SCIENCE.—SUPPLEMENT.

FRIDAY, FEBRUARY 18, 1887.

ASPECTS OF EDUCATION.

I. — HUMANISM.

SINCE the revival of learning, secondary education in Europe has passed through three phases, which may be conveniently called humanism, realism, and naturalism. The first is grounded upon the study of language, and especially of the two dead languages, Greek and Latin. The second is based upon the study of things instead of words, the education of the mind through the eye and the hand. Closely connected with this, is the study of those things which may be of direct influence upon and direct importance to life. The third is not, in the first instance, study at all. It is an attempt to build up the whole nature of the man; to educate, first his body, then his character, and lastly his mind. All theories of education which have taken a practical form during the last three hundred years may be ranged under one or other of these three heads. Modern education, as we know it, is an unconscious, but not the less a real, compromise between the three ends. If we consider each separately, we shall be in the best position to understand the system to which they have given rise.

It is important to remember that the reformation in Europe happened at the time when the best European intellects were directed towards the study of the classics. This was not a mere coincidence. The revival of learning, as it is called, that is, the closer and more intimate acquaintance with Greek and Latin texts, which had before been known through translations and paraphrases, was in itself the principal cause of a reformation. The critical spirit thus engendered, the dissatisfaction aroused with the teaching of the old religion, the revolt against the schoolmen, were also efficient in bringing about the reformation. The education of the middle ages was encyclopedic, in aim if not in reality. The seven-years course of study — *trivium* and *quadrivium* — was intended to comprise every thing that a man need know. Grammar taught the whole science of words, dialectics furnished a scholar with the whole armor of argument, rhetoric invested him not only with eloquence in speech but with the more graceful gifts of poetry and imagination. The science of music, the science of numbers, the power of measuring the earth and the heavens, furnished out the completely educated man. Hand-books of the middle ages intended for students cover the whole ground of human knowledge. The 'Trésor' of Brunetto Latini, the master of Dante, is divided into three books; the first book into five parts, the last two into two parts each. The first book speaks of the origin of all things. After this comes philosophy, divided into its two component parts of theory and practice. Theory has three great divisions, — theology, the knowledge of God; physics, the knowledge of the world; and mathematics, the knowledge of the four sciences which form the *quadrivium*. Practice has also three divisions, — ethics, to teach us how to govern ourselves; economics, to teach us how to govern our family and our belongings; and politics, the highest of all sciences and the most noble of human occupations, which teaches us to govern towns, kingdoms, and nations, in both peace and war. As a prelude to these nobler sciences stand the preliminary arts of grammar, dialectics, and rhetoric.

It is true that before the reformation this noble plan of education had become narrowed and formalized. The church had pressed all knowledge into its service, and no form of knowledge was highly valued which did not contribute to the service of the church. The methods of teaching became corrupted: memory was substituted for thought. There was a striking contrast between the high aims of the best part of the middle ages and the scanty attainments of its decadence: but the shell was still there, and as long as that remained, life might be poured into it.

The renaissance swept away this effort as a dream. Scholars brought face to face with Virgil and Horace, with Cicero and Plato, were so won by the charm of a new and marvellous language, that all their strength was spent in explaining and appreciating it. The literary results of the renaissance were twofold. On the one hand, it aroused the pure enjoyment of literary form and expression; on the other, by stimulating a more exact scholarship and a more minute philosophy, it urged on the human mind to inquiry and to rebellion.

Just as the stream of this revival was in full flood, the reformation came, and separated the culture of Protestants from that of the old church. We do not sufficiently realize what a wrench this was. We are so accustomed to regard Protestant-

ism as a stimulus to independence and originality of thought, that we do not consider what a loss was at first suffered by the breach with the old religion. The whole culture of the middle ages was intimately connected with the church. If we take Dante as an example, who was steeped in all the knowledge of his time, we find that, in every thing he wrote, the ecclesiastical aspect is as prominent as the poetical. There is no moment when he has not an equal right to stand among the doctors of theology and with the poets of Parnassus. Those who broke with the church of Rome had to create a culture of their own, and the culture which they created was naturally that which then prevailed in the church which they were leaving.

It was this that gave Melanchthon his importance in the reformation, and that earned for him the name of the 'teacher of Germany.' He was by nature an exact scholar. He was well read in both Greek and Latin. He may have intended to fill up the other divisions of learning, but both his taste and his powers led him to confine himself to those departments in which he excelled. He said to his school-boys, 'Whatever you wish to learn, learn grammar first.' He recommended the study of Cicero, Livy, Virgil, Ovid, and Quintilian, and among Greek writers, Homer, Herodotus, Demosthenes, and Lucian. He recommended the writing of Latin letters and Latin verses, with Latin speeches and themes for the more advanced students.

Melanchthon might have intended, if life lasted, to deal successively with other branches of the mediaeval curriculum, but his own tastes and the success of his first efforts determined his whole career. He made the study of language in all its branches current coin for Protestants, but here he stopped.

Whatever may have been the influence of Melanchthon on Protestant schools, there is no doubt that they received their form from John Sturm of Strasburg, who was rector of Strasburg high school for forty-five years, from 1538 to 1583. We find his name in the pages of Ascham, and it is very probable that his plan of study formed the model on which the new college of Westminster was organized, but his influence extended not only to England but to all Protestant countries. He was a politician as well as a school-master; and was in constant correspondence with the leaders of the Protestant party all over Europe. His great powers were devoted to an elaborate plan for teaching the Latin language, in all its extent and in its fullest elegance, to school-boys. We have a complete account of the organization of his school, and there is this remarkable fact about it,—the boys were not only made to proceed from step to step towards final excellence, but they were strictly prohibited from taking more than one step at a time. In the examinations which were held at the close of each year, it was not only a crime to have omitted to learn the set subjects for that period, but it was as great a crime to have learned more than had been set. Not only was the human mind tied and bound within the limits of a curriculum, but individual minds were prohibited from outstepping the limits of that curriculum in any particular. Sturm must be regarded, more than any one else, as the creator for Protestants of the classical system of English public-school education as it is remembered by many who are still living. In this system, boys began to learn the Latin grammar before they learned English grammar; they were set to do Latin verses before they could write Latin prose. The Latin taught was not the masculine language of Lucretius and Cæsar, but the ornate and artificial diction of Horace and Virgil, and, above all, of Cicero. There is no doubt that this system, narrow and faulty as it was, gave a good education, so long as people believed in it. To know Horace and Virgil by heart became the first duty of an English gentleman. Speeches in parliament were considered incomplete if they did not contain at least one Latin quotation. A false quantity was held to be a greater crime than a slip in logical argument. Cicero not only influenced the education of English statesmen, but had no inconsiderable effect upon their conduct. The vanity of self-inspection, the continual reference to what is dignified and becoming, coupled with a high-minded devotion to duty and a strong if somewhat romantic patriotism, distinguished English statesmen in the eighteenth century as much as they distinguished the great orator of Rome.

There is, indeed, much to be said for humanistic training as a discipline of the mind. It is true that it deals only with words, and its highest efforts are, to decide what expression is absolutely best under certain circumstances. It is no light thing to render an English sentence, ornate and idiomatic, into a Latin sentence which exactly represents its meaning and which is equally ornate and idiomatic. It is difficult to analyze the subtle tact by which a scholar decides a particular reading in a particular passage to be right and all other readings to be wrong, or by which he determines one Latin or Greek verse to be so decidedly superior to another, that their comparative merit admits of no argument or hesitation. Any number of competently trained scholars would agree together in a matter of this kind, and yet it is entirely beyond argument that not one of them, if cross-examined

in a witness-box, could give reasons for his judgment which would satisfy a jury. The question is determined by the most delicate weighing of probabilities, by a subtle tact similar to that by which the most complicated operation of an artificer is carried on. Is not this the very process which we have to apply to the most difficult problems of life? The organon of mathematical reasoning is a far clumsier and blunter instrument than the organon by which humanistic difficulties are decided, while the organon of scientific reasoning is clumsier and blunter still. Mathematics deals for the most part with things which can be accurately apprehended by the mind. It aims, more than anything else, at exactness, and although in its higher branches it admits hypotheses of probability, yet its principal object is certainty. Science goes farther than this; it not only admits certainty of apprehension, but it claims that it should touch, see, and handle the matters with which it deals. Few results can stand this coarse analysis. If biology and chemistry refuse to acknowledge any truth which cannot be demonstrated to the senses, they put out of their reach those truths which are the most important to know, and which can be arrived at by probability alone. If methematics admits of demonstation which shall give a clear proof to any one who asks it, it removes from its sphere those judgments which rest upon the trained instinct of experts, and which can only be made clear to one who has undergone a similar training.

Regarded from this point of view, humanism was no bad preparation for active life or for devotion to any other study. It had the advantage of being small in compass, and of limits which were easily ascertained. Devotion to humanistic studies, properly understood, did not exclude application to other studies which might be considered more grave and important. William Pitt, chancellor of the exchequer at twenty-two, prime minister at twenty-four, was a first-rate humanist, as he was an excellent mathematician; but this did not prevent him from being an admirable orator, a close reasoner, a profound student of history and politics, and a political economist far in advance of his time. Much as we may regret that education in Protestant countries, especially in England, Holland, and Sweden, was narrowed by the humanistic tendency, we must not refuse to give that training all the credit which it deserves.

OSCAR BROWNING.

OF 250 railway employees examined in Budapest by Lichtenberg, 36.8 per cent were found to have impaired hearing, — a result which is certainly startling.

PUBLIC INSTRUCTION IN NEW YORK STATE IN 1886.

THE advance sheets of the annual report of the superintendent of public instruction of New York state, Andrew S. Draper, while not containing the full tables of statistics and the appendices that will accompany the full report, enable us to judge of the work of the past year.

The aggregate amount of money expended by the department during the year was $13,896,834.08, and it covers the expenses of supervision, of normal schools, teachers' institutes, Indian schools, and institutions for the deaf, dumb, and blind. It does not include the expenses of those parts of the school system that come immediately under the supervision of the regents of the university. The total number of teachers employed was 31,325, of whom 25,373 were females. The average annual salary of teachers was $701.31 in the cities, and $261.66 in the towns. The number of children of school age — between 5 and 21 years — was 1,735,073. The number who attended the public schools at some time during the year was 1,027,767; the average daily attendance was 625,813. The whole number instructed in the common schools, normal school, academies, colleges, private schools, and law and medical schools, was 1,212,327. The average number of weeks taught was, in the cities, 39.7, in the towns; 33.6.

From the data collected, it seems that fifty-nine per cent of the school population attended the public schools at some time during the year, against sixty-nine per cent in 1870. At first sight this number seems very small, but its smallness is apparent rather than real; for all persons between the ages of five and twenty-one are reckoned as of school age, and it is therefore possible for a boy to be returned as not attending school who has been fifteen years a pupil. Furthermore, it must be recollected that among the forty-one per cent of non-attending children are reckoned all these who attend private schools and academies; and in a state like New York, which contains a very large urban population, the number of pupils in private schools and academies will be very large: so the figures as to school attendance cited above, and which first meet the eye in reading the report, are misleading. In another paragraph, however, Superintendent Draper makes the direct statement that the number of pupils in the public schools, private schools, and academies, at some time during the year, was *sixty-eight* per cent of the school population.

Mr. Draper finds that the compulsory-education act of 1874 has not only been ineffectual, but that in its present form it is hardly capable of being