Demonstrator to Prof. Dewar. The grace for establishing the office was opposed, but carried by 76 votes to 70.

Prof. Macalister has been appointed Chairman of the Examiners for the Natural Sciences Tripos in the present year.

The Fitzwilliam Museum Syndicate report that the catalogue of the Egyptian Collection, prepared by Dr. Budge, is now ready for printing, and will forthwith be published.

SCIENTIFIC SERIALS.

THE *American Meteorological Journal* for December last contains six memorial articles upon the work of the late Prof. W. Ferrel, read at a meeting of the New England Meteorological Society in October last. Prof. W. M. Davis states that Ferrel's view of the general circulation of the atmosphere is now accepted in its essential features by most meteorologists; and were it not for the silence regarding it on the part of some of the British school, it would be regarded as universally acceptable. But in Great Britain it finds little recognition; unfortunately, Prof. Davis thinks, for the advance of the science in this country. The essential part of Ferrel's theory, first stated in 1859, is that an equatorial-polar convectional circulation on a rotating earth must consist chiefly of oblique winds from a western quarter, with high velocities nearly at right angles to the gradients; and that the initial high pressure about the poles, due to low temperature, will be reversed to low pressure by the excessive centrifugal force of the whirling winds, thus leaving a belt of high pressure near the tropics. He draws a sharp contrast between the general circulation and the cyclonic circulation. Both are cyclonic, inasmuch as they whirl, but one has a cold centre, and the other a warm one.—H. Helm Clayton contributes an article on the verification of weather forecasts. Among the elements to be considered he includes (1) the kind of phenomenon, *e.g.* cloud, rain, &c.; (2) the time of occurrence; (3) the duration of the phenomenon; (4) the intensity; (5) the length of time in advance that the phenomenon is predicted. He also describes the methods of verification adopted in some countries.—Cold waves, by Dr. A. Woeikof. The object of the paper is to disprove Prof. Russell's theory that cold waves are not due chiefly to radiation from the ground, but to extreme cooling of the upper air. Dr. Woeikof shows from observations from various sources that the cold waves are certainly due to radiation, not necessarily at the place where the cold is felt, but at a distance—in the United States to the north-west, in Europe to the north-east.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 21.—"On the Mechanism of the Closure of the Larynx: a Preliminary Communication." By T. P. Anderson Stuart, M.D., Professor of Physiology, University of Sydney, Australia.

The epiglottis having been displaced from its time-honoured function of closing the larynx as a lid, the paper proceeds to show how after all the larynx *is* closed. Briefly, the closure is effected by, on the one hand, a folding up of the margins of the entrance and an obliteration of the channel of the vestibule from the entrance downwards to the level of the glottis, and, on the other hand, by the well-known movement upwards and forwards of the entire larynx against the base of the tongue—the lower part of the epiglottis intervening, but taking no active part in the process. The observations, &c., were made as follows: (1) on a man who has a large hole in the side of the neck, a result of an operation for epithelioma, through which deglutition, simple closure of the larynx, &c., can be observed proceeding in a manifestly perfectly normal manner; (2) on healthy persons examined by the laryngoscope by the author and by two professed laryngoscopists; (3) experiments on the different classes of animals; (4) the anatomy and comparative anatomy of the parts; (5) the clinical and *post-mortem* records of morbid conditions.

When simple closure is to be effected in man, the arytenoid cartilages, inclosed in the mucous membrane, (1) are rotated, so that the vocal processes (eventually) come into apposition; (2) glide forwards on the cricoid articular surface, so that the posterior broad part of their articular surface comes to rest on the cricoid; (3) approach each other, so that their inner faces are, in part at least, in contact; (4) fold forwards at the crico-arytenoid joint, so that their tips come into contact with the lower part of the epiglottis. At the same time the aryepiglottic folds become tense, pulling inwards the lateral margins of the epiglottis, and so deepening its groove to receive the tips of the arytenoids and the Santorinian cartilages. Thus the entrance assumes the form of a squat T-shaped fissure, its transverse limb bounded in front by the epiglottis, behind by the aryepiglottic folds, and its vertical or antero-posterior or mesial—the more primitive—limb by the arytenoid cartilages. The head of the T is curved concave backwards and its stem is short. A *slight* movement of the entire larynx upwards and forwards takes place—not nearly so much as in deglutition. The epiglottis does not *actively* move, and in deglutition, for instance, the bolus is seen to glide over its laryngeal surface, its lingual surface being closely pressed against the dorsum of the tongue. But all animals are not alike, and too little account has been taken of differences in the anatomy of the parts, these carrying with them, as they do, differences in their physiology. The foregoing account applies only where, as in man, the arytenoids are long and narrow: where they are high and broad they move more bodily forwards, and where they are low and narrow, *i.e.* small, neither folding nor movement forwards would suffice to close the orifice, and there the lower part of the epiglottis is permanently bent backwards, so that the contact of the arytenoids with the front wall of the laryngeal cavity is effected with a minimum of movement of the arytenoids and the true vocal cords are, as it were, under cover of a sort of hood formed by the epiglottis. The exact behaviour of the distal portion of the epiglottis varies; so does the value of the movement upwards and forwards of the entire larynx, even in individuals of the same species. The arytenoids in their mucous membrane thus form a valve which, when it stands backwards, closes the food-channel and drafts the air forwards into the larynx, and when it lies forwards in deglutition closes the air channel and opens the food-channel. The external thyro-arytenoid muscles with the transverse arytenoid muscle, are the agents by which the before-mentioned four movements of the arytenoid cartilages are brought about. The aryepiglottic muscles tense the edge of the aryepiglottic fold, and cross to the base of the opposite arytenoid cartilage to avert the tendency they would otherwise have to pull asunder the arytenoids' tips. As worked out in the paper, it is seen that a very large number of details in the anatomy of the larynx receive an adequate explanation by this account of the closure of the larynx, *e.g.* the detailed anatomy of the muscles just mentioned, the sacculus, the structure of the false cord, the crico-arytenoid joint, its surfaces and ligaments, the anatomy of the larynx and its cavity in the different classes of animals, the ephithelial lining the cavity, &c.

"Birds are extremely instructive in this connection. Here the vocal function is entirely removed from the larynx, so that the larynx has for its sole office the guarding of the entrance of the trachea. Inspection and experiment show the entrance to be closed by the arytenoid cartilages, or bones, and the thyro-arytenoid muscles. Since this is their function in Birds (and the same applies to Tortoises, Lizards, Reptiles, Frogs, &c.) is it not all the more likely to be at least a function in Mammals?"

The plane of the larynx at the level of the glottis corresponds to the larynx in its more primitive forms—linear when closed, lozenge-shaped when open, bounded exclusively by cartilage and muscle. In man the vocal function has been superadded: all that lies above the level of the glottis has been built on that level, and the vibrating property has been got at a physiologically cheaper rate through fibrous than through muscular tissue. For details we must refer to the paper in the Proceedings.

January 28.—"Note on some Specimens of Rock which have been exposed to High Temperatures." By Prof. T. G. Bonney, D.Sc., LL.D., F.R.S.

The first described were two specimens of the micrograite of Threlkeld (Keswick): the effect of heating (probably to about 2000° F.) had been to melt down the felspathic and the micaceous constituents, cracking, but not materially affecting, the quartz. Next, in overburnt brick (composed mainly of disintegrated granite) from Les Talbots (Guernsey) similar effects: partial melting of larger fragments of felspar: in one case twin planes could be traced within the melted part. Thirdly, five specimens of melted basalt from Rowley Regis. Four of these were glasses (one with spherulites), the fifth exhibited skeletal crystals of felspar with a peculiar grouping, rarely and imperfectly seen in naturally-cooled basalts. With these were compared two specimens of magma-basalts, obtained by the author from the Rowley mass, which exhibited a very different structure. The author suggested that this difference might be due to the absence of water from the artificially melted rock, which might also account for the rarity of tachylites in nature.

February 4.—"On the Mechanical Stretching of Liquids: an Experimental Determination of the Volume-Extensibility of Ethyl Alcohol." By A. M. Worthington, M.A. Communicated by Prof. Poynting, F.R.S.

After adverting to the three known methods of subjecting a liquid to tension, viz. (i.) the method of the inverted barometer, (ii.) the centrifugal method devised by Osborne-Reynolds, (iii.) the method of cooling discovered in 1850 by Berthelot, and pointing out that the first two afford means of measuring stress but not strain, while the third gives a measure of strain but not stress, the author proceeds to describe the manner in which he had used the method of Berthelot in combination with a new mode of determining the stress, and had succeeded in obtaining simultaneous measures of tensile stress and strain for ethyl alcohol up to a tension of more than 17 atmospheres, or 255 pounds per square inch.

The liquid, deprived of air by prolonged boiling, is sealed in a strong glass vessel, which it almost fills at a particular temperature, the residual space being occupied only by vapour. On raising the temperature, the liquid expands and fills the whole. On now lowering the temperature, the liquid is prevented from contracting by its adhesion to the walls of the vessels, and remains distended, still filling the whole and exerting an inward pull on the walls of the vessel. The tension exerted is measured by means of the change in capacity of the ellipsoidal bulb of a thermometer sealed into the vessel and called the "tonometer." This bulb becomes slightly more spherical, and therefore more capacious, under the pull of the liquid, and the mercury in the tonometer-stem falls. The tension corresponding to the fall is previously determined from observation of the rise produced by an equal pressure applied over the same surface.

The liquid is caused at any desired instant to let go its hold and spring back to the unstretched volume corresponding to its temperature and to its saturated vapour pressure, by heating for a moment, by means of an electric current, a fine platinum wire passing transversely through the capillary tube that forms part of the vessel. The space left vacant in the tube represents the *apparent* extension uncorrected for the yielding of the glass vessel.

The measures obtained show that, within the limits of observational error, the stress and this apparent strain are proportional up to the highest tension reached (17 atmospheres); but, since the small yielding of the nearly rigid glass vessel must itself be proportional to the stress, it follows that the stress and absolute strain are proportional.

By subjecting the liquid to a pressure of twelve atmospheres *in the same vessel*, it was found that the apparent compressibility was the same as the apparent extensibility, whence it is deduced that between pressures of + 12 and − 17 atmospheres the absolute coefficient of elasticity is, within the limits of observational error, constant. Its actual value is best obtained by observations of compressibility.

The paper concludes with a description and explanation of a peculiar phenomenon of adhesion between two solids in contact when immersed in a liquid that is subjected to tension.

Physical Society, January 22.—Prof. O. J. Lodge, F.R.S., Vice-President, in the chair.—Prof. G. F. Fitzgerald, F.R.S., read a paper on the driving of electromagnetic vibrations by electromagnetic and electrostatic engines. The author pointed out that as the electromagnetic vibrations set up by Leyden jar or condenser discharges die out very rapidly, it was very desirable to obtain some means whereby the vibrations could be maintained continuously. Comparing such vibrations with those of sound, he said the jar discharges were analogous to the transient sound produced by suddenly taking a cork out of a bottle; what was now required was to obtain a continuous electromagnetic vibration analogous to the sound produced by blowing across the top of a bottle-neck. In other words, some form of electric whistle or organ-pipe was required. These considerations led him to try whether electromagnetic vibrations could be maintained by using a discharging circuit part of which was divided into two branches, and placing between these branches a secondary circuit turned to respond to the primary discharge. This did not prove successful, on account of there being nothing analogous to the eddies produced near an organ-pipe slit. The analogy could, he thought, be made more complete by utilizing the magnetic force of the secondary to direct the primary current first into one of the two branches and then into the other. If spark gaps be put between two adjacent ends of the branches and the main wire, then the magnetic effect of the secondary current should cause the spark to take the two possible paths alternately. Electrically-driven tuning-forks and vibrating spirals were cases in which magnetic forces set up vibrations, but here the frequency depended on the properties of matter, and not on electrical resonance. The frequency of delicate reeds could, however, be controlled by resonance cavities with which they were connected, and he saw no reason why the same action could not be imitated electromagnetically, using an electric spark as the reed. Referring to the properties of iron in connection with electromagnetic vibrations, he pointed out that a prism of steel 1 millimetre long had a period of longitudinal vibration of about one-millionth of a second, and, as this was comparable with the rates of electromagnetic vibrations, the immense damping effect which iron had on such vibrations might be due to the setting up of sound vibrations in the material. Other methods of driving electromagnetic vibrations had suggested themselves in the shape of series dynamos or alternators. The polarity of a series dynamo driving a magnetic motor would, under certain circumstances, reverse periodically, and thus set up an oscillatory current in the circuit. Similar effects can be got from series dynamos charging cells or condensers. In an experiment made two weeks before, with Planté cells and a Gramme dynamo, reversals occurred every fifteen seconds. Greater frequencies might be expected with condensers. The latter case he had worked out theoretically. He had also tried experiments with Leyden jars and a dynamo, but got no result. This might have been expected, for the calculated frequency was such as would prevent the currents and the magnetism penetrating more than skin deep. Calling the quantity of electricity on the condenser Q, the differential equation for a dynamo of inductance L, and resistance r, and a condenser of capacity x is

$$L\ddot{Q} + r\dot{Q} + \frac{Q}{x} = \dot{L}\dot{Q},$$

or

$$L\ddot{Q} + (r - \dot{L})\dot{Q} + \frac{Q}{x} = 0.$$

If $\dot{L}$ be = 0, the solution of the equation is

$$Q = Q_0 \epsilon^{-\frac{r}{L}t} \cos 2\pi\frac{t}{T},$$

and the rate of degradation of amplitude depends on the factor

$$\epsilon^{-\frac{r}{L}t}.$$

If, however, $\dot{L}$ be greater than r, the exponent of ϵ becomes +, and hence Q would go on increasing until limited by the saturation of the iron or the increased resistance of the conductors due to heating. A dynamo without iron, provided one could be made to run fast enough to send a current through itself, would be likely to give the desired effect. The author thought that by making such a dynamo large enough and its armature very long, it would be possible to get a frequency of about one million. Electrostatic machines seem, however, to be more promising driving agents. Like series dynamos, their polarity depends on the initial charge, and can be easily reversed. Hitherto such machines have been inefficient mainly on account of the sparking in them, but Maxwell had shown how this could be obviated. There was the same kind of difference between electromagnetic and electrostatic machines as between Hero's engine and the modern pressure engine. Like modern engines electrostatic machines worked by varying capacity, but the effect of this variation in electrostatic machines was only to vary the frequency and not the rate of degradation. From the fact that electrostatic multipliers could be driven by alternating currents, he thought they might be made to drive alternating currents. If magnetic currents could be obtained, then electrostatic engines would easily be produced. In conclusion, the author described a modified electrostatic multiplier which he beli ved offered a feasible solution of the problem. In this machine the collectors were supposed joined to the ends of the vibrating circuit, and would therefore become + and − alternately. Inductors and brushes were to be so arranged that an insulating cylinder turning between them should have many + and − charges distributed alternately round its periphery. By suitable adjustment these charges could be collected at the proper instants so as to keep up the vibration.—The chairman, Prof. Lodge, said the paper was very suggestive and full of interesting points. The subject of electromagnetic vibrations was attracting great attention in America in connection with the manufacture of light. Hertz's oscillations die out too soon to be satisfactory, for their duration rarely exceeds a thousandth part of the interval between consecutive discharges. The theory of dynamos charging condensers he considered extremely interesting, and thought the fact that the damping factor could be changed in sign must have tremendous consequences.—Dr. W. E. Sumpner asked a question about a method of doubling frequency of alternation recently described by Mr. Trouton, in which the armature of one alternator excites the fields of a similar machine. Mr. Trouton had said that after once doubling the frequency it was not possible to go on doing so. He (Dr. Sumpner) thought that by adding other machines the frequency could be still further increased, and gave a proof of the fact. In reply, Prof. Fitzgerald said that adding another machine increased the frequency by a given amount and did not double the preceding one. Hence to increase the frequency a thousand-fold, a thousand machines would be required, and on this account Mr. Trouton considered it impracticable. Prof. S. P. Thompson thought the paper very suggestive, and the acoustic analogies very interesting. Melde's apparatus was an instance of doubling or halving a frequency. On reading the title of the paper, he had expected hearing of a method of maintaining electromagnetic vibrations by giving occasional impulses in some such way as that in which a tuning-fork could be kept vibrating by allowing the hammer of a trembling bell to knock against it. There was another method of intensifying electric oscillations which he had only seen mentioned in a patent specification by Sir W. Siemens, who suggested using a series dynamo with a telegraph cable to augment the signalling currents. On the subject of ironless dynamos he (Prof. Thompson) desired further information. Some years ago he had made calculations and found the speed at which they would require to run was so enormous as to be beyond the range of engineering possibility. Mr. C. V. Boys, referring to the author's suggestion of using an electric spark with alternate paths to maintain vibration, said that he had tried whether an oscillatory spark was displaced by a magnetic field, but the displacement, even when photographed by a revolving mirror, was barely appreciable. Prof. Perry asked for an explanation of the term "skin-deep magnetism." He was not previously aware that Sir W. Siemens had described a method of improving cable signalling by using a series dynamo. He himself had patented a somewhat similar arrangement. He had also made a dynamo without iron, but had not got it to work. In reply to Prof. Perry the author of the paper said that in electromagnetic vibrations the magnetic force alternates so rapidly that it could not penetrate far into the field magnet of a dynamo before it is reversed; hence the magnetism would only be skin-deep. Dr. Burton suggested that a commutator with many segments, something like that used by Mr. Gordon in his researches on specific inductive capacity, might possibly be employed for producing high frequencies.—A communication on supplementary colours, by Prof. S. P. Thompson, F.R.S., was postponed.

Entomological Society, January 27.—The fifty-ninth annual meeting, which had been adjourned from the 20th inst. on account of the death of H.R.H. the Duke of Clarence.—Mr. F. DuCane Godman, F.R.S., President, in the chair.—An abstract of the Treasurer's accounts, showing a good balance in the Society's favour, having been read by one of the Auditors, the Secretary, Mr. H. Goss, read the Report of the Council. It was then announced that the following gentlemen had been elected as Officers and Council for 1892:—President: Mr. Frederick DuCane Godman, F.R.S. Treasurer: Mr. Robert McLachlan, F.R.S. Secretaries: Mr. Herbert Goss and the Rev. Canon Fowler. Librarian: Mr. George C. Champion. And as other Members of the Council: Mr. C. G. Barrett, Mr. Herbert Druce, Captain Henry J. Elwes, Prof. Raphael Meldola, F.R.S., Mr. Edward B. Poulton, F.R.S., Dr. David Sharp, F.R.S., Colonel Charles Swinhoe, and the Right Hon. Lord Walsingham, F.R.S. It was also announced that the President would appoint Captain Elwes, Dr. Sharp, and Lord Walsingham, Vice-Presidents for the session 1892-93.—The President then delivered an address. After alluding to the vast number of species of insects, and to the recent calculations of Dr. Sharp and Lord Walsingham as to the probable number of them as yet undescribed, he referred to the difficulty experienced in preparing a monograph of the fauna of even a comparatively small part of the world, *e.g.* Mexico and Central America, and certain small islands in the West Indian Archipelago, upon which he, with a large number of competent assistants, had been engaged for many years. The examination of the collections recently made in St. Vincent, alone, had obliged him to search the whole of Europe and North America for specialists; and similar collections from Grenada were still untouched in consequence of the number of workers being unequal to the demands upon their time. He observed that the extent of the subject of entomology was so vast that nothing but a systematic and continuous effort to amass collections, work them out, and preserve them, could place us in a position to proceed safely with the larger questions which followed the initial step of naming species: and it would only be by the steady effort of our Museum officials, not only to work at the subject themselves, but to enlist the aid of every available outside worker, that substantial progress could be made. The President concluded by referring to the losses by death during the year of several Fellows of the Society and other entomologists, special mention being made of M. André, the Duke of Devonshire, Mr. F. Grut, Mr. E. W. Janson, Prof. Felipe Poey, Sir William Macleay, Mr. H. Edwards, Mr. Robert Gillo, and Dr. J. M. J. Af Tengström.

Geological Society, January 27.—Dr. W. T. Blanford, F.R.S., Vice-President, in the chair.—The following communications were read:—On the hornblende-schists, gneisses, and other crystalline rocks of Sark, by the Rev. Edwin Hill and Prof. T. G. Bonney, F.R.S. The authors refer to Mr. Hill's paper, published in 1887, for a general description of the island. They were led to examine Sark again in the hope that its rocks might afford some clue to the genesis of the hornblende-schist of the Lizard. They describe the structure, macroscopic and microscopic, of the various foliated rocks. These are:—(*a*) The basement gneiss, a slightly foliated, somewhat granitoid rock, probably of igneous origin, but with some abnormal environment, and possibly intrusive into, instead of older than the rock which succeeds it. (*b*) The hornblende-schists, almost identical with those of the Lizard, but in one case yet more distinctly banded. (*c*) Banded gneisses, sometimes rather fine-grained, variably banded; quartzofelspathic layers alternating with those rich in biotite or occasionally hornblende. Some of these gneisses resemble the "granulitic group" of the Lizard; others recall certain of the less coarse, well-banded gneisses of Scotland, *e.g.* south of Aberdeen. Sometimes they are much "gnarled" by subsequent earth-movements, by which, however, as a rule, the crystalline rocks of the island do not appear to have been very seriously affected. (*d*) A very remarkable group of local occurrence which exhibits great variety. In some places large masses of a dark green hornblende-rock are broken up and traversed by a pale red vein-granite or aplite. The former rock is drawn out into irregular lenticles, elongated lumps, and finally streaks, and has been melted down locally into the aplite. This then becomes a well-banded biotite gneiss, which macroscopically and microscopically agrees with types which are common among the Archæan rocks. Sark therefore presents an example of the genesis of such a gneiss, and the authors are of opinion that probably all the above-named rocks are of igneous origin, but became solid ultimately under somewhat abnormal conditions, to which the peculiar structures (which distinguish them from ordinary igneous rocks) are due. They attribute the banding to the effect of fluxional movements, anterior to final consolidation, in a mass to some extent heterogeneous. This hypothesis they consider may be applied to all gneisses or schists which exhibit similar structures—that is, to a considerable number (but by no means all) of the Archæan rocks. The second part of the paper consists of notes on some of the dykes and obviously intrusive igneous rocks of the island. Among these are four (new) dykes of "mica-trap," one of which exhibits a very remarkable "pisolitic" structure. The variety of picrite described by Prof. Bonney in 1889 (from a boulder in Port du Moulin) has also been discovered *in situ*. The reading of this paper was followed by a discussion, in which Major-General McMahon, Prof. Judd, Mr. Hudleston, Mr. Barrow, the Rev. Edwin Hill, and Prof. Bonney took part.—On the plutonic rocks of Garabal Hill and Meall Breac, by J. R. Dakyns and J. J. H. Teall, F.R.S. (Communicated by permission of the Director-General of the Geological Survey.) The plutonic rocks described occur in a complex forming a belt of high ground south-west of Inverarnan. They vary considerably in composition, and though gradual passages are sometimes found between more or less acid rocks, at other times the junction is sharp. The more acid are always found to cut through the less acid when the two rocks are found in juxtaposition, and fragments occurring in a rock are less acid than the rock itself. Though thus shown to be of different ages, they must evidently be referred to one geological period. The first rocks to be formed were peridotites; then followed diorite, tonalite, granite, and eurite in order of increasing acidity. The specific gravities, colours, and textures of the rocks are considered, and a detailed account of the constituent minerals given. The essential minerals are arranged in the following order, based on their general distribution in the different types of rock: olivine, pyroxene, hornblende, biotite, plagioclase, orthoclase and quartz, microcline. The following is the order in which the principal constituents commenced to form in the rocks: iron-ores, olivine, pyroxene, hornblende, biotite, plagioclase, orthoclase, microcline, and quartz. The chemical composition of the rocks is discussed, data being furnished by a series of analyses made by Mr. J. H. Player, and a diagrammatic representation of the molecular relations of the different bases and silica is given. The relations between mineralogical composition, chemical composition, and geological age are then considered; and the following conclusions are reached:—(1) That the various rocks have resulted from the differentiation of an originally homogeneous magma. (2) That the chronological sequence from peridotite to eurite is connected with the order of formation of minerals in igneous magmas. The paper was discussed by Dr. Hatch, Prof. Bonney, and Mr. Barrow.—North Italian Bryozoa; Part II. Cyclostomata, by Arthur Wm. Waters.

PARIS.

Academy of Sciences, February 1.—M. D'Abbadie in the chair.—Note on a structure placed on the summit of Mont Blanc, by M. J. Janssen. It will be remembered that, after failing to reach the rock through the snow on the top of Mont Blanc, M. Janssen, last October, made some observations in a temporary hut for the purpose of testing whether it was displaced appreciably by the movement of the snow. The observations failed to indicate any movement. On January 2 the hut was visited by M. Dunod, and some observations made in it at M. Janssen's request show that no change of place has occurred during this interval of four months.—Observations of solar spots and faculæ made with the Brunner equatorial (0·16 metre aperture) of Lyon Observatory during the latter half of 1891, by M. Em. Marchand. (See Our Astronomical Column.)—Temperate regions; local conditions of persistency of atmospheric currents; derived currents; origin and translation of certain cyclonic movements, by M. Marcel Brillouin.—On an extension of Sturm's theorem, by M. E. Phragmén.—On Laplace and Lavoisier's apparatus for measuring the linear expansion of solids, by M. E. Grimaux. The author has come into the possession of some copper-plates drawn by Lavoisier in illustration of his method of determining the coefficient of linear expansion. Pulls have been obtained from these plates and presented to the Academy.—On the compressibility of saline solutions, by M. Henri Gilbault.—On electro-capillary phenomena, by M. Gouy.—On the optical determination of high temperatures, by M. H. Le Chatelier. Some experiments have been made with the idea of measuring high temperatures by determining the intensity of the radiations emitted by a pyrometer of platinum, or clay, or other material, when compared with the light of a standard lamp. The results obtained indicate that the method is a good one. The principal difficulties, of course, depend upon the fact that the radiations emitted by an incandescent body are affected by conditions other than temperature. M. Le Chatelier, however, seems to have satisfactorily overcome these difficulties.—On achromatism, by M. A. Broca.—Barium and strontium nitrides, by M. Maquenne. These nitrides are formed by the direct action of nitrogen at a red heat upon the metals obtained from amalgams formed by electrolysis. The analyses given prove their composition to be represented by N_2Ba_3 and N_2Sr_3 respectively. They yield ammonia on treatment with water, and may be viewed as metallic ammonias. Barium nitride does not give ethyl bases when treated with alcohol. It reacts energetically at a red heat with carbon monoxide, producing barium cyanide and oxide. Strontium nitride similarly yields only a trace of strontium cyanide, the chief products being the oxide, carbonate, and carbon.—Carbon chlorobromides, by M. A. Besson. (See Notes.)—Action of metals on salts dissolved in organic liquids, by M. Raoul Varet. Certain metals, able to precipitate others from their salts dissolved in water, lose this property when certain organic liquids are used as solvents. This difference of action is due somewhat to the water and somewhat to the formation of molecular compounds formed by the union of the products present.—On monosodium mannite, by M. de Forcrand.—Transformation of sulphanilic into sulphanilocarbamic acid in the animal economy, by M. J. Ville.—Chemical study of the chlorophyll bodies of the pericarp of the grape, by M. A. Etard.—Researches on the adherence to the leaves of plants, and notably to the leaves of the potato, of copper compounds used to prevent their diseases, by M. Aimé Girard.—Development of the *organe vibratile* of Composite Ascidiæ, by M. A. Pizon.—On the locust (*Schistocerca peregrina*, Oliv.) and its changes of colour; *rôle* of the pigments in the phenomena of histolysis and histogenesis which accompany the metamorphosis, by M. Kunckel d'Herculais.—On the commencement and extinction of cambial activity in trees, by M. Emile Mer.—Absolute surfaces and relative divisions of the earth occupied by the principal geological groups, by General Alexis de Tillo. The author states the relative surfaces, of each of the present continents, which existed in different geological periods.—Investigation of the nature of the waters and mud of Lake Annecy, by M. L. Duparc.

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