acic legs becoming shorter towards the pygridium, but without any essential differences amongst each other. Each limb consists of two nearly equal members, one of which was evidently used for crawling, and the other for swimming. These two members and their joints may be correlated with certain typical forms of Crustacean legs among the *Schizopoda*, *Cumacea*, and *Decapoda*, and may be described in the same terms.—On the diamond in the Cañon Diablo meteoric iron and on the hardness of carborundum, by George F. Kunz and Oliver W. Huntingdon. The carborundum made by Mr. Acheson, of Pittsburg, is capable of scratching most varieties of corundum, but not the diamond.

SOCIETIES AND ACADEMIES.

LONDON.

Anthropological Institute, December 12.—Prof. A. Macalister, F.R.S., President, in the chair.—Mr. Cuthbert E. Peek exhibited some specimens of fishing-line made of human hair, some needles constructed from ribs of feather, and two message-sticks from the extreme north of Queensland.—Mr. W. L. Duckworth read a paper on the collection of skulls of Aboriginal Australians in the Cambridge University Museum, and the following papers were also read:—On an unusual form of rush basket from the northern territory of South Australia, by Mr. R. Etheridge, jun.—On a modification of the Australian Aboriginal weapon, termed the leonile, langeel, bendi or buccan, by Mr. R. Etheridge, jun.—An Australian Aboriginal musical instrument, by Mr. R. Etheridge, jun.—The Aborigines of North-West Australia, by Mr. P. W. Bassett-Smith.—Rites and customs of Australian Aborigines, by Mr. H. B. Purcell.—Japanese onomatopes and the origin of language, by Mr. W. G. Aston.

Mathematical Society, December 14.—A. B. Kempe, F.R.S., President, in the chair.—On the stability of a deformed elastic wire, by A. B. Basset, F.R.S.—This paper commences with a discussion of the different methods of determining the stability of a deformed elastic wire which is in equilibrium, and then proceeds to discuss two special problems. When a naturally straight wire is deformed into a helix having m convolutions, the helical form is unstable unless its pitch is greater than $\sec^{-1} 2m$. This result shows that it is impossible to deform the wire into a helix of *small* pitch and having a great many convolutions, such as the spring of an ordinary spring-balance, unless the wire is given a permanent set. The two special cases in which the terminal stresses consist, (1) of a thrust and a flexural couple, (2) of a couple alone, are also noticed; and in the latter case the helix is unstable when the length of the wire exceeds half a convolution. When the natural form of the wire is a circular coil, which is unrolled and the ends joined together without twist, so that the wire forms a circular ring, the ring will be unstable when the length of the wire is greater than about one and a half convolutions. The ring is stable from displacements in its plane, and consequently will not collapse like a boiler flue; but it is unstable for displacements perpendicular to its plane, which involve torsion as well as flexion. The stable figure will consequently consist of a closed tortuous curve.—Papers were also read by R. J. Dallas, on the linear automorphic transformations of certain quantics; and by Dr. Hobson, F.R.S., on Bessel's functions and relations connecting them with spherical and hyperspherical harmonics.—Messrs. Love, Greenhill, Macmahon, and the President spoke on the subject of the communications.—The following papers were taken as read:—A theorem of Liouville's, by Prof. G. B. Mathews; note on non-Euclidian geometry, by H. F. Baker; note on an identity in elliptic functions, by Prof. L. J. Rogers; and note on a variable seven-points circle analogous to the Brocard circle of a plane triangle, by J. Griffiths.

Royal Meteorological Society, December 20.—Dr. C. Theodore Williams, President, in the chair.—Mr. C. Harding gave an account of the great storm of November 16 to 20, 1893. This storm was the most violent of recent years, and, so far as anemometrical records are concerned, the wind attained a greater velocity than has previously been recorded in the British Islands. The velocity of the wind was 96 miles in the hour from 8.30 to 9.30 p.m. on November 16 in the Orkneys, where the hurricane burst with such suddenness that it is described as like the shot of a gun, and the wind afterwards attained the very high rate of 90 miles and upwards, in the hour, for 5 consecutive hours. At Holyhead the storm was terrific; the anemometer recorded a wind velocity of 89 miles in the hour, and it was 80 miles or above for 11 hours, while the force of a whole gale, 65 miles an hour and upwards, was maintained for 31 hours, and for 4½ days the mean hourly velocity was 54 miles. Many of the gusts were at the rate of 115 miles an hour, and at Fleetwood a squall occurred with the wind at the rate of 120 miles in the hour. The storm was felt over the entire area of the United Kingdom, and the wreck returns show that disasters occurred with almost equal frequency on all coasts. Four weeks after the storm the official records gave the total loss of life on our coasts as 335, while there were 140 vessels which had been abandoned, or had foundered, stranded, or met with other severe casualty, involving either loss of life, or saving of life by some extraneous assistance. There were 600 lives saved on our coasts by aid of the Lifeboat Institution and other means. The author has tracked the storm from the neighbourhood of the Bahamas on November 7, across the Atlantic and over the British Islands to Central Europe on November 20.—The other papers read were on rainfall and evaporation observations at the Bombay Waterworks, by Mr. S. Tomlinson; and on changes in the character of certain months, by Mr. A. E. Watson.

DUBLIN.

Royal Dublin Society, November 22.—Prof. W. N. Hartley, F.R.S., in the chair.—Prof. T. Johnson communicated a paper on the systematic position of the Bangiaceæ. The author, with Berthold and others, regards the group as true Florideæ, and discusses in his paper the views expressed by Schmitz, in a recent number of *La Nuova Notarisia*, against their Floridean nature—Mr. Thomas Preston gave an elementary explanation of the system of waves attending a bullet moving at a high speed through the atmosphere.—Mr. W. E. Adeney read a note on the present condition of the water in the Vartry reservoir at Roundwood, co. Wicklow, and Mr. Richard J. Moss gave the results of an examination of the Vartry water as at present supplied to Dublin.

PARIS.

Academy of Sciences, Annual Public Meeting, December 18.—M. de Lacaze-Duthiers in the chair.—After some commemorative words on the deaths of Sir Richard Owen, Kummer, and de Candolle, Foreign Associates, and those of Chambrelent, Admiral Pâris and Charcot, Members of the Academy, by the President, M. Bertrand, one of the Secretaries, announced the names of those to whom prizes had been awarded. In *Geometry*, the Prix Francœur was awarded to M. G. Robin for mathematical physics, and the Prix Poncelet to M. G. Kœnigs, for geometrical and mechanical work.—*Mechanics:* The extraordinary prize of 6000 francs offered by the Département de la Marine for contrivances increasing the efficiency of the Navy, was distributed among M. Bourdelles (for lighthouse illumination), M. Lephay (compass with luminous index), and M. de Frayssеix (system of optical pointing); the Prix Montyon of 700 francs to M. Flamant (hydraulics), the Prix Plumey of 2500 francs to M. Lebasteur (steam engine appliances); the Prix Fourneyron of 500 francs, to M. Brousset (fly-wheels).—*Astronomy:* The Prix Lalande of 540 francs, to M. Schulhof (Comets); the Prix Valz of 460 francs, to N. Berberich (Minor Planets). The Prix Janssen of a gold medal, to Mr. Samuel Langley (Astronomical Physics).—*Physics:* The Prix La Caze of 10,000 fr., to M. E. H. Amagat (gases and liquids).—*Statistics:* The Prix Montyon of 500 fr., to Dr. Marvand (diseases of soldiers).—*Chemistry:* The Prix Jecker of 10,000 fr., to M. D. Forcrand and M. Griner in equal parts, with a special prize to M. Gautier.—The Prix La Caze of 10,000 fr., to M. Lemoine (Phosphorus Compounds).—*Mineralogie and Geology:* The Grand Prix, to M. Marcellin Boule (The Central Plateau of France). The Prix Bordin of 3000 fr. was distributed amongst MM. Bourgeois, Gorgen, Michel, and Duboin for their researches in mineral synthesis. The Prix Delesse of 1400 fr., to M. Fayol (Commentry Strata). The Prix Fontannes of 2000 fr., to M. R. Zeiller (Palæontology).—*Botany:* The Prix Desmazières of 1600 fr., to M. C. Sauvageau (Algæ). The Prix Montagne, to MM. Cardot (Mosses) and Gaillard (Fungi).—*Agriculture:* The Prix

Morogues, to M. Millardet (Mildew).—*Anatomy and Zoology.* The Prix Thore, to M. Corbière (Muscineæ).—*Medicine and Surgery:* The Prix Montyon was distributed between MM. Huchard (Heart Diseases), Delorme (Army Surgery), and Pinard and Varnier (Pathological Atlas). The Prix Barbier, 500 fr. each to MM. Sanson (Heredity) and Dr. Mauclaire (Osteo-Arthritis). The Prix Bréant, being the interest on a sum of 100,000 francs offered for a cure for cholera, was distributed amongst MM. Netter and Thoinot (French Cholera, 1892) and MM. Grimbert and Burlureaux (Treatment of Tuberculosis by Creosote Injections). The Prix Godard of 1,000 francs, to Dr. Tourneux (Physiological Atlas). The Prix Serres of 7500 francs, to M. Pizon (Blastogenesis), with small portions to MM. Sabatier (Spermatogenesis) and Letulle (Inflammation). The Prix Bellion of 1400 francs, to Dr. C. Chabrié (Physiology of the Kidney) and Dr. Coustan (Fatigue). The Prix Mège to Dr. Herrgott (History of Obstetrics). The Prix Lallemand of 1800 francs, to M. Trolard (Venous System).—*Physiology:* The Prix Montyon of 750 francs, to M. Laulanié (Respiration) and MM. Abelous and Langlois (Renal Capsules). The Prix La Caze, of 10,000 francs, to M. d'Arsonval (Physiological Effects of Electricity). The Prix Pourat to M. E. Meyer (Renal Secretion). The Prix Martin-Damourette, of 1400 francs, to Dr. Géraud (Albuminuria).—*General Prizes:* The Arago Medal to Mr. Asaph Hall (Satellites of Mars) and Mr. E. E. Barnard (Jupiter's First Satellite). The Prix Montyon, for improvements in unhealthy industries, was divided between MM. Garros (Porcelain Manufacture) and Coquillon (Fire-damp Meter). The Prix Trémont, of 1100 francs, to M. Jules Morin for his useful hydrostatic and other inventions. The Prix Gegner of 4000 francs to M. Serret. The Prix Petit d'Ormoz of 10,000 francs, to M. Stieltjes (Mathematics), and another of the same amount to M. Marcel Bertrand (Physics of the Globe). The Prix Tchihatchef of 10,000 francs, to M. Grégoire Groum-Grschimailo (The Pamirs). The Prix Gaston Planté, of 3,000 francs, to M. Blondlot (Electric Interference). Mme. de Laplace's Prize, consisting of Laplace's works, to M. Bès de Berc, of the École Nationale des Mines.

BERLIN.

Physical Society, December 1.—Prof. Schwalbe, President, in the chair.—Prof. Neesen demonstrated a method of coating aluminium with other metals. This consists in dipping the aluminium in a solution of caustic potash or soda, or of hydrochloric acid, until bubbles of gas make their appearance on its surface, whereupon it is dipped into a solution of corrosive sublimate to amalgamate its surface. After a second dipping into caustic potash until bubbles of gas are evolved, the metal is placed in a solution of a salt of the desired metal. A film of the latter is rapidly formed, and is so firmly adherent that, in the case of silver, gold, or copper, the plate can be rolled out or polished. When coating with gold or copper, it is well to first apply a layer of silver. When thus treated the aluminium may be soldered with ordinary zinc solder.—Dr. Wien spoke on the entropy of radiation.

Meteorological Society, November 7.—Prof. von Bezold, President, in the chair.—Dr. Arendt spoke on the transport of heat by means of aerial currents on the earth's surface, based on calculations derived from material provided by the Hamburg station. He first determined for each month of the year the direction and rate of the wind, from which he calculated the resultant volume of air transported over Hamburg. From the temperature and speed of the winds he obtained, under certain assumptions, numerical values for the amount of heat carried towards Hamburg during each month of the year.

December 5.—Dr. Vettin, President, in the chair.—Prof. Hellmann presented a book on "Snow-crystals," and gave an account of its contents, during which he discussed fully the structure and classification of snow-crystals. All the crystals belong to the hexagonal system, and are either flat or columnar. The radiating stars, the plates, and mixed forms belong to the first category; while the prisms and much more rare pyramids belong to the second.—Dr. H. Meyer communicated the results of his observations, made in conjunction with Prof. Köppen, on the cloud-conditions of various climates. They had rejected as valueless mean values based on determinations which are largely influenced by the personal opinion of the observer, and had in preference calculated the frequency of the occurrence of clouds. They had in this, for simplicity's sake, distinguished between three groups: (1) Complete absence of clouds; cloudiness zero. (2) Intermittent occurrence of clouds; cloudiness 1 to 9. (3) Total cloudiness represented by 10. Taking a series of stations in various climates, they had calculated and graphically represented the frequency of the three groups for the morning, midday, and evening for each month. It appeared that for Hamburg and the whole of middle and north Europe, in passing from the cold to the warm periods of both the day and year, the intermittent cloudiness increases; while complete cloudiness, which is most frequent in winter, and in the morning and evening, diminishes. Complete cloudlessness is always the most rare condition. The above characters change gradually towards the Mediterranean, even at Lesina, and more markedly at Alexandria. In mid-Asia, East Siberia, China, Batavia, and Rio Janeiro, and on the elevated station of Pike's Peak, and also on the Atlantic Ocean, the change in cloudiness in passing from winter to summer is reversed.

BOOKS and SERIALS RECEIVED.

BOOKS.—A Text-Book on Gas, Oil, and Air-Engines: B. Donkin, Jun. (Griffin).—An Elementary Treatise on Fourier's Series: Dr. W. E. Byerly (Boston, Ginn).—Uniplanar Algebra: Dr. J. Stringham (San Francisco, Berkeley Press).—Science and Hebrew Tradition: T. H. Huxley (Macmillan).—Dictionary of the Active Principles of Plants: C. E. Sohn (Baillière).—The Country and Church of the Cheeryble Brothers: Rev. W. H. Elliot (Selkirk, Lewis).—Hints to Travellers, 7th edition (Royal Geographical Society).—The Story of the Sun: Sir R. Ball (Cassell).

SERIALS.—Insect Life, Vol. 6, No. 2 (Washington).—Cabinet Portrait Gallery, Part 52 (Cassell).—Astronomy and Astro-Physics, December (Wesley).—Economic Journal, December (Macmillan).—Journal of the Franklin Institute, December (Philadelphia).—Internationales Archiv für Ethnographie, Band vi. Heft 6 (Kegan Paul).—Journal of the Royal Microscopical Society, December (Williams and Norgate).—Royal Geographical Society, Supplementary Papers, Vol. III. Part 5 (Murray).

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