

Bay of Fundy, near Eastport. Here the tide rushes along with great power, and the molluscs are obliged to cling to the bottom with great tenacity to prevent being swept away. Only the smaller individuals can withstand this by getting into the crevices of the rocks. The species is thus perpetuated by the smaller members, and rarely attains any considerable size.

THE Inspectors of Salmon Fisheries of England and Wales have just issued their annual report. Examples are given of the serious injuries inflicted on salmon rivers—and not only on salmon rivers but on the health of the public—by the pollutions poured into rivers, and it is to be hoped that powers will be given to enforce the removal of such matters from our streams. Altogether the prospects of our salmon rivers appear very favourable, and much good is to be expected from the working of the new Act.

A SEAM of coal has been discovered at Sandwell Park, near Birmingham, 418 yards below the surface.

SOME good popular scientific lectures are at present being given by Prof. Gardner at the Polytechnic.

THE May number of *Annals and Magazine of Natural History* contains, among other articles, a list of butterflies taken by Lieut. Bell on the march to Coomasie, with a description of six new species. Dr. Nicholson describes a new genus of Palæozoic corals from the Niagara group of India, which he names *Duncanella*, in honour of Mr. P. M. Duncan. Dr. Young gives a description of a new genus of carboniferous Polyzoa, and suggests the name *Rhabdomeson*. A plate is given illustrating *Rhabdomeson gracile*. There is also a brief note of an apparently new species of humming-bird, of the genus *Eriocnemis*, by Mr. Elliot. The discussion about Eozoon is continued.

AN excellent device has been forwarded to us for use in field-club excursions. It is designed to promote an interest in common flowers, and can of course be varied and worked without a prize. It consists of a large envelope, with a description, but not the name, of a plant, and directions as to what ought to be done with the plant when found. The particular envelope, forwarded to us by Mr. Higgins of the Liverpool Naturalist's Club, contains the following on its back:—

EXTRA PRIZE.

DESCRIPTION OF PLANT.

Leaves opposite, Sessile, Lanceolate, Acuminate.
Sepals 5, half as long as the 5 deeply-cleft Petals.
Stamens 10, Styles 3, height about 12 in.

Members finding a plant answering to this description should take it to the President or Botanical Referee, with their name signed at the foot of this slip. When correct the slips will be initialed and handed to the Secretary. The finder should be prepared to answer questions on the description; but the name of the plant will not be officially announced till after tea.

A Prize or Prizes will be awarded at the end of the Season to those most successful.

Signed, _____

THE additions to the Zoological Society's Gardens during the past week include a Beisa Antelope (*Oryx beisa*) new to the collection, from Central Africa, presented by Admiral Arthur Cumming; an Indian Gazelle (*Gazella bennetti*), presented by Mr. J. H. Bainbridge; an Indian Ratel (*Meilivora indica*), presented by Mr. L. Macneill; a Mauge's Dasyure (*Dasyurus maugei*) from Australia, presented by Mr. F. Kirby; two Little Whimbrels (*Numenius minutus*) from the Navigator Islands, presented by Rev. S. J. Whitmee; a Guilding's Amazon (*Chrysotis guildingi*) from St. Vincent, purchased; a Bennett's Cassowary (*Casuarus bennetti*) from New Britain, deposited.

SCIENTIFIC SERIALS

THE *American Journal of Science*, May 1874.—The May number contains the following papers:—On the polarisation of light, by Prof. A. W. Wright. Prof. Wright instituted a series of observations with different instruments, which he describes, obtaining, however, only faint and uncertain results. At last he has been enabled to make observations he considers reliable. He obtained a quartz plate, cut perpendicularly to the axis, and exhibiting by polarised light an unusual intensity of colour. Examined with one Nicol and unpolarised light the plate is perfectly colourless, and shows no trace of its heterogeneous structure. Placed between two Nicols, it showed bands of colour, the plate being a macle, the body consisting of left-handed quartz, crossed by a band of right-handed quartz, bounded by strips of different structure. The plate was used in a tube 11 in. long, and formed an instrument especially adapted to the detection of small degrees of polarisation. The observations were made facing the south-west in a dimmed room, so that the eye should be sensitive. The results of the numerous observations on different evenings were entirely concordant, and are thus summed up by Prof. Wright:—(1) The zodiacal light is polarised in a plane passing through the sun. (2) The amount of polarisation is, with a high degree of probability, as much as 15 per cent. but can hardly be as much as 20 per cent. (3) The spectrum of the light is not perceptibly different from that of sunlight, except in intensity. (4) The light is derived from the sun, and is reflected from solid matter. (5) This solid matter consists of small bodies (meteoroids) revolving about the sun in orbits crowded together towards the ecliptic.—The second article is the first instalment of a communication by Mr. W. M. Fontaine, On the "great conglomerate" of New River, West Virginia.—The third article is by Mr. S. W. Johnson, On the use of potassium dichromate in ultimate organic analysis. Potassium dichromate, the author thinks, possesses all the properties needful for an oxidant in organic analysis, and ordinary kuolin is the best material for diluting it. He gives the details of some of his experiments.—Then follows an article by Mr. C. H. Hitchcock, On the Helderberg Rocks of New Hampshire, which is illustrated by a map, and is to be continued.—The Rev. H. C. Hovey contributes an interesting article on *Rabies mephitica*. The bite of the common skunk (*Mephitis mephitis* Shaw) is often dangerous, and leads to symptoms somewhat analogous to those which follow the bite of a mad dog. Mr. Hovey has obtained particulars of forty-one cases of *Rabies mephitica*, and of these forty were fatal.—Mr. Carey Lea of Philadelphia finds that when silver bromide is treated with pyrogalllic acid, after exposure to light, the black substance which remains contains bromine and is resolved by nitric acid into normal silver bromide (left behind as a pale yellow film) and silver which passes into solution. It is, therefore, either a sub-bromide or an oxy-bromide; not an oxide. The existence of these compounds is evidently an argument for doubling the atomic weight of silver, as has recently been proposed on other grounds.—Mr. Meek continues his notes on the fossils figured in the recently-issued fifth volume of the Illinois state geological report.—The brief contributions from the physical laboratory of the Harvard College are also continued. They include No. v., On a method of freezing a magnetic bar from the influence of the earth's magnetism, by John Trowbridge. No. vi. Note on Melde's experiment, by W. Lowery. No. vii. A spark adjuster for the Holtz machine, by James Minot. No. viii. Effect of condensers on the brush discharge from the Holtz machine.—Mr. E. A. Verrill continues contributions to zoology, giving the results of dredging at three stations on the coast of New England, on Cashe's ledge, Jeffrey's ledge, and Stellwagen Bank.—In the "Scientific Intelligence," the section "Chemistry and Physics" consists of notices of papers published in Europe. In section "Geology and Natural History" there is a notice of a communication in the *Overland Monthly* On mountain sculpture in the Sierra Nevada, and on the method of glacial erosion, by E. S. Carr. He holds that glaciers do not so much mould and shape rocks as that they "disinter forms already conceived and ripe." The grain of a rock determines its surface-forms.—There is also an extract from a letter to Dr. Dana, referring to volcanic action in Hawaii, where Mauna Loa has been in full activity since April 1873.—An abstract is given of Prof. W. S. Clarke's experiments on the amount of pressure in the sap of plants. The mercurial gauge has been used on the sugar maple, and observations were made day and night from April 1 to July 20.

The maximum pressure was found to be equal to sustaining a column of water 31.73 ft. high. One of the most interesting portions of the experiments was to determine, if possible, whether any other force than the vital action of the roots is necessary to produce the sap-pressure. A black birch-tree was selected, and a root was severed at 10 ft. from the trunk, and to it was attached a mercurial gauge. This showed a maximum pressure equal to 85.8 ft. of water, and proved that "the absorbing power of living birch rootlets without the aid of any of the numerous helps imposed upon them by ingenious philosophers, such as exhalation, capillarity, oscillation, &c., was quite sufficient to account for the most essential of the curious phenomena connected with the circulation of sap."

Journal of the Franklin Institute, April. —The following are some of the important papers in the number:—Report of the Committee of the Institute on the Westinghouse car-brake. This brake in its simplest form consists of a small steam-engine placed in the locomotive, which, taking steam from the boiler, works an air-pump, which compresses air into a main reservoir, secured beneath the car. By an ingenious arrangement of pipes and automatically acting valves, the air is admitted into a series of brake cylinders, one under each car, the pistons of which are connected with and act upon the ordinary brake-levers, and thus apply the brakes to the wheels. The inventor has made important improvements on this, by means of which the compressed air may be admitted almost instantaneously into the brake-cylinders, and the train brought to a standstill in an incredibly short space of time; e.g. a train, going at the speed of thirty miles an hour up a gradient of 29.6 ft. per mile, was brought to a stop in 16 seconds. Scott's legacy, premium, and medal, were awarded to the inventor by the Institute.—The principles of shop-manipulation for apprentices is continued.—On the mechanical calculation of earthwork (or the results of physical measurements in general) according to the prismoidal or other formulæ, by C. Herschell, C.E. This paper relates mainly to the important uses to which the polar planimeter can be put.—Prof. R. H. Thurston contributes two papers which have been published separately: On the thermal and mechanical properties of air and other gas, subjected to compression or expansion; and On the strength, elasticity, and resilience of materials of machine construction; both papers are illustrated with diagrams.

The *Journal of Mental Science* for April, opens with the third number of the Morrisonian Lectures on Insanity for 1873, in which Dr. Skae and Dr. Clouston still further exemplify the classification of the various kinds of insanity according to the bodily disease or condition with which they are associated. In speaking of Climacteric Insanity it is contended that men between 50 and 60 have a critical period corresponding to that passed through by women between 40 and 50; but the evidence seems far from conclusive. But nothing can be more striking and terribly instructive than the amount of insanity of one kind or another that is unmistakably connected with the organs and functions of generation.—The morbid psychology of criminals by David Nicolson, M.B., continues; and his observations on this unfortunate class are very valuable and well worth recording—especially perhaps may they prove useful "as a basis of comparison for kindred phenomena occurring in circumstances less definite and uniform." No one is likely to be very seriously injured by the common prison delusion "that their food is poisoned;" but if the same painful fancy take possession, as it sometimes does, of individuals in the outer world, it may not be so readily recognised as a delusion, and the consequences may be very mournful.—A psychological study of the character of Jean Jacques Rousseau, by J. Hawkes, M.D., suggests the idea of a washerwoman sounding the Atlantic with her clothes line, and finding it very shallow all over.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, April 1.—In this number Dr. Mohn furnishes a number of data from three years' observations of the temperature in and near Christiania—at the Institute and the Observatory—and of the decrease of heat with height; a station named Frognersäter having been chosen, situated about five miles NN.W. from the Observatory, and 408 metres above the sea. The air within the city is shown (as in other localities) to be warmer than without. The temperature in general decreases with the height, and most quickly in May; in the winter months the decrease is small, and it passes, in December, into an increase. Dr. Mohn studied the meteorological conditions present in three separate cases:—(a) Frognersäter warmer than Christiania; (b) colder and exces-

sive; (c) change of temperature on fall of rain or snow. As regards (a), it occurred in cold weather; the wind N.E. or E., and light; atmospheric pressure about 7 mm. above normal; sky most often clear, but sometimes a mist covered Christiania, while Frognersäter was in sunshine. The author inquires at some length into the causes of change of temperature with height, and points out that the elements of greatest influence here are the strength of wind and the relative moisture. The change increases with the former and decreases with the latter. To this is joined the action of precipitates, in so far as this, accompanied by greater relative moisture, contributes to lessening the decrease of temperature with the height.—Prof. Ebermayer follows with a review (in part) of a new text-book of climatology by Dr. Lorrenz and Dr. Rothe. From personal observation he disputes the authors' assertion that the increase of cells in plants takes place only by night.—Among the "Kleinere Mittheilungen," we note some meteorological observations from the north-west coast of Spain.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 7.—"Preliminary Experiments on a Magnetised Copper Wire," by Prof. Balfour Stewart, LL.D., F.R.S., and Arthur Schuster, Ph.D.

1. The following experiments were made in the physical laboratory of Owens College, Manchester:—

A copper wire was wound fifty-three times in one direction round the poles of a powerful electro-magnet, the length of wire encircling these poles being about twelve metres.

A Wheatstone bridge was employed to measure the resistance of the wire, and a very delicate Thomson's reflecting galvanometer, by Elliott Brothers, was likewise used.

Experiments were made at intervals of two minutes; and on each occasion the current was allowed to pass through the bridge for ten seconds, the measurement being taken by the first swing of the galvanometer, which lasted for about eight seconds. Three cells of Grove's battery were used for producing this current, but on the other hand six similar cells were employed for magnetising the electro-magnet.

2. In the first experiments made, the induction-current due to the wire coiled round the magnet affected the galvanometer, but after Dec. 12 a solid key put into the circuit was taken out, so that no induction-current passed.

The following is a specimen of the observations made:—

Time of putting on current. h. m.	Dec. 17, 1873. Whole deflection observed (increasing deflection denotes increasing resistance).		Condition of magnet.
11 11		312	off
13		317	off
15		311	off
17		345	on
19		328	off
21		306	on
23		303	off
25		293	on
27		300	off
29		290	on
31		307	off
33		283	on
35		292	off
37		288	on
39		302	off
41		292	on
43		309	off

It will be seen from this experiment that the first effect of putting on the magnetism was a marked increase of resistance; but with this exception the resistance, when the magnetism was on, was less than the mean of the two resistances on both sides of it, representing the magnetism off.

3. The arrangement remained untouched, as far as we know, from Dec. 15, when it was finally made, until Dec. 19, when the experiments were interrupted during the Christmas holidays; and in all cases the first effect of putting on the magnetism was a marked increase of resistance.

It was soon seen that this first effect had some reference to the time elapsing since the last experiments were made. For in-