

action on the gate post; to understand the true mechanical principles on which a good plough is made and worked, as distinguished from a bad one; to know how to forge a bolt and thread it or to select the right grain in and kind of wood for a fork handle or a mallet, are of considerable advantage. In connection with the many sciences he has to learn, the young farmer will be the better through life for knowing than for not knowing the "nearly nothings" which can be learned in the workshop only. A general command over the use of one's fingers is a very important element of industrial efficiency. It can, of course, be developed by training, but the greater part of this may be of a general character and not special to the particular occupation, to be able to bear in mind many things at a time, to have everything ready when wanted, to act promptly and show resource when things go wrong, to accommodate one's self quickly to changes in details of the work done, to have always a reserve of force which will come out in emergency, these are the qualities which make a great industrial people. To give our students this needed adaptability, the new building just completed furnishes facilities for carrying on operations and give instruction along this line of work. To our success as a nation it is necessary that the young race of men who are to do the work should have passed through better training than their fathers and possess superior skill to the youth of other nations.

The instruction does not aim at the production of finished articles, though all exercises are embodied as far as possible in complete objects, but to inculcate principles, emphasizing the reason for doing work in the particular way which is the result of practical

constructive experience. These principles involve exercises having values only as they have rendered educational service in the process of construction, or in their manipulation. In this way the student not only acquires conception of skill as such, but also the idea that correct results are only attained by the skilful application of a plan clearly thought out. The endeavor is to find the best plan, and the reason for its preference. In changing conditions of the thing in hand during its construction, there is a constant necessity for creating new means to meet new requirements and directive skill and logical processes thus evolved make Manual Training rise to the level of scientific or mathematical studies as a means of intellectual development.

The Manual Training.

First Year.

Woodworking:

Drawing.—Freehand sketches of simple objects—implements and parts of machinery. Geometric problems, isometric projection, working drawings of objects made in workshop.

Benchwork.—The use, care, sharpening, grinding and adjustment of the jack, smoothing block and jointer planes; chisels, gouges, brace and bits; rip, cross-cut, tenon and turning saws; simple joints—their construction and application. Simple, useful objects.

Timber.—Its preservation, principal varieties of wood and their leading uses. (Thirteen lectures.)

Second Year.

Metal Working:

Drawing.—Freehand sketches of implements and parts of machinery. Projection, machine details—bolts, nuts, screw threads. Working drawings of objects made in workshop.

Forge.—Fire and heat—tools, ham-