proportion of the papers are by members of the Society, as are also several of the illustrations. The papers are on very varied subjects and all up to a creditable standard. The preface complains that so few members take an active part in the Society's proceedings, but, in this respect, the Society is no worse than others of much greater pretension. Still it would be to the advantage of the youthful members if the patrons and office-bearers made every effort to increase the number of actual workers. We regret that our space prevents us making special reference to any of the papers. The Botanical Section has issued a list of local plants, by H. W. Trott, the result of many years' observation; this last, we daresay, may be obtained by any one desiring it. The price is only 9*d.*

LONDON SCHOOL-BOARD DISTRICTS.—Mr. Stanford is preparing for the School-Board of London a series of maps of the various School-Board districts of the metropolis, which are likely to possess considerable interest. These maps are on the scale of six inches to a mile, show the various School-Board subdivisions, the positions of the schools which have been erected by the Board, and, in a different colour, of those which are under the Board's inspection. We have seen the sheet of the Hackney district, and no better evidence could be produced of the thoroughly good work done by the Board since its institution.

## SCIENTIFIC SERIALS

*Memorie della Società degli Spettroscopisti Italiani*, January.—Note from Prof. Draper on photographing the spectra of Venus and α Lyræ; a 28-inch reflector and a 12-inch refractor are the instruments used, and an exposure of from ten to twenty minutes. In the photograph of the spectrum of α Lyræ bands or broad lines appear in the ultra-violet region totally different to anything in the solar spectrum.

February.—Letter on the comet Borelly, 1877, Brorsen-Bruhns, 1857, and the eclipse of the moon of February 27, 1877. The spectra of the first appears, according to him, to consist of some carbon compound.—Tables of statistics of protuberances and spots observed at Rome in the months of January and February, 1877.—List of positions on the solar limb in which the vapour of magnesium was observed from February 20, 1876, to July 4 of the same year.—In the appendix to this number appears an article explaining the construction of the several different forms of aneroid barometers.

March.—List of positions on the solar limb in which the vapour of magnesium was observed from July to November, 1876, by Prof. Tacchini, and a table for the year showing the frequency of visibility of the *b*-line and 1,474-line, from which it appears that the latter line is more frequently visible than the former. Table of positions and size of protuberances observed at Rome in 1876, by Father Secchi.—Some observations of the zodiacal light, by Prof. A. Serpieri.—Note by Prof. Tacchini on Mr. Le Verrier's researches on the intra-Mercurial planet.—Drawings of chromosphere for September and October, 1875, made at Rome and Palermo.

April.—Spots and facula observed spectroscopically and directly at Palermo in 1876. This paper consists of the daily notes of observations of the chromosphere for last year.—Table of spots and faculæ observed in February and March, 1877, by Prof. Tacchini.—Drawings of the chromosphere for October, November, and December, 1875, by Secchi, Ferrari, and Tacchini, observed at Rome and Palermo.

*Journal de Physique*, April.—On the cause of the motion in the radiometer, by M. Gaffie.—On the capillary theory of Gauss and its extension to the capillary properties of liquid lines, by M. Lippmann.—New electric lamp, by M. Jabloschkoff.—On the quadrant electrometer of Sir W. Thomson, by M. Benoit.—Complement to the theory of the microscope and the dark chamber, by M. Neyreneuf.—Experiments of static electricity, by M. Grisson.

May. — On the observation of the infra-red part of the solar spectrum by means of the effects of phosphorescence, by M. Edm. Becquerel.—Determination of the polar distance in magnets, by M. Benoit.—Electric variation produced by contraction of the heart in the living man, by M. De la Roche.—On a new industrial application of heat, called the thermodynamic motor, by M. Ferd. Tommasi.—On the absorbent power of moist air, by M. Hoorweg.—On refrigerating mixtures of snow and sulphuric acid, by M. Pfaundler.

*Morphologisches Jahrbuch*, vol. iii. Part 1.—Oscar Hertwig, contributions on the formation, fertilisation, and cleavage of the animal ovum, part second (*Hæmopis, Nephelis, Rana temporaria*, and *R. esculenta*), 86 pages, 5 plates.—A. Rauber, the fixation of long bones in joints, and the form of the bones.—W. Moldenhauer, the development of the middle and outer ear, 56 pages, 4 plates.

*Reale Istituto Lombardo di Scienze e Lettere, Rendiconti*, vol. x. Fasc. vii.—Two new mycetes parasitic on vines, by M. Cattaneo.—On a cause little estimated in the pathogenesis of some female diseases, by M. de Giovanni.—The molecular velocity of gas and the corresponding velocity of sound, by M. Brusotti.

## SOCIETIES AND ACADEMIES

### LONDON

**Chemical Society**, June 7.—Dr. Gladstone in the chair.—The following papers were read:—On the gases inclosed in lignite coal and mineral resin from Bovey Heathfield, by J. W. Thomas. Four samples were examined, two of which contained much hydrated oxide of iron in the cleavages. The gases consisted chiefly of carbonic acid, carbonic oxide, nitrogen, and sulphuretted hydrogen. In one case sulphur sublimed off in yellow crystals; organo-sulphur compounds, mercaptan, sulphide of allyl, &c., were also present in the gases. The lignites resemble cannel coal more than any other of the true coals as regards the occluded gases, but are far less stable, decomposing, *in vacuo*, below 200° C., whilst the true coals resist a temperature of 300° C. It seems probable that the iron pyrites of true coal have derived their sulphur from that existing in organic combination in the plants from which coal is produced.—On apparatus for gas analysis, by Dr. Frankland. The author proposes to substitute for the india-rubber cork, which has several disadvantages, at the bottom of the water-cylinder, a cast-iron base through which the two glass tubes pass, and are firmly clamped by a wooden clamp; the latter is screwed to the cast-iron base. The most important improvement is, however, the removal of the steel clamps which connect the laboratory and measuring tubes. These are replaced by a glass cup at the top of the measuring tube into which fits the drawn-out end of the laboratory tube, covered with thin sheet-india-rubber; this flexible joint, when wetted and covered with mercury, is quite air-tight.—On narcotine, cotarnine, and hydrocotarnine, Part V., by Dr. Wright. The preparation of bromhydrocotarnine hydrobromide, bromocotarnine hydrobromide, and tribromhydrocotarnine hydrobromide is described; the second of these bodies, when heated to 200° splits into a new base, tarconine, and a large amount of an indigo-blue substance; the latter body is very insoluble, but dissolves in strong sulphuric acid, forming a magnificent intense purplish solution. Bromocotarnin crystallises in fine scarlet crystals. Noropianic acid and other substances were also prepared and their properties examined.—On otto of limes, by C. H. Piesse and Dr. Wright. A terpene-like body boiling at 176° C. was obtained which yielded but little cymene. The residue in the retort, after standing two to three months, formed a quantity of crystals. These crystals were investigated and their composition determined.—On primary normal heptyl alcohol and some of its derivatives, by C. F. Cross. Pure œnanthol was prepared with a specific gravity of 0·823 at 16° C. Pure heptyl alcohol is colourless, has an agreeable odour, sp. gr. at 0° 0·833, boils at 175°. Heptyl chloride, bromide, iodide, acetate, and œnanthylate were prepared and examined; their boiling-points closely agree with those calculated by Schorlemmer.—On the transformation of aurin into rosanilin, by Messrs. Dale and Schorlemmer. The authors find the spectra of the hydrochlorides of their new base, and rosaniline quite identical; they have also prepared from their base Hofmann's violet, aniline blue, and aniline green.

**Geological Society**, May 23.—Prof. P. Martin Duncan, F.R.S., president, in the chair.—Richard George Coke, Robert Slater, and William Swanston were elected fellows of the Society.—The president read a letter from Mr. C. J. Lambert, announcing that he had allotted the sum of 500*l.* to the Geological Society out of the 25,000*l.* left by his father for distribution. The president further announced that the sum of 500*l.* had already been paid to the Society, and would be invested for its benefit.—The following communications were read;—Remarks on the coal-bearing deposits near Erekli, the ancient Heraclea, Pontus Bithynia, by Rear-Admiral T. A. B. Spratt, C.B., F.R.S.

—On the structure and affinities of the genus *Siphonia*, by W. J. Sollas, F.G.S. This paper contained, first, a full account of the history of the genus *Siphonia*, including a complete list of its described species, and, next, a description of its general and minute structure. Its skeletal network was shown to consist of spicular elements belonging to the Lithistid type of sponges, and most closely allied in generic details to the recent form *Discodermia polydiscus*. Not only in this character but in every other, *Siphonia* was shown to approach *Discodermia* so closely as to be almost identical with it. The mineral replacements which have affected the siliceous skeleton of *Siphonia* were then considered. The paper concluded with a systematic description of the genus.—On the serpentine and associated rocks of the Lizard district, by Rev. T. G. Bonney, F.G.S., fellow and late tutor of St. John's College, Cambridge. The author stated that considerable doubt appeared still to exist as to the true relations of the lizard serpentine and the associated hornblende schists, and as to the origin of the serpentine. He had carefully examined all the junctions accessible on the Cornish coast (inland they are generally obscured). Some of them are concealed by *débris*, &c., but the majority prove beyond doubt that the serpentine is intrusive. Further, almost everywhere large fragments of hornblende schist are caught up and included in the serpentine. Besides the serpentine there is a large mass of gabbro at Crousa Down, and many dykes and veins along the east coast almost to the extremity of the serpentine region. At Coverack Cove, near the above mass, are gabbros of two ages, the older much resembling a kind of troktolite. On microscopic examination it proves to be chiefly plagioclase felspar, augitic minerals (including diallage), and olivine partially converted into serpentine. There is a red and a green variety. The newer, a coarser variety, appears to be of the same age as the other veins on the coast, and connected with the main mass. Some remarkable changes have taken place in this also. In certain places it exhibits a separation of its mineral constituents, causing it to resemble a foliated rock. This is proved to be due to pressure at right angles to the structure. The minerals also are often changed. The felspar is replaced by a white granular mineral resembling saussurite; the diallage (which occurs sometimes in very large crystals) is often partially, or even wholly, converted into rather minute crystalline hornblende. In these specimens there is no olivine to be distinguished. The great mass, however, is rich in olivine, yet a weathered specimen from it, resembling in aspect the gabbro of the veins, does not show olivine. Hence the author believes that in certain cases the olivine, instead of being converted into serpentine, aids in forming the hornblende. Further, there are dykes and veins over the same area of a dark trap. Some of these are augitic, others hornblendic. The author believes that at any rate in certain of these the hornblende is of secondary formation. On the west coast are veins of granite; those on the east coast, said to be granite, prove, on careful examination, to be altered rock, remarkably like granite veins, but not really such. In discussing the origin of the serpentine the author called attention to a structure commonly seen, which appeared to be a true "fluidal structure." He then described the result of microscopic examination of many specimens of the lizard and some other serpentines. Commencing with slightly altered lherzolite (from the Ariége), he traced the change through the older gabbro of Coverack to the serpentine rock of that place, which contains a large quantity of unaltered olivine; and so to other serpentines in which the olivine is quite replaced by the mineral serpentine. He described also the mode of the change. The other minerals found in the serpentine rock are enstatite, varieties of augite, and occasionally a fair quantity of picotite, with, of course, oxides of iron. Hence he concluded that, as had been already shown as regards some other serpentines, that of the lizard was the result of the hydrous alteration of an olivine rock, such as lherzolite.—On certain ancient devitrified pitchstones and perlites from the Lower Silurian district of Shropshire, by S. Allport, F.G.S.

**Physical Society**, June 9.—Prof. G. C. Foster, president, in the chair.—The following candidates were elected members of the Society:—Mr. W. H. Northcott and Mr. L. J. Whalley.—Mr. S. P. Thompson read a paper on interference fringes within the Nicol prism. After referring to the original paper by the inventor in 1828, in which this phenomenon was referred to, he gave a general description of it prior to explaining the cause. If the "field" of a Nicol be explored by the eye it will be seen to be bordered on one side by a margin of violet-blue light, and on the other, when the light passes obliquely through the prism, by an orange band within which lie a series of coloured fringes; these latter are very clearly seen with monochromatic light, when a second set, within the blue band, also appears. The author showed that these two sets are due to interference taking place within the film of balsam at the critical angle of total reflexion for ordinary and extraordinary rays respectively; they are therefore analogous to the interference bands in a thin film, placed beneath a prism of a more highly refracting substance and occurring just within the limit of total internal reflection, as first observed by Sir W. Herschel. At the conclusion of the scientific business of the Society, a special general meeting was held.

**Royal Microscopical Society**, June 6.—Dr. Robt. Braithwaite, vice-president, in the chair.—Six new fellows were elected, and M. L'Abbé Renard was elected an honorary fellow of the Society.—A paper by the Rev. J. Delsaulx on the thermodynamic origin of the Brownian motion was read by the secretary, and described the observations of the author with regard to the motion of fluid in rock cavities and molecular motion generally, with a view to establish the theory that it was due to the action of temperature. The observations had been suggested by the study of Crookes's radiometer.—A letter from Mr. H. C. Sorby on the subject was also read to the meeting, and Mr. Hartley described his experiments which led to the same conclusions. The meeting was then adjourned until October.

EDINBURGH

**Royal Society**, June 4.—Prof. Kelland in the chair.—Sir C. Wyville Thomson read a paper on the structure and relations of the genus Holypus.—Mr. Alexander Buchan, M.A., secretary to the Scottish Meteorological Society, communicated the second part of his investigations of the diurnal oscillations of the barometer. He stated that the summer months of the northern hemisphere as indicated by the barometer were May, June, and July, the winter months being November, December, and January, both corresponding with the sun's declination. He has now results of the daily barometric readings from upwards of 110 stations at different parts of the earth's surface. His investigations showed that a long-continued series of observations was absolutely necessary to show the peculiarities of the barometric curve. For instance, three years' observations gave in the case of Great Britain only the broadest characteristics. He found that no theory as yet propounded would explain the diurnal oscillations of the barometer, and that as more facts were obtained the difficulty of framing a satisfactory theory was greatly increased.—In his paper on the air dissolved in sea-water, Mr. J. Y. Buchanan stated that the result of the analysis he has as yet made of the specimens of the air dissolved in sea-water which were collected in the recent *Challenger* expedition, tends to show that as regards surface-water least air was dissolved where the temperature was highest, *e.g.*, near the equator, and most where the temperature was least, as in the polar sea. As regards the percentage of oxygen present at different depths it diminishes from the surface to a depth of 300 fathoms and increases from that point to lower depths. Prof. Tait communicated two laboratory notes; (1) Two plates either of the same or different metals were placed very close to one another but insulated and one of them raised in temperature: a difference of potential was produced, which was capable of producing a current measurable by a sensitive galvanometer. (2) He had seen in Dr. Blair's "Scientific Aphorisms" a hypothesis to account for gravitation very like that of Lesage's ultramundane corpuscles, which Blair stated was suggested to him by Newton's works, and Prof. Tait was anxious to ascertain if any part of it was due to Lesage or was entirely original. Prof. Tait laid on the table an algebraic identity which could be used to sum various series.

DUBLIN

**Royal Society**, May 21.—Prof. J. Emerson Reynolds, M.D., in the chair.—The following papers were read:—On some measurements of the polarisation of light coming from the moon and from the planet Venus, by Earl Rosse, F.R.S. Lord Rosse gave the results at which he had already arrived from a very large number of observations on the polarisation of light from particular parts of the moon's surface made in the years 1872, 1873, 1874, and 1875, and which are still in progress. The observations indicate that the polarisation of the light coming from the plains is greater than that of the light coming from the mountainous regions.—Notes on the crustacea of Ireland, by Mr. William Andrews. An account of the rarer

species found on the Irish coasts.—On the substitution of an alkaline base in chlorimetry, by Mr. J. Smyth, F.C.S. The author treats bleaching lime with an alkaline carbonate, and thus obtains the chlorine in a more convenient form for tetration.—On a specimen of quartz with a pearly lustre, by Mr. R. J. Moss, F.C.S. The faces of the pyramidal crystals, of which the specimens consist, possess a laminated structure, which causes a very perfect reflection of light. The laminæ consist of quartz exclusively. Mr. Moss concludes that this novel variety of quartz must be regarded as a modification of cup-quartz, the laminated structure being the result of periodic interruptions in the growth of the crystals.—An account of recent attempts to obtain water by deep wells under London, by Prof. Hull, F.R.S. The author referred principally to the scientific results of the recent boring at Messrs. Meux's brewery.—On a remarkable action of light on certain organo-metallic bodies, by Prof. J. Emerson Reynolds, M.D. The author described a number of experiments with mercuric ethide and its homologues, and showed that the pure ethide when sealed up in a tube and exposed to light for some months is wholly decomposed into mercury and nearly pure liquid hydrocarbon.—On the penetration of heat across Crookes's layer, by Mr. G. Johnstone Stoney, F.R.S. The author described the way in which heat is transferred across the vacuous spaces in Crookes's radiometers. He traced the laws under which this transfer of heat takes place, and showed that they are different from the already-known laws of radiation, convection, conduction, and contact. Mr. Stoney suggests that the newly-discovered mode of conveying heat should be called penetration. He showed that a large body of observations were made more than thirty years ago by De La Provostaye and De Sains upon heat conveyed in this way, but without its theory being understood. Unexplained observations made by Dulong and Petit, Grove, and other physicists also admitted of interpretation by the newly-discovered laws. Mr. Geo. M. Fitzgerald was the first to observe that the important results obtained by De La Provostaye and De Sains were due to this cause, and it was by him that they were brought under Mr. Stoney's notice.

PARIS

**Academy of Sciences**, June 4.—M. Peligot in the chair.—The following papers were read:—Preliminary reply to observations by M. Mouchez on the "Nouvelle Navigation," by M. Villarceau.—On the densities of vapour, by M. H. Sainte Claire Deville.—Researches on the law of Avogadro, by M. Wurtz.—On the atomic notation; reply to M. Berthelot by M. Wurtz.—Atoms and equivalents, reply to M. Wurtz, by M. Berthelot.—Reply to M. Fizeau, by M. Berthelot.—On the parallel striæ frequently presented by the surface of fragments of diamonds of the carbonado variety, and on their imitation by means of artificial friction, by M. Daubrée. These striæ seem to show that fragments, now sparsely scattered, must have been at one time, before they were thrust up to the surface, in contact with one another and exerting mutual pressure.—On the regeneration of the red blood corpuscles in frogs after considerable hæmorrhage, by M. Vulpian. The corpuscles result from evolution of small colourless spheroidal nucleated cells, which become discoid, then oval, and a little before they reach the size of red corpuscles, they produce hæmoglobin.—M. Gervais announced the receipt of a fresh batch of natural history specimens (chiefly birds and insects) from the Japanese Government. He remarked on some skeletons of Cetaceans.—On the true number of elementary co-variants of a system of two binary biquadratic forms, by Mr. Sylvester.—On the spectrum of Winnecke's comet, by P. Secchi. His experiments lead him to think it similar to that of other comets, and to have for base carbonic oxide.—On some metallic seleniurets and tellurets, by M. Margottet.—Study on oxides of iron, by M. Moissan. He believes the pyrophorus of magnum is formed in great part of pyrophoric protoxide of iron.—On the preparation and composition of emetine, by MM. Lefort and Wurtz. Emetine does not form basic salts, at least in the conditions in which it is ordinarily obtained.—Reproduction of albite, by M. Hautefeuille. Albite may be easily had by heating to a dark red a mixture of tungstic acid and a very alkaline silico-aluminate of soda.—Strontian; its diffusion in mineral and organic nature at the present epoch and in the series of geological times; consequences relative to saliferous mineral waters, by M. Dienlafait. *Inter alia*, of eight hundred springs coming under the designation of saliferous waters, there are only forty-four in which strontian has not been found.—On the affinity of blood corpuscles for carbonic acid, by MM. Mathieu and Urbain. A reply to M. Fredericq, who holds that the $CO_2$ is expanded in the plasma, not fixed by the globules. The authors cite figures to show that the globules of horse blood can fix about twice as much $CO_2$ as the serum. Some substances (as ether) increase the absorbing power for O and $CO_2$; others (as alum) diminish it.—Experimental studies on regeneration of cartilaginous and osseous tissues. by M. Peyrand.—Historical remarks on the theory of movement of one or several bodies, of constant or variable forms, in an incompressible fluid (continued), by M. Bjerknes.—Comparative study of experiments by day and by night made by MM. Perrier and Bassot, by M. Perrier. The mean errors of an isolated observation for the day and the night, are of the same order of magnitude. The errors arising from the atmosphere are compensated better in night than in day observations.—Siphon barometers whose indications are not influenced by variations of temperature, by M. Gautier.—Observations on a note of M. Yvon on nitrates of bismuth, by M. Ditte.—Combinations of quercite with butyric and acetic acids, by M. Prunier.—Investigation of salicylic acid in wines and urine, by M. Robinet.—Observations on M. Bert's experiments on anthracic disease, by M. Davaine.—Experiments showing that there is not in toxical putrefied blood, liquid or solid virus without organic ferments, by M. Feltz.—On various specimens of Brazilian clay and coal, by M. Guignet.—Female flowers of Cordaites, by M. Renault.—Result of geological explorations in 1875–76 in connection with the channel railway, by MM. Potier and De Lapparent.—Researches on the vitality of spermatozoids of trout, by M. Heneguy. They resist the action of alcohol and anæsthetics in such quantity as would kill *e.g.* infusoria.—Determinations of ammonia in the air and the meteoric water of Montsouris, by M. Levy.

GENEVA

**Physical and Natural History Society**, April 5.—Prof. Forel gave an account of his observations on the transparency of the waters of the Lake of Geneva. This transparency, much greater in winter than in summer, is modified very suddenly at the two periods of its annual variation. The changes of temperature are insufficient to account for the phenomenon. On filtering the water of the lake, M. Forel found in suspension fine particles almost exclusively organic, and proved that their proportion increases with the number of strata at different densities.—M. Théod. Turrettini described the discovery which he had made of a freezing mixture of chloride of magnesium and snow, which gave a temperature of – 34° C.—Prof. Wartmann announced a series of researches undertaken by him which enabled him to understand the extra-polar-derivation of currents traversing mercurial conductors.—M. Duby spoke of the capture of certain insects by the *Petunia* and the part played by the sticky glands in this respect.

ROME

**R. Accademia dei Lincei**, April 8.—Influence of nicotine on the animal organism, by M. Corso. The increase of blood pressure may be obtained without preserving intact the vasomotor centre. It is not due to reflex action. The first effect of nicotine on the pupil is dilatation.—The president (M. Sella) read a necrological notice on Prof. Panceri.—Considerations on specific heat, by M. Cerruti.—The Roman Tuscia and the Tolfa (continued), by M. Ponza.—A memoir by M. Bagnis was presented, containing illustrations of a first hundred cryptogams from the Agro Romano, studied by him.—M. Volpicelli replied to M. Cantoni's recent objections to the electrostatic doctrine of Melloni.

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