

AN interesting discovery has been made in one of the limestone quarries of Stromberg (Rhenish Prussia). In a small cave, such as occur frequently in the calcareous rock, the skeleton of a cave-bear was found. To judge from the thickness and length of the bones the animal must have measured at least 2½ or 3 metres in length and 2 metres in height. The teeth, of which sixteen were found, are of enormous size. Discoveries of this kind however are by no means rare in this neighbourhood, nor indeed in limestone caves generally.

AN earthquake shock was felt in Eastern France on the night of July 21-22 at Aix-les-Bains, Lyons, Grenoble, Chalons, and other places. The time of the phenomenon was 2h. 3s. a.m. at Lyons and Chalons, and the direction from north to south. No accident is reported in either of these places. The shock was also felt in Switzerland in a large number of places, at Geneva, Morges, Lausanne at about 2h. 45m. a.m. local time; indeed it is stated to have been the sharpest felt in the district since 1854. Nowhere has any accident been recorded. A terrible storm was raging in these regions on the 21st, a few hours before the earthquake took place. Spontaneous currents have interrupted also the telegraphic communications.

A SPECIAL library has been established by subscription in Paris for secular education. The subscribers have resolved to adopt a scientific creed, and to prescribe the use of fiction in books written for young people.

MR. RICHARD ANDERSON, the author of the well-known work on "Lightning Conductors," will contribute a short series of articles on "Thunderstorms: their History and Mystery," to the *St. James's Magazine*. The first article will appear in August.

M. BRUGSCH, conservator of the Boulak Museum, has returned from Thebes with the contents of twenty sarcophagi recently discovered behind the ancient Palace of Queen Hatason. Amongst some 5000 antiquities which have been obtained the most remarkable are several mummies in a perfect state of preservation, and of considerable historical interest.

THE boring of the Arlberg tunnel is proceeding with great rapidity. The length finished since June, 1880, is 1720 metres, and an average yearly advance of 2160 metres is confidently expected after a while. The average of Mont Cenis and the St. Gothard was only 1112 and 1670 respectively. The St. Gothard tunnel will be completed by the end of September, but the lines of approach are not likely to be ready before next spring.

THE *Weserzeitung* reports that near the village of Rantrum a quantity of silver has been found buried about one foot deep in the ground. It consists of thirty-four small bars, six fragments of antique silver ornaments, and eight coins; the latter bear Arabic inscriptions, and may probably be dirhems of the Abassidic Caliph of Bagdad, who lived in the eighth century of the present era. The small bars were formerly used as money, and were weighed, before coins had any conventional value. Ornaments were frequently used in the same way. All the objects found were in a vase.

THE seventh Annual Exhibition held by the British Beekeepers' Association was opened at the Horticultural Gardens on Tuesday, and will remain open till Monday next.

A REMARKABLE eruption was recently observed by the passengers of the ss. *Glenelg*, at the northern end of the Bay of Plenty, New Zealand. The water rose suddenly to a height of four feet, and spread over a circle of sixty feet in diameter, throwing up sand, shells, stones, and mud. The steamer was only about twenty yards outside the circle. The water continued boiling for some time.

THE *Italia Centrale*, a paper published at Reggio (Emilia) announces that the most remarkable mud-volcano of the province of Emilia, the Salsa di Querciola, has developed an extraordinary activity for a few days past, and has greatly frightened the neighbouring inhabitants. Loud subterranean noise was heard even in the plains around, incandescent lava was ejected to a height of several metres, and an earthquake was also noticed. Large numbers of tourists and curious inhabitants are proceeding to Regnano to witness the spectacle.

A REMARKABLE natural phenomenon is reported from Cs. Gorbo (Szolnok-Doboka Comitat, Hungary). On June 27 the Buznau Mountain, situated close to the village of Pappelke, suddenly broke in two. The fissure measures 30 to 40 metres in breadth, 25 to 30 metres in depth, and 400 to 500 metres in length. Some of the houses in Pappelke also show cracks, so that the whole seems to have been the effect of an earthquake. A landslip took place at the same time, and a field with an apple-tree in the middle of it has moved about 10 metres nearer to the village. Great excitement prevails in the neighbourhood.

VARIOUS antique bronze arms and implements, altogether weighing about four or five kilogrammes, have been found by forest labourers at a place called Friedhofstannen, in the district of Cattenbühl, near Oberode (Hanover). They were buried in the ground at a very slight depth. The objects consist of battle-axes, a sickle, a knife for taking off the hides of animals, a bracelet, rings. They are supposed to be of Celtic or Phœnician origin. In the neighbourhood of the spot where they were found there is an ancient earth-mound, dating from a very remote period, and inclosed by a circular pit of some 400 yards in circumference, the so-called ring or "kring." Above it was the Hessian frontier fortress of Friedeweh, below it the Spiegelburg.

THE tenth general meeting of the Saxo-Thuringian Apicultural Society will be held at Quedlinburg on July 31-August 2. An exhibition of living bees in hives, also of implements and products of bee-culture, will take place simultaneously.

WE have already received the Calendar of the Newcastle-on-Tyne College of Physical Science for 1881-82.

AN interesting paper on "Prehistoric Hackney" by Mr. J. E. Greenhill, read before the Hackney Natural History Society, has been printed in a separate form.

FROM the *Proceedings* of the Liverpool Naturalists' Field Club we learn that that society has reached its majority. There is the usual account of excursions and an address by the president, the Rev. H. H. Higgins, on "Animal Defences."

THE additions to the Zoological Society's Gardens during the past week include a Silver Fox (*Canis fulvus*, var. *argentata*) from Nova Scotia, presented by Mr. S. R. Platt; three Hedgehogs (*Erinaceus europæus*), British, presented by Mr. W. Dunn, C.M.Z.S.; two Black-tailed Parrakeets (*Polytelis melanurus*) from New South Wales, presented by Mr. Gerald Arbuthnot; a Green Tree Frog (*Hyla arborea*), European, presented by Mrs. Humphrey; six Black and White Geese (*Anseranas melanoleuca*), seven Australian Wild Ducks (*Anas superciliosa*) from Australia, received in exchange. The following, amongst many other insects, may now be seen in the Insectarium:—Perfect specimens of the Swallow-tailed Butterfly (second brood from small larvæ), Camberwell Beauty, Spurge Elephant and Privet Hawk-moths, Northern Brown Butterfly, Chalk-hill Blue Butterfly and Burnet Moth. There are also fine examples of the imago of the Atlas Moth, and larvæ of this moth larger than any yet grown in England.

#### OUR ASTRONOMICAL COLUMN

ENCKE'S COMET.—The ephemeris of this comet for its approaching re-appearance was issued from Pulkowa last month; but unfortunately the editor of the *Astronomische*

*Nachrichten* has not considered it was necessary to reprint it in that journal, where the ephemerides for previous appearances have always found a place.

After the death of Dr. von Asten, the calculations for this comet were taken up by Dr. O. Backlund, who has continued the computation of the perturbations by Venus, the Earth, Mars, Jupiter, and Saturn from 1878 to 1881, taking account also of the effect of the so-called resisting-medium on the mean motion and angle of excentricity. The following are the elements of the comet's orbit:—

Epoch 1881, July 2<sup>o</sup> M.T. at Berlin

Mean anomaly ... ..	319 26 48.7	} M.Eq. 1881 <sup>o</sup> .
Longitude of perihelion ...	158 30 5.5	
„ ascending node ... ..	334 34 3.1	
Inclination ... ..	12 53 0.3	
Angle of excentricity ... ..	57 43 30.75	
Mean daily sidereal motion ...	1072 <sup>o</sup> .65852	

From these elements we find—

Semi-axis major ... 2 <sup>o</sup> 22005	Perihelion dist. ... 0 <sup>o</sup> 34301
Semi axis minor ... 1 <sup>o</sup> 18547	Aphelion dist. ... 4 <sup>o</sup> 09709
Excentricity ... .. 0 <sup>o</sup> 8454969	Period ... .. 1208 <sup>o</sup> 21 days

The track of the comet in the heavens at this appearance is a favourable one for observation in this hemisphere. It will be nearest to the earth on October 11, when it will be distant 0<sup>o</sup>543 of the earth's mean distance from the sun, and situated in the constellation Leo Minor, in the vicinity of the star Fl 21, and the theoretical intensity of light will attain a maximum on November 9, when the comet situated near 89 Virginis will rise about 2h. 15m. before the sun.

The following ephemeris for the month of August is contracted from the accurate one given by Dr. Backlund, and applies to mean midnight at Berlin:—

August	R.A.		Decl.	Log. distance from	
	h.	m. s.		Sun.	Earth.
1	2	56 22	+26	31 <sup>o</sup> 0	0 <sup>o</sup> 2701 ... 0 <sup>o</sup> 2400
3	3	0 23	27	0 <sup>o</sup> 3	
5	3	4 31	27	30 <sup>o</sup> 2	0 <sup>o</sup> 2592 ... 0 <sup>o</sup> 2173
7	3	8 46	28	0 <sup>o</sup> 7	
9	3	13 9	28	31 <sup>o</sup> 9	0 <sup>o</sup> 2478 ... 0 <sup>o</sup> 1934
11	3	17 41	29	3 <sup>o</sup> 9	
13	3	22 22	29	36 <sup>o</sup> 6	0 <sup>o</sup> 2359 ... 0 <sup>o</sup> 1683
15	3	27 14	30	10 <sup>o</sup> 2	
17	3	32 18	30	44 <sup>o</sup> 5	0 <sup>o</sup> 2233 ... 0 <sup>o</sup> 1419
19	3	37 35	31	19 <sup>o</sup> 8	
21	3	43 6	31	56 <sup>o</sup> 0	0 <sup>o</sup> 2101 ... 0 <sup>o</sup> 1142
23	3	48 53	32	33 <sup>o</sup> 1	
25	3	54 58	33	11 <sup>o</sup> 2	0 <sup>o</sup> 1962 ... 0 <sup>o</sup> 0850
27	4	1 23	33	50 <sup>o</sup> 2	
29	4	8 10	34	30 <sup>o</sup> 3	0 <sup>o</sup> 1814 ... 0 <sup>o</sup> 0543
31	4	15 23	+35	11 <sup>o</sup> 3	

It remains to be seen whether the comet can be perceived with the larger telescopes of the present day with a less intensity of light than 0<sup>o</sup>24, which was that at the time of its discovery in August, 1848, with the 15-inch refractor at Harvard College, U.S., and which will correspond to about the day of new moon, August 24.

COMET 1881 *c*.—Elements of this comet have been published in circulars issued from Lord Crawford's Observatory at Dun Echt, from which it appears that it will increase very considerably in brightness. The perihelion passage does not take place until August 21. The comet is rapidly approaching the earth.

### BIOLOGICAL NOTES

ON SOME NEW LOWER GREEN ALGÆ.—George Klebs publishes some very interesting facts about a number of forms of green Algæ found living within the cell-tissues of some flowering-plants. The painstaking way in which the life-history of these have been worked cannot be too sufficiently admired. For full details the student should refer to the numbers of the *Botanische Zeitung* for April and May, where also will be found excellent coloured illustrations of all the species. In order to call attention to these curious species we give the specific diagnosis in detail:—*Family Protococccæ. Genus Chlorochytrium*.—Through continued division into two parts each cell becomes resolved into spherical zoospores, which upon leaving the mother-cell conjugate within the gelatinous envelope. The

zygozoospores before becoming surrounded with a membrane make their way by means of processes into the intercellular spaces of living plants. During the time favourable for vegetation many generations follow one another in a single year; that nearest to the winter falls into a resting stage. *Chlorochytrium lemnae*.—This species lives in the widened intercellular spaces of the parenchyma of the *Lemna trisulca*: cells chiefly spherical or elliptical; the part of the growing zygozospore which remains in connection with the epidermis becomes a spherical cellulose plug. In the next genus, *Endosphæra*, through continued division into two, each cell falls into a number of daughter-cells surrounded with a membrane, from which, by further division, the spherical zoospores result; those, taking their origin from the same mother-cell, immediately upon leaving it conjugate; they make their way into living tissues like those of the *Chlorochytrium*. The formation of zoospores only takes place in the spring; the new generation requires a full year to reach maturity. The species *Endosphæra biennis* lives in the intercellular spaces of the sub-epidermal parenchyma of leaves of *Potamogeton lucens*: its cells are mostly spherical; the part of the germinating zoospore which remains in connection with the epidermis soon dies off. In the genus *Phyllobium* at the time of maturity, the protoplasm of every cell containing chlorophyll is differentiated into cylindrical or spherical portions, through the changing of some of these into smaller ones, zoospores—both macro and micro are formed—these conjugate. The zygozoospores make their way into the stomates of partly living, partly dead leaves of phanerogams. The development of every cell takes a year. The species *Phyllobium dimorphum* lives in the leaves of *Lysimachia nummularia*, *Ajuga*, *Chlora*, &c.; the zygozoospores develop processes which grow into branched green tubes among the vascular bundles belonging to the veins of the leaves. The protoplasm of those zygozoospores which develop a process forms into either a spherical or longish resting cell, which lasts during the winter, and in the next summer again develops zoospores. According to the surrounding circumstances the processes are well developed or not. They may be quite rudimentary, in which case small tubeless resting cells become formed, which form asexual zoospores. In the genus *Scotinosphæra* every cell shows at the time of maturity a differentiation of its green protoplasm into cylindrical or spherical bodies; by their conjugating, during which a reddish granular substance is secreted, a single mass is formed, through whose repeated division, during which division the granular substance is gradually again taken up, the zoospores are formed. These are asexual, and make their way into decaying vegetable tissues. Their development lasts a year. *Scotinosphæra paradoxa* lives in the dead or dying tissues of *Lemna trisulca*, and also in species of *Hypnum*. Its cells are mostly spherical, and the zoospores are spindle-shaped. (*Botanische Zeitung*, May 27, 1881.)

ON THE INFLUENCE OF INTERMITTENT ILLUMINATION ON THE DEVELOPMENT OF CHLOROPHYLL.—Dr. Karl Mikosch and Dr. Adolf Stöhr publish the result of their investigations made in the Physiological Institution of the Vienna University. The results of these they summarise as follows:—If a continually-lasting 2.5-minutes illumination of etiolated seedlings of barley or oats is compared with an intermittent illumination in the relation of 1 : 1 lasting five minutes, then one will find that in both cases the light is throughout present an equal time. Now if the chlorophyll-formation takes place at the same time as the illumination, then the working of the continued illumination must exactly correspond at the end of 2.5 minutes with the sum of the single effects of the intermittent illumination. As a matter of fact, however, at the end of the continued illumination there has been either no chlorophyll formed, or at any rate no quantity of it that can be pointed out anywhere. On the other hand, the mass of chlorophyll which is formed during the intermittent illumination is beyond doubt capable of being pointed out with a spectroscope. One must therefore imagine that a certain time elapses between illumination and chlorophyll-formation. From this however it follows:—1. That the chlorophyll-formation is a process of photochemic induction. The first trace of chlorophyll that can be pointed out with a spectroscope appears in seedlings of barley and oats grown in the dark after illumination lasting five minutes; it is a matter of indifference whether it is illuminated the whole time through, or only in the relation of 1 : 1 second. One cannot take for granted that in the one case only the half quantity of chlorophyll is formed when an alcoholic solution even shows the absorption-lines of the chlorophyll spectrum, still this will clearly disappear if the solution is made