SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 4.—"On the Molybdates and Vanadates of Lead, and on a new Mineral from Leadhills," by Prof. Dr. Albert Schrauf, of Vienna.

"On the Structures and Affinities of *Gwynia annulata*, Dunc., with Remarks upon the Persistence of Palæozoic Types of Madreporaria," by Prof. P. Martin Duncan.

The dredging expedition which searched the sea-floor in the track of the Gulf Stream of 1868, yielded, amongst other interesting Madreporaria, a form which has been described by Count Pourtales under the name of *Haplophyllia paradoxa*; and which was decided by him to belong to the section *Rugosa*.

The last expedition of the *Porcupine*, under the supervision of Dr. Carpenter and Mr. J. Gwyn Jeffreys, obtained, off the Adventure Bank in the Mediterranean, many specimens of a coral which has very remarkable structures and affinities. The species is described under the name of *Gwynia annulata*, Dunc. The necessity of including it amongst the Rugosa and in the same family, the *Cyathoxonidæ*, as *Haplophyllia paradoxa*, is shown. Having this proof of the persistence of the rugose type from the palæozoic seas to the present, the affinities of some so-called anomalous genera of midtertiary and secondary deposits are critically examined. The Australian tertiary genus *Conosmilia*, three of whose species have strong structural resemblance with the Rugosa, is determined to be allied to the *Stauridæ*, and especially to the Permian genus *Polycœlia*. The secondary and tertiary genera with hexameral, octomeral, or tetrameral and decameral septal arrangements are noticed, and the rugose characteristics of many lower Liassic and Rhetic species are examined. The impossibility of maintaining the distinctness of the palæozoic and neozoic coral faunas is asserted; and it is attempted to be proved that whilst some rugose types have persisted, hexameral types have originated from others, and have occasionally recurred to the original tetrameral or octomeral types; and that the species of corals with the confused and irregular septal members, so characteristic of the lowest neozoic strata, descended from those *Rugosa* which have an indefinite arrangement of the septa. The relation between the Australian tertiary and recent faunas, and those of the later palæozoic and early neozoic in Europe, is noticed, and also the long-continued biological alliances between the coral faunas of the two sides of the Atlantic Ocean.

"Remarks on the Determination of a Ship's Place at Sea." In a Letter to Prof. Stokes, by G. B. Airy, LL.D., Astronomer Royal.

May 11.—"An Experimental Inquiry into the Constitution of Blood, and the Nutrition of Muscular Tissue," by William Marcet, M.D., F.R.S. The results obtained from the inquiry which forms the subject of the paper are as follows:—

First. That blood is strictly a colloid fluid.

Second. That although blood be strictly a colloid, it contains invariably a small proportion of diffusible constituents amounting to nearly 7·3 grms. in 1,000 of blood, and 9·25 grms. in an equal volume of serum, these proportions diffusing out of blood in twenty-four hours.

Third. That the proportion of chlorine contained in blood has a remarkable degree of fixity, and may be considered as amounting to three parts (the correct mean being 3·06) in 1,000.

Fourth. That blood contains phosphoric anhydride and iron in a perfect colloid state, or quite undiffusible when submitted to dialysis, the relative proportions appearing to vary from 78·61 per cent. of peroxide of iron and 29·39 of phosphoric anhydride, to 76·2 and 23·8 respectively, the proportion of phosphoric anhydride having a tendency to be rather higher.

Fifth. That blood contains more phosphoric anhydride and potash, bulk for bulk, than serum.

Sixth. That a mixture of colloid phosphoric anhydride and potash can be prepared artificially by dialysis, and that the colloid mass thus obtained appears to retain the characters of the neutral tribasic phosphate from which it originates; it exhibits an alkaline reaction, yields a yellow precipitate with nitrate of silver, and after complete precipitation the reaction is acid.

Seventh. That by dialysing certain proportions of phosphate of sodium and chloride of potassium during a certain time, proportions of phosphoric anhydride, potash, chlorine, and soda are obtained in the colloid fluid very similar to the proportions these same substances bear to each other in serum after twenty-four hours dialysis.

Eighth. That muscular tissue is formed of three different classes of substances; the first including those substances which constitute the tissue proper, or the portion of flesh insoluble in the preparation of the aqueous extract, and consisting of albumen and phosphoric anhydride with varying proportions of potash and magnesia; the second class including the same substances as are found in the tissue proper, and in the same proportions relatively to the albumen present in that class, but existing in solution and in the colloid state; the third class including the same substances as are found in the two others, and moreover a small quantity of chlorine and soda, which, although relatively minute, is never absent. The constituents of this class are crystalloid, and consequently diffusible, the phosphoric anhydride and potash being present precisely in the proportion required to form a neutral tribasic phosphate, or a pyrophosphate, as the formula $2KO\ PO_5$ can equally be $2KO\ HO\ PO_5$.

Ninth. That flesh contains in store a supply of nourishment equal to about one-third more than its requirement for immediate use, this being apparently a provision of nature to allow of muscular exercise during prolonged fasting.

Tenth. That the numbers representing the excess of phosphoric anhydride and potash in blood over the proportion of these substances in an equal volume of serum in the regular normal nutrition of herbivorous animals, appear to bear to each other nearly the same relation as that which exists between the phosphoric anhydride and potash on their way out of muscular tissue.

Eleventh. That vegetables used as food for man and animals, such as flour, potato, and rice, transform phosphoric anhydride and potash from the crystalloid or diffusible into the colloid, or undiffusible state; and it is only after having been thus prepared that these substances appear to be fit to become normal constituents of blood, and contribute to the nutrition of flesh.

A final remark, and one which is worth consideration, is the fact established by the whole of the present investigation, that there is a constant change, as rotation in nature from crystalloids to colloids, and from colloids to crystalloids.

"On Protoplasmic Life." By F. Crace-Calvert, F.R.S.

A year since the publication of Dr. Tyndall's interesting paper on the abundance of germ life in the atmosphere, and the difficulty of destroying this life, as well as others paper published by eminent men of science, suggested the inquiry if the germs existing or produced in a liquid in a state of fermentation or of putrefaction could be conveyed to a liquid susceptible of entering into these states; and although at the present time the results of this inquiry are not sufficiently complete for publication, still I have observed some facts arising out of the subject of protoplasmic life which I wish now to lay before the Royal Society.

As a pure fluid free from life, and having no chemical reaction, was essential to carrying out the investigation, I directed my attention to the preparation of pure distilled water. Having always found life in distilled water prepared by the ordinary methods by keeping it a few days, after many trials I employed an apparatus which gave satisfactory results, and enabled me to obtain water which remained free from life for several months.

The water had to be redistilled three or four times before it was obtained free from germs, and it was then kept in the apparatus in which it was distilled until wanted, to prevent any contact with air.

Some water which had been distilled on the 20th of November, 1870, being still free from life on the 7th of December, was introduced by a siphon into twelve small tubes and then left exposed to the atmosphere for fifteen hours, when they were closed. Every eight days some of the tubes were opened, and their contents examined. On the fifteenth, therefore, the first examination was made; when no life was observed; on the 23rd two or three other tubes were examined, and again no life was detected; whilst in the series opened on the 2nd of January, 1871, that is to say, twenty-four days from the time the tubes were closed, two or three *black vibrios* were found in each field. Being impressed with the idea that this slow and limited development of protoplasmic life might be attributed to the small amount of life existing in the atmosphere at this period of the year,* a second series of experiments was commenced on the 4th of January. The distilled water in the flask being still free from life, a certain quantity of it was put into twelve small tubes, which were placed near putrid meat at a temperature of 21° to 26° C. for two hours, and then sealed. On the 10th of the same month the contents of some of the tubes were examined, when two or three small *black vibrios*

* During the intense cold of December and January last, I found it took an exposure to the atmosphere of two days at a temperature of 12° C. before life appeared in solution of white of egg in the pure distilled water, whilst as the weather got warmer the time required became less.

were observed under each field. This result shows that the fluid having been placed near a source of protoplasmic life, germs had become impregnated in two hours in sufficient quantity for life to become visible in six days instead of twenty-four. Other tubes of this series were opened on the 17th of January, when a slight increase of life was noticed; but no further development appeared to take place after this date, as some examined on the 10th of March did not contain more life than those of the 17th of January.

This very limited amount of life naturally suggested the idea that it might be due to the employment of perfectly pure water, so that Mr. Calvert commenced a third series of experiments.

On the 9th of February 100 fluid grains of albumen from a new-laid egg were introduced as quickly as possible and with the greatest care, into ten ounces of pure distilled water contained in the flask in which it had been condensed, and an atmosphere of hydrogen kept over it. On the 16th some of the fluid was taken out by means of a siphon and examined, and no life being present, twelve tubes were filled with the fluid exposed to the air for eight hours and closed. On the 21st the contents of some of the tubes were examined, when a few vibrios and microzyma were distinctly seen in each field. On the 27th other tubes were examined, and showed a marked increase in the amount of life. In this series, in which a *fermentable substance* was employed, life appeared in five days, and an increase in ten, instead of requiring twenty-four days, as was the case when pure water only was employed.

As the weather had become much warmer, and a marked increase of life in the atmosphere had taken place, some of the same albumen solution as had been employed in the above experiments was left exposed in similar tubes to its influence, when a large quantity of life was rapidly developed, and continued to increase. This result appears to show that the increase of life is not due to reproduction merely, but to the introduction of fresh germs; for, excepting this fresh supply, there appears to be no reason why life should increase more rapidly in the open than in the closed tubes.

"Action of Heat on Protoplasmic Life," by F. Crace Calvert, F.R.S.

Those investigators of germ-life who favour the theory of spontaneous generation, have assumed that a temperature of 212° Fahr., or the boiling-point of the fluid which they experimented upon, was sufficient to destroy all protoplasmic life, and that the life they subsequently observed in these fluids was developed from non-living matter.

I therefore made several series of experiments, in the hope that they might throw some light on the subject.

To carry out the experiments I prepared a series of small tubes made of very thick and well-annealed glass, each tube about four centimetres in length, and having a bore of five millimetres. The fluid to be operated upon was introduced into them, and left exposed to the atmosphere for sufficient length of time for germ-life to be largely developed. Each tube was then hermetically sealed and wrapped in wire gauze, to prevent any accident to the operator in case of the bursting of any of the tubes. They were then placed in an oil-bath, and gradually heated to the required temperature, at which they were maintained for half an hour.

Sugar Solution.—A solution of sugar was prepared by dissolving one part of sugar in ten parts of water. This solution was made with common water, and exposed all night to the atmosphere, so that life might impregnate it. The fluid was prepared on the 1st of November, 1870, introduced into tubes on the 2nd, and allowed to remain five days. On the 7th of November twelve tubes were kept without being heated, twelve were heated to 200° Fahr., twelve to 300°, and twelve to 400° Fahr.

The contents of the tubes were microscopically examined on the 1st of December, twenty-four days after heating.

In the sugar solution which was not heated there were about thirty animalcules under each field of the microscope, principally *small black vibrios*; two or three microzymes swimming slowly about; three or four *ordinary swimming vibrios*, and a few bacteria. In that which was heated for half an hour at 212 F., a great portion of the life had disappeared, and no animalcules were swimming. Four or five *small black vibrios* were observed moving energetically to and fro; two or three *ordinary vibrios* were also observed moving energetically *in the same position of the field, that is, without swimming about.* Heated for half an hour at 300° F. the sugar was slightly charred, but one or two *ordinary vibrios*, and one or two *small black vibrios* were observed in motion under the field of the microscope. In the solutions heated to the higher temperatures there was no trace of organisms.

Remarks.—The black vibrios here referred to are far more opaque than the other varieties of vibrios, and are the most important of all, as I have found them to resist not only very high temperatures, but all chemical solutions. I shall, in my paper on putrefaction and the action of antiseptics, describe the various vibrios, and give various drawings of them.

Hay Infusion.—An infusion of hay was made by macerating it in common water for one hour, then filtering the liquor, and leaving it exposed to the atmosphere all night, when it was sealed in the small tubes, twelve of which were used for each experiment. The infusion was made on the 4th of November, sealed in tubes on the 5th, and heated on the 7th.

The results were examined on the 1st of December, 1871, twenty-four days after being heated.

The hay infusion not heated contained "fungus matter" and other low organisms. The tubes, which were heated to 212° F. and 300° F., contained a few small "black vibrios," [but whether they were living or dead is not stated]. The tubes exposed to higher temperatures showed no trace of organisms.

Gelatine Solution.—A solution of gelatine, prepared of such strength that it remained liquid on cooling, was exposed for twenty-four hours to the atmosphere. It was then introduced into the small tubes, and the tubes sealed. The solution was made on the 4th of November, the tubes sealed on the 5th, and subjected to the different temperatures on the 7th.

The fluids were examined on the 1st of December, 1871, twenty-four days after being heated.

In the gelatine solution which was not heated, there were seven or eight animalcules under each field, five or six of which were quite different from anything observed in the other fluids. They had long thin bodies, swimming with a peristaltic motion. One or two ordinary swimming vibrios were also present; but the small black vibrios were absent. In the gelatine solution heated for half an hour at 100° F., the organisms ceased to exhibit any active movements; and in that which was heated for half an hour at 212° F., a very decided diminution in the quantity of life present was noticed In the solutions heated to the higher temperatures no life was found.

Putrid Meat Fluid.—Water was placed in an open vessel, and a piece of meat suspended in it until it became putrid and contaminated with myriads of animalcules. This fluid was placed in the usual tubes, which were sealed on the 7th November, and heated on the same day.

The contents of the tubes were subjected to examination on the 1st of December, or twenty-four days after having been heated.

In the solution which was not heated, a large quantity of life was present, namely, microzyma and several distinct species of vibrios, among which were a number of the small black ones frequently mentioned. In that which was heated for half an hour at 100° F., this temperature had but slightly affected the life present, the animalcules being as numerous as in the liquid not heated, and not moving as usual. In that which was heated for half an hour at 212° F., although heat had *deprived the animalcules of the power of locomotion*, still they retained a sufficient amount of vital force to "place it beyond a doubt that life was not destroyed." In that which was heated for half an hour at 300° F. a large quantity of the life in the fluid was destroyed, but some vibrios still remained, the small black ones being the most numerous. In the solutions exposed to the higher temperatures there was no trace of organisms.

Although perfectly aware of the interesting researches of Prof. Melsens, proving that the most intense cold does not destroy the active power of vaccine lymph, still I thought it desirable to ascertain the effect of a temperature of 15° F. on well-developed germ-life, similar to that which had been subjected to the action of heat.

Some putrid-meat liquor, therefore, containing a large quantity of microzyma and vibrios, was subjected for twenty hours to the influence of a temperature ranging between the freezing-point of water and 17° below that point, when the ice was melted, and the liquor examined. The animalcules retained their vitality, but appeared very languid, and their power of locomotion was greatly decreased. Two hours after melting the ice the liquor was again examined, when the animalcules appeared to be as energetic as before.

In the discussion which followed the reading of Dr. Calvert's papers Dr. Charlton Bastian remarked upon the number of assumptions which were introduced, and gave reasons for his opinion that the experiments were wholly inconclusive in their nature. He was not aware that Prof. Tyndall had ever revealed an "abundance of germ life" in the air, whilst M. Pasteur had distinctly stated that he had been unable to recognise Bacteria or their germs in the dust filtered from the atmosphere. Even if Bacteria were widely diffused in the air, it would still have to be shown that they were alive. From the fact that some eminently inoculable fluids might be pretty freely exposed to the air for two or three weeks without showing the least signs of turbidity—though they could always be rendered turbid in two or three days after bringing them into contact with actual living Bacteria—he thought there was reason to believe that *living* Bacteria were by no means abundant in the air. And as he had found that all other naked lower forms of life with which he had experimented were unable to survive the effects of even short periods of desiccation, he thought there was much reason for the belief that the same rule would hold good for Bacteria. Dr. Bastian failed to find in Dr. Calvert's papers sufficient evidence that the organisms found in some of the solutions were really alive, and with regard to those experiments in which fermentable substances had been employed, it was assuming the very point at issue to suppose that the more numerous organisms which were present in them could only have come from the atmosphere. With regard to the influence of heat upon the life of Bacteria and many other organisms, Dr. Bastian gave some particulars concerning experiments, which tended to show, as he thought, conclusively, that they were all killed by an exposure in fluids, for ten minutes, to a heat of 60° C. (140° F.) There was no difficulty in ascertaining when Amœbæ or Ciliated Infusoria were killed, though with respect to Bacteria there was much more difficulty. Where the movements were not of an active character, after the Bacteria had been subjected to different degrees of heat, no reliable opinion as to their life or death could be arrived at. Bacteria which were really living might in many cases exhibit movements differing in no respect from those which dead Bacteria would display. From the exhibition of such movements, therefore, it could not be positively affirmed that the organisms were living, or that they were dead. The case was different, however, with regard to reproduction—dead organisms could not multiply. Having found a fluid, therefore, which was most suitable for the nourishment of Bacteria, but which seemed to be wholly incapable of giving origin to them *de novo*, he inoculated portions of it with living Bacteria, and then found that those fluids which had been heated to 50° C. or 55° C. for ten minutes became quite turbid in two or three days, whilst others, heated for the same time to 60°, 65°, 70°, 75° C. and upwards, invariably remained clear and showed no signs of turbidity. As living Bacteria will always multiply under suitable conditions in suitable fluids, their failure to multiply was the best evidence that they had been killed. The conclusion that Bacteria were killed by exposure in fluids to a heat of 60° C. was one which had been previously arrived at by Prof. Wyman and M. Pouchet, though such a conclusion was now much strengthened by Dr. Bastian's recent experiments. These results were harmonious also with the fact that Amœbæ, Ciliated Infusoria, and almost all the other lower organisms with which experiments had been made, were also killed by even a shorter exposure to a temperature of 60° C. (140° F.)

Geologists' Association, May 5.—Rev. T. Wiltshire, president, in the chair.—"On the Fauna of the Carboniferous Epoch," by Henry Woodward. In this paper the author protested against that mode of thought which seemed to imply that the globe was, during the various geologic periods, a vast aquarium, and urged the similarity of the conditions which now prevail with those that were obtained during the deposition of the various systems of the stratified rocks. Mr. Woodward combated the opinion of many, that during the Carboniferous period the atmosphere was heavily charged with carbonic acid gas, which, while it supplied the profuse vegetation of that epoch with carbon, prevented the radiation of heat from the earth, and thus produced an abnormal warmth which, with abundant moisture, was the cause of the vast growths that formed the beds of coal we now use for fuel. It was contended that the atmosphere under normal conditions was quite sufficient to supply all the carbonic acid that was required for the vegetation which composed all the beds in the world, and that, as we find the Gulf Stream exerting a great influence on the climate of England at the present time, so unusual warmth and humidity and great alterations of the isothermal lines of the globe, might have been produced by ocean currents consequent upon changes of coast-lines and other causes of which we can know little. The animal life of the epoch was then described, and some valuable lists of species were appended to the paper. The Rev. Mr. Henslow, referring to Mr. Woodward's remarks respecting the discovery by Prof. Morris of the "Mother coal" of Bradford being made up of spores and spore cases, stated that Prof. Huxley had concluded that coal generally was formed in this manner. Prof. Morris heartily approved of Mr. Woodward's opinion in favour of the contemporaneity of formations usually considered to be of successive epochs, and pointed out the great differences in the thickness in the underlying beds, and in other stratigraphical conditions of the Carboniferous limestone, millstone grit, and coal measures, in various districts. In Shropshire, for instance, the Carboniferous beds repose upon Silurian rocks, and in Scotland the coal seams are intercalated with the main limestone. Mr. Woodward, after passing a high eulogium on Prof. Morris, whose knowledge of the subject was most varied and extensive, briefly described several species of crustacea of which diagrams were exhibited, and directed the attention of the Association to a cast of the head of an undescribed species of *Anthracosaurus* allied to *A. Russelli*, recently obtained by Mr. George Maw, from the coal measures of Coalbrook Dale.

Paris

Academy of Sciences, April 10.—M. Chasles read a very interesting paper on the properties belonging to a system of cones. Every one of these properties discovered by the law of analogy relates to a series of certain geometrical objects, compared with a series of other objects of the same nature. The demonstrations are not given except by the arrangement of the different propositions, which are sixty in number, and fill twelve closely printed pages of the *Comptes Rendus*.—Dr. Declat, who does not belong to the Academy, read a memoir on the effects of phenic acid. He attributes to this specific the power of curing the German cattle plague, or at least of preventing it. The experiments do not appear, however, very conclusive.—M. Aubert presented a memoir on the moral causes of the inferiority exhibited by French armies during the last campaigning. These causes are very numerous, and the principal of them is the making of the army an instrument for the protection of an internal despotism. The discussion of these subjects was considered as being out of the limits and province of the Academy. The memoir in former years would have been rejected under the old rules, but the president, M. Delaunay, referred it to a special committee, composed of General Morin, director of the Conservatoire des Arts, and M. Amiral Paris. The *Comptes Rendus* for this sitting publishes a list of periodicals which were offered to the French Academy in the month of March. As many as fifteen publications were special periodicals, which resumed their publication during the few weeks of the cessation of fighting round Paris. The celebrated Abbé Moigno has lost no time in starting his *Les Mondes*, as the whole set for March was presented to the Academy. The foreign list was very short and incomplete, as NATURE, which had been presented, was omitted. The only English paper mentioned was the *Monthly Notices of the Royal Astronomical Society*.—M. Barral, the editor of two agricultural papers which are mentioned in the aforesaid list—*Bulletin hebdomadaire du Journal d'Agriculture* and *Journal de l'Agriculture*—having taken steps opposed to Communist rule, was obliged to leave Paris. His papers are now published at Versailles. M. Wolf, an Austrian subject, was present at the sitting. He is conducting observations at the National Observatory, where the instruments were not packed as on the occasion of the former shelling and investment. They run the risk of being smashed to pieces.

April 17.—M. Payen read an important paper on Cellulose. It is known that stony fruits or stony parts of fleshy fruits, like cherries and peaches, are composed of cellulose, impregnated with incrusting materials. The digestion of this cellulose is rendered more easy and complete by giving to the animals some fatty matters. The same may be said of stems of vegetables and straw. The application of this theory to the breeding of cattle is obvious. M. Payen exhibited some reactions, which show theoretically that the results obtained in Germany by the analysis of evacuations are truthful and genuine. The paper elicited some observations from M. Chevreul, who read afterwards on his own account a short report on a small pamphlet written by him during the investment of Paris. The title of this *brochure* is somewhat long, and explains clearly the meaning of the work: "On a fault of reasoning which is committed very often by people engaged in natural philosophy when reasoning on the concrete. The explanations are drawn from the last writings of M. Chevreul." These writings are mostly communications presented by M. Chevreul to the Academy for the last three years, when he was strenuously advocating a new classification of sciences as well as of the different objects of nature.—M. Trécul read some interesting observations on the Vegetation of Ferns. —M. Sant Venant, a member of the Section of Mechanics, presented a paper written by M. Boussinerg, a promising young French mathematician, who does not belong to the Academy. The paper related to the observations of an immense number of transcendental equations which present themselves to the mathematical inquirer when studying physical phenomena.

April 24.—The account of this sitting was published in the last number of NATURE. We have nothing of importance to add to it. All the *Comptes Rendus* of the period are signed by M. Elie de Beaumont, acting as perpetual secretary. M. Elie de Beaumont was formerly a senator, although it can hardly be said he has ever meddled with politics. M. Delaunay, the present director of the National Observatory, has inaugurated the regular publishing of a monthly abstract of meteorological observation. It is a practice which is revived from Arago's, but was stopped by M. Leverrier when he stepped into office in 1854.

BERLIN

Royal Prussian Academy of Sciences, March 6.—M. Roth read the continuation of his historical remarks upon the theory of metamorphism, and the production of crystalline slates. —Prof. A. W. Hofmann read papers on phosphuretted hydrogen, and on the direct substitution of the alcoholic radicals for the hydrogen in that compound.

March 9.—M. Riess read a paper on the action of the subsidiary currents of the electrical battery upon the main current and upon each other.

March 30.—Prof. Hofmann described an eudiometer with movable wires. The apparatus consists of a glass tube, with two short narrow tubes attached to it at right-angles, and opening into it opposite to each other; these are closed by steel caps, through which steel screws pass, bearing the platinum wires. The screws are furnished with loops for the attachment of wires. —Prof. Hofmann also read a memoir on isodicyanic æthers, compounds which occupy a middle place between the cyanic and cyanuric æthers; and another on biuret and allied compounds. —Prof. Dove read a paper on the behaviour of agate in the magnetic field.

VIENNA

I. R. Geological Institution, April 18.—Prof. Peters, of Gratz, sent a communication about a newly discovered mineral spring at Hengsberg, near Gratz. Besides a large quantity of free carbonic acid and carbonate of lime, the water contains chlorine, bromine, traces of iodine, boracic acid, and among the alcalies a considerable quantity of lithium.—M. J. Pauer related a remarkable phenomenon which has occurred during recent years in the large lake of Neusiedel, near Oldenburg, in Hungary. This lake, which measured nearly six German (about 150 English) square miles, was entirely dried up in the year 1865, and the ground was gradually converted into arable land. During the last winter, however, the water regained its territory, and to the great damage of the cultivators the basin is again filled up nearly to the same extent which it occupied formerly. Documents were found which prove that similar events took place in former centuries, and on one spot were discovered trunks of trees rooting in the ground as much as three feet in diameter. They prove that at a former period the lake was dry through a long series of years.—M. E. v. Mojrisovics presented a memoir on the so-called alveolaric Orthoceratites from the Triassic and Liassic deposits of the Alps. He proved that they all are the phragmocones of a particular genus of the family of the Belemnitidæ, and that their isolated rostra are the forms which Gümbel called Attractites. The genus was described many years ago by Fr. v. Hauer and named Aulacoceras, but he had united it with the family of the Orthoceratidæ. To Aulacoceras belong all formerly so-called Orthoceratites with a marginal sipho, from the mesozoic formations of the Alps, and only the species with a central sipho are real Orthoceratites.

BOOKS RECEIVED

ENGLISH.—Discourses on Practical Physic: Dr. B. W. Richardson (Churchill).—The Coming Race (Blackwood and Sons).

FOREIGN.—(Through Williams and Norgate)—Vorwort zu der Physik der Erde: Dr. R. Reuschle.—Grundzüge der technischen Natur-lehre: Dr. Ph. Huber.—Lehrbuch der Physik und Mechanik: Dr. L. Blum.—Lehrbuch der Physik: Dr. W. Eisenlohr.—Anatomie und systematische Beschreibung der Alcyonarien: Dr. A. Kölliker.

DIARY

THURSDAY, MAY 18.

SOCIETY OF ANTIQUARIES, at 8.30.—Exhibition of Stone Implements (Palæolithic), with Papers by A. W. Franks, V.P., and J. Evans, F.R.S.
CHEMICAL SOCIETY, at 8.—On a New Double Salt of Thallium: R. J. Friswell.—On a New Benzolic Derivative: Dr. Armstrong.
ROYAL INSTITUTION, at 3.—On Sound: Prof. Tyndall, F.R.S.

FRIDAY, MAY 19.

ROYAL INSTITUTION, at 9.—On Bishop Berkeley and the Metaphysics of Sensation: Prof. Huxley, F.R.S.
ROYAL UNITED SERVICE INSTITUTION, at 3.—The Winds of the North Atlantic: Captain H. Toynbee, F.R.A.S.

SATURDAY, MAY 20.

ROYAL SCHOOL OF MINES, at 8.—Geology: Dr. Cobbold.
ROYAL INSTITUTION, at 3.—On the Instruments Used in Modern Astronomy: J. N. Lockyer, F.R.S.

MONDAY, MAY 22.

ROYAL GEOGRAPHICAL SOCIETY, at 1.—Anniversary Meeting.

TUESDAY, MAY 23.

ROYAL INSTITUTION, at 3.—On the Principle of Least Action in Nature: Rev. Prof. Haughton.

WEDNESDAY, MAY 24.

GEOLOGICAL SOCIETY, at 8.—Geological Observations on British Guiana: J. G. Lawkins, F.G.S.—On the Principal Features of the Stratigraphical Distribution of the British Fossil Lamellibranchiata: J. Logan Lobley, F.G.S.
LINNEAN SOCIETY, at 3.—Anniversary Meeting.

THURSDAY, MAY 25.

ROYAL SOCIETY, at 8.30.
SOCIETY OF ANTIQUARIES, at 8.30.
ROYAL INSTITUTION, at 3.—On Sound: Prof. Tyndall, F.R.S.

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