remain unimpeached and unimpaired were the plan of the universe unrolled like a map at our feet, and the mind of man qualified to take in the whole scheme of creation at a glance.

"Seek not for fulness of knowlege," said Democritus, "but for fulness of understanding." Mathematics does a good deal that is indispensable towards this latter object, and so helps to make us capable of understanding ourselves and the world. What does it do towards that knowledge directly.

Knowledge of the laws of Number and Form is an important part of world-knowledge in itself, the most wide-embracing department indeed, since these laws apply to all things whatsoever Now, we in this nineteenth century may know, besides many facts about the world without asking our way of Mathematics; but our guides would not have the way themselves had they so acted; and, if we persist in ignorance of the necessary preliminaries, we must be content to find our progress in the understanding of Nature's laws repeatedly stopped and checked. First and independent among sciences, these two stand at the door of every other, so soon as it rises from being a classification to being a science, and no one can pass without a parley more or less prolonged. No science can be understood without some knowledge of Number. Even Botany presupposes that. The Physical Sciences and Chemistry ask a good deal more; quantitative modes of thought are continually called for, and the higher developments of Electricity. Heat, &c., are distinct application of Mathematics. Mathematical habits and mathematical ideas are absolutely invaluable. A distinguished chemist told me the other day that, in his opinion, Chemistry suffered much from the absence among chemists of mathematical training. I am sure that chemical students have suffered, as a glance at the text-books will show. Then look at the great group of sciences comprised under the old-fashioned name of Natural Philosophy. The observed facts of Nature here are few indeed, compared with the enormous developments obtained by the application of Mathematics to them. All the wonderful machinery of the nineteenth century is a product of this; not to be known really without it, any more than we can know the laws of the universe governing the motion of the stars and the development of worlds. If we would know the world, we must first of all know the necessary laws of Form and Number, which apply to all external phenomena whatsoever, and mingle with all other laws, so as to make these to a large extent unintelligible without them.

There is such a thing as Popular Science, which gives the results of difficult thought, avoiding the difficulty. Much of this is good, when the better of a real knowledge is unattainable. Popular Science is, however, for grown-up people who had not the education in youth which we should desire to see given to our children now. There is an evil inherent in it when taught as Popular Science in youth. It promotes habits of satisfaction with imperfect mental grasp, and that is a moral no less than an intellectual evil.

To know ourselves, and, in ourselves, the human race, is rather the concern of a very different part of the curriculum. The life of the human race, as revealed in History, and in Language with the Literature which it contains, can do more for us here, and, as so doing, its knowledge is essential; only let it not be the history of disorganised barren facts, but of living social growths and valuable biographies; let it not be the mere language of grammar and vocabulary, but a key to literature and a reflex of national lives and thoughts. The language of a people is an index of its character, and diversities of language note diversities of national character, the study of which is an added wealth to thought. Only among a nation of precise thinkers could the French language have grown up, and German is the expression of voluminous thinking; while Gaelic is, I believe, unrivalled in its capacity for invective and pathos. Then, there is the knowledge of antiquity which the study of ancient languages opens up,—only too often lost sight of, in the rage after grammar and idiomatic composition; as if it were more valuable to write empty Latin verses than to know the writers of antiquity as friends. We want to know what people thousands of years ago thought, rather than all the petty details of how they expressed themselves. Is not this overshadowing of the greater end by the lesser largely due to the the fact that we have forced on Classics that part in training which belongs most naturally to Science? Literature has to do with culture of the human side of life rather than with development of mental grasp and training to precision; and Literature, it seems to me, should be the main end of linguistic study.

After History, Language, and Literature, in the culture of this human side, come the Social Sciences, Some elementary sociology might be founded on historical studies, and such a typical social science as Political Economy should find a place in school education, if only to initiate habits of thought on social subjects.

Now here, again, habits of thinking quantitatively become invaluable, and applications of mathematical principles are sometimes called for. The Currency question, in Political Economy, is an instance of this. There can be little doubt, too, that as this young group of sciences grows, it will call more and more for development in terms of quantity. A moment's consideration shows that the Science of Society must necessarily involve mathematical principles largely in its development.

Are we to aim at knowing the inner individual self as well as the "ourselves" of the human race? Some day, I hope the subject Sciences will have their place at the end of the school course; but as yet it is perhaps too soon; our time is too short, and our burden too heavy, and our work too young (for it is quite true that we in England have been neglecting our secondary education till of late). Still our work in school must be considered with reference to a possible after-study of these. In truth, every one who is cultured at all is, consciously or unconsciously, given to metaphysical and ethical speculations; and it is certainly the business of education to see that his habitual tracks of thought should be such as to aid him in these speculations. At best we could only make a beginning in such studies at school, for real experience of life—individual personal life—is necessary to understand them. We must have thought and felt, manifoldly, before we can analyse thought and feeling; we must have lived, before we can really understand the problems of right living; and we must have gained a firm control of all our mental faculties, before we use them largely in the most difficult and misleading investigations of all.

With this last requirement our school course should supply us. It can make us ready to learn ourselves, by training us to observe and think well in general, and also by accustoming us to turn our thoughts inward in a reflective spirit. History and Literature offer means for this latter—means which may be neglected, but can be employed with much effect. But History and Literature do not give (indeed, sometimes rather discourage, so heterogeneous are the materials) any true training in precision of thought. On the contrary, it requires a