

is that ignorance conducive to his functions as an intelligent being? All nations which have in recent years revised their educational systems, have provided a class of Secondary Schools for the industrial classes, especially devoted to teach them the principles of science and art relating to their industries. Holland compels every town of 10,000 inhabitants to erect such schools."

#### V.—NECESSITY FOR TEACHING PRACTICAL SCIENCE IN THE SCHOOLS—EXAMPLES.

1. What Dr. Lyon Playfair has remarked, in an opening address to the Educational Section of the Social Science Congress, held last year at Newcastle, in regard to English Elementary Schools and the teaching of practical science in them, applies largely to Canada.—

"The educational principle of Continental nations is to link on primary schools to secondary improvement schools. The links are always composed of higher subjects, the three R's being in all cases the basis of instruction; elementary science, and even some of its applications, is uniformly encouraged and generally enforced. But as we have no schools corresponding to the secondary improvement schools for the working classes, we suppose we can do without, used as links. No armour-plate of knowledge is given to our future artisan but a mere veneer of the three R's, so thin as to rub off completely in three or four years of the wear and tear of life. Under our present system of elementary teaching, no knowledge whatever bearing on the life-work of a people reaches them by our system of State Education. The air they breathe, the water they drink, the tools they use, the plants they grow, the mines they excavate, might all be made the subjects of surpassing interest and importance to them during their whole life; yet of these they learn not one fact. Yet we are surprised at the consequences of their ignorance. A thousand men perish yearly in our coal mines, but no school master tells the poor miner the nature of the explosive gas which scorches him, or of the after damp which chokes him. Boilers and steam-engines blow up so continually that a Committee of the House of Commons is now engaged in trying to diminish their alarming frequency, but the poor stokers who are scalded to death, or blown to pieces, were never instructed in the nature and properties of them. In Great Britain alone more than one hundred thousand people perish annually, and at least five times as many sicken grievously, out of pure ignorance of the laws of health, which are never taught them at school."

2. In regard to the study of Natural Science in the Schools, the Royal Commissioners appointed to enquire into systems of schools, say:—

"We think it established that the study of Natural Science develops better than any other studies the observing faculties, disciplines the intellect by teaching induction as well as deduction, supplies a useful balance to the studies of language and mathematics, and provides much instruction of great value for the occupations of after life."

#### VI.—THE STUDY OF NATURAL HISTORY IN THE SCHOOLS.

1. In further illustration of this subject, I beg to add a few words by Professor Agassiz, formerly a distinguished teacher in Switzerland, latterly a more distinguished professor in the United States. In an address at an educational meeting in Boston "on the desirability of introducing the study of natural history into our Schools, and of using that instruction as a means of developing the faculties of children and leading them to a knowledge of the Creator," Professor Agassiz observes:—

"I wish to awaken a conviction that the knowledge of nature in our day lies at the very foundation of the prosperity of States; that the study of the phenomena of nature is one of the most efficient means for the development of the human faculties, and that, on these grounds, it is highly important that this branch of education should be introduced into our Schools as soon as possible. To satisfy you how important the study of nature is to the community at large, I need only allude to the manner in which, in modern times, man has learned to control the forces of nature, and to work out the material which our earth produces. The importance of that knowledge is everywhere manifested to us. And I can refer to no better evidence to prove that there is hardly any other training better fitted to develop the highest faculties of man than by alluding to that venerable old man, Humboldt, who was the embodiment of the most extensive human knowledge in our day, who acquired that position, and became an object of reverence throughout the world, merely by his devotion to the study of nature. If it be true then, that a knowledge of nature is so important for the welfare of States and for the training of men to such high positions among their fellows, by the development of their best faculties, how desirable that such a study should form part of all education! And I trust that the time when it will be introduced into our Schools

will only be so far removed as is necessary for the preparation of teachers capable of imparting that instruction in the most elementary form. The only difficulty is to find teachers equal to the task, for, in my estimation, the elementary instruction is the most difficult. It is a mistaken view with many, that a teacher is always efficiently prepared to impart the first elementary instruction to those entrusted to his care. Nothing can be further from the truth; and I believe that in entrusting the education of the young to incompetent teachers, the opportunity is frequently lost of unfolding the highest capacities of the pupils, by not attending at once to their wants. I have been a teacher since I was fifteen years of age, and I am a teacher still, and I hope I shall be a teacher all my life. I do love to teach; and there is nothing so pleasant to me as to develop the faculties of my fellow beings who, in their early age, are entrusted to my care; and I am satisfied that there are branches of knowledge which are better taught without books than with them; and there are some cases so obvious, that I wonder why it is that teachers always resort to books when they would teach some new branch in their schools. When we would study natural history, instead of books let us take specimens—stones, minerals, crystals. When we would study plants, let us go to the plants themselves, and not to the books describing them. When we would study animals, let us observe animals."

2. Thomas Carlyle wrote,—"For many years it has been one of my constant regrets, that no schoolmaster of mine had a knowledge of natural history, so far, at least, as to have taught me the little winged and wingless neighbours that are continually meeting me with a salutation which I cannot answer, as things are; but there will come a day when, in all Scottish towns and villages, the schoolmasters will be strictly required to possess such capabilities."

#### VII.—THE VALUE OF DRAWING IN OUR SCHOOLS.

1.—So important and necessary was drawing (which is now prescribed in our Schools) felt to be, as a branch of learning, that in 1870, the Legislature of Massachusetts passed the following law on the subject:—

"The General Statutes are hereby amended so as to include Drawing among the branches of learning which are by said Section required to be taught in the Public Schools.

"Any City or Town may, and every City and Town having more than ten thousand inhabitants shall, annually make provision for giving free instruction in Industrial or Mechanical Drawing, to persons over fifteen years of age, either in day or evening schools, under the direction of the School Committee."

2.—On this enactment, the Secretary of the Board of Massachusetts remarks:—

"This is one of the most important laws of the Session of 1870, and is destined, I doubt not, to produce lasting and beneficial results. It will not, therefore, be out of place, to give a brief account of the steps which led to its enactment. \* \* \* \*

"In response to a petition presented to the Legislature, in June, 1869, by several of the leading citizens of Boston, a Resolve was passed directing the Board of Education 'to consider the expediency of making provision by law for giving free instruction to men, women, and children in mechanical drawing, either in existing schools, or those to be established for that purpose, in all the towns in the Commonwealth having more than five thousand inhabitants, and report a definite plan therefor to the next general Court.'

"The Board cordially entered upon the task thus committed to them. \* \* \* \* The Petition and Resolve were referred to a Special Committee, with instructions to make such enquiries as they deemed advisable, and report their conclusions for the consideration of the whole Board. This resulted in the issuing of a circular, asking for the opinions of gentlemen connected with the various mechanical and manufacturing industries of the Commonwealth, of others familiar with the workings of our system of Public Instruction, and especially of gentlemen eminent for their skill and experience in this particular department of instruction.

"The communications received were presented to the Board, accompanied by a brief and able report. The report presented met with the unanimous approval of the Board, and it was voted to recommend to the Legislature the following action, to wit:

"That a law be passed requiring: 'First, that elementary and freehand drawing be taught in all the Public Schools of every grade in the Commonwealth; and, Second, that all Cities and Towns having more than ten thousand inhabitants be required to make provision for giving annually, free instruction in industrial or mechanical drawing to men, women, and children in such manner as the Board of Education shall prescribe.'

"The recommendations were favourably received by the Legislature, and embodied in the foregoing Act, and in an Order of the