the Promotion of Science : illustrations of the rise, progress, and results of the various organisations for the promotion of science ; models, drawings, descriptions, and statistics.

MR. STANFORD has just published a North Polar map, superior in most respects to anything we have seen. It embraces a circle of forty degrees from the pole, thus including the whole of England. It exhibits faithfully all the circumpolar lands hitherto discovered, and in bold red letters shows the points reached by all the most important discoverers, with the date of discovery, from Sebastian Cabot down to Payer and Weyprecht ; even the spot where it is hoped that H.M.S. *Discovery* will winter is indicated. By means of dark and light blue, the usual limits of the ice and open water are clearly shown, and the whole execution of the map reflects the greatest credit on Mr. Stanford's establishment.

WE have seen an ingenious scientific apparatus which entirely obviates the use of matches or tapers, and does away with the attendant danger in lighting gas. It consists of a small bichromate of potash battery, the zinc plate of which is so arranged that by the pressure of the finger it can be immersed in the exciting fluid and put the battery in action. Rising from the top of the battery is a light brass stem, like a taper-holder, but in the form of a swan's neck, terminating in a little bell, within which the two "poles" of the battery are united by a spiral of platinum wire ; this wire, when the battery is put in action by the immersion of the zinc plate, becomes white hot, and will instantly ignite the gas if held over the open burner. The name which the maker, Mr. Horatio Yeates, has given to this happy contrivance is the "Galvano-Pyreon, or Voltaic Gas-lighter."

M. ELIE DE BEAUMONT left a library containing a number of valuable scientific books, which his nephew and heir has presented to the Geological Survey of France, of which his uncle was Director. The grant includes more than 2,000 volumes relating to geology, and 600 maps.

WE formerly mentioned that the widow of the late General Poncelet founded a few years ago a prize to be awarded by the Institute. It was a handsome sum of money to be given every two or three years to the author of the best essay on Mechanics. Last week Madame Poncelet sent to the Academy a large number of copies of the *Œuvres Complètes* of her husband, which were completed only last month, with the request that each successful competitor for the Poncelet Prize should be presented with a copy. But as the stock would be exhausted in the course of five or six centuries, the careful widow has created a special accumulating fund providing for a new edition in the year 2600 A.D.

THE Paris Acclimatisation Society held its anniversary meeting on the 6th of May, under the presidency of M. Drouyn de Lhuys. M. Pichot gave a long and interesting address on acclimatisation in Egypt under the Pharaohs. Many prizes were awarded for practical results obtained in the way of introducing new kinds of animals into France. One of these was given by M. Joseph Cornely, for having succeeded in the multiplication of the kangaroos left in a state of liberty.

THE additions to the Zoological Society's Gardens during the past week include a Guinea Baboon (*Cynocephalus sphinx*) from West Africa, presented by Mr. Lionel Hart; a Yellow-shouldered Amazon (*Chrysotis ochroptera*) from South America, presented by Miss M. Sutherland ; a Molucca Deer (*Cervus moluccensis*), a Pampas Deer (*Cervus campestris*), born in the Gardens ; two Chinese Jay-Thrushes (*Garrulax chinensis*) from China, purchased ; a Patas Monkey (*Cercopithecus ruber*) from West Africa ; a Hairy Tree Porcupine (*Cercolabes rupestris*), a Rock Cavy (*Cerodon rupestris*) from Brazil, deposited.

NATURAL HISTORY OF KERGUELEN'S ISLAND *

IT is difficult, owing to the inexactness of the charts, to inform you of the positions of the Astronomical Stations in whose neighbourhood I have been able to work in this island. The German station is in Betsy Cove, the American at Molloy Point, Royal Sound. The English stations also are in this Sound, the second being situated about three miles N. by W. of Swain's Haulover. The first English station is between these last two on the main land, six or seven miles N.W. of Three Island Harbour, in what will be called Observatory Bay. Two days before the Transit of Venus a party under Lieut. Goodridge, R.N., was detached from the first English station to observe the transit from a position which he selected near the base of Thumb Peak. I have not yet been able to visit Betsy Cove.

Observatory Bay is one of the minor inlets of a peninsula comprised between two narrow arms of the sea. One of these runs up from the Sound, along the western flank of the hills adjacent to Mount Crozier, several miles, and terminates at a distance of three or four hours to the north of us, and about four miles from the inlet near Vulcan Cove. The other arm, opening nine or ten miles away to the southward, proceeds in a north-easterly direction to within three or four miles of the former, and no great distance from Foundry Branch.

Besides the inlets of the sea, numerous freshwater lakes present obstacles to inland travelling. Some in this neighbourhood are two or three miles in length, but in general they are not more than a mile long. They are usually shallow, and appear to be uninhabited by fish. The bogs and streams in this vicinity are not impassable, but can be traversed with ease if ordinary care be taken.

The most salient features of the landscape are the basaltic hills, with irregular terraces of rock on their sides, and broken cliffs at their summits. In lieu of grass, their slopes are clothed with banks and boulder-like clumps of *Azorella selago*, excepting where rich damp loam affords a soil suitable for the *Acæna* and the *Pringlea*. Here and there a fern (*Lomaria*) and grass (*Festuca*) grow in the interspaces of the other plants.

The climate of Royal Sound is far warmer and drier than we were led to expect it would be. In November the weather was very pleasant; since then it has deteriorated, though the snow has not again covered the ground as it did when we first arrived. Probably the previous accounts of its meteorology were based upon observations taken in parts of the island where bad weather prevails ; or it may be that the condition of the country in winter has been presumed to be constant throughout the year. In one respect we were rightly informed ; for usually when there is no breeze there is a gale. A calm day is an exceptional event. Meteorological observations are being taken in Observatory Bay on board the *Volage* and by the sappers on shore.

Corresponding with the unlooked-for superiority in climate, a difference is noticeable in the vegetation of this part of the island. Some plants which occur at both extremities of the country display in Royal Sound marks of luxuriance. For instance, *Pringlea antiscorbutica*, which is elsewhere apetalous, here in sheltered places frequently develops petals ; some flowers in the same inflorescence possessing one petal only, others having two, three, or four. And the petals are not always of a pale greenish colour, but occasionally are tinged with purple. Again, *Lomaria alpina*, which is mentioned in the flora as rare in the neighbourhood of Christmas Harbour, is excessively common and very finely grown here. There are also more species of flowering plants and of the higher orders of Cryptogamia here than were found by the Antarctic Expedition at the north of the island. But there are fewer species of mosses, lichens, and algæ. Their paucity, in comparison with those of the other district, is probably due to the nature of the rocks on land, and to the seclusion of the bay from the open sea. The additions to the flora are for the most part Falkland Islands species.

In speaking of the climate, it may be mentioned that the plants of Kerguelen's Island are not (as was supposed) in flower throughout the year ; but probably some of them do not cease flowering until late in the winter. When we first arrived in Royal Sound the ground was covered with snow, and scarcely

* "First Report of the Naturalist attached to the Transit of Venus Expedition to Kerguelen's Island, December 1874" By the Rev. E. A. Eaton. Communicated by the President. A letter to the Secretary of the Royal Society, dated Royal Sound, Kerguelen's Island, 31st December, 1874. Read April 8.

anything had begun to come out. The *Pringlea* was far advanced in bud, barely commencing to blossom. The *Acæna* was just beginning to burst into leaf. About the first week in November *Festuca Cookii* came out, and a few days later *Azorella selago*. The young fronds of the ferns were just about to unroll. In the third week of the same month *Montia fontana* and *Acæna affinis* were in flower in a sheltered spot, and *Leptinella plumosa* was first found in blossom. *Galium antarcticum* appeared about the same date. A week later, *Ranunculus hydrophilus* and a *Festuca* (*purpurascens?*) were out, and *Lycopodium clavatum* was sprouting. By the middle of the month *Triodia* and *Lyallia kerguelensis* and also *Ranunculus crassipes* were in flower; the *Pringlea* was everywhere past flowering (excepting upon the mountains), and *Aira antarctica* began to shoot forth its panicles. Before the end of the month a *Carex* came out; but *Bulliarda* and other plants delayed still.

A few species of Mammals have been introduced into the island. Mice (evidently *Mus musculus*, L.) are common along the coast, and have been found by us in various places. The rabbits, transported by order of the Admiralty from the convict settlement in Table Bay, have been landed by H.M.S. *Volage* in Royal Sound. They share with the birds holes of the petrels, and are (it is almost superfluous to mention) propagating freely. Their favourite food is the *Acæna;* but they occasionally eat *Pringlea* leaves and gnaw away the green surface of *Azorella*. In the Crozettes, whose climate and flora are said to resemble those of this island, rabbits have become extremely abundant, and so rank and coarse that the sealers will not eat them. Goats are increasing in numbers on the leeward side of the main land.

Whales and porpoises occasionally enter the Sound. Old skulls of the latter, wanting the lower jaw, are cast up here and there on the beaches.

Up to the present time I have captured only two species of seals—a female sea leopard and two males of a Platyrhine Seal. The other kinds frequent the more open parts of the coast and islands.

Twenty-two species of birds, at the fewest, perhaps twenty-three, frequent Royal Sound, viz., a *Chionis*, a Cormorant, a Teal, a Tern, a Gull, a Skua, eleven (perhaps twelve) Petrels, two Albatrosses, and three (perhaps four) Penguins. Of these, I have procured eggs of the first six; also of six Petrels, one Albatross, and two Penguins. The *Thalassidromæ* are preparing for laying.

Fish are rather scarce in Observatory Bay. Only three species have hitherto occurred to us, two of which are common under stones at low water. The remains of a *Raia* have also been picked up on one of the islands by an officer of the *Volage*, but hardly sufficient is left to enable the species to be determined. It is allied to *R. clavata* and *R. radiata*.

The entomology of the island is very interesting. Most of the larger insects seem to be incapable of flight. I have found representatives of the orders Lepidoptera, Diptera, Coleoptera, and Colembola.

The Lepidoptera comprise a species of the *Noctuina* (as I suppose) and one of the *Tineina*. Of the first I have not yet reared the imago; the larva is a moss eater and subterranean: the adult is probably as large as an *Agrotis* of medium size. The species of *Tineina* is probably one of the *Gelechidæ*, judging from the form of the palpi. Its larva feeds on young shoots of *Festucæ*, and sometimes spins a silken cocoon for the pupa. The imago, of which the sexes are alike, has acute and very abbreviated wings, and the posterior pair extremely minute. In repose the antennæ are widely separated, and almost divaricate. When the sun shines the adult is active, and, if alarmed, jumps to a distance of two or three inches at a time. During its passage through the air the wings are vibrated.

The Diptera are represented by species of the Tipulidæ and Muscidæ. There are three of the former family. One of them is a small species of the Cecidomyidæ, which is abundant in mossy places, and presents no marked peculiarity. Another seems to be a degraded member of the Tipulidæ. The antennæ have six joints, the palpi two; the wings are ligulate and very minute. It possesses halteres, and the female has the ovipositor enclosed in an exposed sheath. Although it is unable to fly, it lives upon rocks in the sea, which are covered at high water, and there it deposits its eggs in tufts of *Enteromorpha*. The third species has full-sized wings: it was caught in the house. The indigenous Muscidæ are very sluggish in their movements, and are incapable of flight. Four species are common about here. One of them is abundant on *Pringlea*, crawling over the leaves. When it is approached it feigns to be dead, and, tucking up its legs, drops down into the axils of the leaves; or, if it happens to be upon a plane surface, one need only look at it closely, and it throws itself promptly upon its back and remains motionless until the threatened danger is over, when it gradually ventures to move its limbs and struggle to regain its footing. Its wings are represented by minute gemmules, and it possesses halteres. The ovipositor is extended, its apical joint alone being retracted. The penis is porrected beneath the abdomen, where it fits into a notch at the apex of the penultimate segment. The larva feeds on decaying vegetable matter. Another species occurs on dead birds and animals, as well as beneath stones near the highest tide-mark. It is completely destitute of even the vestiges of wings and halteres. The sexual organs are concealed. It and the preceding species are rather smooth. A third species, slightly hairy, is common among tide refuse and on the adjacent rocks, which are coated with stunted *Enteromorpha*, on which plant, *inter alia*, the larva feeds. It has very small triangular rudiments of wings, slightly emarginate near the apex of the costa, and possesses halteres. The sexual organs are not exposed. The fourth species occurs amongst grass growing along the shore, and also in Shag rookeries. Its linear and very narrow wings are almost as long as the abdomen. It can jump, but cannot fly. The sexual organs are retracted.

A *Pulex* is parasitic upon *Halidroma*, and one (possibly the same species) on *Diomedea fuliginosa*.

Coleoptera are not uncommon. The larger species seem to have their elytra soldered together. There is a small species of the Brachyelytra.

Several species of *Nirmiidæ* have been obtained.

Two *Poduræ* (one black, the other white) are plentiful.

There appear to be few species of Spiders, though individuals are numerous. Penguins and some of the other birds are infested with Ticks. The remaining Arachnida are related to *Cribates*.

The Crustacea, Annelida, Mollusca, and Echinodermata in this part of the island have probably been collected by the *Challenger* more extensively than I have been able to do; therefore I need not particularise further about them than to state that Entomostraca abound in the lakes; an earthworm is common, and a land-snail is very plentiful amongst the rocks on the hills. This last appears to appreciate comparative heat, for specimens obtained in an exposed place during the frosty weather were assembled together for warmth, under the drip of an icicle.

In Observatory Bay Cœlenterata are not numerous. One or two species of Actiniidæ on the rocks and Macrocystis roots, and an Ilyanthid in mud, are the only Actinozoa I have met with. The Hydrozoa similarly have afforded only three species—a Corynid, a Campanularian, and a *Sertularella*.

There are several Sponges.

With the exception of *Limosella aquatica*, and perhaps *Agrostis antarctica*, I have obtained all the flowering plants and ferns given in the "Flora Antarctica" as indigenous to the island. Besides these, *Ranunculus hydrophilus* and another species, a *Carex*, a *Festuca* (probably *F. purpurascens*, but I have no work containing descriptions of the flowering plants), *Polypodium vulgare*, a fern allied to *Polypodium*, and *Cystopteris fragilis* have occurred to me. There is also a plant which appears to belong to the Juncaceæ. *Lycopodium clavatum* and *L. selago* are common about here. None of the Mosses, Hepaticæ, or Lichens have been worked out as yet; but amongst them are one or two species of *Cladonia*, and some examples of *Lecanora paleacea*. Fungi are represented by *Agaricus* (*Psalliota*) *arvensis*, *Coprinus atramentarius*, and a peculiar parasite on *Azorella*, which grows out from the rosettes in the form of a clear jelly, which becomes changed into a firm yellowish substance of indefinite form. There are also some *Sphæriacei* on grass and dead stems of plants. At present few additions have been made to the marine flora. The larger Algæ in Royal Sound are usually not cast upon the shore by the waves, and I have almost been entirely dependent upon grapples thrown from the rocks for specimens of the more delicate forms. *Polysiphonia Sulivanæ* and *Rhytiphlæa Gomardii* are amongst the novelties. A large number of zoological and botanical specimens have been lost through my inability to attend to them in time without assistance. This has principally affected the number of duplicates; but in one instance it has led to the loss of a species—one of the Petrels, which was the commonest bird about here when we first arrived. Fortunately it is a well-known species.

The 1st of March is announced as the approximate date of our sailing from Kerguelen's Island. Five weeks later I hope to

arrive at the Cape and to forward to you such of the specimens collected as require only ordinary care in their transmission. The more fragile things are likely to reach you in better condition if I keep them until my return to England, than they would if they were sent with the others.

SCIENTIFIC SERIALS

Journal de Physique théorique et appliquée, Feb. 1875.—This number contains several papers reprinted from other serials, and the following original ones :—On the spectra of yttrium, erbium, didymium, and lanthanum, by Prof. R. Thalèn. On account of the difficulty to obtain the compounds of these metals in a pure state, considerable doubt has hitherto existed, whether certain lines that always appeared in the spectra of yttrium and ertium and in those of didymium and lanthanum belonged to the first or second metal in the pair ; the state of these questions in 1868 was, that there were twelve lines which always appeared when yttrium or erbium were examined, and sixteen lines in the case of didymium and lanthanum. Prof. Thalèn succeeded in obtaining sufficient quantities of compounds of each of the metals, from M. Cleve, Professor of Chemistry at the Upsala University, and these were of undoubted purity. He was thus enabled to study their spectra most accurately, and the following table shows the number of lines found in former and in the recent researches :—

Metal.	Number of lines, 1868.		1873.
Yttrium	70	+ 12 uncertain	106
Erbium	10		83
Didymium	6	+ 16 ,,	209
Lanthanum	49		188

It was found that the twelve uncertain lines that always appeared with yttrium or erbium belong to yttrium only ; in the same way the sixteen uncertain ones in the second case belong only to the lanthanum spectrum. Prof. Thalèn gives a detailed map of the spectra in question.—Researches on the induction sparks and electro-magnets ; their application to electro-chronographs, by M. Marcel Deprez.—On analogies in the evolution of gases from their over-saturated solutions, and the decomposition of certain explosive substances, by M. D. Gernez.—On the preservation of energy in electric currents, by M. E. Bouty.—On the transformation of static into dynamic electricity, by M. E. Bichat.

Der Zoologische Garten.—In the January number, the first article is a description of the new Zoological Gardens at Frankfort, by the director, Dr. Max Schmidt, illustrated by a coloured plan. J. von Fischer gives an account of the habits of *Herpestes galera* as observed in confinement. E. Buck figures and describes an apparatus for producing currents in the water of aquaria ; it may be worked either by a miniature steam-engine or by clockwork. H. Schacht gives minute details of the breeding habits of the common swallow (*Hirundo rustica*) ; and A. B. Meyer and K. von Rosenberg both write upon the newly discovered Bird of Paradise (*Diphyllodus Gulielmi III.*, Van Muschenbroek) from Ternate.—In the February number is printed a paper read by Dr. Hermann Müller before the Provincial Society of Westphalia, on the stingless Brazilian Honey-bees of the genus *Melipona*, and the possibility of their acclimatisation in Europe. Dr. J. J. Rein remarks on the distribution of some of the mammals of Japan ; and C. Geitel writes on the feeding of small birds in winter in the neighbourhood of human habitations.

Poggendorff's Annalen der Physik und Chemie, 1875, No. 2, contain the following papers :—On the galvanic conducting capacity of melted salts, by F. Braun. The author experimented with twelve different salts, and tabulates his results ; the salts were nitrates of potash, soda and silver, carbonates of potash and soda, sulphate of soda, chlorides of potassium, sodium, strontium, zinc and lead, and iodide of potassium.—On a compilation of facts which prove a decrease of volume as a consequence of chemical action in solid bodies, by W. Müller.—On the electric conducting capacity of the chlorides of the alkalies and alkaline earths as well as of nitric acid in aqueous solutions, by F. Kohlrausch and O. Grotrian. This is the last part of the author's interesting communications, and treats of the liquids examined, of the resistances observed, of the conducting capacities in their relation to that of mercury, and of their dependence on temperature ; further, of their proportion to the percentage of concentration of liquids, of the co-efficients of temperature, and of the conducting capacity of dilute solutions.—On the theory of galvanometers, by H. Weber.—A reply to Baron Eötvös' remarks on a part of the astronomical undulation-theory by Ed. Ketteler.—Some remarks upon Helmholtz's work on Sound, "Die Lehre von den Tonempfindungen," by Emil v. Quanten ; these remarks relate principally to what Helmholtz says on vowels.—A reply to Herr C. Heumann regarding his claim of priority in observing the action of nitrate of silver upon sulphide of copper, by R. Schneider.—On the construction of lightning conductors, by Dr. W. A. Nippoldt. Some remarks by Dr. G. Baumgartner, on Prof. E. Edlund's paper on the nature of electricity.—Description of a very simple apparatus to photograph spectra, by Hermann W. Vogel ; this apparatus can even be applied to an ordinary pocket spectroscope of the smallest dimensions.—On the phenomena of interference visible on mirrors covered with dust or a fine layer of grease, by Prof. M. Sekulic.—Researches on apparent adhesion, by J. Stefan.—On the conducting capacity of the halogen compounds of lead, by E. Wiedemann.

Transactions of the Manchester Geological Society, Part viii. vol. xiii., 1874-75.—Nearly the whole of this part is occupied by an elaborate illustrated paper on "Hæmatite Deposits," by Mr. J. D. Kendall. There is a short paper by Mr. A. W. Waters on "Tertiary Coals," in reference to specimens of carbonised peat he found in Northern Italy under rather peculiar circumstances. Part ix. is occupied with the discussion on Mr. Kendall's paper on Hæmatite deposits, and with a long paper on basalt and its effects, by Mr. G. C. Greenwell, F.G.S.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 29.—"On a Continuous Self-Registering Thermometer," by H. Harrison Cripps. Communicated by Prof. Stokes, Sec. R.S.

The instrument is divided into two portions :—First, the thermometer, which marks the degrees ; secondly, the clockwork, which indicates the hours and minutes. The thermometer is first described. The form in which it was originally made, and which perhaps serves best for illustrating the principle, was the following :—A glass bulb, rather more than an inch in diameter, ends in a glass tube 12 inches long, having a bore of $\frac{1}{8}$ inch. This tube is coiled round the bulb in such a manner as to form a complete circle four inches in diameter, the bulb being in the centre of this circle. Fixed to opposite poles of the bulb, exactly at right angles to the encircling tube, are two needle-pointed pivots. These pivots work in minute metal depressions fixed to the sides of two parallel uprights. It will be seen from this arrangement that the bulb with its glass tube will rotate freely between the uprights, and the pivots will be the centre of a circle, the circumference of which is formed by the glass tube. The bulb is filled with spirit in such quantity that at 60° Fahrenheit the spirit will fill not only the bulb, but about 4 inches of the tube. Mercury is then passed into the tube till it comes into contact with the spirit, and in such quantity as to fill up about three inches of the remaining portion of the tube. The spirit is now heated to 120°, and as it expands forces the column of mercury in front of it till the mercury comes within $\frac{1}{4}$ inch of the end of the tube. The tube is then hermetically sealed, enclosing a small quantity of air. If the thermometer be now arranged with its needle-points between the uprights, it will be observed that, as the spirit contracts on cooling, it draws the column of mercury with it. This immediately alters the centre of gravity, and the bulb and tube begin to revolve in a direction opposite to that of the receding mercury. On again applying heat, and the mercury passing forwards, the bulb regains its original position. By this simple arrangement, the two forces, heat and gravity, acting in contrary directions, generate a beautifully steady rotatory movement. The method by which this movement is made serviceable for moving the register will now be described. A grooved wheel, two inches in diameter, is fixed to one of the central pivots, therefore revolving with the bulb. Directly above, and at a distance of seven inches from this wheel, is fixed between needle-points another wheel of exactly similar size. Around and between these two wheels passes a minute endless chain. To the chain is fixed a tiny pencil, which will be carried backwards and forwards between the wheels in a perpendicular line. This constitutes the register worked by the thermometer. The clockwork portion of the machine is so arranged that it causes a vertical cylinder, four inches diameter and five inches in length, to revolve once in twenty-four hours. Round this cylinder is fixed a piece of paper twelve inches long, five inches wide.