irregularity, and they may condone it if they will. A notice whereof a previous notice in writing has been given, if irregular, should be called to the attention of the mover before he makes his motion, and it will save both time and unpleasantness.

As soon as proposed by the President, the Society is in possession of the question, and it must be disposed of in one way or another before any other business can be proceeded with. At this stage the debate commences. If the entire question be objected to, it is opposed in debate, but no amendment or form of motion is necessary for its negation, for when the debate is at an end the President puts the question, and it is resolved simply in the affirmative or negative.

If it is desired to avoid an expression of opinion, the majority can do it in various ways, to be treated of in the sequel, but the motion can only be withdrawn by leave of the Society, granted without any negative voice. If any negative voice be heard when the President asks, 'Is it your pleasure that this motion be withdrawn,' the motion must then be put, and the result is generally that it is negatived without a division. When an amendment has been proposed to a question, the original motion cannot be withdrawn or negatived, as the latter must first be disposed of, having been interposed.

The modes in which a majority may evade or supersede a question are:

1. By moving the adjournment.
2. By moving the 'previous question.'
3. By what is called in Parliament moving the 'Orders of the day;' but the Society has no orders of the day, although there can be an analogous practice, however, which will be explained.
4. By amendment.

[In our next paper we will discuss these respective modes.]

DR. PIKE'S ADDRESS TO THE NATURAL SCIENCE ASSOCIATION.

(Continued from last issue.)

One of the important effects of the combination of a literary and scientific training is to assist the purely literary student to get rid of that attitude of mind which leads to pretty but inaccurate arrangement of thought. Scientific knowledge is, as I have said, above all exact; and it is exact in rather a different way than are the laws of grammar. A student's knowledge and use of grammar is empirical and disconnected; his knowledge of science involves the connection of diverse facts with the great theory he compares them by.

In discussing this question with a classical authority, he replied that, in his opinion, if you ask a student to arrange the senses in which the subjunctive mood is used in Latin, and to classify every subjunctive he meets with in his author under one or other of say five heads, the training afforded to the mind will be precisely the same in character as that supplied in chemistry.

Now, I cannot say that I agree with him. Provided there were a clear theory connecting the subjunctive mood with language in general, and with the classification in particular, and provided the student could prove his method at each step, I should not feel so sure he was not right. Now, no fact, no classification is of any importance in science, except with regard to the theory for which it is studied.

In fact, the investigation and study of a science, beginning with the most simple facts, and stripping even from these the unessential features, confining the attention to one object through all the various steps, may serve as a model of the mental work which a man has to perform from his cradle to his grave. No form of knowledge teaches us like science what is the power and what the weakness of our senses. A distinguished classical scholar, who has been long engaged in educational work, Henry Sedgwick, of Cambridge, has written a passage in 'An Essay on the Theory of Classical Education,' which bears on this subject, and which I should like to read to you. 'We may admit that a knowledge of the processes and results of physical science does not by itself constitute culture. We may admit that an appreciative acquaintance with literature, a grasp of the method as well as the facts of history, is a most important element, and should be more prominent in thoughts of educators, and yet feel that culture, without the former element, is now shallow and incomplete. Physical science is now so bound up with all the interests of mankind, from the lowest and most material to the loftiest and most profound; it is so engrossing in its infinite detail, so exciting in its progress and promise, so fascinating in the varied beauty of its revelations, that it draws to itself an ever increasing amount of intellectual energy; so that the intellectual man who has been trained without it must feel at every turn his inability to comprehend thoroughly the present phase of the progress of humanity, and his limited sympathy with the thoughts and feelings, labors and aspirations, of his fellow-men. And if there be any who believe that the summit of a liberal education, the crown of the highest culture, is philosophy—meaning by philosophy the sustained effort, if it be no more than an effort, to frame a complete and reasoned synthesis of the facts of the universe—on them it may be especially urged how poorly equipped a man comes to such a study, however competent he may be to interpret the thoughts of ancient thinkers, if he has not qualified himself to examine, comprehensively and closely, the wonderful scale of methods by which the human mind has achieved its various degrees of conquest over the world of sense. When the most fascinating of ancient philosophers taught, but the first step of this conquest had been attained. We are told that Plato wrote over the door of his school, "Let no one who is without geometry enter here." In all seriousness we may ask the thoughtful men, who believe that philosophy can still be best learned by the study of the Greek masters, to consider what the inscription over the door should be in the nineteenth century of the Christian era.'

A purely literary education represses originality, and leads the student to accept blindly the opinion of others; indeed, so much time is devoted to the cultivation of elegance, of expression and the perception of beauty, that the attention of the student is called away from the real subject matter of his study. Now, in science the student is taught from the outset to think for himself. No *réchauffé* of the opinions of others is enough; he is expected to be able to say of any theory why he adopts it; and if he attains sufficient mastery over his science to undertake an original investigation at the completion of his student's career, he will experience a peculiar charm and elevating stimulus which has no parallel in a literary student's career. To be the first to reach a mountain top, to have travelled furthest into an unknown country, have ever exercised peculiar influence on men's minds; and although we can no longer hope to discover altogether new countries in science—although we cannot feel as Dalton must have felt when the theory of atoms flashed into his mind—yet to have made a new discovery or successful investigation, however trifling, is to have acquired a treasure which will last a lifetime.

There is one other feature of scientific work which has perhaps helped to increase the distrust which still lingers in the minds of the classical men, although they have accepted it as a basis of education. There is such a gap between the knowledge of the classics and of commercial life, that as all the best minds have formerly been educated by the first, any subject which appears to be connected with commerce has been viewed with distrust. Now, *pari passu* with the advance of each science has followed its technical applications, and in the minds of most these applications are confused with the science itself.

It therefore seems to me of great importance to free our minds from this confusion, and to recognize clearly the object of each science. For instance, if we accept as the object of chemistry the investigation of the constitution of matter, it clearly has no immediate connection with commerce. The investigation of matter of one kind is only more important than another so far as it assists us in our objects. To say that the study of iron is more important than that of rubidium, because of its importance to the arts, is to a scientific chemist in the highest degree ridiculous; it is only to be considered in its relation to the general task before us, viz., the investigation of the constitution of matter. And whilst speaking on this subject, I would like to urge those who are intending to use their science in its applications, whether they study biology, chemistry or physics, to remember that they will have far greater command over the facts they have to deal with in the application of the science if they have achieved a mastery over the principles of the science itself. Thus, for instance, if I had to select a student to place at the head of a chemical work, I would far rather trust one who had a command over the whole science than he who had devoted his attention to the minute details of the works themselves.

And finally, although I have repudiated the close connection of science with the arts as the main reason for introducing it into a liberal education, yet such connection forms no slight part of its practical value. Science such as biology, chemistry and geology, which deal with subjects so nearly related to our every-day lives, ought to form part of the education of all.

I am sure that if the educated of this city had devoted a little time to the acquirement of the principles of science, we should not have had to wait so long for pure water; we should not pour our sewage into the bay; we should not hear senseless outcries against the gas; no lecturer could get audiences on spiritualism and animal magnetism, or some such absurd titles; and quacks would cease to flaunt their charms into our faces at every turn.

[By an oversight a selection read by Dr. Pike from Prof. Huxley's Lay Sermons was not credited in last issue.]