

Colonial commerce; there are three important railway and three useful fishery maps.

On the whole, the work achieves an object of notable importance—a comprehensive summary of one department of American history. There has been a development in time, but the more important changes have been spatial, so that the underlying unity of the work is geographical rather than historical; spread over an extensive area, the people have always tended towards sectional interests, and the chronological sequence of events necessarily depends upon a continuous adjustment to new topographical conditions. In the earlier periods the exchanges were triangular in character; at first, from the north-eastern coast-lands ships carried produce to the West Indies; the goods were, practically, exchanged for sugar, which went to Great Britain, and were there exchanged for British manufactured products to be sent to Boston; later, when the Middle West became populous, farm produce from the Ohio districts went down the Mississippi, was exchanged for cotton, which was sent coastwise to New York, and was there exchanged for manufactured goods, which went west to the Ohio.

The gradual substitution of direct trading based upon increased facilities of ship, canal, and railway, upon increased divergence of fundamental interest as the several areas confined attention to one or other definite form of production, and upon the increased quantity of coin and coin equivalent in the country, is resolved into a commentary upon the steady development of the natural resources of the United States. Tobacco and cotton exports from the plantation States, direct trade with the West Indies (which was always of paramount importance), and direct trade, at a later date, with the Far East, gradually gave the United States the largest mercantile fleet in the world, and despite piracy and privateering, this predominance was maintained until the substitution of iron for timber in the construction of the hulls of ships. The story of the limitation of the fisheries, and of the decline of the whale fishery, helps to explain the smallness of the United States marine, both commercial and naval, at the present day.

The facts for the years 1860, 1880, and 1900 show that the production of maize, wheat, oats, and butter was at least trebled; coal production advanced from 13 to 241 million tons annually, petroleum from a half to 64 million barrels; the numbers of wage-earners engaged in manufacturing increased from 1¼ to 5½ millions, and the manufactured products increased from 377 to 2600 million pounds sterling.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE extension of the London (Royal Free Hospital) School of Medicine for Women at Hunter Street, Brunswick Square, W.C., will be opened by H.M. the Queen on Monday, October 2, at 3 p.m.

By the death, on September 1, of Mrs. William Jackson, widow of Mr. William Jackson, of Thorngrove, Aberdeen, a large sum becomes available for the founding of a chair of engineering in the University of Aberdeen.

ARRANGEMENTS have been made by the Cheshire County Council Education Committee with the authorities of McGill University, Montreal, which will permit of engineering students winning technological scholarships in Cheshire to have a portion of their three years' training at McGill University.

It was announced in our issue of August 31 (vol. xcvi. p. 555) that the Weardale Lead Company is establishing two mining scholarships, each of the value

of 60*l.*, in connection respectively with the Royal School of Mines and Armstrong College, Newcastle-upon-Tyne. The former scholarship will be known as the "Richardson," and the latter, a correspondent informs us, as the "Cameron-Swan," and not the "Cameron," as stated in our note.

THE syllabuses of classes which begin at the Sir John Cass Technical Institute, Aldgate, on September 25 has now been issued. The courses of instruction are specially concerned with the technical training of persons engaged in chemical, metallurgical, and electrical industries. In addition, facilities are offered for special investigation and research. We notice that the curriculum in connection with the fermentation industries includes courses in brewing and malting and the microbiology of the fermentation industries. In the metallurgy department advanced courses are provided on gold, silver, and allied metals, on metallography and pyrometry, and other important technical subjects.

AN abridged calendar for the forthcoming session of the London School of Economics and Political Science (University of London) has been issued. One of the objects of the school is to supply liberal courses of education specially adapted to the needs of persons taking up any kind of administration, such as the service of any Government or local authority, or the higher branches of commerce and industry. Courses of study are arranged also for students desiring to graduate at the University of London in the faculty of economics. The school is provided with a research department in which the methods of utilising great libraries and collections of material are explained and hints are given in the prosecution of research. The time-tables of lectures and classes printed in the calendar are comprehensive and exhaustive, and the list of lecturers includes the names of many distinguished authorities.

THE new session of the Battersea Polytechnic begins on September 19. In the day technical college, courses have been arranged in civil, electrical, motor, and chemical engineering, and full preparation for degrees in science at the University of London. The department of hygiene and physiology provides training for women sanitary inspectors and health visitors. Full evening courses will be held in a great variety of subjects in science, technology, and commerce. Special classes for the training of men and women munition workers are held, and the manufacture of munitions for the Admiralty is undertaken. At the request of the War Office, a full-time course in engineering for men of the Royal Flying Corps has been arranged. Red Cross classes for women in the subjects of first aid, home nursing, cookery, and laundry work are also held. In addition, the members of the chemistry department have been engaged on the preparation of chemical substances for the War Office, and the staff of the physics department has assisted in the testing of optical instruments for the Ministry of Munitions.

#### SOCIETIES AND ACADEMIES.

##### PARIS.

Academy of Sciences, August 28.—M. Paul Appell in the chair.—A. Lacroix: The constitution of the volcanic rocks of the archipelago of the Comores. This archipelago is entirely volcanic, and geological researches are carried out with difficulty; basaltic tufa predominates, and the porous rocks have undergone profound alteration. The tropical vegetation is very intense and effectually hides the subsoil. A chart of the geological formation of the Grand Comore is given, together with six complete chemical analyses of typical

rocks.—M. Friedmann: The vortices in a liquid at variable temperature.—L. Hartmann: The determination of the mechanical equivalent of heat by the method of Hirn. It is shown that the hypothesis which forms the basis of the determination of Hirn is not confirmed by experiment.—C. Camichel: The amplitude of the odd harmonics in the strokes of a hydraulic ram.—G. A. Le Roy: A reagent for free chlorine in drinking water. The amount of free chlorine in drinking water which has been purified by means of hypochlorites is at present controlled by the well-known iodide of starch reaction. The new reagent suggested, which has a higher sensibility than the iodide of starch, is the chlorohydrate of hexamethylparaminotriphenylmethane. The violet colour is formed immediately, and its intensity is proportional to the amount of free chlorine present. Water containing only three hundred millionths of chlorine gives a visible reaction with the new reagent; about three times this quantity is necessary to show the iodide of starch reaction. Details for the preparation and use of the reagent are given.

## CAPE TOWN.

Royal Society of South Africa, July 19.—Dr. L. Péringuey, president, in the chair.—E. J. Goddard: *Pelodrilus africanus*, a new Haplotaxid from South Africa. The species here described constitutes the first representative of the family Haplotaxidæ recorded from South Africa. Of the two genera included within this family, one—Haplotaxis—is represented by fresh-water species in Europe, North America, and New Zealand, while the remaining genus—Pelodrilus—is represented in New Zealand by a species inhabiting damp earth. The African species is to be included in the latter genus. The specimens were obtained in mud on Sneeuw Kop, near Wellington, Cape Province, at an elevation of 5000 ft. above sea-level. The length varies from 20 to 40 mm.—Paul A. van der Bijl: Note on *Polysaccum crassipes*, a common fungus in Eucalyptus plantations around Pretoria. *Polysaccum crassipes* is so common in Eucalyptus plantations around Pretoria that it appeared interesting to determine in what relation it stood to the Eucalypti. The investigation was begun at the Botanical Laboratories, Pretoria, and afterwards concluded at the Natal Herbarium, Durban. The morphology of the fungus is briefly dealt with and followed by suggestions which indicate that the relation between the fungus and host is one of symbiosis.

## CALCUTTA.

Asiatic Society of Bengal, August 2.—Dr. N. Annandale: Zoological results of a tour in the Far East. I., The Mollusca of Lake Biwa, Japan. Lake Biwa, as might be expected from its geographical position and from what is known of the fauna of Japan generally, seems to be, so far as the Mollusca are concerned, the meeting-place of two lines of migration, one coming from the north, the other from the south.

## BOOKS RECEIVED.

Index of Genera and Species referred to, and an Index to the Plates, in the *Ibis* (seventh, eighth, and ninth series), 1895-1912. Pp. 513. (London: British Ornithologists' Union; W. Wesley and Son.) 1l. 12s. 6d.

Cradles or Coffins? By J. Marchant. Pp. 96. (London: C. A. Pearson, Ltd.) 1s. net.

First Course in General Science. By Prof. D. Barber and others. Pp. vii+607. (New York: H. Holt and Co.)

Cleator and Cleator Moor, Past and Present. By

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Rev. Cæsar Caine. Pp. xviii+475. (Kendal: T. Wilson.) 21s. net.

Earliest Man. By F. W. H. Migeod. Pp. xii+132. (London: Kegan Paul and Co., Ltd.) 3s. 6d. net.

The Principles of Electrical Engineering and their Application. By Prof. G. Kapp. Vol. i., Principles. Pp. xii+356. (London: E. Arnold.) 15s. net.

The Elements of Non-Euclidean Plane Geometry and Trigonometry. By Prof. H. S. Carslaw. Pp. xii+179. (London: Longmans and Co.) 5s. net.

Royal Society of Arts. Cantor Lectures on Optical Glass. By Dr. W. Rosenhain. (London: Royal Society of Arts.) 1s.

Raphael Meldola: Reminiscences of his Worth and Work. Edited by J. Marchant. Pp. xv+225. (London: Williams and Norgate.) 5s. net.

Tree Wounds and Diseases: their Prevention and Treatment, with a special chapter on Fruit Trees. By A. D. Webster. Pp. xx+209. (London: Williams and Norgate.) 7s. 6d. net.

Mathematical Papers for Admission into the Royal Military Academy and the Royal Military College. February-June, 1916. By R. M. Milne. Pp. 30. (London: Macmillan and Co., Ltd.) 1s. net.

Manual of Russian Commercial Correspondence. By M. Sieff. Pp. xx+232. (London: Kegan Paul and Co., Ltd.) 3s. 6d. net.

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