M. Van Rysselberghe's "universal meteorographic system" (which we lately noticed), is here described in full, with illustrations, and deserves the attention of meteorologists.

SOCIETIES AND ACADEMIES

EDINBURGH

Royal Society, Dec. 22, 1873.—Sir W. Thomson, president, in the chair. At the request of the Council, Dr. Andrews gave an address on ozone. After giving a full *résumé* of the history of the discovery of the more important properties and relations of ozone, Dr. Andrews showed a number of beautiful experiments. Especially remarkable among these was a class-illustration of the contraction of oxygen by the silent electrical discharge. By the use of a new form of apparatus a diminution of volume was obtained, exceeding any hitherto recorded. Among the more remarkable of the new experiments shown was one quite recently made by the lecturer, proving that coarsely pounded glass, shaken in a vessel containing electrolytic oxygen, rapidly destroys the ozone reactions. This experiment forms a new link between a purely mechanical action and a chemical change, closer than any hitherto observed. The chairman, thanking the lecturer in the name of the Society, pointed out how very large a portion of all that we know about ozone is due entirely to the exquisite researches of Dr. Andrews.

Royal Physical Society, Dec. 17, 1873.—Dr. James M'Bain, R.N., president, in the chair.—The communications read were the following :—On a deposit of magnetic iron ore on the shores of Bute, by James Middleton, M.B. (with exhibition of specimens.) It seems that some time ago Mr. Cameron, of Rothesay, had noticed some remarkable kind of black sand on the beach at Bogany Point, at the entrance to Rothesay Bay. Being interested in it, he carried home a specimen, dried it, and made an examination of it, the result being that he found the sand to consist of almost pure magnetic iron-ore. Bogany Point is not the only part of Bute where it has been found, as it occurs at Kilmichael in the Kyles of Bute. An interesting circumstance, probably connected with this deposit, is that captains of small coasters in the neighbourhood say that they have noticed a divergence of the compass near the point where the principal deposit lies.—Experiments regarding the rate of deposition of sediment from fresh and salt water, by David Robertson, F.G.S. A simple way to illustrate the experiment of the precipitation in fresh and sea water is to take two small glass jars of equal size. Fill the two about four-fifths full, the one with sea and the other with fresh water ; then fill both up with clay dissolved in fresh water—say about the consistence of cream—and stir both well up. Set the jars side by side to settle, and in a very short time the precipitation in the jar containing the sea-water will be seen to be going on rapidly, while in the jar with the fresh water little or no change will be observable. From these results, we can easily understand that whatever changes may have taken place relatively to land and sea from other causes, it does not appear that deposits from fresh water currents can be carried far seaward.—Note on the deposition of mud from various solutions, by Joseph Sommerville.

MANCHESTER

Literary and Philosophical Society, Dec. 16, 1873.—E. W. Binney, F.R.S., vice-president, in the chair.—"Method of Construction of a New Barometer," by Dr. J. P. Joule, F.R.S., president. The condition of the instrument placed on March 18 in the Society's Hall proves that it is possible to use sulphuric acid on the top of the mercurial column without chemical action taking place. I have therefore proceeded to prepare other tubes with a view to test, by practical work, the merits of the new contrivance. A tube of about $\frac{3}{16}$ inch bore is selected. It is first cleaned by drawing a knotted string through it. It is then bent to the siphon shape ; and near the longer end it is drawn to a capillary tube. It is then washed with nitric acid ; afterwards with sulphuric acid. The sulphuric acid is then drained off. Mercury is then poured into the short limb. The end of the longer limb is then attached to my mercurial exhauster. On working this the mercury rises in the tube, and, being replenished by pouring it into the short limb, soon arrives at the height due to the atmospheric pressure. It carries with it the acid left adhering to its sides, so that after a few hours half, or, what is better, one third of an inch of acid stands above the mercury. Small bubbles of air are seen to arise ; but by leaving the tube in connection with the exhauster for a day or two these finally cease. Mercury is then poured into the short limb until that in the longer rises nearly to the capillary part of the tube. This is then sealed and detached from the exhauster. Mercury is then removed from the shorter limb until it stands in the long one at a convenient height. Sulphuric acid is then introduced into the short limb until it forms a column equal to that in the longer limb. A small tube is finally attached to the short limb, and dipping a little way into a small bottle containing a small quantity of sulphuric acid, prevents the access of moist air into the short limb. The tube thus completed possesses the following advantages :—1st. There is the utmost facility in the movement of the column, so that the most minute changes of pressure are at once registered without any dragging. 2nd. The depression produced by capillary action is reduced to one half, so that the siphon arrangement can be satisfactorily used as affording an accurate neutralisation of capillary action.—Mr. Baxendell read a letter from Prof. C. Piazzi Smyth, F.R.S., Astronomer Royal of Scotland, referring to Prof. Reynolds's experiments on exploding glass tubes, and confirmatory of the conclusions of the immense force exerted by water when suddenly converted into steam, as when lightning rends a tree.

VIENNA

Imperial Academy of Sciences, Oct. 9, 1873.—Prof. Krasan made two contributions in plant physiology ; one of them as to what degree of heat wheat-seeds can bear without losing the power of germination. It is much higher than had been thought. They could bear a boiling heat for some hours, desiccation being effected by very gradual rise of temperature, and the use of chloride of calcium (65° for one hour was the limit previously supposed) —A second paper treated of the germination of tubers and bulbs of some early-spring plants.—Prof Lindemann communicated a paper on the behaviour of acrylic acid towards hydrogen liberated from acid solution, and towards agents of oxidation. He finds that acrylic acid at 100° C., with zinc and sulphuric acid, readily passes into ordinary propionic acid ; and that, in oxidation, it furnishes no acetic acid. He thinks acrolein and acrylic acid cannot be constituted similarly to true aldehydes and fatty acids.

October 16.—Prof. Heller, who had been requested to study the Tunicata of the Adriatic, gave a paper on the vascular system of these animals, and especially Ascidians. The walls of the heart (which is a long cylindrical bag, with a thin pericardium), show fine striated muscular fibres, not parallel, but forming a network. The two vascular trunks immediately proceeding from the heart have a similar wall-structure, and contract along with it. The vessels supplying the outer coat in Ascidians always appear as double vessels, joined together only at the end of the last ramification ; in one vessel the blood flows outwards, in the other inwards. The blood in Ascidians is often coloured ; sometimes greenish yellow, sometimes brownish ; while in some species (as *A. intestinalis*), it is quite colourless.—Dr. Von Reuss communicated the first part of a monograph of the fossil bryozoa of miocene Tertiary strata in Austro-Hungary. —Prof. Ritter read a paper on the path of Winnecke's Comet (III. 1819).—Prof. Böhm described experiments which proved the injurious action of ordinary gas on plants. For example, of ten plants (Fuchsia and Salvia), in pots, in which gas was constantly being conducted to the roots, seven died in four months. It was also shown that the gas does not in the first instance kill plants, but that it poisons the ground. Dr. Böhm recommends Von Jürgen's method of preserving plants from gas in the ground, which is, to place the pipes in wider pipes communicating with the outside air, and in which a draught is produced.

October 23.—M. Stefan gave the result of experiments on evaporation, made chiefly with ether. The rapidity of evaporation of a liquid in a tube is inversely proportional to the distance of the liquid surface from the open end of the tube ; it is independent of the diameter, and increases with the temperature. If a pipe, closed at one end, open at the other, is dipped with the latter in ether, bubbles are developed, and the times in which successive equal numbers of bubbles appear, are (initially) in the proportion of the odd numbers. If the tube contains hydrogen instead of air, the same number of bubbles appears in a four times shorter period. Thus evaporation in hydrogen is four times quicker than in air. If a pipe, with open stop-cock, is dipped in ether, and the cock then closed, the

surface of liquid within the tube sinks under that without, and the depths to which it sinks in given times are as the fourth roots of the times.—Dr. Peyritsch communicated a memoir on Laboulbenia, describing a new species of the parasitic fungus, also the mode of development.

I. R. Geological Institute, Oct. 30, 1873.—Prof. Dr. A. Alth sent the first part of a monograph on the palæozoic rocks of Fadolia and "its organic remains," which will be published in the transactions of the Institute. This first part of Dr. Alth's memoir contains the geological description of the oldest formations of Padolia which, covered by large masses of cretaceous and tertiary deposits, and nearly horizontally stratified, appear only in the deep creeks along the beds of the rivers. The lowest rudimentary beds, resting immediately upon granite are sandstones which alternate with violet Argyle-slates, and are almost deprived of fossils. They contain the known concretionary globes of phosphorite. The next layer consists out of bituminous limestone with many fossils which belong to the Wenlock series; it is covered by grey marly slates which contain Brachiopods and Crinoids, and rarer Trilobites and Orthoceratites. The highest Silurian beds are green or grey shists alternating with crystalline limestones, which correspond to the Ludlow-series and contain, besides other fossils, very interesting remains of fishes. The Silurian strata are covered by red sandstone of Devonian age, and these immediately by the cretaceous strata. Of the fossil remains are described in the first part of the memoir, the fishes, chiefly Cephalaspidæ but partly also Placadermata (M. Cay) and the Crustaceæ, as Trilobites and Ostracadæ. They are figured on five plates.—Dr. O. Leny describes a fossiliferous bed belonging to the upper Neocomian limestone (Spatangenkalk) near Klein, in Vorarlberg. It consists chiefly of well-preserved oyster-shells and contains, besides, many different forms of Brachiopods, which certainly lived here in company with the oysters. This observation furnishes a new proof that the ancient Brachiopods were not confined to the deep sea like the modern representatives of this class, but inhabited the shores, also, together with the oysters; analogous observations had been made formerly by Th. Fuchs in the tertiary deposits of the Vienna basin, and by Dr. Majsisovics in the Muschelkalk of the Rhaetic.—Dr. C. Doelter examined last summer the environs of the Gurgl-valley in the Oetzthal Alps. He sends a notice about the different crystalline rocks which form this region.

GÖTTINGEN

Royal Society of Sciences, Sept. 3, 1873.—Chemical papers were communicated, on a base from nitrobenzanilid (Hübner and Retschy), on the xylidine from coal tar (Hübner and Struck), on the combination of nitrile with aldehydes (Hübner and Jacobsen).

November 12.—Dr. Hermann Ethé made a lengthy communication on the oldest period in new Persian poetry, criticising works of the poet Rûdagê, some of whose songs he translates.

BOSTON, U.S.

Natural History Society, Oct. 15, 1873.—Mr. S. H. Scudder described some kittens which he had seen at Plymouth, N.H., supposed to be a cross between the rabbit and the cat. The animals had a short rabbit-like tail, long haunches, and the gait of a rabbit, but in other respects were cat-like. Mr. Scudder could not believe the possibility of a cross between animals so far apart in the natural system, and asked for information from those present.—Dr. T. M. Brewer read a paper on the specific characters of the hermit thrushes, and also read extracts on their habits from the forthcoming work on "Birds of North America," by Prof. Baird, Mr. Ridgeway, and himself.—Dr. T. Sterry Hunt gave some account of the crystalline rocks of the Blue Ridge and their decomposed condition, as seen by him at various points in the region to the south-west of Lynchburg, Va. They are principally gneisses with hornblendic and micaceous schists, like those of the Montalban or White Mountain series, and are completely decomposed to a depth of 50 ft. or more from the surface, being changed into an unctuous reddish brick-clay, in the midst of which the interbedded layers of quartz are seen retaining their original positions, and showing the highly-inclined attitude of the strata. The nature of these chemical changes of the gneissic and hornblendic rocks consisted essentially in the removal, in the form of soluble carbonates, of the alkalies, lime, and magnesia of the silicated minerals and the hydration of the residues. The great antiquity of this chemical decomposition of the rocks was next alluded to. It was, in his opinion, effected at a time when a highly carbonated atmosphere and a climate very different from our own prevailed.

PARIS

Academy of Sciences, Dec. 22, 1873.—M. de Quatrefages, president, in the chair.—The following papers were read:—Note on the report of the last meeting by M. Pasteur. The author called attention to the tone of M. Trecul's paper, which he considered was too personal; he briefly re-asserted his statements with regard to the origin of Mycoderma, &c.—M. Trecul replied and adduced in support of his own views as opposed to those of M. Pasteur, the experiments of Wyman, H. Hoffman, and Bastian. After a brief reply from M. Pasteur the subject was dropped.—On loss of magnetism, by M. J. Jamin. The paper dealt with the loss of increasing magnetism, as exhibited on cooling, suffered by a steel bar subjected to increasing temperatures.—Researches on the stability and reciprocal transformations of the oxidised compounds of nitrogen, by M. Berthelot.—On the results of the experiments made by the commission on vine sickness of the department of Herault, by M. H. Marès.—On a skeleton of *Paleotherium Magnum*, found in the Vitry-sur-Seine gypsum quarries.—On the anharmonic relation of four points of a plane.—Note on magnetism (6th part), by J. M. Gaugain.—On the phenomena of gaseous thermo-diffusion in leaves and on the circulatory movements which result from the chlorophyllian respiration, by M. A. Merget.—On the action of incandescent bodies in the transmission of electricity, by M. E. Douliot.—On an eruption of mud from the volcano of Nisyros, by M. Gorceix.—On the limit of the ice in the Arctic Ocean, by M. Ch. Grad.—On the form of the *Phylloxera*, a comparative study of the young, from leaves and branches, of hybernating and of sexed insects, by M. Max-Cornu.—An essay on the geographical distribution of the primitive populations of the departments of the Seine-et-Marne and Moselle.—On bilinear polynomes, by M. C. Jordan.—On the physical constitution of the sun, an answer to M. Faye's criticisms, by M. E. Vicaire.—Note on a process for the measurement of the relative intensity of the constituent elements of different luminous sources, by M. H. Trannin—On the chemical composition of certain vegetable parenchyma, by M. Maudet.—New researches on the preparation of Kermes mineral, and on the action of alkaline carbonates and alkaline earthy bases on sulphide of antimony, by M. A. Terreil.

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ERRATUM.—Vol. ix. p. 124. 1st col. l. 6, for "South Villa," read "Campden Hill, Kensington."