minds without a bias, and only dried up and chilled natures already prepared for the operation. Descartes wrote that he was anxious not to lose any more of his time in the barren operation of geometry and arithmetic studies which never lead to anything important. Voltaire tells us, *j'ai toujours remarqué que la géometrie laisse l'esprit où elle le trouve.* It is not to be denied that much ingenuity is required in the higher mathematics, such as in the integration of a complicated deferential; an exercise of knowledge and judgment, only attainable by study and perseverance. The operation, however, is nothing more than the reduction of an equation to greater simplicity, and I cannot recognize any operation of reason, or any mental training beyond the exercise of patience and diligence. Moreover, when the result has been reached, it is simply the means to an end: the creation of a formula applicable to mechanics or astronomy. In the former to determine the force required to meet a strain; in the latter to admit of the calculation of the movement of heavenly bodies; a science essential to the architect, the engineer, the electrician and the astronomer. I refer those who desire to examine into the view I express to the "Discussions on Literature and Philosophy," by Sir William Hamilton.

The same remark applies to the physical sciences, whether it be chemistry, geology, electricity, indeed to any section of physics. The interval is wide between the incidental study of any branch, and concentrated undivided attention in its acquirement, The former only aims at a general superficial acquaintance with facts and principles, in itself desirable and worthy of consideration, for it saves us from making ourselves ridiculous, and enables us to understand new inventions and discoveries. What can we learn of chemistry, except in a general way, without constant experiments with stills and retorts, the use of delicate instruments for analysis, and the pneumatic trough for the test of gases; indeed even a moderate knowledge of chemistry calls for the work of years in a laboratory. The superficial information we obtain from books we soon forget, and all that we commit to memory relative to symbols, is only remembered by those with whom it is a duty to know something of chemistry without the desire of becoming chemists. In the same way minute and precise knowledge relative to geology, mineralogy, electricity is only possible when we make some one study the leading subject of investigation. Can we hope to do more in any case than master the leading facts and characteristics of the several sciences we superficially investigate?

How can it be otherwise if the men who attain eminence concentrate their attention on one branch only? There is such a sub-division of labour, so constant an examination of the codified truths, such nice and delicate distinctions, possibly slight in themselves, but on which important theories depend, that it is only by constant study and examination that the truth is to be had. In modern scientific work, the "good all round man" is simply acceptable in the circle of mediocrity. He may shine in an after-dinner conversation, and, with those who know a subject superficially, may pass for erudite; but with abler critics his reputation is indeed slight. The French tell us that in the kingdom of the blind the one-eyed are kings, *Dans le royaume des aveugles les borgnes sont rois.* In modern life, to succeed in the science we profess, we require both eyes, and the use of every faculty.

On this point I will ask, whether in the high schools and universities we are not introducing too many subjects, and thus dissipate the attention of the student in place of concentrating it upon the choice he should make of a limited number; the studies enforced having little influence on the formation of character. There is a tendency to impart a superficial knowledge of a multiplicity of subjects, each one of which to be thoroughly mastered demands many years of patient study. Are we justified in devoting the first years of impressionable youth to this diversified ordeal? Is it not rather our duty to inculcate the belief that knowledge can only be attained by persistent effort in one direction. You may look through the records of literature, art, science, and political life; you may probe the lives of those who have attained eminence, I care not what the career has been, you will find that success in each case was not attributable to imperfect, uncertain, feverish, dissipated effort, but to careful, conscientious study, directed within the acquirement by which reputation has been gained.

I am afraid that this is not the common view. The modern curriculum embraces a multitude of subjects, even the narrative of which is bewildering.

We may recall the advertisement of the immortal Squeers in Nicholas Nickleby.

"Youth are boarded, clothed, booked, furnished with pocket-money, provided with all necessaries, instructed in all languages living and dead, mathematics, orthography, geometry, astronomy, trigonometry, the use of the globes, algebra, single stick (if required), writing, arithmetic, fortification, and every other branch of classical literature. Terms: Twenty guineas per annum. No extras, no vacation, and diet unparalleled."

This diversity, however, is by no means antagonistic to the views of the class, who, rejecting classics and modern languages as the studies best adapted to form the mind, would substitute the sciences for the inculcation of mental discipline. We cannot, however, adduce the influence that science has exercised on civilization and personal comfort, with its ramifications and beneficent effects, as a criterion of the moral benefit to be inculcated by the study so advocated. Any system of education that would neglect such consideration would be strangely imperfect It was the fault in the teaching of the last, and the early years of this century. It is absolutely necessary that we obtain a fair knowledge of the principles and laws by which natural phenomena in the application of science are controlled; but this acquaintance with every-day facts is widely different from the minute and extended investigations, conducted as if it were the pursuit of an attainment to form the main labour of after-life.

It cannot be gainsaid that any one science consists of a myriad of cumulative inter-dependent facts from which generalizations are drawn to admit of nomenclature, classification, and order, inductively forming the principles by which any science is governed. Essentially it is the case in geology; palæontology is above all other of its branches dependent on minute differences of species. We may recollect "The Autocrat of the Breakfast Table," by Oliver Wendell Holmes, who tells us of the professor who had devoted the main years of his life to the special study of a species of the beetle. We have to-day men who are mentioned as authorities of the species of the trilobite, and who define the classification of the poriferæ, known as the common sponge.

This minute study is essential in the determination of geological epochs, the relative age in the formations of the earth's genesis, as a guide to practical husbandry; but this technical minuteness can have no influence on general education. In this respect I conceive that it is unwise to do more than attempt to implant the cardinal facts and the general principles which, to a certain extent, can be mastered by ordinary industry.

Undoubtedly there is a great difference in the mental constitution of students, and their capacity for learning. No fallacy is so patent as the declaration that all men are born equal. Some are highly favoured in appearance and disposition. In a large city the consequence of our civilization is, that the majority of its denizens must toil and moil, and the few be rich and prosperous. We also differ in the objects individually we desire to attain; but in this inequality we find the incentive to progress, and the influences by which civilization is advanced, for the one active principle prevails, we aim to attain that which we do not possess. Johnson laughed at the idea of anyone writing a book, except for some reward. The man in want of money has its acquisition in view. Those in the enjoyment of ample means seek for honour and distinction. We cannot hope to find in this world the happy valley of peace and content, where no wish is unsatisfied and want unknown. Who can read unmoved Johnson's address to those "who listen with credulity to the whispers of fancy, and pursue with eagerness the phantoms of hope, who expect that age will perform the promises of youth, and the deficiencies of the present day will be supplied by the morrow." In a few words, it is a chapter of despondency and disappointment.

I believe that it is generally conceded, that whatever the inequalities of life, the means of happiness are equally extended; that is to say, that it lies in the grasp of all who seek to obtain it by prudence, rectitude and self-denial; that we are less dependent on external circumstances than many suppose. It has been said that a man is what he knoweth. Is it not more correct to say that a man is what he wanteth;