people of the country. Technical education was necessary. He was not one of those who could see for a moment that the prosperity of England was on the wane. But if England meant to keep her position in the commercial world she must not be behind with regard to the most important thing which had arisen in modern days connected with commerce—namely, the necessity of giving technical instruction to those who had to work in England's commercial market.

SCIENTIFIC SERIALS.

American Journal of Science, December.—A microsclerometer, for determining the hardness of minerals, by T. A. Jaggar. This instrument depends upon the energy required to make a boring of a certain diameter and depth under a given weight and by means of a diamond point of a cleavage tetrahedron of perfect shape. The hardness is measured by the number of turns required to make the boring, or by the depth reached after a certain number of revolutions. The depth is measured by a microscope attached to the boring point, by bringing successive divisions of a slanting micrometer scale into focus. The values found for the hardness of Mohs's scale-minerals show even greater gaps than those obtained by Pfaff and Rosival. Taking corundum as 1000, topaz is 152, quartz 40, orthoclase 25, apatite 1·23, fluorite 0·75, calcite 0·26, and gypsum 0·04.—On the sapphires from Montana, by G. F. Kunz. Sapphires were first found in transported gravels along the bars of the Upper Missouri, then in the earthy products of decomposed dikes, and lastly further down in the unaltered igneous rock itself. Much beautiful material has already been obtained, but little of high value.—On the corundum-bearing rock from Yogo Gulch, Montana, by L. V. Pirsson. The dikes of igneous rock containing sapphire and corundum are of a dark grey, basic appearance, and have an uneven fracture. In thin sections it appears as a dark lamprophyre, consisting mainly of biotite and pyroxene. There is a little iron ore present, but much less than is usually seen in rocks of this class.—Electrical measurements by alternating currents, by Henry A. Rowland. Gives some twenty-four methods of measuring inductances, capacities and resistances by means of alternating currents. Some of these depend upon a new principle in the shape of an adjustment of two currents to a phase difference of 90°. This is done by passing one current through the fixed, and the other through the suspended coil of an electrodynamometer. The fixed coil may then be made to carry a heavy current, and the sensitiveness of the apparatus is greatly increased. Inductances can be compared to within 1 in 10,000, but care must be taken not to twist the leads, as their electrostatic action is then very great. The question of standard inductances is thus practically solved.

THE latest issue of the *Izvestia* of the Russian Geographical Society is of exceptional interest. It contains, first, a brief sketch, by P. K. Kozloff, of the Roborovsky's Tibet expedition, in which the author dwells especially upon his own "excursions"—that is, the journeys which he made separately from the main body of the expedition, and gives very valuable data relative to the nature, and especially the animal world, of the visited regions. The reports about the journey in the Sy-chuan province, and to the Southern Kuku-nor ridge are especially interesting.—The geologist, E. E. Anert, contributes a very valuable sketch of his journeys in Manchuria. He started from the Suifun river, near Vladivostok, and went first to Ninguta, and then to Ghirin, the capital of Manchuria, where he took a boat and went down the Sungari till its junction with the Amur. The great Manchurian river, up to Ghirin, has been described already in 1864, by the expedition of Colonel Chernyaeff, who had with him the astronomer Usoltseff and P. Kropotkin; but the papers of these two explorers, which were printed in the *Memoirs* of the Siberian Geographical Society, were destroyed, as well as the original maps, during the Irkutsk conflagration, and remained almost quite unknown to geographers.—A third paper, of great interest, is by V. I. Lipsky, who was the leader of the Hissar expedition of 1896. Notwithstanding great difficulties, due to heavy snowfalls in winter, which were followed by heavy rains in spring, Lipsky explored the Hissar ridge from the south. The heights of the passes are from 12,000 to 14,000 feet. Ten new glaciers were discovered; they all lie above the 10,000 feet level, and are all surrounded by large moraines testifying to their previous larger extension.—The fourth paper is by Th. K. Drizhenko, who was at the head of a hydrographic expedition for the exploration of Lake Baikal in 1896. The paper is accompanied by a map of the lake showing the positions of the 100, 400 and 700 fathoms depth-lines, and another map showing the distribution of surface temperature during the month of August. The work of the expedition was continued this summer as well.—In the same issue G. V. Levitsky discusses the advisability of having a few seismic observatories in Siberia and Central Asia, each provided with a horizontal pendulum.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 9.—"On the Refractivities of Air, Oxygen, Nitrogen, Argon, Hydrogen, and Helium." By Prof. William Ramsay, LL.D., F.R.S., and Morris W. Travers, B.Sc.

In the course of an investigation on the nature of helium, many measurements of the refractivities of different samples were made with a view to determining their composition.

Since, on account of the great difference between the refractivities of air and helium, it was found inconvenient to compare the two gases directly, the helium was compared with hydrogen, and the refractivity of the hydrogen was afterwards determined with regard to air. As a check the hydrogen was subsequently compared with oxygen, and nitrogen free from argon, these gases were also measured against one another, and against air. At a later stage in the investigation the refractivities of argon and carbon dioxide were also determined.

The measurements were made by the interference method described by Lord Rayleigh (*Proc. Roy. Soc.*, 59, 198-208).

Special attention was paid to the purity of the gases examined and a full description of the methods of preparation is given in the paper. It is possible that the discrepancies between the results obtained by various observers may be due to the presence of impurities in the gases which they employed.

The mean values obtained for the refractivities of the gases examined are tabulated below.

Refractivities of Gases, Air equal to Unity.

	Directly compared.	Through Oxygen.	Through Nitrogen.	Through Hydrogen.	Through Argon.
Hydrogen ...	0·4733	0·4737	0·4727	—	—
Oxygen ...	0·9243	—	0·9247	0·9237	0·9261
Nitrogen ...	1·0163	1·0155	—	1·0170	1·0191
Argon	0·9596	0·9577	0·9572	—	—
Carbon dioxide	—	1·5316	—	—	—

Calculated from the determinations given above, assuming Dale and Gladstone's formula for mixtures of gases, the refractivity of air becomes 99·647 instead of 100.

Turning to the determinations of other investigators, it was found that since Dulong, in 1826, no single experimenter had made measurements of both oxygen and atmospheric nitrogen. Mascart determined the refractivity of nitrogen, and found it to be 1·0178, a value which closely agrees with the figure given above.

Lorenz determined the value for oxygen, 0·9347, but there is reason to doubt the purity of the gas which he employed. The refractivity of air calculated from the data of Mascart and Lorenz becomes 100·15.

Since the value obtained for the refractivity of air, calculated from the values obtained for oxygen, nitrogen and argon, differs from 100 by an amount far exceeding the limit of experimental error, we were driven to the conclusion that the refractivity of air is somewhat less than the refractivities of its constituents, taken in the proportion in which they occur.

It appeared advisable to try other mixtures; and a mixture of hydrogen and helium was first selected, because these are both very "perfect" gases, inasmuch as their critical points lie very low. It was to be expected that if a difference between calculated and found values should exist, it should be of the inverse character to that of a mixture of oxygen and nitrogen, for they are two somewhat "imperfect" gases. The result has borne out this idea.

A mixture was made of 20·60 c.c. of hydrogen and of 20·12 c.c. of helium free from argon, and of the density 1·960; and with the refractivity of the mixture those of hydrogen and

helium were compared. Taking the refractivity of the mixture as unity, the following ratios were found :—

Hydrogen/mixture ...	1·5977 1·5957	Mean ...	1·5967
Helium/mixture ...	0·4513 0·4478	,, ...	0·4495

The calculated values are—

$$\frac{(\cdot04495 \times 20\cdot12)}{40\cdot72} = 22\cdot21$$

$$\frac{(1\cdot5967 \times 20\cdot60)}{40\cdot72} = \frac{80\cdot87}{102\cdot99}.$$

Here the calculated value of the refractivity of the mixture is 3 per cent. higher than the found value, while with air the calculated value is 0·35 per cent. too low.

A third experiment was made, in which the "artificial air" was a mixture of 19·13 c.c. of carbon dioxide with 19·29 c.c. of oxygen, both gases supposed to be at 0° and 760 mm. Again, taking the refractivity of the mixture as unity we found the following ratios :—

Carbon dioxide/mixture	1·2450
Oxygen/mixture	0·7525

The calculated values are :—

$$\frac{(1\cdot2450 \times 19\cdot13)}{38\cdot42} = 61\cdot99.$$

$$\frac{(0\cdot7525 \times 19\cdot29)}{38\cdot42} = \frac{37\cdot78}{99\cdot77}$$

Here, as with air, the total refractivity found is less than that calculated. It is true the difference is not great, but we are persuaded that it is real, for it considerably exceeds the error of our several determinations.

The case is not bettered if Lorentz and Lorenz's formula be substituted for Gladstone and Dale's. Using their formula, $n^2 - 1/n^2 + 2$, the calculated result is 99·72 per cent. of that found for air.

The coefficient of compressibility of hydrogen is too small, while that of other gases, such as oxygen and nitrogen, is too great. The effect of mixing equal volumes of hydrogen and helium, each of which has too large a coefficient of elasticity, is to cause each to occupy twice the volume that they previously occupied, and to halve approximately the pressure for each. The pressure is, therefore, lower than it would be for an absolutely ideal gas, for each gas, hydrogen and helium. The sum of these pressures will accordingly be too low, or transposing, the sum of the volumes will be too great. The opposite argument holds for air.

Now, in considering volumes, we deal not merely with the co-volume, *i.e.* the space occupied by the molecules, but also with the interstitial space inhabited by the molecules. But the refractive power, if Clausius's deduction from the formula of Lorenz and Lorentz is correct, is a function of the dielectric constant, and hence of the co-volumes of the gases. And here the discrepancy is more easily detected than by any determination of density. It must, therefore, be concluded that gases are not, as postulated by Dalton, indifferent to one another's presence, but that they modify one another's properties in the same manner as do liquids, though to a different extent. This mutual action at high pressures and small volumes modifies even the volume relations, as recently shown by Dr. Kuenen. And it must persist at low pressures and large volumes, though it may not always be possible to make measurements of pressure and volume accurate enough to lead to its detection. The refractivity, however, seems to be a means delicate enough to be used for this purpose.

"The Electric Conductivity of Nitric Acid." By V. H. Veley, F.R.S., and J. J. Manley, Daubeny Curator of the Magdalen College Laboratory, Oxford.

In this paper an account is given of determinations of the electric conductivity of nitric acid of percentage strengths from 1·3 to 99·97, purified from nitrous acid, sulphuric acid and the halogen acids. Special forms of apparatus, and special methods of measurements were adopted to overcome the difficulties of polarisation of the concentrated acid.

The chemical and certain physical properties of the practically anhydrous acid were studied ; this acid has no action on various metals such as copper, silver, cadmium, mercury, magnesium, iron and tin, nor on calcium carbonate either at ordinary temperatures or at the boiling point. Sulphur and iron pyrites dissolve quickly and completely in the gently-warmed acid. The values are given for the corrected density at 4/4, 14·2/4 and 24·2/4 of the 99·97 acid, as also for thirty-two samples of acid of $K_0 \times 10^8$, $K_{15} \times 10^8$, $K_{30} \times 10^8$, viz. conductivity in mercury units, and for $\alpha 10^4$, and $\beta 10^6$, the temperature coefficients in the equation $R_t = R_0 (1 - \alpha t + \beta t^2)$. It is shown that whereas nitric acid behaves as other electrolytes in possessing a positive temperature coefficient of conductivity for percentage strengths from 1·3 to 96·12, yet from this point upwards it behaves as a metallic conductor. The results of the experiments point to the existence of hydrates of nitric acid containing $10H_2O$, $3H_2O$, $2H_2O$ and H_2O, with one molecular proportion of HNO_3 and of $1H_2O$ with $2HNO_3$, or $H_4N_2O_7$, the analogue of pyrophosphoric acid. Evidence is thus added to that previously accumulated of definite combinations of nitric acid with water.

Chemical Society, December 2.—Prof. Dewar, President, in the chair.—The following papers were read :—The representation of the isomeric benzene hexachlorides by Collie's space-formula, by F. E. Matthews. The author shows that Collie's space-formula for benzene satisfactorily explains the existence of two benzene hexachlorides ; amongst other facts explained are the different stability of the isomerides and the formation of only two.—Compounds of piperidine with phenols, by O. Rosenheim and P. Schidrowitz. A number of addition products of piperidine and phenols or their derivatives of a salt-like nature have been prepared in which the phenol acts as an acid ; they are crystalline, and are decomposed by strong alkalis or acids.

Royal Meteorological Society, December 15.—Mr. E. Mawley, President, in the chair.—Mr. W. Marriott read a paper on the rainfall of Seathwaite, Cumberland. This place has long been noted for its heavy rainfall, being in fact one of the wettest spots in the British Isles—the average yearly amount is 137 inches. The spring months of April, May and June are the driest, so they not only have the least rainfall, but also the least number of rainy days. August, the month when the Lake District is thronged with visitors, has the greatest number of rainy days. The heavy nature of the rainfall may be gathered from the fact that 21 per cent. of the falls are above 1 inch, 2 per cent. being above 3 inches. The greatest fall in one day was 8·03 inches on November 12. The author has investigated the atmospheric conditions under which the heavy rainfalls occurred at Seathwaite, and he finds that these heavy falls are due to the direction and force of the wind. When the wind is blowing strongly from the south-east or south-west, it will be concentrated in the valleys on the windward of Scafell, and rush up them with considerable force, the air current consequently being projected to a considerable altitude beyond Scafell. Owing to the reduction of temperature with elevation, the air parts with a great deal of its moisture, which falls as rain. With such a process going on continuously for a whole day, the heavy rainfall at Seathwaite is fully accounted for.—Mr. R. C. Mossman also read a paper on the daily values of non-instrumental meteorological phenomena in London from 1763 to 1896. The phenomena discussed were thunderstorms, lightning without thunder, fog, snow, hail and gales.

CAMBRIDGE.

Philosophical Society, December 6.—Mr. F. Darwin, President, in the chair.—Features of interest in the fauna of the Sandwich Islands (with exhibitions), by Mr. R. C. L. Perkins. Mr. Perkins exhibited and read some notes on some of the more interesting insects from the Hawaiian Islands. Several species of endemic dragon-flies (*Agrioninæ*) were shown, some of which passed their earlier stages in water, in the usual manner, while others in the nymph state lived amongst the leaves of a liliaceous plant, the diversity in habit having probably been brought about by the extreme poverty of the freshwater fauna, the terrestrial species being much more favourably situated in regard to a constant supply of food. A series of examples of three or four allied species of Longicorn beetles of the genus *Plagithmysus* were remarkable for their extreme variability in colour, in spite of their limited range. The varieties of each species fell into two or three groups, which were hardly, if at all, connected by intermediate forms. The differences between the extreme forms of a species were in some cases more striking than the differences between the species themselves. The habits of these beetles, and the several distinct

sets of stridulating organs with which they are furnished, were also referred to. A collection of wasps from the islands of Molokai and Kauai were exhibited, to show the great difference in superficial appearance between those inhabiting the latter island, and those from the rest of the group. No protective significance could be attributed to the uniform and conspicuous markings of the Kauai species.—Remarks on a journey to investigate the habits and development of *Lepidosiren paradoxa*, by Mr. J. Graham Kerr. The author gave a short account of an expedition which he had made to the interior of the Gran Chaco of Paraguay for the purpose of investigating the habits and development of *Lepidosiren paradoxa*. He was aided by a grant from the Balfour Fund, and was accompanied by Mr. J. S. Budgett of Trinity College. Lepidosiren occurs in considerable quantity in the swamps towards the centre of the Gran Chaco boreal. It is sluggish in habits, wriggling slowly about among the thick vegetation of the swamp. At short but very irregular intervals it visits the surface and takes a breath of air. Its food consists mainly of large Ampullarias and masses of confervoid algæ. The young are to a greater extent vegetable feeders than are the adults. Lepidosiren makes a burrow in the ground at the bottom of the swamp, and lines it with soft grass. In this the eggs are laid. The papillæ on the hind limb of the male grow out into long filaments during the breeding season, and during life these are blood-red in colour. They appear to be ornamental structures. The eggs are very large—about 7 mm. in diameter. Cœlomic eggs have a thick gelatinous coat: in fertilised and developing eggs this becomes thin and horny. Segmentation is during its later stages holoblastic and unequal. Gastrulation takes place in a manner which recalls that of *Urodele amphibia*, and of Cyclostomes. Eventually a tadpole larva is hatched out. This develops large external gills and a very large sucker of the Amphibian type. The external gills and sucker disappear about six weeks after hatching. At the same time the colour of the young Lepidosiren becomes much darker, and they become much more lively in their habits. For the first ten to twelve weeks of its free existence the young Lepidosiren does not eat, but lives on the yolk in the walls of its gut. A remarkable habit of Lepidosiren was mentioned, in that their normally very dark colour becomes during the night nearly white. The black chromatophores shrink up during the hours of darkness, large yellow chromatophores which are also present remaining expanded. During the dry season the Lepidosiren retreats into the mud, in which it remains breathing by means of an air-hole until the waters return and set it free.

EDINBURGH.

Royal Society, December 6.—The following are the president and vice-presidents for the coming session:—Lord Kelvin; Lord McLaren, Rev. Prof. Flint, Prof. McKendrick, Prof. Chrystal, Sir Arthur Mitchell, and Sir William Turner. Papers were read as follows:—On the food, fuel, and air of the world, by Lord Kelvin.—Chapters on the mineralogy of Scotland, chapter viii., Silicates, by the late Prof. Heddle.—Note on the disturbance of the magnetic and meteorological instruments at the Colaba Observatory during the earthquake of June 12, 1897, by N. A. Moos.—On a problem of Sylvester's in elimination, by Prof. E. J. Nanson.—On the velocity of graded actions, by Prof. Walker.—Preliminary note on a characteristic of certain chemical reactions, by Prof. Gibson.—On the directions which are most altered by a homogeneous strain, by Prof. Tait.

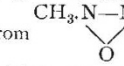
Mathematical Society, December 10.—Mr. J. B. Clark, President, in the chair.—The following papers were read:—Some questions in arithmetic, by Prof. Steggall.—Methods of solution of the equations of elasticity, by Mr. John Dougall.—Trigonometrical notes, by Prof. John Jack.—Note on a transformation of the equations of hydrodynamics, by Mr. Carslaw.

PARIS.

Academy of Sciences, December 13.—M. A. Chatin in the chair.—The election of M. Ditte, as a Member in the Section of Chemistry, was confirmed by the President of the Republic.—On the work carried out in 1897 at the observatory at Mt. Blanc, by M. J. Janssen. The chief work done was on the value of the solar constant, although the observations were much interfered with by the unfavourable weather.—On the periods of double integrals, by M. H. Poincaré.—Signification of the number and symmetry of the fibro-vascular bundles of the petiole in the measurement of the perfection of plants, by M. Ad. Chatin.—On the first modifications of nerves in simple wounds of the cornea, by M. L. Ranvier. The nerve fibres of the cornea, which are divided by section, grow with an unexpected rapidity and activity, if they are in continuity with their origin cells.—Remarks, by M. Lœwy, on presentation of the annual publications of the Bureau des Longitudes.—On a new method for determining the vertical, by MM. J. Perchot and W. Ebert. The method of Deichmüller, floating a mirror in a bath of mercury, can be modified to give good results which are free from the prejudicial effects of capillary phenomena The results are as accurate as with the plain mercury bath, and good measurements can be obtained in Paris, where the amount of vibration renders the use of the plain bath very troublesome.—On the problem of Ribaucour, by M. C. Guichard.—On an analytical form of the integrals of linear partial differential equations of two independent variables, by M. J. Le Roux.—On the resolution of certain differential systems, by M. Riquier.—On a double generalisation of the equations of Lie, by M. E. Vessiot.—On the positions of unstable equilibrium, by M. P. Painlevé.—On the displacement of a plane of which all the points describe spherical lines, by M. Raoul Bricard.—The problem of the distribution of electricity and the problem of C. Neumann, by M. W. Stekloff.—New method of attacking platinum. Preparation of the bromoplatinates of ammonium and potassium, by M. Georges Méker. Platinum is attacked by a fused mixture of ammonium sulphate and bromide, although it resists the action of either salt taken separately. Ammonium bromoplatinate is readily isolated in a pure state from the fused mass.—On phosphorous oxide, by M. A. Besson. By warming together H_3PO_3 with an excess of PCl_3 on the water bath, and washing the product with water, a reddish solid is left, which on analysis gives exact figures for the oxide P_2O.—Properties of sodium carbide, by M. Camille Matignon. The carbide forms a white powder, not explosive by shock or by friction. On slight heating, it burns in air to sodium carbonate. In chemical activity, sodium acetylide far exceeds the corresponding calcium compound, nearly all the reactions being so violent that carbon is set free, and the sodium acting as in the free state.—On a new series of cyclic ketones, by M. A. Béhal. The fractional distillation of the heavy oil from wood tar, followed by conversion the benzoyl-oximes, has furnished two new ketones.—On the neutralisation of glycerophosphoric acid by alkalis, in presence of helianthine and phenolphthaleïn, by MM. H. Imbert and A. Astruc. The quantities of soda solution required to neutralise a given weight of glycerophosphoric acid in presence of helianthine and phenolphthaleïn respectively are as 1 : 2. A method for the estimation of the acid is worked out from these data.—Heat of neutralisation of glycerophosphoric acid, by MM. H. Imbert and G. Belugou.—New results relating to rachitis, by M. Œchsner de Coninck.—On species in botany, by M. Paul Parmentier—On polymorphism of branches in inflorescences, by M. H. Ricome. Branches of many inflorescences show differences among themselves. In branches in which the direction is near the vertical, the symmetry is normal. In branches much inclined to the vertical, this symmetry is more or less disturbed.—On the geology of the islands of Metelin, Lesbos, and Lemnos in the Ægean Sea, by M. L. De Launay.—On an apparatus generating leucocytes observed in the peritoneum, by M. J. J. Andeer. The peritoneum is the starting-point for the ostiolic apparatus of the whole animal. It is here shown that the peritoneum is also the starting-point for the genesis and formation of the elements of the blood.—Cholesterin and the biliary salts as a chemical vaccine against snake poison, by M. C. Phisalix. The bile salts exert the same protecting influence against snake poison as the bile itself.—On the entozoa of man in Normandy, by M. Ed. Spalikowski.

AMSTERDAM.

Royal Academy of Sciences, October 30.—Prof. van de Sande Bakhuyzen in the chair.—Prof. J. C. Kapteyn on the velocity with which the solar system moves in space. This velocity is deduced from the velocity in the line of sight of fifty-one stars measured by Vogel. It was demonstrated that from these velocities the sun's motion can be deduced with a weight more than seven times as great as that of the determination made by Vogel himself, if the ratio of the average velocity of the stars to that of the sun, previously communicated to the Academy, be made use of. Prof. Kapteyn found for the velocity of the system $10{\cdot}4 \pm 0{\cdot}7$ miles per second. From this, in connection with a previous communication, is further deduced the mean

parallax of stars of different magnitude.—Prof. Hubrecht presented for publication in the *Proceedings* a paper by Dr. G. C. J. Vosmaer, of Utrecht, entitled "On the retrograde development of the blood-vessels in the omentum of the rabbit," and showed by means of camera sketches of the omen of rabbits (new-born, one day, four days, eight days) that Ranvier's "cellules or réseaux vasoformatifs" are the last remnants of a process of retrograde development of vascular tissues in this membrane.—Prof. Bakhuis Roozeboom on an inquiry made by Dr. Mohr into the behaviour of solutions of $NH_4Cl + FeCl_3$, on crystallising out. Besides the well-known double salt $FeCl_3.2NH_4Cl.H_2O(D_1)$, there were detected: $FeCl_3.NH_4Cl(D_2)$ and $2FeCl_3.NH_4Cl.4H_2O(D_3)$. They were obtained by a new method of evaporation at a constant temperature in a desiccator under the microscope. Some solutions, which precipitate D_1 on evaporation, dissolve it again, when the evaporation is prolonged. The mixed crystals, which can also be precipitated from certain solutions, probably contain Fe as D_1.—On behalf of Dr. Cohen the speaker made a communication to the effect that the irregularities observed in the Weston-element (Clarke's, with the substitution of cadmium for zinc) had been found to be caused by a transformation which solid cadmium sulphate undergoes at 13°. It suffices to heat the element a little above this temperature to restore its normal behaviour.—Prof. van Bemmelen presented, on behalf of Dr. Klobbie, a paper on equilibrium in the water-ether, water-malonic acid and ether-malonic acid systems, and the isotherm of the water-ether-malonic acid system at 15°.—Prof. van der Waals communicated, on behalf of Dr. P. Zeeman, a third paper on doublets and triplets produced by external magnetic forces. Dr. Zeeman, working with a Rowland grating, has succeeded in photographing the outer components of the magnetic triplet, the light of the central component being quenched by means of a Nicol. The negatives obtained in this manner, and specimens of which were shown at the meeting, are particularly adapted for measurements concerning the magnetic change. Measurements of one of the blue cadmium lines have given for e/m the value 2, $4 \cdot 10^7$. The experiments are being continued.—His inquiries into the action of nitric acid upon methyl amides have occasioned Prof. Franchimont to study also the action of nitric acid upon methyl nitramines, and he has found that even below 0° nitrous oxide and methyl nitrate are formed nearly quantitatively, which is more easily deduced from the formula $CH_3.NH.NO_2$ than from  Methyl nitramine does not produce blue, violet, or green colorations with ferric chloride, though under certain circumstances a reddish-brown ferric salt may be obtained from it. Prof. Franchimont further presented, on behalf of Mr. P. van Romburgh, a paper on the occurrence of certain volatile products in tropical plants. Mr. van Romburgh has already examined more than 900 genera and found methyl alcohol in many of them, acetone in some of them, but methyl salicylate in many more of them, viz. in 18 per cent. of the number examined. Sometimes it occurs together with prussic acid. The volatile reducing substance described by Reinke and Curtius was also often detected and obtained as a liquid from indigo, rameh, and the leaves of sugar-cane.—Prof. Lorentz on the question of the relative motion of the earth and the ether. Remarks on a recent memoir by Prof. A. A. Michelson (*Amer. Journ. of Science*, ser. 4, vol. iii. p. 475). The author discusses the assumptions that are necessary in the theory of aberration.—Prof. Stokvis presented the dissertations of Mr. J. Keyzer, entitled "Ueber Haematoporphyrin im Harn," and of Mr. J. de Hartogh, jun., entitled "Ueber Peptonurie und den Nachweis des Peptons im Harn," and added some oral elucidations.

NEW SOUTH WALES.

Royal Society, October 6.—The President, Henry Deane, in the chair.—Note on mutilations practised by Australian aborigines, by T. L. Bancroft. The paper dealt with the object of the "Mika" or "Kulpi" operation of the Australian aborigines.—On a cordierite-bearing rock from Broken Hill, by J. Collett Moulden. This is believed to be the first time that cordierite has been recorded in Australia. It has a somewhat extensive development in the metamorphic rocks of Broken Hill, and is described in detail from two parallel exposures of granulitic rock about half a mile S.E. by E. from Block 14 Mine. The cordierite occurs in large crystals and also in grains through the granulite.—Note on the occurrence of a nickeliferous opal near Tamworth, N.S. Wales, by D. A. Porter. Several years ago a specimen of opal brought to the writer was said to have been obtained in the "Never-never" ranges on the head waters of Attunga Creek, and not far distant from Mount Gulligal, Parish of Attunga, County of Inglis. Some little while ago, being in the vicinity, Mr. Porter found the locality and secured a few small specimens, one of which he forwarded to be exhibited before this Society. The mineral occurs in the form of small veins in serpentine rock, and is accompanied by veins of a pinkish or salmon coloured chalcedony, exhibiting a porcelain-like texture and broken surfaces.—Icebergs in the Southern Ocean, No. 2, by H. C. Russell, C.M.G., F.R.S. This paper was prepared as a continuation of one read before the Royal Society, September 4, 1895. It deals with the reports of icebergs seen since the end of July 1895. One hundred and two ships have reported ice in the interval; nearly the whole of the ice, so reported, was within the area enclosed between 40° and 86° east longitude and 40° to 62° south latitude; very few reports of ice outside that area have been received. It was shown that the *Thermopyle* steamed for 1000 miles amongst icebergs, and that the ocean was clear one hundred to one hundred and twenty miles north of this track. Some idea of the number of icebergs may be gathered from the fact that the officers of one ship counted 977 bergs, and those of another ship 4500. This and the previous paper cover a period of six years, and it was shown that at times the icebergs come into, or leave the track of vessels in a few days; three instances in which there had been sudden disappearances were shown to be coincident in point of time with the advent in Australia and the ocean between the Cape and Australia of strong north to north-west winds.

BOOKS RECEIVED.

Observational Astronomy: A. Mee, 2nd edition (Cardiff, *Western Mail*).—Annuaire Astronomique, 1898: C. Flammarion (Paris, E. Flammarion).—Catalogue of the Madreporarian Corals in the British Museum (Natural History): H. M. Bernard, Vol. 3 (London).—Annals of the Cape Observatory, Vols. 3, 6, 7 (Darling).—Ambroise Paré and his Times, 1510–1590; S. Paget (Putnam).—Model of a Locomotive: C. Volkert, translated (Philip).—26th Annual Report of the Local Government Board, 1896–97 (Eyre).—Solutions of the Exercises in Taylor's Euclid, Books vi.–xi.: W. W. Taylor (Cambridge University Press).—Elements of the Mathematical Theory of Electricity and Magnetism: Prof. J. J. Thomson 2nd edition (Cambridge University Press).—The Steam Engine and other Heat Engines: Prof. J. A. Ewing, 2nd edition (Cambridge University Press).

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