into a sealed tube, and heated for 7 hours to 125°. The principal results of this reaction were hydrochloric acid, free iodine, and methylene iodide CH_2I_2. Now, remembering the fact, demonstrated by Kekulé, that iodides, submitted to the action of hydriodic acid, undergo an inverse substitution, the reaction just described may be explained by supposing that the chloroform is in the first instance converted into iodoform, which is then converted into methylene iodide by the action of the hydriodic acid, thus—

$$CHCl_3 + 3HI = CHI_3 + 3HCl,$$
$$\text{and } CHI_3 + HI = CH_2I_2 + I_2.$$

In other cases, the action represented by the second equation goes so far as to remove all the iodine from the iodated product formed in the first instance, and convert it into the corresponding hydride. Such, indeed, is the case with compounds belonging to the aromatic series. Berthelot [Bull. Soc. Chim. (2) ix. 30] has shown that Julin's chloride of carbon, or perchlorinated benzene, C_6Cl_6, is converted into benzene, C_6H_6, when heated to 280° with a large excess of hydriodic acid; and Lieben finds that monochlorobenzene, C_6H_5Cl, heated to 235°, for 15 hours, with from three to five times its weight of hydriodic acid, likewise yields benzene.

The action of hydriodic acid on organic chlorine-compounds appears, then, to exhibit two cases:—(1.) The chloride is easily converted into the corresponding iodide by double decomposition, whereas the transformation of the iodide into the corresponding hydride is difficult, and takes place only at high temperatures. In this case, if the experiment is well conducted, an iodide is obtained without a trace of hydride. Such is the case in the action of hydriodic acid on the chlorides of the series $C_nH_{2n+1}Cl$. (2.) The chloride is attacked by hydriodic acid with difficulty, and only at a high temperature, whereas the conversion of the iodide into hydride takes place easily, and at a comparatively low temperature. In such cases, as with the chlorides of the aromatic series, the product of the reaction is a hydride without any trace of iodide. In some cases, as that of chloroform, intermediate products are obtained, only part of the iodine being removed by the inverse reaction. [Giornale di Scienze di Palermo, v. 130.]

SCIENTIFIC SERIALS

THE *Archives des Sciences Physiques et Naturelles* for December 15, contains a paper by Professor Heer, on the Miocene Flora of Spitzbergen. The writer gives a preliminary account of the fossil plants collected and sent to him by the Swedish Polar Expedition of 1868. The number of species found in the Spitzbergen Archipelago amounted to 131, of which 123 were phanerogamic, and 8 cryptogamic. Figures and a detailed description of these are promised to appear in the Memoirs of the Stockholm Academy. The next paper is an extract of Thomsen's Thermochemical Researches (taken from Poggendorff's *Annalen*), to which Marignac has appended some valuable comments. Prof. Marignac adds a paper of his own, on the influence of water on the double decompositions of salts, and on the thermal phenomena which accompany them. The author was induced to publish this preliminary memoir in consequence of the appearance of Thomsen's results. He points out some interesting cases of retardation of chemical equilibrium, and intends to investigate them further. The rest of this number—the last of the year—is occupied by the usual *Bulletin Scientifique*, Meteorological Observations, and an index to the volume (xxxvi. N. S.)

In Polli's *Annali di Chimica applicata alla Medicina* for December, we observe, among other papers, a note on the action of hydric sulphate on iodides, by Dr. Vitali. It is generally supposed that the action referred to terminates with the production of sulphurous oxide and iodine; but Vitali has noticed, in addition, the formation of hydric sulphide and sulphur—fresh instances, consequently, of the reducing energy of hydric iodide. In a paper on Ferric Albuminate, Peretti shows that albumen is capable of dissolving Ferric oxide. The filtered solution, if evaporated at a gentle heat, dries up to a rose-coloured pellicle, which can be again dissolved in water, and coagulates at 75°. Details are given as to some of the reactions of the solution. Bellini contributes an article on the therapeutic (pharmaceutical) formulæ of sulphur. There are also several papers on dietetics, hygiene, and pathology, &c., taken from other journals, and an index to the volume, of which the present is the concluding number.

THE last two numbers of the *Revue des Cours Scientifiques* (Dec. 25, 1869, and Jan. 1, 1870), contain an elaborate paper on Vaccination, by M. Brouardel; a translation of Dr. Bence Jones's Croonian Lectures; an account of Schimper's Researches in Vegetable Palæontology, by M. Ch. Grad; and a lecture given by M. Bouchardat at the Paris Academy of Medicine "On the Mortality of Foster-children."

SOCIETIES AND ACADEMIES

LONDON

Geological Society, December 22, 1869.—Prof. Huxley, LL.D., F.R.S., in the chair. Messrs. Hopkinson, J. Sanders, and Jabez Church, C.E., were elected Fellows of the Society. The following communications were read:—1. "On the Iron-ores associated with the Basalts of the North-east of Ireland." By Mr. Ralph Tate, Assoc. Linn. Soc., F.G.S., and John S. Holden, M.D., F.G.S. The authors introduced their account of the iron-ores of the Antrim basalts, by stating that since 1790 an iron band had been known in the midst of the basalt of the Giant's Causeway, but that only within the last few years have further discoveries been made, which have developed a new branch of industry in the north-east of Ireland. The iron-ore of the numerous exposures was considered to represent portions of one sheet extending uniformly throughout the basalt and over a very large area. Indeed everywhere the iron band and its associated rock-masses present identical features, from which the authors deduced the following generalised section:—The underlying basalt gradually passes upwards into a variegated lithomarge of about 30 feet thick, graduating insensibly into a red or yellow ochre or bole of about 5–6 feet in thickness, which passes into a dense red ochreous mass of about 2 feet, charged with ferruginous spheroids consisting chiefly of a protoxide and peroxide. The spheroids are of the average size of peas; they increase in number and size towards the upper part of the band, and not unfrequently constitute that portion of it. The line of junction between the iron band and the overlying, and usually more or less columnar basalt, is in all cases well defined, and in a few instances exhibits decided unconformability. The authors discussed the several theories that may be suggested to account for the origin of the present condition of the pisolitic ore, and proceeded to point out what appear to have been the several stages of metamorphic action by which the pisolitic ore had been elaborated out of basalt. From field observations and chemical analysis, they have been led to consider the bole and lithomarge as the resultants of aqueous action in combination with acidulated gases, which, dissolving out certain mineral substances, has effected the decomposition of the basalts; and to assume that the bole underlying the iron band was a wet terrestrial surface, and that the subsequent outflow of basalt effected, by its heat, pressure, and evolved gases, a reduction of the contained oxides of iron into the more concentrated form in which they occur in the pisolite, the aggregation of the ferruginous particles being a result of the same actions. The ferruginous series, with interstratified plant-beds at Ballypalidy, was next described, and demonstrated to be of sedimentary origin; the ferruginous conglomerate resulting from the degradation of the pisolitic ore, of which it is chiefly reconstructed, and of the underlying ochres. Many additions were made to the list of plant remains from these beds; and priority of discovery of plants in the Antrim basalts was accorded to Dr. Bryce, F.G.S. Mr. D. Forbes was not prepared to admit some of the theoretical conclusions of the authors, and objected to calling in metamorphism to account for all that was hard to be understood. He could not recognise the division of beds so similar in character into two classes. He wished to know, assuming that the iron-ore merely resulted from the decomposition of the basalt, what became of all the silica and alumina which constituted three-fourths of the mass. The origin of the pisolitic ores was in fact organic. In Sweden certain lakes were regularly dredged each year for the pisolitic ore still in course of formation by means of confervoid algæ. He therefore regarded the whole of these beds as in a certain sense sedimentary, and though due to organic agency, yet still deriving their original mineral matter indirectly from the basalt. The basalt contained a considerable amount both of phosphorus and sulphur; and if the ores had been derived directly from the basalt, both these substances would have been present in them. This was an argument against any direct metamorphism. The presence of venadium afforded additional reasons for regarding these ores as formed in the same manner as bog iron and similar ores. Sir Charles Lyell had observed in the basalts of Madeira red ochreous bands, which represented old land surfaces, in one of which Mr. Hartog and he had discovered a leaf-bed containing vegetation of much the same character as that of the island at the present day. Near Catania, in a recent lava-stream, he had seen the junction of the lava with the soil of the ancient gardens; and in character the soil now under the lava resembled the red beds in Madeira. Mr. W. W. Smyth was on the whole inclined to admit the power of metamorphism to produce such changes as had been here effected. He commented on the advantages of employing this Irish ore for admixture with hæmatitic ore, on account of the abundance of alumina present. Possibly there had been some difference in the chemical character of the different flows of basalt. Mr. Evans suggested that the Ballypalidy beds might be the littoral deposits of a lake in which the pisolitic ores of the other parts of Antrim were deposited farther from the shore, and subsequently buried under a basaltic flow. Mr. Etheridge inquired whether the pisolitic ore had been subjected to microscopic examination, with a view of finding traces of organic forms, such as *Gallionella*. Mr. Tate, in reply, defended his views as to metamorphic action. He thought the uniformity in thickness and character of the pisolitic ore band over so large an area showed that it could not be a lacustrine deposit. He had not as yet examined the spheroids under the microscope.

"Notes on the Structure of *Sigillaria*." By Principal Dawson, F.R.S., F.G.S., Montreal. In this paper the author criticised the statements of Mr. Carruthers on the structure of *Sigillaria* (see Q. J. G. S. xxv. p. 248). He remarked that *Sigillaria*, as evidenced by his specimens, is not coniferous; that the coniferous trunks found in the Coal-formation of Nova Scotia do not present discigerous tissue of the same type as that of *Sigillaria*; that no conifer has a slender woody axis surrounded by an enormously thick bark; that *Calamodendron* was probably a gymnosperm, and allied to *Sigillaria*; that although *Stigmaria* may not always show medullary rays, the distinct separation of the wood into wedges is an evidence of their having existed; that the difference in minute structure between *Sigillaria* and *Stigmaria* involves no serious difficulty if the former be regarded as allied to *Cycadaceæ*; and further, that we do not know how many of the *Stigmariæ* belong to *Sigillaria* proper, or *Favularia*, or to such forms as *Clathraria* and *Leioderma*, which may have been more nearly allied to *Lepidophloios*; that the fruit figured by Goldenberg as that of *Sigillaria* is more probably that of *Lepidophloios*, or may be a male catkin with pollen; and that he has found *Trigonocarpa* scattered round the trunks of *Sigillariæ*, and on the surface of the soil in which they grew. He agreed with Mr. Carruthers in regarding Mr. Binney's *Sigillaria vascularis* as allied to *Lepidodendron*. Prof. Morris thought that *Clathraria* and *Lepidophlois* ought to be discriminated from the *Sigillariæ*, as being rather more nearly allied with cycadaceous plants, especially the former. He pointed out the manner in which certain vascular bundles communicating between the centre of the stem of *Sigillaria* and allied genera and their bark might be mistaken for medullary rays.

"Note on some new Animal Remains from the Carboniferous and Devonian of Canada." By Principal Dawson, F.R.S., F.G.S., Montreal. The author described the characters presented by the lower jaw of an Amphibian, of which a cast had occurred in the coarse sandstone of the Coal-formation between Ragged Reef and the Joggins Coal-mine. It measured 6 inches in length; and its surface was marked on the lower and posterior part with a network of ridges enclosing rounded depressions. The anterior part of the jaw had contained about 16 teeth, some of which remained in the matrix. These were stout, conical, and blunt, with large pulp-cavities, and about 32 longitudinal striæ, corresponding to the same number of folds of dentine. The author stated that this jaw resembled most closely those of *Baphetes* and *Dendrerpeton*, but more especially the former. He regarded it as distinct from *Baphetes planiceps*, and proposed for it the name of *B. minor*. If distinct, this raises the number of species of Amphibia from the Coal-measures of Nova Scotia to nine. The author also noticed some insect remains found by him in slabs containing *Sphenophyllum*. They were referred by Mr. Scudder to the Blattariæ. From the Devonian beds of Gaspé the author stated that he had obtained a small species of *Cephalaspis*, the first yet detected in America. With it were spines of *Machairacanthus* and remains of some other fishes. At Gaspé he had also obtained a new species of *Psilophyton*, several trunks of *Prototaxites*, and a species of *Cyclostigma*. The President objected to the term *Reptiles* being applied to Amphibia, from which they were totally distinct. He questioned the safety of attributing the jaw to *Baphetes*, of which no lower jaw had been previously found. Mr. Etheridge remarked that the *Cephalaspis* differed materially in its proportions from any in either the Russian or British rocks.

"Note on a Crocodilian Skull from Kimmeridge Bay, Dorset." By J. W. Hulke, F.R.S., F.G.S. The author described a large Steneosaurian skull in the British Museum, from Kimmeridge Bay, which had been previously regarded as Pliosaurian, and was recently identified with *Dakosaurus* by Mr. Davies, sen. From the agreement of their dimensions, and their occurrence near together, the author thought it probable that this skull and the lower jaw described by him last session belonged to the same individual. It differs from the *Steneosaurus rostro-minor* in the greater stoutness of its snout, in the presence of an anterior pair of nasal bones prolonged into the nostril, and in the number of its teeth. The author proposed to name it *Steneosaurus Manseli*, after its discoverer.

"Note on some Teeth associated with two fragments of a Jaw, from Kimmeridge Bay." By J. W. Hulke, F.R.S., F.G.S. The author described some small teeth associated with fragments of a long slender snout not unlike that of an Ichthyosaur, but too incomplete to be certainly identified. The teeth are peculiar in the great development of the cementum, which gives the base of the tooth the form of a small bulb. The exserted crowns are slightly curved, smooth, cylindrical, and pointed. The attachment to the dentary bone was probably by means of the soft tissues, and the teeth seem to have been seated in an open groove in the surface of the jaw-bone. Until additional material reveals the true nature of this fossil, the author proposes to place it alone, and to call it provisionally *Euthekiodon*. The following specimens were exhibited:—Fossils and Rock-specimens from Antrim; exhibited by Ralph Tate, Esq., F.G.S. Fossils from Kimmeridge Bay; exhibited by J. W. Hulke, Esq., F.R.S.

Photographic Society, Dec. 14, 1869.—J. Glaisher, F.R.S., president, in the chair. The Secretary read a paper by Dr. Van Monckhoven, "On a new artificial light suitable for the production of photographic enlargements," of which we give the following abstract:—In M. Kirchhoff's analysis of the sun, he has shown that there are incandescent upon the sun's surface large quantities of calcium, sodium, iron, magnesium, chromium, &c. Whether these metals exist in a free state on the sun's surface, or whether they are in the form of volatile compounds, the presence of a very high temperature, *i.e.* combustion, would be sufficient to yield not only an extremely dazzling light, but also one possessed of considerable chemical power. These conditions actually exist in the sun, the chemical action of whose rays is due mainly to the presence of chromium, titanium,* and magnesium. The author has found by experiment that nearly all the metals of the alkalies and alkaline earths, as likewise many of the metalloids, when burning in oxygen, give rise to a large emission of chemical rays, due to the production of an oxide at a high temperature, and that the same phenomenon is evident when the same oxides are produced by the decomposition of the metallic salts in a volatilised condition at a very high temperature. Magnesium produces oxide of magnesium heated to whiteness by the flame. If we direct the jet of an oxyhydrogen lamp upon the carbonate or the chloride of magnesium, we produce in either case oxide of magnesium (magnesia) at a high temperature, and moreover obtain in both instances flames rich in chemical rays. So long as the salt is not entirely decomposed the light is sustained in all its brilliancy, but when nothing but magnesia remains the light loses its brightness, and at the same time the greater portion of its chemical activity. If metallic oxides (such as lime, magnesia, alumina, zirconia) are employed and heated by the oxyhydrogen flame to a very high temperature, the illumination is very brilliant; but it is much less photogenic in its character than when the oxide in a nascent condition is produced at a high temperature, as in the case of chlorides, carbonates, &c. In the latter instance the coloured lines of the spectrum inherent to each metal may be observed, but not in the former, and this circumstance induces me to believe that the chemical action of the sun is due to the cause mentioned. Magnesium is well known to emit an abundance of actinic rays; chromium is possessed of far greater chemical intensity. If dry hydrogen gas is passed through chlorochromic acid and afterwards ignited in a current of oxygen, oxide

* It is only recently that this metal has been discovered in the sun.

of chromium is produced at a very high temperature, and at the same time, a flame of such extraordinary chemical power, that chloride-of-silver paper held at a distance of twenty centimetres (eight inches) blackens sensibly in thirty seconds, or about as quickly as in full daylight. The same experiment may be conducted with equal success with chloride of titanium, which gives a blue flame of extraordinary chemical power. Unfortunately, these chlorides can be manipulated only by persons well versed in scientific research, as they become decomposed under the influence of moist gases, and the lamp then emits a considerable amount of vapour, as in the case of metallic magnesium. Magnesium, chromium, and titanium, all of which exist in the sun, are the sources of light most suitable for the purpose. The author is at the present moment occupied in establishing the coincidence of the ultra-violet rays of the spectrum with those of these metals. For the purposes of photographic enlargement, the author uses the Drummond system, substituting for the cylinder of lime, one of very pure carbonate of magnesia, free from soda, baryta, and iron, either alone in a very compressed state, or containing titanate of magnesia obtained by a mixture of chloride of titanium and carbonate of magnesia. The pillars are square at their base, three centimetres in diameter, and eight in height; they burn for an hour and a half, and cost less than half a franc apiece. They emit a very brilliant and economical light. Instead of pure hydrogen gas, ordinary coal gas, or even alcohol, together with oxygen, may be used. The preparation of oxygen, on the author's plan, is very easy, and free from danger. He employs for the purpose calcined oxide of manganese; it is then finely powdered and passed through a sieve. The chlorate of potash he uses is also pulverised and sifted; 600 grms. of brown manganese and 1,200 grms. of chlorate are well mixed by hand in an earthen vessel and sifted, care being taken not to allow any organic matter to enter, and the whole is then introduced into the wrought-iron retort A (fig. 1). The cork stopper E, covered with tinfoil, is put into its place, and the junction F,

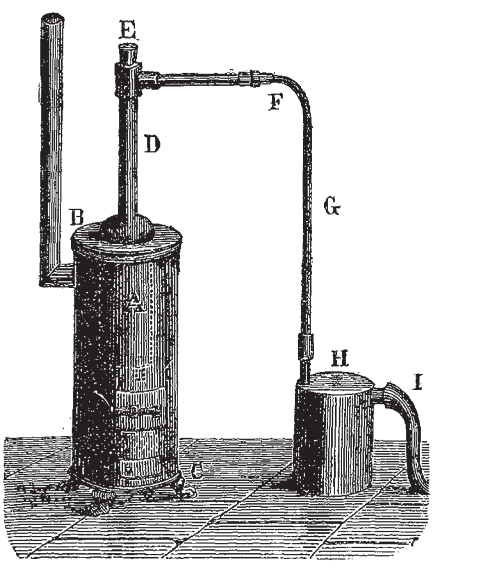

FIG. 1.

which places the retort, by means of the leaden pipe G and rubber tube I, in communication with the gas-bag, is adapted. The delivery tube (I) should be of at least half an inch internal diameter, and the wash-bottle H must be half filled with water. A small quantity of ignited charcoal is thrown into the little furnace B C, or a gas jet may be used, and after the lapse of a few minutes the india-rubber bag begins to inflate, and in twenty minutes it is full of oxygen; it is necessary during this operation to remove the weights and pressure-boards from the top of the bag. When the operation is finished and the retort somewhat cooled, the junction F is unscrewed, the cork E taken away, and warm water poured in until the retort A is filled. The water is allowed to remain for an hour, and the contents are then poured into a large jar, where, after the lapse of an hour or so, the oxide of manganese subsides. The clear water is decanted off, and the black deposit put upon a plate near the hearth to dry, after which it is again ready for repeated employment as often as desired. With ordinary native manganese a much higher temperature is necessary, the mixture having a tendency to puff up, and the operation becomes dangerous. For this reason it is advisable to use a cork stopper, E. A kilogramme of chlorate of potash yields 270 litres of oxygen, and this quantity will supply the lamp for two or three hours; thus the cost of our light, including coal-gas and the magnesia, amounts to two francs per hour. The oxyhydrogen burner used (shown in figs. 2 and 3) is very

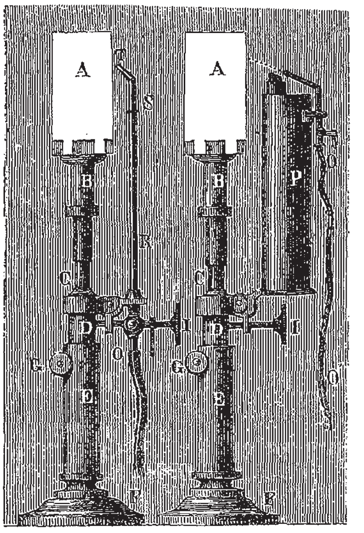

FIG. 2 FIG. 3

convenient. Those who have gas laid on in their houses will use the apparatus with two jets of gas (fig. 2); others will find it more expedient to employ the spirit-lamp arrangement (fig. 3). In both figures the same initials refer to similar details; A is the pillar of magnesia fixed upon a stem, B, which may be turned, lowered, or raised upon the rod C. E F is the stand or support, and G the pinion by means of which the light is adjusted in the centre of the apparatus. The jets for the two separate gases are formed by two concentric tubes, R, S T, sliding at S, so that the upper portion of the tube S T may be raised when it is desired to heat the top of the magnesia pillar A. Two stopcocks, O, P, lead the gases into the apparatus, the letters H and O being marked upon them to distinguish the oxygen supply-tube from that of the hydrogen or coal-gas. By means of a screw, I, the tubes R, S T, may be approached to, or removed from, the magnesia pillar. The coal-gas does not mix with the oxygen, excepting in the flame itself. The manner of employing the apparatus is exceedingly simple. The tube and stopcock marked H (connected with the supply of coal-gas), is first opened and the gas ignited; the stopcock marked O (in connection with the bag of

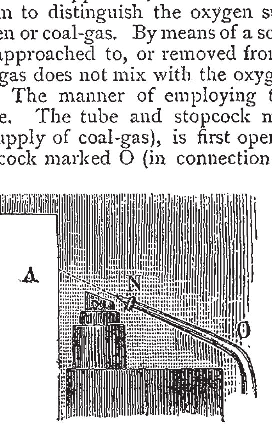

FIG. 4.

oxygen) is also opened, and the tube B then raised in such a manner that the top of the pillar A is heated by the flame, the extremity of the tube T being brought almost into contact with the magnesia. The heat soon indents the pillar, and *it is only when a cavity has been formed that the light attains its highest* *brilliancy;* at this stage the stopcock H is partially closed until the maximum amount of light has been secured. The apparatus (fig. 3) is very similar to the other. The lamp P is filled with alcohol, the wick being round and cut obliquely, as in fig. 4, the extremity of the jet N O being near enough to the wick to touch it lightly. The wick M should be almost in contact with the pillar A, which is brought about by the screw I (fig. 3). To this apparatus there is connected but one india-rubber tube, O O′, in communication with the oxygen bag. Fig. 4 shows the exact position that the jet N O should occupy in relation to the magnesia pillar. The enlarging-apparatus is shown in fig. 5. A case of

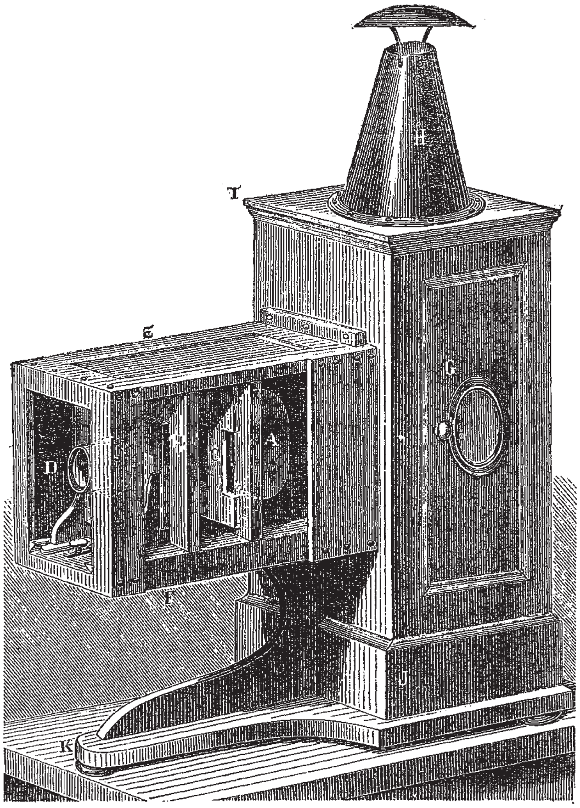

FIG. 5

polished oak, I J, surmounted by a chimney, H, with doors at the sides, G, furnished with green glass, contains the lamp. The optical apparatus is contained in the box E; it is formed of two lenses of very white flint glass, of which one is seen at A. These two lenses condense the light and transmit it through another lens, D.* Between this latter and the lenses, A, is placed the negative to be enlarged (held in the frame C). The lenses which condense the light are prepared from very translucent flint glass rather than crown glass, which latter possesses to a considerable degree the power of absorbing chemical rays emitted at a low temperature, as is here the case. For further particulars, the reader is referred to the *Photographic Journal,* No. 212.

MANCHESTER

Literary and Philosophical Society, December 14, 1869.—J. P. Joule, LL.D., F.R.S., &c., president, in the chair. Sir Charles Lyell, Bart., LL.D., D.C.L., F.R.S., &c., and Henry Clifton Sorby, F.R.S., F.G.S., were elected honorary members of the society. Mr. R. Routledge was elected an ordinary member.—Mr. W. Boyd Dawkins, F.R.S., exhibited a stone-hammer and rude splinters of flint, brought over by Mr. Bauerman from the turquoise mines of the promontory of Sinai. These mines were worked, according to the evidence of the hieroglyphic inscriptions on the rock, by the Egyptians from the third to the thirteenth of the dynasties mentioned by Manetho. The tools and flint flakes found there in and around the workings, exactly coincide with the grooves in the rock made in the excavation, and evidently have been blunted by such use. There was no evidence that metal of any kind was used in the work. Mr. Bauerman also satisfied himself that the hieroglyphs were cut with implements similar to those used in the mining. This discovery is very important, because it opens up the question as to what tools the Egyptians used in working their wonderful monuments of granite and syenite. If it were worth their while to conduct turquoise mining with flint flakes in the Sinaitic promontory, and if they used the same tools in the hieroglyphs that fix the date of these mines—and of this there can be no reasonable doubt—it is very probable that they employed the same means for the same end elsewhere, and that, to say the least, a part of their marvellously minute sculpture in Egypt has also been wrought with flint. There is no evidence that they were acquainted with the use of steel. Iron and bronze are not hard enough for the purpose.—"On the Hades, Throws, Shifts, &c., of the Metalliferous Veins of the North of England," by Mr. J. Curry, of Boltsburn, Eastgate, County of Durham. Communicated by E. W. Binney, F.R.S., F.G.S. The new views, contained in this paper, are embraced under the consideration that the hades, throws, shifts, &c., may have been chiefly accomplished by peculiar modes of depositing of the sediments, during the contemporaneous building of the veins and strata. These modes were minutely described and illustrated by diagrams, which are requisite to convey a clear conception of the processes.

Physical and Mathematical Section, December 7, 1869.—E. W. Binney, F.R.S., F.G.S., president of the section, in the chair. "On the Mean Monthly Temperature at Old Trafford, Manchester, 1861 to 1868, and also the Mean for the Twenty Years 1849 to 1868," by G. V. Vernon, F.R.A.S., F.M.S.

PARIS

Academy of Sciences, December 27, 1869.—M. H. Sainte-Claire Deville called attention to the *Annuaire du Bureau des Longitudes* for 1870, and indicated that it contained a series of observations on the densities and co-efficients of dilatations of bodies which would render it useful in chemical laboratories.—M. C. Sainte-Claire Deville, in presenting a portion of the *Bulletin Météorologique de l'Observatoire de Montsouris,* noticed the progress of that establishment and the steps that are being taken for the cultivation of meteorology in France.—General Morin made a communication on some successful experiments which have been made on the acclimatisation of the *Cinchona officinalis* in the island of Réunion.—An extract from a letter of M. I. Pierre to M. Peligot, on the presence of potash and soda in various parts of plants, was read, in which the author stated that from his investigation of wheat, it appeared that where salt exists in the soil, both soda and potash occur in the plants grown on it, but that the latter increases in quantity up to the ear, whilst the soda is found especially in the lower parts of the plant. The amount of potash in different parts of the plant is in harmony with the amounts of nitrogen and phosphoric acid.—A note by M. S. Cloëz, on the disinfection of commercial sulphide of carbon, was presented. His process consisted in agitating the crude substance with $\frac{1}{2}$ per cent. of its weight of finely-powdered corrosive sublimate, which throws down a semifluid compound of disagreeable odour. The supernatant liquid is then decanted and distilled. — Some chemical researches on copper, by Mr. T. Sterry Hunt, were communicated. The author referred to the resemblances existing between perchloride of silver and protochloride of copper, which also extend to the oxides. He described the behaviour of protoxide of copper with various chlorides, especially those of magnesium and iron, and also that of peroxide of copper with protochloride of iron.—M. Daubrée presented a note by M. Terreil on the modifications undergone by minerals by the action of saline solutions. It related to the action of the alkaline monosulphides upon the natural metallic sulphides, selenides, and tellurides, singly or in combination.—A note by M. J. Personne, on the preparation and properties of hydrate of chloral, was read. The author described the differences in the physical properties of the substances obtained by himself and M. Roussin as hydrate of chloral, and indicated that these are due to the fact that the

* In apparatus where the lenses, A, are ten inches in diameter, one of them may be removed, and the case, I J, also; then, by adjusting a reflector, it is possible to work by sunlight when the same is procurable.

compound prepared by the latter is not pure, but contaminated by the presence of a considerable amount of alcohol.—M. Dubrunfant continued the discussion on the nature of inverted sugar, by a description of his method of separating levulose from it. He effects the separation by the addition of hydrate of lime to a solution of inverted sugar, presses the crystalline magma produced, and removes the lime by treating both the solid residue and the expressed fluid with an acid. This process, according to the author, effects the nearly complete separation of the two forms of glucose, and he suggested that it might become of importance, as levulose possesses far higher sweetening powers than right glucose.—Mr. T. L. Phipson communicated a note on some substances extracted from the fruit of the walnut. From the green envelope of the fruit he obtained a yellow, crystalline substance, of little stability; this, in a few hours, produced a black, amorphous, resinous substance, $C_6 H_6 O_7$, which the author called *regianic acid.* With alkalies it forms soluble salts of a magnificent purple colour, and with oxide of lead a violet-brown insoluble salt. For the yellow body he proposed the name of *regianine.* A substance occurring in the episperm of the nut was called *nucitannine;* it is the cause of the harsh taste of that skin. From it, by treatment with mineral acids, the author obtained glucose, ellagic acid, and a red, insoluble body, which he named *rothic acid.* Its composition was said to be $C_{28} H_{12} O_{14}$. The green envelope, when fresh, absorbs oxygen with avidity from the air; when mixed with soda, it absorbs oxygen much more rapidly than phosphorus.—In a note on the simultaneous action of the intra-pilar current and nascent hydrogen upon organic acids, M. E. Royer described his treatment of oxalic acids by these agencies. Concentrated solution of that acid, placed in the porous cell of a Grove's battery, furnished a considerable quantity of formic acid in a few days, the oxalic acid having been split, and hydrogen having combined with each of the two half-molecules. No carbonic acid was set free.—M. Delafosse presented a report upon M. Kokscharow's contributions to the mineralogy of Russia, indicating the general character of that work.—M. Feil exhibited some specimens of heavy glass (Faraday's glass), prepared by a new process which enables it to be produced in large masses. He also sent in some examples of artificial gems.—A note by M. M. A. Gaudin, on the production of artificial gems, was also communicated; it was accompanied by a small collection of specimens.—A memoir was presented on the general movements of the atmosphere, by M. Peslin; also one on the graduation of galvanometers, by M. P. Blaserna; and another, containing the first part of a new method for the solution of problems in mechanics, by M. Piaron de Mondesir.—Of biological papers, M. Lacaze-Duthiers communicated a first memoir on the morphology of the mollusca, relating to the *Gasteropoda.* To this we may probably refer elsewhere.—M. P. P. Dehérain presented a paper on the metamorphoses and migrations of the proximate principles in herbaceous plants, in which the author traced the course of the more important vegetable compounds from one set of organs to another during the life of the plant, and indicated the changes which they undergo in different parts. He ascribed the transport of soluble materials from one part of a plant to another to the varying amount of aqueous evaporation from the surface. The accumulation of insoluble proximate principles in the seed was also accounted for by the author on the supposition (experimentally arrived at) that wherever in a system fully charged with liquids there is a point at which the dissolved elements become insoluble, they tend towards that point in order to maintain the equilibrium. Of the means by which the soluble elements are converted into insoluble ones, the author attempted no explanation.—M. Milne Edwards presented a note by M. Balbiani on the constitution and mode of formation of the ovum in the *Sacculinæ*, in which that author contests some of the points insisted on by M. E. van Beneden in a former paper (see NATURE, p. 246).—The question of the antiquity of the horse in Egypt formed the subject of notes by MM. F. Hément, F. Lenormant, and Faye. M. Lenormant disposes of the passage in Genesis in which *mules* are supposed to be referred to. He seems inclined to consider that the word translated mules (which occurs nowhere else in the Bible) really signifies hot springs. M. Faye, in opposition to all authority, holds fast by the ordinary modern version, and also cites the passage in the same book in which horses are mentioned among the animals taken by Joseph in exchange for corn during the years of famine in Egypt. From the fact that horses are here familiarly mentioned, M. Faye infers that their employment in Egypt as domestic animals must then have been of long standing.—M. E. Decaisne communicated a paper on suckling by mothers; and Mr. T. L. Phipson a note on the explosion and fall of meteorites. Papers were also presented by M. Bonjean, on the detection of hydrocyanic acid and cyanides in cases of poisoning; by M. Guyot, on the toxical effect of rosolic acid; by M. Trouvé, on the employment of electricity in seeking metallic bodies in wounds, &c.; by M. L. Colin, on telluric emanations and their connection with fevers; by M. Gouteyron, on the influence of the shell of iron vessels upon the compass; by M. Jouglet, on the production of an explosive powder by the action of coal-gas upon nitrate of copper; and by M. Dupuis, on a new hydraulic lever.

DIARY

THURSDAY, JANUARY 6.

ROYAL SOCIETY, at 8.30.—Some Account of the Suez Canal: J. F. Bateman, F.R.S.—On the Mineral Constituents of Meteorites: N. Story Maskelyne.—On Fluoride of Silver: G. Gore, F.R.S.

ROYAL INSTITUTION, at 3.—On Light (Juvenile Lectures): Prof. Tyndall, F.R.S.

SATURDAY, JANUARY 8.

ROYAL INSTITUTION, at 3.—On Light (Juvenile Lectures): Prof. Tyndall F.R.S.

MONDAY, JANUARY 10.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.

MEDICAL SOCIETY, at 8.

TUESDAY, JANUARY 11.

CIVIL ENGINEERS, at 8.

PHOTOGRAPHIC SOCIETY, at 8.

ETHNOLOGICAL SOCIETY, at 8.—On the Kitai and Kara-Kitai: Dr. Gustave Oppert.—On the Origin of the Tasmanians, geologically considered: J. Bonwick, Esq.—On some Prehistoric Remains discovered in New Zealand: Dr. Julius Haast, F.R.S.

WEDNESDAY, JANUARY 12.

MICROSCOPICAL SOCIETY, at 8.—On the Calcareous Spicula of the Gorgoniadæ: W. S. Kent, F.Z.S.—On an Undescribed Stage of Development of Tetrarhyncus Corollatus: Alfred Sanders, M.R.C.S.—On a New Method of Measuring Spectra Bands: John Browning, F.R.A.S.

GEOLOGICAL SOCIETY, at 8.—On the Superficial Deposits of Portions of the Avon and Severn Valleys and Adjoining Districts: T. G. B. Lloyd, Esq., C.E., F.G.S.—On the Geological Position and Geographical Distribution of the Reptilian or Dolomitic Conglomerate of the Bristol Area: R. Etheridge, Esq., F.G.S.

THURSDAY, JANUARY 13.

LONDON MATHEMATICAL SOCIETY, at 8.—Equations of Centres and Foci of certain Involutions: Mr. J. J. Walker.

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