

## SOCIETIES AND ACADEMIES

LONDON

**Geological Society, Jan. 21.**—Prof. P. Martin Duncan, F.R.S., vice-president, in the chair.—“The secondary rocks of Scotland (second paper). On the ancient volcanoes of the Highlands and their relations to the Mesozoic strata,” by J. W. Judd, F.G.S. That the rocks forming the great plateaux of the Hebrides and the north of Ireland are really the vestiges of innumerable lava-streams, is a fact which has long been recognised by geologists. That these lavas were of *subaerial* and not *subaqueous* origin is proved by the absence of all contemporaneous interbedded sedimentary rocks, by the evidently terrestrial origin of the surfaces on which they lie, and by the intercalation among them of old soils, forests, mud-streams, river-gravels, lake deposits, and masses of unstratified tuffs and ashes. From the analogy of existing volcanic districts, we can scarcely doubt that these great accumulations of igneous products, which must originally have covered many thousands of square miles, and which still often exhibit a thickness of 2,000 ft., were ejected from great volcanic mountains; and a careful study of the district fully confirms this conclusion, enabling us, indeed, to determine the sites of these old volcanoes, to estimate their dimensions, to investigate their internal structure, and to trace the history of their formation. The following is Mr. Judd's conclusion on the subject of his paper:—It appears that during the Newer Palæozoic and the Tertiary periods, the north-western parts of the British archipelago were the scene of displays of volcanic activity upon the grandest scale. During either of these, the eruption of felspathic lavas, &c., preceded, as a whole, that of the basaltic; and in both the volcanic action was brought to a close by the formation of “puyis.” The range of Newer-Palæozoic volcanoes arose along a line striking N.E. and S.W.; that of the Tertiary volcanoes along one striking from N. to S.; and each appears to have been connected with a great system of subterranean disturbance. It is an interesting circumstance that the epochs of maximum volcanic activity, the Old Red sandstone and the Miocene, appear to have been coincident with those which, as shown by Prof. Ramsay, were characterised by the greatest extent of continental land in the area. The Secondary strata were deposited in the interval between the two epochs of volcanic activity, and the features which they present have been largely influenced by this circumstance. Apart from this consideration, however, the volcanic rocks of the Highlands are of the highest interest to the geologist, both from their enabling him to decipher to so great an extent the “geological records” of the district, and from the light which they throw upon some of the obscurest problems of physical geology.—Remarks on fossils from Oberburg, Styria, by A. W. Waters, F.G.S. The author noticed the limited occurrence of Eocene deposits in Styria, and referred briefly to the researches of Prof. Reuss and Prof. Stur upon them. He then indicated certain species of fossils which he had detected in these beds, adding about nine species to Stur's list.

**Anthropological Institute, Jan. 27.**—Prof. Busk, F.R.S., president, in the chair.—Anniversary Meeting.—Before proceeding to read his address, the president referred to the financial condition of the Institute, which, although it showed that the receipts were adequate for the necessary expenditure on the present economical principles of management, would not admit either of paying off any more of the debt or of increasing the scope and usefulness of the Institute. Until the unfortunate and utterly indefensible secession of members early in 1873, on a purely personal question, the Institute, since its formation, had paid off the combined debts of the two old societies at the rate of 100*l.* a year. He appealed to the loyalty of the members now forming the Institute to make a united effort finally to extinguish the debt of 800*l.* A year's income would do it, and it was suggested that if each member contributed one year's subscription, that great result would be attained and the Institute would certainly before long occupy a high position amongst the scientific bodies of the kingdom. As an encouragement to the body of members and as an earnest of the sincerity and vigour of his colleagues in management, the president had much pleasure in announcing that nearly 250*l.* had been promised by members present at a council-meeting held that day, provided the sum of 500*l.* be contributed by other members of the Institute.—The president then delivered the annual address, in which he viewed the work done during 1873 by English and foreign

anthropologists. Amongst a large number of topics he adverted at considerable length to the important contributions to craniometry, by Dr. H. von Jhering and Dr. Paul Broca, criticising the respective methods employed by those distinguished anthropologists; and concluded that part of his address with the observation that the study of craniology is almost futile when applied to highly civilised, and consequently much mixed peoples, and that its results are the more certain in proportion to the purity of race. That purity at the present time was rapidly disappearing, and with it the surest data for the determination of the problems involved in the antiquity and physical origin of man.—The following was the list of officers and council elected to serve for 1874:—President—Prof. Geo. Busk, F.R.S. Vice-presidents—John Evans, F.R.S.; Col. A. Lane Fox, F.S.A.; A. W. Franks, M.A.; Francis Galton, F.R.S.; Prof. Huxley, F.R.S.; Sir John Lubbock, Bart., F.R.S. Director—E. W. Brabrook, F.S.A.—Treasurer—Rev. Dunbar I. Heath, M.A. Council—Dr. John Beddoe, F.R.S.; W. Blackmore; H. G. Bohn, F.R.G.S.; Dr. A. Campbell; Hyde Clarke; Dr. J. Bernard Davis, F.R.S.; W. Boyd Dawkins, F.R.S.; Robert Dunn, F.R.C.S.; David Forbes, F.R.S.; Sir Duncan Gibb, Bart, M.D.; George Harris, F.S.A.; J. Park Harrison, M.A. J. F. McLennan; C. R. Markham, C.B. F.R.S.; Frederic Ouvry, F.S.A.; F. G. H. Price, F.R.G.S.; J. E. Price, F.S.A.; F. W. Rudler, F.G.S.; C. R. Des Ruffières, F.R.S.L.; E. Burnet Tylor, F.R.S.

EDINBURGH

**Royal Physical Society, Jan. 28.**—Mr. Scot Skirving, president, in the chair.—The following communications were read: Note on the Crushed Boulders from the Old Red Conglomerate in Kincardineshire, by James C. Howden, M.D.,—On Crushed Boulders from Arbroath, and other localities, by Mr. Charles W. Peach.—Report of the Dredging Committee for 1873, by James Middleton, M.B., convener. The meeting of the committee had been held conjointly with the Naturalists' Field Club. In all about 133 species of animals had been obtained, including two new to the Firth of Forth.—Note on the Suspension of Clay in Water, by Mr. William Durham. This research was undertaken in continuance of those recorded in the papers on the same subject read at the last meeting. As the general result of Mr. Durham's elaborate and careful series of experiments, it was found that clay held in suspension by water sinks more quickly if the water is slightly acidulated, and more slowly if a slight amount of an alkali is added, but that the conditions are reversed if a large amount of either substance is mixed with the water.

MANCHESTER

**Geological Society, Jan. 27.**—Mr. J. Dickenson Hill in the chair.—Mr. J. Aitken exhibited some new fossil fishes from the millstone grit, Yorkshire, and read a paper descriptive of the bed whence they were obtained. He said that evidences of fossils had been brought to the surface during the excavations connected with the scheme for taking water from Widdop colliery to the borough of Halifax by a tunnel cut through Wadsworth Moor, about two miles north of Hebdenbridge. After an examination, by no means exhaustive, there had been discovered seven specimens of *Goniatites*, three of *Nautili*, two of *Orthoceratites*, two of *Avicula pecten*, two of *Posodonia*, one of *Gastropod*, one of *Milania*, fish remains, &c. The discovery of the most remarkable character was a new species of *Acrolepis* presenting peculiar characteristics. The situation in which these remains occurred was near but somewhat above the middle of the shells which usually divided the third floors from the fourth or undermost grit.

GÖTTINGEN

**Royal Academy of Sciences, Nov. 1, 1873.**—M. Schering communicated a paper on the Hamilton-Jacobi theory for forces whose measurement depends on the motion of bodies.—MM. Wagner, Philippi, and Tollens described some researches on the Allyl group, made with the view of establishing the constitution of allyl alcohol, and of some of its compounds, especially acrylic acid. They find new evidence, in opposition to Wislicenus, that acrylic acid, as well as acetic acid, propionic acid, and all other organic acids, contains the group CO<sub>2</sub>H, and may therefore be classed with them.—MM. von Grote and Tollens described an acid obtained from cane sugar by means of dilute sulphuric acid; and M. Tollens gave the first results of an investigation as to combinations of starch with alkali.

Nov. 20.—Prof. L uroth read a paper on reckoning by projections; and Prof. Hattendorff made some observations on Sturm's theorem.

Dec. 3.—M. Enneper communicated a paper on the general theory of surfaces.

Dec. 10.—The Society celebrated its 121st anniversary. The prizes for competition in the next three years were announced. In the physical section the Society invites experiments on the artificial production of some crystallised minerals, as stephanite, pyrrargyrite, grey copper ore, galena, fluor spar; in order to solution of the question how crystallised sulphur and fluor-compounds have arisen in the natural state. In the mathematical section, the Society desires an investigation of current-work, *i.e.* the work done by the electro-motive forces in their action on the current electricity, especially in its relation to the heat produced from the current, and the *vis viva* produced from it immediately in the current electricity, or mediately, in other movable particles in the conductor. Papers on these subjects must be sent before Sept. 1875, in the former case, and Sept. 1876, in the latter. The prizes offered are fifty ducats each.—Prof. Ewald communicated an interesting paper on the so-called rhetorical ornaments of Oriental speech (a subject suggested, apparently, by the late visit of the "king of kings").—M. Riecke presented a note on the function of leaf-teeth, and the morphological value of some leaf-nectaries. In the bud, the teeth often prevent the hermetical closure of the two folded halves of the leaf; which is perhaps important, that the bud may not suffer from the want of gas. A more evident function consists in the separation of resin or mucilage. *Prunus avium* is taken as a good example; and two other types of structure are also described. The teeth of leaves of *Prunus avium* are closely allied, morphologically, to numerous nectar-secreting organs in these and other kinds of leaf.

Dec. 17.—M. Bjerkn es read a paper giving a generalisation of the problem of motions produced in a still inelastic fluid by the motion of an ellipsoid.—M. W ohler presented a list of the meteorites in the University collection at G ttingen.

#### VIENNA

Imperial Academy of Sciences, Dec. 4, 1873.—Prof. Mach stated that he had made experiments, during the summer, on the time required for rotation of the plane of polarisation by a current—a flint glass disc being rotated between the magnetic poles; but similar experiments by Villari had been described in *Pogg. Ann.* (No. 7, 1873), and the results were almost identical. Villari used a double plate; and Prof. Mach points out another very simple method for such researches, *viz.*, the spectral observation of a sounding glass rod placed between the magnetic poles.—A paper by Dr. Dvorak described some experiments on the velocity of sound in gas-mixtures. If a mixture is made of two different gases, with densities  $d$  and  $d'$  respectively, and both with an expansive force 1, the velocity of sound  $V$  in the

mixture =  $\sqrt{\frac{2}{d+d'}}$  The author's results show close agree-

ment with the theory. Thus for mixtures of carbonic acid and hydrogen, air and hydrogen, ordinary gas and CO., respectively, the observed and calculated numbers for the half wave-length of a given tone were these: 71.5, 71.0; 88, 89.0; 64, 63.3. The author remarks that for a simple gas, as well as for a mixture of gases, the gas theory implies not one velocity, but a graduated series of velocities, of sound; and perhaps the prolongation in sound of a cannon shot heard at a distance may be thus explained.—Dr. Exner communicated a determination of the temperature at which water has a maximum of density. He improved on Rumford's method by using thermo-elements instead of a mercury thermometer. The value obtained was 3.945°.

#### PARIS

Academy of Sciences, Jan. 26.—M. Bertrand in the chair.—The following papers were read: On the various reactions of the compounds of oxygen and nitrogen, by M. Berthelot.—On the production of yeast in a mineral solution containing sugar, by M. Pasteur. The author described the growth of yeast in a solution of inorganic substances such as enter into the composition of its ash added to a solution of sugar. M. Tr eluc replied at some length to certain of M. Pasteur's remarks.—On the liquefaction and solidification of acetylene by the silent electric discharge, by MM. P. and A. Thenard. The author found that this gas condensed at the rate of four or five cubic centimetres a

minute into a solid horny body isomeric with acetylene; by varying the conditions of experiment a liquid isomer was also obtained.—Experimental researches on Newton's rings, by M. P. Desains.—Direct demonstration of the equation

$$\int \frac{dQ}{T} = 0 \text{ for every closed and reversible cycle, by M. A.}$$

Ledieu. This paper formed a sequel to the author's other papers on thermo-dynamics, lately published.—Note on Poncelet's teaching of applied mechanics, by General Morin.—A note from Prof. Nordenski old was read; he has detected iron, nickel and cobalt in the carbonaceous dust found in 1870 on the Greenland snow; traces of phosphorus were also found.—Instructions for M. Do met-Adanson's travel in Tunis, by M. Cosson. The instructions are issued to M. Adanson, who is about to undertake a botanical exploration of Tunis.—On magnetism, by M. J. M. Gaugain.—New researches on the rejoining end to end of the fibres of sensory with the fibres of motor-nerves, by M. A. Vulpian.—Organogenesis compared with androgenesis in its relation to natural affinities, by Ad. Chatin. This portion of the author's paper deals with the *polygonoid* and *cactoid* plants.—Researches on the silicified plants of Autun; study of the genus *Myelopteris*, by M. B. Renault.—On the presence of a considerable proportion of potassic nitrate in two varieties of *Amaranthus*, by M. A. Boutin. The author found that *A. atropurpureus* contained 22.7 and *A. ruber* 16.0 per cent. of the weight of the dried plant; he suggested a possible future cultivation of the plant on this account.—On the theory of the flight of birds, by MM. H. and L. Planavergne.—On a statistical chart showing the distribution of the population of Paris, by M. Vauthier.—On the geometrical properties of rational fractions, by M. F. Lucas.—On the determination of the pluckerian numbers of envelopes, by M. H. G. Zeuthen.—On the theory of numerical equations, by M. Laguerre.—On the breaking of magnetised needles, by M. Bouty. The author found that if the steel was very brittle and broke like glass the two portions are magnets of the same magnetic moment, but not so if the steel has to be bent backwards and forwards before it breaks.—On certain peculiarities in the efflorescence of the two hydrates of sodic sulphate, by M. D. Gernez.—Researches on the reaction of argentic chloride on phosphoric di-iodide, by M. Arm. Gautier.—On the isomerism of terebentene and terebene, from a physical point of view, by M. J. Ribau.—On the alterations of the soft matter (of the brain) accompanying the tearing and cutting back of the sciatic nerve in the rabbit, by M. G. Hayem.—On the pluvial *r egime* of the torrid zones in the Indian and Pacific Ocean basins, by M. V. Raulin.—Note on Professor Tyndall's experiments on the acoustic transparency of air, by M. W. de Fonvielle.—On the production of crystals of calcic oxalate and ammoniac-magnesian phosphate, by M. E. Monier. During the meeting, the Academy elected M. P. Gervais as successor to the late M. Coste, of the section of Anatomy and Zoology.

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