

presents to us many that have not yet been solved; and it is fair to conclude that, when administered by able men who are bent on making the most of it, it will afford mental discipline as severe as can be administered. Let us make no mistake on this point. No branch of study makes greater demands on the mental powers, the perseverance, the industry of teachers and pupils. Whatever you do with your imbeciles, be assured that you cannot make Science teachers of them.

But how are we to get these teachers, if nothing short of a miracle can bring them from our public schools. We have two sources of hope. In the first place, as we have Classical schools with Modern departments, whose venerable traditions are sure to secure their highest talents for classical studies and classical tuition; so let us establish Modern schools with Classical departments, the leading masters of which shall be scientific scholars of wide culture and experience in teaching. There are such men, but they have not been tempted into our schools. If I were asked to name the prince of Science teachers, I should have no hesitation in pointing to a man whom most of us have heard. He has all the characteristics of a great teacher. He reads the minds and estimates the powers of his hearers, so that, while he always demands some effort on their part to follow him, the effort is always possible to them, for he is never beyond their depths. Whatever the age or class of his pupils, he always brings them *en rapport* with himself, and excites in them enthusiasm for his subject. The feeble efforts of children, and the matured aspirations of scholars and savans, are alike rewarded; each is encouraged to trust in his own powers to discover truth; and we older students who have had at times to listen to hours of tangled eloquence, which none could comprehend, may be induced to reflect how much of the clearness of the argument is due to the teacher, and think of the man; but children come from his teaching, thinking not of the teacher but his subject; feeling they have understood his exposition, that they have really thought out something for themselves, and so strengthened in a natural and healthy self-confidence.

There is no danger, under his teaching, either of confounding, on the one hand, Science and Magic—the teacher and the magician; or, on the other hand, Science with a dry-goods store, and the teacher with the retailer of small wares. Now I say, give us good Modern schools with Classical departments, and with Huxleys as Head-masters; then shall we learn the value of Science as an instrument of culture,—then shall we find the ablest and most intelligent pupils becoming teachers of Science.

The Charity Commissioners are resuscitating old foundations and building new schools; they are bringing the constitutions of other schools into harmony with the present time. Why do they not give us some Modern schools with Classical departments,—some great Public Schools presided over by Scientific scholars? They make, in their schools, the most revolutionary changes in all other respects; why not so far depart from the type of the schools that are hampered by the trammels of tradition as to found schools where the head of the Science department may be the head of the whole school.

The answer given is, that the founders have mentioned Latin and Greek as the principal studies, and so they must remain because it was the pious founder's wish. But the pious founder said that the children were to be clothed alike in flannel gowns; and many people think it a pleasant sight to see a troop of children uniformly clad, marching with meek and humble mien, bearing

themselves lowly and reverently to all their betters. The sight brings to our recollection the charitable dispositions of our countrymen and countrywomen, and enables us to identify ourselves with a munificent and charitable race. Yet you are abolishing these pleasant relics of the past.

Again, the pious founder said they should have porridge for breakfast, and rye-bread for supper, and you give them tea and coffee and things he never heard of. What is the reply? If the pious founder were here to taste these lately-imported beverages, he would change the prescribed diet. Flannel is warm, porridge is wholesome, rye bread is good; we will have them in their places; but we shall best show respect for the pious founder if we give him credit for intelligence, and assume that, if he were here now, he would have us take advantage of the world's progress in these latter days. Oh, the dishonesty of human prejudice! The ghost of the pious founder is like the ghosts in modern spiritualism: he appears only "when the influences are suitable." Considering the magnitude of the changes which have been made, there can be no real impediment to the course we suggest. Give us a few schools in which Science shall have the highest place.

But our other hope rests on those teachers who do not labour in chains. Many such are members of this College, and I have taken so much pains to demonstrate that the constitutions of our Public Schools should not be taken as models in respect to this subject, that I may the more forcibly urge you to bring all your knowledge of the art of teaching to bear on this subject, and to work out for yourselves the problem of the true functions of Science as an instrument of education. It can only be worked out by practical teachers who know the subject. The hope is not without support, while in University Local Examinations the percentage of candidates who satisfactorily take up Science is very small, and is not increasing in any formidable rate; in the examinations of the College, both in the candidates who take up the subject and in the quality of the work done, progress is most rapid and satisfactory.

Thirdly—what are we to aim at in our endeavour to use Science in Schools? The objects to be aimed at are as follows:—

- (1) To teach the children to observe objects and operations.
- (2) To describe accurately what is seen and done.
- (3) To reason on simple phenomena.

Now, there should be three courses, or three periods, in which these three objects in succession have the chief consideration. In the first course of Science lessons given to the youngest children, we should tell little or nothing,—tell only the names of things used, and as few of those as possible. The object being to excite a love of observation and a longing for scientific knowledge, the lessons will principally consist in exhibiting differences and getting them seen and pointed out.

In the first stage the teacher will be satisfied with evidences of observation; but, in the second stage, he will be bent on receiving the answer in scientific and grammatical language.

Finally, he will put off to the last stage, or leave to be formed at a later time, the more general laws and the theories of Science. The reasons for this will, on a little thought, be evident. These theories and laws form the crowning stones of the pyramid, and must be placed last,—a broad base with many stones having to be laid first.

We must begin with common and familiar properties of things—a glass of water or a bottle of air. With a few glass tubes which can be bent as required, a few com-