

very hopeful for either of the educational measures referred to, and unless the Government seriously pushes them forward another Session will pass without the much-needed legislation. The measures are urgently pressing for consideration, and they ought not to be permitted again to lapse, as they have done before.

THE *Lancet* announces that the Senate of Glasgow University have appointed Prof. Michael Foster to be Gifford Lecturer in the Glasgow University for the sessions 1898-99 and 1899-1900, in succession to Prof. Bruce, whose term of office expires with the current session.

THE students of Finsbury Technical College will hold their annual conversazione at the College on February 18. Prof. S. P. Thompson has promised to lecture on "Wireless Telegraphy." Mr. Ives will give an exhibition of colour photography, and glow-lamp making will be demonstrated by Mr. Robertson.

AN illustrated article on technical education in the United States, together with some other statistics relating to the occupations of students who have passed through certain representative American institutions, appears in the January *Record of Technical and Secondary Education*. Among other articles we notice one on technical instruction given to fishermen in Aberdeenshire and Essex.

THE following item of information from the tenth annual report (1897) of the Clerkenwell Public Library, London, is worth recording:—"Scientific works are very largely circulated. Biology, including evolution and methods of scientific research, is a very popular subject, the sixty-eight works which the library contains on this topic having been issued over 2800 times within recent years. In this subject two copies of Darwin's 'Descent of Man' have been issued nearly 200 times, a record which is exceeded only by the most popular novels."

DR. W. B. BENHAM, M.A., New College, Oxford, has been elected to the chair of Biology in the University of Otago, and will leave England at the end of March. Dr. Benham has for the past seven years held the post of "Aldrichian Demonstrator in Comparative Anatomy" at Oxford, and as such has acted as assistant to Prof. Lankester, to whom he was previously assistant in University College, London. For ten years Dr. Benham has been Lecturer in Animal Biology at Bedford College for Women, London; and was appointed Examiner in Zoology in the University of London last year. His original researches are embodied in some thirty papers: these are mainly concerned with the anatomy and classification of the Oligochaete Annelids; he has also contributed the article "Polychaeta" to the Cambridge Natural History, and published an account of the Brain of the Chimpanzee "Sally," the Blood of *Magelina*, the Anatomy of *Phoronis*, &c.

At the annual congress of the South-eastern Union of Scientific Societies, held at Tunbridge Wells last May, Mr. S. Atwood, of New Brompton Natural History Society, drew attention to the difficulty of securing rooms for meetings in some of the smaller towns, even where suitable rooms belonging to Technical Institutes existed, which the Societies would be willing to hire. On the proposition of Mr. Pankhurst, of Brighton, the following resolution was passed unanimously:—"That it be an instruction to the Council of this Union to consider the question of how far buildings erected under or used for the purposes of the Technical Institution Acts may be made available for the use of local scientific societies." Since then the Council have had the matter under consideration, and have communicated with Colonel Holland, of the Kent County Council, who has replied to the effect that the Technical Education Committee have no control over Technical Institutes, and the local authority must be applied to for the permission desired. Colonel Holland adds: "If that authority wishes to help, it can do so without any permission from the Technical Education Committee." It appears, therefore, that no legal obstacle exists to the use of rooms belonging to or used for the purposes of technical instruction when such rooms are not needed for their special objects.

In a paper on the teaching of science in secondary schools, read on January 12, in Birmingham, before the Friends Guild of Teachers, Dr. Bevan Lean deprecated children beginning systematic work in science or entering the laboratory before the age of thirteen or fourteen, and urged that before boys (and girls) were allowed to learn chemistry or physics they should possess at least a sound knowledge of arithmetic. It was emphasised that the teaching of science in schools should not be in any

sense commercial, nor should its aim be the mere awakening of interest or even the gain of knowledge: it was valuable solely as a means of mental culture, because through it could best be stimulated the power of accurately ascertaining facts and drawing correct inferences. It was urged that this educational value could best be obtained through chemistry, because chemistry admitted of quantitative experiment within the time of a short class and of an infinite variety of experiment; and, moreover, it so frequently touched matters and operations that were familiar to children in every-day life. The scientific method of investigating nature must be illustrated, and that necessitated placing the children in the attitude of discoverers, so that they could proceed from the known to the unknown, and not from the simple to the complex. Experience showed, too, that the problems on which great investigators were engaged 100 years ago were suitable for the modern schoolboy. This did not mean that we could build up the whole of our science for ourselves. The time for books and lectures would come, but at school it was far more important that boys and girls should be placed in direct contact with facts in the attitude of inquirers. It was a necessary corollary that the teacher ought to have a knowledge of the history of his science, and that it would be a great advantage if he had himself carried on original research: at the least, he ought to have an inveterate habit of inquiry.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society, January.—On the commutator groups, by Dr. G. A. Miller. This is a collection of eleven theorems, some of which are proved in the present paper. For proofs of the remaining theorems reference is made to the writings of Frobenius and Dedekind. Dr. G. A. Miller has also a paper, read before the Society at its December meeting, entitled "On the limit of transitivity of the multiply transitive substitution groups that do not contain the alternating group." This is a paper which contains three theorems and four lemmas bearing upon results recently given by Jordan and Bochert in *Liouville's Journal* and the *Mathematische Annalen* respectively.—Geometry of some differential expressions in hexaspherical coordinates, by Dr. V. Snyder, read at the Toronto meeting, is an appendix to the author's dissertation "Ueber die linearen Complexe der Lie'schen Kugelgeometrie" (Göttingen, 1895). It gives an outline of differential geometry, and shows the application of it to the quadratic complex. Some results are, among the ∞^3 spheres which touch a given surface, there are ∞^2 which also cut a fixed sphere at a constant angle. These spheres either envelope another surface or are arranged in ∞^1 pencils, touching the surface along the curve of intersection with the sphere, which is then a line of curvature of the given surface (*cf.* Darboux, "Théorie des surfaces," vol. i. p. 257, who does not mention the exceptional case). The locus of the point-sphere in a spherical complex of degree n is a surface of degree $2n$, and contains the circle at infinity as an n -fold line. The surface of singularities of a quadratic spherical complex is a cyclide. The Dupin cyclide is the only surface that can be the complete envelope of a non-reducible special quadratic spherical complex. Numerous references are given to writers on the subject.—Dr. E. O. Lovett gives a useful abstract of some lectures by Sophus Lie, viz. "Vorlesungen über Differentialgleichungen mit bekannten infinitesimalen Transformationen" (edited by Dr. G. Scheffers, Leipzig, 1891).—Dr. Charlotte A. Scott, in a short note, commends a translation of Prof. Klein's "Vorträge über ausgewählte Fragen der Elementargeometrie," by Messrs. W. W. Beman and D. E. Smith.—The "Notes" and "New Publications" give their usual useful information.

Bulletins of the St. Petersburg Society of Naturalists, 1897 (xviii.), Nos. 2 and 3, February and March.—No. 2.—Geological excursion in North Russia, by Amalitzkiy.—Age of clay slates on the Upper Ulba, Altai, by von Petz.—Excursion to Crimea (botany), by Levandoskiy.—On the part played by iron on the motions and the degeneration of cells when they are submitted to the bactericidal action of the immunised serum, by Sakharoff.—On fertilisation in *Fugians regia* and *F. nigra*, by Navashin.

No. 3.—On the relations between the Upper Tertiary in Russia, Rumania, and Austro-Hungary, by Andrusoff.—Journey to East Persia (geo-botany), by Korovyakoff.—All these communications are fully summed up in French or German.