable qualities in a lad; and boys that have been given up as worthless in ordinary school work have, by their success in the shop, been encouraged to take an interest in this work.

Moreover, there is a sense of power begotten in dealing with substances so easily altered and shaped as wood, red-hot iron and molten lead; and the boy is at the same time brought into contact with the most ordinary things and learns to take an interest in them. Thus all things become new. The car wheel is examined to see whether it is made of metal or paper, the bridge to discover the nature of its support, the bookcase to learn the way it is jointed, and so with everything. The boy is taught to sympathize with the great busy world around him, and what is even more important retains that curiosity, that spirit of investigation which is so characteristic of the child in those younger days when it learns so much, but which I am afraid is often destroyed by the routine of our schools.

Of still more importance is the training imparted in planning and creating. In all Manual Training Schools the student is required to make a drawing to a scale of the object he wishes to construct, and then to

work from it. In original work, there must first be in his mind a general conception of what he wants, then comes the thought of the exact form and size, then follow measurements and calculations, and then the drawing is made and worked to. I know of no more valuable training than this, but lack of time prevents further dwelling upon this point.

In connection with the mental value of a course in shop-work, I would direct attention to two things: 1st. That in this, as in everything else, boys may be improperly taught; hence the necessity of putting the work in the hands of teachers of experience, and not in the hands of mere mechanics or machinists, no matter how skilful they may be. At Woodstock we are fortunate to have on our staff men who naturally take to mechanical work. This last year three of the teachers were engaged in teaching in the shop, and we are arranging for teaching help from others of the staff. Thus and thus only will it be possible to make our course valuable educationally. 2nd. That in addition to the mental advantages already enumerated as resulting from workshop practice, there is this to be kept well in mind: the workshop should be regarded in its educational relations more as a mathematical and physical laboratory than as anything else. This has not always been kept sufficiently in view by the advocates of this branch of school work. It is, however, being more and more recognized as its chief function. It can be easily seen how wide a scope is offered for the application and explanation of mathematical forms and principles, and for experiment in physics.

But most important of all is the moral effect of a course in shop-work. It has been urged against our schools that they alienate the affections of our young people from the farm and workshop; and while this alienation has perhaps been over-rated, I am myself aware of boys who have entered school hoping to get a training that would the better fit them for farm life, who have lost their first love as they have proceeded with their work. No boy can for four years undergo a course of training in a shop and all it implies and fail to learn to regard manual labor as most honorable.

It was my intention to outline a course of work from the Kindergarten to the University, but this I cannot do for fear of proving burdensome. Suffice it to say that well-planned and carefully graded courses are now provided in the schools in which the work is taught. Of necessity some time must be spent in learning how to use and care for the ordinary tools of a carpenter. With us the object is to make the boy discover for himself these things. Then a graded course of exercises is followed out, intended to give skill in the use of tools, a knowledge of the properties of wood, and the most advantageous way of utilizing material. After the ordinary carpentering comes wood-turning, then more advanced work in carpentry, then wood-carving, blacksmithing, casting, machine work and construction of machines and engines, illustrating the departments of mathematics and physical science.

The question is often asked to what extent can the system be used in our public

and high schools. While experience seems to show that a boy younger than twelve years cannot profitably begin the use of tools, there should be in every public school a bench or two with as many complete sets of tools. Now that a really good kit may be procured for \$20 or less, there should be no difficulty in securing these. The older boys might profitably use them and follow out the plan of work generally adopted. An hour a day will accomplish wonderful results. In the junior classes preparation should be made for tool work. The Kindergarten, clay modelling and drawing will give sufficient work, and will, if carefully taught, lead right up to the use of tools.

In the High School it is not too much to hope for a complete workshop with twenty or thirty kits of tools and an instructor capable of teaching the work. Any teacher who is of a practical turn can, in a few months, acquire skill and knowledge enough to teach the carpentry, and a special course during the summer vacation in a machine shop or in a factory alongside a good workman will enable him to acquire sufficient skill as a wood-turner, or carver, or blacksmith, to warrant him in adding any of these departments to the course. An hour a day, or even every other day, is all that is necessary to make the course profitable.

In the University the shop-work will grow into the study of machinery, the enquiry into the heating power of fuels, the expansive power of vapors, the generation and storage of electricity, the study of architecture, the application of chemistry to the various industries; in fact there is no limit to the development of the work from the beginnings already made in the School of Science and the physical laboratories of Toronto University. As yet, however, it is impossible to outline what such a course should be, and we must be content to hope that it will not be long before the same unanimity in regard to the advanced course may be found as now exists with reference to the work in its earlier stages.

✻ English. ✻

THE MEMORIZING OF LITERATURE.

ALL modern systems of education show a very marked and prominent tendency, the tendency to cultivate inquiry rather than faith, to depend upon reason rather than memory. No one realizes the change that has come over education in this respect more than the teacher of to-day, who is able to contrast his own methods with those under which he himself grew up. How often, when two or three of us talk together of old school-days and old school-books, do old studies recur to our minds, and lo! from the dim recesses of memory steals forth many a list of prepositions and conjunctions, pronouns personal and adjectives distributive. Queer grammatical train, how we smile over the quaint gait and antique forms! Peace to the ashes of such knowledge and such teaching.

Yet in acknowledging that the memory has been sadly abused in past systems, we by no means acknowledge that memory has no true part to play in education. And here we do not mean memory in the broad sense of the term as the hand-maid of foreign languages, mathematics, science. In all such subjects every teacher knows that a retentive memory is the first requisite of a successful scholar that failure is assured to the pupil whose alleged brain is a sieve without a bottom. We mean memory in a narrower sense, when it is used simply as a store-house for things which have no particular