

coke as on the gas, and cater for the supply of a good domestic fuel at the price of coal, instead of treating coke purely as a by-product, the demand for it would soon reach a point that would enable the desired reductions in the price of gas to be made. There is no need to fear as to the other by-products; the output of sulphate of ammonia could be doubled without affecting the market, and a good tar will look after itself; it was high heats that ruined the tar market, and with the demand for tar increasing for road work, no flooding of the market need be feared.

During the last few years the statement has several times been put forward that "as the gas manager's end and aim is gas, it is his duty to obtain the greatest volume of gas possible per ton of coal"; but with this I venture to disagree. The gas manager's duty is to obtain the greatest possible value per ton of coal, and until every industry dealing with coal recognises that in this respect its aim is the same, little economy will be possible in our rapidly diminishing store of coal.

The pressing of temperatures in carbonisation to higher and higher degrees with the old conditions of lightly charged retorts has given larger yields of gas, but it has loaded the gas with carbon bisulphide, depreciated the coke, and ruined the tar; and one of the chief claims for the adoption of the full-charge horizontals and intermittent vertical retorts for carbonisation is that they have improved the character of both coke and tar.

As I have shown, this is due to a certain proportion of the gas and tar vapour coming off through the cool core and so escaping over-cracking, but it can be only a partial improvement; whilst, so far as the coke goes, the nearer it approaches metallurgical coke the less it is fitted for a domestic fuel. True it is, that where the coke has been made harder and brighter the gas manager's market has improved; but it has been for use in furnaces, manufacturing processes, and for producers that the increased demand has been felt, and not for domestic use.

Even for the heating of furnaces the coke made at extreme temperatures is not so good as when the heats were slightly lower; and in Germany this is beginning to be recognised, and Körting, in a paper read this summer (1911), points out that the inclined settings, which used to work with 12 per cent. of fuel, now require fully 16 per cent., an increase due partly to higher temperatures, but largely to more highly carbonised coke.

Already the strides forward which gas has made as a domestic fuel are telling the tale in our atmosphere, and the yellow fogs of the last century are getting rarer; and if coke could be made a domestic fuel by leaving in it 6 to 8 per cent. of volatile matter to facilitate ignition and give a flame, the gasworks of the country could command the fuel market.

Remember that the sale of gas cannot be pushed beyond a certain point without overstocking with coke; the sale of both *pro rata* must be pushed, and if only you could be persuaded that this is the right road, you would be backed up by the smoke reformers and the public, and find yourselves able to sell a fuel coke at the price of the best coals.

I have shown that the factor for which you ruin your coke as a domestic fuel is about 3000 cubic feet of gas of the same value as blue water gas; the 3000 cubic feet of gas left in the coke would be worth four or five shillings a ton on the selling price, and the cost of replacing it by water gas would be about one shilling, whilst the creation of a large domestic market would enable a reduction in the price of gas to be made that would still further increase its use as a fuel.

Now I am sure in my own mind that these are the lines the gas industry should consider seriously, and that the advances in the next ten years must be an endeavour to get nearer to the ideal of carbonisation and to improve both gas and coke.

In a course of lectures such as these, four seems an ample allowance at the commencement—and probably to the audience more than ample at the end—but I realise only now how miserably inadequate the time has been for the expression of the matter I desired to bring before you, and can only hope that some of the points, controversial though they may be, will prove helpful in considering the carbonisation of coal.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE committee formed to promote a scheme for providing a college of university rank at Brighton has resolved that the scheme shall be one for establishing a constituent college of London University for the county of Sussex, the subjects to be arts, sciences, engineering, and pedagogy in the first instance, but medicine and law to be undertaken later.

THE Old Students' Association of the Central Technical College is organising a dinner to celebrate the election of Prof. W. C. Unwin, F.R.S., as president of the Institution of Civil Engineers. The dinner, which will be held at the Criterion Restaurant on Saturday, February 10, is intended to be a gathering of old students of the Central Technical College and Prof. Unwin's students at Cooper's Hill. The chair will be taken by Mr. W. Duddell, F.R.S., president of the Central Old Students' Association. Tickets may be obtained from Mr. G. W. Tripp, 4 Fairfield Road, Charlton, Kent.

SEVERAL gifts to American universities are announced in the issue of *Science* for January 12. Mr. Jacob H. Schiff has given 20,000*l.* to Cornell University to promote studies in German culture; the 200,000*l.* fund for the further endowment of the medical school of Western Reserve University has been completed; and De Pauw University has just brought to a successful close the campaign to raise 80,000*l.* to meet the conditional gift of 20,000*l.* from the Rockefeller Educational Board. The subscriptions amount to a little more than 88,000*l.* This will make the productive endowment of the University something above 200,000*l.*

THE late Dr. R. D. Roberts, whose death occurred on November 14 last, left estate of the gross value of 10,024*l.*, of which the net personalty has been sworn at 6021*l.* He bequeathed the ultimate residue of his property "to the University College of Wales, at Aberystwyth, to form the nucleus of a fund to be formed and administered in accordance with a scheme to be prepared by the said University College, and approved by my trustees, to enable professors, after a certain number of years of service—say, not less than ten—to be released from the professional duties for a period of about a year, and, at any rate, not less than six months on full salary, a substitute being paid out of the income of the fund, the purpose of this release from college duties being to enable the professor to refresh his mind by travel or research or visits to other universities, and so gain fresh stimulus and equipment for his work."

It has been announced that the ordinance for the institution of degrees in veterinary science promoted by the University of Edinburgh has been passed by the Privy Council, and has received his Majesty's sanction. The ordinance will come into operation at the beginning of the next summer session, and by it the University is empowered to confer the degrees of Bachelor of Science and Doctor of Science in veterinary science. The Edinburgh veterinary student will now be in a position to obtain an academic distinction in addition to the diploma of membership of the Royal College of Veterinary Surgeons. The present time marks a distinct epoch in the history of veterinary science in Scotland. The Royal (Dick) Veterinary College—the original Scottish veterinary school—is about to enter upon a fresh era, inasmuch as it has been decided to erect new and up-to-date buildings on a scale which will do credit to the important educational centre in which it is located. At the same time, the students of the college are being afforded the means of entering the ranks of university graduates. These developments cannot fail to exert an important effect upon veterinary teaching in Edinburgh and upon the veterinary profession in Scotland.

### SOCIETIES AND ACADEMIES.

#### LONDON.

Royal Society, January 18. — Sir Archibald Geikie, K.C.B., president, followed by Sir A. B. Kempe, vice-president, in the chair.—Dr. J. S. Haldane, C. Gordon Douglas, Dr. Y. Henderson, and Dr. E. C. Schneider: The physiological effects of low atmospheric pressures, as observed on Pike's Peak, Colorado. The

following is a short preliminary account of a series of observations made in the summer of 1911 on the summit of Pike's Peak, Colorado. Pike's Peak is 14,107 feet above sea-level, the barometric pressure on the summit being about 18 inches (457 mm.). There is an excellent stone house close to the summit, in which the authors were accommodated during their stay of five weeks. The main object of the expedition was to discover to what extent, and by what means, adaptation takes place to low barometric pressure, and consequent deficiency in the partial pressure of oxygen in the air. The authors' chief conclusions are as follows:—(1) After two or three days on the summit of Pike's Peak very distinct signs of acclimatisation began to appear. (2) Before acclimatisation occurred, blueness of the lips and face, nausea, intestinal disturbance, headache, fainting in some persons, and periodic breathing were observed, besides great hyperpnoea on exertion or holding the breath for a few seconds. (3) All these symptoms are referable, directly or indirectly, to want of oxygen produced by the diminished partial pressure of oxygen in the air. The authors did not observe, either in themselves or in the large number of persons who ascended the peak, any symptoms (apart from the effects of the bright light) not referable to the same cause. (4) After acclimatisation had occurred these symptoms disappeared, with the exception that hyperpnoea on exertion or on holding the breath for a few seconds was still much greater than usual. Periodic breathing was still observed occasionally, and blueness of the lips and face was present after continuous and powerful exertion, such as walking up hill. (5) The respiratory exchange during rest remained about normal in the one subject on whom exact experiments were made, and the respiratory exchange during work did not appear to be markedly increased. (6) After acclimatisation the alveolar carbon dioxide pressure was diminished from about 40 mm. to about 27 mm. during rest or moderate exertion, which corresponded to an increase of about 50 per cent. in the ventilation of the lung alveoli. During severe exertion the alveolar carbon dioxide pressure was about half what it normally is during similar exertion, which corresponded to an increase of about 100 per cent. in the hyperpnoea; and owing to a temporary alteration in the respiratory quotient the breathing was still further increased, so that it was for a time increased to thrice what it would have been at sea-level with the same oxygen consumption. (7) The change in the level of alveolar carbon dioxide pressure occurred gradually after going up, and disappeared gradually on coming down, the change taking a number of days to reach completion. (8) The percentage of hæmoglobin in the blood increased for several weeks on the summit of Pike's Peak, and varied in different acclimatised persons from 115 to 154 per cent. on the scale of the Gowers-Haldane hæmoglobinometer, corresponding to an oxygen capacity of from 21 to 28.5 c.c. of oxygen per 100 c.c. of blood. The number of red corpuscles per cubic mm. of blood increased parallel with the hæmoglobin, and the percentage volume of red corpuscles, as determined by the hæmatocrit, also increased in proportion to the percentage of hæmoglobin. (9) A large increase in the total amount of hæmoglobin (determined by the carbon monoxide method) in the body occurred during the first three weeks, and along with this increase there was found, except in the first week, a slight increase in blood volume, as well as the increase, already referred to, in the percentage of hæmoglobin. (10) On coming down from Pike's Peak the hæmoglobin percentage diminished much more rapidly than the total hæmoglobin, so that the blood volume was still further increased at first. It required about four weeks for the excess of hæmoglobin and blood volume to disappear, though the hæmoglobin percentage fell to normal much earlier. (11) So far as the authors could ascertain, there was very little change in the rate of circulation on Pike's Peak after acclimatisation. Pulse and blood pressure were but little affected. In most cases, however, there was a slight increase in the pulse-rate. (12) After acclimatisation the oxygen pressure in the arterial blood (measured by the carbon monoxide method) rose during rest to about 35 mm. of mercury, or 66 per cent. above the alveolar oxygen pressure, and remained at a level of only about 12 mm. below the normal oxygen pressure at sea-level. Immediately after ascending the peak, and before

acclimatisation had occurred, the arterial oxygen pressure was found to be about 45 mm. below normal, and only slightly above the alveolar oxygen pressure. This change appears to be due to a progressive increase in the activity of the alveolar epithelium in secreting oxygen inwards. On raising the alveolar oxygen pressure to normal, the difference between alveolar and arterial oxygen pressure diminished rapidly. (13) Acclimatisation to high altitudes is due mainly to the increased secretory activity of the alveolar epithelium, but partly also to the increased lung ventilation, and to a lesser extent to the increased hæmoglobin percentage in the blood. The acclimatisation takes some days to develop. During rapid ascents in balloons or aeroplanes it would not have time to develop, and this explains the contrast between the experience of balloonists, &c., and that of mountaineers who ascend gradually.—**J. Barcroft**: The effect of altitude upon the dissociation curve of the blood. The affinity of hæmoglobin for oxygen depends, among other things, upon the hydrogen ion concentration of the blood. After removing the CO<sub>2</sub> from blood, a scale was made out for the blood of each person plotting the percentage of oxyhæmoglobin at a standard oxygen pressure vertically, and the amount of acid added to the blood horizontally. Thus, by estimating the percentage of oxygen in the hæmoglobin of blood at high altitudes, an estimate can be made of the acid which has been contributed to it by the organism. It thus appeared that at each altitude the alkalinity of the blood decreased (apart from CO<sub>2</sub>). This was so in the resting individual, but much more markedly so during exercise. The dissociation curve of blood exposed to the CO<sub>2</sub> pressure of the alveolar air confirmed the result that during rest the dissociation curve remains constant. During activity the affinity of the blood for oxygen decreases, and the hæmoglobin is able to unite with less oxygen in the lung, and to do so at a lower rate. On the other hand, the rate of dissociation in the tissues increases. The acid which accumulates in the blood is not lactic acid entirely, and during rest only to a slight extent. The persons whose blood was most alkaline (apart from CO<sub>2</sub>) were most prone to sickness.—**R. Kirkpatrick**: Note on *Astrosclera willeyana*, Lister. *Astrosclera willeyana*, Lister, is a small columnar, or mushroom-shaped, organism, somewhat resembling a coral in appearance. It has been described by various zoologists respectively as a calcareous sponge, a siliceous sponge, and a coral. Mr. Kirkpatrick, who dredged numerous specimens from a depth of 50 to 100 fathoms off Christmas Island, Indian Ocean, has found that the organism is a siliceous sponge with a supplementary skeleton of aragonite, and that it owes its unique character (viz. that of forming a supplementary skeleton of aragonite) to its association with a degenerate *Floridean alga* (red seaweed). Certain of the sponge cells envelop the spores of the alga, and secrete around them concentric layers of aragonite. The little spherules so formed are in several respects comparable with the cyst pearls of pearl oysters and mussels. The spherules are at first loose and separate, but later become welded together so as to form a firm coral-like skeleton. The encysted algal spores may be killed and wholly calcified, or they may retain their vitality and germinate, so as to form branching thread-like filaments, which bore their way through the solid calcareous walls. The algal plants in the soft tissues of the sponge are of microscopic dimensions.—**Dr. H. B. Fantham**: *Herpetomonas pediculi*, nov. spec., parasitic in the alimentary tract of *Pediculus vestimenti*, the human body-lice. *Herpetomonas pediculi* is a parasitic flagellate protozoan. It has been investigated especially in body-lice reared and fed on the author's own blood. It also occurs in "wild" lice, but only some 8 per cent. are infected, and then slightly. The life-cycle of the parasite comprises pre-flagellate, flagellate, and post-flagellate stages, which gradually merge into each other. These forms of the parasite occur broadly in the fore-, mid-, and hind-gut respectively of adult lice, while pre-flagellate stages also occur in the digestive tract of larval *pediculi*. The pre-flagellate stage resembles the Leishman-Donovan body. The length of the flagellate body varies from 11  $\mu$  to 26  $\mu$ , while the single free flagellum is usually about as long as the body. Oval, encysted post-flagellate stages may be recovered from the faeces of infected lice. Striated thick-walled cysts occur very rarely. The mode of infec-

tion is casual, cysts being swallowed accidentally by lice. There is no hereditary infection. *H. pediculi* is important in at least two respects:—(1) it occurs in human body-lice, which themselves may act as carriers of disease in certain circumstances in some parts of the world; also (2) it has been asserted that parasites belonging to the genera *Herpetomonas* and *Crithidia*, occurring in blood-sucking insects, are stages in the life-cycles of trypanosomes of vertebrates. Although many lice, infected with *H. pediculi*, had been bred on the author's body, fed only on his blood throughout their lives, and kept confined, yet no trypanosome has been found in his blood, whether examined by smear, thick film, culture, or by sub-inoculation into white rats, the experiments having extended over a period of nearly three years. Also, rats inoculated with *H. pediculi* have not developed trypanosomes. *H. pediculi* is a harmless parasite of the digestive tract of *Pediculus vestimenti*, and has no connection with any vertebrate trypanosome. The possible occurrence of such a natural *Herpetomonas* in lice must be remembered when experimenting with *pediculi* as possible transmitters of Leishmania.—Captain A. D. Fraser and Dr. H. L. Duke: An antelope trypanosome. Ten days after blood of a bushbuck, which was shot on the shores of the Victoria Nyanza, had been injected into a healthy goat, trypanosomes appeared in the goat's blood. The same species of trypanosome was present in blood smears made from another bushbuck and a sikitunga, which were shot in the same neighbourhood. The small characteristic trypanosome corresponds morphologically to the one which was discovered in cattle in Uganda, and was named *Trypanosoma uniforme* by the Royal Society Sleeping Sickness Commission, 1908–10. This is shown by curves representing the distribution, by percentages, in respect to length of the antelope trypanosome and *T. uniforme*. Cattle, goats, sheep, and bushbuck were infected. Monkeys, pigs, dogs, cats, guinea-pigs, and white rats proved to be refractory. It is concluded that the trypanosome found in the antelope was *T. uniforme*. Experimentally it was shown that laboratory-bred *Glossina palpalis* were capable of transmitting this species of trypanosome from infected to healthy animals. Of six experiments, four were successful. The flies became infective in from twenty-seven to thirty-seven days, and the infection in the fly was always limited to the proboscis. In order to ascertain if *G. palpalis* caught on the Lake-shore, near where the infected antelope had been shot, were naturally infected, flies were collected there and brought to Mpumu, where they were fed on a healthy goat. After 1020 flies had been put on the goat it became infected with *Trypanosoma uniforme*. Some days afterwards *T. vivax*, with which wild flies had previously been shown to be naturally infected, also appeared in the goat's blood. The conclusions are:—(1) this trypanosome, which is of fairly frequent occurrence among Lake-shore antelope, is *T. uniforme*; (2) the available evidence points to *Glossina palpalis* as being the carrier of this species of trypanosome; (3) *G. palpalis* caught on the Lake-shore are naturally infected with *Trypanosoma uniforme*.

## PARIS.

Academy of Sciences, January 8th.—M. Lippmann in the chair.—Paul Sabatier and A. Mailhe: The catalytic decomposition of formic esters. The authors have previously shown that formic acid suffers catalytic decomposition in two different ways, some catalytic agents, such as titanium dioxide, producing carbon monoxide and water, others, such as finely divided metals and zinc oxide, giving rise to carbon dioxide and hydrogen. Catalysis by the oxides of thorium, manganese, &c., takes place in both ways. The study has been extended to the action of these various catalytic agents on the formic esters, and the predominant reaction is a decomposition of the ester into alcohol and carbon monoxide.—G. Fayet: A new comet of short period. Observations on a very faint comet, of about seven years' period, discovered by M. Schumasse.—M. Taitzéica: Isothermal surfaces.—Paul Lévy: The integro-differential equations of M. Hadamard.—P. Helbronner: Survey of the higher regions of the French Alps.—Marcel Oswald: A simple relation between the coefficient of expansion of liquids and the temperature.

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If  $\alpha$  be the coefficient of expansion at  $T^\circ$  absolute,  $T_c$  the critical temperature absolute, then the expression  $\alpha = \frac{1}{2T_c - T}$

holds good. Using the general formula  $\alpha = \frac{1}{\lambda T_c - T}$ , the

values of  $\lambda$  obtained with various liquids approximate closely to 2.—C. Matignon and M. Lassieur: Actions of nitrogen and oxygen on magnesium. Oxygen begins to act on magnesium at  $600^\circ$  C., and nitrogen at about  $670^\circ$  C., the former acting much the more rapidly. The addition of mercury to form an amalgam does not facilitate these reactions.—L. C. Maillard: Action of amino-acids on the sugars. Amino-acids act rapidly at  $100^\circ$  C., slowly at  $37^\circ$  C., with various sugars, producing brown substances, with elimination of carbon dioxide and water. The carbon dioxide is split off from the amino-acid. The action is general, having been obtained with glycocine, sarcosine, alanine, tyrosine, glutamic acid, &c.; of these, alanine acts the most readily.—Marin Mollard: Comparison of the phenomena of oxidation in galls and in the homologous normal organs. The respiratory quotients for normal leaves of the elm, and for the galls produced by *Tetraneura Ulmi*, are practically the same in darkness; but in light, in an atmosphere containing 8 per cent. of carbon dioxide, for the same volume of this gas absorbed, much less oxygen is evolved by the galls than by the sound leaves.—J. Winter: Remarks on the gastric acidity. There is no uniform type of gastric juice, its composition depending on the food taken, the psychic state, &c. There is no direct connection between the production of gastric juice and that of its acid constituents.—H. Labbé and L. Violle: Elimination of amino acid nitrogen in depancreatised dogs. In depancreatised dogs the ratio of the urinary amino-acid nitrogen to the total nitrogen of the urine is about four times as great as for normal animals.—P. Magitot: The possibility of preserving the human cornea in a living state after removal from the body. A human eye, removed in a case of glaucoma, was kept for eight days in hæmolyzed human serum, the cornea, previously opalescent, gradually regaining its transparency. Part of this cornea was then grafted into another patient's cornea which had become entirely opaque owing to an accident. The transplanted cornea has retained its transparency after seven months, and the vision is one-tenth normal.—Robert Lévy: Relation of arachnolysin to the female genital organs of spiders.—Maurice Arthus: Intoxication by venoms and by proteids. The effects of snake poisons on rabbits closely resemble those of anaphylaxis, therefore a rabbit sensitised by injection of proteid material should be rendered more sensitive to snake venoms, and *vice versa*. This is found to be the case. The venom of the cobra has two distinct actions, one an effect common to snake poisons, the other a curare-like action confined to the venoms of a restricted number of snakes.—L. G. Seurat: The life-cycle of the Spiroptera of the dog.—F. Picard: The biology of the potato-moth (*Phthorimaea operculella*) and its occurrence in France. This moth, which inflicts great damage on the potato crop in the United States, Australia, and other parts of the globe, has lately appeared in various districts in France, but so far its distribution there is not wide. Disinfection with carbon bisulphide appears to be the only remedy.—A. Quidor: Torsion of the Lernæidæ, and their affinities to Sphyriion and Hepatophylus.—Louis Gentil: Geological observations on the route of General Moinier's column between Fez and the Atlantic Coast.—E. A. Martel: The cañon of the Rhonc.—Alfred Angot: Value of the magnetic elements at the Observatory of Val-Joyeux to January 1, 1912.—Alfred Angot: Mean value of the cloudiness at the time of the forthcoming total eclipse of the sun. The chances for and against fine weather along the central line in France on April 17 have been arrived at from consideration of the weather, at Paris and Nantes, for the period April 15 to 19 during the twenty years 1891–1910. The unfavourable cases exceed the favourable by nearly 2 to 1.

January 15.—M. Lippmann in the chair.—B. Baillaud: The catalogue of stars published by M. Cosserat, director of the Observatory of Toulouse. Remarks on vol. viii. of the "Annales de l'Observatoire de Toulouse."—Émile Picard: A general theorem relating to

uniform functions of one variable connected by an algebraical relation.—E. **Vallier**: The present position of the ballistic problem. A *résumé* of the formulæ that have been proposed to connect the air resistance with the velocity of a projectile.—Auguste **Righi**: Sparks in rarefied air and under the action of a magnetic field. The effect produced is illustrated by a photographic reproduction; an illustration of a special form of vacuum tube is also given, by means of which the mechanical effects of the spark in gases under reduced pressure have been studied.—The secretary announced the death of Jacob Amsler, correspondent for the section of mechanics.—J. **Hadamard**: A question relating to viscous liquids. An acknowledgment of priority to a paper by M. Rybczynski.—Louis **Roy**: The general equations of flexible membranes.—M. **de Broglie**: The observation of the Brownian motion in gases at low pressures. Working with fumes of phosphorus in air at about 1 mm. pressure, the independence of the Brownian motion and the pressure has been approximately verified for pressures between wide limits, but starting from a certain pressure (some millimetres of mercury) the agitation tends to increase.—C. **Leenhardt** and A. **Boutaric**: Cryoscopy in sodium thiosulphate crystallised with five molecules of water. A direct determination of the latent heat of fusion calorimetrically gave  $L=47.9$  at the temperature  $48.5^\circ$ , and using this value in the van 't Hoff formula, the molecular lowering found is  $K=42.8$ . The direct determination of  $K$  with urea as the solute gave  $K=42.6$ . It is important that the solvent should contain water of crystallisation corresponding exactly with the formula  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ , and details of the method of working are given.—Eugène **Wourtsel**: A new determination of the atomic weight of nitrogen. The method is based on the determination of the weight of oxygen required to convert a known weight of nitric oxide into the peroxide  $\text{N}_2\text{O}_4$ . Five experiments gave  $N=14.007$  ( $O=16$ ), the extreme values being 14.005 and 14.008.—A. **Besson**: The preparation of magnesium silicide and its decomposition by acids. A study of the reaction between magnesium powder and finely divided quartz, and of the conditions giving a maximum yield of magnesium silicide. Hydrochloric acid was found to be the best acid for attacking the silicide, the maximum yield of hydrogen silicide obtainable being from 6 per cent. to 7 per cent.—L. **Hugonenoq** and A. **Morel**: The combinations of chromium hydroxide with the amino-acids derived from the albumens.—A. **Guyot** and A. **Kovache**: The action of formic acid upon the triarylcarbinols. Triphenylcarbinol ( $\text{C}_6\text{H}_5$ )<sub>3</sub>C(OH), heating with 20 times its weight of anhydrous formic acid, is quantitatively reduced to the hydrocarbon triphenylmethane, and the reaction is general for triarylcarbinols.—A. **Tison**: The dichotomic nervation in the Conifers. Dichotomy is shown to be the normal mode of ramification in certain appendices of Conifers.—G. **Arnaud** and Ed. **Foëx**: The form of *Oidium* of the oak in France.—A. **Marie** and Léon **MacAuliffe**: The morphological characters of 61 French murderers and suicides.—A. **Magnan**: Food and the length of the intestine in mammals. Results of the dissection of 280 mammals show that the nature of the food is an important factor in the evolution of the alimentary canal.—M. **Bizot**: The brachio-antibrachial in the Cheiroptera.—Mlle. E. **Peyrega** and F. **Vlès**: An oxyhæmoglobin band in the ultraviolet spectrum of blood. This band, in position near  $\text{Cd } 12$ , was first noted by Soret in 1883, but its existence has since been denied by many investigators. The authors' investigations confirm those of Soret, and they consider that the negative results obtained subsequently were due to too rapid variations of the concentration.—E. **Vasticar**: The structure of the internal pillars of Corti's organ.—A. **Trillat**: The influence of the gases evolved by putrefying organic substances on the growth of bacteria.—Paul **Vuillemin**: A human parasitic fungus, *Glenospora graphii*.—P. **Chaussé**: A new distinctive character of the human and bovine tubercle bacillus. The domestic animals, dog and cat, contract tuberculosis much more easily from the bovine tubercle bacillus than from that of human origin.—J. **Bridré** and A. **Boquet**: Vaccination of sheep against scab by means of a specially prepared virus. The process of preparing the modified virus is described in detail, and from the results of experiments on 300 sheep the method

would appear to be of general application. It has several advantages over the method in current use, the main one being that the closed local lesion is not contagious.—F. **Kerforne**: The nature and origin of the iron minerals of the forest of Lorges (Côtes-du-Nord).—Émile **Haug** and Léon **Bertrand**: The geological structure in the north of the department of Var.—J. **Vallot**: The measurement of the subterranean excavation produced by the spring of Fon Tréboula.—M. **Thoulet**: A bathy-lithological map of the sea floor on the coasts of the Gulf of Lyons.

## NEW SOUTH WALES.

**Linnean Society**, November 29, 1911.—Mr. W. W. Froggatt, president, in the chair.—P. **Cameron**: A collection of parasitic Hymenoptera (chiefly bred) made by Mr. W. W. Froggatt in New South Wales, with descriptions of new genera and species. Part ii. Five genera and nineteen species of the family Chalcididae are described as new. The type-specimens of three species were bred from the codlin-moth.—R. E. **Turner**: A revision of the Australian species of the genus *Cerceris* (Hymenoptera). Eighteen species, including one described as new, are treated of. The types of all the species, except the common *C. australis*, Sauss., have been consulted. The dry conditions prevalent over a large part of Australia are eminently suitable for the members of the genus. Nevertheless, it may prove not to be so well represented as in North Africa and India, for the section of the genus, characterised by a raised plate at the base of the second ventral segment, seems to be entirely absent from Australia.—Dr. R. **Greig-Smith**: Contributions to a knowledge of soil-fertility. No. iv. The agriceri and bacterio-toxins of soil. Soils which have been heated to  $65^\circ-75^\circ$  in order to kill off the phagocytic protozoa of Russell and Hutchinson give a greatly increased bacterial growth after treatment with the volatile disinfectants or fat-solvents. This effect is obtained with the soil-bacteria and with added test-bacteria. The treatment with disinfectants, therefore, does something more than destroy the protozoa. One is justified in ascribing the effect to the translation of the agriceri by the behaviour of the various layers of the soil, following the treatment with ether or chloroform. The top layers, which contain most translated agriceri, give lessened bacterial growths, and, conversely, the lowest layers produce greater numbers of bacteria than the intermediate soil. The action of the agriceri cannot be so clearly shown in soils heated at higher temperatures, on account of the disturbing influences of the natural toxins and the heat-toxins of Pickering. The volatile disinfectants have no action upon the toxins of the soil, either in destroying or translating them. The enhanced bacterial growth after chloroform treatment could not be credited to traces of disinfectant remaining in the soil. It was noted that an abnormally toxic soil became normal after heavy rains, and experimental work showed that the toxins were washed from the upper into the lower layers.—D. **McAlpine**: The fibro-vascular system of the pear (pome). After maceration in water for five days, the elaborate fibro-vascular system may be satisfactorily displayed. It has the same general plan as that of the apple, described in detail in a paper read at the last meeting.—A. B. **Walkom**: Note on a new species of *Favosites* from the Yass District, N.S.W. The fossil coral described occurs in the Silurian beds of Derrengullen Creek, near Yass, together with *F. gothlandica*, Lam., and *F. basaltica*, Goldfuss, var. *salebrosa*. It is more nearly allied to the former, but has the corallite tubes generally larger, the tabulæ more closely spaced, the septa more regularly arranged and shorter, and the mural pores usually in three vertical rows.

## BOOKS RECEIVED.

A Dictionary of Applied Chemistry. By Sir Edward Thorpe, C.B., F.R.S., assisted by eminent contributors. Revised and enlarged edition. Vol. i. Pp. viii+758. (London: Longmans and Co.) 45s. net.  
Papers and Proceedings. Fifth Annual Meeting, American Sociological Society, held at St. Louis, Mo., December 27-30, 1910. Vol. v. Pp. vi+267. (Chicago: University of Chicago Press; Cambridge University Press.)  
Scientific Features of Modern Medicine. By Prof. F. S.