

mechanical engineers, plumbers, painters and decorators, and carpenters and joiners, in centres where technical instruction is given in those subjects, attendance at the school and satisfactory progress being required as part condition of the apprenticeship.

I have already alluded to the fact that the continuation school should, as a part of our system, supply or keep up that very necessary portion of work, mental training. Unfortunately, a boy, having left school and gone to a trade, usually considers his mental work past and done with, conceiving that it is only necessary now to learn his work. It is not until later years that he usually finds out his mistake. I have often found—nay, constantly find—young men ignorant of the simplest calculation or arithmetical knowledge really necessary to their trade; in the plumbing classes particularly has this been so. One of the first duties of an artisan in most trades is to make himself proficient in arithmetic, geometrical, freehand, and scale drawing, in order that he may readily understand working drawings, and, if necessary, express himself by means of rough freehand sketches; and every effort should be made to induce the student to follow such a course of work previous to entering upon his special instruction.

Next comes the question of theoretical instruction, combined, in many cases, with workshop practice. In the majority of trades there can be no doubt that the practice of the same can be best acquired in the workshop or factory, and that the instruction given in the technical school should be supplementary to such daily practice. There are, however, many trades where the practice thereof is necessarily combined with theoretical instruction, such, for instance, as plumbing, bookbinding, mechanical and building trades, weaving, &c.; in the latter case the excellent textile classes of Manchester are an example. In these cases machines and tools are fully employed as in the course of trade practice. The question has been raised, is not this teaching the practice of a trade as expressly forbidden by the Technical Instruction Act? Such, however, is not the case. The machines, &c., are used for the purpose of illustrating how certain processes are performed.

As Sir Philip Magnus puts it, "The difference between the use of such machinery and tools in the shop and in the school is that in the shop the apprentice or young artisan acquires slowly, under considerable difficulty, and frequently without any explanation of the why or the wherefore, the knowledge of how to use the particular machine or appliances; and, once having learnt it, he is kept working at it so as to gain skill and rapidity of execution in its use. In the school, on the other hand, he learns leisurely how the tool is used, the principles of its construction, the errors to avoid, and the means of rectifying them when they occur, the nature of the material wrought, and the means of distinguishing different qualities of such material; and having learnt all this, and having acquired a certain degree of manipulative skill, he is not expected by constant repetition of the same process to aim at that rapidity of execution which is indispensable for trade purposes, but is allowed to pass on to the explanation of the use of some other machine, and to the learning of some other process. It will be seen, therefore, that, although a technical school may be equipped almost as completely as a trade-shop, the equipment serves a very different purpose. Its object is the production of intelligent workpeople, and not the production of saleable goods."

"That goods may be produced is an incident only in the production of intelligent artisans. The practice a student obtains in a technical school is not intended to give him a complete mastery and rapidity of execution—the result of constant practice—which can be acquired only in the shop or factory, where work is done on commercial lines, but rather it enables him to understand the appliances of his trade, and to use them with care and judgment. Nor, indeed, can the technical school, howsoever completely it may be equipped, afford that special training in adapting means to ends, in economic working, and in the appreciation of the commercial importance of detail, and of the true value of time, which is acquired in the shop."

The theoretical work, therefore, is doubly valuable where continued conjointly with workshop practice. It is not, however, possible in towns such as those of New Zealand to form special classes for all trades; the best that can be done is to establish classes in any special industry in the district. In other cases there must be a certain amount of general collective teaching, particularly in relation to science-work.

In all classes affecting particular industries it is very necessary that the instructor should be a man acquainted with the practice and theory of his work; not a theorist, but a man in whom the students will have confidence as having a thorough knowledge of his business; anything else will be a failure. Take mechanical drawing and building construction as an example; both classes require men who have constant practice in the every-day work of those branches; the mere mechanical or architectural draughtsman is not the man required; he must, if possible, be an experienced man in his particular profession. Only under such conditions will our classes succeed. There can be no doubt that instructors of technical classes should be practical craftsmen.

From my personal knowledge I should say the trades organizations of New Zealand will gladly assist the Education Boards in the formation of classes for the apprentices and younger men, and I am hopeful that the trades will interest themselves in this direction. Co-operation will lead to excellent results, and the employed as well as the employers should awake to the necessity of aiding the great cause of education. Much might be done by the unions in the direction of encouragement to their younger members to qualify themselves for their work, in classifying the workmen first, second, or third class in accordance with their ability, and thus avoid the present pernicious practice of paying the bad workman a wage equal to the more experienced man, simply because he is a journeyman. Surely if the unions have the interests of their trade at heart there should be no difficulty in arranging some such scheme in conjunction with the employers. At present there seems little inducement for a man to perfect or improve himself once he reaches the ordinary level of workmanship.

Further, I suggest the advisability of the unions issuing a certificate to members of their trade who have served a proper apprenticeship, and qualified as tradesmen by examination, in addition to