

INDIAN GEOGRAPHICAL NAMES

THE Committee of the Geographical Society of Bombay appointed to prepare an index of geographical names in India, in vernacular and English spellings, with memoranda—geographical, etymological, antiquarian, and statistical—have published the outline of a general plan to guide in the formation of the proposed index, and to enumerate the particulars it might properly include.

The object is primarily *geographical* and *etymological*, but the Committee hopes information may be placed at its disposal to make it also historical and statistical.

The committee, therefore, considers that a full index of the kind ought to embrace—

1. Names of towns, villages of any size or note, railway stations, &c., with the taluka and district or state in which each is situated, its longitude and latitude; the population; name of the river or stream on which each is situated; altitude above the sea-level; the dates and names of founders; the etymology of the name; the Sanskrit or ancient name; notes of connected events, peculiar products or manufactures; places of note, temples, commemorative pillars, &c., in their vicinity, with references to fuller descriptions already published.
2. Names of the talukas or divisions in each district, with the area, chief town and population.
3. Shrines and places of pilgrimage, with notes of the objects of adoration or pilgrimage, dates of fairs, &c., and precise locality.
4. Rivers, their rise, course, and confluence or debouchure; lakes, with their size or area and products; hot springs, with their temperature.
5. Mountain ranges, with average heights; peaks, with their greatest altitudes; hill forts, with notes of events connected with them and their present condition.
6. Valleys, plateaux, &c., having particular designations, with notes on their peculiarities.
7. Tribes and peculiar sects, with notes of their habitats, castes, race, peculiar deities, occupations, &c.

These notes are not intended to be lengthy and need seldom extend to half-a-dozen lines; but may generally be restricted to one or two: whilst all detailed information collected might be preserved by the Geographical Society for reference.

If this plan can be well filled up, the proposed list will include the names on the maps of Rennell, Arrowsmith, Allen, Walker and Keith Johnston and in the road-books, with many others in addition. It would thus be of considerable extent and require a large amount of patient labour, besides the collection of much information that has never yet been brought together from the many districts of so vast a country.

The Committee proposes to compile every name in the characters of the vernacular or vernaculars of the district in which it occurs and in the language to which the name belongs. Purely Muhammadan names must be given in Urdu and in the characters of the Hindu dialect of the place; Hindu names in the form or forms used by educated Hindus of the vicinity, whether Hindi, Bengali, Panjabi, Kashmiri, Sindhi, Kachhi, Gujarati, Marathi, Uriya, Telugu, Tamil, Malayalim, Singalese, or Burmese; but, for convenience in printing, it may be best to use the Devnagari alphabet for all the Sanskrit dialects at least. Each name should be followed by its transliteration into Roman characters according to the alphabet of Sir William Jones, as now written by the Royal Asiatic and other Societies and by most orientologists, the English spellings in common use and on the Trigonometrical Survey maps, both the English and vernacular forms being arranged so that, either being known, a name may at once be found in its alphabetical place in the index.

The committee hopes to add any peculiar forms of Indian names found in the best-known historical and descriptive works on India, such as the writings of Orme, Dow, Elphinstone, Grant Duff, Mill, Wilson, Thornton, Montgomery Martin, Rennell, Hamilton, &c.; also the Greek and Sanskrit ancient names so far as they have been identified by Lassen, De Saint-Martin, Cunningham, &c.

Considering the nature and extent of the work, the committee feels that it must be mainly dependent upon fresh information from each locality. Believing also that with adequate assistance such an index would be of permanent value to all connected with this country, it recommends the Geographical Society to bring the matter before the Government at Bombay, with the request

that the committee and society be afforded that assistance in procuring the desiderated information, which Government alone can afford, by obtaining the services of its officers in the Revenue, Educational and other departments, in collecting the vernacular names and other particulars and that the Government of Bombay graciously use its influence in obtaining for the society similar assistance from the other Governments of India.

SOCIETIES AND ACADEMIES

The Secretary of the Philosophical Society of Glasgow wishes us to state that the report of the proceedings of that Society in our Number of the 3rd inst. was not an official one. In acceding to this request we would point out the desirableness of the Secretaries of all Societies sending us official reports, since it is only by that means that accuracy can be insured. When this clear duty of an official is performed by an ordinary member, who, without having access to documents and notes, is yet anxious that the work of his Society should be represented, and sends a report faute de mieux, it is impossible always to guard against error. All reports forwarded to us should be as short as possible, distinctly written, and deal only with advances on our previous knowledge.

LONDON

Royal Society, February 10.—The following papers were read: "On some remarkable Spectra of Compounds of Zirconia and the Oxides of Uranium." No. 1. By H. C. Sorby, F.R.S. We shall return to this communication.—"On linear differential equations," No. 2. W. H. L. Russell.

"On the mathematical theory of stream-lines, especially those with four foci and upwards." W. J. Macquorn Rankine. A *stream-line* is the line that is traced by a particle in a current of fluid. In a steady current, each individual stream-line preserves its figure and position unchanged, marking the track of a filament or continuous series of particles that follow each other. The motions in different parts of a steady current may be represented to the eye and to the mind by means of a group of stream-lines. Stream-lines are important in connection with naval architecture; for the curves which the particles of water describe relatively to a ship, in moving past her, are stream-lines. If the figure of a ship is such that the particles of water glide smoothly over her skin, that figure is a *stream-line surface*; being a surface which contains an indefinite number of stream-lines. The author in a previous paper proposed to call such stream-lines *Neoids*; that is, ship-shape lines. He refers to previous investigations relating to stream-lines, especially to those of Mr. Stokes, in the Cambridge Transactions for 1842 and 1850, on the "Motion of a liquid past a solid," of Dr. Hoppe, on the "Stream-lines generated by a sphere," in the *Quarterly Journal of Mathematics* for 1856, and his own previous papers on "Plane water-lines in two dimensions," in the Philosophical Transactions for 1864, and on "Stream-lines," in the *Philosophical Magazine* for that year. He states that all the Neoid or ship-shape stream-lines whose properties have hitherto been investigated in detail, are either *unifocal* or *bifocal*; that is to say, they may be conceived to be generated by the combination of an uniform progressive motion, with another motion consisting in a divergence of the particles from a certain point or focus, followed by a convergence either towards the same point or towards a second point. Those which are continuous closed curves, when unifocal, are circular, when bifocal, they are blunt-ended ovals, in which the length may exceed the breadth in any given proportions. To obtain an unifocal or bifocal neoid resembling a longitudinal line of a ship with sharp ends, it is necessary to take a part only of a stream-line: there is then discontinuity of form and of motion at each of the two ends of that line.

The author states that the occasion of the investigation described in the present paper, was the communication to him by Mr. William Froude of some results of experiments of his on the resistance of model boats, of lengths ranging from three to twelve feet. A summary of those results is printed at the end of a Report to the British Association on the State of "Existing Knowledge of the Qualities of Ships." In each case two models were compared together of equal displacement and equal length; the water-line of one was a wave-line with fine sharp ends, that of the other had blunt rounded ends, each joined to the midship body by a slightly hollow neck; a form suggested, Mr. Froude states, by the appearance of water-birds when swimming. At low velocities, the resistance of the sharp-ended boat was the

smaller; at a certain velocity, bearing a definite relation to the length of the model, the resistances became equal; at higher velocities, the round-ended model had a rapidly increasing advantage over the sharp-ended model.

Hence it appeared to the author to be desirable to investigate the mathematical properties of stream-lines resembling the water-lines of Mr. Froude's bird-like models. He has found that endless varieties of such forms, all closed curves free from discontinuity of form and of motion, may be obtained by using four foci instead of two. They may be called from this property *quadrifocal stream-lines*, or, from the idea that suggested such shapes to Mr. Froude, *Cycnoids*; that is, swan-like lines.*

Those lines are not to be confounded with the lines of a yacht, having at a distance the appearance of a swan, which was designed and built some years ago by Mr. Peacock, for the figure of that vessel is simply oval. The paper contains four chapters. The first three are mainly cinematal and geometrical, relating to the forms of stream-line surfaces in two and in three dimensions, especially those with more than one pair of foci and surfaces of revolution—the method of constructing graphically and without calculation (by means of processes first applied to lines of magnetic force by Mr. Clerk Maxwell) the traces of such surfaces, which methods are exemplified by diagrams drawn to scale—the motions of the particles of liquid past those surfaces. The fourth chapter is dynamical: it treats of the momentum and of the energy of the disturbance in the liquid, caused by the progressive motion of a solid that is bounded by a ship-shape stream-line surface of any figure whatsoever—the ratio borne by the total energy of the disturbance in the liquid to that of the disturbing body when that body displaces a mass of liquid equal to its own mass, which ratio ranges in different cases from $\frac{1}{2}$ to 1—the acceleration and retardation of ships as affected by the disturbance in the water—the use of experiments on the retardation of ships in finding their resistance—the disturbances of pressure which accompany the disturbances of motion in the liquid. Up to this point, the dynamical principles arrived at in the fourth chapter are certain and exact, like the geometrical and cinematic principles in the three preceding chapters. The results obtained in the remainder of the fourth chapter are in some respects approximate and conjectural, being to a great extent designed to suggest plans for future experiments and rules for their reduction. These results relate to the disturbance of level which accompany the disturbances of motion, when the liquid has a free upper surface—to the waves which originate in those disturbances of level and to the action of those waves in dispersing energy and so causing resistance to the motion of the vessel;—to friction, or skin-resistance and to the "wake" or following current which that kind of resistance causes the disturbing solid body to drag behind it—lastly, to the action of propelling instruments in overcoming different kinds of resistance. The resistance caused by viscosity is not treated of, because its laws have been completely investigated by Mr. Stokes, and because, for bodies of the size of ships, moving at their ordinary velocities, that kind of resistance is inconsiderable compared with skin-resistance and wave-resistance. The resistance caused by discontinuity of figure is stated to be analogous in its effects to friction; but it is not investigated in detail, because ships ought not to be built of discontinuous (commonly called "unfair") figures. In a supplement the author calls attention to the agreement between the position of the points at which there is no disturbance of the pressure on the surface of a sphere, as deduced from Dr. Hoppe's investigation, published in 1856 (*Quarterly Journal of Mathematics*), or on the surface of a short vertical cylinder with a flat bottom, as determined by the experiments of the Rev. E. L. Berthou before 1850 (*Proc. Roy. Soc. vol. v. 1850*; also, "*Transactions of the Society of Engineers*," 6th December, 1869. The theoretical value of the angular distance of those points from the foremost pole of the sphere is $\sin^{-1} \frac{2}{3} = 41^{\circ} 49'$; the value deduced from the experiment is $41^{\circ} 30'$. The author then adds some remarks on a suggestion made by Mr. William Froude, that the wave-resistance of a ship is diminished when two series of waves originating at different points of her surface partially neutralise each other by interference; stating that, with regard to this and many other questions of the resistance of vessels, a great advancement of knowledge is to be expected from the publication in detail of the results of experiments on which Mr. Froude has long been engaged.

Zoological Society of London, February 10.—Mr. John Gould, in the chair. The secretary stated the principal

* Κυκνοειδής.

additions to the society's menagerie during January, amongst which was a specimen of the Great Northern Diver (*Colymbus glacialis*), captured in Cornwall, and presented to the society by A. R. Hunt, Esq.—A letter was read from Mr. W. H. Hudson, of Buenos Ayres, containing some observations on the ornithology of La Plata.—A communication was read from Mr. R. Swinhoe, describing a new deer from China, which Mr. Swinhoe regarded as constituting a new genus of the family *Cervidae*, distinguished by the large canines and the entire want of horns in both sexes. This deer was stated to be common on the islands on the lower part of the river Yangtze-Kiang near Ching-Kiang, and to be often brought into the market of that city, but appeared hitherto to have escaped the observation of naturalists. Mr. Swinhoe proposed to call it *Hydropotes inermis*.—A communication was read from Mr. George Gulliver, on the size of the red corpuscles of the blood of *Moschus*, *Tragulus*, *Orycteropus*, *Ailurus*, and some other mammalia, to which were added some historical notices relating to the same subject.—A communication was read from Surgeon Francis Day, containing the second portion of his paper on the fishes of Burmah.—The Rev. O. P. Cambridge communicated a monograph of the genus *Idiops* belonging to the family Mygalidae, in which were included descriptions of three species considered to be new to science.—A communication was read from Mr. John Brazier, containing descriptions of three new species of shells from the Australian coast belonging to the genera *Voluta* and *Comus*.—Mr. Henry Adams communicated a description of a new species of mollusk of the genus *Colus* from the L'Agulhas Bank, Cape of Good Hope, which he proposed to call *Colus ventricosus*.

Ethnological Society, February 8.—Dr. A. Campbell in the chair. The following new members were announced: Sir Charles Wentworth Dilke, Bart., M.P., Rev. A. S. Farrar, Messrs. M. C. Fisher, F. R. Munton, and F. B. Wright. "On some flakes of flint and chert discovered in the angular *detritus* beneath a submerged forest at Porlock and Minehead in West Somerset." Mr. Boyd Dawkins. These objects of human workmanship prove that man must have lived on the old land-surface before the destruction of the forest, and the accumulation of the series of overlying deposits. It has been supposed that this *detritus* was of glacial age; but the author doubts this. He believes, however, that there is evidence to show that the latest date which can be assigned to these remains is an early stage in the Neolithic period. Dr. Richard King, Colonel Lane Fox, Rev. Dr. Nicholas, and Mr. McLennan spoke upon this communication.—The Chairman then read some notes introductory to a paper on the remains of prehistoric man in the neighbourhood of the Crinan Canal in Argyleshire. This canal is nine miles in length, and connects Loch Fyne with Loch Crinan. The Rev. Mr. Mapleton described with great precision the prehistoric remains in this locality, among which the most curious were some peculiar cup-shaped cavities and concentric rings rudely sculptured on certain stones. In addition to these petroglyphs, there are many menhirs, and numerous cairns of various forms: crannoss occur in most of the lochs, but are usually merely solitary dwellings. Several duns, a vitrified fort, a brough, and a flint-manufactory are also among the remains in this district. The Rev. Dr. Nicholas and Colonel Lane Fox made some remarks upon this paper.—The assistant-secretary exhibited and described a stone hammer-head found by Mr. R. Mout in the old workshop of a copper-mine in Portugal.

Entomological Society, February 7.—Mr. A. R. Wallace, president, in the chair.—Mr. Bates, Major Parry, and Mr. Pascoe were nominated as vice-presidents. It was announced that the council offered two prizes of the value of five guineas each, for essays of sufficient merit, drawn up from personal observation, on the anatomy or economy of any insect or insects. The essays to be sent in before the end of November next.—Mr. Bond and Prof. Westwood exhibited several butterflies, the colouration of each being partly that of the male and partly that of the female character. Mr. Bond, on behalf of Dr. Wallace, exhibited cocoons from various parts of the world, of *Bombyx Yamamai* and *Antheraea Peruii*. Mr. Stainton exhibited a large box full of *Micro-Lepidoptera*, each specimen being separately labelled to show the locality and date of capture. Mr. Bond exhibited some more specimens of *Acridium peregrinum*, from Plymouth; Mr. Fred. Smith made some observations upon the *Locusta migratoria* of Linné, and *L. Christii* of Curtis. Prof. Westwood exhibited a new form of *Cynipidae*, from the Sula

Islands. Mr. Janson, on behalf of Mr. Crotch, exhibited *Philonthus cicatricosus*, *Dyschirius angustatus*, *Hydroparus unistriatus*, and *H. m-natissimus*, four recent additions to the list of British beetles. —Major Parry exhibited *Hicagus obscurus*, a North-American species placed by Leconte among the *Scarabæideæ*, of which it has since been suggested that it might possibly belong to the *Lucanideæ*.—The secretary read a letter from Mr. Roland Trimen, on the habits of some South-African species of *Pausidae*.—The following papers were read:—"A revised catalogue of the *Lucanoid coleoptera*, with remarks on the nomenclature and descriptions of new species" (the concluding part), by Major Parry; "On the species of *Charaxes* described in the 'Reise der Novara,' with descriptions of two new species," by Mr. A. G. Butler. Mr. McLachlan presented the MS. of "A catalogue of the *Neuroptera* of the British Isles," being the first instalment of the proposed list of all our indigenous insects.

EDINBURGH

Royal Physical Society, January 26.—Mr. R. F. Logan, president, in the chair. Mr. F. W. Lyon, M.D., and Mr. B. N. Peach, of the Geological Survey, were elected resident members. The following communications were read:—

"Notes on the meteoric shower of November 1869, as observed at the Cape of Good Hope; and on the supposed fall of an aerolite there." By D. R. Kannemeyer. A number of specimens of star-fish and echini, recently added to the British fauna, from Shetland, &c., were exhibited and commented on by Mr. Charles W. Peach. The specimen first mentioned by Mr. Peach was *Comatula rosacea*, for a long time the only known representative, in our seas, of the fossil encrinites; two other species are now known, viz., *Antedon Sarsii*, of which several specimens have been taken in 80 to 100 fathoms off Unst, and *Antedon Celticus*, which has been captured in the Minch and Sleat of Sound, and about 10 years ago in the Sound of Skye. The other specimens exhibited were as follows:—*Ophiura affinis*—got on both sides of Shetland, at Wick, N.B., and off the coast of Northumberland; was taken for *Ophiroma bellis*. *Luidia Sarsii*—Shetland in deep water, at Wick, N.B., and in Cornwall. *Archaster Parleii*—Two specimens only were taken off Shetland in 1864 and 1867; the most beautiful of our native stars. *Goniaster aculeatum*—Variety of *G. phrygianus*; very deep water off Unst, Shetland, 1864, two specimens only. *Cribella curta*—Variety *C. sanguinolenta*, occurs between tide-marks from Cornwall to Shetland. *Cidaris papillata*—the "Piper" of the Shetland fisherman, although not new, has hitherto been considered as very rare; has turned up in numbers on the west coast of Shetland in 100 to 110 fathoms. *Echinus Norvegicus* has been also found occasionally in great numbers in deep water, same locality, with *Toxopneustes pictus*, another beautiful addition. The one of the greatest interest is *Spatangus meridionalis*, from equally deep water, same locality, it being especially a Mediterranean form; it is a magnificent species. Several of the above species are also found in the Mediterranean and as these are living in the same spot with Boreal and Arctic forms, it would be interesting to know how they got there, as it is now well ascertained that the Gulf Stream does not reach those seas. All the above are additions to the British list. He was at present unable to give their names. Although he was aware that many new *Holothuricæ* had been found, he did not notice them.

Remarks on the Bill and Food of the Indian Skimmer (*Rynchops albigollis*). By Mr. William Bell. Communicated by Dr. Davidson. It has been stated that the African species of the genus feed on the ground, searching the soft mud with their bills. Mr. Bell had watched these birds near Saharanpore; he had seen them on the mud, but never searching it as if for food. They were well named skimmers, as with their long and powerful wings they flew along the surface of the water; they opened their bills very wide and struck the water at a low angle of 10 deg. or 15 deg., dipping into it in this way to catch small fish and other inhabitants of the water and he had found their stomachs filled with the bones of fish.

Notice of *Larus minutus*, the Little Gull, recently captured in Berwickshire, &c. By John Alex. Smith, M.D. (the specimen was exhibited).—This rare gull, the smallest of the genus *Larus*, was shot in the harbour of Coldingham, Berwickshire, on the 27th of December. It was the property of Mr. Andrew Wilson, Coldingham. It is a native of Eastern Europe, migrating from the Baltic and Gothland, where it breeds, to the South of Europe and Caspian Sea in the winter and is a rare straggler to Scotland, only some two or three specimens having been previously observed.

The bird is a young male in immature plumage. Temminck states that it feeds on insects and worms and very little is known of its habits. Dr. Smith found the stomach and gullet of this bird filled with fishbones and was able to detect among these part of the fifteen-spined stickleback, *Gasterosteus spinachia*. The bird was easily distinguished by its small size, measuring only 11½ inches from the bill to the extremity of the tail. Dr. Smith exhibited a fine adult male *Mergus albellus*, the seamew recently shot, he believed, in Forfarshire; also a specimen of the *Mergus alle*, the little rotche shot in the end of December at Sealcliff. He had hoped to be able to exhibit a very fine specimen of the rare *Alanda alpestris*, the shore lark, which he had examined. It was killed at St. Andrews in company with a flock of snow buntings, on the 31st of December and is the property of Mr. R. Wardlaw Ramsay, jun. He had just learned that another specimen had been killed at Dunbar in the beginning of this month and was in the possession of Mr. F. Balfour of Whittinghame. Very few instances are on record of this bird having been seen in Scotland. Mr. Scott Skirving was inclined to think that the general resemblance borne by this bird to the buntings might help to make it overlooked, and that it might not be so very rare as it was considered to be.

DUBLIN

Royal Irish Academy, January 24.—The Rev. Dr. Jellett, president, in the chair. Mr. Eugene A. Conwell read a paper on a tumulus and chamber in the Island of Gavr' Inis, Morbihan, Brittany; and described the conditions of the purchase of the Island in 1832, in regard to the treasure supposed to be concealed in this tumulus, and the subsequent clearing out of the interior chamber and gallery, measuring 50 feet 8 inches in length. The large blocks composing the walls and roof were not of the native rock of the island; and, excepting three, which were quartz, were granite, and must have been procured from the adjoining continent. Supposing this monument to have been erected by an essentially primitive people, and at a period subsequent to the time when the present island of Gavr' Inis was a portion of the adjoining continent, what a miracle of mechanical power must have been exerted to drag these immense blocks to the shore, to place them on solid rafts, and, after disembarking them, to haul them to the opposite end of the island, where the tumulus is erected, adjoining a cliff! The paper was illustrated by three large sheets giving minute details of the general plan and section of the tumulus, with ground plan, elevations, and measurements of the stones composing the interior chamber—planned and drawn in 1869 by Sir Henry Dryden, Bart., and Rev. W. C. Leukis—together with 21 sheets of drawings of the sculptures on the stones, executed by Sir Henry Dryden. No capstone, and only one pavement-stone, was found sculptured. Twenty-two of the upright stones were profusely covered with sculptures, of the intended significance of which, whether ideographic, symbolic, or intended merely for ornamentation the author could offer no explanation.—Mr. Conwell also exhibited two series of drawings from the cairns on Sliabh-na-Caillighe, one to show the kindred character of the ancient sculptures of Ireland and Brittany, and the other the sculptures on twenty-eight inscribed stones in a single cairn on Sliabh-na-Caillighe, exhibiting an elaborate diffuseness and a variety of characters unequalled in any single cairn hitherto opened and described in any part of the world.—Professor R. S. Ball read a paper "On the small oscillations of a rigid body about a fixed point under the action of any forces, and more particularly when gravity is the only force acting."—Dr. Sigerson read an account of some examinations of the minute organisms found floating in the air of cities, comparing them with those met with in the sea breezes and in country air.

Royal Geological Society of Ireland, February 9.—Mr. G. Dixon in the chair. Professor Macalister read the Annual Report of the Council. The Rev. Professor Haughton, M.D., read a paper "on the mineral constituents of the granites of Scotland." Dr. J. E. Reynolds exhibited a new mode of exhibiting ordinary hand specimens of minerals to a class, by means of the lime light.

Institution of Civil Engineers in Ireland, February 9.—Mr. J. Ball Greene in the chair. The chairman delivered the annual address.

GLASGOW

Geological Society of Glasgow, January 27.—Mr. John Young, vice-president, in the chair. On the "Sutherlandshire gold-fields." Mr. William Cameron. The author referred to a

paper he had read before this society in 1866 upon the Auriferous Rocks and Drifts of Victoria, in which he stated that it was possible there might yet be found in Scotland fields where, with modern appliances, gold might be profitably worked. This conjecture has since been realised as a fact. He exhibited a rough-sketch map, showing the geographical position and geological structure of the gold-bearing districts of Scotland, also several interesting sections of the rocks and drifts in the vicinity of Kildonan, describing the prominent geological features of the country as lower Silurian, consisting of mica schist, gneiss, granite, chloritic schist, &c., with occasional quartz veins. No discovery of gold *in situ* had yet been made, and the question as to the true matrix of the Sutherland gold had yet to be decided. In regard to this question, it was pointed out that the materials associated with gold in the drifts are the same as those of the surrounding rocks. Moreover, the gold of each stream varies in character, apparently pointing to some local peculiarity rather than to a glacial origin. The chairman said he could not detect glacial striae in the drift, which resembled usual river gravel. Dr. Boyce agreed with Mr. Cameron as to the probable local origin of the gold.

NORFOLK

Norfolk and Norwich Naturalists' Society, January 25.—The president, the Rev. J. Crompton, in the chair. Two Richards pipits, two shore larks, an immature goshawk, and a fulmar petrel were exhibited by Mr. Gunn, all procured on the Norfolk coast during the present winter. The Rev. J. A. Lawrence, of Bergh Apton, exhibited some remarkable fasciated stems of the holly (*Ilex aquifolium*), one specimen resuming its ordinary growth at the summit, the branches into which it separated being clothed with leaves in the usual manner.—Mr. Stevenson read a paper on the rare birds which have visited us during the past autumn and winter, in which he stated that no less than thirteen shore larks had been killed on the Norfolk coast between the 7th of November and the 12th of January. Of this species, at one time considered a very great rarity, thirty-two specimens have been procured in Norfolk since 1850. Of those recently obtained, it was remarkable that only four out of thirteen proved to be males, whereas out of eleven examples killed between 1830 and 1862, all were males but two; but in the winter of 1866-7, four pairs were males and females. Six specimens of Richards pipits had been procured in Norfolk; and the present season was remarkable for the number which had been obtained in other and more southern counties, amounting to eleven examples in the neighbourhood of Brighton alone. This species was apparently a bird of passage, but out of its ordinary line of migration, when thus accidentally met with upon our Eastern coast. The goshawk may now be ranked amongst the rarest of our raptorial visitants. He knew of only ten examples procure d in Norfolk during the last forty years, of which all but two were young birds. Mr. Stevenson alluded to the unusual number of woodcocks killed during the past autumn, including a strange melanoid variety killed near Cromer. He mentioned the following birds as having been killed on the coast in October and November:—the pomarine skua, Buffon's skua, purple sand-piper, little gull (immature), and a considerable number of storm petrels, some of which had been found far inland. Mr. Southwell stated that the food of one of the Richards pipits, which he examined, consisted of a small species of lady-bird, and that two of the shore larks (which were very fat) had been feeding entirely on seeds of *Arenaria peploides*.—Mr. Crowfoot, of Beccles, read a paper on rare European birds, their nests and eggs, and exhibited eggs of the wall creeper (*Tichodroma muraria*), taken in Switzerland; Baillon's crake, from Potter Heigham, Norfolk, in 1866; the little crake, and little gull, the latter eggs taken on 31st of May, on Lake Ladoga.

PARIS

Academy of Sciences, February 7.—M. C. Sainte-Claire Deville communicated a note by M. C. Naudin, describing an extraordinary fall of snow at Collioure, in the Eastern Pyrenees. This fall commenced on the 21st January, about 5 A.M., and lasted until the morning of the 23rd, or for at least forty-four hours. M. Naudin estimates the average thickness of snow which fell during this period at 0.80 metre (about thirty-two inches); the thermometer during the fall departed very little from the freezing point (0° C). Great damage was done to the olive-trees, which were broken by the weight of the snow, but the author stated that palms, although pressed flat by the snow and afterwards encased in ice for ten or twelve days, received no

injury.—M. de Saint-Venant presented a report on a memoir by M. Maurice Lévy, entitled "An essay on a rational theory of the equilibrium of recently moved soils, and its applications to the calculation of the stability of supporting walls," supplementing it by a memoir of his own on the approximate determination of the thrust exerted by soils without cohesion, against a wall of a certain inclination.—M. E. J. Maumené presented a memoir on the general theory of chemical action, embodying a fresh proof of the breaking down of the chemical type in the so-called actions of substitution.—M. Delaurier forwarded some investigations on thermo-electricity, M. de Plagniol a further note on the silk-worm disease (*Moris-flats*), and M. Gaudin a letter relating to his mode of manufacture of artificial gems.—M. Bontemps offered for the acceptance of the Academy some manuscript works of M. Charles, who first employed hydrogen gas in balloons.—M. Faye communicated a note by M. Laussedat on the application of the graphic method to the prediction of eclipses of the sun; and also two notes by M. Heis on observations of the zodiacal light and of the aurora borealis at Münster in Westphalia.—A note was received from M. H. de Kéricuff on the determination of the parallax of Venus.—The fourth and concluding portion of the paper by M. Piarron de Mondesir, "On a new method for the solution of mechanical problems," was presented by M. Sainte-Claire Deville, who also communicated a paper by MM. L. Troost and P. Hautefeuille "On the heat of combination of silicium with chlorine and oxygen," to which he appended some remarks.—Other chemical papers communicated were:—"On a new method for the synthesis of the organic acids," by M. Berthelot, and "On the simultaneous formation of isomers in definite proportions," by M. A. Rosenstiehl.—M. E. Becquerel communicated a note by M. E. Bouchotte on a simplification of Holtz's electrical machine, and on a process for the estimation of the relation existing between the dynamical work expended and the electricity produced.—MM. A. Béchamp and A. Estot presented a note "On the nature and origin of the blood-corpuscles," in which they maintain that these globules are "aggregations of microzymata," which may become developed into Bacteria, Bacteridia, &c.—M. Lacaze-Duthiers communicated a valuable paper "On the organisation of the *Aspergillum javanum*."—A note by M. G. Coiteau on the genus *Asterostoma*, a group of fossil sea-urchins, probably of cretaceous date, was communicated by M. de Verneuil. The author described two new species from Cuba, viz., *A. jimenoii* and *A. cubensis*; only a single species was previously known.—A note by M. Gorseix on the present state of the volcano of Santorin was also read, and M. F. Lenormant presented a note on the antiquity of the ass and horse among the Aryan peoples.

BERLIN

Royal Prussian Academy of Sciences, November 8, 1869.—M. Hagen read a paper on the movement of water in tubes directed vertically downwards.—Prof. Ehrenberg communicated an extract from a letter received from Dr. Julius Haast, of Canterbury, New Zealand, describing his discovery of an old dwelling of moa-hunters, with its cooking-places and other objects of interest. The stone implements found in this place were made of flint, and not polished; they resembled those found at Amiens. Dr. Haast considers that his researches confirm the opinion that the moa-hunters belonged to a different race from the Maories, who, he added, have no tradition concerning the former existence of the extinct gigantic birds.

November 25.—Prof. Poggendorff read a long and elaborate paper on Holtz's rotation electricity and the force manifested by it, which he regards as the most powerful yet produced by frictional electricity.—Prof. W. Peters communicated descriptions of some new species of Saurian reptiles and Batrachia, namely: *Polychrus (Chaunolemus, subg. n.) multicarinatus*, from Costa Rica; *Tropidolepisma Richardi*, from North Australia; *Gymnodactylus Steudneri*, from Sennaar; *Cyclorhamphus fasciatus*, from Chili; and *Hyla gracilentia*, from North-east Australia.—Professor Hoffmann read a memoir on the sulphuretted urea-compounds, and another upon the action of iodine upon thiobenzamide.—A supplement to the November *Monatsbericht* contains M. du Bois-Reymond's memoir on the movement of magnets under the influence of moisture.

VIENNA

Imperial Geological Institution, January 4.—A note by M. von Lipold relating to M. Kreczi's views on the "colonies" of the Silurian basin of Bohemia was communicated by Mr. J. Barrande, who also presented his reply to M. Lipold's remarks.

M. J. Rumpf presented a notice of the magnetic pyrites of Leoben in Carinthia, and of crystals of magnesite from Maria-Zell in Styria. M. C. von Ettingshausen read a paper on the fossil flora of Sagor in Carniola, which presents the characters of the Aquitanian flora. Prof. E. Suess noticed the occurrence of *Fusulina* in the upper carboniferous limestone of the Southern Alps, which he had already compared with the Russian *Fusulina*-limestone. The species found agrees with the *F. robusta* of Meek, from California. Abich has described a *F. spherica* from the upper carboniferous limestone of Armenia, which is probably identical with *F. robusta*. *F. cylindrica* occurs in Spain. M. Karl von Hauer communicated a paper on the occurrence of sulphur near Szwoyowice in Galicia; and M. K. M. Paul exhibited the geological map of the northern parts of the counties of Zemplin and Ungh in Hungary, and made some remarks upon the geology of the district.

PHILADELPHIA

Academy of Natural Sciences.—August 17.—Dr. Leidy made some remarks on a tooth of *Equus fraternus*, reading an extract from a letter by T. C. Broadhead relating thereto.—A paper on "Brevoortia" by Alphonzo Wood was read.

September 7.—Mr. Meehan made some remarks upon the development of the buds of plants. He said it was well known that all vegetable physiologists taught there were two classes of buds in plants—one called adventitious buds, which had a kind of nomadic existence, the other axillary buds, which were supposed to owe their origin to the leaf from the base of which they sprang. It was customary to speak of these as the parent leaves of the axillary buds. He would show that the leaf not only did not aid the axillary bud formation, but was rather a foe to bud development. He exhibited vigorous shoots of the Kentucky coffee and honey locust trees, and hichorins of walnuts, showing what had either been entirely overlooked by other botanists or passed over of no importance, that there were in these two or three buds instead of the usual axillary bud, one above another in direct line, and that in all these instances the farthest removed from the base of the leaf, and, of course, the one the least under its influence, was the largest and best developed. He gave the results of extended observations as proof of the same principle from single bud cases. He exhibited specimens of some maple shoots of the present season's growth.—Mr. C. H. Redfield stated that the *Aspidium aculeatum* (L.), though widely distributed over the globe, had, in the United States, been restricted, as was supposed, to the mountains and mountain gorges of New Hampshire, Vermont, and Northern New York, and to Northern Minnesota. He had, however, recently found it growing in abundance in the Stony Clove of the Catskill Mountains, about two degrees farther south than it had before been noticed, and under conditions very similar to those in which it grows in the notch of Mount Mansfield, Vermont.

October 5.—A written communication was received from Prof. Emnis, entitled "Meteors, their composition and the Cause of their Ignition," and another, "On variations in the genus *Agriotilus*," by Elliott Cours, A.M., Ph.D.

October 12.—Mr. Meehan presented a paper for publication, entitled "On the Law of Development in the Flowers of *Ambrosia artemisiifolia*." Mr. Meehan accompanied the presentation with verbal remarks illustrated by the plants.

October 19.—Mr. A. H. Smith made some remarks in regard to a plant discovered some years back by Michaux, and named by him *Carex miliaris*. Some time ago, near Moosehead Lake, Mr. Smith discovered plants which, when submitted to Gray, were called by him *Carex retundata*, and *Carex pulla*. These plants were immature; afterwards procuring perfect plants Mr. Smith thought that they were identical with the *Carex miliaris* of Michaux.

December 21.—Prof. Cope made some remarks on a cranium of the *Hyperaodron bidens* from the coast of Rhode Island, presented by Samuel Powell of Newport. He stated that it was a female which entered the harbour of the latter place with a calf. A male was some time after cast ashore dead near Dennis, Mass., and was preserved complete in the Mus. Comp. Zoology, Cambridge. (See Allen, Mammals, Massachusetts.) He said that the muzzle of the female was longer than represented for European specimens, but that of the male was as short, and that no difference could be detected in the skeleton of either. He, therefore, retained the name *H. bidens*. He stated that *Mesoplodon Sowerbiiensis* also occurred on the coast of Nantucket. He next exhibited the left

ramus of the mandible of a finner whale of the miocene of Edgecombe Co. North Carolina. He pointed out its characters were nearest those of the *Eschrichtius cephalus*, but that there was a groove inside the upper edge of the jaw. He called it *Eschrichtius polyporus*. He exhibited a number of remains of fossil reptiles from Sampson Co. North Carolina, of cretaceous age, which were intrusive in miocene beds. Among these were humerus, tibia, fibula, metatarsus, caudal vertebra, and, perhaps, cervical vertebra and dermal bone of a gigantic Dinosaur, found together by Prof. H. C. Kerr, Director of the Geological Survey of North Carolina. The remains indicated a species having the same general form and size as the *Hadrosaurus Foulkei*. The caudal vertebra was of very different form, and resembled more that of *Hylæosaurus minus* the diapophysis. This vertebra was elongate, depressed, and angulate. The animal presented various other points distinguishing it from *Hadrosaurus*, and was named *Hypsiberma crassicauda*.

Two caudal vertebrae of another animal from the same county, but different locality, indicated a true *Hadrosaurus*. One, near the thirtieth caudal, was twice the size of that of *H. Foulkei*, the vertical diameter of the centrum being 4.5 inches. It presented so many peculiarities of form that Prof. Cope thought it to have belonged to a species distinct from *H. Foulkei*. A caudal apparently terminal was shorter than the same in that species. He named it *Hadrosaurus tripos*. Another reptile from the same locality was indicated by an elongate conic tooth. He named it *Polydectes biturgidus*.

January 4.—Dr. Linz exhibited the broken extremity of the snout of a large extinct mammal brought by Dr. Hayden from Colorado Territory, which resembled in some respects the genus *Sivatherium*, especially in presenting a horn core on each side of the front. The nasals were even shorter than in *Sivatherium*, and the horn cores appear to be in advance of the orbits. He suggested that it might belong to *Titanotherium*, but named it *Megacerops coloradensis*. He stated that he had received from the same region remains of a large reptile allied to *Porcilopleurum*. Prof. Cope exhibited the ischiatic bones of two *Dinosauria*. One of these, the *Megadactylus polyzebus* of Hitchcock, had probably been one of those that left its tracks in the strata of the Connecticut valley sandstone. With these a subround bilobed impression had frequently been found, just behind the heels on the median line. This he showed to be the impression of the extremities of the ischia. These bones were directed backwards, and for the posterior half of their length were in close contact, forming an elongate rod, on which the animal rested when in a sitting position. The structure in *Laclaps* was shown to be quite similar.—Prof. O. C. Marsh, of Yale College, exhibited a tooth of a new species of Rhinoceros from the miocene of Squankum, New Jersey, which he regarded as representing a species distinct from those already known. He called it *R. matutinus*, and stated that it was the first species discovered east of the Mississippi. He exhibited several vertebrae of a *Hadrosaurus* from the upper cretaceous greensand of Bamerbaro, New Jersey, which belonged to a species of smaller size than the *H. Foulkei*. He regarded it as distinct, and called it *H. minor*. He exhibited a large tooth of a mosasauroid reptile, of a shorter and thicker form than usual, and which had been taken from a fragment of a jaw, which indicated a species with short, massive muzzle. It is from North Carolina. He proposed to call it *Mosasaurus crassidus*. The vertebra of another Mosasauroid was exhibited, which he referred to the genus *Liodon* (regarded by Prof. Cope as synonymous with *Macrosaurus*), and which presented peculiarities which separated it from *L. lacris* and *L. validis*. Its diapophyses were prolonged to an unusual distance on the caudal series of vertebrae. He proposed for it the name of *Liodon laticaudus*.—Thomas Meehan referred to his former observations that the so-called leaves of coniferæ were but phylloid branchlets, and that the real leaves existed chiefly in the form of adnate scales. In some coniferæ these adnate leaves had the power of elongating into free foliaceous awns. The larch was an instance. In *Pinus* this had never been noticed. He now exhibited specimens of *Pinus serotina*, in which the leaf scales under each fascicle of phylloids had developed into leafy awns two inches in length, demonstrating the correctness of his original observation. He further remarked that those adnate true leaves were as different on different species, as the leaves of other plants, and afforded excellent specific characters, much better in fact than many derived from the number of phylloids in a fascicle, or even from many points in the cones. Specimens to illustrate this were exhibited.

BUFFALO

Society of Natural Sciences, December 9, 1869.—Annual meeting.—The president, G. W. Clinton, in the chair. The following officers were elected for the ensuing year:—President, Geo. W. Clinton, LL.D.; vice-presidents, A. T. Chester, D.D., Everard Palmer, and Henry A. Richmond; treasurer, James Sweeney; librarian, Otto Bessar. Dr. Bird, of Sioux City, Iowa, and Johnson Pettit, of Grimsby, Ontario, were chosen corresponding members.

BOSTON

Society of Natural History, December 15, 1869.—The following paper was presented:—"Notes on the mammals of Iowa." By Mr. J. A. Allen.

The list of the mammals given in this paper is based mainly upon notes gathered during three months spent in the state of Iowa in the summer of 1867, for the purpose of collecting and studying its animals and plants. A few species have been inserted upon the authority of other authors, while a few others are given from their known occurrence in nearly all the adjoining states, though not, to the author's knowledge, yet reported from this. The whole number enumerated is forty-eight, and probably but two or three remain to be added to perfect the list of the indigenous mammals of the state. Attention is also called to such others as are most likely to occur. If three or four northern ones be found to reach the northern parts of the state, the whole number, including the introduced house-rats and mice, may be increased to about fifty-five or fifty-six, which is a number somewhat greater than is found in many of the Atlantic states, excluding the marine species, the seals and cetaceans. Iowa being situated in a prairie region, it necessarily differs considerably in the general character of its fauna, and especially in respect to its mammalia, from that of the wooded portion of the United States to the eastward, as all who have given attention to the geographical distribution of animals must be aware. Yet we do not in this state fairly enter upon the so-called Middle Province of the continent, which differs so markedly, both in fauna and flora, from the Eastern Province. A great change in the fauna and flora is met with, however, at the point of junction of the wooded and woodless regions of the eastern half of the continent, which in the latitude of Iowa occurs more than a hundred miles to the eastward of that state. At this point as great and as abrupt a change occurs as usually takes place between two contiguous faunal districts, one of which lies to the north or to the south of the other, or where the line of division is an isothermal one, separating different climatic and zoological zones. A few only, if any, of the species embraced in this list seem to find their eastern limit of distribution in this state; but, with two or three exceptions, they range through southern Wisconsin, Illinois, and even into north-western Indiana and southern Michigan, or to the eastern limit of the prairies. Also, with very few exceptions, none are restricted to it in either their northward or southward range. A few of the more northern species, whose southern range is restricted to the southern border of the Alleghanian fauna, may reach the northern counties of Iowa, as a few essentially southern species may approach, or even be found occasionally within its southern borders. Iowa is hence mainly embraced within the Carolinian fauna, at least so far as its mammals, birds, and reptiles are concerned, though generally heretofore supposed to belong, in great part, at least, to the Alleghanian. Among the strictly prairie mammals represented, are at least four rodents (*Spermophilus tridecemlineatus*, *S. Franklinii*, *Geomys bursarius*, *Hesperomys michiganensis*), two carnivores (*Canis latrans*, *Taxidea americana*), and at least one insectivore (*Scalops argentatus*). Only one eastern species, the red squirrel (*Sciurus hudsonius*), appears to find at the prairie line its western limit, if, as some have supposed, it be true that this animal does not range across the continent. Hence the difference between the mammalian fauna of the prairies of the Upper Mississippi valley and that of the forest region to the eastward consists in the addition of a number of species peculiar to the prairies. Since all the larger species of mammalia are everywhere rapidly disappearing before the revolutionising influences of civilisation, and since great and general changes occur in the faunal and floral features of every country when brought under cultivation, it becomes a matter of unusual interest to preserve as correct a record as possible of the primitive conditions of our own country in this respect, for comparison with its subsequent altered status, as well as a history of the change.

DIARY

THURSDAY, FEBRUARY 17.

ROYAL SOCIETY, at 8.30.—On a Distinct Form of Transient Hemipia: Dr. Hubert Airy.—Account of the Great Melbourne Telescope, from April, 1868, to its commencement of operations in Australia in 1869: A. Le Sueur.
LINNEAN SOCIETY, at 8.—On the Tree Ferns of British Sikkim: Mr. Scott.
CHEMICAL SOCIETY, at 8.
ZOOLOGICAL SOCIETY, at 4.
ANTIQUARIES, at 8.30.—On Some Monastic Inventories: Rev. M. E. C. Walcott.—On Some Roman Antiquities: S. Sharp.
ROYAL INSTITUTION, at 3.—On the Architecture of the Human Body: Prof. Humphry.

FRIDAY, FEBRUARY 18.

ROYAL INSTITUTION, at 8.—Theories of the Physical Forces: Mr. W. K. Clifford.
PHILOLOGICAL SOCIETY, at 8.30.
GEOLOGICAL SOCIETY, at 1.—Anniversary Meeting.

SATURDAY, FEBRUARY 19.

ROYAL INSTITUTION, at 3.—Science of Religion: Prof. Max Müller.

MONDAY, FEBRUARY 21.

VICTORIA INSTITUTE, at 8.—Spontaneous Generation, or the Problem of Life: Rev. Prof. Kirk.
LONDON INSTITUTION, at 4.
MEDICAL SOCIETY, at 8.
ENTOMOLOGICAL SOCIETY, at 7.
ROYAL ASIATIC SOCIETY, at 3.

TUESDAY, FEBRUARY 22.

ETHNOLOGICAL SOCIETY, at 8.—On Recent Archaeological Discoveries in Yorkshire: C. Monkman, Esq.—On the Natives of Naga, Philippine Island: Dr. Jagor.
INSTITUTION OF CIVIL ENGINEERS, at 8.
ROYAL MEDICAL AND CHIRURGICAL SOCIETY, at 8.30.
ROYAL INSTITUTION, at 3.—On the Architecture of the Human Body: Prof. Humphry.

WEDNESDAY, FEBRUARY 23.

ARCHAEOLOGICAL ASSOCIATION, at 8.
GEOLOGICAL SOCIETY, at 8.—Additional observations on the Neocomian Strata of Yorkshire and Lincolnshire, with notes on their relations to the Beds of the same age throughout Northern Europe: By Mr. J. W. Judd.—On Deep-mining with relation to the Mineral-bearing Strata in the S.W. of Ireland: By Mr. Samuel Hyde. Communicated by Mr. R. Etheridge.—On the Structure of a Fern-stem from the Lower Eocene at Herne Bay, and on its allies, recent and fossil: By Mr. W. Carruthers.
SOCIETY OF ARTS, at 8.—On Economy of Fuel for Domestic purposes: Mr. D. Galton, C.B.

THURSDAY, FEBRUARY 24.

ZOOLOGICAL SOCIETY, at 8.30.—On the Classification of the Capitonidae: Messrs. Marshall.—On the White Wag-tails of China: Mr. R. Swinhoe.—On the Deer living in the Society's Menagerie: Mr. Selater.

BOOKS RECEIVED

FOREIGN.—Les Oiseaux décrits et figurés d'après la Classification de Georges Cuvier mise au courant des progrès de la science, 72 Planches, les espèces remarquables et les caractères, génériques tirés du bec et des pattes: texte explicatif; Figures Coloriées.—Pétrifications remarquables des Alpes Suisses, le Corallien de Winimis; W. A. Ooster; avec une Introduction Géologique et 24 Planches des Fossiles: C. de Fischer-Ooster.—Monographie der Molluskengattung Venus: Linné; Dr. Edward Römer.—Fossile Flora der jüngsten Steinkohlenformation und des Rothliegenden im Saar-Rhein Gebiete: Ch. Ernst Weiss. (Williams and Norgate.)

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