

A FRENCH translation of Prof. Romanes's "Mental Evolution in Man" is in course of preparation in Paris.

THE *Oesterreichische Botanische Zeitschrift*, now in its thirtieth year, is edited, from the commencement of the present year, by Dr. Richard R. von Wettstein.

AT the annual meeting of the Governors of Aberdare Hall, University College, Cardiff, which took place this month, the Executive Committee were able to submit a most satisfactory report. Several students had distinguished themselves by gaining scholarships both at the College and Hall; two had taken the B.A. degree (London); others had passed the Intermediate in Arts and matriculation examinations, among whom was Miss Moss, who took the twelfth place in Honours division, matriculation examination.

THE additions to the Zoological Society's Gardens during the past week include two Chinese Mynahs (*Acridotheres cristatellus*) from China, presented by Mrs. Rigby; a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, presented by Miss Liming; a Long-tailed Copsychus (*Copsychus macrurus*, ♂) from India, two Silky Bower-Birds (*Ptilonorhynchus violaceus*, ♂ ♀) from Australia, a Blue and Yellow Macaw (*Ara ararauna*) from South America, deposited; two Squirrel Monkeys (*Chrysotrrix sciurea*) from Guiana, a Four-horned Antelope (*Tetracerus quadricornis*, ♂) from India, a South American Flamingo (*Phenicopterus ignipalliatu*s) from South America, purchased; a Gayal (*Bibos frontalis*, ♀), a Vulpine Phalanger (*Phalangista vulpina*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF JUPITER.—An excellent series of eighty-four drawings of the planet Jupiter at different periods during the years 1881-86, made with the reflector of 3 feet aperture at Birr Castle Observatory by Dr. Boeddicker, has just been published in the form of a communication to the Royal Dublin Society (vol. iv. series 2, March 1889). Twenty-two of the drawings were made during the opposition of 1881-82, thirty-one during 1882-83, twenty-one during 1883-84, eight during 1884-85, and two during 1885-86. The drawings made at the telescope have been exactly reproduced by a photo-mechanical process in order to avoid the errors which might have arisen by the employment of the ordinary lithographic process. Throughout the descriptive notes a very convenient notation has been employed for reference to the various features. Dr. Boeddicker draws attention to the three observations of March 16, 1883, showing remarkable changes in the appearance of one of the belts during the course of an hour. The first drawing shows two detached patches, which, in the succeeding drawings, become the shadows of large cumulus-like clouds lying across the Jovian surface. It is suggested that these apparent changes may be simply due to the combination of the more obvious details with the finer ones after prolonged examination, and that the discrepancies between drawings made at the same time by different observers may thus be accounted for. Photography may be expected in the near future to overcome this difficulty.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 MARCH 31—APRIL 6.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on March 31

Sun rises, 5h. 38m.; souths, 12h. 4m. 8.2s.; sets, 18h. 30m.; right asc. on meridian, oh. 40.3m.; decl. 4° 21' N. Sidereal Time at Sunset, 7h. 7m.

Moon (New on March 31, 12h.) rises, 6h. 12m.; souths, 12h. 13m.; sets, 18h. 28m.; right asc. on meridian, oh. 49.2m.; decl. 0° 7' S.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury..	5	17	10	47	16	17	23 23.3	6 35 S.
Venus....	6	4	14	16	22	28	2 52.9	22 52 N.
Mars.....	6	16	13	22	20	28	1 58.3	12 1 N.
Jupiter...	2	1	5	57	9	53	18 31.9	22 57 S.
Saturn....	12	49	20	28	4	7*	9 5.7	17 53 N.
Uranus ...	19	16*	0	42	6	8	13 16.3	7 21 S.
Neptune..	7	33	15	17	23	1	3 53.7	18 37 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

April. h.
2 ... 2 ... Mars in conjunction with and 5° 7' north of the Moon.
3 ... 5 ... Venus in conjunction with and 11° 7' north of the Moon.

Variable Stars.

Star.	R.A.		Decl.		h.	m.
	h.	m.	h.	m.		
U Cephei ...	0	52.5	81	17 N.	Apr. 1,	4 15 m
Algol ...	3	1.0	40	32 N.	Mar. 31,	19 50 m
ζ Geminorum ...	6	57.5	20	44 N.	Apr. 4,	1 0 M
R Canis Minoris ...	7	2.6	10	12 N.	„	5, m
R Canis Majoris ...	7	14.5	16	11 S.	„	5, 19 47 m
and at intervals of 27 16						
U Monocerotis ...	7	25.5	9	33 S.	Apr. 6,	M
U Geminorum ...	7	48.5	22	18 N.	„	6, M
W Virginis ...	13	20.3	2	48 S.	„	2, 1 0 m
X Boötis ...	14	18.9	16	50 N.	„	1, M
δ Libræ ...	14	55.1	8	5 S.	„	2, 2 0 m
U Coronæ ...	15	13.7	32	3 N.	„	4, 4 30 m
8 Lyræ... ..	18	46.0	33	14 N.	„	3, 0 0 m ₂
R Lyræ ...	18	52.0	43	48 N.	„	5, m
δ Cephei ..	22	25.0	57	51 N.	„	2, 23 0 M

M signifies maximum; m minimum; m₂ secondary minimum.

Meteor-Showers.

	R.A.	Decl.	
Near γ Libræ ...	233	15 S.	Swift; long paths.
From Delphinus ...	305	12 N.	Slow; bright.

GEOGRAPHICAL NOTES.

AT the meeting of the Geographical Society on Monday two papers were read, both dealing with the Caucasus, midway between Kazbek and Elburz. Here the chain towers up in two great parallel crests, containing within a few square miles at least half a dozen peaks over 16,000 feet in height, an elevation probably reached nowhere else by the summits of the crystalline crest. Two of these peaks are recognized as the second and third summits of the Caucasus—Koshtantau, 17,091 feet; and Dychtau, 16,924 feet. One of the papers, by Mr. A. F. Mummery, described his ascent last summer of Koshtantau, while Mr. H. W. Holder dealt with the peaks of the neighbouring Bezingi Glacier. From Mujal, on the south-west of the Zanner Glacier, Mr. Mummery and his companion made their way round by the Thuber and Gvalda passes to Bezingi in order to make the ascent from that side. The arrangement of this part of the chain, Mr. Mummery states, is, from an Alpine point of view, very curious. There is a lofty ridge with occasional *aiguilles*, from the southern slopes of which stretch the great ice-fields of the Thuber, and there is a second and rather less lofty ridge to the north and parallel to it, from the northern flank of which flow the Basil-su and its various affluents. In the narrow trough between these two ridges lies the head of the Gvalda Glacier. Though seldom so clearly marked as in this instance, the same system of short parallel ridges may be traced throughout the whole central group, with the result that the upper and middle basins of the great glaciers are nearly always parallel to the main ridges, and it is only when the drainage from these catchment basins reaches the head of the lateral valleys that the ice sweeps round and flows away at right angles from the watershed. The Gvalda Glacier is probably the most important on the south side of the Caucasus, and far exceeds in size any on the south slope of the Alps. Its basin probably exceeds in extent that of the Glacier du Géant, to which it is not without a resemblance. The Caucasian glaciers in this part of the chain are

much less crevassed than the Alpine, apparently due to the lesser inclination of the great glaciers, and possibly to the greater thickness of their ice. With reference to Caucasian forests, Mr. Mummery has some interesting observations. The upper valley of the Basil-su can still boast a fairly extensive forest; but partly by the axe, and mainly by the agency of the sheep and goats, the forests are fast shrinking. Below a certain point in the Basil-su Valley, not a tree, not a bush is to be seen; the country has been denuded by the flocks of the natives. Mr. Mummery is inclined to attribute the extraordinary contrast between the treelessness of the northern valleys and the dense forests of the southern less to climatic differences than to the form in which the wealth of their respective inhabitants exists: in the one case, oxen, horses, sheep, and goats; in the other, well-tilled and neatly fenced fields and orchards. Though at first sight it appears difficult to believe that sheep and goats can destroy the forest over great stretches of country, a careful examination of the Upper Basil-su shows that the cause is sufficient to produce a continuous contraction of the forest area, and leaves it a mere question of time as to when the last tree in that valley shall be cut down and burnt. After overcoming many difficulties, Mr. Mummery reached the summit of Kosh-tantau, the first time the mountain had been scaled.

MR. HOLDER and his friends also succeeded in climbing Kosh-tantau and several other peaks. He gave in his paper an instructive account of the striking difference in the character of the mountains which form the two great chains of the Caucasus and the Alps. Mr. Holder was much impressed with the wildness, the majesty, the awfulness, of the Caucasus. Whilst the main glacier streams, e.g. the Bezingi, the Mishirgi, and the Dych-su, have but a slight fall, and are but little crevassed, the upper parts of the glaciers, those which come down from the mountains to form the great streams, have so steep a fall that they may be compared rather to cascades than streams of ice, and are cut into *seracs* of the most fantastic character. Comparatively little snow lies on the steep southern faces of the mountains, and the rocks which face the south are so broken and loose that the danger of falling stones in ascending and descending is extreme. No single bit of rock can be trusted, and the rope ought never for a moment to be discarded. On the northern faces much more snow lies, and the rocks were firmer and more reliable. The climate of the Caucasus is healthy and invigorating, yet distinctly more humid than in the Alps. It may perhaps be sufficiently interesting to note that none of the party experienced the slightest inconvenience on account of the rarity of the atmosphere at the highest altitude reached, over 17,000 feet; but that above about 15,000 feet the snow was always of the light and powdery character so tantalizing and fatiguing to mountaineers.

THE March number of *Petermann's Mitteilungen* contains a long paper by Spiridon Gopčević on the ethnographical conditions of Macedonia and Old Servia. Herr Otto F. Ehlers contributes a lively account of his ascent of Kilimanjaro last summer. He does not add much to our knowledge of the mountain, nor did he reach the actual summit. He went round its north face, and endeavoured from the north-east side to find out the character of the summit. He found the same wall of ice which was seen by Dr. Meyer. He states that so far as he could observe he could see no trace of a crater, while the masses of ice and snow lay in quiet wave-like lines, with much fresh snow. The height he estimates at over 19,690 feet. He makes the extraordinary statement that traces of elephants, buffaloes, and antelopes were met with at a height of about 16,000 feet, where also he found the last traces of vegetation.

M. JULES BORELLI has just returned from an exploration extending over nearly two years in the country of Shoa and in Galla Land, undertaken under the patronage of the French Government. M. Borelli has added much to our knowledge of Shoa and its people, and among other things has discovered the source of the Hawash. His most important work has, however, been done in the region to the south of Shoa, in the country peopled mainly by the Gallas. He traced the Omo River, to about 6° 20' N. lat. His map throws quite a new light on the hydrography of the region. Hitherto, the Omo has been conjectured to be the upper course of the Jub, which falls into the Indian Ocean at the equator. But the data collected by M. Borelli, and which appear to be confirmed by the recent discoveries of Count Teleki, open the field to new hypotheses.

It would appear that the Omo, instead of flowing towards the east, takes a westerly and then a southerly direction, when, at about 2° N. lat., with a breadth of over 1500 feet, it expands into the great lake Samburu. It remains now to discover whether this lake is an African Caspian, or whether it has an outflow towards Lake Victoria Nyanza. In that case the Omo becomes a remote feeder of the Nile.

ELECTRICAL NOTES.

NAGAOKA (*Phil. Mag.*, February 1889) of the Imperial University, Japan, has investigated the effects of torsion and longitudinal stress on the magnetization of nickel. Stress increases the magnetization of iron, but diminishes that of nickel, and the effect of torsion is also reversed in the two metals. Twisting nickel wire increases magnetization, while it diminishes that of iron. Nagaoka finds that this is true for weak stresses only. Beyond a critical value of the stress in a constant field, one end of the nickel wire acquires the two opposite kinds of magnetism during torsion and detorsion. The nickel wire used was unfortunately impure, for it contained 1·7 per cent. of iron, but the fact was clear that during untwisting the polarity of a nickel wire changed sign.

DR. JOHN HOPKINSON, F.R.S., has given the Royal Society (March 7) some interesting facts relating to the magnetization of iron at high temperatures. At 737° C. all traces of magnetism disappear, but before this point is reached, viz. 727°, its permeability increases with great rapidity to a very high figure, when it suddenly drops to unity. In a subsequent paper, read March 21, he showed that the resistance also makes an abrupt change at the same temperature, which is that of recalcence, as discovered by Barrett.

SHELFORD BIDWELL (R.S., March 14) showed a very pretty experiment by which the effect of radiations on the magnetization of iron were made evident. An iron bar is carefully annealed, cooled, magnetized, and then demagnetized by currents without any mechanical motion. The condensed beam from an oxyhydrogen lamp is thrown upon its pole, when magnetism at once appears. There is an instantaneous magnetic change, which is purely an effect of radiation.

A. BERNSTEIN (*Centralblatt für Electrotechnik*, i. p. 165, 1889) has proved that the formula $C = a\sqrt{d^3}$ is not true for the fusing currents of wires of a diameter smaller than 0·25 mm. It is known that such fine wires absorb more energy than thicker ones to acquire the same temperature in air, and that the formula is $C = ad$. Bernstein has experimented with carbons of different diameters in the moderate vacuum of a glow lamp, and has obtained the following results:—

Diameter in mm.	Energy per sq. mm. of surface.
0·9	0·51
0·56	0·54
0·295	0·56
0·185	0·85
0·15	0·95

His conclusion is that lamps with thick carbons absorb less energy relatively than lamps with fine filaments, and are therefore more economical.

C. S. BOWIE (*Electric World*, February 23, 1889) has found that the static electricity generated by calender rolls in a paper mill acts very injuriously on the life of glow lamps. They are now effectually protected with wire guards.

AMONG the numerous practical purposes to which electricity can be applied *tanning* must be added. Leather is said to be produced from the raw hide in four days.

IF Prof. Oliver Lodge has failed to secure general faith in his lightning conductor theories, he at least has succeeded in directing scientific fashion to experimenting with Leyden jars. Right (*Bull. Acad. dei Lincei*, xii. 16, 1888) has constructed a battery of 108 condensers, having a capacity of 18,810 electrostatic units. With it he has produced sparks 5 metres long over strips of glass coated with zinc filings, and 1 metre long over water. Platinum, iron, brass, gold wires, very fine and of 3½ metres length, are instantly vaporized into beautiful coloured coronæ of the same shape as that impressed on the wire. The wire becomes vapour at a high temperature, and forms as it were a vacuum tube, the sides of which are cold air.