

to confine the teaching of zoology almost exclusively to what would commonly be understood by the term "Biology." The authorized text-book of Natural History, Mr. Ellis Davidson's "Animal Kingdom," is probably as bad a work upon the subject as could have been selected. It is crowded with inaccuracies and mis-statements of every sort and kind; its style is most objectionable, and it exhibits conclusive evidence that its author has neither enjoyed the advantages of a classical training, nor has even a moderate knowledge of the laws of English composition. Altogether it is entirely unsuited for its ostensible purpose, or, indeed, for any purpose that appears upon the surface.

Geology is a subject which might advantageously be taught in schools, and its omission is quite inexplicable. It has most important bearings upon various departments of practical life (as, for example, husbandry), and it can very readily be taught practically, finding its illustrations in every railway cutting, brook course, or mountain side. It has also most intimate and important relations with the subject of Physical Geography, which may, indeed, be regarded as nothing more than the Geology of the present. The number and excellence of the introductory text books on this subject render it invidious for me to name any one in particular, but it is questionable if Professor Page's "Introductory Text Book of Geology" has ever been surpassed for teaching purposes.

Physiology, though in many respects a subject of great importance, can only be taught with considerable difficulty in schools. Comparative Physiology can be best taught in connexion with Natural History; and the more special departments of Human Physiology should only be touched upon within certain very definite limits. In any case, physiological teaching is useless, unless illustrated with numerous diagrams. As regards text books, Cutler's "First Book on Anatomy and Physiology" may be in most respects commended; but the little book entitled "Our Bodies," by Mr. Ellis Davidson, is open to the same censure as the work by that author on Natural History. It is the production of a writer who has no practical acquaintance, and but a very imperfect second-hand knowledge of his subject, and who labours under the additional disadvantage of a marked want of literary training.

As regards Mechanics, it may be questioned if this subject can be profitably taught in schools, except by the aid of mechanical models and diagrams, such as are seldom available. The elements of Natural Philosophy, however, may be seasonably and advantageously taught to advanced pupils, and there is no difficulty in obtaining suitable text-books on this subject.

Lastly, as regards Agriculture, it is chiefly of importance to note that this subject is not a *Science* at all, in the strict and proper acceptance of the term. Agriculture is what is sometimes, though inappropriately, termed an "Applied Science." It is an "Art." In other words, Scientific Agriculture consists in the application to husbandry of the sciences of Chemistry, Natural History, Botany, and Geology. These sciences can, as regards their elements, be taught with profit in schools; but agriculture can only be learnt upon the farm, and should find no place in ordinary school education, nor indeed in any course of study which cannot be carried out and enforced practically. Holding this view, as I do very strongly, it seems unnecessary that I should offer any opinion upon the merits of the authorized Text-book of Agriculture.

In closing this imperfect address, I can merely thank you for the attention with which you have listened to opinions in which you may find yourselves, perhaps, in some cases unable to concur. The subject is one upon which probably no two men think exactly alike; and I am far from supposing that my own views are altogether free from objection. I have, however, felt it my duty to express my views upon this important subject with perfect candour, it being better not to speak at all on such questions than not to speak freely and unreservedly. I can simply hope that if we should differ, we may "agree to differ" without any diminution of mutual respect. Votes of thanks were unanimously passed to Professor Nicholson for his ably written paper, and also to Professor Wilson for reading the same.

SCHOOL ORGANIZATION.—Mr. Inspector Miller, in introducing his subject, remarked that if teachers found their school not properly organized under the supervision of the School Inspector, he (the teacher) should set about organizing the school himself according to the limit table, so as to have the work of the school placed on a proper basis; until teachers do so, they would not be doing justice to themselves or those placed under their care. Thorough examinations should take place, and a complete record kept of all work done in the school. He dealt with the subject of tests. Teachers should endeavour to make their pupils believe they were earnest in their work. He considered it was better to give short lessons to pupils than long ones. The teacher should do all in his power to establish a good feeling between himself and his pupils. A teacher should devote much time to review, which would help him in his

after studies. There should be a time-table kept in each school. A class-book should be kept in which to keep a record of the work of each class on every day of the week, and every month the pupil should receive a report as to the progress he had made in the different branches of study. General registers should be kept. He deprecated teachers allowing pupils to do the work they (the teachers) should do. If they did not do their work themselves they had better not do it at all. The speaker further dealt with school organization. A desultory conversation ensued as to matters in connection with school organization. A unanimous vote of thanks was passed to Mr. Miller for his address.

EUCLID AS A TEXT-BOOK.—Mr. Thomas Kirkland, M.A., read a paper on Euclid as a text-book. He criticised Euclid's defects, while admitting the benefits arising from a properly conducted study of Geometrical science. He argued that there was strong presumptive evidence against the value of Euclid as a text-book from the following facts: That it has been virtually abandoned on the continent of Europe and in the United States, being retained mainly in England and Canada; that it was written nearly 2,000 years ago, and therefore must be very imperfect on account of its not embodying late discoveries; and that it was not intended to serve the purpose of an elementary text-book at all. The faults of Euclid were then grouped under the following heads:—Phraseology, method, matter and particular doctrines. The phraseology was condemned as being verbose, especially in the definitions, as well as stiff and formal; the nomenclature was antiquated and infelicitous; and Euclid was condemned for his want of generalization in the use of terms. His method was described as being impaired by the undue limitation of the number of his first principles, by the rejection of hypothetical constructions and the refusal to examine the properties of a figure before the construction is actually effected; by the neglect of the method of superposition, of which he might, with advantage, have made more use; by there being no explanation given why any particular course is adopted; and by the absence of very proper classification. Such fundamental defects, it was argued, could not be remedied by an annotated Euclid, or Euclid with a commentary. They strike at the very root of the matter, and necessitate treatment of the subject for beginners, on different principles and by different methods. In matter, Euclid was described as erring in his first principles, both on the side of excess and defect. Some of his definitions were mere statements; others were not definitions at all, as they did not explain the terms; others were mere verbal definitions; while others were properly theorems. Defects were pointed out in both postulates and axioms, while it was shown that the elements contain a considerable number of superfluous propositions, while they omit some which they should have included. In many cases the proofs might be simplified by adopting a different mode of demonstration. Under the head of particular doctrines the deficiency in Euclid's treatment of angles, parallels and proportion was dwelt upon. The definition of an angle should have been made to include angles equal to and greater than two right angles. The many attempts made to improve upon Euclid's treatment of parallels show that it has always appeared unsatisfactory to mathematicians. His definition of proportion was characterized as unnatural and a violation of common sense. In opposition to those who argue in favour of retaining Euclid as a text-book, it was urged that the pressure of educational work was too great to admit of teaching errors merely for the purpose of correcting them, and that in many cases the errors would remain fixed in the learner's mind, while the corrections would be forgotten. The practical objections to Euclid were then dwelt upon. Prominent amongst them was the discouragement entailed on beginners by the use of so defective a text-book. It was further urged that boys might learn Euclid without becoming proficient in geometry, as they often failed in the application of principles, their failure being due largely to his defective method, while the mastery of his text takes up so much of the pupil's time, that very little is left for acquiring a knowledge of practical geometry. Against the argument that Euclid supplies an admirable mental discipline, it was urged that the acquisition of knowledge and mental training are rather separable in idea than in fact, while geometry, taught by a proper method, might be made equally available as a means of disciplining the intellect, while the knowledge of the science was far more readily and accurately acquired. Moreover, it was questionable whether the study of Euclid was such an excellent training for the reason, inasmuch as the type was imperfect. While his argument was ever faultless, inflexible, incapable of reply, it was conveyed with unnecessary prolixity and verbosity, and with a stiffness of form which is never found in scientific reasoning or in common life. An able and interesting paper was wound up by a caveat against applying to geometrical science the exceptions taken to Euclid's method of treating it, and by attention being called to the fact that