of annealed iron wires under this rate of alternation is about 385. For oscillations of the same period, the wave-length along parallel copper wires varies directly with the diameter of the wires, the maximum difference observed being 5 per cent. with wires of 0·03915 and 0·1201 cm. diameter respectively.—The present status of high-temperature research, by Carl Barus. To clear away the anomalies now existing in high temperature data, either the boiling point of zinc must come down from 930° to 905°, or else the melting points of gold, silver, and copper must move up 30° or 40°, or both must move towards each other by corresponding amounts.—The recent eruption in the crater of Kilauea, by L. A. Thurston. This is a description of the subsidence of the lava lake on July 11, when its level fell 250 feet.—On solutions of metallic silver, by M. Carey Lea. The solutions previously described are all colloidal, and at the same time absolutely transparent.

*Wiedemann's Annalen der Physik and Chemie*, No. 10.—On pure water, by F. Kohlrausch and A. Heydweiler. (See Notes.)—Magnetic experimental investigations, by Carl Fromme. This paper deals with the self-induction and the electrostatic capacity of wire coils and their influence upon magnetic phenomena. Coils with bifilar winding are free from self-induction, and also from electrostatic capacity as long as their resistance does not exceed 1000 ohms. At 2000 ohms their capacity is already very considerable. Coils wound by Chaperon's method, *i.e.* with the direction of winding changing with each round, are perfectly free from capacity, and their self-induction is negligible. It is therefore quite feasible to determine their resistance by the alternate current method.—Examination of the Ketteler-Helmholtz dispersion formula, by Heinrich Rubens. The electromagnetic theory of dispersion, as developed by Herr von Helmholtz, is in complete accordance with the results obtained in the case of fluorspar, quartz, rock-salt, sylvine, and one of the heavy Jena silicate-flint glasses. The agreement extends over the whole region of the spectrum investigated, comprising 5½ octaves.—Bolometric investigations, by F. Paschen. This is a reply to Herr Ångström's criticism of his work on the absorption spectrum of carbonic anhydride.—On the infra-red dispersion of fluorspar, by F. Paschen. The spectrum of the fluorspar prism employed was calibrated by Langley's grating method. The best source of radiation was found to be a small piece of platinum foil coated with oxide of iron. The region of the spectrum examined extended from 0·8840 $\mu$ to 9·4291 $\mu$, and the corresponding refractive indices ranged from 1·42996 to 1·31612.—Change of volume during melting, by Max Toepler. The author investigated the number of cubic cm. by which a gramme of various elements expanded or contracted during melting. The list included eleven metals and five non-metals. He found that the coefficient of expansion of the elements in the solid state, and their change of volume during melting, show a definite relation to each other.—The depression of the freezing-point of a solvent by electrolytes, by Harry C. Jones. In the case of a solution of phosphoric acid of concentrations 0·077 and 0·146, the numbers obtained, 2·52 and 2·31, are in fair accordance with those obtained by Arrhenius, but not with those of Loomis.

## SOCIETIES AND ACADEMIES.

### LONDON.

Entomological Society, October 3.—The Right Hon. Lord Walsingham, F.R.S., Vice-president, in the chair.—Mr. W. F. H. Blandford exhibited specimens of a sand-flea, chigoe or nigua, received from Mr. Szigetváry, of the Imperial Maritime Customs, China, who had found them in the ears of sewer-rats trapped at Ningpo. Mr. Blandford stated that the species was allied to, but not identical with, the American species, *Sarcopsylla penetrans*, L., one of the most troublesome pests in Tropical America and the West Indies to man and various domestic and wild animals, the female burrowing into the skin, usually of the feet, but also of any other accessible region. He said that the distribution of the chigoe was recorded over Tropical America and the Antilles from 30° north to 30° south, and of late years it had established itself in Angola, Loango, and the Congo. Colonel Swinhoe, Mr. McLachlan, Lord Walsingham, Mr. Champion, Mr. J. J. Walker, Mr. Barrett, and others, took part in the discussion which ensued.—Mr. F. C. Adams exhibited a specimen of *Mallota cristaloides*, a species of Diptera new to Britain, taken by himself in the New Forest on July 20 last. He said that the species had been identified by Mr. Austen, of the British Museum, and that he had presented the specimen to the National Collection. Mr. Verrall made some remarks on the species and on the distribution of several allied species in the United Kingdom. Lord Walsingham, as a trustee of the British Museum, expressed his satisfaction at the presentation of the specimen to that institution.—Mr. Tutt exhibited specimens of a form of *Zygæna exulans*, well scaled, and with the nervures and forelegs of a decidedly orange colour, collected during the last week in July by Dr. Chapman in the La Grave district of the Alps, at a considerable elevation; also specimens of the same species taken by Dr. Chapman near Cogne, and others from the Grison Valley, which were less well scaled. He also exhibited Scotch specimens for comparison, and stated that he was of opinion that the latter were probably as thickly scaled as the continental ones, but that, owing to the differences in the climate of Scotland and Switzerland, collectors had fewer opportunities of getting the Scotch specimens in good condition.—Mr. P. M. Bright exhibited a remarkable series of varieties of *Arctia menthastri* from N. Scotland, also series of *Liparis monacha* (including dark varieties) and *Boarmia roboraria* from the New Forest; *Zygæna exulans*, from Braemar; *Noctua glareosa*, from Montrose and the Shetlands; *Agrotis pyrophila*, from the Isle of Portland, and Pitcaple, N.B.; red varieties of *Teniocampa gracilis*; and a specimen of *Sterrha sacraria*, taken at light, at Mudeford, in October, 1893; also living larvæ of *Eulepia cribrum*.—Mr. J. J. Walker exhibited a living specimen of a large species of Pulex, which he believed to be *Hystricopsylla talpæ*, Curtis, taken at Hartlip, Kent. Mr. Verrall and the chairman made some remarks on this and allied species.—Mr. K. J. Morton communicated a paper, entitled "Palæarctic Nemouræ."—Lord Walsingham read a paper, entitled "A Catalogue of the Pterophoridæ, Tortricidæ, and Tineidæ of the Madeira Islands, with Notes and Descriptions of New Species." In this paper sixty-six species of Lepidoptera belonging to these families were recorded as occurring in the Madeiras, of which thirty were noticed as peculiar to the Islands, twelve as common to the Madeiras and Canaries, of which two were not known as occurring elsewhere, and one extends its range only to North Africa. Over thirty species were added to the list, and one new genus, seven new species, and two new varieties were described. Mr. Jacoby and Mr. Bethune-Baker made some remarks on the species and their geographical distribution.—Mr. Blandford read a paper, entitled "A Supplementary Note on the Scolytidæ of Japan, with a list of Species."

### PARIS.

Academy of Sciences, October 15.—M. Lœwy in the chair.—The death of M. N. Pringsheim, on October 6, 1894, was announced to the Academy, and a short account of his work given by M. Bornet.—Determination, partly experimental and partly theoretical, of the inferior contraction of a bending fluid sheet, either depressed, submerged below, or adherent, on a weir having its up-river face vertical, by M. J. Boussinesq.—Observations of Gale's comet (1894, *b*) made with the great equatorial at Bordeaux Observatory by MM. G. Rayet, L. Picart, and F. Courty. A note by M. G. Rayet. The apparent positions of the comet on twenty-seven days between May 4 and July 31 are tabulated.—On the degree of incandescence of lamps, by M. A. Crova. The conclusions are given: (1) That the quantity of light emitted by a gas-burner per litre of gas used increases with the quantity of the combustible burnt per hour, whereas the degree of incandescence slightly diminishes, up to a maximum yield which should not be exceeded; (2) that, for lamps with incandescent substances, the maximum yield corresponds to the minimum amount of the combustible which must be burnt in order to obtain the maximum degree of incandescence.—Report on the memoir by M. Stieltjes, on "Researches on Continued Fractions." After a detailed consideration of the memoir, the report proceeds to say: "This work by M. Stieltjes is one of the most remarkable memoirs on analysis which has been written in late years."—Disappearance of the southern polar spot of Mars, by M. G. Bigourdan. The spot ceased to be visible on October 13.—First observations of the pendulum in the Alps of Dauphiny. The values obtained for the constant of gravitation are given below in column $g_0$, for comparison the values calculated for each place at latitude $\phi$ from the formula $g_\phi = 9{\cdot}78124(1 + 0{\cdot}005243\sin^2\phi)$ are ap-

pended. The values of $g_0$ are corrected to sea-level by means of the densities of subjacent formations taken from the most recent work.

| | $g_0$. | | $g_1$. |
|---|---|---|---|
| Paris ... ... .. | 9·81013 | ... | 9·81030 |
| Valence ... ... ... | 9·80640 | ... | 9·80682 |
| Grenoble... ... ... | 9·80603 | ... | 9·80705 |
| La Bérarde ... ... | 9·80530 | ... | 9·80682 |
| Marseilles ... ... | 9·80539 | ... | 9·80536 |

The variation of the observed from the calculated value at La Bérarde becomes less when a correction is made for the influence of the mass of the surrounding mountains, $g_0$ is then 9·80575.—On the infinitesimal transformations of the trajectories of systems, by M. Paul Painlevé.—On the reduction of the structure of a group to its canonic form, by M. E. Cartan.—Experimental researches on the congelation of sulphuric acid of different degrees of concentration, by M. Raoul Pictet. Four extensive series of experiments carried out on large volumes of the acid, in different ways and with all the precautions indicated by the study of the laws of crystallisation at low temperatures, yield concurrent curves which include the cases between pure $H_2O$ and pure $H_2SO_4$. This curve crosses the line of zero temperature five times (including origin with pure $H_2O$). On descending parts of the curve the liquid contains a larger proportion of acid than the solid, on ascending parts the inverse is the case; at the summits of the curve the titre of the liquid is the same as that of the solid. The maxima and minima do not, in general, correspond to definite hydrates.—Application of Trouton's law to the saturated alcohols of the fatty series, by M. W. Longuinine. The author finds that Trouton's constant is constant only for groups of similarly constituted substances, and varies from group to group. If M be the molecular weight, $r$ the latent heat of vaporisation, T the absolute temperature of the boiling point, $\frac{M r}{T} = 26{\cdot}34$ for fatty saturated alcohols. Water gives the value 25·86, ethers 21, hydrocarbons about 20. Formic and acetic acids appear to be exceptions giving the values 12·82 and 13·03. Acetic acid, however, gives 25·9 if the heat required to bring the vapour to the normal condition of $C_2H_4O_2$ be added to the latent heat. Probably formic acid is a similar case.—Action of chloride of sulphur on the copper derivatives of acetylacetone and benzoylacetone, by M. Victor Vaillant.—On estimations of glucose by cupro-alkaline liquids, by M. Fernand Gand.—On pine tar, by M. Adolphe Renard. A new hydrocarbon $C_{11}H_{22}$ is characterised; it is probably a member of the aromatic series.—Action of the sands and waters of the Sahara on cements and hydraulic limes, by M. Jules Perret.—On the homarian origin of crabs, by M. E. L. Bouvier.—On a disease of Ailanthus in the parks and promenades of Paris, by M. Louis Mangin. This disease is characterised as fungoidal, but the species of fungus causing it has not yet been determined.

### New South Wales.

Linnean Society, August 29.—Prof. David, President, in the chair.—On the Kuditcha shoes of Central Australia, by R. Etheridge, jun. The remarkable slippers described are in vogue among certain tribes toward the centre of the continent. They are made of human hair, interlaced with emu feathers, with a cementing medium of human blood in the sole. Their variously described functions—their use by the rain-maker, by the authorised agents in obtaining blood-revenge, and to disguise tracks when wife-hunting—were summarised and discussed; and it was pointed out that it is not improbable that their use was not so much to conceal tracks as to disguise the direction in which the wearer was travelling, the heel and toe being alike.—A list of exotic trees and shrubs which have become hosts for certain Australian parasitical plants, by Fred Turner. Indigenous members of the N.O. *Loranthaceæ*, more particularly *Loranthus celastroiaes*, Sieb., *L. pendulus*, Sieb., and *Viscum articulatum*, Burm., were shown to have taken very kindly to certain exotic plants. Twenty-seven species, belonging to a dozen natural orders, serving as hosts, had come under the author's notice in New South Wales, the *Rosaceæ*, as compared with other orders, supplying the largest number.—On the formation of a "Mackerel Sky," by A. H. S. Lucas. A description of the remarkable sky of this nature seen over Sydney on April 20, 1894, was given from the notes of Mr. Russell, the Government Astronomer. The author then proceeded to compare the arrangement of the clouds with that of the ridges of sand in ripple-mark, and showed how they are formed similarly, as a result of the wave-motion of layers of the air. He considered the condensation to be produced by rarefaction of the air in the ridges of the waves with consequent fall of temperature. The condensation into cloud thus rendered manifest the position of the wave-crests. He then referred to Prof. von Bezold's paper in the February number of "Himmel und Erde," which advances somewhat similar views as to the origin and importance of wave-clouds. He concluded by suggesting that the wave-cloud, or *Undulus*, should take its place in the classification of clouds by the side of the other elemental forms, *Cirrus*, *Cumulus* and *Stratus*.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Books.—Dissections Illustrated: C. G Brodie. Part 3 (Whittaker).—Lectures on Biology: Dr. R. W. Shufeldt (Chicago).—Chemical Handicraft (J. J. Griffin).—From the Greeks to Darwin: Dr. H. F. Osborn (Macmillan).—On Preservation of Health in India: Sir J. Fayrer (Macmillan).—Manual of Physico-Chemical Measurements: Prof. W. Ostwald, translated by Dr. J. Walker (Macmillan).—Text-Book of the Diseases of Trees: Prof. R. Hartig, translated by Dr. W. Somerville (Macmillan).—University College, Nottingham, Calendar 1894-95 (Nottingham, Sands).—Reprint of the North American Zoology: George Ord, Appendix by S. N. Rhoads (the Editor, Haddonfield, N.J.).—Peru, 2 Vols: E. W. Middendorf (Berlin, Oppenheim).—A Manual of Exotic Ferns and Selaginella: E. Sandford; cheaper edition (Stock).—University College of North Wales, Calendar 1894-95 (Manchester, Cornish).—Leçons de Chemie: H. Gautier and G. Charpy; deux edition (Paris, Gauthier-Villars).—The Great Ice-Age: Dr. James Geikie, 3rd edit. (Stanford).—Electric Light and Power: A. F. Guy (Bigas).

Pamphlets.—A Laboratory Guide and Analytical Tables: J. Grant (Manchester, Smith and Wood).—A Discourse on Roses and the Odour of Rose: J. C. Sawer (Brighton, Smith).—Report on Meteorological Observations in British East Africa for 1893: E. G. Ravenstein (Philip).—Brief Notes on the Physical and Chemical Properties of Soils: R. Warington (Chapman).—On the Whirling and Vibration of Shafts (Philosophical Transactions of the Royal Society of London, Vol. 185 (1894) A, pp. 279–360: S. Dunkerley (K. Paul).—On Derived Crystals in the Basaltic Andesite of Glasdrumman Port, co. Down (Scientific Transactions of the Royal Dublin Society, Vol. v. series 2: Prof. G. A. J. Cole (Williams and Norgate).—Twelfth Annual Report of the Fishery Board for Scotland for the Year 1893, Part 2.—Report on Salmon Fisheries (Edinburgh).—The Slide Rule: C. N. Pickworth (Emmott).—Geschichte der Bibliothek und Naturaliensammlung der Kaiserlichen Leopoldinisch-Carolinischen Deutschen Akademie der Naturforscher: Dr. O. Grulich (Halle).

Serials.—Encyklopædie der Naturwissenschaften, Dritte Abthg., 22 and 23 Lief$^{s}$, Zweite Abthg., 83–85 Lief$^{s}$, (Breslau, Trewendt).—Engineering Magazine, October (Tucker).—American Journal of Science, October (New Haven).—Record of Technical and Secondary Education, October (Macmillan).—American Meteorological Journal, October (Ginn).—Proceedings of Bristol Naturalists' Society, 1893–94 (Bristol).—American Historical Register, No. 2 (Philadelphia).—Palestine Exploration Fund, Quarterly Statement, October (London).—Quarterly Review, October (Murray).

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