Almost all the alterations which have been made in that work, in more recent times, under the pretence of rendering it more easy, or more compendious, have tended to diminish its usefulness in our system of education. And a person writing an elementary book of Mathematics cannot aim at any higher success than that his work should keep its ground and discharge its office as long and as well as Euclid's Elements of Geometry have done. Yet perhaps it may sometimes appear, both to teachers and students, that it is a waste of time and perverseness of judgment to adhere to the ancient kinds of Mathematics [Arithmetic and Geometry] when we have, in the Modern Analysis, an instrument of greater power and range for the solution of problems; giving us the old results by more compendious methods; an instrument, too, in itself admirable for its beauty and generality. But to this we reply, that we require our *Permanent Mathematical Studies*, not as an instrument, but as an exercise of the intellectual powers: that it is not *for their results* but *for the intellectual habits* which they generate that such studies are pursued. To this we may add, as we have always stated, that, in most minds, the significance of Analytical Methods is never fully understood except when a foundation has been laid in Geometrical studies. There is no more a waste of time in studying Geometry before we proceed to solve questions by the Differential Calculus, than there is a waste of time in making ourselves acquainted with the grammar of a language before we try to read its Philosophical or Poetical Literature."

The late Professor De Morgan, who was unsurpassed for his insight into the fundamental principles of Mathematical Science, and his power of expressing them, printed some remarks on the first six books of Euclid in the "Companion to the Almanack" for 1849. He states. "There never has been, and till we see it we never shall believe there can be, a system of Geometry worthy of the name, which has any material departures (we do not speak of corrections, or extensions, or developments) from the plan laid down by Euclid."

To these opinions may be added that of the late H. J. S. Smith, M.A., Savilian Professor in the University of Oxford:—

"I should not wish to use words which may seem to reach too far, but I often find the conviction forced upon me, that the increase of mathematical knowledge is a necessary condition for the advancement of Science, and if so, a no less necessary condition for the advancement of mankind. I could not argue well for the enduring intellectual strength of any nation of men whose education was not based on a solid foundation of mathematical learning, and whose scientific conception, or in other words, whose notions of the world and of the things in it, were not braced and girt together with a strong framework of mathematical reasoning. It is something for men to learn what proof is, and what it is not: and I do not know where this lesson can be better learned than in the schools of a science which has never had to take one step backwards, which has never asserted without proof, nor retracted a proved assertion, a science which, while ever advancing with human civilization, is as unchangeable in its principles as human reason; the same at all times and in all places; so that the work done at Alexandria or Syracuse two thousand years ago (whatever may have been added to it since) is as perfect in its kind, and as direct and unerring in its appeal to our intelligence, as if it had been done yesterday at Berlin or Gottingen by one of our contemporaries. Perhaps, also, it might not be impossible to show, and even from instances within our own times, that a decline in the mathematical productiveness of a people implies a decline in intellectual force along the whole line: and it might not be absurd to contend that on this ground the maintenance of a high standard of mathematical attainment among the scientific men of a country is an object of almost national concern."

The following examples may serve as a verification of the correctness of the foregoing opinions:—

The account of Edmund Stone is chiefly taken from Dr. Hutton, and it may be cited as an example of true genius overcoming all the disadvantages of birth, fortune, and education.

Edmund Stone was a son of one of the gardeners of the Duke of Argyll. At eight years of age he was taught to read; and at eighteen, without further assistance, he had made such advances in mathematical knowledge as to be able to read the Principia of Newton. As the Duke was one day walking in his garden, he saw a copy of Newton's Principia lying on the grass, and called some one near him to take it back to the library. Young Stone, the gardener, modestly observed that the book belonged to him. "To you!" replied the Duke: "do you understand Geometry, Latin, Newton!" "I know a little of them," replied the young man, with an air of simplicity. The Duke was surprised, and having himself a taste for the Sciences, he entered into conversation with the young mathematician. He asked him several questions, and was astonished at the force, the accuracy and the candour of his answers. "But how," said the Duke, "came you by the knowledge of all these things?" Stone replied, "A servant taught me, ten years since, to read. Does anyone need to know more than the twenty-four letters of the alphabet in order to learn anything else that one wishes?" The Duke's curiosity was redoubled: he sat down on a bank and requested a detail of all his proceedings. "When I first learned to read," said Stone, "the masons were then at work upon your house; I went near them one day, and saw that the architect used a rule and compasses, and that he made calculations. I enquired what might be the meaning and use of these things, and was informed that there is a Science called Arithmetic. I purchased a book of arithmetic and learned it. I was told there was another science called Geometry: I bought the books and learned Geometry. By reading I found that there were good books in these two sciences in Latin: I bought a dictionary and learned Latin. I understood, also, that there were good books of the same kind in French: I bought a dictionary and learned French: and this, my Lord, is what I have done. It seems to me that we may learn everything when we know the twenty four letters of the alphabet." The Duke, highly pleased with the account, brought this wonderful genius out of obscurity, and provided him with employment which left him leisure to apply himself to the Sciences.

Stone afterwards went to London, where he became known by his talents, and in 1725 was chosen a Fellow of the Royal Society, and wrote several articles which were printed in the Transactions of the Society. He was also the author of a New Mathematical Dictionary, which was published in 1726. In 1730 he printed a Treatise on Fluxions, partly taken from the Marquis de l'Hospital's "Analyse des Infiniments Petits," and in 1766 he put forth "Some Reflections on the Uncertainty of the figure and magnitude of the Earth and on the different opinions of the most celebrated Astronomers."

Having no independent means he was obliged to employ his pen in writing for a subsistence, and he rather injured than increased his reputation by his injudicious productions. His name was erased in 1742 from the Register of Fellows of the Royal Society, and he died in poverty in the early part of the year 1768. Splendid talents, without high moral principle, could not save him from the degradation to which he had reduced himself.

(To be continued.)

BATTALION EDUCATION.

I confess myself appalled sometimes at this problem of what we call educating children, by the scores of thousands. It is easy to recall earlier experiences of different systems, or rather of the workings of methods upon no system, when the individual was not lost in the mass, and self-instruction and self-dependence were the daily lessons. Probably each of us has recollections of incidents and events of our school life spent in widely diversified localities, in other States and nationalities, none of which have but the slightest relationship or similarity to the experiences of the young people of New York city to-day. We can recall, perhaps, the country schoolhouse and the country schoolmaster—the small fraction of the days spent in recitations of lessons learned with more or less diligence at home or in our seats; the well-worn text-books which our older brothers had used before us; the slate and the atlas that had come down even from a former generation, the working out of problems in a self-reliant way, the unassisted application of a book to learn what was in it; the sense of mastery in success, of defeat in failure. Whether hard or easy, it was a struggle on individual account. The *et ceteras* of a gratuitous supply list were unknown. The sense of ownership of our appliances fostered the idea of individual independence. We worked our way for personal advancement, and if we whittled the old desk we did it with our own jackknives.

All this has changed. The experience of such days and places