

and the elasticity of the solid material may be expected to have some influence on the result. This influence, however, will be minute, as the part of the disturbing force which is variable and produces nutation is very much smaller, even at its maximum, than the precessional force. The consideration of this matter, however, has no bearing upon the validity or not of Mr. Hopkins's method, but simply upon the numerical value of his final result, not upon the question of the fluidity or solidity of the earth's mass."

The Archdeacon is of opinion "that the strictures of M. Delaunay upon this method, which the genius of Mr. Hopkins devised, betray an oversight of the real point upon which the success of his method depends, and that this method stands unimpaired."

SCIENTIFIC SERIALS

THE *Geological Magazine* for July (No. 73) contains rather fewer original articles than usual, but what there are will be found interesting. The series of notices of eminent living geologists is continued in a notice of one of the most accomplished of the number, Professor John Phillips, of whom we have a good biography, but a very unsatisfactory portrait. Mr. Carruthers gives a notice of the so-called fossil forest near Cairo; he distinguishes a new species of *Nicolia* (*N. oventii*), and illustrates its microscopic structure as compared with that of the old species *N. aegyptiaca* Unger.—Mr. Kinahan communicates a paper containing a comparison of the geological features of Devon, Cornwall, and Galway, with a discussion of the means by which they have been produced; and Miss E. Hodgson a long disquisition on the origin and distribution of the granite-drift of the Furness district. The longest article in the journal is a report of Mr. David Forbes' lecture on Volcanoes, which will be read with much interest.

The *Journal of the Asiatic Society* for April, contains the following Natural History papers—Observations on some Indian and Malayan Amphibia and Reptilia, by Dr. F. Stoliczka. The species described in this paper have been partially collected by the author along the Burmese and Malayan coast, in Penang and Singapore, partially at the Nicobar and Andaman islands, only a few species are noticed from Java, and a few also from the N. W. Himalayas. Short notes on the geographical distribution, and on the general character of the amphibian and reptilian fauna of the Andamans and Nicobars, form a brief preface to the detailed descriptions. Complete lists of all the known species occurring on the two last-named groups of islands are appended. Dr. Stoliczka gave a short sketch of the relations existing between the Andaman and Nicobar reptilian fauna and that of Burma on the one, and that of Java, Sumatra, and the Philippine islands on the other hand. All these islands, he said, have many species in common. He also specially notices the very great number of viperine snakes (*Trimeresurus*) which are to be met with at the Nicobars, but fortunately these species appear to be less dangerous than continental forms usually are. The Nicobarese say that not a single fatal case has resulted from the bite of these *Trimeresurus*, and certainly all the specimens examined had a comparatively small poison-gland. The result of the bite is said to be only a swelling of the wounded part. Dr. Stoliczka also exhibited a specimen of the rare *Callophis intestinalis* obtained from Upper Burma. The species has the poison glands extending from the head to about one-third of the total length of the body, lying free in the cavity of the anterior part, and causing the heart to be much further removed backward than is generally the case in other species of snakes. The President thought there were one or two remarkable features in Dr. Stoliczka's interesting paper. One to which he particularly referred was the relative inefficiency of the poison in certain snakes of Penang and the Nicobars in comparison with the poison of the cognate species found in this country. He did not know whether the circumstances which rendered the possession of an invariably fatal weapon necessary to particular classes of snakes in the struggle for life, while others could maintain themselves without it, had yet received much attention. *A priori*, he thought, one would be disposed to expect that a poison which would disable without causing immediate death, would be more deterrent in its effects, and, therefore, more widely useful to its possessor, than one which killed instantly. At any rate it was curious to find some of the insular species of snakes, though provided with a perfect poison apparatus, much less fatal in the effect of their bite than other

closely allied species in Bengal were. The investigation of the causes which had led to this difference ought to be attractive. A short discussion on the effects of snake poisoning ensued. Mr. Waldie desired to know what the symptoms resulted from the bite of the Nicobar vipers, and whether they are the same as are usually known to originate from the bite of other poisonous snakes. Dr. Stoliczka said that the Nicobarese only speak of a swelling of the bitten part, and that they exhibit very little fear of these snakes. Dr. Stoliczka also observed that the poison gland in the species of *Trimeresurus* which he had examined, has a simple glandular form without any appendages, but the skin forming it is very tough, and internally partitioned by numerous irregular lamellæ. The poison of the fresh snake was always present in a comparatively small quantity, and appeared less viscose than the Cobra poison. The differences between the effects of poisoning of the cobra and daboia had been pointed out by Dr. Fyrrer.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 22.—II. "On the Physics of Arctic Ice as explanatory of the Glacial Remains in Scotland." By Dr. Robert Brown, F.R.G.S., &c. In this paper the author entered into an extended inquiry how far the formation of the boulder-clays and other glacial remains in Scotland and the North of England can be accounted for, on the theory of a great ice-covering having at one time overlain the country in much the same manner as it does now Greenland and other extreme Arctic countries. Taking the hypothesis of Agassiz as his groundwork, Dr. Brown entered into a minute description of the present glacier-system of Greenland, and the nature of Arctic ice-action; and into an inquiry how far glacial remains in Britain correspond with those at present in course of formation in Greenland and at the bottom of Baffin Bay, Davis Straits, and the fjords and bays adjoining these seas. These inquiries were commenced in the year 1861, and have been continued at intervals ever since up to the present summer in various portions of the Arctic regions, the Continent of Europe, in Great Britain, and in North America across to the Pacific. The results of these extended researches have led him to conclude—1. That the subzozoic boulder-clay corresponds with the *moraine profonde* which underlies glaciers, and in all likelihood is the immediate base on which the ice-cap of Greenland rests. 2. That the fossiliferous, laminated, or brick-clays find their counterpart in the thick impalpable mud which the sub-glacial streams are pouring into the sea, filling up the fjords, even shoaling the sea far out, and absolutely in some cases turning the glaciers from their course into other valleys. Allowing the very moderate computation that this impalpable mud accumulates at the rate of only six inches per annum, a deposit of fifty feet in a century must form. If Scotland was at one time covered with an ice-cap, or had glaciers of any extent (as cannot be doubted), then this deposit must have been equally forming, and as a geological formation must be accounted for. No difference could be detected between this glacial mud and the present brick-clays, and every fact went to show that it was to this that we must look for the formation of these laminated fossiliferous clays. The amount of earth deposited on the bottom by icebergs was very insignificant indeed, and could in no degree account for the *boulder-clay*, though it was shown that much of the *boulder-drift* in some places could be so accounted for. It was, however, demonstrated that there was a great distinction between the boulders which belonged to the *moraine profonde* and those which were carried off on icebergs as part of the ordinary lateral moraines. The fjords, as already partially advocated in a paper in the *Journal of the Royal Geographical Society* (vol. xxxix.), he considered due to glacial action, the glaciers having taken possession of these fjords when they were mere valleys, when the coast was higher than now. He further showed that the American explorers are in error when they describe the coast of Greenland as rising to the north of 73°, and subsiding to the south of that parallel. There had been a former rise of the coast, and a fall was now in course of progress through the whole extent. Whether these had previously alternated with other rises and falls is not clearly evidenced by remains, but no doubt exists that a rise preceded the present subsidence. Numerous facts were adduced in support of this assertion. The remainder of Dr. Brown's paper was occupied in

an attempt to apply the doctrines regarding the physical action of Arctic ice-action to account for the Scottish glacial remains, and to deduce therefrom evidence regarding the changes Scotland underwent during, and subsequent to, the glacial period.

Aeronautical Society, June 3.—Mr. James Glaisher, F.R.S., in the chair. The following extract from the minutes of a late meeting at Stafford House, was read by the Secretary. It was remarked how little had been done in this county either to demonstrate the possibility of navigating the air, or to prove its impracticability. Sir William Fairbairn observed that we know but little of the reaction or lifting power of various forms of screw blades in the atmosphere, relative to the force employed, though such experiments might be easily tried, and the data obtained. Mr. Brooke was of opinion that if a successful aerial machine were to be constructed, the most simple and obvious plan would be that of inclined surfaces, impelled forward horizontally. The most successful experiment that he had ever witnessed was upon this principle, the motive power being a wound-up watch spring, which, as long as the power lasted, sustained the machine; and further, that most large birds were capable, during long periods of their flight, of sustaining themselves exactly in this way. It was also remarked that we were practically ignorant of the correct laws of the sustaining power of inclined surfaces of different forms and areas, and this want of knowledge was a perpetual stumbling-block to those who were willing to spend time and money in experiments. From the fact that as the weight and size of birds increased, so did the relative wing area decrease, it would appear that the ratio of sustaining surface to weight or resistance was by no means in equal proportions. The Chairman stated that with respect to plane surfaces of various figures exposed to the direct impact of the wind, he had already been trying some experiments with such instruments as were at his disposal, and that by employing two anemometers at the same time, so as to be sure of comparative results, he found that the indication of force increased with the size of the surface; also in the two instruments, equal surfaces shaped into different contours, gave different results. These interesting experiments, so directly bearing upon the question of aerial propulsion and resistance, were still occupying his attention, but at present he could say nothing from actual experiment of the resistance of inclined surfaces of various forms. It was then proposed that an experimental fund should be raised by subscription, and that a suitable and well-finished anemometer should be constructed, having the means of instantly setting various plane surfaces at any desired angle, and capable of registering both horizontal and vertical force simultaneously for all degrees of inclination. The results to be published for the benefit of the Society. Upon this proposition being put to the meeting it was carried unanimously.

Ethnological Society, June 21.—Prof. Huxley, F.R.S., president, in the chair. Colonel Lane Fox made some remarks on the Dorchester dykes and Sinodun Hill, to which attention has recently been directed, and showed that the works are British, and not Roman. He stated that the demolition of these works had been arrested for the present.—Mr. David Forbes, F.R.S., read a paper on the Aymara Indians of Bolivia and Peru. He described them as a small, massive, thick-set race, with large heads and short limbs. The trunk is disproportionately large, and the capacity of the thorax is enormous, being adapted to meet the requirements of respiration in a rarefied atmosphere, as the Aymara lives at an elevation of from 8,000 to 16,000 feet above the sea-level. The proportions of the lower limbs are curious, the thigh being shorter than the leg; the heel is inconspicuous. In colour, the Aymara varies from copper-red to yellowish brown and blackish brown, according to the altitude at which he lives. Many of the customs of the Aymaras depend on their peculiar conditions of life. In consequence of the low boiling-point of water at such great altitudes, beans are rarely used, and the food consists chiefly of potatoes peculiarly prepared. Clay is added to the food, not for any nutritious matter in it, but apparently only to increase the bulk of the meal. In religion, the Aymaras are nominally Christians. They appear to have no system of writing. The discussion on this communication was supported by the President, Mr. E. G. Squier, Mr. Cull, Mr. Denny, Mr. Bollaert, Mr. Harrison, and Mr. C. Markham. At the same meeting Dr. A. Campbell exhibited tracings of certain rock-inscriptions from British Guiana, and the Hon. E. G. Squier displayed a large collection of drawings, photographs, &c., from Peru.

Anthropological Society of London, June 14.—John Beddoe, M.D., president, in the chair.—Logan D. H. Russell, M.D., of Wilmington, Delaware, was elected a local secretary.—A paper, by Dr. Henry Hudson, was read "On the Irish Celt," in which the author depicted the mental and moral characteristics of that type, and drew conclusions as to the kind of government most suitable to such a people.—Mr. G. H. Kinahan contributed a paper "On the Race Elements of the Irish People." That paper entered largely into the pedigree of the chief families of Connaught and Munster, and treated of the effects of the Cromwellian and other confiscations.—The President (Dr. Beddoe) then read a paper "On the Kelts of Ireland." The principal points proved or indicated in it were the following:—That the Kelts known to the Greek and Latin authors, though they were a light-haired race as compared with the Italians, were darker than the Teutonic tribes, and that their physical type differed in other respects. That the Irish are, generally speaking, a dark-haired but light-eyed race, and that wherever there is much light hair it may be accounted for by a Danish or English cross. That the dark hair of the Irish may be, partly at least, attributed to the Gaelic Kelts. That there is less resemblance between the Irish, taken as a whole, and the Basques, who are generally considered to be the purest Iberians extant, than between the South Welsh and the Basques. That any Basque or Iberian element in Ireland is probably small, and can have only partially contributed to the prevalence of dark hair among the Western Irish. That Ugrian or Ligurian elements may also be present there. The paper was illustrated by minute details respecting the physical types in various parts of modern Ireland, including extensive observations on the colour of the eyes and hair; and the author exhibited a number of photographic and other portraits of Basques and of Bretons, Welshmen, Walloons, and other supposed descendants of the Celtic race.

Meteorological Society, June 15.—Ordinary meeting, Charles V. Walker, F.R.S., president, in the chair. Messrs. W. C. Ellis and Francis Nunes were elected Fellows, and Padre Prof. F. Denza was elected an Honorary Fellow of the society.—The following communications were made: "On the path of the large fireball of November 6th, 1869," by Prof. A. S. Herschel; "On the temperature of the air in Natal, South Africa," by R. J. Mann, M.D., F.R.A.S., &c.; "On the atmospheric pressure with relation to wind and rain," by R. Strachan, F.M.S., and "On the November meteors of 1869, as seen from the Mauritius," by Charles Meldrum, F.R.A.S.—The anniversary meeting was then held, and the report of the council on the present state of meteorological science both at home and abroad, also their report on the present state of the society, which now numbers 343 Ordinary, Life, and Honorary Fellows, and the treasurer's report were then read and adopted. The following is the result of the ballot for the officers and council for the ensuing year.—President, Charles T. Walker, F.R.S., F.R.A.S.; Vice-Presidents, Nathaniel Beardmore, C.E., F.R.S.; C. O. F. Cator; Robert J. Mann, M.D., F.R.A.S.; John W. Tripe, M.D. Treasurer, Henry Perigal, F.R.A.S. Trustees, Sir Antonio Brady, F.G.S., and S. W. Silver. Secretaries, Charles Brooke, F.R.S., F.R.C.S., and James Glaisher, F.R.S., F.R.A.S. Foreign secretaries, Lieut.-Colonel Alex. Strange, F.R.S., F.R.A.S. Council, Arthur Brewin, F.R.A.S., George Dives, F. W. Doggett, Henry S. Eaton, F. Gaster, Charles M. Gibson, Rev. Joseph B. Reade, M.A., F.R.S., W. Wilson Saunders, F.R.S., F.L.S., Thomas Sopwith, F.R.S., George J. Symons, S. C. Whitbread, F.R.S., F.R.A.S., E. O. W. Whitehouse, F.S.A., &c.

Statistical Society, June 23.—William Newmarch, F.R.S., president, in the chair. The following is the list of president, council, and officers, elected to serve for the ensuing year:—President, William Newmarch, F.R.S. Council, Major-General Balfour, C.B., Dr. Thomas Graham Balfour, F.R.S., R. Dudley Baxter, Samuel Brown, Hyde Clarke, D.C.L., L. H. Courtney, Sir C. Wentworth Dilke, Bart., M.P., Dr. W. Farr, F.R.S., W. Fowler, M.P., F. Galton, F.R.S., Right Hon. W. E. Gladstone, M.P., J. Glover, W. A. Guy, M.B., F.R.S., J. T. Hammick, F. Hendriks, J. Heywood, F.R.S., W. Barwick Hodge, F. Jourdan, Prof. Leone Levi, Sir Massey Lopes, Bart., M.P., W. G. Lumley, Q.C., LL.M., J. MacClelland, F. Purdy, Bernhard Samuelson, M.P., Col. W. H. Sykes, M.P., F.R.S., Ernest Seyd, W. T aylor, W. Pollard-Urquhart, M.P., Prof. Jacob Waley, J. Walter, M.P. Treasurer, J. T.

Hammick. Honorary Secretaries, W. Golden Lumley, Q.C., LL.M., F. Purdy, Prof. Jacob Waley.

BRISTOL

The Observing Astronomical Society.—Report of observations made by the members during the period from May 7 to July 6, 1870, inclusive. *Solar Phenomena*.—Mr. John Birmingham, of Tuam, writes: "A remarkable obscuration of the sun was observed here on May 22. It lasted from sunrise to sunset, with a short interval in the afternoon of returning brightness. The sun was of a beautiful pink colour, though there was no fog whatever, and its light was so reduced as to permit a long observation of it through the telescope without the aid of a dark glass. I am informed that the same phenomenon was noticed in the South of England on the next day (the 23rd), and on that day also, but late in the afternoon, it was observed at Rohrbach (Moselle), and described by M. Hamant in a letter to the Scientific Association; so that the cause of the obscuration, whatever it was, seems to have been moving eastward and southward." Mr. T. W. Backhouse, of Sunderland, reports that in May "there was a remarkable case of a solar spot making a revolution round another. It occurred with respect to the two largest spots of a group that was half way across the northern zone on May 9. The smaller spot was south of the larger on the 7th at 3^h, but preceded it on the 12th at 21^h, the line joining the two spots having rotated through an angle of 80° or 90° in 5½ days. This movement continued to the 15th, but this would be partly apparent owing to the group approaching the limb. By that time the larger spot was reduced to the size of the other. I cannot say whether the motion was a curve or a straight line, though it was probably the former; nor can I say which of the spots moved or whether both did. They were about 22,000 miles apart on the 9th, at 3^h; but on the 13th, at 20^h, they were 32,000 miles apart. One spot must therefore have moved, relatively to the other, about 34,000 miles in 4½ days, or at the rate of 300 miles per hour." Mr. T. G. E. Elger, of Bedford, says: "The sun spots observed during June were, with the exception of one group, small and devoid of interest when compared with those seen in April and May. The largest spots were confined to the sun's northern hemisphere. Between the 8th and 15th the spots were all small; on the latter date there were only two groups on the disc, and these were insignificant. On the 19th a very remarkable spot was observed, it formed the preceding member of a large scattered group 2' 52" in length; its penumbra measured about 1' 10" in greatest diameter. At 10 A.M. an isolated mass of light, intensely bright, was remarked on the nucleus. This, at 2 P.M., formed a 'bridge' connecting adjacent sides of the umbra. The nucleus of this spot was very irregular in colour. At 5^h 15^m on the 19th the central portion was noted as brown and the border as black, and subsequently the variety of tint was still more marked. At 7 A.M. on the 21st, when the penumbra showed evident signs of cyclonic action, not more than half the area of the nucleus was black, the remainder was made up of patches of various shades of brown. The group disappeared at the limb on the 27th." The Rev. S. J. Johnson, of Crediton, observed numerous spots on the sun on May 13. There were then four groups with penumbrae close together. Mr. H. Michell Whitley, of Penarth, says: "June 21—I noted on the sun's disc one very large, round, and well-defined spot; on one side, however, the penumbra was invaded by two tongues of faculae for a short distance, and in the centre of the umbra was a bright patch."

The Planet Saturn.—Mr. H. Michell Whitley repeatedly observed this object with his 6¼ in. reflector. He says—"June 21. Air very unsteady, but after midnight better. The Ball—duller yellow than rings, equatorial zone yellow, north of this a pale red belt, and another farther north again, towards Pole much fainter and about midway. Pole of planet bluish grey, edges of ball slightly shaded; no other spots or markings. Ring A—Inferior in brightness to B; colour, pale yellow; no subdivisions or markings on it. Ball's division—Traced all round; widest and darkest, if at all, in Wansa; sharply defined. In colour it was not so black as the sky, but deeper than the crape ring across the ball; colour, dusky. Ring B—This ring was very bright for a short distance from its outer edge, which was very sharply defined; colour gradually deepens and light fades towards inner edge; outer edge lemon yellow, duller and deeper inwards, strongly suspected to be streaky, but no actual subdivision seen. No line of light on inner edge of ring, which was not sharply defined. Ring C, or Crape Ring—Very delicate

colour, dusky purple. I could with care, as a very fine object, trace the edge of the globe through it up to ring B, equally distinct in E and Wansa; no markings of any kind upon it.—June 28, 10^h to 11^h 15^m. Power, 250; definition very fluttering. N. equatorial ruddy belt very distinct; equatorial yellow band the brightest part of the planet. Between the N. equatorial ruddy belt and N. Pole lay one or more very faint ruddy bands. Pole, pale bluish grey; no other markings. The Crape Ring very dark and distinct across the Ball.—July 2, 10^h. Definition very sharp; power 250. A glimpse observation. The two belts before mentioned very much plainer and darker than on June 21—28, and not of such a ruddy hue."

Lunar Observations.—Mr. John Birmingham, of Tuam, Ireland, reports that on June 6 he saw "A very marked central depression in the white spot of Linné though the terminator was so far away as the boundary between the Mare and the Palus Putridinus. The depression was rather east of the exact centre of the white spot, so that the western exterior slope was longer than the eastern." Mr. H. Michell Whitley has observed with great care many interesting and difficult lunar objects, and the results of his observations have been sent to Mr. W. R. Birt, F.R.A.S.

Winnecke's Comet.—Mr. George J. Walker, of Teignmouth, observed this body on June 5, 6, and 7. He says that "It looked like a tolerably bright nebula;" on the 6th, at 14^h 13^m the comet looked faint owing to the strong twilight.

Meteors.—Mr. G. J. Walker saw "a splendid meteor" on June 24. It traversed the greater part of the sky, and was much larger and brighter than Venus. It was of a blue colour. Mr. Walker adds, "I think it appeared a little to the right of Altair, and passed over Vega and on to the Pointers in Ursa Major; it had a magnificent train, and I think must have traversed an arc of about 120°. The time of its appearance, as well as I could make out from my watch, was 11^h 13^m G.M.T., and it may have been seven or eight seconds making its sweep over the heavens. I did not hear any sound with it." Mr. H. M. Whitley observed a brilliant meteor on June 29 at 11^h 30^m. It was of the second magnitude. "Pale yellow; velocity very great."

A New Red Star.—Mr. John Birmingham has "frequently observed a red star in Cygnus, not, I believe, previously noticed; at least, it is not in Schjellerup's catalogue (Ast. Nach., No. 1,591), which gives a list of all the red stars known up to 1866. It is of a deep red, of about the 8th Mag., and is near a blue star of the same size. Its approximate position, compared with 32 Cygni, is about

R. A. 20^h 15^m 37^s; Declin. + 47° 27' 28".

Occultation.—Mr. Walker witnessed the occultation of θ Libræ on June 11, and found that the exact time of disappearance was 9^h 27^m 55^s 6^s G.M.T.

EDINBURGH

Botanical Society, May 12.—Sir Walter Elliot, president, in the chair.—The following communications were read:—Botanical Notes of a Journey through Spain and Portugal, by Mr. T. C. Archer; Botanical Notes on the Garden of Montserrat, Portugal, by Mr. T. C. Archer; Botanical Notes taken on the Rock of Gibraltar, by Mr. T. C. Archer; Report on the open-air Vegetation at the Royal Botanic Garden, by Mr. M'Nab.

June 9.—Sir Walter Elliot, president, in the chair. The following communications were read:—Notes on the Ipecacuanha Plant. By Dr. Gunning, Rio Janeiro. Dr. Gunning states that the Ipecacuanha plant is exceedingly scarce in the province of Rio Janeiro from having been pulled up, and no attention paid to its cultivation. It is exported from Sao Paulo, the province south of Rio, but chiefly from Matto Grosso, a thousand miles up the River Plate. At present Dr. Gunning is rearing a number of cuttings for transmission to India, where it is proposed to cultivate it extensively.—New and rare Mosses from Ben Lawers. By Dr. J. Stirton, Glasgow. In this paper the author reviewed the progress of discovery of mosses on Ben Lawers within the ten years, indicated in general terms the habitats of the rarer species, as well as their tendencies towards increased luxuriance, or gradual decay and extinction, and noticed the affinities between the Cryptogamic Flora of the mountain (Ben Lawers) and that of Scandinavia, more especially of the Dovrefield.—Notice of Grimmiæ, collected on Arthur Seat, near Edinburgh, by Mr. William Bell and Mr. Sadler. The authors described twelve species and several varieties of the genus Grimmiæ, as growing on Arthur Seat; noticed their dis-

tribution over the hill, and the kind of rocks on which they occurred.—Notes on some British Mosses. By Mr. Wm. Wilson. Mr. Wilson referred to the British species of *Andraea*, which he had revised for the second edition of his "Bryologia Britannica," and especially to *Didymodon jenueri*, a moss recently described and figured in the Society's Transactions. The latter he believed to be in no way specifically different from *Cynodontium polycarpon*.—On the Ferns found in the Valley of the Derwent. By Mr. T. W. Mawson. Mr. Mawson enumerated twenty-eight species and varieties of ferns as indigenous to the Valley of Derwentwater, including *Asplenium germanicum*, *A. septentrionale*, *Hymenophyllum wilsoni*, *Osmunda regalis*, *Phlogoglossum vulgatum*, *Allesorus crispus*, &c.

PARIS

Academy of Sciences, July 18.—M. Bertrand communicated a paper by M. L. Painvin on the determination of the elements of the angle of inflexion of a developable surface defined by its tangential equations.—Several papers on physical subjects were presented, namely—an extract of a letter from M. De la Reve to M. Dumas on the magnetic rotatory powers of liquids; further researches upon electro-capillary action, and on the formation of crystallised oxchloride of copper and other analogous compounds by M. Becquerel; a memoir on the variations of temperature produced by the mixing of two liquids by M. H. Sainte-Claire Deville, in reply to the last communication by M. Jamin, and a reply by the same author to the criticisms of M. Jamin upon a memoir published in 1860; thermal researches upon the metallic character of hydrogen associated with palladium, and on a voltaic couple, in which hydrogen is the active metal by M. P. A. Favre; and a note by M. F. Lucas, communicated by M. E. Becquerel, on the possibility of obtaining fire signals visible at a great distance, for which purpose the author proposes to employ an electric spark generated by an apparatus described by him.—M. de Saint-Venant presented a memoir on the elementary demonstration of the formula of propagation of a wave or intumescence in a prismatic canal, with remarks on the propagation of sound and light, on ressaults, and on the distinction of rivers and torrents.—A note was read by M. Sonrel on the photographic investigation of the sun at the Imperial Observatory of Paris.—MM. Becquerel and E. Becquerel presented a note on the observations of temperature made beneath the soil at the Garden of Plants from 1864-1870, by means of thermo-electric cables, with tables of results.—The following chemical papers were read:—Investigations upon the action of the chlorides of platinum, palladium, and gold upon the phosphines and arsines, by MM. A. Cahours and H. Gall; a note on the decomposition of oxalic acid by M. P. Carles, communicated by M. Bussy; and a note by M. J. Personne on the conversion of chloral into aldehyde, also presented by M. Bussy.—M. Combes presented a note by M. Flajolot on some crystallised compounds of the oxides of lead and antimony, and of oxide of lead with antimonic acid from the province of Constantine, in Algeria.—A report was read from M. Pasteur on the results of the rearing of silkworms from eggs prepared by processes of selection at Villa Vicentina.—M. C. Robin communicated a note by M. A. Sanson on the influence of the rapid development of the bones upon their density; and M. P. Balestra presented an account of his researches and experiments upon the nature and origin of marsh miasmata, from which he is inclined to believe that the miasmata of marshy places are due to the spores of algæ floating in the air.

VIENNA

Imperial Academy of Sciences, June 17.—Dr. K. Exner communicated a memoir on the sensation of light.—M. J. Schubert communicated drawings and descriptions of a lamp and of an electrical apparatus for producing sound.—M. Tschermak presented a report on the recent fall of a meteorite near Muzuk, in Fezzan.—M. K. Puschl presented a memoir on the amount of heat and the temperature of bodies.—A memoir on reflex action of the nasal mucous membrane upon respiration and the circulation of the blood, by Dr. Kratschmer, was communicated by Prof. E. Hering.—Prof. A. Winckler presented a memoir on the relations between the perfect Abelian integrals of different kinds.—M. von Littrow remarked upon the elements of Winnecke's comet, as calculated by Dr. von Oppolzer.—Prof. Hlasiwetz communicated the results of a long series of experiments made by Dr. Weselsky on the formation of the chinones; and Prof. A. Bauer noticed a compound of platinum and lead having the formula Pt + Pb.

June 23.—The following memoirs were communicated by the

Secretary:—On the path of Hind's comet (1847, I.), by Dr. K. Hornstein; on similar conic sections, by M. E. Weyr; and two theories of the movement of free resting masses, by Dr. Recht.—Dr. L. J. Fitzinger communicated the third part of his critical revision of the family of the bats, including the genera *Nyctinomus*, *Thyroptera*, *Exochurus*, *Cnephaiophilus*, and *Vesperus*.—A memoir by Prof. G. Hinrichs (of Iowa), on the statistics of crystalline symmetry, was read, as also a note on the annual course of the temperature at Klagenfurt, Trieste, and Arvavaralja, by Dr. K. Jelinek.

BERLIN

Royal Prussian Academy of Sciences, May 5.—Professor Ehrenberg read a communication on the increasing knowledge of invisible life in the rock-forming *Bacillariæ* of California.

May 12.—Professor Poggendorff read a memoir upon some new and remarkable properties of the diametrical conductors of the electrical machine and on a double machine founded upon these. This paper, which is of considerable length, is illustrated with a figure of the new double machine.—Professor W. Peters read a description, illustrated with figures, of *Platemys tuberosa*, a new species of tortoise from British Guiana.

May 19.—Professor Rammelsberg read a paper on the composition of the meteorites of Shalka and Hainholz.

May 23.—Professor Ewald read a paper on some questions relating to the geology of the Andes.

GÖTTINGEN

Royal Society of Science, April 6.—A paper by M. W. Krauss on the anterior epithelium of the cornea was read.

April 27.—M. A. Clebsch communicated a paper by Prof. C. Schweigger on the size of the ophthalmoscopic picture, and M. L. Meyer read a note on the occurrence of granular cells in the nervous centres.

May 7.—Prof. Sartorius von Waltershausen read a memoir on the isomorphism of the sulphates of lead, baryta, strontian, lime, potash, soda, and ammonia.—Dr. M. A. Stern presented a simple proof of the law of quadratic reciprocity, and some propositions connected therewith.—M. A. Clebsch read a paper on certain problems of the theory of algebraic surfaces.—M. W. Klinkerfues presented a note of some investigations on the movement of the earth and sun in the æther.—Prof. Enneper read a paper on a problem of mathematical geometry, and Prof. Kohlrusch a notice of the influence of temperature on the coefficients of elasticity of certain metals.

BOSTON

Natural History Society, *Section of Entomology*, March 23.—Mr. S. H. Scudder in the chair. "Synopsis *Pseudoscopionidum synonymica*," by Dr. H. Hagen.—Dr. Hagen stated that Dr. A. S. Packard, jun., had recently discovered in Brunswick, Maine, and in Salem, a species of *Amphientomum*, a genus of Neuroptera, whose body is covered with scales, and heretofore known only from Ceylon.—The following paper was read:—"On the Synonymy of *Thecla Calanus*," by Samuel H. Scudder.

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ERRATUM.—Page 235, second column, line 24, for "Caprera" read "Capri."