

Carpenter, F.R.S., refuting the old theories of the non-existence of animal life at great depths, and bringing to light (with others) animals such as *Pentacrinus wyville-thomsoni* and *Bathycrinus gracilis*, pedunculate star-fishes allied to the *Comatula*, from 2,435 fathoms, whose very existence was unsuspected, and who were supposed "in the lapse of ages to have been worsted in the struggle for life." And following these investigations came the exploring expedition of H.M.S. *Challenger*, the most important mission of its kind that Great Britain had ever engaged in, from whence we now and then get stray tidings of yet more remarkable animals,—animals of comparatively high organisation, allied to the lobster, dredged up from 2,000 fathoms: in one individual, a gigantic amphipodal crustacean, "the eyes of the creature extended in two great facetted lobes over the whole of the anterior part of the cephalo-thorax, like the eyes *Agolina* among Trilobites" (NATURE, vol. vii. p. 388). In another, *Deidamia leptodactyle*, there were no traces whatever of eyes of sight or their pedicels (NATURE, vol. viii. p. 52). Further, from the enormous depth of 3,000 fathoms, or nearly $3\frac{1}{2}$ statute miles, "a depth which does not appear to be greatly exceeded in any part of the ocean," have been taken a tube-building annelid, its tube formed of the gritty matter which occurs but sparingly in the clay at the bottom, affording, in fact, as Prof. Wyville Thomson remarks, "conclusive proof that the conditions of the bottom of the sea to all depths are not only such as to admit of the existence of animal life, but are such as to allow of the unlimited extension of the distribution of animals high in the zoological series, and closely in relation with the characteristic faunæ of shallower zones" (NATURE, vol. viii. p. 53).

Contemporaneously with these expeditions and what would appear to be not an inappropriate *sequitur*, marine aquaria of extensive size, and constructed on scientific principles, had been established in some of our principal towns, thus affording a new source of enjoyment and an intellectual gratification to the people—that of the examination of living marine animals as they exist "in the depths of the sea"—and combining with this in some instances a source of pecuniary benefit to the promoters. The public interest in these establishments seemed so great that the arrival of the octopus had attracted almost as much attention as the visit of a foreign emperor, and the death of the porpoise was mourned as a national calamity.

In conclusion the president said he hoped he had said something suggested by the recent marine excursion to interest the members in marine zoology. For his own part he could say that the little attention he had been able to devote to it had been a most acceptable relief to official duties (as Treasurer of the Borough), always laborious and responsible, and at the same time it had brought him in contact with fellow-workers in natural history from whose friendship and kindly intercourse he had derived the most lasting pleasure.

Mr. Hughes ventured to express his opinion that a Marine Aquarium, if constructed properly and managed efficiently—for instance like that beautiful one at the Crystal Palace under the direction of his friend, Mr. W. Alford Lloyd, who had done more for the advancement of public aquaria than any man living—would be most acceptable to Birmingham, where the great Priestley carried on his scientific researches, and in 1773 obtained the Copley medal of the Royal Society for the discovery of the mutual dependence of plants and animals on each other—the grand principle of all aquaria. It occurred to him after much thought, and as a successful student of marine aquaria for many years, that no greater attraction or means of intellectual recreation for the working classes and their neighbours in the mining districts could be devised, because it would be so utterly different from any other exhibition now existing, and so suitable as a relief and mental refreshment for those in crowded courts to whom the sea was but a name. It was indisputable that "the sea and its living wonders" had irresistible fascination to us far away from it. The peculiar central inland position of Birmingham would be highly advantageous by allowing ready and rapid modes of conveyance of rare animals from almost any part of the coast. He commended the project to the earnest consideration of the many wealthy and intellectual men in the town, and could not help believing and hoping—although his views as a naturalist might be sanguine—that Birmingham would sooner or later possess a marine aquarium worthy of it, and follow the example of London, Brighton, Liverpool, Manchester, Plymouth, and other large towns, which, besides others on the Continent, had already taken the matter up.

We understand that Mr. Hughes' suggestion has been acted upon, and that an influential committee has since been appointed to make inquiries with the view to the promotion of an efficient marine aquarium for Birmingham.

SCIENTIFIC SERIALS

Astronomische Nachrichten, No. 1,969, Jan. 9.—This number contains a paper by Prof. Spoerer on M. Faye's theory of solar spots. He refers to M. Faye's statement that spots are below the surface of the sun, and to his reliance on his treatment of Carrington's observations; for if a spot be observed for two or more revolutions its distance from the limb can be calculated on the assumption that the spot is on the surface of the sun. Should, however, the observed plan of the spot not agree with the calculated position, the assumption will be that the spot is below or above the surface of the sun. Prof. Spoerer informs us that, on the whole, his observations show that the observed distance from the limb of the sun are too great; this he ascribes to the effect of refraction altering the position of the sun's limb to a greater degree than that of the spot.—On the identity of Coggia's Comet of Nov. 10, with Comet 1818 I. by Prof. Weiss. In this paper the author gives the elements of Coggia's comet as lately determined, together with the recorded observations of Comet 1818 I. from which he considers the two comets to be identical.—In a second paper by Prof. Weiss he gives elements calculated on a parabolic orbit and on two elliptic orbits of 55.82 and 6.9775 years respectively, being on the assumption in the first case that one revolution has happened since 1818, and in the other that eight have taken place.—Observations on variable stars, by G. T. G. Schmidt. From observations up to the end of 1873, given at length in his paper, we extract the epochs of maxima and minima of the following stars:—

	Max.	Min.	
Mira Ceti	about May 25	Jan. 30.5, 1873,	mag. 9.5
S Scorpii	Sept. 13, mag. 10	—	"
R Scorpii	Aug. 27, mag. 10.8	—	"
R Bootis	Sept. 15,	—	"
R Virginis	July 27,	May 13	"
S Coronæ	July 6,	—	Period, 363 days.
	Max.	Min.	
R Leonis	May 18	—	
R Leporis	—	Jan. 29	
χ Bygni	Oct. 5	—	Period 404.7 days.
	May 13	June 16	
R Scuti ...	July 9	Aug. 21	
	Sept. 20	Oct. 13	
	Nov. 4	—	

Wilhelm Schur gives an opposition ephemeris for Arethusa. The opposition happening Jan. 21, the R. A. being then

8. 2. 52.78 and Dec. + 4. 1. 54

The fourth line of the spectrum of the nebula in Orion, by D'Arrest. The author refers to a note on this line by Dr. Vogel in *Astron. Nach.*, No. 1963, mentioning the fact that the fourth line of the nebula coincided with H γ , and goes on to mention that this line was known to Huggins in 1864, and by Capt. Herschell in 1868, and was brought to the notice of the Royal Society in 1872 by Huggins. Its wave-length he gives as 4343. The author also mentions a peculiarity in the spectrum of B. Durchm + 22° 4203.—Mr. J. Birmingham states in a note that he believes that 252 Schjellcrup has disappeared, and he thinks this star a remarkable variable.

Medizinische Jahrbücher: k.k. Gesellsch. d. Aerzte: Vienna, 1873, Heft 3 and 4.—The last two issues of this quarterly journal for 1873 contain the following papers of scientific interest:—Researches into the minute structure of the Tendon, by Arnold Spina, with an illustration; the Nerves of the Knee-joint in the Rabbit, by Dr. C. Nicoladoni (with a figure); contributions to the Anatomy of the Human Bladder, by Dr. Gustav Jurie; Quarantine in Cholera, a report to the International Medical Congress, by Dr. Oser.

SOCIETIES AND ACADEMIES

LONDON

Zoological Society, Jan. 20.—Prof. Newton, F.R.S., vice-president, in the chair.—Mr. Sclater exhibited two skulls of Baird's Tapir (*Tapirus bairdi*) received from Mr. Constantine

Rickards, of Oaxaca, Mexico. The receipt of these specimens proved that this Tapir extended from Panama through Central America into Southern Mexico, and was probably the only species of this genus to be met with in America, north of the Panamanian Isthmus.—Mr. Sclater also exhibited and made remarks on skulls of *Ovis arkar*, from the Altai Mountains, and the stuffed skin of a specimen of the Wild Ibex of Crete.—Mr. E. Ward exhibited two feet of a Fawn, the mother of which had had double hind feet, and had for several years brought forth fawns having the same malformation.—A communication was read from Dr. O. Finsch containing a description of an apparently new species of Parrot from Western Peru, which was proposed to be called *Psittacula andicola*.—A second paper by Dr. Finsch contained the description of a new species of Fruit Pigeon from the Pacific Island of Rapa or Opara. This unique specimen had been sent to the author by Mr. F. W. Hutton, of Otago, New Zealand, after whom it was proposed to name the bird *Ptilonopus huttoni*.—A note was read by Major O. B. C. St. John, on the locality of the Beatrix Antelope (*Oryx beatrix*), which was believed to be the south of Muscat.—Mr. Edward R. Alston read the description of a new Bat of the genus *Pteropus*, which had been sent to him from Samoa for identification by the Rev. S. J. Whitmee. Mr. Alton proposed to call this species *Pteropus whitmeei*.—A communication was read from Mr. A. G. Butler, containing a list of the species of *Fulgora*, with descriptions of three new species in the collection of the British Museum.—A communication was read from Mr. Herbert Druce, containing an account of the Lepidopterous Insects collected by Mr. E. Layard, at Chentaboon and Mahconchaisee, Siam, with descriptions of new species.

Meteorological Society, Jan. 21.—Dr. R. J. Mann, president, in the chair.—The date of the annual meeting having been altered in June last to January, the report of the Council was shorter than usual. The Council have been making efforts to render the operations of the Society more extended. They took advantage of the presence of their foreign secretary, Mr. Scott, as one of the delegates from this country, at the Meteorological Congress at Vienna, to request him to represent the Society. The congress was duly held from September 1st to 16th, when Mr. Scott presented a report on the replies received in answer to a series of questions which the Council issued to the Fellows on several important points in connection with the hours of observation, instruments, &c., and which has been printed in the report of the Congress. The report concluded by stating that the Council have to mark, with some measure of satisfaction, the maintenance of the numbers of the Society during a somewhat critical and transitional period in its history, when changes of detail have been entered upon with a view to increased energy of action, and when the beneficial results of the alterations have not yet had time to be practically felt. The president then delivered his address. After alluding to the loss which the Society had recently sustained in the death of Mr. Beardmore, and marking the place that gentleman had filled as president at the transition era of the Society's history, the president drew attention to a misconception that is largely entertained of the primary aims of meteorological science, and pointed out that desirable as a comprehensive and reliable theory is, the immediate object of observational work is none the less certainly the determination of climate in different regions of the earth, and the investigation of the method by which the action of the great natural forces that determine temperature, direction and force of wind, and rainfall, is influenced by physical conditions. This argument was supported by evidence of the valuable practical results that are secured in these particulars by the labours of meteorologists. The address then proceeded to note briefly the chief landmarks that had marked the yearly progress of meteorological science since the period of Mr. Beardmore's presidency, when the Society, in its remodelled form, had just reached the half-way stage of its history. From this review it appeared that the photographic method of record has been largely extended; that the discussion of the Greenwich observations from 1848 to 1868 is being steadily pursued; that the influence of meteorological conditions upon the public health is carefully investigated in the metropolitan district; that telegraphic intercommunication of meteorological aspects is now regularly made throughout the United States of America; and from the Meteorological Office of London through England, and through France to the shores of the North Sea and Baltic in one direction, and to Corunna in the other; and that storm-warnings are displayed and fishermen's barometers maintained at 129

coast stations. The methodical investigation of the connection of sun-spot periods with atmospheric phenomena, such as rain-fall, auroræ, and magnetic storms and earth-currents was also alluded to. Among other topics of special interest connected with the recent progress of meteorological science, the president dwelt with special favour and affection upon the discovery and establishment of Buys Ballot's law and Mr. T. Stevenson's barometric gradient; the extension of the influence which indicates this law to the great vertical circulation of the oceans, traced out by Dr. Carpenter and Prof. Wyville Thomson; the marine charts, and especially the mapping out of the mid-Atlantic area of the Doldrum calms, by Capt. Toynbee; Mr. Meldrum's Mauritius investigations of the movements of the cyclones of the Indian Ocean; the daily weather charts of the Meteorological Office; the deleterious physiological influence of the recent heavy fog in London; Mr. Symond's examination of the rainfall of the British Islands, with a volunteer staff of 1,700 observers systematically distributed; Mr. Draper's deductions as to the invariability of the climate of the United States, and to the orderly progress of storms across the entire breadth of the Atlantic; the establishment and work of International Meteorological conferences; and the barometric compensation of clock-rates for altering pressure and resistance of the atmosphere.—The following gentlemen were elected officers and council for the ensuing year:—President—R. J. Mann, M.D., F.R.A.S. Vice-Presidents—C. Brooke, M.A., F.R.S.; G. Dines; H. S. Eaton, M.A.; Lieut.-Col. A. Strange, F.R.S. Treasurer—H. Perigal, F.R.A.S. Trustees—Sir Antonio Brady, F.G.S.; S. W. Silver, F.R.G.S. Secretaries—G. J. Symons; J. W. Tripe, M.D. Foreign Secretary—Robert H. Scott, F.R.S. Council—Percy Bicknell; A. Brewin, F.R.A.S.; C. O. F. Cator, M.A.; R. Field, B.A., Assoc. Inst. C.E.; F. Gaster; J. K. Laughton, F.R.A.S.; R. J. Lecky, F.R.A.S.; W. C. Nash; Rev. S. J. Perry, F.R.A.S.; Capt. H. Toynbee, F.R.A.S.; C. V. Walker, F.R.S.; E. O. Wildman Whitehouse, Assoc. Inst. C.E.

Entomological Society, Jan. 5.—Prof. Westwood, president, in the chair.—Mr. Meldola exhibited some photographs of minute insects taken with the camera-obscura and microscope.—Mr. McLachlan called attention to a paper in the last part of the "Annales de la Soc. Ent. de France," by M. Bar and Dr. Laboulbène on a species of moth belonging to the *Bombycidae*, described and figured by M. Bar as *Palustris laboulbenei*, and of very extraordinary habits, the larva being aquatic, living in the canals of the sugar plantations in Cayenne, and feeding upon an aquatic plant. The hairy larva breathed by means of small spiracles, a supply of air being apparently entangled in its hairs.—Mr. Butler remarked that Mr. J. V. Riley, in the *Journal* of the St. Louis Academy of Sciences, had alluded to *Apatura lycaon* Fab. and *A. hyrse* Fab. as distinct species, whereas he believed them to be identical with the *A. dlicia* Edwards.—A letter from M. Ernest Olivier stated that he had recently come into possession of a portion of the collection of his grandfather, the celebrated French coleopterist, and that he would be happy to show it to any entomologist who might desire to examine the types.—Mr. Smith communicated a paper on the hymenopterous genus *Xylocopa*; and Mr. D. Sharp a paper on the *Pselaphidae* and *Scydmanidae* of Japan, from the collections of Mr. George Lewis.

EDINBURGH

Royal Society, Jan. 19.—Principal Sir Alex. Grant, vice-president, in the chair.—The following communications were read:—Additional remarks on the fossil trees of Craigleith quarry, by Sir Robert Christison, Bart.—On a method of demonstrating the relations of the convolutions of the brain to the surface of the head, by Prof. Turner.—On some peculiarities in the embryogeny of *Tropaeolum speciosum*, Endl. and Poepp., and *T. peregrinum*, L., by Prof. Alex. Dickson.—Notes on Mr. Sang's communication of April 7, 1873, on a singular property possessed by the fluid enclosed in crystal cavities. (1) By Prof. Tait; (2) By Prof. Swan.—Preliminary note on the sense of rotation, and the function of the semicircular canals of the internal ear, by Prof. Crum-Brown.

DUBLIN

Royal Zoological Society of Ireland, Jan. 13.—His Excellency, Earl Spencer, president, in the chair.—The report was read by the Rev. Prof. Haughton, M.D., secretary, who referred, among other matters, to the loss by death of an old pelican (*Pelicanus onocrotalus*) "who had been domiciled in the Gardens for forty-two years. He was supposed to have been

eight years of age upon his admission, so that he was a bird of over fifty at the time of his death.—Every effort was made to prolong his valuable existence by feeding him on live eels and whisky punch; but old age prevailed, and he died peacefully on the approach of the cold weather. He drank the punch with great relish; in fact he had resided so long in Dublin that it must have come naturally to him, and this and the live eels prolonged his life for at least a fortnight." We are sorry to see the funds of the society are not in a very thriving condition.

VIENNA

I. R. Geological Institute, Nov. 18.—The director, F. v. Hauer, stated that towards the end of the international exhibition he had asked almost all Austrian and a great many of the foreign exhibitors of ores, coals, or other useful minerals, to present these objects to the museum of the Institute. This request was very successful, more than a hundred exhibitors have offered the whole or parts of their expositions to the Institute, and the number of the donors is increasing still every day. Out of the objects obtained in this way will be formed a particular collection of useful minerals from Austria and from abroad, embracing ores, coals, salts, building-stones, all sorts of useful clays, limestones, &c., minerals used for colours, for dung, &c. This collection, which will contain generally specimens of large size, will form quite a new and, as he hopes, very interesting branch of the museum.—Dr. R. v. Drasche: Geological observations on a journey to the west coast of Spitzbergen during the summer of 1873. The journey was made in a schooner chartered especially for the purpose. Dr. Drasche left Tromsøe on June 30, went to the north till Amsterdamö in 79° 45' N. lat., and returned to Hammerfest on August 27. Many very interesting observations and large collections of rocks and fossils are the fruit of the expedition. Here we will give only a few particulars: On the flat land which forms the eastern part of Danskö and Amsterdamö, Dr. Drasche found very large masses of erratic boulders, which consist partly of certain varieties of granites, syenites, and gneiss, unobserved till now on the shores of Spitzbergen. Probably they are brought down by glaciers out of the interior of the island. The Hekla Hook formation (Nordenskiöld), which is probably Devonian, is formed in the Belsund by black limestones and chloritic slates, which resemble very much the Taunus-slates. The mountain limestone formation is developed in large masses and with many fossils in the Belsund and on the island of Azelö. On Cape Staratschin the mountain limestone alternates with very fine Hyperith. The Triassic formation was accurately studied on Cape Thorsden; it contains here many Ceratites, Nautilus, Halobia, &c., besides which were found the remains of a saurian. The Jurassic and the Tertiary formation are formed by marly beds in the Ice-fiord, and can scarcely be separated from each other whenever they do not contain fossils. On the Goose Island in the Ice-fiord Dr. Drasche found proofs of a very recent levation of the ground. From 8 ft. to 10 ft. above the highest level of the sea the ground is covered with shells of *Mytilus edulis*, which have preserved perfectly well their bluish colour.—M. Niedzwiedzki has examined the microscopical structure of a large number of the eruptive rocks of the Banat which by Prof. Cotta had been united under the name "Banatites." He found that the mineral which mostly prevails is a plagioklastic feldspar out of the Andesin series. He concludes therefore that the rocks from Dognacska, Oravitza, and Csiklova, which hitherto generally had been called Syenites, are rather to be considered as quartz-bearing Diorites. The basalt, which transverse in small veins the "Banatite" from Moldova contains, besides a vitreous ground-mass, only Augite, Olivine, Biatite, and Magnetite, and therefore cannot be united with any one of the great divisions of the basalt rocks.

PHILADELPHIA

Academy of Natural Sciences, Sept. 23.—"Exceptional Conditions in the Vegetation of Forest Seed," by Mr. Thomas Meehan.—Mr. T. Meehan also presented some specimens of a malformed clover, *Trifolium pratense*.—Mr. Gentry made the following remarks regarding the nest of *Vireo solitarius* (Vieil). Audubon, in describing the nest of *Vireo solitarius* (Vieil.) affirms it "is prettily constructed and fixed in a partially pensile manner between two twigs of a low bush, on a branch running horizontally from the main stem, and formed externally of grey lichens, slightly put together, and lined with hair chiefly from the deer and racoon." My experience has been quite different. I have five nests of this species, four of which are perfectly simi-

lar in structure; the remaining one formed of the culms of a species of *Aira*, constituting an exceptional case, and the only one that has ever fallen under my notice. They are all shallow, loose in texture, scarcely surviving the season for which they were designed, and placed between two twigs of a cedar or a maple tree at a considerable elevation from the ground, on a branch nearly horizontal to the main axis. They are built entirely of clusters of male flowers of *Quercus palustris*, which, having performed their allotted function, don their brownish hue at the very period when they can be utilised. Here is evidently a change within a moderately short period, rendered necessary by external causes. This necessity may have grown out of inability to procure the favourite materials, or a desire for self-preservation. I am satisfied, however, that the former has not been the leading one, but that self-preservation has operated in this case for individual and family good.

PARIS

Academy of Sciences, Jan. 19.—M. Bertrand [in the chair.—The following papers were read:—On the theory of shocks, by M. H. Resal.—Memoir on the temperatures observed by means of electric thermometers, at the Jardin des Plantes, from the surface of the ground to a depth of thirty-six metres during the meteorological year 1873, by M. M. Becquerel and E. Becquerel.—On the formation, in the gaseous state, of the oxides of nitrogen from their elements by means of heat, by M. Berthelot. The paper dealt with the thermal phenomena accompanying these formations.—On the discovery of a deposit of bismuth in France, by M. Ad. Carnot.—On organogenesis compared with androgenesis, &c., by M. Ad. Chatin.—On the geometrical properties of rational fractions, by M. F. Lucas.—On the vibratory movement of an elastic wire fastened to a tuning-fork, by M. E. Gripon.—On the measurement of the magnetic movement in very small magnetised needles, by M. E. Bouty.—On the modes of forming black phosphorus, by M. E. Ritter. The author stated that certain samples of phosphorus refuse to blacken when heated to 70°, while others show that property. The latter contain a trace of arsenic, and to arsenide of phosphorus the author attributed the blackening. He gave analysis of the arsenide which agree with the formula As_2P_3 .—On the existence of two isomeric modifications of anhydrous sodic sulphate, by M. L. C. de Coppet.—On the solubility of succinic acid in water, by M. E. Bourgoin.—On a new cause of spontaneous gangrene accompanied by obliteration of the capillary arteries, by M. L. Tripier.—On the pathological development of the eye in the so-called telescope fish, by M. G. Camuset.—During the meeting, the places of MM. Petit and Valz, in the Astronomical section, were filled up. For the first, Dr. Huggins obtained 38 votes, M. Stéphan 2, and Mr. Newcomb 1; for the second, Mr. Newcomb obtained 46 votes, and M. Stéphan, 1; Messrs. Huggins and Newcomb were accordingly elected.

CONTENTS

	PAGE
THE DUTY OF ELECTORS	237
PHYSICAL GEOGRAPHY	238
ANIMAL MECHANICS	239
POLAR EXPLORATION	240
OUR BOOK SHELF	241
LETTERS TO THE EDITOR:—	
Prof. Barrett and Sensitive Flames.—Prof. J. Tyndall, LL.D., F.R.S.	241
Remarkable Fossils.—T. W. COWAN	241
Earthquake in Argyllshire.—T. STEVENSON	242
Telegraphing Extraordinary.—R. S. COLLEY	242
Echo at Maidenhead	242
Flight of Birds.—HORACE B. PORTER	242
Vivisection.—Dr. C. M. INGLEBY	242
Instinct of Monkeys	243
VIVISECTION	243
AMERICAN SCIENTIFIC ENTERPRISE	243
TUBES FOR SILENT ELECTRICAL DISCHARGES (<i>With Illustrations</i>)	244
HAECKEL ON INFUSORIA	247
LECTURE EXPERIMENT (<i>With Illustration</i>)	247
A SCIENCE LECTURE AT THE CHARTERHOUSE	247
NOTES	248
THE ACOUSTIC TRANSPARENCY AND OPACITY OF THE ATMOSPHERE. Royal Institution, Friday Evening Discourse by PROF. TYNDALL, F.R.S. (<i>With Illustration</i>)	251
BIRMINGHAM NATURAL HISTORY AND MICROSCOPICAL SOCIETY	253
SCIENTIFIC SERIALS	254
SOCIETIES AND ACADEMIES	255