SOCIETIES AND ACADEMIES

London

Geological Society, March 8.—Pro. P. Martin Duncan, F.R.S., president, in the chair.—W. J. Chetwood Crawley, Walter Keeping, Joseph Thompson, and William Walker, were elected Fellows of the Society. The following communications were read :—1. On the influence of various substances in accelerating the precipitation of clay suspended in water, by Mr. Wm. Ramsay Principal Assistant in Glasgow University Laboratory. Communicated by Prof. Ramsay, F.R.S., V.P.G.S. The author referring to the fact that clay when suspended in water in excessively minute particles, settles more rapidly when the water contains salts in solution, noticed the opinions expressed by previous writers on the subject, and gave the results of experiments made by him, from which it would appear that the rapidity of precipitation is proportionate to the amount of heat absorbed by the salts in process of solution. By another series of experiments he found that the fluidity of the respective solutions had apparently no influence on the rapidity of deposition of the clay. He also found that clay is deposited less quickly in acid solutions than in solutions of salts, and more rapidly in a solution of caustic soda than in one of caustic potash. In solutions of common salt of different strengths he found that clay settled in the inverse order of their specific gravities. From all these results the author is inclined to attribute the varying rapidity of the settling of clay suspended in saline solutions to the varying absorption of heat by the solutions. When water containing suspended clay was heated, the rapidity of the settling of the clay was proportionate to the heat of the water. The author suggests that the increased rapidity of settlement may be due to the greater amplitude of vibration of the molecules of water when heated ; the vibrations being performed in equal times, particles descending at right angles to the plane of vibration will experience less resistance from the molecules of water. A note by Prof. Ramsay, briefly indicating some of the geological bearings of these results, was appended to the paper.—2. On some Fossiliferous Cambrian Shales near Carnarvon. By Mr. J. E. Marr. Communicated by Prof. T. McKenny Hughes, F.G.S. With an Appendix, by Mr. Henry Hicks. Tl e shales described by the author extend from about three miles S.W. of Carnarvon to Bangor, running nearly parallel to the Menai Straits. They are faulted against Lower Cambrian to the east, and disappear against a dyke on the west. The shales vary from greyish black to bluish black in colour, and are generally sandy and micaceous, but in places chiefly clayey. Fossils were obtained from three places on the banks of the Seiont, namely, near Point Seiont (where the beds are concretionary in structure), along the old tramway from Carnarvon to Wanttle, and near Peblig Bridge. The first-named locality is richest in fossils ; and here there is a greenstone dyke, parallel to the bedding of the rock, and altering the shales for a distance of about four yards from the edge of the dyke. The fossils seem to indicate that the deposit belongs to the upper part of the Arenig group. Mr. Hicks pointed out that the fauna clearly showed that these beds belong to the Arieng group, many of the species being identical with those found in the upper part of that group at St. David's Shelve, and in Cumberland. The new species found by Mr. Marr are a *Caryocaris* (*C. Marrii*) and an *Æglina* (*A. Hughesii*). The other fossils were *Didymograptus indentus*, *D. bifidus*, *D. Murchisoni*, and the var. *furcillatus*. Species of *Barrandea*, *Trinucleus*, *Lingula*, *Obolella*, *Discina*, &c., and *Orthoceras caeresiense*. The rock in its general character is extremely like that at the same horizon in the succession at St. David's Shelve, and in Cumberland, and indicates, therefore, the prevalence of similar physical conditions when deposited. The rock is such as would be formed over an even sea-bottom at some considerable distance from land and in moderate deep water. Mr. Hicks looked upon this discovery as of considerable importance, since it clearly proved the position of beds hitherto imperfectly known, and moreover shows that similar conditions prevailed over extensive areas at the time these beds were deposited. It also furnished further evidence in support of Mr. Hicks's opinion that no break occurs anywhere in the Welsh area between the Cambrian and Lower Silurian rocks. —3. On the occurrence of the Rhætic Beds near Leicester. By Mr. W. J. Harrison, Curator of the Town Museum, Leicester. The sections described by the author are shown in brick-pits in the Spinney Hills, forming the eastern boundary of the town of Leicester, and in the Crown Hill on the eastern side of a valley excavated by the Willow Brook. In the latter locality they are capped by Lower Lias. They have a slight dip to the south-east. The brick-pits show a thickness of about 30 feet of Rhætic beds above the Triassic red marl, to which their stratification is parallel. The lowest bed is a light-coloured sandy marl about 17 feet thick, traversed by three or four courses of harder, whiter stone, and containing crystals of selenite, pseudomorphs of salt, and numerous small fish-scales. A single insect wing was obtained from it. This bed extends across the valley of the Willow Brook, and forms the base of Crown Hill. Above it comes the Bone-bed, from 2 to 3 inches thick, containing numerous small teeth, bones, and scales of fishes and Saurians, including large vertebræ of *Ichthyosaurus*, ribs probably of *Plesiosaurus*, and some bones of Labyrinthodont character. Two species of *Axinus* also occur. The Bone-bed is followed by about 2½ feet of coarse black shales, overlaid by a very thin band of hard reddish sandstone, with casts of *Axinus*, and this by about 2 feet of finely laminated black shales containing *Cardium rhæticum*, *Avicula contorta*, and a Starfish (*Ophiolepis Damesii*). Above these come about 5 feet of shales with sandy partings, the lower foot rather dark and containing *Avicula contorta*, *Cardium rhæticum*, *Ostrea liassica*, and a new *Pholidophorus ;* the remainder light-coloured, but with the same shells. The topmost bed in the section is a band of nodular limestone 6 inches thick. The same sequence is observed in Crown Hill. There are indications of the existence of a second nodular limestone and of beds of light-coloured clay and sand, but obscured by drift, in which, however, blocks of limestone occur with *Monotis decussata* and *Anoplophora musculoides*. The author indicates other localities where traces of the Rhætic beds are to be seen, and states that wherever the true junction of the Trias and Lias is exposed, the Rhætics appear to be invariably present. The paper also included some particulars with regard to borings in the Trias near Leicester.—4. Hæmatite in the Silurians. By Mr. J. D. Kendall. The author referred to a former paper in which he showed that direction of the hæmatite deposits in the Carboniferous Limestone of Cumberland and Lancashire is parallel to that of the meridional divisional planes, or nearly north and south ; while the deposits in the Silurians are in two directions, some parallel to one set of divisional planes and some to the other. In the present paper he describes a deposit of hæmatite at Water Blean, in the parish of Millom in Cumberland, in Coniston Limestone, which appears to be altogether unlike those referred to in his former paper. The Silurians here are all conformable, with a strike about 65° N.E. and S.W. and a dip of about 80° to N.W., but their order is inverted. The hæmatite occurs in the Coniston Limestone in the form of short veins, varying in width from a few inches to 9 feet, running in the direction of the strike, and having the same dip as the limestone, their deposition having taken place along the bed-joints of the rock. The author accounts for this difference in the deposits by the fact that in the Coniston Limestone at Water Blean the bed-joints are much more persistent than the divisional planes, which are very irregular and not at all so strong and open as the bed-joints.

Zoological Society, March 21.—Dr. E. Hamilton, vice-president, in the chair.—Mr. Sclater exhibited and made remarks on a series of skins of the parrots of the Fiji Islands, obtained by Mr. E. L. Layard belonging to the collection of Lord Walden, and called special attention to a new species of the genus *Pyrrhulopsis* of Reichenbach from the Island of Taviuni, which Mr. Layard had proposed to call *P. taviunensis*.—Mr. A. G. Butler read a paper containing descriptions of some new Lepidoptera from the collection of Lieut. Howland Roberts.—A communication was read from Mr. Andrew Anderson, containing corrections of and additions to a former paper of his on the Raptorial Birds of North-Western India.—Mr. Howard Saunders read a paper on the *Stercorariinæ* or Skua Gulls, in which he revised and corrected the synonymy of several species, and traced their respective ranges so far as they were known. He considered that *Stercorarius chilensis* (Bp.), although more nearly allied to the Northern form *S. catarrhactes* than to *S. antarcticus*, was perfectly distinguishable from either by its constant rufous coloration of the underparts and axillaries ; its range as at present known being restricted to the West coast of South America. The range of *Sterc. pomatorhinus* was shown to extend from S. lat. 82° N. to about 30° S., and that of Richardson's Skua, to which he restored the original, but lately disused name of *Stercorarius crepidatus* reached from 82° N. to more than 40° S., on the coast of New Zealand : *S. spinicauda* (Hardy), from the African coast, being regarded as merely this bird in winter dress.

Anthropological Institute, March 14.—Col. A. Lane Fox, president, in the chair.—Mr. Stanbridge, of Daylesford, Victoria, exhibited and presented a collection of stone implements from Australia. It consisted of some axe heads, a mounted stone spear head, some wallongs, or grinding stones, and a Yowiwi, or large flat stone, on which the Nardoo seed is ground. A large stone implement, supposed to be for digging, was also lent. The president considered this last was an unfinished tool which would have been reduced in size if finished; but it had been used apparently in its present state, one of the ends being much rubbed.—Capt. Melford Campbell, President of Nevis, exhibited some stone implements. One of these, a knife or dagger, from Honduras, is 10½ inches long, and made of a thick flake of buff coloured chert of a fine amber hue; similar but smaller specimens from the same place are already in the Christy collection. Three polished Celts, from Turk's and Cairo Islands were shown by Capt. Campbell.—Mr. H. H. Howorth read a paper on the Samatæ, which was followed by a discussion.—Mr. H. Dillon, the Director, read a translation by Capt. R. F. Burton, of two letters from H. B. M.'s Vice-Consul at Lissa, H. Topich, on some human remains recently found in the Island of Pelagosa.

Meteorological Society, March 15.—Mr. H. S. Eaton, M.A., president, in the chair.—R. Trout Hawley Bartley, M.D., John Wuford Budd, Lieutenant-Colonel George E. Bulger, W. Brown Clegram, M. Inst. C.E., J. Sanford Dyason, John Eunson, Assoc. Inst. C.E., Thomas W. Grindle, Assoc. Inst. C.E., Major F. Bonnycastle Gritton, Junius Hardwicke, F.R.C.S., Alfred O. Walker, and the Rev. E. William Watts, M.A., were duly elected Fellows of the Society.—The following papers were then read:—On the Rhé-electromètre of Marianoni, by Robert James Mann, F.R.A.S.—On the variation of errors in hydrometers, by R. Strachan.—On the deduction of mean results from meteorological observations, by L. F. Käntz (translated from the *Repertorium für Meteorologie*, by J. S. Harding).—Summary of observations made at Stanley, Falkland Islands, during 1875, by F. E. Cobb.—Contributions to the Meteorology of West Australia, by R. H. Scott, F.R.S.

Victoria (Philosophical) Institute, March 20.—A paper was read upon the flint implements found in Brixham Cavern, in which the author, Mr. Whitley, alluded to the statements of Mr. Pengelly, whose active superintendence of the exploration of the cavern under the auspices of the Royal and Geological Societies was deserving of the warmest thanks of all geologists. Mr. Whitley complained that the Report of the Royal Society and the specimens had been allowed to lie by for fifteen years before being published and rendered accessible to the public. The consequence was, that for a long time theories having no foundation in fact had been promulgated as to these specimens, and several statements in regard to Brixham Cavern and its contents had been made in well-known geological works, which did not accord either with the recent Report of the Royal Society or Mr. Pengelly's subsequent one.

Institution of Civil Engineers, March 21.—Mr. Geo. Robert Stephenson, president, in the chair.—The paper read was descriptive of the hydraulic canal lift at Anderton, on the River Weaver, by Mr. Sidengham Duer, B.Sc., Assoc. Inst. C.E.

PARIS

Academy of Sciences, March 20.—Vice-Admiral Paris in the chair.—The following papers were read:—On the first method of Jacobi for integration of equations with partial derivatives of the first order, by M. Bertrand.—On the inferior limit which should be set to admission of steam into a steam-engine, by M. Resal.—On the storms called *foehn* in Switzerland, by M. Faye. These occur in certain parts, when a cyclone from the south-west meets the Alps; instead of showers and fall of temperature, the wind blows hotly and dryly; there is also a marked barometric depression. Around the special region the tempest produces its ordinary effects. The facts are explained by the gyratory descent of a mass of air, deprived by the mountains of the cirrhus which whirlwinds formed in the upper regions usually carry downwards. Now it is objected against M. Faye's theory of storms that a descending current should give a barometric maximum; but here, with manifest descent, there is a minimum. The barometric depression (both in the *foehn* and the ordinary storm) is a simple consequence of the gyratory movement, not the index of a strong suction excited from above on the inferior layers.—Note on an apparatus for determining the intensity and the law of development of pressures in the bore of guns with reference to the time, by M. Morin. The gaseous pressure is caused to press out a metallic jet of tin, the length of which increases with the pressure with sufficient regularity (each millimetre corresponds to about 237 kilogrammes of pressure per square centimetre). A piston is in contact with the tin cylinder, and a pencil at the end of its rod gives a tracing on a chronometric apparatus.—Determinations of nitrates and of ammonia in the water of the Seine, made on 18th March, 1876, above the bridge of Austerlitz, by M. Boussingault.—On the volume of the Seine, and the flood of 17th March, 1876, by M. Belgrand. This flood is the third highest in this century (the highest was in 1802). The Seine, in its greatest flood, gives fifty-two times more water than at low water.—On the spectrum of calcium, by Mr. Lockyer.—Actinometric measurements on the summit of Mont Blanc, by M. Violle (he will shortly give his results).—On the next hatching of winter eggs of Phylloxera; note by M. Balbiani.—Physiological action of *Amanita muscaria*, general phenomena of the poisoning; effects on organs of circulation and respiration, and disorders of calorification, by M. Alison, *inter alia*, the lowering of temperature by this substance, and the restoration to normal temperature with atropine are important.—On the means employed for education and instruction of deaf mutes, by the method of articulation, by M. Magnat.—Impossibility of the equation $x^7 + y^7 + z^7 = 0$, by M. Pepin.—On the behaviour of chronometers, by M. Rouyaux.—Geometrical solution of the problem of determining the most probable place of a ship by means of any number of straight lines of altitude greater than 2, by M. Bertot.—Influence of temperature on magnetisation, by M. Gaugain. The new facts given are briefly these:—When a steel bar in contact with a magnetic pole is gradually heated to a blue tint, the magnetism first increases, reaches a maximum, then decreases. The bar being allowed to cool while in contact, the total magnetism increases all the time, so that, when the bar has cooled to the surrounding temperature, it has much greater magnetism than before heating. The total magnetism of the bar, brought back to ordinary temperature, is greater the more the bar has been heated (at least under the temperature giving a blue tint). After breaking contact of the cooled bar for a few seconds it loses a part, but not all, of the increase of magnetism that resulted from heating.—On a rock intercalated in the gneiss of the Mantiqueira, Brazil, by M. Gorceix.—Reply to two *critiques* by M. Faye, by M. Hildebrandsson. He calls attention to three facts. It is rare that the form of isobars is circular. Synoptic charts show that the air moves spirally towards the centre of a minimum. The anterior and the posterior parts of a squall are quite different, so that after passing the centre you have a sudden change in the weather; and this is explained if the motion of the air have an upward component, for then other air unceasingly flows in from different regions. The facts cited are in opposition to M. Faye's theory.

CONTENTS