housing and endowing the college by passing the following resolution :—" That the authorities of Bedford College in issuing an appeal for funds in accordance with the scheme submitted to the Senate be permitted to state that the appeal is made with the knowledge and full approval of the Senate." The Princess of Wales has promised a donation to the funds, and Lady Tate has promised 10,000*l.* for a library to be called after the late Sir Henry Tate. Donations to the fund may be sent to Major Darwin, hon. treasurer of the college, or to Miss Henrietta Busk, hon secretary of the appeal fund, at Bedford College, Baker Street, W. Friends of higher education for women are urged to help in placing the college on an adequate and permanent basis.

MR. ARNOLD-FORSTER, M.P., Secretary of State for War, distributed the prizes to successful students of the Woolwich Polytechnic on Saturday last. In his speech which followed the presentation of the prizes Mr. Arnold-Forster emphasised the importance of sound scientific and technical education. He said that the great lesson this country has to learn is the importance of scientific organisation. There was a time, not so long ago, when we were in the habit of laughing at the methods and ways in vogue on the Continent, and of considering ourselves immeasurably superior to Germany and other nations. But a change has taken place, and these other nations—not by following our example, but by organising on scientific lines—have become immeasurably more advanced and fit to succeed than those who preceded them one or two generations ago; and we have to exert ourselves to protect ourselves from defeat in the industrial contest. Referring to the importance of scientific organisation, Mr. Arnold-Forster spoke of an instance in which he discovered that the electric carbons in use by the Admiralty were largely manufactured in France. Realising the importance of this in case of war, he made inquiries, and, as the result of these and of experiment, it has been found possible to produce electric carbons in this country of the same perfection and accuracy as those formerly brought in from abroad. He expressed his pleasure that a great step forward has been made in the matter of standardising and testing, and that in both these departments this country is abreast of the times. A good deal could be done by scientific organisation, and he looked to such institutions as the polytechnics to accomplish much in that direction.

THE address delivered by Prof. Henry T. Bovey, F.R.S., at the Universal Exposition, St. Louis, 1904, on the fundamental conceptions which enter into technology, has been reprinted as a pamphlet from the *McGill University Magazine*. After defining the " technologue " as an intermediary between the savant and the mechanic, translating the discoveries of the former into the uses of the latter, Prof. Bovey tries to ascertain the controlling ideas common to all technical experts. These, he says, have all observed that nature works in no arbitrary manner, but by fixed laws; that if these laws could be brought into right relation with us, we might be able to gear our small machines to the vast wheel of nature; that in the study of the laws of nature there is certainly revealed more of the infinite possibilities of our environment. In order to study to advantage, workers in pure and applied science must get into line with psychological laws, when it will be found that the apprehension of a fact by the mind requires the exercise of the power of observation, and the observations must be of a special character, minute, accurate, and selective. Observation, he says, means to see with attention, and as soon as concentration takes place, a process of analysis begins and the worker passes to classification and generalisation. Throughout this process the training of the hand stimulates the brain centres. Technology has a two-fold nature; first, learning by specialised study how to understand and apply the principles of mechanics to the construction of works of utility, and, secondly, training the mind to work easily along lines of scientific thought. The idea of utility, he maintains, seems to be the key to the distinction between pure science and technology; indeed, technology may be called the child of science on one hand, and of industrial progress on the other.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 16.—" On the Occurrence of Certain Ciliated Infusoria within the Eggs of a Rotifer, considered from the Point of View of Heterogenesis." By H. Charlton **Bastian,** M.A., M.D., F.R.S.

The weight of preconceptions against the possibility of the occurrence of heterogenesis has hitherto been so strong as to have made it almost impossible to obtain any adequate consideration for the actual evidence adduced in favour of this or that alleged instance. But of late, preconceptions in the domain of physics and chemistry have received severe shocks, and when we are told that a so-called " element " is daily being transformed and another is actually originating therefrom, there appears more chance of attention being paid to the alleged existence of phenomena in the organic world which would seem to be but the carrying on into a higher platform of the familiar but important phenomena known as allotropism and isomerism.

Hitherto, alleged instances of heterogenesis have, without adequate consideration of evidence, been almost always assumed to be results of " infection," but the writer claims that in the cases with which the present memoir is concerned, any such explanation is quite impossible in regard to one of the cases, at least, in which we have masses of living matter so large that they average $\frac{1}{8}$ mm. in diameter, being converted in the course of three days into great ciliated Infusoria of equal bulk.

The communication (which is illustrated by a large number of photomicrographs) deals with two sets of heterogenetic transformations occurring in the great eggs or " gemmæ " of one of the largest of the rotifers, namely, (1) the transformation of the entire contents of a Hydatina egg into a single great Otostoma; and (2) the segmentation of the Hydatina egg into twelve to twenty spherical masses, and the development of these sometimes into embryo Vorticellæ and sometimes into embryo Oxytrichæ.

(1) *The Transformation of the Entire Contents of a Hydatina Egg into a Great Otostoma.*—Having witnessed on very many occasions the stages of this remarkable transformation of the contents of a rotifer's egg into a ciliated infusorium, the author is desirous of acquainting the Royal Society with the simple procedure needful to enable zoologists to study for themselves the series of changes leading to a result which many of them may be disposed to deem incredible.

All that is necessary is to procure a good stock of these large rotifers by placing some surface mud, having a coating of Euglenæ, from a ditch in which Hydatinæ are known to exist, into a glass bowl, and to pour thereon water to a depth of about 4 inches. In the course of two or three days (with a temperature of 16° C. or 17° C.), if the Hydatinæ are abundant, a good crop of their large eggs will be seen at the surface of the fluid, where it is in contact with the glass.

By the aid of a scalpel passed along their track for a short distance, groups of twenty or thirty eggs may be taken up at one time, and gently pressed off the edge of the blade into a small, white stone pot full of water. Some of such small masses of eggs (mixed, perhaps, with a few Euglenæ) will float, and others will sink. After seven or eight of these masses have been gathered and deposited, the cover should be placed upon the pot so as to cut off from the eggs all light rays, both visible and invisible. Two other pots should be similarly charged.

When the pots have remained covered for thirty-six hours, one of them may be opened, and some of the small masses of eggs from the bottom of the pot should be taken up with a tiny pipette and placed in a drop of water on a microscope slip.

On examination by a low power it will be seen that there are many empty egg-cases, that within some eggs there are embryo Hydatinæ in different stages of development, while within the remaining eggs the contents will be wholly different, consisting of an aggregate of minute pellucid vesicles, each containing a few granules, together with a variable amount of granules interspersed among the vesicles.

When a second pot is opened two and a half or three days after the eggs have been placed therein, and portions of its contents are examined in the same way, a larger proportion of empty egg-cases will be seen. There may be very few or even no developing rotifers still within the eggs, and in other egg-cases, instead of the motionless vesicular contents previously seen, great ciliates may be found slowly revolving, or, under the influence of the light, rupturing the egg-case, struggling out, and swimming away with rapid movements, partly of rotation. Some of the Infusoria before they emerge undergo segmentation into two, four, or rarely, even into eight smaller ciliates.

The large undivided Infusoria have their bodies densely packed with large corpuscles (modified representatives of the vesicles of an earlier stage), and a large elongated nucleus which can be readily seen in some of them. They possess the characteristic ear-shaped mouth indicated by the name Otostoma, and cilia are distributed all over the body in longitudinal lines, so as to give the appearance of a delicate longitudinal striation.

As a control experiment it will be well at the time that the pots are charged to place two or three batches of the eggs with some of the same water into a watch glass, which is left exposed to light; and at the expiration of three or four days, as well as at later periods, to search among its contents for any of the same large ciliates, and also for any eggs in the intermediate vesicular stage above referred to. The author has invariably found that such a search yielded only negative results.

In taking batches of eggs, in the manner indicated, to be placed in the pots, individual eggs will necessarily be of different ages. It is only eggs that have not begun to develop which, under the cutting off not only of ordinary light, but probably of some invisible light rays, become speedily transformed into great ciliated Infusoria. Cutting off ordinary light rays alone from the eggs, by placing them in a small covered glass dish shut up in a cupboard or box and maintained at the same temperature as before, seemed at first not to lead to similar results, but it was subsequently ascertained that the transformation will occur under such conditions, though only after the lapse of about nine days. It looks, therefore, as if the stoppage of some invisible rays, capable of passing through wood but not through stone, notably hastens the process.

During the time that these observations were being made, and previously, no Otostomata had ever been seen in association with Hydatinæ, except those that had been taken from the experimental vessels. On two occasions since, though from wholly different localities, Otostomata had been found in association with Hydatinæ. The adult forms have been found to be much larger, having from two to three times the length of the great embryos which issue from the egg-cases, and also to be more highly organised.

Many of these adult specimens the author has been able to keep for two months, and he has seen them pass into an encysted condition, when they constitute masses the bulk of which is several times greater than that of Hydatina eggs. They are, likewise, enclosed in thick cyst walls, wholly unlike the thin egg-cases of the Hydatina.

A Hydatina egg could not possibly be confounded with an adult encysted Otostoma, and the embryo Otostoma which emerges from the egg-case embodies the whole of the transformed substance of the egg. *No minute Otostoma is ever to be seen within an egg, devouring its contents.* No ciliate is seen until the total contents of the egg having been transformed, the whole mass begins to revolve within the egg-case as a great embryo Otostoma.

(2) *The Origin of Twelve to Twenty Vorticellae or Oxytrichae from the Substance of a Single Hydatina Egg.*—These are most remarkable variations, which at different times have been occasionally met with in Hydatina eggs taken from the experimental vessels.

If the egg-substance is found to have segmented into twelve to twenty more or less equal spherical masses, there is at first no means of knowing whether such masses are to be developed into embryo Vorticellæ or into embryo Oxytrichæ. But if either of the masses is seen to be revolving within its own delicate cyst, we may be sure that this particular egg will not yield Vorticellæ, as these embryos do not revolve before rupturing their cysts, and the Hydatina egg produces either the one or the other form—never a mixture of the two.

It cannot be supposed that twelve to twenty of either of these ciliates in an embryo condition could penetrate the egg-case, could devour its contents without being seen, and would then, as embryos, encyst themselves (all in two days, or less)—only, almost immediately after, again to pass out of their encysted condition, and to appear as the active young Vorticellæ or Oxytrichæ the development of which the author has traced.

In its normal development the Hydatina egg never goes through changes in which it is converted into an aggregate of minute vesicles, or into a smaller number of separate and larger spheres, such as occurs as a prelude to the transformation of the egg-contents into ciliated Infusoria of this or that kind.

Geological Society, March 8.—Dr. J. E. Marr, F.R.S., president, in the chair.—*Exhibits.*—A series of photographic views illustrating the geological structure and physical features of the mountains of Skye: A. **Harker.** The "Cullinan" diamond: Dr. F. H. **Hatch.** By means of lantern slides from photographs the diamond was shown from four points of view. The stone was a portion (probably less than half) of a distorted octahedral crystal. As it now existed, the stone was bounded by portions of four original octahedral surfaces and by four cleavage-planes. The former showed in places a slight curvature, a mammillary structure, striations, and triangular pittings, while the cleavage-surfaces were distinguished by greater regularity and smoothness. The stone weighed 3024¾ carats. Its greatest linear dimension was 4 inches. It was of remarkable purity for so large a stone, approaching "blue-white" in colour. It was found at the beginning of the present year, in the "yellow ground" of the Premier Mine, at a depth of 18 feet below the surface. The Premier Mine was a true "pipe," situated on the farm of Elandsfontein, twenty miles north-east of Pretoria (Transvaal).—*Papers.*—Observations on some of the Loxonematidæ, with descriptions of two new species: Miss J. **Donald.** Shells having more convex whorls, or less sigmoidal lines of growth than *L. sinuosum,* cannot be left within the genus Loxonema. The two new species described resemble the type in form and in the sinuosity of the lines of growth; but the whorls are ornamented with spiral striæ, two of which frequently stand out and give the shell a banded appearance.—On some Gasteropoda from the Silurian rocks of Llangadock (Caermarthenshire): Miss J. **Donald.** These fossils occur almost entirely in the state of casts and moulds. Eleven distinct forms have been made out, referable to seven genera; but only seven are sufficiently well preserved for specific determination. Five of these are new, including one described in the previous communication; a new genus is described, for the reception of *Euomphalus funatus.*

Chemical Society, March 15.—Prof. W. A. Tilden, F.R.S., president, in the chair.—It was announced that Prof. Percy Frankland had presented to the society the eudiometer made and used by the late Sir Edward Frankland for the analysis of ethyl in 1849; that Prof. Retzius, of Stockholm, had presented an engraving of Berzelius; and that Mr. Oscar Guttmann had presented a bronze medal struck in honour of Roger Bacon in Paris in 1818. The council, on behalf of the society, had expressed its thanks for these gifts.—The following papers were read:—The velocity of oxime formation in certain ketones: A. W. **Stewart.** The results of measurements of these velocities are generally in agreement with those already found for the addition of sodium hydrogen sulphite to ketonic compounds, and since the two reactions belong to different types, it seems probable that the hindrance to the reactions in the case of ketones containing many methyl groups near the carbonyl is due to stereochemical and not to purely chemical causes.—The ultra-violet absorption spectra of certain enol-keto-tautomerides, part ii.: E. C. C. **Baly** and C. H. **Desch.** The results indicate that the absorption band in these compounds is due to change of linking taking place when one tautomeric form passes into the other. It is possible to account for the formation of the absorption bands by adopting the physical

conception of the atoms as a system of electrons, and in this way the formation of the bands is placed in the same category as other spectral phenomena.—Esterification constants of substituted acrylic acids: J. J. **Sudborough** and D. J. **Roberts.** The esterification constants of some twenty-two substituted acrylic and allied acids with methyl alcohol have been determined. The results indicate that a substituted acrylic acid is esterified less readily than the corresponding saturated acid, and more readily than the corresponding acetylenic acid, and that the effect of introducing substituents into acrylic acid is to lower the rate of esterification.—α-Chlorocinnamic acids: J. J. **Sudborough** and T. C. **James.**—Di*ortho*-substituted benzoic acid, part vi., conversion of methyl into ethyl esters: J. J. **Sudborough** and T. H. **Davies.**—Simple method for the estimation of acetyl groups: J. J. **Sudborough** and W. **Thomas.** The acetyl derivative is hydrolysed with benzenesulphonic acid and the mixture subjected to steam distillation.—Gynocardin, a new cyanogenetic glucoside: F. B. **Power** and F. H. **Lees.** This substance, obtained from the seeds of *Gynocardia odorata*, has the formula $C_{13}H_{19}O_9N$, and is readily hydrolysed by *gynocardase*, the enzyme present in the seeds, and with difficulty by boiling 5 per cent. hydrochloric or sulphuric acid yielding *d*-glucose, hydrogen cyanide, and an undetermined aldehyde or ketone. With alkalis it yields *gynocardinic acid*, $C_{12}H_{19}O_9.CO_2H$.—Catechin and acacatechin. Supplementary note: A. G. **Perkin.**—The action of ethyl dibromopropanetetracarboxylate on the disodium derivative of ethyl propanetetracarboxylate. A correction: W. H. **Perkin,** jun.—Glutaconic acid and the conversion of glutaric acid into trimethylenedicarboxylic acid: W. H. **Perkin,** jun., and G. **Tattersall.**—The transformations of highly substituted nitroaminobenzenes: K. J. P. **Orton** and A. E. **Smith.**—An asymmetric synthesis of quadrivalent sulphur: S. **Smiles.** It is shown that the two isomeric *d*- and *l*-methylethylthetine *l*-menthyl ester bromides are produced in equal amount from the interaction of methylethyl sulphide and *l*-menthyl bromoacetate.—The action of α-halogen ketones on alkyl sulphides: S. **Smiles.** It has been found that certain α-halogen-substituted ketones interact with alkyl sulphides, forming the halides of sulphine bases. Descriptions of the products formed in several cases are given.—Pinene *iso*nitrosocyanide and its derivatives: W. A. **Tilden** and H. **Burrows.** Pinene *iso*nitrosocyanide is shown to be a nitrile, and from it has been obtained the corresponding pinene *iso*nitrosocarboxylamide,

$$C_{10}H_{15}(:NOH).CO.NH_2,$$

which on hydrolysis with hydrochloric acid yields an oily substance which is probably the ketonic acid

$$O:C_{10}H_{15}.CO_2H.$$

—Some interactions of metallic cyanides with organic bases: R. de J. **Fleming-Struthers.** Descriptions of a number of compounds produced by the interaction of phenylhydrazine with various metallic cyanides are given.

Royal Microscopical Society, March 15.—Mr. A. D Michael in the chair.—A review of the work done by metallographers: J. E. **Stead,** F.R.S. Illustrations were shown of the changes produced in metals by strains, a diagram of the apparatus by which rapid reversals of strains were effected being exhibited in illustration of this portion of the subject. The effect of the continued heating of an alloy of copper and tin in boiling mercury, and also that produced by immersion in liquid air, were demonstrated. Slides were also shown to illustrate "surface flow" in antimony, and the microscopic structure of the new silver standard.

Linnean Society, March 16.—Prof. W. A. Herdman, F.R.S., president, in the chair.—*Exhibits.*—Animated photographs of plants taken by the kammatograph, showing the natural movements of the plants accelerated so as to be followed readily by the eye: Mrs. D. H. **Scott.**—A series of thirty lantern-slides, from photographs, of bird-life in the Falkland Islands: R. **Vallentin.**—*Paper.*—Contributions to the flora of Liberia: Dr. Otto **Stapf.** Descriptions of 3 new genera and 56 new species, in a collection of about 260 species, collected by Mr. Alexander Whyte in the neighbourhood of Monrovia, in three different localities. The flora shows a specific likeness to that of Sierra Leone, and the new genera are not endemic.

Physical Society, March 24.—Prof. J. H. Poynting, F.R.S., president, in the chair.—Note on the voltage ratios of an inverted rotary converter: W. C. **Clinton.** The values of the voltage ratios usually given for an inverted rotary converter make no allowance for the resistance of the armature. In this note terms due to the effect of armature resistance are introduced into the ordinary theoretical equations. The resultant voltage on the alternate current side is found to be less than that given by the usual rule. The calculation is only made for open circuit conditions on the alternate current side.—On the flux of light from the electric arc with varying power supply: G. B. **Dyke.** The paper records the results of experiments made on the electric arc with the following objects:—(1) To obtain a series of curves for alternating and continuous arcs of different lengths showing the relation between the mean spherical candle-power and the power supplied to the arc; (2) to compare the efficiencies of the alternating and continuous arcs under different conditions of arc-length and power-supply.—On the application of the cymometer to the measurement of coefficiencies of coupling of oscillation transformers: Dr. J. A. **Fleming.** This paper deals first with the latest pattern of instrument called by the author a cymometer, designed for the measurement of the frequency of electric oscillations, and also the length of long electric waves.

CAMBRIDGE.

Philosophical Society, March 13.—Prof. Marshall Ward, president, in the chair.—On the relation in size between the megalosphere and the microspheric and megalospheric tests in the Nummulites: J. J. **Lister.** At the meeting of the society on October 31, 1904, the author directed attention to the fact that in the three English species of Nummulites, viz. *N. laevigatus, variolarius* and "*elegans,*" both megalospheric and microspheric forms were represented and associated in the Bracklesham and Barton beds of the Hampshire basin. A comparison of the sizes of the megalospheres in these species suggested that a definite relation might exist between them and the sizes of the whole microspheric tests. To examine this question several species have been studied. Arranging these species in order of the sizes of the megalospheres, this is found to coincide with the order of the volumes of the microspheric tests (with the exception of the variety *obesus* of *N. perforatus,* the microspheric test of which falls one place out in the series).—The penguins of the Antarctic: E. A. **Wilson.**—The old moraines of South Victoria Land: H. T. **Ferrar.** The paper first dealt with the topography of South Victoria Land, a land consisting of a range of mountains some 800 miles long in a north and south direction, with a steep eastward face on an average 10,000 feet high, facing the sea and buttressing a vast interior ice-field. Details were given of the stranded moraines on Cape Adare, on the Possession Islands and on Franklin Island, as well as those high on the slopes of Mount Erebus and Terror. The latter could only have been landed there by the Ross ice-sheet being thicker than it is at present. Reversed glaciers, glaciers not reaching the sea, and beheaded glaciers were mentioned, all pointing to the same conclusion, a retreat of the ice. This retreat is now going on, so that increase of cold could not produce a greater glaciation. If this former greater extension was due to a warmer climate, why have the New Zealand glaciers decreased of late, and what is the connection of the "Ice-age" of Europe with the "Great Glacier Epoch" of New Zealand and Patagonia?—Notes on a collection of parasites from the museum of University College, Dundee: A. E. **Shipley.** The collection consisted of fifteen species of Nematoda and ten Cestoda, and came mainly from marine animals of the northern seas, as might have been expected from the importance of Dundee as a whaling centre.—On the maturation of the egg and early development in certain sawflies (Tenthredinidæ): L. **Doncaster.** In the eggs of sawflies which produce males when unfertilised (*Nematus ribesii, N. lacteus, N. pavidus*), the second polar nucleus conjugates with the inner daughter-nucleus of the first polar body. The conjugating nuclei then break up into a group of chromosomes which contain twice the number that is found in the maturation mitoses. These chromosomes persist for some hours, but finally dis-

appear. In the species which produce females from unfertilised eggs (*Poecilosoma luteolum, Hemichroa rufa, Croesus varus*) no conjugation between polar nuclei takes place. In all cases the egg-nucleus sinks into the yolk and gives rise to the cells of the embryo, and the chromosome number remains the same as that observed in the maturation divisions. Centrosomes were never seen in the maturation mitoses, but are present in the division-spindles of the yolk-nuclei and blastoderm of both fertilised and virgin eggs.—Densities of the earth's crust beneath continents and oceans compared: Rev. O. **Fisher.**

PARIS.

Academy of Sciences, March 27.—M. Troost in the chair.—On vessels of fused silica, their employment in chemistry, and their permeability: M. **Berthelot** (see p. 544).—The construction in an opaque homogeneous medium of luminous rays which penetrate by a plane face: J. **Boussinesq.**—On surra and the differentiation of trypanosomes: A. **Laveran** and F. **Mesnil.** An experimental comparison of the trypanosomes of surra arising in the island of Mauritius and in India shows that they are morphologicaly the same, but the pathogenic action upon animals in the laboratory showed some differences between the two trypanosomes. It seems clear that the trypanosomes of surra of Mauritius and of India are the same species. There are three species which differ in their virulence, the order of activity being India, Mauritius, and Mbori.—On the plants from the Coal-measures found in the borings at Éply, Lesménils, and Pont-à-Mousson: R. **Zeiler.** The impressions of plants found at Éply correspond to a well marked Westphalian flora. Of the specimens from the Lesménils boring two, *Lonchopteris Defrancei* and *Cingularia typica,* have hitherto been observed in the Sarre coal basin, and hence would appear to point to the beds now being explored being a prolongation of this field. The specimens from Pont-à-Mousson also point to the Sarrebrück stage of the Westphalian Coal-measures.—On the monochloro-derivatives of methylcyclohexane: Paul **Sabatier** and Alp. **Mailhe.** Chlorine acts readily upon methylcyclohexanone at the ordinary temperature, giving rise to numerous chlorinated derivatives. Of these a special study has been made of the monochlor-derivatives, the main product being shown to consist of two of the five possible isomers.—Prof. van 't Hoff was elected a correspondant for the section of mechanics in the place of the late Prof. Willard Gibbs.—The search for Tempel's periodic comet (1867, 2) in 1905: R. **Gautier.** This comet, first seen in 1867, and again in 1873 and 1879, did not make its reappearance as predicted in 1885, 1892, and 1898. The date of its possible appearance in 1905 is discussed, and its elements calculated. The author expresses the hope that a special search will be made over the regions indicated by observatories possessing instruments of sufficient power or equipped with photographic apparatus.—On Coulomb's law: L. **Lecornu.** A reply to some remarks of M. Painlevé on the same subject.—On a new arrangement for the use of the methods of interferential spectroscopy: Ch. **Fabry.** The method is specially adapted for the study of a spectrum formed of numerous brilliant lines, such as that of iron, in the electric arc. The apparatus is a modification of one previously described by the author. Instead of the interference bands being observed directly, they are viewed through a spectroscope, the slit of which may be left fairly large, unless rays very close together are under observation. The arrangement possesses several advantages over the earlier form, the chief being that there is no possibility of mistaking the radiation under examination.—An electrometer with sextants and a neutral needle: M. **Guinchant.** The theory of the instrument is given, together with its experimental verification. The instrument gave a deflection of 310 mm. for a potential difference of one volt, and the delicacy can be increased three times by a slight modification of the arrangements.—The oxidation of metals in the cold in presence of ammonia: C. **Matignon** and G. **Desplantes.** In the presence of ammonia the slow oxidation by oxygen at the ordinary temperature of a large number of metals takes place, including mercury, silver, nickel, cobalt, molybdenum, tungsten, and copper.—Cryoscopic studies made in hydrocyanic acid: M. **Lespieau** (see p. 544).—Ferric ethylate: Paul **Nicolardot.** The author has repeated the experiments of Grimaux, and concludes that the soluble ferric ethylate described by the latter does not exist. The compound always contains sodium.—On substituted ureas from natural leucine: MM. **Hugounenq** and **Morel.** From the carbimide of the ethyl ester of leucine the authors have prepared leucine-hydantoic acid, the mixed urea of leucine and aniline, and symmetrical leucine urea.—On some iodomercurates of pyridine: Maurice **François.**—On the heat of formation of calcium hydride and nitride: A. **Guntz** and Henry **Basset.** By distilling commercial calcium in a vacuum, with rapid cooling of the vapour, the authors succeeded in obtaining the metal in a pure state, and in a finely divided condition suitable for its conversion into the hydride and nitride. The calorimetric results show that all the heats of formation of calcium compounds, based on Thomsen's data, ought to be increased by 20·4 calories. This gives a positive instead of a negative heat of formation for calcium carbide.—Some applications of Watt's principle to the dissociation of the carbonates of lead and silver: Albert **Colson.**—The heat of formation of oximes: Ph. **Landrieu.** The amount of heat given off by the reaction between aldehydes and ketones has been studied in two ways: firstly, by the interaction of the two substances in aqueous solution in presence of soda, and secondly, indirectly, by the bomb calorimeter. Figures are given for oximes derived from acetone, acetaldehyde, methyl-ethyl-ketone, benzaldehyde, acetophenone, camphor, and diphenyl-ketone, good agreement being obtained between the two methods.—On the origin and composition of the essence of herb-bennet root: Em. **Bourquelot** and H. **Hérissey.** It is found that the essential oil does not exist preformed in the plant, but is the result of the interaction of a new enzyme upon a glucoside. The smell is due to the presence of eugenol, the latter being identified by conversion into its benzoyl ester.—On the experimental bases of the reticular hypothesis: G. **Friedel.**—On a case of commensalism between a species of Balanoglossus and *Lepidasthenia Digueti*: Ch. **Gravier.**—On the cause of the variations in the length of the intestine in the larvæ of *Rana esculenta*: Émile **Yung.** It is shown that the shortening is retarded by the presence of undigested substances, the shortening taking place when the intestine is empty.—On the growth in weight of the guinea-pig: Mlle. M. **Stefanowska.** The relation found between weight and age is shown in the form of two curves, algebraic expressions for which are also given.—On the heats of combustion of the nervous and muscular tissue of the guinea-pig, expressed as a function of the age: J. **Tribot.**—Contribution to the study of acid dyscrasia: M. A. **Desgrez** and Mlle. Bl. **Guende.**—The action of calcium permanganate upon the toxins of tetanus, diphtheria, and tuberculosis: J. **Baudran.**—On a case of osteomalacia causing extreme deformation of the skeleton, and terminated by a spontaneous retrocession of the lesions: P. **Berger.**—On the favourable action of the X-rays in some cases of non-suppurating tuberculous adenopathy: J. **Bergonié.**—The palæontological discoveries of M. de Morgan in Persia: H. **Douvillé.**—On the discovery of coal at Meurthe-et-Moselle: C. **Cavallier.**—On the boring for coal at Meurthe-et-Moselle: R. **Nicklés.**—The discovery of a workable seam of coal in French Lorraine: Francis **Laur.**—On the course of the solidification of the earth: A. **Leduc.** A discussion of the views on this question recently put forward by MM. Lœwy and Puiseux.—On the influence of eclipses on the movement of the atmosphere: W. **de Fonvielle** and Paul **Borde.**—The relation between the density and salinity of sea-water: A. **Chevallier.**

INDIA.

Asiatic Society of Bengal, March 1.—Earwigs of the Indian Museum: M. **Burr.** A list of the specimens in the Indian Museum, with descriptions of four new species.—On the fresh-water polype of the Calcutta tanks, with exhibition of living specimens: N. **Annandale.** The polype of the Calcutta tanks is identical with *Hydra viridis,* Linn. It varies considerably in colour. What is probably the same species has been seen in the botanic gardens at Penang.—The composition of the oil from Bir

Bahoti or the "rains insect" (*Bucella carniola*): E. G. **Hill.** An oil extracted from this mite is used medicinally by the Mohammedans of Allahabad. Analysis shows that its chief constituent is myristodiolein, with small quantities of stearin, cholesterol and colouring matter.—Contributions to Oriental herpetology, ii., notes on the lizards in the Indian Museum, with descriptions of new forms and lists of species recorded from British India and Ceylon, and of specimens collected on Sinkip Island (East Sumatra) by the late Prof. Wood-Mason's collector (part i.): N. **Annandale.** The present contribution deals with the collection of Oriental geckos, eublepharids, agamids, slowworms and monitors in the Indian Museum. Three new forms and a doubtful fourth are described, while notes on the distribution and systematic position of a number of others are given.—Customs in the trans-border territories of the North-West Frontier Province: H. A. **Rose.** A contribution to the customary law of the trans-border tribes on the North-West Frontier of India.—The Agraharis of Sasaram: L. S. S. **O'Malley.**

DIARY OF SOCIETIES.

THURSDAY, APRIL 6.

ROYAL SOCIETY, at 4.30.—On Reciprocal Innervation of Antagonistic Muscles, Seventh Note: Prof. C. S. Sherrington, F.R.S.—The Influence of Cobra-Venom on the Proteid Metabolism: Dr. James Scott.—Further Experiments and Histological Investigations on Intumescences, with some Observations on Nuclear Division in Pathological Tissues: Miss E. Dale.—On the Toxin-Antitoxin Reaction, with Special Reference to the Neutralisation of Lysin by Antilysin: J. A. Craw.—On the Nature of the Silver Reaction in Animal and Vegetable Tissues: Prof. A. B. Macallum.—On Endophytic Adaptation shown by *Erysiphe Graminis* DC. under Cultural Conditions: E. S. Salmon.—Ovulation and Degeneration of Ova in the Rabbit: Walter Heape.

CHEMICAL SOCIETY, at 8.—The Basic Properties of Oxygen at Low Temperatures. Additive Compounds of the Halogens with Organic Substances containing Oxygen: D. McIntosh.—Note on the Interaction of Metallic Cyanides and Organic Halides: N. V. Sidgwick.—The Chemical Dynamics of the Reactions between Sodium Thiosulphate and Organic Halogen Compounds. Part II. Halogen-substituted Acetates: A. Slator.—The Chemical Kinetics of Reactions with inverse Reactions. The Decomposition of Dimethylcarbamide: C. E. Fawsitt.—The Tautomerism of Acetyl Thiocyanate: A. E. Dixon and J. Hawthorne.—A Method of Determining the Specific Gravity of Soluble Salts by Displacement in their own Mother Liquor, and its Application in the Case of the Alkaline Halides: J. Y. Buchanan.—The Combination of Mercaptans with Unsaturated Ketonic Compounds: S. Ruhemann.—A new Formation of Acetylcamphor: M. O. Forster and Miss H. M. Judd.—Preparation and Properties of 1:4:5-Trimethylglyoxaline: H. A. D. Jowett.—Bromomethylheptylketone: H. A. D. Jowett.—On the Existence of a Carbide of Magnesium: J. T. Nance.—The Action of Carbon Monoxide on Ammonia: H. Jackson and D. N. Laurie.—Isomeric Salts of the Type $NR_1R_2H_3$. A Correction. Isomeric Forms of *d*-Bromo- and *d*-Chloro-camphorsulphonic Acids: F. S. Kipping.—Isomerism of *a*-Bromo- and *a*-Chloro-camphor: F. S. Kipping.—*l*-Phenylethylamine: F. S. Kipping and A. E. Hunter.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Discussion of the Report to Council on the International Electrical Congress at St. Louis, by W. Duddell, and of Papers on Systems of Electric Units Published in Part clxx. (last issue) of the *Journal*.

ROYAL INSTITUTION, at 5.—Synthetic Chemistry: Prof. R. Meldola, F.R.S.

RÖNTGEN SOCIETY, at 8.15.—Exhibition Evening.

LINNEAN SOCIETY, at 8.—Intra-axillary Scales of Aquatic Monocotyledons: Prof. R. J. Harvey Gibson.—A further Communication on the Study of *Pelomyxa palustris*: Mrs. Veley.

SOCIETY OF ARTS, at 4.30.—The Prospects of the Shan States: Sir J. George Scott.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, at 8.—The Design of Concrete-Steel Beams: W. Noble Twelvetrees.

FRIDAY, APRIL 7.

ROYAL INSTITUTION, at 9.—American Industry: Alfred Mosely.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Cofferdams for Dock Use: R. G. Clark.—Bath Corporation Waterworks Extension: J. R. Fox.

GEOLOGISTS' ASSOCIATION, at 8.—The Relative Ages of the Stone Implements of the Lower Thames Valley: M. A. C. Hinton and A. S. Kennard.

SATURDAY APRIL 8.

ROYAL INSTITUTION, at 3.—Some Controverted Questions of Optics: Lord Rayleigh.

THE ESSEX FIELD CLUB, at 6.30. (At Essex Museum of Natural History, Stratford).—Twenty-fifth Annual Meeting.—Natural History Museums: F. W. Rudler.

MONDAY, APRIL 10.

INSTITUTION OF CIVIL ENGINEERS, at 8.—"James Forrest" Lecture: Unsolved Problems in Electrical Engineering: Colonel R. E. B. Crompton, C.B.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Problem of the Upper Yangtse Provinces and their Communications: Colonel C. C. Manifold.

TUESDAY, APRIL 11.

ROYAL INSTITUTION, at 5.—Tibet: P. Landon.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Maintenance and Strengthening of Early Iron Bridges: W. Marriott.

WEDNESDAY, APRIL 12.

SOCIETY OF ARTS, at 8.—The Industrial Resources of the State of Matto Grosso, Brazil: G. T. Milne.

THURSDAY, APRIL 13.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: A Quantitative Study of Carbon Dioxide Assimilation and Leaf-temperature in Natural Illumination: F. F. Blackman and Miss G. Matthaei.—On Colour Vision by Very Weak Light: Dr. G. J. Burch, F.R.S.—On a New Type of Electric Furnace, with a Redetermination of the Melting Point of Platinum: Dr. J. A. Harker.—The Refractive Indices of Sulphuric Acid: Dr. V. H. Veley, F.R.S., and J. J. Manley.—(1) The Improved Electric Micrometer: (2) The Amplitude of the Minimum Audible Impulsive Sound: Dr. P. E. Shaw.—On the Intensity and Direction of the Force of Gravity in India: Lieut.-Colonel S. G. Burrard, R.E., F.R.S.

ROYAL INSTITUTION, at 5.—Synthetic Chemistry: Prof. R. Meldola, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Alternating Current Series Motor: F. Creedy.—Discussion of Mr. Bion J. Arnold's address to the joint meeting at St. Louis.

INSTITUTION OF MINING AND METALLURGY, at 8.—The Kedabeg Copper Mines: Gustav Köller.—Refining Gold Bullion and Cyanide Precipitates with Oxygen Gas: T. Kirke Rose.—Wood Gas for Power Purposes and Gas Generator: G. M. Douglas.—Notes on the Prestea District, Gold Coast Colony: P. Poore.—Notes on the New Dharwar Gold Field of India: R. O. Ahlers.—The Cause of Border Segregation in some Igneous Magmas: J. Park.

MATHEMATICAL SOCIETY, at 5.30.—On Irreducible Jacobians of Degree Six: P. W. Wood.—On Fermat's Numbers and the Converse of Fermat's Theorem: A. E. Western.—On the Strains that accompany Bending: Prof. A. E. H. Love.

FRIDAY, APRIL 14.

ROYAL INSTITUTION, at 9.—The Law of Pressure of Gases below Atmosphere: Lord Rayleigh.

PHYSICAL SOCIETY, at 8.—On Ellipsoidal Lenses: R. J. Sowter.—(1) The Determination of the Moment of Inertia of the Magnets used in the Measurement of the Horizontal Component of the Earth's Field: (2) Exhibition of a Series of Lecture Experiments illustrating the Properties of the Gaseous Ions produced by Radium and other Sources: Dr. W. Watson, F.R.S.

ROYAL ASTRONOMICAL SOCIETY, at 5.

MALACOLOGICAL SOCIETY, at 8.—Anatomical and Systematic Notes on Dorcasia, Trigonephrus, Corilla, Thersites, and Chloritis: Henry A. Pilsbry.—Some Account of the Anatomy of *Cassidaria rugosa*, L.: Alexander Reynell.—Notes on a small Collection of Shells from the Victoria Falls, Zambesi River: H. B. Preston.—Descriptions of Six New Species of Land Shells from South Africa: H. Burnup.

SATURDAY, APRIL 15.

ROYAL INSTITUTION, at 3.—Some Controverted Questions of Optics: Lord Rayleigh.

CONTENTS.