

be drawn out neatly with ruler and compasses; and elementary proof should be given, depending generally merely on symmetry and proportion. The strict logic of Euclid is best reserved till the faculties are more developed. Splendid as is the training, it is too severe for boys of eleven and twelve, and rather retards than advances them in the subject.

Contemporaneously with the geometry class there should be a carpentry class: two lessons of two hours each a week is not at all too much to devote to this purpose. Short lectures should be given on the nature of woods and the use of tools, which should be introduced in proper order; first the saw, then the chisel, and then the plane. But all objects should be made to scale and measurement, and, if possible, little drawings of them made in a book, serving as practice in drawing and a record of progress. Then the jack- and trying-planes should be introduced, and the boys taught the principles of making rectangular blocks of substances, the rules for which are of course the same for wood, stone, or metal. The tests to show whether a surface is true or skew-shaped, &c., should be explained. The boys may then go through a simple series of joints, such as are here shown, in drawing, and made up. But with all this it must be remembered that it is just as easy to do unprofitable handwork as unprofitable headwork, and that technical education badly conducted may become more "mechanical" and stupefying than the worst-conducted book-lesson. The above instructions will probably be sufficient for most boys up to the time they leave the Board school.

The girls, and perhaps some boys, may be treated perhaps more on the artistic side. Instead of geometrical drawing and construction, they might be taught freehand drawing and modelling. I here exhibit a collection of work of a class of little girls at St. Jude's School, Whitechapel. It is not a good plan to place the work to be modelled on a flat table—it should be inclined at a steep angle like a desk, and the design to be copied placed sloping forward above it, so that the planes of both are about perpendicular to lines drawn from the eye to their respective centres. The good arrangement of light is also important. Stone, wood, or metal-work depends on cutting a form out; modelling depends on building up. Hence the procedure in these arts is fundamentally different—a fact which should not be lost sight of.

We lastly come to the question of cost. The annexed list is arranged for a class of thirty boys, there being supposed to be 300 in the school, of whom 150 had two lessons of carpentry each week. The set of drawing-instruments here exhibited has been found to answer very well, and costs, complete, 3s. The best form of bench, I think, is with an iron bench-screw. It is found in the French schools that the boys spoil wooden ones. Tools in carpentry may be divided into three classes—(1) necessary tools, (2) difficulty-saving tools, (3) labour-saving tools. An example of the second is, for instance, the "valet" and the mortising-chisel. An example of the third is the mortising-machine. It is obvious that the beginners should be furnished with the two first of these classes as much as possible, but not with the last. They should learn to sharpen their own tools. To fit up a room with thirty benches and iron screws would cost about £30, and, therefore, adding £1 10s. a head for tools, we have £75 as the price of outfit for the school, including wood. The yearly salary of the teacher would be about the same as the salary of School Board masters. It is earnestly to be hoped that attempts will not be made to introduce turning or ironwork into the schools: it only distracts the attention of the boys, renders the class much more difficult to teach, and ends by spoiling the courses of instruction. It will be quite enough if the boys learn to make a few joints thoroughly, and to do their geometrical drawing fairly well. And so, also, wood-carving and fancy work should be forbidden during school-hours. For the modelling for thirty children we need 5 cwt. clay, thirty desks, thirty modelling-tools, thirty boards for clay, a selection of copies. The cost of this will be about £12. I have thus endeavoured to investigate the uses, objects, and cost of technical education in the Board schools; and it seems to me that these and other considerations, which will doubtless occur to the many gentlemen in the room of far more experience than myself in these matters, abundantly show that technical education in the Board schools may not only be made most beneficial to the children, but that this may be done at a cost that need in no way alarm the ratepayer, provided that the system is conducted with economy, and under due direction and limitation.

List of Tools required for an Elementary School for Thirty Boys in a Class.—30 12-in. rules, 1d. each; 30 gauges, 7d. each; 3 5-in. compasses, 9d. each; 3 dozen pencils, 9d. per dozen; nails (various), 4s. 6d.; screws (various), 2s.; 30 protractors, 6d. each; 30 awls, 3s. per dozen; 30 gimlets, 3s. 6d. per dozen; 6 pincers, 1s. 2d. each.; 30 iron wedges, 1s. each; 30 $\frac{3}{4}$ -in. chisels, 10s. per dozen; 30 $\frac{3}{8}$ -in. chisels, 8s. per dozen; 15 $\frac{1}{4}$ -in. socket mortising-chisels, 1s. 6d. each; 15 $\frac{1}{2}$ -in. socket mortising-chisels, 1s. 10d. each; 30 gouges (3 sizes), 11s. per dozen; 30 14-in. jack-planes, 4s. 8d. each; 30 20-in. trying-planes, 5s. 6d. each; 1 grindstone, £2; 1 axe, 2s. 6d.; 6 hones (with case), 4s. each; 2 oil-cans, 6d. each; 4 quires sandpaper, 6d. per quire; 1lb. glue, 10d.; 1 gluepot and brush, 2s. 6d.; $\frac{1}{2}$ standard of wood, £5; 1 broom and some brushes, 5s.; 1 spirit-level, 2s. 6d.; 6 screwdrivers, 1s. 6d. each; 6 rasps, 7d. each; 30 22-in. hand-saws, 5s. each; 30 10-in. tenon-saws, 5s. each; 30 Exeter hammers (No. 4), 1s. 6d. each; 30 5-in. mallets, 1s. 3d. each; 30 squares, 2s. 6d. each: total, £58 5s. 7d.*

SLOYD, OR HAND-WORK, AS A FACTOR IN EDUCATION. BY EVELYN CHAPMAN.

At a time when so much is being said and done with regard to technical education, and when it has just been made the subject of a Bill in the House of Commons, which only fell through last session for lack of time for its due consideration, it surely behoves us to look abroad and see what is being done there in the same direction. We find that Sweden has succeeded in elaborating a system of manual instruction for her schools which serves as an admirable preparation not only for technical education, but for practical life. This system is called "slöjd," and is applied to the

* Less an average of 20 per cent. discount for cash gives £46 12s., or £1 10s. 9d. per head.