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Mr. Murray calls attention to:—The Progressive Science Series: "On Whales," by F. E. Beddard, F.R.S., illustrated; "The Stars," by Prof. Newcomb, illustrated; "Man and the Higher Apes," by Dr. Keith, illustrated; "Heredity," by J. Arthur Thomson, illustrated; "Bacteriology," by Dr. G. Newman, illustrated.

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Mr. T. Fisher Unwin gives notice of:—"The Climbs of Norman Neruda," by Mrs. Norman Neruda, illustrated; "The Kingdom of the Ba-Rotsi—Upper Zambesia," by Alfred Bertrand, translated by A. B. Miall, illustrated; "Claude Bernard," by Prof. Michael Foster, F.R.S. (vol. vi. "Masters of Medicine" Series).

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#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 199th meeting of the Junior Scientific Club took place on Friday evening, March 10, at the Museum. In private business the officers for next term were elected, and there was a long debate on a motion of Mr. A. E. Boycott (Oriel) to confine the ordinary membership of the Club to members of the two Universities of Oxford and Cambridge and to persons engaged in scientific work in Oxford in connection with the University. Ultimately the amendment of Mr. A. F. Walden (New College) to delete the words "in connection with the University" was carried by a large majority, and the amended motion passed. In public business, Mr. F. W. Charlton (Merton) read a paper on "Gold mining," and Mr.

A. F. Walden a paper "On the condition of dissolved substances in solutions other than aqueous."

The Robert Boyle Lecture of 1899 will be delivered in Eight's week of next term, by Prof. E. Ray Lankester, F.R.S.

CAMBRIDGE.—The grace for the establishment of a professorship of Agriculture will be offered to the Senate on May 11.

The researches in magnetism and electricity, presented by Mr. S. W. Richardson and Mr. J. Henry, advanced students of Trinity College, have been approved by the special Board for Physics as qualifying for the B.A. degree.

Mr. T. Andrews, F.R.S., has presented a valuable metallurgical microscope to the engineering laboratory.

The degree of M.A. *honoris causa* has been conferred on Dr. G. Sims Woodhead, Professor of Pathology.

Profs. Thomson, Forsyth, and Macalister, and Mr. F. Darwin have been appointed electors to the Allen Studentship for original research recently founded in the University.

It appears from a useful table published in the *Library World* for February, that 363 towns and districts of the United Kingdom have adopted the Public Libraries Act. The progress of the movement was slow while the power of adoption remained in the hands of the ratepayers; but since it was transferred, in 1893, to the option of town councils and other authorities, the rate of progress has increased nearly threefold. Between 1850 and 1892, 256 places had adopted the Act—an annual average of about 6; but in the six years from 1893 to 1898, 107 places had established libraries—a yearly average of 16, excluding London, which still retains the public vote.

THE names of the present curators of patronage, by whom the appointment of a professor of physiology in the University of Edinburgh, in succession to the late Dr. Rutherford, are given by the *British Medical Journal* as follows:—Principal Sir William Muir, the Right Hon. J. P. B. Robertson, Lord Justice-General for Scotland; and Dr. Patrick Heron Watson, elected by the University Court, while the following four curators are elected by the Town Council; the Right Hon. Lord Provost Mitchell Thomson, Lieut.-Colonel Alexander Forbes MacKay, Sir James Alexander Russell, and Mr. George Auldjo Jamieson. It is stated that already the following gentlemen are candidates for the vacant chair: Prof. E. A. Schäfer, F.R.S., Dr. William Stirling, Dr. Diarmid Noël Paton, Dr. E. Waymouth Reid, F.R.S., and Dr. E. W. Wace Carlier, senior assistant to the late Prof. Rutherford. Dr. Carlier is at present giving the lectures in physiology in the University. The emoluments of the chair will in future be of the annual value of 1400*l.*

A GEODETIC observatory is a necessary part of the equipment of an institution giving instruction in geodetic methods of surveying. Such an observatory has lately been established in connection with the Massachusetts Institute of Technology. This observatory is intended primarily to be used in giving instruction in the most refined methods of determining latitude and longitude, and is also to be used in magnetic and gravity observations. A hill in the south-eastern part of Middlesex Fells was chosen for the site. Here was found a firm foundation for the most delicate instruments, free from the vibrations caused by railroad and highway traffic, and not too far from Boston. Much work has been done at the observatory that could not before be performed in any of the Institute buildings. This is especially true of the tests on delicate spirit-levels and the determination of constants depending on such observations. This is due to the freedom of the observatory from vibrations, while its distance from all magnetic disturbances renders it especially favourable for observation with the magnetometer and dip circle. It has been attempted to give the students in geodesy such practice as will not only illustrate the theory, but enable them to make satisfactory observations of paramount value with all the various instruments employed. The observatory will also be used by all civil engineering students in connection with their fourth year astronomy. The observatory, on account of its good position, will be a valuable magnetic station, and its observations will probably be incorporated in the general magnetic work of the United States Government.

IN the House of Lords on Tuesday, the Duke of Devonshire called attention to the subject of secondary education, and introduced a Bill dealing with it. The *Times* reports him to have said, in the course of his remarks, that by the Bill it is proposed to constitute a Board of Education of the same

character as the Board of Trade or the Board of Agriculture. Like the Board of Trade, and unlike the Board of Agriculture, the new department will have a Parliamentary secretary as well as a president; but the office of vice-president will cease to exist, although the present vice-president will continue to be a member of the Board. The Bill will give more elastic powers for the transfer of the educational functions of the Charity Commissioners to the new department. At first there will only be such an inspection and examination of local schools as will bring the endowed, municipal, private, and proprietary schools within their areas to some common local scheme. It is intended that the inspection shall be optional, except in the case of schools which are being conducted under schemes framed by the Endowed Schools Commissioners. In the first instance, no attempt will be made to impose upon the schools anything like uniformity in their course of instruction, but the inspection will be made in accordance with the advice given by the consultative committee. It is considered that the registers of teachers, both in elementary and secondary schools, may be most properly kept by the Department itself; but it is provided that the regulations relating to the registers shall be framed in accordance with the advice given by the consultative committee. The composition of that committee will not be stereotyped by the terms of the Bill, which provides, however, that two-thirds of the members shall be representatives of the Universities or of other teaching bodies. The organisation of the Science and Art Department will be revised, and the task will be undertaken by a departmental committee, which will be appointed as soon as the principle of the amalgamation of this Department with the Education Department has been approved by Parliament. The inquiry will occupy a considerable amount of time, and it is, therefore, proposed that the present Bill shall not come into force until April 1 next year.—The Bill was read for a first time.

#### SOCIETIES AND ACADEMIES.

##### LONDON.

**Royal Society**, February 23.—“Deposition of Barium Sulphate as a Cementing Material of Sandstone.” By Frank Clowes, D.Sc., Emeritus Professor, University College, Nottingham. Communicated by Prof. H. E. Armstrong, F.R.S.

Some years ago the author described the occurrence of a peculiar sandstone over a large area in Bramcote and Stapleford, near Nottingham (*Roy. Soc. Proc.*, vol. xlv. p. 363). The sandstone was remarkable for its high specific gravity; and chemical analysis, supported by microscopical examination, proved that the high specific gravity was due to the existence in the sandstone of a large proportion of highly crystalline barium sulphate. In the rock itself the percentage of the sulphate varied from 33·3 to 50·1; and it evidently served as the binding or cementing material which held the sand grains together. The occurrence of this sandstone was stated by geologists to be unique in the United Kingdom.

Mr. J. J. H. Teall made an examination of the sandstone, and, after breaking up a portion of the rock, found that the small cleavage flakes gave the optical characters of crystallised barium sulphate. Mr. Teall further stated that the barium sulphate occurred in large irregular crystalline patches, which included the sand grains.

The author noted that in some parts of the rock the sulphate occurred in reticulated veins enclosing small patches of more or less loose sand grains; while in other parts of the rock the sulphate occurred in spherical or oval masses, between which looser sand was interspersed; occasionally, however, the barium sulphate was uniformly distributed.

The appearance presented by the weathered surface of the rock varied according to the mode in which the resistant sulphate was distributed. When it was uniformly distributed, it formed an almost complete protection against weathering; the reticulated distribution of the sulphate caused the surface of the weathered rock to present a fretted surface, with the thin veins of sulphate projecting from the surface; while when the sulphate had bound together spherical or oval masses in the substance of the sand, these were left in pebble-like forms as soon as the loose sand had been washed out from between them.

Dr. Bedson had shown (*J.S.C.I.*, vol. vi. p. 712) that barium chloride was present to the extent of 137·2 parts per 100,000 in

some of the colliery waters of the Durham coal-field, and the ferrous sulphate and sulphuric acid derived from the iron pyrites in the beds of coal and shale caused the frequent deposition of barium sulphate from such water. The author of the present paper described some of these deposits (*Roy. Soc. Proc.*, June 1889), and suggested that the calcium sulphate present in the waters of the Nottingham district would in a similar way cause barium sulphate deposits from barium chloride spring water. But in the Nottingham district all evidence of barium chloride in solution was wanting.

Such a barium chloride water, derived from an artesian boring at Ilkeston, has recently been found by Mr. John White (*The Analyst*, February 1899). The Ilkeston boring has been made in the immediate neighbourhood of the Bramcote and Stapleford sandstone which contains the large proportion of barium sulphate. Since the barium chloride is found to the extent of 40·7 parts per 100,000 in the water from this boring, and seems to be a normal constituent of the water, it would appear that soluble barium salts are present in the district, and may therefore have given rise to the deposition of the barium sulphate in the original sand beds. The crystallisation of the sulphate around the sand grains would then cause it to act as a compact, insoluble cementing material.

Since the publication of his original paper on the occurrence of barium sulphate in the Bramcote sandstone, the author has continued his examination of samples of sandstone from the basement of the pebble beds of the Bunter, with the object of ascertaining whether the occurrence of barium, either as sulphate or in other forms of combination, was characteristic of the sandstones of that geological period. He had thus far failed to find any similar rock to that at Bramcote, and it therefore seems probable that the occurrence of barium sulphate, although it extends over a very extensive area at Bramcote and Stapleford, must be looked upon as being due to purely local causes. Such local causes, however, appear to have occurred in certain other districts, since Messrs. J. Lomas and C. C. Moore stated to the Liverpool Geological Society, on February 8, 1898, that large proportions of crystallised barium sulphate occurred in triassic sandstones at Prenton and Bidston. In different specimens of the sandstone the percentage of the sulphate varied from 12·4 to 33·8 per cent. It was described as being colourless and highly crystalline, and adherent to the sand grains in such a way as to show that it has been deposited *in situ* subsequently to the sand grains. Mr. Lomas stated that the occurrence of barytes in the trias was fairly common, and mentioned the following localities, in which its presence is well known: Beeston, Alderley Edge, Oxton, Storeton, and Peakstones Rock, Alton.

“Some Experiments bearing on the Theory of Voltaic Action.” By J. Brown. Communicated by Prof. Everett, F.R.S.

The experiments were intended to test the theory which attributes the difference of potential observed near metals in contact to the chemical action of films condensed on their surfaces, from the atmosphere or gas in which they are immersed, by investigating the effect of removing the chemically active matters from this atmosphere. On the hypotheses the difference of potential should be reduced thereby to zero, and regain a value near its original, when air was re-admitted. Previous experimenters had not found this to be the case, but it was hoped that elaborate precautions in details might give more definite results than had been hitherto obtained.

A copper-zinc volta condenser with plates 101 mm. by 47 mm. was sealed up in a glass tube in an atmosphere of nitrogen exhausted to a few millimetres pressure, together with metallic potassium and sodium, to absorb any oxygen or other chemically active matters that might have remained in the nitrogen. The zinc plate of the condenser was carried on a glass support hinged to a prolongation of the copper plate, so that on tilting the tube the plates could be separated, in order to measure the difference of potential by a well-known zero method. Platinum wires sealed into the tube made connections for this purpose. Three experiments were made.

In No. 1, lasting six months, the difference of potential fell gradually from 0·74 volt at starting to 0·33 volt. On admitting air it rose to 0·48 volt.

In No. 2, lasting eighteen months, the fall was from 0·7 volt to 0·52 volt, and on opening the tube this value did not sensibly change. The fall was therefore probably due to the well-known effect of tarnishing of the zinc surface.