

Organisation of Expert Knowledge.

We are reminded by the report of a Royal Commission—that on Coast Erosion in 1911—that systematic observations and the collation and organisation of geological and engineering knowledge are urgently needed in connection with the protection of our coasts and the reclamation of new lands. For it will be remembered that the Commission found that during the last thirty-five years the gain of land, as shown by Ordnance Survey maps, has been more than seven times the loss by erosion.

Here, again, the British Association may reflect with pride that it paved the way for this national inquiry. For many years its Committee on Coast Erosion gathered and collated evidence on erosion, and induced the Admiralty to instruct the coastguard to observe and report upon changes that take place from time to time.

After recommending "that the Board of Trade should be constituted the Central Sea-Defence Authority for the United Kingdom for the purpose of the administration of the coast-line in the interest of sea defence," the Commissioners go on to urge that "that Department should have the assistance of scientific experts to collate information and to secure systematic observations with regard to questions such as the changes taking place below the level of low water, the travel of materials in deep water, the movements of outlying sandbanks, etc., which are continually happening on the coasts of the kingdom, and with regard to which the information at present is scanty and vague."⁸

In economic geology, as in the case of other applied sciences, we must rely in the future less upon chance individual effort and initiative. We must concentrate, centralise, and organise; and at every stage we shall need expert control and advice as regards those larger scientific issues of national importance which have a direct practical bearing.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LEEDS.—The annual report of the Department of Coal, Gas, and Fuel Industries, of which Prof. J. W. Cobb occupies the chair as Livesey professor, has just been issued by the University. It begins with a reference to the number of students who have entered the Army or are connected with the war work of the department, and also to the election of candidates to the recently founded Corbet-Woodall scholarship and Arthur Walker exhibition. Courses of lectures, which have been given in the past by specialists connected with the gas and fuel industries, have had to be restricted owing to the demands made by the war upon the lecturers. The research work of the department during the year includes two important publications. The Ventilation Research Committee, representing the Institution of Gas Engineers, has issued its third report. The work has been carried out, as before, by Mr. W. Harrison, who has made a careful and interesting study of causes of down-draughts, the effect of ventilating burners, etc. The second research, by Prof. Cobb and Mr. H. Hollings, on "Thermal Phenomena in Carbonisation," was read before the Institution of Gas Engineers in June last. The other work of the department has been mainly on behalf of the Ministry of Munitions and the Royal Society War Committee.

THE chemical courses of the Finsbury Technical College, which commenced on Tuesday, October 3, are

⁸ Royal Commission on Coast Erosion, etc., 1911. Third (and Final) Report, pp. 160-61.

undergoing modification and extension in order to cope with the increased demand for chemists trained to take up industrial posts. Commencing at first with a two-year curriculum, the courses have in recent years been extended over a period of three years, and in many instances students have, with profit to themselves, continued their advanced studies into a fourth year and even longer. If the renaissance of British chemical industry is to be fruitful, there will not only be a demand for more chemists, but it will be essential that these newcomers should be better trained than their predecessors. The Executive Committee of the City and Guilds of London Institute has placed at the disposal of the chemical department of the Finsbury college a new suite of rooms, to be fitted as advanced laboratories of applied chemistry. The work of adaptation is in full progress, and the laboratories will be sufficiently ready for advanced students early in the new year. The installation of technical appliances is being extended, partly by purchase and partly by construction in the chemical department. Factory methods of conducting filtration, evaporation, distillation, desiccation, heating under pressure, and other generalised processes will be studied, and the possession of this plant and apparatus will render possible the execution of industrial researches in many branches of inorganic and organic chemistry, as, for example, the extraction of metals, preparation of alloys, cements, glazes, porcelains, glass, enamels, pigments, synthetic dyes, artificial perfumes, and pharmaceutical products. One gratifying feature of this development is the fact that the effort to develop along industrial lines is so far appreciated by certain firms that they have assisted by gifts of plant and chemicals.

IN a pamphlet of thirty-six pages, entitled "Scientific Method in Schools" (Cambridge University Press, price 1s.) Mr. W. H. S. Jones, senior classical master at the Perse School, has put forward some well-timed suggestions upon a subject now universally admitted to be of first-rate importance. Starting from the assumptions (1) that all subjects, in different ways and to different degrees, can be made to give a training in scientific method, and (2) that the scientific training even of the future researcher in physics or chemistry will be more effective if it is not confined to his special subject, but rests on a broad foundation, he puts forward the thesis that "whatever subjects are included in the curriculum, each one should contribute its quota to a comprehensive scheme of scientific method." He does not demand a strict "heuristic" treatment of every subject, but maintains that in lessons occurring regularly "once a week or once a fortnight in each subject," the pupil should be confronted with problems to be attacked by strict application of the methods of deduction and induction—particularly the latter—and should be taught to be constantly conscious of the necessity of working according to fixed laws. Mr. Jones introduces his proposals by quotations from Cicero and Charles Lamb, but does not show whether he is aware how entirely they are congruent with the results of the best relevant psychological researches of the present day. Be that as it may, the practical teacher will be more directly interested in the eleven detailed examples, drawn from courses in languages, history, geography, biology, and mechanics, which the author gives in illustration of his thesis. Of these, some represent the joint work of master and class, some the unaided work of schoolboys or undergraduates. It would be unreasonable to expect them to be proof against criticism (indeed, Mr. Jones disclaims any intention of offering them as models), but all will be found interesting and instructive as exemplifying a method of procedure of the general soundness and importance of which there can be no doubt.

ON Monday, October 2, her Majesty the Queen opened the extension of the science laboratories of the London Royal Free Hospital School of Medicine for Women. The ceremony took place in the anatomical department, where more than 600 guests were accommodated. The Queen was addressed by the dean of the school, Miss Aldrich Blake, M.D., who gave a brief account of the school, comparing its position in 1874, when it was founded by Dr. Sophia Jex-Blake, with a total of fourteen students, and its present condition, with splendidly equipped laboratories and more than 400 students; by Dr. Winifred Cullis (lecturer in physiology), who thanked the Queen for the interest she had shown in the work and education of medical women, and all those who by their help had made it possible to carry out this much-needed extension; and by the chairman of the council, who, having handed to the Queen a key presented by the architects, asked her to open the extension. After the Queen had declared it open, her Majesty made a tour of the new laboratories. The extension which has now been carried out was planned and arranged for before the war, owing to the steadily increasing annual entry of students. When war broke out it was for a time uncertain whether the extension should be proceeded with, but the number of students entering the school in 1914 was so great that there was no alternative. Consequently an appeal for 30,000*l.* was issued, the appeal was generously responded to, and within seventeen months the whole sum was obtained. On the top floor the whole extension is given to the anatomical department, which now has one of the finest dissecting rooms in the country (an excellently lighted room, 140 ft. in length), private rooms, demonstration room, preparation rooms, and mortuary. The next floor is given to the physiological department, and the extension provides an advanced laboratory, demonstration theatre, dark-room, storeroom, and private and research rooms. In the floor below is an extension of the chemical department, adding to it an organic laboratory, balance room, and private and research rooms; on this floor is found also a students' union room. Below this is the extension of the physics laboratory, including lecture room, dark-rooms, and research room, and also some laboratories for pathological research.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 18.—M. Camille Jordan in the chair.—A. **Lacroix**: The riebeckite syenites of Alter Pedroso (Portugal), their mesocrate forms (lusitanites), and their transformation into leptynites and into gneiss.—E. **Picard**: Certain subgroups of the hyperfuchsian groups, corresponding with certain ternary quadratic forms.—E. **Esclançon**: Doppler's principle and the whistling of projectiles.—H. **Bordier**: The action of the X-rays upon iodine and iodide of starch in aqueous solution. The solutions are decolorised, a few minutes' exposure to the X-rays giving the same effect as several hours' exposure to ultra-violet light.—M. **Mauger**: The minettes of Jersey.—Ph. **Flajolet**: The perturbations of the magnetic declination at Lyons (Saint-Genis-Laval) during the first quarter of 1916.

BOOKS RECEIVED.

Science from an Easy Chair. By Sir Ray Lankester. Pp. xii+292. (London: Methuen and Co., Ltd.) 1*s.* net.

Doctors at War. By J. W. Barlow. Pp. 144. (London: D. Nutt.) 2*s.* 6*d.* net.

Evolution by Means of Hybridization. By J. P.

Lotsy. Pp. viii+166. (The Hague: M. Nijhoff.) 6*s.* net.

History of Manufactures in the United States, 1607-1860. By V. S. Clark. Pp. xii+675. (Washington: Carnegie Institution.)

The Classics of International Law:—

Le Droit des Gens. By E. de Vattel. 3 vols.

(1) Photographic Reproduction of Books I. and II. of the First Edition (1758), with Introduction by Albert de Lapradelle. Pp. 600. (2) Photographic Reproduction of Books III. and IV. of the First Edition (1758). Pp. 375. (3) Translation of Edition of 1758 (by Charles G. Fenwick), with translation (by G. D. Gregory) of Introduction by A. de Lapradelle. Pp. 486. (Washington: Carnegie Institution.) 8 dollars.

De Jure Naturæ et Gentium Dissertationes. By S. Rachel. 2 vols. (1) Reproduction of Edition of 1676, Introduction by L. von Bar, and List of Errata. Pp. 361. (2) Translation of the Text, by J. P. Bate, with Index of Authors Cited. Pp. 255. (Washington: Carnegie Institution.) 4 dollars.

British Rainfall, 1915. By H. R. Mill and C. Salter. Pp. 288. (London: E. Stanford, Ltd.) 1*0s.*

Illustrations of the British Flora. By W. H. Fitch and W. G. Smith. Fourth, revised, edition. Pp. xvi+338. (London: L. Reeve and Co., Ltd.) 9*s.* net.

Results of Meteorological Observations in the Five Years 1911-15; also of Underground Temperatures in the Twelve Years 1898-1910, made at the Radcliffe Observatory, Oxford. Vol. II. Pp. xv+215. (Oxford: H. Milford.)

CONTENTS.

	PAGE
The Organism as Phoenix	85
Hydraulic Formula Reconstruction. By B. C.	87
Serum Reactions and Bacterial Therapy. By Prof. R. T. Hewlett	88
School Mathematics. By C. G.	88
Our Bookshelf	89
Letters to the Editor:—	
Optical Deterioration of the Atmosphere in July and August, 1916.—Sir Napier Shaw, F.R.S.	90
Science in Education.—Prof. Frederick Soddy, F.R.S.	90
An Imperial Department of Mineral Production. By Prof. Henry Louis	91
The Survey Link Connecting the Triangulations of India and Russia. (Illustrated.) By Sir T. H. Holdich, K.C.M.G., K.C.I.E.	92
Mr. Bedford McNeill	94
Notes	94
Our Astronomical Column:—	
The Astronomical Compass	98
Effect of Haze on Solar Rotation Measures	99
The Masses of Visual Binary Stars	99
Mutation and Evolution. By W. P. P.	99
Some Problems in Eugenics. By G. H. C.	99
The British Association at Newcastle:—	
Section C.—Geology.—Opening Address (Abridged) by Prof. W. S. Boulton, D.Sc., F.G.S., President of the Section	100
University and Educational Intelligence	103
Societies and Academies	104
Books Received	104

Editorial and Publishing Offices:

MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.

Advertisements and business letters to be addressed to the Publishers.

Editorial Communications to the Editor.

Telegraphic Address: PHUSIS, LONDON.

Telephone Number: GERRARD 8830.