T. Sterry Hunt, Hon. LL.D. of the University, has been presented to the same Museum by Mr. Douglas, of New York.

The Walsingham Medal, given annually by the Lord High Steward for an essay on a biological subject, has been awarded to Mr. I. L. Tuckett, Fellow of Trinity College. Essays for the next award are to be sent in to Prof. Newton, by October 10, 1896.

Dr. Joseph Griffiths has been appointed an Examiner in Surgery.

The Special Board for Medicine propose a new scheme for the degree of Master in Surgery, whereby the degree will be open to M.A.s and B.C.s who have made contributions of sufficient merit to the advancement of the science or art of surgery.

Prof. J. G. McKendrick, F.R.S., has been appointed an Elector to the Chair of Physiology, in the place of the late Prof. Huxley.

A grant of £50 has been made by the State Medicine Syndicate to the Department of Pathology, in aid of the course of bacteriology there given.

The Agricultural Science Syndicate report an increase in the number of candidates for the University's diploma in agriculture. All of the candidates at the recent examination were trained in Cambridge, and one of them obtained the silver medal of the Royal Agricultural Society. Seventeen students, all of them members of the University, are now attending the courses provided in the sciences bearing on agriculture. The fees for the examination are not yet sufficient to meet the expenses.

THE Calendar (1894-95) of the Imperial University of Japan, which has come to hand from Tokyo, should be seen by all who desire to know something about the history of that University, and the work that is being done. The number of professorial chairs in the several Colleges appears surprisingly large to those who are not familiar with the character of the University. There are twenty-three chairs attached to the College of Medicine, twenty-one to the College of Engineering, seventeen to the College of Science, and twenty to the College of Agriculture, not to mention those in the Colleges of Law and Literature. From each of the Colleges valuable memoirs on special researches have been issued, and the University seems to be carrying out the objects of its founders, viz., "the teaching of such arts and sciences as are required for the purposes of the State, and the prosecution of original investigations in such arts and sciences."

MR. WILLIAM TATE, of the Royal College of Science, South Kensington, has been appointed Professor of Chemistry at the Civil Engineering College, Sibpur, Calcutta.

PROF. R. A. SAMPSON has been appointed to the chair of Mathematics in Durham University, vacated by the resignation of the Rev. R. J. Pearce.

THE parts of the University of Virginia destroyed by fire are being rebuilt. *Science* states that reconstruction of the Rotunda, the central building of the group recently destroyed, has already been begun. The necessary money to do this, about £16,000, has been practically subscribed. It is proposed to build a general academical building costing £18,000, a physical laboratory costing £6000, a building for mechanics and engineering costing £6000, and a building for the law school costing £4000. Governor O'Ferrall has promised to recommend in his message to the State Legislature a prompt and liberal appropriation to repair the losses of the school, and it is hoped that £40,000 will be received from this source. Appeals are being made to friends of the University and of education to contribute to the rebuilding and enlargement of the University.

The annual meeting of the National Association for the Promotion of Technical and Secondary Education was held on Tuesday, the Duke of Devonshire being in the chair. After the eighth annual report of the Association, presented by Sir Henry Roscoe, had been adopted, the Duke of Devonshire opened a conference of representatives of technical education committees of county and borough Councils. The subjects discussed were evening continuation schools, the award and tenure of scholarships, and trade and technical classes.

SOCIETIES AND ACADEMIES.

LONDON.

Institution of Civil Engineers, December 3.—Sir Benjamin Baker, K.C.M.G., President, in the chair.—The Influence of Carbon on Iron, by Mr. John Oliver Arnold. This paper embodied the results of researches undertaken by the author primarily to determine whether, at high temperatures, the carbon still remained in combination with the iron. A series of eight 3-inch square crucible-steel ingots, ranging in carbon between 0·08 per cent. and 1·47 per cent., the total impurities other than carbon averaging 0·2 per cent., were hammered and rolled to $1\frac{1}{16}$ inch diameter. They were then submitted to chemical, mechanical, microscopical, thermal, and magnetic tests, in three standard physical conditions, namely: normal, or cooled in air; annealed, or very slowly cooled; and hardened, or very rapidly cooled. The differential analyses for carbon confirmed the conclusion arrived at by the author in a previous research, that the hard plates of Sorby's laminæ consisted of pure crystallised Fe_3C; and under certain conditions contained practically the whole of the carbon present in the steel. The mechanical tests showed that in normal steels the tenacity increased with carbon up to 1·2 per cent., a further addition of carbon causing a diminution in the stress. The ductility of normal steel diminished with the carbon; the elongation with 0·1 per cent. of carbon being 47 per cent., and at 1·5 per cent. 3 per cent. on 2 inches. Under compression the softness of normal steel decreased with the carbon until 0·9 per cent. of that element was present. Annealed steels under compression indicated a maximum hardness at 0·9 per cent., and were distinct softer than the normal metals. Steel with 1·5 per cent. of carbon was softer than iron containing 0·1 per cent. In hardened steels the rigidity of the metals increased enormously as the carbon rose. The microscopical investigation showed that pure iron consisted of cubic and octahedral crystals. The general results of the microscopical examination sustained the theory that the hardness of quenched steel was due not to a hard allotropic modification of iron, but to a definite sub-carbide corresponding to the formula $Fe_{24}C$. The magnetic observations on hardened steels had led the author to the conclusions that (1) the magnetic permeability varied inversely as the carbon present; (2) the permanent magnetism was directly proportional to the carbides of iron present; and (3) in iron containing between 0·1 per cent. and 0·9 per cent. of carbon the permanent magnetism was directly proportional to the sub-carbide of iron present. The author based the existence of a sub-carbide of iron, possessing the formula $Fe_{24}C$, to which the phenomena of hardening and tempering were due, on the following experimental facts: (1) the well-marked saturation points in the micro-structure of normal, annealed, and hardened steels; (2) a sharp maximum in a curve, the co-ordinates of which were heat evolved or absorbed at the carbon change point, Ar. 1, and the carbon percentage; (3) a point in the compression curve of hardened steels at which molecular flow ceased; and (4) a sharp maximum in a curve, the co-ordinates of which were the carbon percentage and permanent magnetism in hardened steels.—The Dilatation, Annealing, and Welding of Iron and Steel, by Mr. Thomas Wrightson. This paper dealt with investigations of some of the physical changes which occurred in iron during its passage from the homogeneous molten state to the solid and more permanent condition. With regard to the alleged floating of solid iron upon molten iron of the same kind, the author had found that if the piece of solid iron was lowered into the liquid metal by means of an iron fork, it always descended with the fork, but in a few seconds left the prongs and floated to the surface. For some time the sphere continued to rise above the surface until, at such a temperature that it melted, it quickly joined the molten metal. On first sinking the ball proved itself to be denser than the liquid iron. It then expanded and became considerably less dense than the liquid; and lastly, a reversal took place and the ball in melting became of the same density as the liquid. The assumption that dilatation was continuous and uniform during the passage from the liquid to the solid state was therefore erroneous. In order to eliminate the errors due to the emergence of the floating body above the surface of the molten metal, the author used for subsequent experiments an instrument by which the specific gravity of a 4-inch cast-iron ball, completely submerged in the metal, could be observed and continuously recorded. A specimen of the record obtained from the apparatus was given. Experiments upon grey Cleveland iron showed that the specific gravities of the cold solid iron, molten iron, and of plastic iron, were 6·95, 6·88, and 6·50 respectively; and that in passing from the solid to the plastic condition, the iron underwent an increase of volume of 6·92 per cent., followed by a quick contraction as it became liquid. The order of experiment was afterwards reversed, and the change of volume was measured as the molten iron solidified. Into two spherical moulds of dried

loam, 15 inches in diameter, was poured in one case Cleveland white-iron, and in the other Cleveland grey-iron. The fluid metal first entirely filled the mould. An expansion of the outer layers then took place as the metal became plastic, the diameter of the ball therefore increasing. The liquid interior, not having commenced to expand, sank in the hollow shell formed by the cooling and expanding layers of the outside, and thus formed a cavity at the top, which was shown in a photograph of the cross-section of the ball. The metal round the inner surface of the top cavity then hardened, and the interior liquid metal expanded gradually towards the centre; and, by its pressure on the soft outer envelope, also tended to increase the diameter of the ball. This action continued until the outer layers arrived at such a temperature that they should contract; when a contest arose between the contracting force of the fast-thickening outer layers and the expanding force of the interior as it in turn became plastic. When these forces balanced each other, further expansion was arrested. After this point in the cooling had been reached, the outer layers contracted as far as their condition would allow, but not to the full natural extent, as, while the outside was in a state of tension owing to the swelling of the interior, fresh layers of plastic and solidifying metal had been built up in the interior. By the time contraction had commenced, these had formed an arch of many courses under different degrees of tension; and such a structure tended to prevent the free contraction of the whole mass. The interior of this enlarged vessel then contracted and drew away principally from the upper part owing to the mass of plastic iron tending to gravitate to the bottom of the ball. The results of further experiments on the buoyancy of solid rolled low-carbon steel showed that it followed the same law as cast-iron. It appeared, therefore, that the physical changes from liquid to solid, as from solid to liquid, were similar in grey-iron, white-iron, and low-carbon steel. In view of the apparent analogy between the expansions of cast-iron in cooling from the liquid to the plastic condition and the expansion of water in cooling from 4° C. to 0° C., the author had undertaken experiments to ascertain whether the welding of iron could be attributed to similar action to that producing regelation in ice. To identify the two phenomena, it must be proved that the surface of the iron at the moment of welding contracted with increase and expanded with decrease of temperature. But as, according to the reasoning of the late Dr. James Thomson, matter possessing this property must also be cooled by impact or pressure, the identification would be complete, if this collateral property of the cooling of welding iron under pressure could be demonstrated. In the author's experiments, which were carried out at the Mint, with the aid of Prof. Roberts-Austen, the temperature at the welding surface of iron heated in an electric-welding machine was taken by a Roberts-Austen recording pyrometer. The results were given of a series of five experiments, in three of which a fall of temperature, ranging between 19° C. and 57° C., had resulted from the application of pressure, at temperatures of between 1300° C. and 1420° C. The thermal expansion of iron was herefore negative between 1300° C. and 1420° C. The theory of regelation in ice was founded on the fact that the melting-point was lowered by pressure. This held good also for iron, in which case, however, there were increasing degrees of mobility between the temperature of 1400° C. and that of melting wrought-iron, 1600° C. When pressure was applied to a bar, *e.g.* at 1400° C., not only was the melting-point lowered, but the mobility of all lower temperatures within the critical condition was increased.

Chemical Society, November 21.—Mr. A. G. Vernon Harcourt, President, in the chair. The following papers were read:—The influence of temperature on refractive power, and on the refraction equivalents of acetylacetone and of ortho- and para-toluidine, by W. H. Perkin, senr. The author ascribes the discrepancies betwee.. his own and Brühl's values for the refraction equivalents of acetylacetone, the toluidines, &c., at high temperatures, to experimental error in the use of Brühl's refractometer.—The evolution of carbon monoxide by alkaline pyrogallol solution during absorption of oxygen, by F. Clowes. The author has determined the experimental conditions regulating the evolution of carbon monoxide during the absorption of oxygen by pyrogallol solution, and details the precautions to be taken for the accurate estimation of oxygen by the absorption method.—The composition of the limiting explosive mixtures of various combustible gases with air, by F. Clowes. The compositions of the limiting explosive mixtures of air with methane, hydrogen, carbon monoxide, ethylene, water-gas, and coal-gas are very different; the narrowest limits are observed in the case of methane, the widest in that of hydrogen.—Note on the estimation of butyric acid, by W. H. Willcox.—Some derivatives of anthraquinone, by E. Schunck and L. Marchlewski. The three isomeric methylpurpuroxanthins and several of the ethers or anthraquinoneoxime have been prepared.—Efflorescence or double ferrous aluminium sulphate on bricks exposed to sulphur dioxide, by D. Paterson. The white asbestos-like efflorescence which appears on bricks exposed to sulphur dioxide, has the composition $Al_2(SO_4)_3$, $FeSO_4$, $24H_2O$, and is evidently identical with a salt found in volcanic regions.

Entomological Society, December 4.—Prof. Meldola, F.R.S., President, in the chair.—Mr. S. H. Scudder, of Cambridge, Mass., U.S.A., was elected an Honorary Fellow to fill the vacancy caused by the death of Prof. C. V. Riley.—The Secretary read a copy of a letter of condolence which he had written, by the direction of the Council, to the Entomological Society of France on the death of their President, M. E. L. Ragonot, and he also read the letter in reply from the Secretary of the Entomological Society of France.—Mr. R. Adkin exhibited a specimen of *Mesogona acetosellæ*, taken at Arlington, Sussex, in October 1895. It was stated that this was the first recorded capture of this species in Britain.—Mr. G. T. Porritt exhibited an example of *Halesus guttatipennis*, taken at Lye, Worcestershire, in November 1889. It was believed to be the third British example. Mr. Porritt also exhibited a series of *Mania typica*, showing a curious malformation in all the specimens. He stated that about one-third of a large brood had emerged in exactly the same form, having the wings only half developed, but with the markings clearly defined. Mr. Tutt and Mr. McLachlan referred to similar malformations in *Agrotis tritici* and *Hadena chenopodii*.—Mr. Goss read a communication from Mr. Sidney Crompton, of Salamanca, Tenerife, announcing the capture there by Mr. Hammerton of two specimens of *Diadema misippus*, a species of butterfly not previously recorded from Tenerife. Mr. Crompton said the specimens were in such fine condition that they must have been introduced into Tenerife in the larval or pupal state, and emerged there. Mr. Hampson, Prof. Meldola, and Mr. Osbert Salvin, F.R.S., made some remarks on the distribution of the species.—Mr. Champion read a paper entitled, "On the Heteromerous Coleoptera of St. Vincent, Grenada, and the Grenadines."—Mr. Kenneth J. Morton communicated a paper entitled, "New or Little Known Palæarctic Perlidæ."

Zoological Society, Nov. 19.—Sir W. H. Flower, K.C.B., F.R.S., President, in the chair.—A letter was read from Mr. J. H. Gurney, respecting a kingfisher (*Alcedo beavani*) which had been lately ascertained to be a permanent resident in some parts of Ceylon.—Mr. Sclater gave a short account of the principal animals he had noticed in the Jardin d'Acclimatation and Jardin des Plantes at Paris during a recent visit.—Mr. Sclater exhibited and made remarks upon the skin of a zebra from Nyasaland, obtained by Mr. R. Crawshay, and a remarkably fine pair of horns of a male Livingstone eland (*Oreas canna livingstonei*), which Mr. H. H. Johnston, C.B., had offered for the Society's acceptance. The animal had been shot by one of Mr. Johnston's hunters, in 1893, between Zomba and Lake Chilwa.—Colonel L. H. Irby exhibited and made remarks on two British-killed specimens of the greater bullfinch (*Pyrrhula major*).—Mr. W. T Blanford, F.R.S., exhibited and made remarks on skins of *Capra sibirica* and of *Ovis ammon*, killed by Major Cumberland in the Altai mountains.—A communication was read from Mr. Swale Vincent, containing contributions to the comparative anatomy and histology of the supra-renal capsules. In the present paper Mr. Vincent described the naked-eye and microscopical anatomy of the supra-renal bodies in the different orders of fishes. He was inclined to the view that supra-renal bodies are present in all the Elasmobranchii, Holocephali, Ganoidei, and Teleostii, and probably also in the Dipnoi. The supra-renal bodies of fishes were in their essence "secreting glands," as the mammalian organ was now supposed to be. There was no relation whatever, in Mr. Vincent's opinion, between the supra-renals and the lymphatic head-kidney. In the great majority, at any rate, of Teleosteans they were both present in a well-developed condition.—Mr. Gerard W. Butler read a paper on the complete or partial suppression of the right lung in the Amphisbænidæ, and of the left lung in snakes and snake-like lizards and Amphibians. The author gave particulars as to the relative development of the right and left lungs in a large number of Amphisbænidæ and other snake-like lizards and snakes and limbless Amphibians,

which appeared to constitute a representative series, and found that, so far as the species on his lists were concerned, it was an invariable rule that in the Amphisbænidæ the right lung was the smaller, and usually rudimentary or absent, while in all other cases of inequality it was the left lung which was the smaller.—Mr. W. Saville Kent read some observations on the frilled lizard (*Chlamydosaurus kingi*) of Western Australia. After describing the peculiarities of this reptile, Mr. Saville Kent stated that he was inclined to regard it, if not as a surviving representative of the Dinosaurian reptilia, as, at any rate, a most interesting and anomalous lacertilian type that inherited its characteristic bipedal method of progression from that extinct group. Mr. Saville Kent's paper was copiously illustrated by photographs taken by him from life of *Chlamydosaurus* in its bipedal running and other characteristic attitudes, and also by specimens which had been mounted in strict accordance with these photographs.—Two communications were read from Dr. A. G. Butler, on a small collection of butterflies made by Consul Alfred Sharpe at Zomba, British Central Africa, and on a collection of Lepidoptera recently collected in Eastern Central Africa by Mr. G. F. Scott Elliot.—A communication was read from Mr. G. S. West, on the buccal glands and teeth of certain poisonous snakes. The author showed that in the Opisthoglyphous snakes the poison-gland is very variable both in form and extent, and that its duct opens into a cavity formed by muscular folds surrounding the grooved tooth. This opening is always towards the outer side of the grooved tooth, and situated either at its base or but a short distance from it, and the parts were shown to be so related that the loss of the tooth does not cause any injury to the duct. The reserve teeth were shown to be in no way connected with the duct until called upon to replace teeth that had been lost. The epithelium of the distal portion of the duct was shown to be of a secretory nature, the cells being mucus-secreting, similar to those forming the lining epithelium of the mouth. In the *Hydrophiinæ* the poison-gland was shown to be more or less free from the superior labial, and to consist of a large number of longitudinally-disposed tubules converging anteriorly towards a central poison-duct. There were two large poison-fangs situated almost side by side at the anterior extremity of the maxilla. The duct when approaching the region of the teeth became slightly sinuous and suddenly enlarged, enclosing a cavity into which there projected two muscular cushions, one in front of the base of each tooth, and it was through the vertical slit between these that the poisonous secretion passed from the duct to the grooves of the poison-teeth.—A communication was read from Mr. William H. Ashmead, containing a report upon the parasitic Hymenoptera of the Island of Grenada, comprising the families Cynipidæ, Ichneumonidæ, Braconidæ, and Proctotrypidæ. This paper enumerated as occurring in Grenada 183 species of the families named in the title, and described 128 of them as new. Of those previously known the majority had been recently described by Mr. Ashmead as found in the neighbouring island of St. Vincent. The Cynipidæ were all parasitic forms, there being apparently a total lack of any gall-making forms of the family in the island.

Geological Society, November 20.—Dr. Henry Woodward, F.R.S., President, in the chair.—The following communications were read:—"Additional Notes on the Tarns of Lakeland," by J. E. Marr, F.R.S. This paper was supplementary to one by the author published in the *Q. J. G. S.*, vol. li. (1895). It contained additional notes on Wateredbath Tarn, described Hard Tarn on Helvellyn, a pond of which the outlet had gradually been diverted from a course over screes to one over solid rock; Hayeswater, a lakelet referred to by Dr. H. R. Mill as in some respects intermediate between the mountain-tarns and the valley-lakes; and Angle Tarn, Patterdale, a good example of a plateau-tarn. In the discussion that followed, Dr. H. R. Mill said that as Mr. Marr had found every tarn that he examined to be held in by a barrier of drift, it seemed most likely that most, if not all, of the larger lakes would be found to owe their origin to the same cause. In this connection it was worth mentioning that Prof. W. M. Davis, of Harvard, considered, from the configuration of the larger lake-basins in the district, that they were produced in drift-blocked valleys.—"Notes on the Glacial Geology of Arctic Europe and its Islands. Part i. Kolguev Island," by Colonel H. W. Feilden, with a report on the erratic boulders from the Kolguev beds, by Prof. T. G. Bonney, F.R.S. Kolguev Island, about the size of Norfolk, was about 50 miles from Arctic Russia and about 130 miles south-west of the nearest part of Novaya Zemlya, with soundings not exceeding 30 fathoms between it and Russia, and probably not more than 75 fathoms between it and Novaya Zemlya. It was entirely composed of a vast accumulation of glacio-marine beds. The northern two-thirds of the island consisted of an elevated ridged area with a maximum height of 250 feet. The author had been furnished with notes by Mr. Trevor-Battye concerning the geology of this region. It was inferred from his observations that this elevated region was composed of beds of sand with erratic boulders not less than 80 feet deep, resting on clays—the "Kolguev clays." Mount Bolvana rose as a symmetrical cone above the tundra, detached from the northern plateau, pointing, in the opinion of the author, to the occurrence of marine erosion. The southern portion of the island was tundra, a dead flat of grass, bog, and peat-levels reaching to the sea; good sections of the Kolguev clays were exposed in the gullies traversing it near the sea on the western coast. In the vicinity of the Gobista river the Kolguev beds consisted of clays merging here and there into sands. They were charged with boulders often ice-scratched, indicating continuous deposition in a comparatively deep sea. The beds yielded many shells of arctic mollusca, such as *Saxicava arctica*, *Mya*, &c., apparently dispersed from top to bottom. The ice-pack had forced many fragments of semi-fossil wood on to the shore, no doubt worked up from a bed immediately below sea-level. No deposit was met with in Kolguev Island precisely similar to what is called "till" in Scotland, though there were many boulder clays in Britain which were in no measure superior in toughness to those of Kolguev; for instance, those of the Yorkshire coast, and the chalky boulder clays of Norfolk. It is suggestive that all the glacial deposits met with by the author in arctic and polar lands (except the terminal moraines now forming above sea-level) should be glacio-marine beds. Prof. Bonney, in his report, described the rocks brought home by the author. A discussion followed, in which Mr. Marr, Mr. Trevor-Battye, Mr. Boulger, Dr. G. J. Hinde, Dr. Gregory, and the Rev. Edwin Hill took part.

CAMBRIDGE.

Philosophical Society, November 11.—Prof. J. J. Thomson, President, in the chair.—The following communications were made:—A method of measuring the hysteresis of iron, by Mr. G. F. C. Searle. A bar of iron is placed in a solenoid, and the magnetising current flowing in the solenoid also passes through the fixed coils of an electrodynamometer. This current can be reversed. A secondary coil is wound on the iron, and the current induced in it by the variation in the magnetic induction passes also round the suspended coil of the electrodynamometer. Thus if H is the magnetic force due to the solenoid, and B is the magnetic induction in the iron, the current in the fixed coils is proportional to H, and the current in the suspended coil is proportional to dB/dt, provided that B changes so slowly that the effects due to self-induction in the secondary circuit are negligible. The couple experienced by the suspended coil at any time is proportional to HdB/dt, and thus the angular momentum acquired during a double reversal of the magnetising current is proportional to $\int HdB$ or to $4\pi\int HdI$, where I is the intensity of magnetisation. Thus the "throw" of the spot of light reflected from a mirror attached to the suspended coil is proportional to the energy lost in hysteresis during the double reversal. Experiments were shown to illustrate the manner in which the method could be applied to investigate the effects of strain and temperature upon the hysteresis in iron.—The form of cubic surfaces containing twenty-seven real straight lines, by Mr. W. H. Blythe. The paper was illustrated by two plaster models. The first represented the general case of a cubic surface having twenty-seven real straight lines, the position of the lines being shown by threads. The second was a rough model of the special form having a tangent plane at infinity, which contains three of the lines. It is constructed to show the position of the remaining twenty-four straight lines, which form a symmetrical system.—Expansion produced by the electric discharge, by Miss Martin. At the suggestion of Prof. Thomson, the experiments of Meissner on the expansion of gases by the electric discharge were repeated by Miss Martin. After some preliminary experiments, in which the results obtained differed from those of Meissner, new apparatus was set up, an exact copy of Meissner's, consisting of an ozone generator with a sulphuric acid pressure-gauge attached; the two tinfoil coats of the generator were connected with the terminals of an electrical machine. In Meissner's original experiments it was

thought that the precaution of never separating the terminals of the electrical machine further than by a small fraction of the distance between the coats of the generator would ensure the absence of discharge between the coats; and in the conditions adopted, Meissner observed that when discharge took place by the passage of a spark between the terminals, there was a temporary increase of pressure; the effect being most marked in the case of CO_2, and least marked in H. In Miss Martin's repetition of the experiments, the generator was put in a dark box, provision being made to let the gauge and the space between the coats of the generator be seen. It was then established that in no case could any deflection of the gauge be seen, except when luminosity could be detected in the generator. It was further observed that when the discharge passed through CO_2 a permanent contraction was produced. The experiments have been repeated by Prof. Thomson, and he finds that if wet CO_2 is used, the effect is more marked; but if carefully dried CO_2 is used, no contraction is produced.

PARIS.

Academy of Sciences, December 2.—M. A. Cornu in the chair.—On the extension of the ideas of Galois to the theory of differential equations, by M. Émile Picard.—Remark on a memoir, by M. Jaumann, entitled, "Longitudinal Light." A note by M. H. Poincaré. The author derives equations, from those found by M. Jaumann, which indicate properties for cathode rays not agreeing with facts, and hence considers that modifications are needed in the hypotheses put forward in the memoir.—On the presence of sodium in aluminium prepared by electrolysis, by M. Henri Moissan. It is shown that electrolytic aluminium contains in general from 0·1 to 0·3 per cent. of sodium, and that the presence of this impurity renders the metal easily attacked by water. Aluminium should always be used alone and pure, as it readily forms electric couples with every other metal, and is then easily attacked by water.—On the origin of argon and of helium in gases disengaged by certain sulphurous waters, by MM. L. Troost and L. Ouvrard. It is shown that, though argon is generally present in waters, helium is only found in certain mineral waters, and does not probably owe its origin to the atmosphere, but to the rocks through which the waters have percolated. M. Bouchard added some remarks on the therapeutic value of helium and argon, and supported the view that these gases have no action on the economy, but admitted that the metals present in helium containing minerals might have medical action when present in minimal amounts.—Structure of the mesenteric ganglia of the pig, by M. L. Ranvier.—Observations on Perrine's comet (16 November, 1895) made with the great equatorial at Bordeaux Observatory by MM. G. Rayet and L. Picart. Note by M. G. Rayet.—M. Ch. V. Zenger, in a note entitled "Studies in molecular physics," sets forth a very simple relation between the density and specific heat of chemical elements, and indicates a new view of the genesis of the elements.—Observations of Swift's comet (1895, August 20) made with the great telescope, and of Perrine's comet (1895, November 16) made with the 0·25m. equatorial at Toulouse Observatory, by M. Rossard.—Note on the construction of the calendar, by M. A. Auric.—On Lamé's equation, by M. G. Floquet.—On the extension of Cauchy's method to systems of equations to the derived partials of any order whatever, by M. J. Beudon.—On the functions of two real variables and on the motion of an arbitrary function, by M. Émile Borel.—On orthogonal systems, by M. Paul Adam.—On a new determination of the ratio between the electrostatic and electromagnetic units, by M. D. Hurmuzescu. The value found gives

$$v = 3{\cdot}0005 \times 10^{10} \text{ to } 3{\cdot}0020 \times 10^{10}.$$

—Relation between the intensity of light and the chemical decomposition which it produces; experiments with mixtures of ferric chloride and oxalic acid, by M. Georges Lemoine. The chemical decomposition of a mixture of ferric chloride and oxalic acid is proportional to the luminous intensity.—On the presence of argon and helium in a natural source of nitrogen, by M. Ch. Moureu.—Experimental determination of the agglutinating power of oils, by M. Louis Campredon.—On a chromium amalgam and some properties of metallic chromium, by M. J. Férée.—On a method of synthesis of complex amides, by M. Albert Colson.—New examples of the superposition of optical effects of asymmetric carbon atoms, by MM. Ph. A. Guye and Ch. Goudet.—On a zoological exploration of Corsica, by M. Louis Roule.—On the anatomy and systematic position of compound Ascidians of the genus *Sigillina*, Sav., by M. Maurice Caullery.—On the accumulation of sugar in beetroots, by M. L. Maquenne.—The pliocene and quaternary glaciers of Auvergne, by M. Marcellin Boule.—On the geology and "tectonique" of the Central Caucasus, by M. E. Fournier.—On two new forms of quartz, by M. P. Termier.—On the effects of the tropical revolutions of the sun and of the moon on the barometric pressure, by M. P. Garrigou-Lagrange.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

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