Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen, November, 1879, to August, 1880.—On general theta-functions, by M. Noether.—Preparations of human ear-bones for lecture purposes, by L. Gerlach.—On the occurrence of two ampullæ in the outer (horizontal) arch of the bony labyrinth, by the same.—On the excretion of hippuric and benzoic acid during fever, by T. Weyl and B. v. Anrep.—On section-systems of algebraic curves, by J. Bacharach.—On the work-product of muscles, by J. Rosenthal.—On dichroïtic fluorescence on platino-cyanides of magnesium; experimental proof of the perpendicularity of the light-vibrations to the plane of polarisation, by E. Lommel.—On the phenomena, in polarised light, of a plate of platinocyanide of magnesium cut at right angles to the optic axis, by the same.—On an artificial lung-cavity preparation, by F. Penzoldt.—On gluten, by T. Weyl and H. Bischoff.—On carbonic oxide hæmoglobin, by T. Weyl and B. v. Anrep.—On vagus-stimulation, by J. Rosenthal.—On unipolar nerve-stimulation and false nerve-stimulation by derived currents, by the same.—On fluorescence, by E. Lommel.—On the invariant representation of algebraic functions, by M. Noether.—On the parasitism of *Elaphomyces granulatus*, by M. Reess.—On poisoning with morels, by E. Bostroem.—On adventive formations, by A. Hansen.—Does the ground-air contain ammonia? by L. Rinck.—On oxygen determination, by F. Zeitler.—Contributions to pathological anatomy, by E. Bostroem.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, May 25.—R. Etheridge, F.R.S., president, in the chair.—Rev. Tom Bullock Hardern, M.A., LL.M., was elected a Fellow of the Society.—The following communications were read:—On the discovery of some remains of plants at the base of the Denbighshire grits, near Corwen, North Wales, by Henry Hicks, M.D., F.G.S.; with an appendix by R. Etheridge, F.R.S., Pres. Geol. Soc. Traces of these fossils were first observed in 1875 by the author in Pen-y-glog quarry, about two miles east of Corwen. Further research has resulted in the discovery of more satisfactory specimens, which have been examined by Messrs. Carruthers, Etheridge, and E. T. Newton. Among them are spherical bodies resembling the *Pachytheca* of Sir J. D. Hooker, from the bone-bed of the Ludlow series, supposed to be Lycopodiaceous spore-cases; also numerous minute bodies stated by Mr. Carruthers to be united in threes, and to agree with the forms of the microspores of Lycopodiaceæ, both recent and fossil; and some fragments, which may belong to these plants, and others, probably belonging to plants described by Dr. Dawson from the Devonian of Canada under the name of *Psilophyton*. The above testify to the existence of a very rich land-flora at the time. Mixed up with these however are numerous carbonaceous fragments of a plant described also by Dr. Dawson from the Devonian of Canada, which he referred to the Coniferæ, but which is, according to Mr. Carruthers, an anomalous form of Alga. The former called it *Prototaxites;* the latter renamed it *Nematophycus*. Numerous microscopical sections, showing the beautiful structure of this interesting plant from the specimens found at Pen y-glog, have been examined by Mr. Etheridge and Mr. Newton, and their conclusions agree with those of Mr. Carruthers. The evidence seems to show that at this mid-Silurian period the immediate area where the plants are now discovered must have been under water, and that the mixture of marine and dry-land plants took place in consequence of floods on rapid marine denudation. The author indicated that the land-areas must have been to the south and west, chiefly islands, surrounded by a moderately deep sea, in which Graptolites occurred in abundance. The position of these beds may be stated to be about 2000 feet below the true Wenlock series, and about the horizon of the Upper Llandovery rocks.—Notes on a mammalian jaw from the Purbeck beds at Swanage, Dorset, by Edgar Willett. Communicated by the President.

Physical Society, May 28.—Prof. Fuller, vice-president, in the chair.—Mr. C. Woodward exhibited apparatus for illustrating wave-motions to a class. This consisted of a number of glass panes of equal size mounted on stands so that they could be ranged in a line or in rank and file. Patches of blue paper were attached to them to represent the moving particle of the wave, the positions being determined by a diagrammatic card which fitted each pane. A machine for showing Fresnel's conception of polarised light consisted of two axles fitted with a number of cranks which supported a roof of rafters bearing at their ridges a number of beads to guide the eye in tracing the wave-motion. By turning the axles the cranks shifted the frame of rafters, and the beads displayed the wave-motion, which was vertical, elliptical, or circular according to the adjustment.—Prof. G. Forbes explained the experiments made by him and Dr. Young to determine the velocity of light. The method employed was that of Fizeau, but instead of having one distant reflector and observing the total eclipse of the reflected ray by a tooth of the revolving wheel, two reflectors, one a quarter of a mile behind the other, were used, and two rays, which were observed when of equal brightness. This method was found more accurate than Fizeau's own plan, and gave curves of brightness. The speeds of the toothed wheel were adjusted until the two rays appeared of equal brightness. The general result was that the velocity of the light of an electric lamp is 187,200 miles per second. Cornu found the light of a petroleum lamp to be 186,700 miles per second, and Michaelson that of the sun to be 186,500 miles per second. The higher number of Prof. Forbes is probably due to the bluer light of electricity, for further experiments made with coloured lights and the spectrum seemed to prove that blue light travels probably over 1 per cent. faster than red light. The experiments were made at Wemyss Bay, in Scotland. Mr. Spottiswoode, P.R.S., said he had followed Prof. Forbes with interest, and these results appeared to modify our ideas of the luminiferous ether. Lord Rayleigh inquired why it was that Jupiter's satellites showed no difference in tint in emerging from eclipse if red and blue rays travelled with unequal velocities? Prof. Forbes believed it due to the gradual character of the emergence of the satellites from behind their primary. According to the new theory variable stars should however seem bluish with an increase of their light. Prof. G. C. Foster pointed out that dispersion of the light in the air would rather have had the effect of retarding the blue rays. Mr. Hall of Baltimore, U.S., then exhibited the experiment in which a current of electricity flowing longitudinally along a thin foil of metal is caused to yield a transverse or lateral current by inserting the foil between the poles of a magnet. The lateral current is observed on a sensitive galvanometer, and care is taken in the first place to find points of connection with the foil, which yield no current before the magnet is applied. The results were that if iron is called + the series is iron +, silver −, gold −, platinum −, tin −. Curiously, nickel, though a magnetic metal like iron, is −; but on inquiry by Prof. Chandler Roberts it proved that the nickel employed was perhaps impure. Cobalt ranges between iron and silver, and is +, like iron. Prof. Perry suggested that the displacement and huddling of the lines of flow of the current by the magnet might cause the current; but Mr. Hall said that an experiment had been tried to test that, and went to prove that it was not due to crowding of these lines.—The Secretary read a paper by Prof. J. H. Poynting on the change of bodies from the solid to the liquid states. There are two types of change exemplified by ice-water and by sealing-wax: in the one a surface melting at the same temperature, in the other a softening of mass and heating. The first was thought by Prof. Forbes to be a limiting case of the second type, but the author gives reasons for supposing that it is rather an exchange phenomenon analogous to what takes place when water evaporates, and the melting-point is reached when the number of molecules passing from the ice to the water is equal to the number passing from the water to the ice. The sealing-wax type is analogous to the change of state in a liquid-gas above its critical point, where it changes gradually from a rather liquid to a certainly gaseous state.

Anthropological Institute, May 10.—Major-General A. Pitt-Rivers, F.R.S., president, in the chair.—Mr. Hyde Clarke exhibited a collection of stone implements collected by Mr. Papadopoulo Keramenes of Smyrna.—Lieut.-Col. R. G. Woodthorpe, R.E., read a paper on the wild tribes of the Naga Hills.—Prof. G. Dancer Thane read a paper on some Naga skulls.

May 24.—Major-General A. Pitt-Rivers, F.R.S., president, in the chair.—Mr. E. H. Man read a paper on the arts of the Andamanese and Nicobarese. After exhibiting and describing the new objects from the Andaman and Nicobar Islands, comprised in the second collection recently presented by him to General Pitt-Rivers, the author gave a slight sketch of the aborigines of the former group; he stated that they are divided into at least nine tribes, linguistically distinguished, and in most, if not all, of these there are two distinct sections, viz. inland and coast men. In confirmation of this

statement Mr. Man read a translation he had made of an account obtained in 1876 from a member of the inland branch of the Awko jûwai tribe, inhabiting a portion of the Middle Andaman, regarding their habits and mode of life, the details of which had since been fully corroborated. In many mental characteristics affinity to the Papuans would appear to exist, and the standard in social and marital relations is shown to be far higher than could be expected from a race so entirely outside the pale of civilisation; the previous accounts of their laxity in this respect are now proved to be erroneous. They have no forms of religion or ideas of worship, and though they have faith in a Supreme Being, the Creator, their belief in the Powers of Evil is much more strongly developed. The habitations of the eight tribes of Great Andaman are of three varieties, partaking almost invariably of the nature of a simple lean-to, while those of the remaining tribe, Jârawa-(da), are somewhat similar in form to the huts erected by the Nicobarese. The rights of private property are recognised and respected; there also appears to be a fair division of labour and perfect equality between the sexes in their social intercourse.—Dr. Allen Thomson, F.R.S., read a paper on some bone necklaces from the Andaman Islands. Several of the specimens exhibited by the author were constructed entirely of human bones, while some were composed of bones of various animals, and others were partly made up of pieces of coral.—Mr. J. Park Harrison, M.A., exhibited an incised slate tablet and other objects from Towyn. The figures upon the slate appeared to represent celts, urns, &c.

Photographic Society, May 10.—J. Glaisher, F.R.S., president, in the chair.—Mr. Leon Warnerke read a paper on a new discovery regarding gelatine emulsion. This consisted in the observed fact that when gelatine emulsion has been submitted to the combined action of light and pyrogallic acid, it becomes insoluble in warm water; a gelatine negative is transferred to glass or paper, and from the back, with warm water, all parts not acted upon by light and the developer can be washed away; consequently a solvent of the silver not acted upon, such as hypo-sulphite, becomes unnecessary, and the remaining film or picture is left intact, and from its purity can be reacted upon in many ways hitherto extremely difficult or impossible. This discovery also becomes valuable in its application to the Woodbury printing process, phototype printing, and burnt-in photography on ceramic ware.

Institution of Civil Engineers, May 31.—Mr. Abernethy, F.R.S.E., president, in the chair.—The paper read was on "The Production of Paraffin and Paraffin Oils," by Mr. R. Henry Brunton, M. Inst. C.E.

PARIS

Academy of Sciences, May 30.—M. Wurtz in the chair.—The following papers were read:—Memoir on the temperature of the air at the surface of the ground and down to 36 m. depth, also the temperature of two pieces of ground, the one bare, the other covered with grass, during 1880, and on the penetration of frost into these, by MM. Becquerel. The effects of the severe cold receive special attention. The screening influence of snow is shown. *Inter alia*, the propagation of frost is slower in grassy ground than in bare ground. In the latter the rate increases very slightly with the depth, the propagation being very regular. In grassy ground the increase is very notable, and with increasing depth, the rate tends to come near that in bare ground. Each layer of ground is subject to two calorific effects: one due to variations of external temperature; the other to the action of deep layers which tend to give a constant temperature.—On rabies, by M. Pasteur, with MM. Chamberland, Roux, and Thuillier. The seat of the virus is not in the saliva alone; the brain contains it, and the authors have successfully inoculated with brain substance. They have also succeeded in shortening the time of incubation, inoculating directly the brain of a dog with cerebral matter from a mad dog (and having recourse to trepanation).—Nebulæ discovered and observed at Marseilles Observatory, by M. Stephan.—On the theory of motion of celestial bodies, by M. Gyldén.—On a new means of accelerating the service of canal-locks, by M. De Caligny.—On the genera *Williamsonia* Carruth. and *Goniolina* D'Orb (continued), by MM. de Saporta and Merion.—Observation and elements of the comet *a* 1881 (L. Swift), by M. Bigourdan.—On Fuchsian functions, by M. Poincaré.—Algebraic relations between the superior sines of a given order, by M. Rouyaux.—On the sines of superior orders, by M. West.—On the discontinuous phosphorescent spectra observed in almost perfect vacuum, by Mr. Crookes. M. Edm. Becquerel recalled his own spectroscopic studies of the light of phosphorescent substances and his excitation of such substances by submitting them to the discharge in vacuum tubes (in which case the rise of temperature and the electric light itself complicated the effects).—New interrupter for induction-coils, by M. Deprez. A claim of priority (to M. Ducretet) on the conical mirror; reply to a communication of M. Pifre, by M. Mouchot.—Discussion of the theory of three fundamental colour sensations; distinctive character of these colours, by M. Rosenstiehl. Certain properties attributed to primary colours do not belong to them exclusively, *e.g.* their producing all perceptible colours when mixed two and two, and the sensation of white arising from the three fundamental sensations being excited equally. The fundamental property of the primary triad is stated to be that colours situated on either side of a primary colour (in the graphic triangle) and equidistant to sight have their complementaries so near together that it becomes difficult to distinguish those which are consecutive.—On the oil of wild thyme, by M. Febve.—On geological microzymas; reply to MM. Chamberland and Roux, by M. Béchamp.—On a vanadate of lead and copper of Laurium, by M. Pisani.—On the existence of the Cambrian formation at Saint Léon and Châtelperron (Allier), by M. Julien.—On the coal-formation of Commentry; experiments made with a view to explain its formation, by M. Fayol. He reproduced the conditions and effects on a small scale by means of basins with a constant level of liquid, receiving currents of water with pebbles, sand, clay, coal, plants (previously immersed some time, so as to sink in quiet water), &c.—Movements of the frog consequent on electric excitation, by M. Richet. Frogs (intact) show great resistance to electric stimuli. (Two Thomson elements were used, with a coil.) The response to a single stimulation of the leg or sciatic nerve was generally more than 0·15 seconds after; the delay was oftener half a second, sometimes as much as ten seconds. With repeated excitations the reaction is sometimes extremely slow. In general the response is more rapid the stronger the excitation. Fatigue comes quickly. Excitations of the sensibility stop voluntary movements. The general movements of flight or defence in intact frogs, on electric excitation, seem to be determined by the bulb. Are they (M. Richet asks) reflex or voluntary?—On symmetrical vaso-motor actions, by MM. Teissier and Kaufmann. Under certain conditions the reverse of the law established by Brown-Séquard and Tholozan holds good; a capillary dilatation on the left side, *e.g.* will produce a vascular constriction on the right side, or *vice versâ*.

VIENNA

Imperial Academy of Sciences, June 2.—M. Burg in the chair.—E. Hornstein, contribution to a knowledge of the system of asteroids.—Prof. S. Stricker, on the law of convulsive action.—Dr. Ludwig Langer, on the chemical composition of human fat at different ages.—Prof. E. Zuckerkandl, on the communications of the venæ pulmonales with the bronchial veins and the veins of mediastinum.—Prof. W. Loebisch and Dr. A. Loos, on glycerin-xanthogenates.—Dr. P. Wesselsky and Dr. R. Benedikt, on hydroquinonic and orcinic ethers.—Dr. L. Szajnocha, contribution to a knowledge of Jurassic Brachiopoda of the Carpathian rocks.—Prof. T. Finger, on an analogon to Kather's pendulum and its use for measuring gravitation.—Dr. S. Ehrmann, on the determinations of nerves in the pigment-cells of frogs' skin

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