the late Prof. James C. Watson the sum of about fourteen thousand dollars had been placed in his hands. When the estate is finally closed a further sum will be paid over to the Academy. The income of the Watson fund is to be used under the direction of three trustees—Messrs. J. E. Hilgard, S. Newcomb, and J. H. C. Coffin—for the purpose of aiding astronomical researches. In accordance with the recommendation of the trustees the Academy granted five hundred dollars from this fund towards defraying the expenses involved in observations of the total solar eclipse of May 6, 1883.

Later in the meeting Prof. Simon Newcomb of Washington was elected Vice-President, and Prof. Asaph Hall of Washington Home Secretary. Five new members were elected: Prof. A. Graham Bell of Washington, Dr. J. S. Billings, U.S.A., of the U.S. Army Medical Museum, Washington; G. K. Gilbert of the U.S. Geological Survey; H. B. Hill and C. L. Jackson, Professors of Chemistry in Harvard College. The whole number of members is now ninety-five.

On the afternoon of Thursday the Academy adjourned to take part by invitation in the ceremonies attending the unveiling of the statue of Prof. Henry in the grounds of the Smithsonian Institution. The time for these ceremonies was purposely fixed to coincide with that of the spring meeting of the Academy. Henry was preeminently a scientific man, and at the time of his death President of the Academy; and yet the members of the Academy were placed far down the line in the procession—after the Commissioners of the District of Columbia, and after officers of the army and navy. This fact must be regarded as evidence of a lack of appreciation of the relations existing between Henry and the Academy and of the true worth and dignity of science.

The exercises, which were in good taste, began with a short address by Chief Justice Waite. After this, at a signal, the covering was quickly drawn aside, instantly revealing the entire statue. Loud applause followed, those who were seated rose to their feet, and all hats were removed. The scene was highly impressive; and when the Philharmonic Society, accompanied by the full marine band, burst forth with Haydn's grand chorus, "The heavens are telling," the heart must have been a hardened one which did not experience a feeling of exaltation.

In the opinion of all, the statue is dignified and pleasing, and vividly calls to mind the honoured original. President Porter's oration, which was the principal event of the afternoon, was listened to with much interest. It dealt with the plain facts of the life of Henry, and was all that his best friends could have desired.

Among the pleasantest social features of the meeting was a reception given to the members of the Academy on Thursday evening by Prof. A. Graham Bell. There were present many well-known gentlemen, among them General Sherman, Chief Justice Waite, Senator Sherman, ex-Secretary Blaine, and the Japanese, Swedish, and Belgian ambassadors.

SCIENTIFIC SERIALS

Zeitschrift für wissenschaftliche Zoologie, Bd. xxxviii. Heft 1, February 20, 1883, contains:—On the vascular system and the imbibition of water in the Najadæ and Mytilidæ, by Dr. Hermann Griesbach (Pl. 1).—Researches among the Protozoa, by Dr. A. Gruber (Plates 2 to 4); describes and figures several new genera and species.—On the origin of the saliva (*Futter saft*) and the salivary glands in the bee, together with an appendix on their olfactory organ, by Dr. P. Schiemenz (Plates 5 to 7).—On the development of the red blood corpuscles, by Dr. W. Feuerstack (woodcuts).—Candid reply to my critics in the matter of the "Brain of Fishes," by G. Futsch.

Proceedings of the St. Petersburg Society of Natural History, Vol. xiii. Part 1, for 1882, contains: On the archæology of Russia, by Count Tivatkov (the Stone Period).—Notes of a journey on the Dnieper in 1844, by Dr. Kessler.—On *Capra caucasica*, Güld., by H. Dinnik.—Darwinism from the point of view of universal physical science, by A. Beketov.—A monograph of the Mysidæ to be found in Russia (Marine, Lacustrine, and Fluviatile), by Voldemaro Czerniavsky, fasc. 2. All the above articles are in Russian except the last, which is in Latin, and it is illustrated by four lithographic plates.

Journal of the Russian Chemical and Physical Society, vol. xv. fascicule 3.—On the hydrocarbon $C_{12}H_{20}$ obtained from the allyl dimethyl carbinol, by Prof. A. Zaytseff and W. Nicolsky.—On the hydrocarbon $C_{10}H_{18}$ obtained from the allyl dipropyl carbinol, by S. Reformatsky. It is a colourless liquid boiling at about 158° Celsius, insoluble in water, and easily soluble in alcohol and ether. It rapidly absorbs the oxygen of the air; density 0·787 at 0°, 0·774 at 16°, and 0·770 at 21°.—Chemical analysis of Kieff clays, by S. Bogdanoff. The white clay contains 96 per cent. of kaolins; the loess contains 83·5 per cent. of quartz, felspar, mica, and other silicates, 5·38 of kaolin, and 6·73 of carbonate of lime.—On the diisooctyl, by A. Alechin.—On the composition of the water which accompanies the naphtha and is discharged by mud-volcanoes of the Government of Tiflis, by A. Potylitzin (second paper).—An elementary demonstration of the pendulum-formula, and on a differential aërial calorimeter, by W. Preobrajensky.

THE *Archives des Sciences Physiques et Naturelles* for February, 1883, contains papers by C. E. Guillaume on electrolytic condensers; by Emile Yung, on the errors of the senses, a contribution to the study of illusions and hallucinations; by Ernest Favre, on the Geological Survey of Switzerland for 1882, concluded in the March number. To the latter C. de Candolle sends an interesting essay on the ripple marks formed on the surface of sands under water, and on other analogous phenomena.

THE *Journal de Physique théorique et appliquée* for March contains papers by Ph. Gilbert, on the experiments best suited for demonstrating the rotation of the earth; by G. Lippmann, on Helmholtz's theory of double electric layers as applied to electro capillary phenomena; by H. Pellat, on the same subject; by A. Rosenstiehl, on the definition of complementary colours; by Ch. Cros and Aug. Vergeraud, on a direct positive photographic paper.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 15.—"On the Changes which take place in the Deviations of the Standard Compass in the Iron Armour-plated, Iron, and Composite-built Ships of the Royal Navy on a considerable change of Magnetic Latitude." By Staff-Commander E. W. Creak, R.N., of the Admiralty Compass Department. Communicated by Capt. Sir F. J. Evans, R.N., K.C.B., F.R.S., Hydrographer of the Admiralty.

The period comprised between the years 1855–68 was one of active research into the magnetic character of the armour-plated and other ships of the Royal Navy and iron ships of the Mercantile Navy.

Among other contributions to this subject a paper by F. J. Evans, Staff-Commander R.N., F.R.S., and Archibald Smith, F.R.S., was read before the Royal Society in March 1865, relating to the armour-plated ships of the Royal Navy, and containing the first published results of the system of observation and analysis of the deviation of the compass established four years previously.

From lack of observations in widely different magnetic latitudes the authors of that paper were unable to define the proportions of the semicircular deviations arising from vertical induction in soft iron and that arising from permanent or subpermanent magnetism in hard iron.

During the last fifteen years vessels of all classes—except turret ships—have visited places of high southern magnetic inclination or dip, and the analysis of the deviations of their standard compasses has been made, showing the constants of hard and soft iron producing semicircular deviation.

The constants for soft iron provide a means of predicting probable changes of deviation on change of magnetic latitude for certain vessels of the following classes, and others of similar construction.

1. Iron armour-plated ships.
2. Iron cased with wood.
3. Iron troopships.
4. Iron and steel cased with wood.
5. Composite-built vessels.
6. Wooden ships with iron beams and vertical bulkheads.

These vessels were all in a state of magnetic stability previous to the observations which have been discussed, and their compasses have had the semicircular deviation reduced to small values, or corrected, in England by permanent bar magnets.

This correction may be considered as the introduction of a permanent magnetic force acting independently, and in opposition to the magnetic forces of the ship proceeding from hard iron,

It is now proposed to consider the effects of a change of magnetic latitude on the component parts of the deviation.

Semicircular Deviation

On semicircular deviation from fore and aft forces, time has but little effect, and the greater part of it is due to permanent magnetism in hard iron which may be reduced to zero for all latitudes, by a permanent magnet.

A second but small part of this semicircular deviation proceeds from sub-permanent magnetism in hard iron. It is subject to alterations slowly by time, from concussion, and from the ship remaining in a constant position with respect to the magnetic meridian for several days, and is more intensely affected by a combination of the two latter causes.

Deviations from sub-permanent magnetism which have temporarily altered in value as described, return slowly to their original value on removal of the inducing cause.

The principal cause of change in the semicircular deviation on change of magnetic latitude, in corrected compasses, arises from vertical induction in soft iron, which changes directly as the tangent of the dip.

In standard compasses judiciously placed with regard to surrounding iron this element of change is small and similar in value for similar classes of ships.

With very few exceptions, nearly the whole of the semicircular deviation from transverse forces is due to permanent magnetism in hard iron subject to the same laws as that proceeding from fore and aft forces.

In the exceptional cases alluded to there is a small part due to vertical induction in soft iron, changing directly as the tangent of the dip.

Quadrantal Deviation

This deviation is caused by induction in horizontal soft iron symmetrically placed, and it does not change with a change of magnetic latitude. Time alone appears to cause a gradual change in its value during the first two or three years after the ship is launched, when it becomes nearly permanent.

The diminution of the mean directive force of the needle which is common to all modern vessels of war, improves slowly at first by lapse of time, and finally assumes a permanent value.

Relative Proportions of Hard and Soft Iron

It has been found that the relative proportions of the hard and soft iron affecting the standard compasses of twenty-five vessels examined differ considerably, even in ships of similar construction.

This difference may be accounted for by the compasses not being placed in the same relative position in the ships, considered as magnets of various forms and containing numerous iron bodies introduced during equipment.

General Conclusions

The following general conclusions have special reference to the standard compass positions in the six classes of vessels previously mentioned.

1. A large proportion of the semicircular deviation is due to permanent magnetism in hard iron.

2. A large proportion of the semicircular deviation may be reduced to zero, or corrected, for all magnetic latitudes, by fixing a hard steel bar magnet or magnets in the compass pillar, in opposition to, and of equal force to, the forces producing that deviation.

3. A very small proportion of the semicircular deviation is due to sub-permanent magnetism, which diminishes slowly by lapse of time.

4. The sub-permanent magnetism produces deviation in the same direction as the permanent magnetism in hard iron, except when temporarily disturbed (1) by the ship's remaining in a constant position with respect to the magnetic meridian for several days, (2) by concussion, or (3) by both combined, when the disturbance is intensified.

5. To ascertain the full value of changes in the sub-permanent magnetism, observations should be taken immediately on the removal of the inducing cause.

6. In the usual place of the standard compass the deviation caused by transient vertical induction in soft iron is small, and of the same value (nearly) for ships of similar construction.

7. The preceding conclusions point to the conditions which should govern the selection of a suitable position for the standard compass with regard to surrounding iron in the ship.

Anthropological Institute, April 24.—Prof. W. H. Flower, F.R.S., president, in the chair.—The election of Mr. C. Roberts, F.R.C.S., was announced.—Mr. W. M. Flinders Petrie read a paper on the mechanical methods of the Egyptians. The author exhibited several specimens of ancient Egyptian work, and described the methods by which he believed them to have been produced.—Mr. F. C. J. Spurrell read a paper on some palæolithic knapping tools and modes of using them.

May 8.—Prof. W. H. Flower, F.R.S., president, in the chair.—Mr. Frederick Bonney read a paper on some customs of the aborigines of the River Darling, New South Wales. The tribes with which the author was most familiar are called Bungy-arlee and Parkungi. They inhabit a district within lat. 29°–34°. S., long. 141°–146° E. The country in its natural state was incapable of supporting a large population, being subject to protracted droughts, during which both food and water were scarce. There is a similarity in the typical features of all the Australian aborigines, but to a close observer each tribe has its own peculiarities. Though ugly and unprepossessing in appearance, they are most kind, gentle, and of quite average intelligence and morality. The aborigines of Australia are often spoken of as the lowest type of humanity, but the author considered this to be a libel on the whole of them, and was positive it is so as regards the tribes he knows best. Mr. Bonney then proceeded to give a description of the life-history of the above-mentioned tribes.—Lieut.-Col. H. H. Godwin-Austen, F.R.S., read a paper on the discovery of some worked flints, cores, and flakes from Blackheath, near Chilworth and Bramley, Surrey.—A paper by Admiral F. S. Tremlett, F.G.S., was read, on stone circles in Brittany, in which the author described three circles discovered by the late Mr. James Milne, in the commune of Carnac; they had presumably been places for cremating the dead, and also for depositing the urns; the greater part of the latter were found inclosed in cists of quartz covered over by a slab of schist, neither of which are to be found in the district.—Mr. W. Galloway exhibited a skull and a number of rubbed bones and other implements from the islands of Oronsay and Colonsay, forming part of a large collection exhibited by him in the Great International Fisheries Exhibition.

Physical Society, May 12.—Prof. Clifton in the chair.—New Member, Mr. A. W. Soward.—Mr. Woodward described an experiment illustrating motion produced by diffusion. A porous reservoir of clay containing air was suspended from one end of a weighted balance beam. A glass tube projected from it below and dipped into a vessel of water. A jet of hydrogen gas was allowed to play on the outside of the reservoir and the balance beam began to oscillate. This is an adaptation of Graham's well-known experiment, and is in fact a diffusion engine. Prof. Adams explained the action by the variation of pressure in the reservoir set up by diffusion.—Mr. W. Lant Carpenter read a paper on some uses of a new projection lantern. This lantern, of German make, is applied by Mr. Paterson, and is simple in construction, cheap, and gives a good image visible to a large audience. It can be used with a three-wick oil lamp or the limelight. Mr. Carpenter showed a number of objects on the screen. Mr. Lecky and Mr. Woodward offered some remarks, the latter deprecating a too frequent use of projection with students.—Dr. C. R. Alder Wright read a paper on the electromotive force of Clark's mercurous sulphate cell and the work done during electrolysis. He described the best mode of constructing Clark's standard cell. According to numerous tests, these cells vary in E.M.F. about 0·2 per cent. + or − among themselves. A cell properly made will keep its value for about two years. It is of great importance that the cell should not be worked or the current reversed through it, otherwise it may permanently deteriorate. The extraction of air from the paste is not very essential, and boiling it is unnecessary. It is more important that the solutions of zinc sulphate should be saturated. Dr. Wright described a cell in vacuum which is a good standard. He found the E.M.F. to vary 0·4 per cent. between 0° and 100° C. With regard to the work done in a cell, among other interesting deductions, he found that in a secondary battery the larger the plates the greater the economy. In the electrolysis of water the greater the surface condensing power of the electrodes for gas the less difference of potential is required to decompose the water. Thus with platinum electrodes a lower E.M.F. serves for the electrolysis than with gold electrodes.—Prof. Foster then took the chair, and Prof. Clifton read a paper on a complete determination of a double convex lens by lineal

measurements on the optical bench. This was a method (some what similar to that of Mr. Boys, previously described to the Society) for determining the four quantities of a lens on the bench by lineal measures, and without the use of the spherometer and prism. Experiments showed that it was about as accurate as the spherometer method.

EDINBURGH

Royal Society, May 7.—Prof. Maclagan, vice-president, in the chair.—By request of the Council Prof. James Geikie gave an address on recent advances in the Pleistocene geology of Europe. The characteristic deposits of this period, which embraces the Palæolithic age of the antiquarians, were described in considerable detail—the terminal and ground moraines and other glacial remains, the fluviatile and lacustrine formations, and the cave deposits. The limits were indicated of the great Scandinavian ice-sheet, which pushed itself southward over North Germany and over the watershed of Central Russia, and westward across the German Ocean towards our islands, thereby modifying the trend of the native ice-streams that have left their traces all over our hills and round our coasts. As an indication of the great power of this agent it was mentioned that some portions of the brown-coal beds of Saxony which have been long worked are really not *in situ*, but have been pushed out of place by the ice-sheet. In describing the fluviatile deposits Prof. Geikie drew attention to a suggestion made by Darwin, that frozen snow accumulating in the valleys below the glacier limits might easily act as barriers and give rise to extensive flooding. The fauna and flora and the evidence of the interglacial beds were then touched upon, and the address ended with a general summary of results with special reference to the climatic peculiarities of the Pleistocene period. It thus appeared that Europe was subjected to great climatic changes, severe glacial periods alternating with times of peculiar equable climate in which temperate flora and fauna flourished side by side with forms which are now met with only in southern regions.

SYDNEY

Linnean Society of New South Wales, March 28.—Rev. J. E. Tenison-Woods, F.L.S., vice-president, in the chair.—The following papers were read:—Occasional notes on plants indigenous in the immediate neighbourhood of Sydney (No. 3), by Edwin Haviland. This paper refers chiefly to the genus *Lobelia*, its mode of fertilisation, and its domestication.—On tooth-marked bones of extinct marsupials, by Chas. W. de Vis, B.A., A large proportion of fossil marsupial bones from the Darling Downs, recently examined by Mr. de Vis, are considered by him to show more or less decided traces of the action of the teeth of carnivorous animals. The tooth-marks are ascribed to the agency partly of the native dog, partly of the *Thylacoleo*, and partly of an extinct species of *Sarcophilus* which was identified by a portion of a tibia.—On *Brachalletes palmeri*, an extinct marsupial, by Chas. W. de Vis, B.A. A femur from the Darling Downs differs so markedly from that of *Macropus* and *Halmaturus* in the less prominent character of the great trochanter that it is considered to belong to a new generic type, proposed to be named *Brachalletes*.—On the habits of the "Mallee hen" (*Leipoa ocellata*), by K. H. Bennett. This gives an interesting and detailed account from the author's own observation of the nidification and general habits of this very curious bird.—Mr. Macleay exhibited a specimen of *Dendrolagus dorianus*, a new species of Tree Kangaroo from Mount Owen Stanley, New Guinea, described by Mr. E. P. Ramsay at the January meeting of the Society. He pointed out that the hair on the body all turned the wrong way.

BERLIN

Physiological Society, April 13.—Prof. du Bois Reymond spoke about a series of electrophysiological investigations which he began at the same time as his "Investigations in Animal Electricity," which have long since been incorporated in science, now forty years ago, and about which he has as yet not published anything, viz., about the secondary electromotor phenomena of muscles, nerves, and electric organs. These latter are distinguished from primary electromotor phenomena of nerves and muscles by the fact that the latter appear in quiescent organs and take place without being directly influenced by an external electric current, whereas the former appear only as a consequence of an extrinsic electrical current, and consequently are connected with the polarisation appearances in electrolytical conductors. When a current is led through a fluid electrolyte by means of metallic electrodes, a reverse (negative) polarisation current is, as is well known, produced between the electrodes by the accumulation of ions on the anode and cathode. In the year 1836 Peltier described a similar negative (in direction opposed to principal current) polarisation in masses of frogs' limbs through which an electrical current was being passed, and explained it in the same way by the development of ions on the electrodes. When Prof. du Bois Reymond repeated this experiment in the beginning of the forties, he found that an electromotive force was active not only at the electrodes, but that each piece of the preparation through which the current was passing had a negative electromotive reaction, and showed an opposite current to the polarising one in a galvanometer that was applied. On further study of this phenomenon, he found this "inner" polarisation in every porous conductor, which is soaked with a readily conducting electrolyte, and it was in all cases negative; on the other hand an outer positive polarisation exhibited itself on the line of contact of dissimilar electrolytes, *e.g.* when the current was led through a pad soaked with water into a salt solution. Fresh animal tissues of the most different kinds, when a current was led through them between pads soaked in common salt, accordingly showed an outer positive and an inner negative polarisation. Further, the lecturer studied an outer and an inner secondary (called forth by the current) resistance, of which the former was at least partially accounted for by the cataphorical action of the current. When afterwards (*i.e.* after the determination of the above-mentioned physical phenomena) the inner polarisation was studied on living muscles, secondary electromotor appearances of such irregularity and complexity manifested themselves that it was only after laborious investigations that were extended over many years that the simple law that the phenomena obey was discovered. It was discovered that when a current was passed through a muscle the inner polarisations might be positive as well as negative, that they depend on the density and length of duration of the polarising current, and that each of these polarisations can be altered in a different manner by these two factors. If the densities and duration of action of the primary current are properly graduated, the phenomena follow the following law:—With very weak polarising currents the inner polarisation is negative, and increases up to a certain limit with the duration of the current; with somewhat stronger currents, the inner polarisation is at first positive, but soon passes over into the negative, which goes on increasing with the duration of the current; with still stronger currents, the initial positive inner polarisation becomes stronger and longer lasting, and then again becomes negative with the longer duration of the primary current. If the density of the polarising current increases still more, the initial positive current becomes weaker and weaker, and finally disappears altogether, and gives way to a polarisation that is negative from the beginning. Accordingly there exists in the interpolar portion of a muscle that is traversed by a current, after a certain limit has been exceeded, a positive inner polarisation, which in a short time is replaced by a negative polarisation, and the deduction from these phenomena is that both secondary electromotive forces—those with the same and with opposite directions—are present in the portion of muscle traversed by the electrical current. These electromotive forces manifest themselves alternately, the predominance of the one and the other being conditioned by the several dependence of each upon the density and duration of the primary current. This indication of a positive inner polarisation, *i.e.* of secondary electromotor forces, which occasion a current in the same direction as the primary current, is a fact of fundamental import in the theory of animal electricity. The positive polarisation proved itself to be dependent upon the direction of the primary current, since it was stronger in the upper half of the muscle when the direction of the current was from below upwards, whereas it was stronger in the lower half with a descending current; furthermore it manifested itself in living muscles only, whereas the negative polarisation occurred also in muscles that had been boiled or otherwise killed; finally, the positive polarisation was less strong in active than in quiescent muscles. At the end of the fifties the lecturer had also succeeded in demonstrating a positive inner polarisation in nerves; it showed the same regularity as was afterwards, with finer appliances, quantitively estimated in muscles; that is to say, with small current-densities a negative polarisation only was manifested; with greater current-densities and very short duration of closing a purely positive polarisation was manifested,

which passed over into a negative polarisation with the longer duration of the primary current. Here also the different manifestations of the nerve polarisation led, as in muscles, to the recognition of two simultaneous electromotive forces, which behave differently to the intensity and duration of the primary current. And as in muscle the direction of the primary current influenced the strength of the positive polarisation, similarly in nerves the direction had an influence upon the positive polarisation predominating in the motor nerve-roots when the current was a descending one, and conversely in the sensory nerve-roots when the current was an ascending one; consequently both times the direction of the physiological nerve-wave predominated. Finally, Prof. du Bois Reymond gave an account of his experiments by which he has demonstrated quite analogous secondary electromotor phenomena in the electric organs of the electric fish (Malapterurus). In the theoretical discussion of the results of these experiments that were carried on for so many years the lecturer pointed out in conclusion that the inner polarisation, the positive polarisation in particular, could scarcely be otherwise explained except by the hypothesis that in the above-mentioned organs (the muscles, nerves, and electric organs) electromotor molecules preexisted during life, which, being turned by the polarising current, became the occasioned causes of the electromotor phenomena.—Prof. Rosenthal of Erlangen spoke about the experiments he had made to ascertain the electric conductivity of living tissues. He dwelt on the difficulty of exactly measuring its amount, which he could only overcome by using alternating currents, of which, by the help of a particular apparatus, currents of one direction only acted upon the galvanometer of the Wheatstone's bridge. On the living man he found the resistance of the epidermis so great that he regards it as an excellent insulator which permits the electrical current to pass through to the deeper organs only through the medium of the canals (the pores) that ramify through it and that are filled with fluid. The measurements of the conductivity of living animal tissues are not yet quite completed.

PARIS

Academy of Sciences, May 7.—M. Blanchard in the chair.—M. Loewy explained his new method for determining at any moment the relative position of the instrumental equator in relation to the real equator. This method is analogous to that already given for right ascensions, being founded on the observation of the stars near the pole, and on the variations in the relations of the coordinates due to the deflection of the instrument. M. Loewy demonstrates mathematically that his plan combines all the theoretical and practical conditions required for the complete solution of the problem. It is based on the theorem here demonstrated that when the track described by a star in apparent distance from the pole coincides with its distance in relation to the instrumental plane, the angle may be exactly determined which is formed by the terrestrial axis with the line of the instrumental poles, by means of the variation observed between the apparent polar distance and the distance in relation to the instrumental plane. The method is independent of any possible variations in the state of the instrument during a period of twelve hours, and it excludes the cause of systematic error due to refraction. It is moreover capable of extreme accuracy, which, by multiplying the points, may be carried as far as is desirable.—M. Tresca submitted some remarks on the observations made last year by Prof. Lemström in Lapland on various circumstances connected with the phenomenon of the aurora borealis, which have been reported in NATURE.—M. Th. du Moncel presented a paper by M. E. Semmola on the annual variation of temperature in the waters of the Bay of Naples, showing the results of observations made during the summer of 1879 and January, 1880, with a Negretti and Zambra thermometer. The observations were generally taken during calm weather between the hours of 11 a.m. and 3 p.m., in depths of 30 or 40 feet, and at some distance from the coast. They showed that on the whole the Bay of Naples is only a few degrees warmer than the Mediterranean, which, from the observations made in the August of 1870 by the English expedition under Prof. Carpenter, was found to be 25° C. at the surface, 15°·5 at a depth of 180 feet, 14° at 230, 13° at 620, and nearly the same down to 10,000 feet. In the bay the temperature varied from 13° on the surface in winter to 27° in summer, showing a mean of about 20°, or 3° higher than the city of Naples. This result also agrees with the mean annual temperature of the Mediterranean, which, according to Mohn, lies between 16° and 19° in the west, and 21°-23° in the east.—Other papers were contributed by M. Lecoq de Boisbaudran on the extremely sensitive character of salts of iridium, rendering them most useful in detecting the presence of the smallest particles of iridium in compound substances; by G. A. Hirn, continuing the *résumé* of the meteorological observations made during 1882 at four points of the Upper Rhine and Vosges highlands; by Th. Schwedoff, on the form of the great comet of September, 1882, with two cuts showing its appearance on October 12 at Lyons, and on October 17 and November 7 at Odessa; by E. de Jonquières, on the identities presented by the reductions belonging respectively to the two "modes" of continuous periodical fractions. By "the two modes" of continuous fractions the author understands, on the one hand the ordinary continuous fractions ("first mode"), on the other those in which the numerators differ from unity ("second mode").—Papers were also submitted by M. Vieille, on the specific heats of some gases at high temperatures; by C. Resio, on the electrodynamograph, an instrument constructed for recording the work executed by machinery; by J. A. Le Bel, on the amylic alcohol developed in alcoholic fermentation; by M. Gonnard, on the staurolites and regular groupings of the felspar crystals in the siliceous porphyry of Four-la-Brouque, near Issoire (Puy-de-Dôme); by J. Thoulet, on the elasticity of rocks and minerals; by P. Mégnin, on the direct reproduction of tænia in the intestines of the dog and man; by B. de Chancourtois, on a common meridian and measurement of time in view of the universal adoption of a complete decimal system, with a planisphere showing two proposed initial meridians passing through Behring Strait and the Azores; by Ch. Contejean, on some special cases of distribution in the Italian flora.

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