

THURSDAY, APRIL 19, 1888.

SCIENTIFIC PROGRESS IN ELEMENTARY SCHOOLS.

A VERY remarkable Report has been received by the London School Board from a Special Committee appointed by it a year ago "to consider the present subjects and modes of instruction in the Board schools, and to report whether such changes can be made as shall secure that children leaving school shall be more fitted than they now are to perform the duties and work of life before them."¹

The Committee, of which Mr. William Bousfield was chairman, was a strong one, representing well the various sections of the London Board. It has produced a Report of twenty-one folio pages, including no less than thirty-one recommendations, and followed by voluminous minutes of evidence given by scientific men and others, who have paid attention to elementary instruction, teachers of special subjects, inspectors, *employés* of the Board, working-men representatives, and others.

This important document is the outcome of several movements. The London Board has, throughout its existence, endeavoured to promote the teaching of science by means of systematic object-lessons; and has made several attempts to give a more practical turn to the instruction. In December 1884, a previous Special Committee reported on technical education, affirming the principle that it was not the duty of the Board to attempt to teach any particular trades, but that it was its duty so to direct the education of its scholars that they could easily take up any special work afterwards, and suggesting various ways by which this might be promoted. Since then the conviction has rapidly grown in the public mind that the teaching is too bookish; the supremacy of the three R's has been rudely assailed; and many people have asserted that other things, such as Lord Reay's three DR's (drill, drawing, and 'droitness), are equally important.

The Report—starting with this definition of education: "the harmonious development of all the faculties, bodily and mental, with which the child is endowed by Nature,"—points out the deficiencies of the present curriculum. It has an earnest paragraph on moral education, and makes various remarks upon the present teaching of history, geography, social economy, and art. But its main criticism is "that the physical or bodily side of education, including the development of muscular strength, of the accuracy and sense of colour and proportion of the eye, and of the pliancy and dexterity of the hand, is almost entirely neglected; and that the mental or brain work, which occupies the great bulk of the time in schools of all kinds, is composed far too much of appeals to the memory only, resulting, at the best, in the retention in the child's mind of a mass of undigested facts, and far too little of the cultivation of intelligence." The Kindergarten principle is strongly approved of, and the first recommendation is: "That the methods of Kindergarten teaching in infant schools be developed for

senior scholars throughout the standards in schools, so as to supply a graduated course of manual training in connection with science teaching and object-lessons."

These, then, are the two main directions of progress that are indicated—the knowledge of Nature, and the power of work; the development of the perceptive faculties, and the education of the senses—and these two are to go hand in hand.

Object-lessons are common in elementary schools, but much is said, both in the Report itself, and in the evidence of Sir John Lubbock and other witnesses, in regard to their improvement, and the importance of good collections of objects. Yet it appears from the appendix that only about forty minutes per week on an average are actually given to these lessons in boys' and girls' schools, and we know from the Annual Reports of the British Association on the teaching of science in such schools that the present regulations of the Government Code are actually diminishing the amount of the teaching of geography and elementary science. The Special Committee, therefore, very properly recommend that application be made to the Education Department to grant more freedom of choice in the selection of class-subjects; and that the provision for object-lessons, and lessons on natural phenomena, should be taken into account in boys' and girls' schools in assessing the merit grant, as is the case at present with infant schools. The Scotch Code has within the last few weeks allowed that either elementary science or English may be taken as the first class-subject, which is a hopeful sign of progress. The favourite scientific subjects taught at present in the London schools are animal physiology and algebra; but the Special Committee favour the teaching of mechanics and the fundamental notions of physical science by means of special teachers on the peripatetic plan; and they recommend "that the teaching of all subjects be accompanied, where possible, by experiments and ocular demonstration, and that the necessary apparatus be supplied to the schools."

As to manual instruction, it exists in infant schools wherever Kindergarten exercises are practised, but in boys' schools there is often no practice of the kind except in writing. In London, and perhaps in most large towns, drawing is generally taught, and it is universally allowed that this is at the very foundation of technical instruction. The Committee recommend "that all manual instruction should be given in connection with the scientific principles underlying the work, and with suitable drawing and geometry." Drawing to scale is invaluable for teaching accuracy in work. But drawing does not give the best idea of form, and there is a conventional element about it which puzzles little children. Hence modelling in clay is also recommended. The Board started a class for the use of tools in carpentry at Beethoven Street School, Kensal, but the outlay was disallowed by the Public Auditor. Six such classes, however, are being carried on at the expense of the City Guilds Technical Institute. There is little doubt that the present disability will be shortly removed, and that eventually a work-room or laboratory will become an essential part of every large Board school. How best to give manual instruction is still a matter of discussion and experiment. Good observations about it will be found in

¹ "School Board for London. Report of the Special Committee on the Subjects and Modes of Instruction in the Board's Schools, with Appendices." (Hazell, Watson, and Viney, 52 Long Acre.)

the evidence of Mr. Henry Cunynghame, Mr. Davis, of Birmingham, and Profs. Unwin and Perry. Mr. Ricks, one of the Board inspectors, has drawn out an elaborate scheme for the development of the Kindergarten system throughout all the standards of a school in the directions spoken of.

Girls are more fortunate than boys in the matter of manual instruction. They are taught needlework universally, and very often cookery. The latter may be considerably extended. Domestic economy also in its various branches should be taught, through practical work, and with reference to scientific principles—as in washing, laying fires, and ventilating rooms.

But how is time to be obtained for the introduction of this perceptive and practical instruction? On that point the Committee are very distinct, and there is a singular unanimity among the witnesses that the attention now paid to spelling and grammar is excessive, if not educationally worthless. There is a curious table, too, in the appendix, which gives the results of inquiry as to the subjects of instruction most or least preferred in the various schools. Grammar is so unpopular with both boys and girls that it almost always attains that bad pre-eminence. Spelling or dictation comes second. In fact there is no doubt that the children dislike what they feel does not add either to their pleasure, or their real knowledge. It is proposed “that the time now given to spelling, parsing, and grammar generally, be reduced.”

There are two points on which we should have liked to see some recommendations of a more vigorous character. The one refers to the teaching of arithmetic, which as laid down by the Code is thoroughly unscientific. The other point is this: there are recommendations in regard to evening classes, the more extended use of the pupil-teachers' schools, and the grouping together of the upper standards of several schools in poor neighbourhoods; but this might have been carried much further, and have included the establishment of such valuable institutions as the central schools which are doing such good work in many of the provincial towns, especially in the North of England.

Nevertheless, these recommendations, if they are all allowed to take effect, will mark an era in education. The Special Committee are happily able to add: “It is significant that these changes are demanded alike by educational theorists, teachers, men of science, leaders of industry, and statesmen, and it rests with the Board to carry them into actual fact.” The Bill of Sir Henry Roscoe, and that on technical education which is promised by the Government, must also have an important bearing on the scientific development of elementary instruction. We await the results of the discussions that must ensue with the deepest interest.

THE NERVOUS SYSTEM AND THE MIND.

The Nervous System and the Mind: a Treatise on the Dynamics of the Human Organism. By Charles Mercier, M.B. (London: Macmillan and Co., 1888.)

THE time may come when the psychological historian will be required to trace the genealogy and career of such terms as “molecular movement,” “discharge,” “explosion,” “unstable matter,” as applied to mental

operations, as well as the familiar expression “environment.” Whoever else may have contributed to their use, they will be traced back in the main to Herbert Spencer. When once the brain was recognized as the organ of mind in a special sense, chiefly through phrenological observations in which Mr. Spencer was himself at one time engaged (he was, if we mistake not, a member of the London Phrenological Society), the physical basis of mind was naturally described in terms applied to material bodies and employed in physics. The combination of atoms forming molecules being regarded as the fundamental element of the substance of the nervous system, molecular movements were correlated with mental operations. Every corpuscle in the gray matter of the convolutions of the brain was regarded as “a reservoir of molecular motion.” It followed that the destructive molecular changes of which the granular protoplasm in the corpuscles is the seat were accompanied by a disengagement or discharge of motion. For the purpose of decomposition or waste, the amount of which is the measure of the force evolved, the remarkable supply of blood received by the cerebral convolutions was seen to be necessary; as also for the recomposition or repair which succeeds waste. Spencer drew some of his analogies from chemical explosions, taking for instance the explosion of the percussion cap and powder in a pistol to symbolize the setting up of decomposition in an adjacent ganglion-cell by (in the case of the retina) a disturbed retinal element. He showed that a partially-decomposed ganglion-cell propagates a shock through the afferent nerve to a large deposit of “unstable matter” in the optic centre, “where an immense amount of molecular motion is thereupon disengaged.” The transmission of waves of molecular motion through nerve-fibres is compared by Spencer to “a row of bricks on end, so placed that each in falling knocks over its neighbour. . . . Each brick, besides the motion it receives, will pass on to the next the motion it has itself gained in falling.”

These and similar propositions have for long become household words. The terms referred to have become a part of psychological, and to a large extent medical, language. One well-known outcome of Spencerian teaching has been its elaborate application to the study of epilepsy, by Dr. Hughlings Jackson, who has been always anxious to acknowledge the source from which he drew his inspiration. Dr. Mercier's book is another stream from the same source. He makes an acknowledgment of similar indebtedness in his preface. We do not think he is justified in his complaint that “the classical works on Mind ignore altogether its association with the body, and study it from a stand-point so purely introspective as to offer no obvious advantage to the alienist, to whom the concomitant disorders of body are so conspicuous and so important.” Holding this opinion it became “absolutely necessary” for Dr. Mercier to prepare the present volume. The writings of Bain, Laycock, and Maudsley, no less than Spencer, are nothing if they do not insist upon the association of mind and body. The very last charge that can be fairly brought against these classical works is that they altogether ignore their correlation. The best evidence of the direction and complexion of the teaching of authors of modern works on psychology is contained in Dr. Mercier's statement that “everyone