

MATHEMATICS.

MATHEMATICS is the science which has for its subject the properties of magnitude and number; or it may be called the art of arguing by numbers and quantities.

The branches of pure mathematics which were first developed were, *Arithmetic*, or the science of numbers, and *Geometry*, or the science of quantity. The latter of these was the only branch of mathematics cultivated by the Greeks, their cumbrous notation opposing a barrier to any effective progress in the former science.

Algebra, or the science of number in its most general form, is of much later growth, and was at first merely a kind of universal arithmetic, general symbols—taking the place of numbers; but its extraordinary development within the last two centuries has established for it a right to be considered as a distinct science. Combinations to these three have given rise to *Trigonometry* and *Analytical Geometry*.

This portion of mathematics includes all those sciences in which a few simple axioms are mathematically shown to be sufficient for the deduction of the most important natural phenomena. The benefits of this science, as a branch of education, are very great, and although its advantages are not always at first clearly seen and appreciated by all who come in contact with it, it is one of the great necessities for the development and improvement of the mind. It trains the mind to industry and perseverance, by leading it to an important result by the slow progress of minute gradations.

As drilling and gymnastic exercises render the body more graceful, healthy, and erect, by training it to self-denying labor, and correcting bad habits; so the study of mathematics may be called a mental drilling, or gymnastic exercise, which makes the mind more healthful and straightforward. Richard Parson, one of the finest classical scholars that England ever produced, was trained by his father from earliest youth to mental arithmetic, to which he always ascribed his literary eminence.

As vice and superstition are founded and upheld by error and false reasoning, the study of mathematics must be *friendly to the cause of religion*, by purging the mind from all sophisms, and grafting in it a love of truth. Sir Isaac Newton, the greatest mathematician of modern times, was remarkable for his politeness of manners, his humility of mind, his extensive information, and his devout piety.

It is the only science which cannot admit of error: opinion, prejudice, and falsity may, in some measure, affect all other sciences, but can have no influence whatever upon the deductions of mathematics. As metals are tested by a crucible, so truth and error are tested by mathematics. Lord Bacon says that "if a man's wits be wandering, let him study the mathematics; for in demonstration, if his wit be called away never so little, he must begin again." Mathematics habituates the mind to

examine minutely every statement, and to take nothing upon trust. Dr. Arbuthnot says that "in the search of truth, an imitation of the method of the geometers will carry a man further than all the dialectical rules."

It may be compared to the ordeals of our forefathers, which only the undefiled could pass harmlessly through. Fuller says that "mathematics is a ballast for the soul, to fix it, not to stall it; and not to jostle our other arts."

SHAKESPEAREAN CRITICISMS

"A man must serve his term to every trade
Save censure—critics all are ready-made."

WHAT is poetry? is a question asked in a recent issue of a literary contemporary, and answered in a long essay, which ends in discovering that after all there is no poetry and no poets.

We shall not attempt to set up our poor opinion against this mighty discovery, and we think it would not be wise to dispel the impression that lingers in the world, that poetry is the language of beauty, of emotion, of aspiration—the one language which goes to human hearts and lifts them up. But the critic on his part thinks he proves beyond a doubt that we are all wrong, that the so-called poets have all been wrong, and everybody wrong, and nobody right, excepting himself and the early Greeks with their first lyric efforts; so Shakespeare, the chief literary glory of the world, as well as all other poets, will have to "step down and out."

Shakespeare has always been pursued by a number of critics, who wrote such masses of critical commentaries and emendations, that it is a wonder the poet has not been smothered altogether by them.

The expositors and critics of Shakespeare all over the world are innumerable; some think his contrasts are too great, not for an attractive, but for a true picture. Take this description for example:—"Shakespeare's style is a compound of furious expressions. No man has submitted words to such contortion, mingled contrasts, raving exaggerations, and the horrible with the divine, as Shakespeare." A stranger would get but a sorry idea of our great poet from such a description as this.

Now, see what the Germans say: "There is no poet so truly loved by us, so thoroughly our own, as your Shakespeare. He has become one of ourselves, and lives as truly in our land as in yours."

Shakespeare's sonnets and dramas have been attacked unmercifully. The every-day critic can hardly let a line escape him without dissecting it. If there is nothing to explain, he explains all the same. He places vast stores of learning upon a preposition. If he wants to say anything, he is never at a loss for an excuse; he touches the most insignificant word, and gives it unexpected and unusual meanings. In speaking of Shakespeare's sonnets, a certain critic deplored the style of metre used, and regret-