of the Hypodermei and the Gasteromycetes.—Plantæ Raddeanæ Monopetalæ, by Ferd. von Herder (continued).—Solution of a problem of the theory of comets, by N. Joukovski (Russian). The geocentric position of a particle of the tail which has left the nucleus since a given time under the action of a given repulsive force, to determine the displacement of the particle for a given change in the repulsive force—such is the problem treated.—Analyses of salt and mud from a volcano of Trans-Caucasia.—An essay on the solution of the geodetical problem, by Th. Sloudsky (in French). The already-known formulæ already give the possibility of embodying all anomalies less than 30″ in latitude and less than 15 oscillations of the pendulum in twenty-fours against the calculated ones. The author tries, however, to give a more theoretical formula, which might at the same time embody larger anomalies.—List of the herbaria of the Moscow University and of the Society of Naturalists, by J. Goroshankin.—Studies on the averages of the relative moistness, by Dr. K. Weihrauch (continued; in German).—Necrology and Annual Report.

Rendiconti del R. Istituto Lombardo, March 26.—History of the first century (1783-1883) of the Reale Istituto, by G. B. Venturi.—On the persistence of the thymus gland in children and adults, by Prof. Giovanni Zoja.—Account of a successful operation performed on a young girl for the purpose of closing an open sore on the left cheek produced by a severe attack of typhoid fever.—Further notes on conformable representations in higher mathematical analysis, by Prof. Giulio Ascoli.—Meteorological observations made at the Royal Observatory of Brera, Milan, during the month of March.

Rivista Scientifico-Industriale, March 31.—A new explanation of the red crepuscular lights that have been attributed to the Krakatoa eruption, by Prof. Carlo Marangoni.—Variations in the electric resistance of solid and pure metallic wires according to the temperature (continued), by Prof. Angelo Emo.—A visitation of caterpillars (*Lithosia caniola*, Hl.) in Florence during the present season, by P. Bargagli.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 23.—"On the Changes produced by Magnetisation in the Length of Rods of Iron, Steel, and Nickel." By Shelford Bidwell, M.A., LL.B.

The earliest systematic experiments on the effects produced by magnetisation upon the length of iron and steel bars are those of Joule, an account of which is published in the *Phil. Mag.* of 1847. Joule's experiments have many times been repeated, and his general results confirmed. In particular, Prof. A. M. Mayer carried out a series of very careful observations with apparatus of elaborate construction and great delicacy. The conclusions at which he arrived were in accord with those of Joule, so far as regards iron; in the case of steel there was some apparent discrepancy, which, however, might to a great extent be accounted for by differences in the quality of the metal used and in the manner of conducting the experiments. In 1882 Prof. Barrett published in NATURE an account of some experiments which he had made, not only on iron but also on bars of nickel and cobalt, with the view of ascertaining the effect of magnetisation upon their length.

The knowledge on the subject up to the present time may be summarised as follows:—

(1) Magnetisation causes in iron bars an elongation, the amount of which varies up to a certain point as the square of the magnetising force. When the saturation-point is approached the elongation is less than this law would require. The effect is greater in proportion to the softness of the metal.

(2) When a rod or wire of iron is stretched by a weight, the elongating effect of magnetisation is diminished; and if the ratio of the weight to the section of the wire exceeds a certain limit, magnetisation causes retraction instead of elongation.

(3) Soft steel behaves like iron, but the elongation for a given magnetising force is smaller (Joule). Hard steel is slightly elongated, both when the magnetising current is made and when it is interrupted, provided that the strength of the successive currents is gradually increased (Joule). The first application of the magnetising force causes elongation of a steel bar if it is tempered blue, and retraction if it is tempered yellow: subsequent applications of the *same* external magnetising force cause temporary retraction, whether the temper of the steel is blue or yellow (Mayer).

(4) The length of a nickel bar is diminished by magnetisation, the maximum retraction being twice as great as the maximum elongation of iron (Barrett).

In order that the results of Joule and Mayer might be comparable with those obtained by the author, he made an attempt to estimate the magnetising forces with which they worked. From data contained in their paper, it was calculated that the strongest magnetising force used by Joule was about 126 units, while the strongest used by Mayer did not on the highest probable estimate exceed 118 units. In the author's experiments the magnetising force was carried up to about 312 units. The metal rods, too, were much smaller than any which had been before used for the purpose, ranging in diameter from 1·40 to 6·25 mm. Their length was in every case 100 mm., and the apparatus was capable of measuring with tolerable certainty an elongation or retraction equal to a ten-millionth part of this length.

By using thinner iron rods and greater magnetising forces than those previously employed, the following curious and interesting fact was established. If the magnetisation be carried beyond a certain critical point, the consequent elongation, instead of remaining stationary at a maximum, becomes diminished, the diminution increasing with the magnetising force. If the force is sufficiently increased, a point is arrived at where the original length of the rod is totally unaffected by magnetisation; and if the magnetisation be carried still further, the original length of the rod will be reduced. It also appeared that the position of the critical point in steel depended in a very remarkable manner upon the hardness or temper of the metal; considerable light is thus thrown on the apparently anomalous results obtained by Joule and by Mayer. Further experiments disclosed strong reason for believing that the value of the critical magnetising force in a thin iron rod was greatly reduced by stretching; this would explain the fact that Joule obtained opposite effects with stretched and unstretched wires.

By ascertaining the relative values of the temporary moments induced by gradually increasing external magnetising forces, an attempt was made to connect the point of maximum elongation with a definite phase of the magnetisation of the several rods in which the elongation had been observed.

Though more experiments must be made before it is possible to generalise from them with perfect safety, the results so far obtained by the author indicate the laws given below. The elongations and magnetisations referred to are temporary only; before the beginning of an experiment the rod was permanently magnetised by passing through the magnetising coil a current equal to the strongest subsequently used. In iron the greatest elongation due to permanent magnetisation was generally found to be about one-third of the total elongation, while in nickel the permanent retraction amounted only to about one-twenty-fifth part of the whole.

I. IRON

(1) The length of an iron rod is increased by magnetisation up to a certain critical value of the magnetising force, when a maximum elongation is reached.

(2) If the critical value of the magnetising force is exceeded, the elongation is diminished until with a sufficiently powerful magnetising force the original length of the rod is unaffected, and, if the force is still further increased, the rod undergoes retraction. Shortly after the critical point is passed the elongation diminishes in proportion as the magnetising force increases. The greatest actual retraction hitherto observed was equal to about half the maximum elongation, but there was no indication of a limit, and a stronger magnetising force would have produced further retraction.

(3) The value of the external magnetising force corresponding to maximum elongation is for a given rod approximately equal to twice its value at the "turning point."

Definition.—The turning point in the magnetisation of an iron bar is reached when the temporary moment begins to increase less rapidly than the external magnetising force.

(4) The external force corresponding to the point of maximum elongation increases (when the quality of the iron is the same) with the diameter of the rod. So also does its value at the turning point.

(5) The amount of the maximum elongation appears to vary inversely as the square root of the diameter of the rod, when the quality of the iron is the same.

(6) The turning point, and therefore presumably the point of maximum elongation, occurs with a smaller magnetising force when the rod is stretched than when it is unstretched.

II. Steel

(7) In soft steel magnetisation produces elongation, which, as in the case of iron, increases up to a certain value of the magnetising force, and afterwards diminishes. The maximum elongation is less than in iron, and the rate of diminution after the maximum is passed is also less.

(8) The critical value of the magnetising force for a steel rod diminishes with increasing hardness up to a certain point, corresponding to a yellow temper; after which it increases, and with very hard steel becomes very high. There is therefore a critical degree of hardness for which the critical magnetising force is a minimum; in steel of a yellow temper the value of the critical magnetising force is lower than in steel which is either softer or harder.

(9) In soft steel a strong magnetising force subsequently diminished may cause a greater temporary elongation than the diminished force is capable of producing if applied in the first place.

(10) A temporary elongation when once produced in soft steel may be maintained by a magnetising force which is itself too small to originate any perceptible elongation.

III. Nickel

(11) Nickel continues to retract with magnetising forces far exceeding those which produce the maximum elongation of iron. The greatest observed retraction of nickel is more than three times the maximum observed elongation of iron, and the limit has not yet been reached.

(12) A nickel wire stretched by a weight undergoes retraction when magnetised.

Anthropological Institute, April 28.—Francis Galton, F.R.S., President, in the chair.—Mr. A. L. Lewis read a paper on the past and present condition of certain rude stone monuments in Westmoreland. The highest point of the railway between Lancaster and Carlisle is a little to the south of the village and station of Shap, in Westmoreland, where there were formerly some very extensive rude stone monuments, now unfortunately almost entirely destroyed. Allusion is made to them by Camden and Dr. Stukeley, and a circle is said to have been destroyed when the railway was made; some remains of this circle may be seen from the train, but only a few stones are left on the spot. The most interesting monument now remaining in the vicinity of Shap is situated at a place called Gunnerskeld, two or three miles to the north, and consists of two irregular, concentric, slightly oval rings, about 50 and 100 feet in diameter respectively, the longest diameters being from north to south.—A paper by Admiral F. S. Tremlett on quadrilateral constructions near Carnac was read. These inclosures were explored by the late Mr. James Miln; in each case the boundary walls are formed of coarse, undressed stones, put together without any kind of cement, and having built up in them a series of small menhirs; they also contained beehive structures for cremation, reddened and become friable from the effects of great heat. It would appear that the cremation had been perfect, as not a particle of calcined bone was found in either of the inclosures.—A paper by M. Jean L'Heureux on the Kekip-Sesoators, or ancient sacrificial stone of the North-West Territory of Canada, was read. Elevated two hundred feet above the level of the surrounding plain, Kekip-Sesoators, the Hill of the Blood Sacrifice, stands like a huge pyramidal mound commanding an extensive view of both Red Deer and Bow River Valleys. A natural platform of about one hundred feet crowns its summit; at the north end of the platform, resting upon the soil, is the Sesoators, a rough boulder of fine-grained quartzose, fifteen inches high and about fourteen in diameter; upon its surface are sculptured half an inch deep the crescent figure of the moon with a shining star over it. Two small concave basins about two inches in diameter are hollowed into the stone, one in the centre of the star, the other about seven inches from it in a straight line; around them are traced various hieroglyphic signs, and all over the surface are numerous small circlets, which remind one of the sacrificial stone of Mexico. Here at a time of private or public necessity, when extraordinary blessings are sought, comes a solitary warrior, himself the priest and the victim; from the time of sunset he sits in solemn vigil gazing in the far east for the coming of the star-god of his ancestors; and when the first ray of the morning star lights the distant horizon, he lays a finger of his left hand on the top of the stone and cuts it off, leaving the blood to flow into the basin. He then presents the bleeding finger to the morning star, and, leaving it in the basin of the star-like figure, retraces his steps towards the lake at the foot of the hill, where he dresses his wound, and at sunrise enters his own village, where he is received with triumphant honours. Amongst the Blackfeet these self-inflicted wounds ranked equal to those received in battle, and are always mentioned first in the public recital of the warrior's great deeds in the national feast of Ocan.

Geologists' Association, May 1.—William Topley, F.G.S., President, in the chair.—A paper was read on wingless birds—recent and fossil—and on birds as a class, by Dr. Henry Woodward, F.R.S. The author prefaced his remarks on wingless birds by giving first a brief account of the characters of birds as a class. He described the peculiarities of the skull and the fore- and hind-limb, the cervical, thoracic, sacral, and caudal vertebræ, with the shoulder-girdle and pelvis. He compared the highly-specialised fore-limbs in existing birds with that of *Archæopteryx*, the former, with three rudimentary digits, having the metacarpal bones anchylosed together; the latter, with three free digits in each manus, armed with claws. He compared the bones of the hind-limb of an adult *Iguanodon* with those of a young *Dinornis*, and showed how closely the characters observable in the former are repeated in the latter. Many interesting analogies were also pointed out in the form of the ilium, ischium, and pubis in *Struthio* and Iguanodon. The *Archæopteryx*, although possessing so many points of divergence from the Avian type, was shown to be the earliest known ancestor of the great division of *Carinatæ* (birds with a keel to the sternum) to which nearly all modern (flying) birds belong. For the *Ratitæ* (or boat-breasted birds), to which division the Ostrich, Rhea, Emu, Cassowary, Apteryx, Dinornis, Æpyornis, &c., belong, an earlier ancestor must be sought. The author contended that, on the evidence before us we have a right to claim a higher antiquity for the *Ratitæ* than for the *Carinatæ*, not only from the present wide distribution of this division of the class, but also from the fossil evidence which embraces for the Struthious order even a still larger geographical area than that shown from existing species. And if we are at liberty to add to this the evidence of the footprints of bipedal animals in the Trias (which agree with the tracks of birds in the number of digits in the foot), then these footprints may be taken as further evidence of their priority in geological time. For the primitive forms of this class we must evidently look to the palæozoic rocks.

Zoological Society, May 5.—Prof. Alfred Newton, F.R.S., Vice-President, in the chair.—A communication was read from Mr. Jean Stolzmann, containing observations on the theory of sexual dimorphism.—Mr. J. Bland Sutton, F.Z.S., read a paper on hypertrophy and its value in evolution, in which he attempted to show that material changes in structure might be the result of what was originally a pathological condition.—Mr. E. T. Newton, F.Z.S., read a paper on the remains of a gigantic species of bird (*Gastornis klasseni*), which had been obtained by Mr. H. M. Klaassen from the "Woolwich and Reading Beds" of the lower Eocene series. The author observed that these fossils proved that in early Eocene times England was inhabited by a race of birds which equalled in their proportions some of the more massive forms of the New Zealand moas.—A communication was read from Mr. R. B. Sharpe, F.Z.S., containing the description of a new species of Hornbill from the Island of Palawan, which he proposed to name *Anthracoceros lemprieri*.—Prof. E. Ray Lankester, F.R.S., read some notes on the right cardiac valve of the specimens of *Apteryx* dissected by Sir Richard Owen in 1841.—A communication was read from Lieut.-Col. C. Swinhoe, F.Z.S., being the third of his series of papers on the Lepidoptera of Bombay and the Deccan. The present paper treated of the second portion of the Heterocera.—A communication was read from Dr. St. George Mivart, F.R.S., containing a correction of a statement concerning the structure of *Viverricula*, contained in a former paper.

Manchester

Literary and Philosophical Society, Feb. 16.—Thomas Alcock, M.D., in the chair.—A proposed revision of the species and varieties of the sub-genus Cylinder (Montfort) of Conus (L.), by Mr. J. Cosmo Melvill, M.A., F.L.S.

March 10.—Prof. W. C. Williamson, LL.D., F.R.S., President, in the chair.—On making sea-water potable, by Thomas Kay, President of the Stockport Natural History Society. Communicated by F. J. Faraday, F.L.S.

March 16.—Thomas Alcock, M.D., in the chair.—On the breeding of the Reed Warbler (*Acrocephalus arundinaceus*) in

Cheshire, by Francis Nicholson, F.Z.S.—On *Lagena crenata*, by Dr. Alcock.—The Post-Glacial Shell-beds at Uddevalla, Sweden, by Mark Stirrup, F.G.S.

PARIS

Academy of Sciences, May 4.—M. Bouley, President, in the chair.—Summary of the meteorological observations made during the year at four stations on the Upper Rhine and in the Vosges district (Schlucht, Munster, Colmar, and Thann), by M. G. A. Hirn. Tables are given of the actinometric observations, of the prevailing winds with their mean and greatest velocities, of the mean and extreme temperature, of the atmospheric pressure and rainfall for each month of the year at all these stations. During the period in question the most salient phenomena were the severe frosts of the month of April, which proved very destructive, especially to the vines, and the sudden and violent hurricane of July 16, which swept with tremendous rapidity over the Vosges, almost unaccompanied by rain, and with very little thunder.—Remarks on the influence exercised by seismatic disturbances on Phylloxera, by M. S. Villalongue. The case is mentioned of a vineyard near Malaga affected by this parasite and supposed to have been destroyed, which nevertheless broke into leaf with fresh vigour after the earthquakes which recently devastated the southern provinces of Spain.—Application of the general laws of the theory of the partition of numbers to numerical functions, by M. N. Bougaieff.—On an easy method of controlling the velocity of electric motor currents (one illustration), by M. Marcel Deprez.—Note on the suppression of the nitrous vapours of the Bunsen pile, and on a new pile which becomes depolarised in the atmosphere, by M. A. d'Arsonval.—On a new variety in the anomalous group of Cyclocephalians, by M. A. Lavocat. This variety, for which the term "ophthalmocephalous" is proposed, is illustrated by the recent case of a still-born lamb, in which nose and eyes were entirely absent, and, in place of the orbits, showing in the median plane a cavity formed by the union of the two temporal fosses. At the same time the tongue, the ears, and all the parts corresponding with these organs were in the normal state.—On the system of canalisation present in the cellules of plants, and on the continuity of the protoplasm in vegetation, by M. L. Olivier. In opposition to the generally accepted views, the author infers from his microscopic studies that in the thickness of the membranous walls of plants there is a highly developed network of canals, by means of which the continuity of the protoplasm is effected throughout the cellular system.—An attempt to determine the relative age of the Grand'-Combe Carboniferous deposits by means of their fossil vegetation, by M. R. Zeiller.

ROME

Reale Accademia dei Lincei, January 4.—On pleasurable and periodic respiration. Prof. Mosso communicated an abstract of a memoir in which he expounds various observations made by him on respiration. By means of tracings taken from a man in a state of complete rest, he has recognised that in the respiratory movements periods of greater or less depth in breathing alternate with one another, and that such periods are observable in all animals, especially during sleep. The author has likewise ascertained that man breathes a greater quantity of air than is necessary, and it is that respiration that he calls pleasurable (*respirazione di lusso*). It is in consequence of this excess in the ordinary breathing that a man does not increase the extent of his respiratory movements in ascending a mountain or in undergoing a change of atmospheric pressure. Prof. Mosso has determined the limit of this pleasurable respiration which is manifested in sleep when no cause would render it necessary. According to the pauses which the periodic respiration undergoes, the author divides it into *remittent* (*remittente*) and *intermittent* (*intermittente*). These pauses do not depend on the movements of the blood-vessels nor on psychical factors. It is a recognised fact that respiration has not a single centre, but that various muscles subserve this function independently of each other. Prof. Mosso concludes that not only is periodic respiration a normal physiological phenomenon, but that it is nothing else than the respiration of Cheyne and Stokes, which has hitherto been looked upon as a morbid condition. The author closes his own paper with a critical review of the theories of the nature of the movements of respiration.—Other communications:—Dr. Piccini described the analyses and the methods of preparation of certain fluor salts of titanium, corresponding to the sesquioxide, which had been obtained by him.—Drs. Ciamician and Silber described the results of the action of nitric acid on pyril-methyl-ketone.—Drs. Ciamician and Magnagui communicated a first note on the action of carbonyl chloride on the potassic compound of pyrrol.—The sanction of the Academy was likewise given to the printing, in the *Atti Academici*, of a memoir by Prof. Belloni, in which the author describes the olfactory and olfactory-auditory apparatus of the teleosteans (the *nuclei rotundi* of Fritsch).—The Secretary, Signor Blaserna, read a communication by Signor Laure, in which the author insists on the necessity of paying great attention to the barometric variations in cases of earthquakes and volcanic eruptions.

January 18.—Articles belonging to the Stone Age discovered in the commune of Breonio Veronese. Prof. Pigorini observed that of all the localities containing remains of the Stone Age Breonio Veronese is the most interesting and the richest, on account of its numerous caves in which primitive man has left his traces. The numerous flint implements found in that locality were attributed by ancient writers to the Cimbri. Some of these have common forms, but others are of very singular shape, and the use of the latter cannot be determined. The importance of such articles, which are found also in the sepulchres of the Stone Age near the caves, but which are there reproduced almost in miniature, consists in the fact that articles of the same form are found among the remains belonging to the prehistoric American stations, which leads us to surmise the existence of a bond of connection in the earliest times between the inhabitants of the Old World and the New. Prof. Pigorini, while dwelling on the great value of the collection of such curiously-shaped articles made by Signor S. de Stefani, and described by him before the Congress at Venice, was glad to be able to announce to the Academy that the collection had been acquired by Prof. Landberg, whose attachment to Italy and whose philanthropic character were well known, and that it was his generous intention to present the collection to the Prehistoric and Ethnographical Museum at Rome. This valuable scientific material is thus to remain in Italy.—On the observations on the solar maculæ and faculæ made in the Observatory of the Collegio Romano in 1884. From the observations made, Signor Tacchini believed that he could conclude that the solar activity was diminishing and that it would very soon reach its minimum. Comparing the observations of 1883 with those of 1884, he found that in 1884 chromospherical phenomena attained a considerable development. Signor Tacchini, although he has not yet completed his labours in reducing the observations, i sof opinion that 1884 will have to be remembered as a year of maximum frequency of hydrogenic perturbations, but he intends to return to the question when he has completed the calculations relating to it.—On an ancient vase representing Sappho.—Signor Comparetti read some preliminary notes regarding an ancient vase belonging to the collection of the Archæological Society of Athens. On this vase, the drawing on which is rather rude, Sappho is represented in the midst of her disciples, she herself being in the act of reading some epic lines written on a roll held in her hand. This vase belongs to the fourth century B.C., and hence to the period in which Sappho was most popular in the refined and gallant society of Athens. According to Prof. Comparetti, the two disciples who are listening to Sappho, must, judging from their names which are written on the vase, be two Athenian hetæræ.—Discovery of an ancient encyclopædia, and the plagiarism practised on it. Signor Narducci announced that he had discovered in the Biblioteca Angelica, at Rome, a parchment MS. belonging to the end of the thirteenth century, containing in its first 129 pages an encyclopædia, hitherto unknown, compiled by Egidio Colonna, of Rome. After giving an account of the contents of this work, Signor Narducci drew attention to the shameless manner in which the encyclopædia of Colonna had been plagiarised by the Englishman Bartholomew Glanville, commonly called *Bartholomeus Anglicus*, who flourished about 1630. This writer acquired the greatest reputation by a book of his called "Liber de proprietatibus rerum," which is in great part copied word for word from the encyclopædia of Colonna.—Other communications: Signor Fiorelli gave an account of the excavations of antiquities made during the month of December.—Dr. Nasini made a communication regarding some researches he had made on the atomic refraction of sulphur, and on the higher value of that refraction.—Dr. Piccini read a note containing some general considerations on peroxides of the type of peroxide of hydrogen, and made a communication as to the continuation of his researches on a new series of titanium compounds.

February 1.—On the hydrogenic protuberances of the sun, observed at the Royal Observatory of the College of Rome in 1884.—Prof. Tacchini, in continuation of his previous note to the effect that 1884 must be considered as a year in which the phenomena of the chromosphere had attained their maximum development, presented the results of observations made by him on 242 days. From these it appeared that the number of the protuberances increased from March to October. In order to get rid of the anomalies which are met with in various observations, and to obtain a curve representing the course of the phenomena in the quinquennial period 1880 to 1884, Prof. Tacchini has taken as monthly means the means of three months, considering each month along with the month before and after it. The curve so constructed shows three culminating points or periods of maximum activity, these corresponding to July, 1880, September to October, 1881, and March, 1884, which last is the highest in the whole series. The maximum of the protuberances follows that of the sunspots, and recent observations make it probable that 1885 will be a year of greater activity in the chromosphere and solar atmosphere.—On the degree of precision in the determination of the density of gases. Dr. Agamennone stated that the first to experiment with a certain amount of success on the density of gases were the physicists Dumas and Boussingault, and that Regnault had introduced the most important improvements in the methods of working adopted by them. He observed, however, that even these improved methods of Regnault were not exempt from certain errors, the nature of which the author pointed out and described, indicating the precautions that had to be used in the various operations of weighing, in order to avoid some of these errors by taking advantage of the accurate instruments which we possess at the present day. The author insisted specially on the constant source of error proceeding from the property which glass has of condensing gases on its surface, and on the exactness of measurement required in determining the pressure at which the gas to be weighed is contained in the vessel in which the weighing is effected. Dr. Agamennone has repeated in the Royal Physical Institute of Rome all the experiments of Regnault, and, correcting an error found in one of the experiments of that physicist, he finds that for the value of the weight of a litre of air, which, according to the corrections made by Kohlrausch and Lasch, would be 1·292756 grammes, there ought to be substituted 1·292767 grammes—a determination which, according to Dr. Agamennone, is subject to a maximum uncertainty of about ± 0·0005 gramme, and to a mean uncertainty of ± 0·000067 gramme.—Determination of the density of the air. Dr. Agamennone having in his previous paper shown how in the determination of the density of gases the errors affecting the final result proceed from the measurements of weight and pressure, announced that he had executed two series of experiments for the determination of the density of the air, making use of weights and pressures separated from one another by pretty wide limits. The pressures employed in the two series of experiments were: (1) that of the atmosphere; and (2) one of two atmospheres. The author, after describing his methods of procedure and the precautions taken by him, communicated his results, which showed a great difference between the mean values of his two series, and that because the air under pressure departs from Mariotte's law. Dr. Agamennone concludes that when the density of a gas is to be determined, the gas being weighed in a compressed state, it is necessary above all to know by direct experiments the variations in volume of the gas operated on, and to know what amount of condensation there is on the walls of the vessel in which the gas is compressed. For the determination of the deviation of a gas from Mariotte's law, which is a matter of so much importance in researches of this kind, the gas might be weighed at different pressures in a resisting vessel with a sufficiently delicate balance. Some experiments of Regnault have shown this method to be sufficiently satisfactory.—Consequences of a new hypothesis of Kohlrausch on thermo-electric phenomena. Dr. Battelli, after giving a *résumé* of the theoretical explanations offered by Thomson and Tait to account for the results obtained experimentally in thermo-electric phenomena, stated also the hypothesis of Kohlrausch on the electrical transport of heat, and showed how, from the conclusions of Kohlrausch, all the formulæ confirmed by experiment might be deduced.—Other communications:—Drs. Ciamician and Silber have continued their studies on the compounds of pyrrol, and explained minutely the method by which they had succeeded in converting pyrrol into pyridin.—Prof. Cassani communicated a paper on the angles of linear spaces.—Dr. Tonelli presented a note on the analytical representation of certain singular functions.—An abstract was communicated of a memoir by Messrs. Vanecek, entitled "Sur la Génération des Surfaces et des Courbes gauches par les Faisceaux de Surfaces."

February 15.—On the worship of stone weapons in the Neolithic age. Signor Pigorini exhibited a singular flint implement which had been found in one of the caves in the commune of Breonio Veronese, referred to the Neolithic age. It has the triangular form of a lance- or arrow-head, but is of rather large dimensions. It weighs, in fact, 1·710 kilo., and one of the equal sides of the triangle is more than 21 cm. in length. It cannot be supposed that this colossal spear-head could have been used as a weapon, chiefly because its dimensions would have required a shaft of quite unmanageable size, but also because the cavity at its base would have rendered the shafting extremely fragile. Signor Pigorini called to mind how, even at the present day, the common people attributed a celestial origin to the weapons of stone—a superstition which also existed among the ancients; but there are proofs that at the very time when these weapons were made they were held as emblems of divinity. There was, in fact, in the Neolithic age, a worship of the axe, since specimens of that weapon are found, of dimensions so small or so large, like that of Breonio Veronese, that they cannot be regarded as anything else than votive offerings.—Concerning a fragment of a manuscript of Cicero belonging to the ninth century. Signor Narducci found, in the Vatican Library, a valuable manuscript containing numerous Ciceronian fragments collected by a certain Hadvardo. Signor Narducci transcribed the manuscript page by page, in the hope that, by collating it with the works of Cicero, now known, he might find some fragments of lost books of the great orator. After identifying each of the fragments, he found that the compiler had not had at his disposal any of the works of Cicero known in the Middle Ages, but not at the present day. Signor Narducci gave a short specimen of the manuscript, with the various readings found at the present day in the most esteemed versions of the various works of Cicero, and he announced that Prof. Schwenke is preparing a critical study of the manuscript in question.

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