New anemograph and anemoscope, by H. Wild (in German). The former has been at work at St. Petersburg since 1887, and gives satisfactory results; the second, which is a simplification of the former, has been in use at St. Petersburg and Pavlovsk for more than ten years, and also works quite satisfactorily.—On the law of reciprocity of quadratic residues, note by Ed. Lucas (in French).—On the structure of nerve-filaments, by Ph. Owsjannikoff.—Apocryphal Acts of Apostles in Coptic language, by O Lemm (in German).

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 5.—"On a Membrane lining the Fossa Patellaris of the Corpus Vitreum." By Prof. T. P. Anderson Stuart.

The existence of a membrane here had been the subject of discussion *pro* and *con.* till 1886-87, when the matter was considered by some to have been finally set at rest by Schwalbe, who decided against it in very clear and explicit terms. According to his description the vitreus jelly itself lies against the lens capsule and forms the posterior boundary of the canal of Petit—if such it could be called, for the canal, he says, is merely to be compared with the other clefts in the vitreus. Any membrane that had been seen he declares to be an artificial product, the result of the action of reagents. The author finds, however, that in the perfectly fresh, unaltered eye, after the removal of the lens in its capsule, there may be raised off the surface of the jelly a membrane which, when stained and mounted, does not show any structure. When the membrane from the four-year-old ox eye was isolated and tied over the mouth of a test-tube ½ inch wide, it sustained a column of water 40 inches high. A smaller column than this may be sustained for days together. When isolated, it may be dried to form a delicate membrane. It is thinner in the centre where it lies against the lens capsule, thicker peripherally where it forms the posterior wall of the canal of Petit, which is thus a true canal. Thus, when the entire vitreus is squeezed, the centre of the anterior face bulges more than the periphery. The line of demarcation of the two parts is fairly sharp. The sun's rays concentrated upon it show fluorescence as marked as in the case of the hyaloid, and at a puncture the sharp fluorescent edge is strikingly different from the jelly showing through the hole. Treated with picrocarmine by the Gross method (to be described in the next number of the *Journal of Anatomy and Physiology*), the membrane is red, the jelly is yellow, and now its wrinkles are seen just as in the case of the hyaloid. In successful meridional sections the membrane is seen *in situ*. For ophthalmological practice, a knowledge of the existence of the membrane is most important, and the observations of ophthalmologists strongly support the author's observations.

"On the Connection between the Suspensory Ligament of the Crystalline Lens and the Lens Capsule." By Prof. T. P. Anderson Stuart.

The common teaching is that there is a direct continuity of substance between the suspensory ligament and the capsule of the lens, but an observation by the author of the paper seems to indicate that the ligament is only cemented to the capsule. On opening eye-balls in an advanced state of decomposition—putrid—he found the lens in its capsule perfectly free, and no indication of any rupture of tissue along the line of attachment of the suspensory ligament. This ligament was found perfectly intact projecting from the collapsed vitreus body as a sort of frilled ring with a free edge. These points are best seen after the Gross staining of the structures, as described by the author in the next number of the *Journal of Anatomy and Physiology*. The observation bears upon the still unsettled question of the development of the lens capsule, and upon cases of detachment of the ligament from the capsule sometimes met in ophthalmological practice; also on cases of atrophy and solution of the suspensory ligament, and cases of luxation of the lens.

"A Simple Mode of Demonstrating how the Form of the Thorax is partly determined by Gravitation." By Prof. T. P. Anderson Stuart.

Remembering how constant and how potent is the action of gravitation, and arguing that the segments of the thorax were so many rings of more or less elastic matter, the author concluded that, if similar rings of any other elastic material were suspended in the same way, the form of the thoracic segments should be reproduced, provided there intervened no other condition strong enough to counteract the action of gravitation. The author has found crinoline steel most convenient, though bands of paper do very well. The form of the thoracic segment of the quadruped, of the human fœtus, and of the human adult, are reproduced in succession if the ring be held between finger and thumb, and turned, from lying in the vertical, till it lies in the horizontal plane. The complete reproduction of the different features of the adult human thorax at its most characteristic level is most striking. This is when the steel, as usually sold, is about 6 feet long and ½ inch wide. As the ring is made smaller, the forms of the higher segments appear in succession. The points which are thus reproduced are so numerous and simultaneous that the author cannot believe them to be mere coincidences, and he therefore concludes that gravitation has had a greater influence in determining the typical form of the thorax than would be generally admitted. This is supported by the shapes assumed by the steel rings when the mode of suspension is varied from the normal, as in deformities of the vertebræ: here the particular form in the individual—the thoracic deformity—is more or less accurately reproduced.

Physical Society, February 13.—Annual General Meeting.—Prof. A. W. Reinold, F.R.S., Past-President, in the chair.—The reports of the Council and Treasurer were read and approved. From the former it appears that there has been a satisfactory increase in the number of members, and in the average attendance at the meetings. During the year a translation of Prof. Van der Waals's memoir on the continuity of the liquid and gaseous states of matter has been issued to members, and it is hoped that the translation of Volta's works, now in hand, will be published before the next general meeting. The Council regret the loss, by death, of Mr. W. H. Snell and Mr. W. Lant Carpenter, and obituary notices of these late members accompany the report. The Treasurer's statement shows that the financial condition of the Society is very satisfactory, and that the sales of the Society's publications have increased considerably.—A vote of thanks, proposed by Mr. Whipple and seconded by Dr. Gladstone, was unanimously accorded to the Lords of the Committee of Council on Education for the use of the room and apparatus. Dr. Atkinson proposed a vote of thanks to the auditors, Prof. Fuller and Dr. Fison, which was seconded by Dr. Thompson, and passed unanimously. The proposer, in referring to the satisfactory nature of the accounts, recommended that the publications of the Society should be brought before physicists and other students of physical science, and Dr. Thompson heartily concurred in this recommendation. A third unanimous vote was accorded to the President and Officers for their services during the past year, the proposer and seconder being Dr. Waller and Prof. Minchin.—The following gentlemen were declared duly elected to form the new Council: President: Prof. W. E. Ayrton, F.R.S.; Vice-Presidents: Dr. E. Atkinson, Walter Baily, Prof. O. J. Lodge, F.R.S., Prof. S. P. Thompson; Secretaries: Prof. J. Perry, F.R.S., T. H. Blakesley; Treasurer: Prof. A. W. Rücker, F.R.S.; Demonstrator: C. V. Boys, F.R.S.; other members of Council:—Shelford Bidwell, F.R.S., W. H. Coffin, Major-General E. R. Festing, R.E., F.R.S., Prof. G. F. Fitzgerald, F.R.S., Prof. J. V. Jones, Rev. F. J. Smith, Prof. W. Stroud, H. Tomlinson, F.R.S., G. M. Whipple, James Wimshurst.—The meeting was then resolved into an ordinary science meeting, and a paper on the change in the absorption spectrum of cobalt glass produced by heat, by Sir John Conroy, Bart., was read by Mr. Blakesley. The absorption spectrum of cobalt glass, when cold, consists of three dark bands in the red, yellow, and green, with a considerable amount of absorption between the first two. When a piece is heated to nearly red heat, the absorption between the first two dark bands diminishes, and the band in the red moves towards the least refrangible end of the spectrum, whilst those in the yellow and green retain their position, but become less distinct. During the heating of the glass the intensity of its colour diminishes, and as the glass cools its original colour and absorption spectrum returns. Diagrams and numbers showing the character and positions of the bands in hot and cold glass accompany the paper, together with the numbers obtained by Dr. W. J. Russell (Proc. Roy. Soc., xxxii. p. 258) for cold cobalt glass. In conclusion, the author says that these observations, and those of Feussner on solutions, show that the absorption spectra of some substances vary with temperature. In solutions, this may be due to formation of different hydrates or to partial dissociation, but in a

solid like cobalt glass an actual change in its chemical constitution at a temperature considerably below its fusing point does not seem probable. Dr. Gladstone said it was generally known that heat affects the colouring power of substances, and that in solutions absorption is greater the higher the temperature. Different solvents sometimes produce effects analogous to heat, for cobalt salt dissolved in water and in alcohol gives pink and blue solutions respectively, and rise of temperature makes the aqueous solution more blue. He concurred with the author as to the causes of the phenomena in liquids, and that the same explanation would not apply to glass. Prof. S. P. Thompson thought Sir John Conroy's results agreed with the experiments which Mr. Ackroyd showed before the Society some years ago, when he demonstrated that the colours reflected by opaque bodies, such as porcelain, &c., when heated, tend towards red.—Prof. Minchin showed some experiments in illustration of his paper on photo-electricity read at the previous meeting. In one of these, a seleno-aluminium battery, illuminated by the light of a taper, deflected an electrometer needle, thereby actuating a relay and ringing a bell. He afterwards exhibited one of his "impulsion cells" in action, and showed the change from the insensitive to the sensitive state produced by a Hertz oscillator at a distance. In the discussion, Mr. Tunzelmann said Kalischer and von Uljanin had worked at the same subject, the former being the first to make experiments on a photo-E.M.F. in selenium. His cells were made by winding brass wires on glass tubes and coating them with selenium, which was subsequently annealed. These cells lost their power after some time, and would not respond to feeble lights. By using two wires of different metals he obtained better results. Fritts, in 1883, used brass and gold plates coated with selenium, and Uljanin employed platinum plates deposited so thin as to be transparent. The latter experimenter found that the E.M.F. was proportional to the square root of the intensity of the light. He also observed that the orange-yellow of the prismatic spectrum produced the greatest effect, whereas the yellow-green and green rays of the diffraction spectrum gave the maximum E.M.F. Comparing these results with Langley's observations on the energy of the spectrum, it would appear that the E.M.F. bears no relation to the maximum energy falling on the surfaces. Speaking of the cause of the phenomena, he said the electrolytic idea of von Uljanin seemed inapplicable to Prof. Minchin's results, and he inquired whether a mixture of selenium and aluminium would undergo a gradual change by exposure to light. Dr. Gladstone said such a change, if it occurred, would be very slow, for nearly all difficult chemical reactions take time to complete. The fading of colours was adduced as an instance of slow chemical change produced by light. Dr. Waller thought the subject might throw light on the changes occurring in the retina, and asked if it was possible to separate thermo-electric and photo-chemical effects. Dr. Burton said he had suggested that the action of light on the retina was a photo-chemical one some time ago. But hitherto it had been difficult to obtain substances sensitive to any but the blue and violet rays, whereas the eye was most sensitive to green and yellow light. In the photo-electric batteries, however, the E.M.F. may generate a current and therefore energy, and the important question seemed to be, Where does this energy come from? Is it a chemical change precipitated by the action of light, or does a direct conversion of light into electric energy occur? Prof. Minchin, in his reply, said he thought his cells really transformed the incident energy. They were usually kept on open circuit, and there appeared to be no deterioration with time, the only change being a sluggishness in developing the maximum E.M.F.

Zoological Society, February 3.—Prof. Flower, F.R.S., President, in the chair.—The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January 1891; and called special attention to a Yellow-crowned Penguin (*Eudyptes antipodum*) from Stewart Island, New Zealand, presented by Sir Henry Peek, Bart., new to the collection.—A letter was read from Dr. Emin Pasha, dated "Bussisi, October 6, 1890," announcing the despatch to the Society of a collection of birds which he had made on his way up from the coast.—The Secretary exhibited, on behalf of Mr. J. W. Willis Bund, a specimen of the Collared Petrel (*Œstrelata torquata*), which had been shot off the Welsh coast in Cardigan Bay in December 1889, and was new to the British Avifauna.—A communication was read from Dr. R. W. Shufeldt, containing remarks on the question of saurognathism of the Woodpeckers and other osteological notes upon that group.—Count T. Salvadori pointed out the characters of two new species of Parrots of the genus *Platycercus*, which he proposed to call *P. xanthogenys* and *P. erythropeplus*, both believed to be from Australia.—Mr. P. L. Sclater, F.R.S., gave an account of a collection of birds, from Tarapacà, Northern Chili, which had been made for Mr. H. Berkeley James by Mr. A. A. Lane. Fifty-three species were recorded as represented in the series, amongst which was a new Finch, proposed to be called *Phrygilus coracinus*.—Mr. F. E. Beddard gave an account of the pouch of the male Thylacine, from a specimen recently living in the Society's Menagerie. Mr. Beddard also described the brain of this animal, and pointed out its differences from the brains of other Marsupials.

CAMBRIDGE.

Philosophical Society, February 9.—Prof. Darwin, President, in the chair.—The following communications were made:—On rectipetality, by Mr. F. Darwin and Miss D. Pertz.—On the occurrence of *Bipalium kewense* in a new locality, by Mr. A. E. Shipley. The specimens exhibited came from an orchid house in the garden of Mr. Lawrence Birch, at Wiley, near Bath. They were apparently introduced in a miscellaneous lot of orchids whose origin was unknown. The species was first described by Prof. Moseley in 1878, from specimens obtained in the Kew hot-houses. Since then, individuals have been found at Haslemere, Welbeck Abbey, Clapham Park, and finally at Bath; they occur nearly always in hot-houses and a few at a time. So far the species does not seem to be becoming acclimatized. Abroad it has been recorded in the Botanic Gardens of Berlin, Frankfort, Cape Town, and Sydney, in the latter place in considerable numbers. The animals are very soft and extensible; they require a moist atmosphere, and die quickly in uncongenial surroundings. They are hermaphrodite, and reproduce both sexually and by transverse fission. They seem to be entirely carnivorous, devouring earthworms and small snails, &c. There is no reason to believe that they are ever harmful to plants. The mucus which is secreted from the skin, chiefly in the anterior region of the body, leaves a slimy trail along the track of the animal, which moves by means of ventrally placed cilia. The skin contains two kinds of urticating organs, (i.) simple rod-like bodies, the rhabdites; and (ii.) somewhat similar bodies one end of which is drawn out into a long thread.—The medusæ of *Millepora* and their relation to the medusiform gonophores of the *Hydromedusæ*, by Mr. S. J. Hickson. In *Millepora plicata* no medusiform structures of any kind were observed. The spermaria are simple sporosacs on the sides of the dactylozooids. The eggs are extremely minute, and show frequently amœboid processes: they are found irregularly distributed in the cœnosarcal canals of the growing edges of the colony. In *Millepora murrayi* from Torres Straits, large well-marked medusæ, bearing the spermaria, were observed lying in ampullæ of the cœnosteum. Even when free from the cœnosarcal canals and ready to escape they show no tentacles, sensory bodies, radial or circular canals, velum or mouth. They are formed by a simple metamorphosis of a zooid of the colony. The eggs of this species, like those of *M. plicata*, are extremely small and amœboid in shape. They are not borne by special gonophores. In the *Stylasteridæ*, the eggs are large, contain a large quantity of yolk, and are borne by definite cup-like structures produced by foldings of the cœnosarcal canals. In *Allopora* the spermarium is inclosed by a simple two-layered sac composed of ectoderm and endoderm. The endoderm at the base is produced into the centre of the spermarium as a simple spadix. In *Distichopora* the male gonophores are similar to those of *Allopora*, but there is no centrally placed endodermal spadix. In both genera a two-layered tube (seminal duct) is produced at the periphery of the gonophore when the spermatozoa are ripe. Neither the gonophores of *Allopora* and *Distichopora* nor the medusæ of *Millepora murrayi* show any traces in development of being degenerate structures like the adelocodonic gonophores of the other *Hydromedusæ*.—The development of the oviduct in the frog, by E. W. MacBride. The previous work on this subject was sketched; the only important paper being one by Hoffmann in the *Zeitschrift für wissenschaftliche Zoologie*, 1886. The development of the abdominal funnel of the oviduct was then described: this arises as a groove in the peritoneum, ventral to the only remaining nephrostome of the pronephros, this latter being the persistent first and not the third of the tadpole's head-kidney, as stated by Hoffmann. This groove is subsequently carried round the root of the lung to the ventral surface, and this extension persists in the adult, though the

length of the orifice is increased. It does not atrophy as suggested by Marshall. The main body of the duct grows back as a solid rod of cells in close connection with and apparently derived from a strip of columnar peritoneal epithelium on the outer border of the kidney. Hoffmann is incorrect in stating that the most anterior part of this rod is split off from the Wolffian duct. At the time when this solid rudiment first appears the Wolffian duct in front of the persistent part of the mesonephros has completely disappeared. The general conclusion reached is the complete independence of the oviduct, in its development, from the Wolffian duct.

PARIS.

Academy of Sciences, February 16.—M. Duchartre in the chair.—On the objections raised to the interpretation of Herr Wiener's experiments, by M. A. Cornu. Further evidence is adduced in support of the conclusion drawn from some experiments made by Herr Wiener (*Comptes rendus*, January 26 and February 9), viz. that in a beam of polarized light the vibrations take place in a direction perpendicular to the plane of vibration, as is indicated by Fresnel's theory.—History of the Ibañez-Brunner apparatus, by M. Rod. Wolf. It is shown that the idea of utilizing optical, instead of real contacts, for the determination of a base line in geodetic observations was acted upon by Tralles and Hassler in 1797.—On solar statistics for 1890, by the same author. (See Our Astronomical Column.)—The Mont Dol elephants, by M. Sirodot. The author describes Quaternary strata exceedingly rich in the *débris* of elephants, he having found as many as 758 teeth within an area of 1400 square metres. Those of *Elephas primigenius* predominate, but with such variations that a great number of the specimens would have been classed as *Elephas antiquus*, or as *Elephas indicus* if they had not been found isolated in particular strata.—Observations of the asteroid discovered by M. Charlois on February 11, made at Paris Observatory, by Mdlle. D. Klumpke. Observations for position were made on February 13 and 14.—On a method for measuring the atmospheric dispersion of light of different wave-lengths, by M. Prosper Henry. (See Our Astronomical Column.)—On the resistance of various gases to the movement of a pendulum, by Commandant Defforges. It has been previously shown that

$$\frac{\Delta T}{T} = Pd + R\sqrt{d},$$

where T = time of oscillation of a pendulum, P = the hydrostatic impulse during motion, d = the density of the surrounding air, and R = its resistance. Six series of experiments in carbon dioxide, three in oxygen, and three in hydrogen, show that the coefficients P and R are the same with the same pendulum for all three gases and also for air. They depend on the form of the pendulum, but not on the nature of the surrounding gas.—Remarks relative to M. Poincaré's note on Herr Wiener's experiment, by M. A. Potier.—Variability of the number of vibrations of musical notes according to their functions, by M. Müller.—On the conductivity of organic acids and their salts, by M. Ostwald.—Reply to M. Ostwald's preceding note, by M. Daniel Berthelot.—On some compounds of pyridine, by M. Raoul Varet.—On amide of sodium, and on a chloride of disodammonium, by M. Joannis.—Researches on *l'huile pour rouge*, by M. Scheurer-Kestner. This compound has been previously described. Some of its combinations are now given.—On the action of excessive cold on animals, by M. G. Colin. The rabbit appears to be able to live through considerable cold. Adult specimens have lived in ordinary hutches suspended from a branch of a tree or standing on a heap of snow, and their temperature has only been lowered about 1° in five or six days, when the outside temperature varied from – 10° to – 15° C. Other specimens have lived in perfect health for two months in cubical hutches completely open on one side, when the temperature ranged from –10° to –25°. Sheep and pigs are also able to live through severe weather, but the dog and horse are killed by it. Observations on the development of some Ascidiæ, by M. A. Pizon.

AMSTERDAM.

Royal Academy of Sciences, January 31.—Prof. van der Waals in the chair.—Dr. Hoogewerff and Dr. van Dorp dealt with the reaction of hypochlorites and hypobromites on phtalimide and phtalamide. When molecular quantities of phtalimide and hypobromite or a hypochlorite are brought together in an alkaline solution, anthranilic acid is obtained in a quantity nearly approaching that given by theory. Under the same circumstances Griess's benzoylencerea is formed from the amide.—Mr. H. A. Lorentz discussed the application of Maxwell's principles to electrical phenomena in moved bodies, the ether being supposed to remain at rest. By the aid of certain assumptions the author establishes the equations of motion for a system of electrified particles. The results may be applied to all phenomena which it is permitted to explain by the hypothesis of such particles. It is found that, by imparting to a dielectric a velocity v in the same direction in which it is traversed by light-waves, the velocity of these latter relatively to the ether is increased by $\left(1 - \frac{1}{n^2}\right)v$, n being the index of refraction. The co-efficient $1 - \frac{1}{n^2}$ is the same which was introduced by Fresnel into the theory of aberration.

STOCKHOLM.

Royal Academy of Sciences, February 11.—On the execution of the measuring of meridian degrees on Spitzbergen, by Prof. Rosén.—A new work, "Biologische Untersuchungen," Neue Folge, I., by Prof. G. Retzius, exhibited by himself.—An examination of the new tables of definite integrals of Bieren de Haan, by Dr. C. F. Lindman.—Anatomical studies of the Scandinavian Cestodea, by Dr. E. Lönnberg.—On the structure of *Ogmogaster plicata*, Creplin, by Hr. Jägerskiöld.—Bromeliaceæ Herbarii Regnelliani, described by Dr. C. A. M. Lindman.—Determination of the maximum elasticity of the vapour of water at low temperatures, by Dr. J. Juhlin.—Comparison between the methods of Ångström and of Neuman for determination of the caloric conductivity of different bodies; i. theoretical foundation, by Dr. Hagström.—Notes on the superficial strata of Scania, by Prof. B. Lundgren.—On *Anthella Wrighti*, n.gen. et n.sp., a singular Actinia, by Hr. O. Carlgren.

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