

"stratosphere," above the troposphere, in which temperature is nearly constant or increases slowly with height, and the isothermal planes tend to become vertical.

Isobars for one-tenth and one-fifth of an atmosphere (0.1 megabar and 0.2 megabar according to the nomenclature of the Paris Conference of Physicists, 1900) are shown by beaded lines in the upper parts of the figures.

Wind-direction observations are indicated by arrows facing the wind, carried on standards.

The chief points of difference between the two models are the following:—

	FIG. 1.	FIG. 2.
(1) Surface temperature ...	From 280° to 285°	From 285° to 290°
(2) Sea-level pressure... ..	From 1.016 to 1.023 megabar (30.0 to 30.2 in.)	From 1.026 to 1.033 megabar (30.3 to 30.5 in.)
(3) Height of lower surface of stratosphere	9 km.	10 km.
(4) Lowest temperature in stratosphere	About 215°	About 205°
(5) Wind direction at south- east angle	Nearly S. throughout	Nearly N. throughout

Both figures show that the position of the coldest air was at a height of 10–11 kilometres over the most southern portion represented.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—The chair of accounting vacated by Prof. Sidney Dawson has been filled by the election of Mr. Charles E. Martineau.

Mr. W. B. Grove has been appointed honorary curator of the fungus herbarium in the Botanical Department.

Prof. R. Saundby has been appointed to represent the University on the General Medical Council for a further period of five years.

Prof. Bostock Hill is to represent the University at the Conference on School Hygiene to be held in Paris in August.

The Pro-Vice-Chancellor (Alderman F. C. Clayton) is presenting to the University a statue of His Majesty King Edward VII., in commemoration of the opening of the new buildings by the late Sovereign. It is understood that the statue is to stand in the entrance hall of the main building.

LEEDS.—Arrangements have now been completed for the establishment of a professorship of coal gas and fuel industries at the University as a memorial to the late Sir George Livesey, upwards of 10,500l. having been subscribed to the fund initiated for the purpose by the Institution of Gas Engineers, and an advisory committee has been formed in connection with the work to be carried out by the holder of the chair.

Dr. J. K. Jamieson, hitherto chief demonstrator of anatomy, has been appointed professor of anatomy in the University.

LONDON.—Sir Henry Roscoe has resigned his membership as a Crown nominee, and Mr. F. D. Acland has been appointed in his place.

Mr. F. L. Golla has been appointed honorary demonstrator of chemical pathology and pharmacology in the physiological laboratory of the University, and Mr. A. D. Mitchell, of Sheffield University, has been appointed scientific assistant in chemistry in the University.

DR. J. D. COALES has been appointed principal of the Wolverhampton Technical School.

MR. J. A. JENKINS, for fifteen years registrar of the University College of South Wales, Cardiff, has resigned that position.

On July 8, the honorary degree of Doctor of Laws of the University of Edinburgh was conferred upon Prof. John Chiene, emeritus professor of surgery in the University; Prof. Matthew Hay, professor of forensic medicine, University of Aberdeen; and Prof. W. H. Perkin, F.R.S., professor of organic chemistry, University of Manchester.

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THE increasing popularity of holiday courses for teachers is an excellent indication of the growing desire of schoolmasters and schoolmistresses to acquaint themselves with improved methods of instruction, and to bring their knowledge up to date by attending during their holidays lectures by experts. The County Council of the West Riding of Yorkshire has arranged a series of vacation courses for teachers, to be held at the Municipal Secondary School, Scarborough, during August next. Among the items in a very attractive programme, we notice a course of ten lectures by Prof. A. Smithells, F.R.S., on solution, and the physics and chemistry of cleansing processes; twelve lectures on the teaching of general elementary science, by Mr. W. Mayhowe Heller; and eight lectures on nature-study, by Mr. O. H. Latter. Laboratory work and excursions have been arranged in connection with these courses. There will also be a course in educational handwork, organised by the Educational Handwork Association, during July and August at the same place, and it is possible for students to take a joint West Riding and handwork course.

ON December 21, 1909, the London County Council decided to make a maintenance grant of 8000l. to the Imperial College of Science and Technology, South Kensington. In return for this grant it secures the privilege of nominating twenty-five students for one year's free instruction at the Imperial College. These are now to be nominated for the first time. The instruction will be of an advanced nature, and therefore only advanced students who are qualified to enter on the fourth year of the course should apply. There is no restriction as to income, but intending candidates must be ordinarily resident in the Administrative County of London, and must be students at an institution aided, maintained, or approved by the council. The free studentships do not entitle the holders to any maintenance grants, but cover all ordinary tuition fees. No examination will be adopted for the final selection of the students from the applications received. The free studentships will be awarded on consideration of the past records of the candidates, the recommendations of their teachers, the course of study they intend to follow, and generally upon their fitness for advanced study in science applied to industry. It is quite possible that, in special cases, the free places may be extended to two or more years. Application should be made without delay, as entries will not be considered after July 23. Application forms (T. 2/268) can be obtained from the Education Officer, London County Council, Victoria Embankment, London, W.C.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 30.—Sir Archibald Geikie, K.C.B., president, in the chair.—Prof. A. D. Waller: A new method for the quantitative estimation of hydrocyanic acid in vegetable and animal tissues. The method is colorimetric, and depends on the reaction between potassium cyanide and picric acid, first studied by Hlasiwetz (*Liebig's Annalen*, cx., p. 289 [1859]), and recently applied by Guignard to the detection of minute quantities of hydrocyanic acid (*Annales Sci. Pharmacol.*, 1906, p. 415) and by H. E. Armstrong to the rapid detection of emulsin (Proceedings, March 10). The colour-scale is prepared by mixing equal volumes of a recently titrated solution of 1/10000 hydrocyanic acid and of picrate mixture (equal volumes of 0.5/100 picric acid and 5/100 sodium carbonate). From this stock solution (T 50), after twenty-four hours in an incubator at 40°, a colour-scale is prepared by further dilution with picrate mixture, to contain, e.g., 1, 2, 3, &c., parts of HCN per million, of tints T 1, T 2, T 3, &c. The estimation is made by matching the colour of the given fluid or of its distillate into picrate mixture (after suitable dilution if required), with that of the colour-scale. Thus, e.g., if the tint of a distillate from 10 c.c. of blood (dil. × 5) into 25 c.c. of picrate is found = T 5, and the volume of picrate + distillate is 40 c.c., the amount of HCN in the distillate = 5 × 40 millionths gram, i.e. 0.000200. A second distillation shows whether or no the whole of the HCN present has been taken over in the first distillate. Results

of the application of the method to (1) a leaf of *Prunus Lawrocerasus*; (2) the blood and tissues of a cat after death by a known amount of HCN; (3) the blood and tissues of a person "found dead."—Prof. A. Dendy: The structure, development, and morphological interpretation of the pineal organs and adjacent parts of the brain in the tuatara (*Sphenodon punctatus*). The "pineal complex" consists of the dorsal sac, the paraphysis, the pineal sac ("epiphysis"), the pineal eye, the pineal nerves and their central connections. There is a well-developed choroid plexus, with special blood-supply, on the roof of the dorsal sac, possessing histological features of considerable interest. The paraphysis is a compound tubular gland, with special blood-supply, differing markedly in histological character from the choroid plexuses. Its lining epithelium forms a syncytium, and its opening, which, in the embryo, lies just in front of the commissura aberrans, becomes shifted upwards in the adult on to the anterior wall of the dorsal sac, by the formation of a "supra-commissural canal," the original opening being blocked up by the anterior choroidal blood-vessels. The histological structure of the pineal sac points to a sensory rather than a glandular function. Its wall is essentially similar in structure to the retina of the pineal eye, consisting of radial supporting fibres, sense-cells, and ganglion-cells and nerve-fibres, and pigment may occasionally be deposited in it. The retina of the pineal eye consists of the same histological elements arranged in essentially the same way, with the sense-cells on the inside and the nervous elements in the middle. The pigment is not lodged either in the sense-cells or in the supporting fibres, but is brought into the retina by wandering pigment-cells. The pigment granules escape from these wandering cells on entering the retina, and stream inwards between the radially arranged elements. The inner ends of the sense-cells project into the cavity of the eye, and are covered each by a little cap, formed apparently by the internal limiting membrane of the retina. The developing lens of the pineal eye increases in size partly as a result of mitotic divisions in a marginal zone of undifferentiated cells. As they approach the centre the cells elongate, and some of them degenerate into a kind of mucus, which is secreted from the inner surface of the lens into the cavity of the eye, where it takes part in the formation of the vitreous body. This process of secretion continues in the adult. The nerve of the pineal sac is from its first appearance median. It joins the roof of the brain between the posterior and superior commissures. The nerve of the pineal eye is shown, especially by its development, to be primarily connected with the left habenular ganglion, which even in the adult has a different shape from that of its fellow of the opposite side. Both nerves persist in a well-developed condition throughout life. The view that the pineal sac and pineal eye are respectively the right and left members of a primitive pair of sense-organs, serially homologous with the lateral eyes, is strongly supported. Altogether six pairs of diverticula are given off from the fore- and mid-brain, viz. the cerebral hemispheres, the optic vesicles of the lateral eyes, the recessus thalami prænucleares, the pineal sense-organs, the recessus geniculi, and the optic lobes. These may all be serially homologous with one another, and each may possibly indicate a separate neuromere. There is no commissura mollis and no unpaired plexus medianus in the third ventricle. Reissner's fibre and the sub-commissural organ are very well developed.—J. A. Crowther: The scattering of homogeneous β rays, and the number of electrons in the atom. (1) The scattering of a homogeneous pencil of β rays has been measured for various substances and for rays of different velocity. It has been shown to obey the following statistical laws:—(i) for rays of given velocity the intensity I of the radiation contained within a given cone may be expressed by the equation $I/I_0 = 1 - e^{-k/t}$, where t is the thickness of material passed through, and k a constant depending upon the angle of the cone; (ii) for rays of given velocity the most probable angle of emergence is proportional to the square root of the thickness of material traversed by the rays; (iii) for rays of different velocities, the probable angle of emergence divided by the square root of the thickness traversed is inversely proportional to the product of the mass of the incident β particle into the square of its

velocity. (2) From equations given by Sir J. J. Thomson, the number of electrons contained in atoms of different elements is deduced. It is thus found:—(i) that the ratio of the number of electrons per atom to the atomic weight is constant, the ratio being very nearly 3.0 for all the elements examined; (ii) that the positive electricity within the atom is not in an electronic condition, but is distributed fairly uniformly over the space occupied by the atom. (3) Experiments are described on the absorption of homogeneous β rays. It is shown that the first stage in the absorption of a pencil of homogeneous β rays consists in the scattering of the rays according to the laws already considered. The absorption of the completely scattered radiation is then shown to take place according to an exponential law.—F. Isaac: The spontaneous crystallisation and the melting- and freezing-point curves of mixtures of two substances which form mixed crystals and possess a minimum or eutectic freezing point.—Mixtures of azobenzene and benzylaniline. The results obtained in this research may be thus summarised:—(1) The freezing- and melting-point curves for mixtures of azobenzene and benzylaniline have been determined, and it has been shown that these substances possess a minimum or eutectic point at 26° for the mixture containing 19 per cent. azobenzene and 81 per cent. benzylaniline, and form a series of mixed crystals on one side only of the eutectic, viz. that with excess of azobenzene. This is, therefore, a limiting case of Roozeboom's Type 5, in which two substances, A and B, possess freezing- and melting-point curves which exhibit a minimum eutectic point, and form two series of mixed crystals, i.e. mixed crystals containing excess of A, and mixed crystals containing excess of B. (2) The melting-point curve has been confirmed by actual analysis of the mixed crystals. (3) The supersolubility curve, or curve of spontaneous crystallisation, has been determined for these mixtures by two methods:—(i) by noting the temperature at which a liquid mixture of known composition crystallises spontaneously in a sealed tube; (ii) by noting the temperature at which a known liquid mixture attains its highest refractive index and gives a dense labile shower when placed in the trough of the inverted goniometer. It has been shown that each mixture possesses a definite temperature of spontaneous crystallisation. The supersolubility curve shows a minimum for liquids having approximately the eutectic composition, and runs approximately parallel to the freezing-point curve. It crosses the melting-point curve three times. The nature of the mixed crystals which first separate spontaneously from any liquid mixture on the supersolubility curve has been investigated. The composition of such crystals has been determined by separating them from their mother liquor and finding their melting points. (5) A few thin sections have been ground from the solid mixtures in the neighbourhood of the eutectic, and their structures examined. These structures do not appear to be permanent. After the lapse of some months they completely changed, new crystal needles appearing all over the sections. These changes, however, appear to be very gradual, and to take place with change of temperature.—E. C. Snow: The determination of the chief correlations between collaterals in the case of a simple Mendelian population mating at random. This paper investigates the values which should hold for the correlations between (a) siblings, (b) uncle and nephew, and (c) first cousins, on the Mendelian hypothesis of "unit-characters." The correlations both for gametic and somatic characters are found. For the former, values independent of the distribution of the dominant and recedant characters among the population are obtained. These are (a) 0.500, (b) 0.250, and (c) 0.250. In the case of the somatic correlations, however, the results depend upon the relative numbers of the population possessing the dominant and recedant attributes before crossing. By varying this proportion, different values of the correlations can be obtained, but these are always less than the corresponding gametic ones stated above. The investigation brings out the important point that, on the Mendelian theory of heredity, the similarity between first cousins is quite as close as, or closer than, those between uncle and nephew. Biometric results previously reached have pointed to the same conclusions. This is of great interest from the medical point of view. In medical diagnosis, a man's

uncles and aunts, but not his cousins, are generally considered; but the results of the present paper show that his cousins, usually more numerous, give just as good a knowledge of his constitutional tendencies as do his uncles and aunts.—C. J. T. **Sewell**: The propagation of sound in a fog. This paper is intended as a sequel to the author's previous paper on "The Extinction of Sound in a Viscous Atmosphere by Small Obstacles of Cylindrical and Spherical Form," in which the loss of energy from the primary waves owing to viscosity was investigated. In the present paper the author has included the additional loss of energy due to heat conduction. The work proceeds on much the same lines as before, and the results obtained are of the same order of magnitude. The chief interest consists in the application of the results to the effect of atmospheric fog upon the propagation and audibility of sound. Waves of high frequency suffer most. If the diameter of the drops of water in a dense fog is assumed to be 0.02 mm., and the density of the fog amounts to $4\frac{1}{2}$ grams per cubic metre, the intensity of sound of wave-length 100 cm. is reduced in the ratio of 1 to e before the sound has travelled a distance of 100 metres. If the wave-length is 1000 cm., this distance is increased to about 350 metres. In any case, the results seem to show that the presence of fog at sea must diminish quite appreciably the audibility of sound.—L. **Southern**s: A determination of the ratio of mass to weight for a radio-active substance. A determination has been made of the ratio of mass to weight for uranium oxide by comparison with the known value for a normal substance (lead oxide). It had been supposed by Sir J. J. Thomson that a radio-active substance might possess greater mass than the same weight of a non-radio-active substance, on account of the greater store of potential energy which is associated with the former. In the case of uranium oxide, the increase in the ratio of mass to weight would be about 1 in 16,000. The investigation has been made by means of a rigid pendulum fitted with two knife-edges and a hollow bob, into which could be packed either of the substances used. Special means have been employed in order to eliminate errors due to slight variations in the position of the centre of gravity of the pendulum, and to other causes. The results show that the ratio for the uranium oxide does not differ from the normal value by more than 1 in 200,000, and thus that the contemplated effect is absent.—F. P. **Burt** and F. L. **Usher**: The relative atomic weights of nitrogen and sulphur. The object of the research was to determine the combining weights of nitrogen and sulphur by the analysis of nitrogen sulphide. The method adopted was briefly as follows:—A weighed quantity of nitrogen sulphide, purified by sublimation *in vacuo* over silver at 100° C., was decomposed by subliming over red-hot quartz wool contained in a quartz tube. The sulphur was deposited a few inches beyond the wool, and the nitrogen was pumped off and estimated in a constant-volume gas burette. Assuming the density of nitrogen, the relative weights of nitrogen and sulphur could be calculated, the sulphur being obtained by difference. The problem was complicated by the impossibility of starting an experiment with the quartz wool in the reaction tube in a gas-free condition. The difficulty was overcome by measuring in blank experiments the quantity of air removable from the hot wool *in vacuo*, and by estimating traces of more condensable gas present by exposing the nitrogen to potash and re-measuring it. The final corrected N/S ratios are as follows, the weight of a "normal litre" of nitrogen in London being taken as 1.25144 grm.:—0.436847, 0.436875, 0.436839, 0.436857, 0.436897, 0.436878, 0.436898. The mean is 0.436870, and the greatest deviation from the mean is 1 in 14,000. From this ratio the atomic weight of sulphur becomes 2.067, if nitrogen be given the very probable value 14.009.—Dr. F. W. **Edridge-Green**: The relation of light perception to colour perception. It may be easily shown that light perception and colour perception are quite distinct. In fact, we can divide cases of colour-blindness into two classes, according as the defect is (a) one of light perception, or (b) one of colour perception or differentiation without any defect in light perception. Of course, both defects may be present in the same individual. The investigation of these two classes of defective vision is much facilitated by the use of a spectrometer which the author

has devised for the purpose. This instrument is a spectrometer so arranged as to make it possible to expose to view in the eye-piece the portion of a spectrum between any two desired wave-lengths. Tested with this instrument, a normal individual will, as a rule, name six distinct colours, namely, red, orange, yellow, green, blue, and violet, and will mark out by means of the shutters about eighteen monochromatic patches. Occasionally we come across individuals with a greater power of differentiating hues, to whom, as to Newton, there is a distinct colour between the blue and violet, which Newton called indigo. Such individuals will mark out a greater number of monochromatic patches, from twenty-two up to twenty-nine. Those who have defective light perception for certain rays, with normal hue perception, behave exactly in the same way as a normal-sighted person with those rays removed or reduced to the same intensity, and not as if a light-perceiving substance which was sensitive to rays from a considerable range of the spectrum had been removed. Those with defective hue perception mark out with the spectrometer a smaller number of monochromatic patches than the normal, and say that there are five, four, three, two, or one colour instead of the normal six. They behave in every way as if their colour sensations were correspondingly limited. Therefore, if the normal be designated hexachromatic, then pentachromatic, tetrachromatic, trichromatic, dichromatic, or monochromatic correctly describes their colour-vision.—M. G. **Sykes**: The anatomy and morphology of the leaves and inflorescences of *Welwitschia mirabilis*. An account is given of the anatomy of the leaves, and of the inflorescence axes, cones, bracts, and flowers of both sexes. It is shown that the male and female inflorescences are essentially similar in their method of vascular supply and in their detailed anatomy, and it is concluded that they are homologous. Various characters suggest comparison with the Cycads and the Medulloseæ. From the position of the embryo-sac relatively to the two coverings of the ovule at various stages of development, they are regarded as two integuments. The seed can be closely compared with that of *Lagenostoma*; its differences from this primitive type are referable to changes dependent on the evolution of siphonogamy and possibly insect fertilisation. In both these seeds the free outer integument is regarded as a primitive character, in contrast with the fused integuments of *Cycas* and *Cardiocrarpus*. In all these cases the entire vascular system appears to be integumental. The connection between *Welwitschia* and the Cycads, the Bennettitales and the Angiosperms, is discussed.—Colonel Sir David **Bruce**, C.B., Captains A. E. **Hamerton** and H. R. **Bateman**, and Captain F. P. **Mackie**: (1) The natural food of *Glossina palpalis*; (2) mechanical transmission of sleeping sickness by the tsetse-fly.—V. H. **Veley** and Prof. A. D. **Waller**: The comparative toxicity of theobromine and caffeine as measured by their direct effects upon the contractility of isolated muscle. It is shown by measurements of the contractility of isolated muscle that the toxicity of theobromine, the base of cocoa, is greater than that of caffeine, the base of coffee and tea, in the proportion of 3:2. The introduction of a second methyl group into the oxy-purine residue, namely, the formation of caffeine from theobromine, thus diminishes the toxic value, a result which is the converse of that observed in the case of the paraffinoid alcohols. The toxic effects of coffee and tea extracts are also studied, and it is shown that the effect of the former is mainly due to the caffeine contents, and not to the tannic acid.—Prof. W. B. **Bottomley**: The assimilation of nitrogen by certain nitrogen-fixing bacteria in the soil.—Prof. A. B. **Macallum**: The inorganic composition of the blood in vertebrates and invertebrates and its origin.—Mary T. **Fraser** and J. A. **Gardner**: The origin and destiny of cholesterol in the animal organism. Part vii.—The quantity of cholesterol and cholesterol esters in the blood of rabbits fed on diets containing varying amounts of cholesterol.

CAMBRIDGE.

Philosophical Society, June 6.—Mr. W. Bateson, president, in the chair.—H. H. **Brindley**: Further notes on the procession of *Cnethocampa pinivora*. Lantern-slides were shown illustrating observations on the procession of the caterpillar of this Eupterotid moth, which infests the

pires of the Landes. The caterpillars march in single file from the nest tree over the sand on fine days in late March and early April, ending the last day's procession by burrowing for pupation. The general impression left by observation of processions is that the larvæ in head-to-tail contact act as one individual, and as such their course of action is very difficult to disturb by artificial interference in respect both of direction of march and general behaviour. Though removal of the leader hardly, if at all, checks the progress of a procession (in a procession of six, for instance, the leaders were removed successively and placed at the rear of the procession six times in fourteen minutes without the procession stopping), the "circulating mass" seems invariably formed on the initiative of the leader. The reason for this frequently occurring event, as, indeed, also the stimuli which determine the behaviour of a procession, remains obscure, while no explanation is forthcoming of the remarkable temporary independence of some larvæ. As in the observations by T. G. Edwards, no irritation of the skin by the poison hairs of the larvæ, in spite of frequent handling, was experienced (Fabre lays much stress on the inconvenience he suffered from this source, so the liability to irritation probably varies in different individuals).—Dr. **Graham-Smith**: The habits of *Musca domestica*.—Dr. N. H. **Swellengrebel** and C. **Strickland**: The development of *Trypanosoma lewisi* in the rat flea (*Ceratophyllus fasciatus*). A development of *T. lewisi* was found to take place first in the mid-gut, later in the hind-gut and rectum of the flea. The forms observed resembled very much the forms of *T. lewisi* in an artificial culture, except that the later stages in the flea, a return to a trypanosome form ("small trypanosomes"), are never found in culture. No such developmental forms were found in a large number of control fleas.—Dr. F. **Ransom**: The absorption of tetanus toxin.—H. **Ackroyd**: The fate of uric acid in the dog.—Dr. **Cobbett**: The absence of living tubercle bacilli from old tuberculous lesions. The author has on several occasions, while working for the Tuberculosis Commission at Stansted, as well as in Sheffield and Cambridge, found that old caseous and calcareous deposits, which were undoubtedly of a tuberculous nature, might contain no tubercle bacilli capable of infecting the guinea-pig.—W. E. **Dixon**: The action of potash salts taken by the mouth. The non-toxicity of potash salts taken by the mouth was shown to be due to the very easy excretion of these salts by the kidneys, so that their concentration in the blood was but slightly increased.—Prof. Sims **Woodhead**: The results of sterilisation experiments on the Cambridge water. Sterilisation by chlorine and chlorine compounds had given most startling results. In a series of preliminary experiments, carried out in the laboratory, it had been found that one part of available chlorine to two million parts of water was sufficient to kill all non-spore-bearing bacteria of the *Bacillus coli* type, and therefore of the typhoid bacillus type, and probably also of the cholera bacillus type, within half an hour even in the presence of the appreciable amount of organic matter that was necessarily added along with the cultures of *Bacillus coli*. Water to which had been added some hundreds of the *Bacillus coli* per c.c. was found after treatment to contain not a single living colon bacillus in 50, 60, and 100 c.c. (The unimportant spore-bearing organisms were not killed.) Having obtained these results in the laboratory, a large experimental plant capable of sterilising more than 80,000 gallons of water per twelve hours, erected at Fulbourn, was used, and three sets of experiments were carried out, one a preliminary series in which the apparatus was run at intervals as required, and then two series of experiments in which the apparatus was run for twelve hours daily for more than a fortnight in each series. The standard of the London Water Board, that there shall be no *Bacillus coli* in quantities of water less than 200 c.c., was taken as the one to be aimed at. In every case, however, quantities of 500 c.c. were examined, and after certain preliminary difficulties had been surmounted, water was obtained in which none of the observers could find the *Bacillus coli* in 500 c.c. The amount of chlorine used in these experiments varied from one part in a million to one in six million parts of water. In the earlier experiments, where up to one part of chlorine in four million

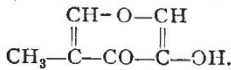
parts of water was used, it was thought necessary to neutralise any remaining chlorine by the addition of sodium bisulphite. After further experiments, where smaller quantities of chlorine were used, this addition was dispensed with, as the water treated, though sterile, did not retain the slightest taste of chlorine. It was suggested, of course, that water so treated might have some effect upon the human organism. All those who were working at Fulbourn drank considerable quantities of this water, and everyone who tried it accepted it as a first-class drinking water.—F. J. M. **Stratton** and R. H. **Compton**: Accident in heredity, with special reference to right- and left-handedness. An examination of the manner in which the inheritance of Mendelian characters would be affected by the action of a constant environmental factor. The assumption is made that a certain proportion of individuals have their characters inverted in appearance by accidental causes, and an application is made to the statistics dealing with the inheritance of the mode of clasping the hands.—R. H. **Compton**: Right- and left-handedness in barley. A study of the two kinds of seedlings of barley, the folded first leaves of which are related to one another as an object to its mirror image. A considerable numerical excess of one kind is found in all the varieties studied. The dimorphism in question is not found to be hereditary, and it appears to be governed neither by the direction of twist of the last foliage leaf below the spike nor by the position of the seed on the spike.—F. T. **Brooks**: The development of *Gnomonia erythrostoma*, the cause of the cherry-leaf scorch disease. The present investigation concerns an examination of the life-history of this fungus from the cytological standpoint, very little work on the Pyrenomycetes having hitherto been done from this point of view.—Dr. A. C. **Dixon**: Jacobi's double-residue theorem in relation to the theory of point-groups.—N. R. **Campbell**: Discontinuities in light emission, ii. The paper is a continuation of one recently presented to the society under the same title. The main object of the research has remained impossible to attain. The subsidiary results do not lend themselves to summary.

PARIS.

Academy of Sciences, June 27.—M. Émile Picard in the chair.—Ph. **van Tieghem**: A new classification of the Inovuleæ group.—J. **Boussinesq**: The conservation of true masses in different phenomena, principally luminous, where there appear fictitious variable masses.—Armand **Gautier**: The action of a red heat on formaldehyde. Experiments show products of decomposition to be carbon monoxide, and hydrogen, with a trace of methane.—B. **Galitzine**: A new type of seismograph for the vertical component.—Charles **Nordmann**: The brightness of Halley's comet, and the composition of its light.—Jules **Baillaud**: Photographic observations of a small planet.—L. **Letombe**: A geometrical study of distribution in machines with separate distributors.—H. **Larose**: The propagation of a discontinuity on a telegraphic line furnished with a transmitter.—A. **Debiere**: The atomic weight of the radium emanation. The author shows that by the loss of an α particle, and consequent departure of an atom of helium of atomic weight 4, the radium of atomic weight 226.5 becomes the emanation of atomic weight 222.5.—G. A. **Hemsalech**: The duration of the emission of spectral rays by luminous vapours in the electric spark.—Gabriel **Sizes** and G. **Massol**: A photographic record of the vibrations of a diapason.—Edmond **Bauer**: The emission of gases.—E. **Henriot**: The rays of potassium.—A. **Besson** and L. **Fournier**: The action of hydrogen on sulphur chloride and thionyl chloride under the influence of an electric discharge.—Witold **Broniewski**: The electrical properties of aluminium-silver alloys.—M. **Kohn-Abrest**: The nitrides and oxides obtained from aluminium heated in air.—G. **Urbain**, M. **Blondei**, and M. **Obiedoff**: The extraction of germanium from blende.—L. J. **Simon**: The acid character of oxalacetic ether.—M. **Lespieau**: The hydrogenation of acetylene compounds.—A. **Béhal**: A new tertiary menthol, and the passage of pinene into menthene.—André **Meyer**: The condensation of phenyl-isoxazolone with mesoxalic ester.—René **Maire** and Adrien **Tison**: Some Plasmodiophoraceæ.—C. **Gessard**: Blood fibrin.—

Maurice **Nicloux**: The products of decomposition of chloroform in the organism.—**M. Caullery** and **A. Lavallée**: Experimental investigation on the initial phases of infection of *Amphiura squamata* by *Rhopalura ophiocoma*.—**Alfred Angot**: The earth tremor of June 24, 1910.—**P. Vialla** and **P. Pacottet**: The culture of the *Roesleria* of the vine.—**A. Marie**: The neutralising properties of a substance isolated from a normal brain.

July 4.—**M. Émile Picard** in the chair.—**J. Boussinesq**: The probable applicability, to rays or kathode currents, of the principle of mass constancy.—**Ch. Lallemand**: The probable exactness of different evaluations of the altitude of Lake Chad. Taking all accounts into consideration, a shore of 240 metres, in round numbers, seems nearest the truth.—**D. Gernex**: The nature of the product called by the name of black phosphorus.—**Armand Gautier** and **P. Claumann**: The action of iron and its oxides, at a red heat, on carbonic oxide. Application to some geological data. The resulting products are carbides of iron, free carbon, and carbon dioxide, together with certain iron oxides.—**Th. Schlösing**, fils: The production of nicotine by the cultivation of tobacco.—**E. L. Bouvier**: The pycnogonids with five pairs of paws collected by the Jean Charcot expedition on board the *Pourquoi-Pas?*—**A. Calmette** and **C. Guérin**: The re-absorption of tuberculous bacilli by cattle following on the injection of mixtures of serum of animals rendered hyper-immune, and bacilli cultivated in series on beef bile.—**A. Perot**: A study of the variation of the wave-length of solar light at the sun's circumference.—**D. Eginitis**: Some phenomena shown by Halley's comet after its passage across the sun. It seems evident that much of the shortening of the tail was due to the angle under which the comet was seen, besides it being not unlikely that some disintegration was brought about by the earth itself.—**Fr. Iniguez**: Physical observations on Halley's comet.—**Serge Bernstein**: Mechanical equations and the calculus of variations.—**F. Ducretet** and **E. Roger**: An apparatus for receiving time on land and on board ship by wireless telegraphy.—**P. Beaulard**: The electrical absorption exercised by some alcohols.—**Mdlle. L. Blanquies**: The constituents of radio-activity induced from actinium.—**A. Dufour**: The rotation of a mercuric arc in a magnetic field. Observations on Döpler's phenomenon.—**Louis Malciès**: The appearance of certain dielectric anomalies by changing the state of the insulating medium. Pure vaseline, an insulator at ordinary temperatures, but a conductor in the liquid state, acts as a medium charged with free ions of both signs, the mobility of which, while non-existent when the substance is semi-fluid, only shows itself on the attainment of a clearly liquid state.—**Jean Villey**: An electrometric micromanometer.—**Maurice de Broglie**: The exclusive presence in the gases evolved from some hydrogenated flames of ions altogether analogous to those produced by Röntgen rays. It was observed, notably in the case of hydrogen, ether, aldehyde, acetone, &c., that the flames of combustion gave ions closely agreeing with Röntgen radiation in velocity.—**V. Auger**: Manganate of sodium and its hydrates. It is possible to obtain manganate of sodium by the decomposition of the corresponding permanganate by means of excess of soda.—**M. Barro**: The decomposition of thorium sulphate by water.—**Léo Vignon**: The adsorption of certain colouring matters.—**E. André**: Acetylenic ketones. The author gives the various physical constants for acetyl, propionyl, butyryl, isovaleryl, and caproyl-phenyl-acetylene.—**A. Backe**: Researches on *iso*-maltol. The author considers the probable formula of this substance to be



—**Em. Bourquelot** and **Mdlle. A. Fichtenholz**: The presence of a glucoside in the leaves of a pear tree, and its extraction.—**Paul Becquerel**: The abiotic action of ultra-violet rays, and the hypothesis of the cosmic origin of life. Although the effect of dryness, low temperature, and cold may serve to retain the vitality of living spores in inter-stellar space, yet the fact that this space is full of ultra-violet radiation, which is shown to have a most destructive effect on spore life, goes far to discredit any theory of the cosmic origin of life.—**Maurice Arthus**:

Cobra poison and curare.—**M. Szezter**: The oxidation of pure oxyhæmoglobin by pure oxygenated water.—**Pierre Girard**: The electrostatic mechanism of osmosis.—**C. Viguiér**: The very rapid maturity of a Spionid larva.—**Edmond Hitzel**: A double bend in the south wall at the base of the peak of Platé, near Chedde (Haute-Savoie).—**L. Cayeux**: The existence of calcareous phosphates in diatoms from Senegal.—**L. De Launay** and **G. Urbain**: The formation of blende, and minerals derived from it.—**M. Ferret**: Some oscillations of the sea observed at Bonifacio.

NEW SOUTH WALES.

Linnean Society, May 25.—**Mr. C. Hedley**, president, in the chair.—**E. C. Grey**: The fatty acids of brain lipoids, part i.—**E. Meyrick**, F.R.S.: Revision of Australian Tortricina. The author dealt with the Tortricina of Australia (and New Zealand) in two papers contributed to the society's Proceedings for 1881 (vol. vi., pp. 410 and 629), the number of Australian species therein recorded being 132. The revision increases the number to 434 species, of which about 232 are described as new; the present paper, the first instalment of the revision, is concerned with 290 species, comprised in the Carposinidæ, Phalonidæ, and Tortricidæ. For this result the author is greatly indebted to the aid of a number of Australian correspondents who forwarded collections; these, together with the material which he had himself accumulated, were taken to the British Museum, and a close comparison instituted with Walker's types, with the result, it is believed, that every one of these was identified satisfactorily. The Tortricina are considered to have originated from the Hilarographa group of the Plutellidæ.

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