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In an interesting address at the University commemoration yesterday Professor Bragg dealt with a subject which is receiving much attention from educationists in all parts of the world. Everywhere, but particularly in British countries, the complaint is heard that the practical side of education is neglected, with the result that what is learned at school proves to be of little value in after-life. This is a utilitarian age. The scholarship which prizes knowledge for its own sake is for the leisured few; the many require that their intellectual training in the years of youth shall have a direct relation to the practical necessities of their future career. It is generally felt that this want is not adequately recognised in directing the studies of the average boy. The school fails to supply him with the outfit which is necessary to qualify him for a successful part in the hard business of ordinary life. He finds that he cannot get on without a further training. He may have learned much, but he sees no outlet for a practical application of his learning. And on that which was so diligently instilled into his mind by the schoolmaster his mind often enough loses its hold while he is acquiring the additional knowledge that is to fit him for the workshop or the office. In the old country the competition of foreigners, who have received a commercial training, is taking the bread out of the mouths of English clerks, whose education has been of a general rather

character. There is the same complaint with regard to the instruction of children of the working classes. The curriculum of the public schools does not include those subjects which are closely related to the various occupations by which the artisan or mechanic has to gain his livelihood. And so arises the demand for technical education. In providing this, continental countries, such as France, Germany, and Belgium, are far ahead of England, and the consequence is that the traditional superiority of the British workman in intelligence and manual skill is being challenged on all sides.

Professor Bragg devotes himself to the enquiry as to the best means of remedying ascertained defects in our educational processes. He shows clearly enough that limiting a boy's education to those subjects which would directly apply to the pursuit of any one trade or profession is both undesirable and impracticable. It is undesirable, because the extreme specialisation of youthful studies tends to narrow the mental horizon and stunt intellectual growth. It is impracticable, because in a small community like our own a comprehensive system of technical instruction is not possible that would educate boys in all the industries into which the energies of adults are directed. We do not understand Professor Bragg to question the value of the work which technical education is capable of achieving, as an addition to the ordinary school curriculum. While we cannot hope to have one school devoted to carpentering, another to smith's work, and so on, there is still room open for instruction in those branches of practical knowledge which are of use in every trade. Technical education of a general type is not to be condemned because a highly specialised system is impracticable. But Professor Bragg's address goes over different ground. He takes the ordinary school, and he asks whether nothing can be done with it to meet the objection that the school-course is not the preparation it ought to be for the duties of after life. This enquiry he

answers in the affirmative. The fault of our educational system is not that it is too comprehensive, or not comprehensive enough. It is not that the wrong subjects are taught. It is that the right subjects are taught wrongly. The cardinal defect is in the methods of education; or rather it is that instead of education there is only teaching. There is a mechanical system of instruction which crams with knowledge, but does not discipline the intellectual faculties for the discovery of truth by the efforts of the learner himself. It is much less important to store the mind with facts in a manner which deprives them of stimulating worth, than to evoke the powers of observation and of reasoning from observation. This point need not be enlarged upon, for Professor Bragg only echoes the views of other educationists who have shown that more intelligent methods of teaching are the supreme want of our educational system. It is much easier to indicate faults than to point the way of reform. Professor Bragg, however, attempts a difficult task. He suggests modifications in the conventional plan of teaching mathematics and physics, which would not only confer additional interest on those subjects, but add to their usefulness as disciplinary studies. As Herbert Spencer has pointed out, the natural path of the student of facts is from the concrete to the abstract, and the more our school system recognises this principle the more successful it must be. It is scarcely possible to teach physical science effectively in any other way. The observation of phenomena must precede the formulation of laws. Abstract theories fail to interest, to stimulate, or, in short, to educate, unless the mind has been prepared for them by the habit of observing, and of deducing from the facts observed the principles that underlie them. The value of a training founded on this basis is not to be measured by the actual worth of the knowledge gained. Its value consists in the wholesome discipline of the mental faculties, and the production of a habit of accurate observation and correct reasoning.

The need of such an improvement of educational methods as will tend to these results is strongly urged by the professor. A plan of teaching that is obviously advantageous in the case of natural science may with equal benefit, if with somewhat more difficulty, be adopted in regard to other subjects, the abstract aspect of which is usually made too prominent. With the same end in view the

professor advocates increased attention to the teaching of drawing and decorative design, of which the direct practical utility is very large, irrespective of its value in encouraging the faculty of observation, and educating the taste. The conclusion of the address is a little disappointing. From teachers themselves change in the monotonous routine of our mechanical system of education will not come in the absence of an external demand for reform. The better way of teaching which Professor Bragg has sketched is to be enforced by an educated public opinion. It is the same with educational methods as with laws: Nothing can be done successfully that exceeds the demand, but once the demand exists it will be met. If this be a correct statement of the case we can only hope that such addresses as that of Professor Bragg will become more frequent, whether from University professors, school teachers, or others competent to enlighten the public. Their effect must be to destroy in time the apathy that permits the continuance of methods of proved inadequacy to the objects for which they were designed. Public opinion is on a wrong scent if it imagines that technical education will cure the evils of the ordinary system of instruction. Technical education has its own functions to perform, and very important and very useful they admittedly are. But the inherent defects of school or college training are an independent question, and must be removed by other means. The vague complaint that our educational system is not practical enough would largely disappear if Professor Bragg's advice were heeded.